AVX **Periodic Tables**

Version 10.1

The Latest CV Tables from the Leader in Capacitor Technology

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COMMERCIAL PRODUCTS

CERAMIC CAPACITORS

TIN/LEAD TERMINATIONS

AUTOMOTIVE SERIES CERAMIC CAPACITORS

SWITCH MODE POWER SUPPLY CAPACITORS

DECOUPLING/LOW INDUCTANCE CAPACITORS

TANTALUM SURFACE MOUNT

HIGH TEMPERATURE

OXICAP® SURFACE MOUNT NIOBIUM OXIDE

RF / MICROWAVE SURFACE MOUNT

FILM CHIP CAPACITORS

LEADED CAPACITORS - MLC

LEADED CAPACITORS - TANTALUM

SUPERCAPACITORS

CIRCUIT PROTECTION

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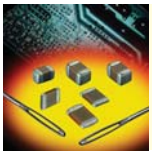
Product Line

CERAMIC CAPACITORS

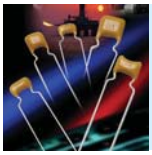


Surface Mount Multilayer Ceramic Capacitors

Automotive	HiCV
MIL/COTS-Plus/Space	High Temperature
CDR/High Reliability	Array
Flexiterm®	Tip and Ring
Flexisafe™	Low Distortion
Ultrathin	Gold Terminated
Tin/Lead	Tin/Lead w Flexiterm®

Switch Mode Power Supply Capacitors (SMPS)

MIL/Space	High Temp
Leaded	High Voltage
TurboCap™	



Leaded Multilayer Ceramic Capacitors

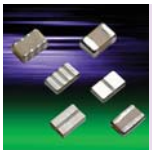
Axial	High Voltage
Radial	MIL/Space/High Reliability
2-Pin Dip	

High Voltage

Surface Mount	Flexiterm®
Leaded	MIL

Glass Capacitor

LOW INDUCTANCE / SIGNAL INTEGRITY



Reverse Geometry

Interdigitated

Ultra Low Inductance

CoreCap® Hybrid Niobium Oxide - MLCC

Low Inductance Array

TANTALUM CAPACITORS

Surface Mount Tantalum Capacitors

Low ESR	High Temp (THJ)
CWR	Established Reliability
Polymer	TACmicrochip®
Fused	Tin/Lead

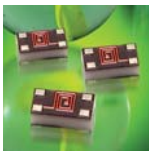
Leaded Tantalum Capacitors

Wet Tantalum
Radial Leaded

Niobium Oxide / OxiCap®

Low ESR
COTS-Plus
Multianode

RF PRODUCTS

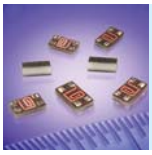


Inductors – Thin-Film

Filters

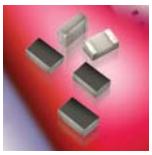
Band Pass	Custom
Low Pass	EMI

Passive Miniaturized Components



Couplers

3dB	3dB 90°
High Directivity	Splitter/Combiner



Capacitors

Microwave	Medium Power
Single Layer	Tight Tolerance/Thin-Film
High Power	RF Capacitors
Broadband	DC Block

ENERGY HARVESTING

Film Capacitors

Surface Mount Film Capacitors
Medium Power Film
High Power Film

Ceramic Capacitors

Molded Ceramic
Stacked Ceramic

Tantalum Capacitors

Multi-Anode (low ESR)
Stacked Capacitors

Pulse Power Supercap

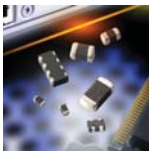
BestCap®

Product Line

CIRCUIT PROTECTION

MLV Transient Voltage Suppressors

Varistors
Multi-element Varistors
Feedthru Varistors
Application Specific Varistors



- AntennaGuard
- USB Series
- CAN Series
- StaticGuard
- Automotive Series
- High Temperature
- Sub pF
- Low Leakage
- Maxcap
- Capguard
- Medium Power Varistors

Thermistors

Negative Temperature Compensation
- Leaded
- Surface Mount

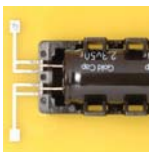
Fuses – Thin-Film

CONNECTORS

LED/Solid State Lighting

Wire to Board
Board to Board
End Cap

Board to Board



DIN 41612 2-Piece
Compression Low Profile 1-Piece
Microleaf/Fine Pitch 2-Piece

FFC/FPC

ZIF/LIF

Automotive

Custom connectors/modules
Pressfit
Insulation Displacement

Portable Devices

Battery
SIM
Memory Products
Speaker/Microphone
I/O

FILTERS

EMI Filters

- Surface Mount
- High Current
- Bulkhead
- MIL/Space

Noise Filters

Low Pass Filters

Ceramic Filters

SAW Filters

Filtered Arrays

Optical Low Pass

PIEZOELECTRIC DEVICES

Telephone Ringer/External Drive

External Drive/Self-Oscillating

Shock Sensor

Actuator

TIMING PRODUCTS

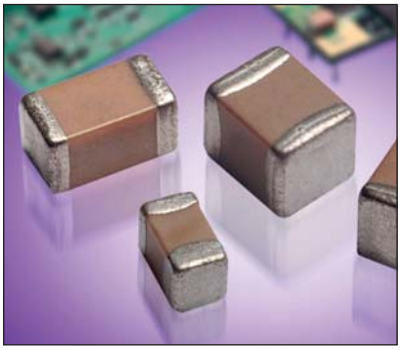
Oscillators

Crystals

Resonators

Standard NP0 (C0G) MLCC

Standard NP0 Dielectric



C0G (NP0) is the most popular formulation of the "temperature-compensating," EIA Class I ceramic materials. Modern C0G (NP0) formulations contain neodymium, samarium and other rare earth oxides.

C0G (NP0) ceramics offer one of the most stable capacitor dielectrics available. Capacitance change with temperature is 0 ±30ppm/°C which is less than ±0.3% ΔC from -55°C to +125°C. Capacitance drift or hysteresis for C0G (NP0) ceramics is negligible at less than ±0.05% versus up to ±2% for films. Typical capacitance change with life is less than ±0.1% for C0G (NP0), one-fifth that shown by most other dielectrics. C0G (NP0) formulations show no aging characteristics.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/ccog.pdf

HOW TO ORDER

0805	5	A	101	J	A	T	2	A
Size (L" x W")	**Voltage** Y = 16V 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric** C0G (NP0) = A	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** B = ±.10 pF (<10pF) C = ±.25 pF (<10pF) D = ±.50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10%	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn 7 = Gold Plated **Contact Factory For 1 = Pd/Ag Term**	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

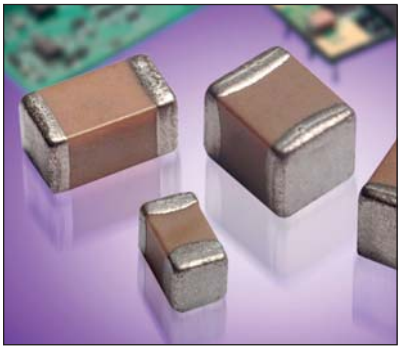
SIZE		0201		0402			0603				0805					1206						1210					1812					1825			2220			2225		
	WVDC	25	50	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200
Cap (pF)	0.5	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.0	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.2	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.5	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	1.8	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	2.2	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	2.7	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	3.3	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	3.9	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	4.7	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	5.6	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	6.8	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	8.2	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																		
	10	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	12	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	15	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	18	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	22	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	27	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	33	A	A	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	39	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	47	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	56	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	68	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	82	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	100	A		C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	120			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	150			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J					J													
	180			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M					J													
	220			C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M					J													
	270			C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M					J													
	330			C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M					J													
	390			C	C	C	G	G	G		J	J	J	J	M	J	J	J	J	J	M					M													
	470						G	G	G		J	J	J	J	M	J	J	J	J	J	M					M													
	560						G	G	G		J	J	J	J	M	J	J	J	J	J	P	J	J	J	J	M													
	680						G	G	G		J	J	J	J	P	J	J	J	J	J	P	J	J	J	J	M													
	820						G	G	G		J	J	J	J		J	J	J	J	M	P	J	J	J	J	M													
	1000						G	G	G		J	J	J	J		J	J	J	J	Q	Q	J	J	J	J	M	K	K	K	K	M	M	M	M				M	M	P
	1200										J	J	J			J	J	J	J	Q	Q	J	J	J	M	M	K	K	K	K	M	M	M	M				M	M	P
	1500										J	J	J			J	J	J	M	Q	Q	J	J	J	M	M	K	K	K	K	M	M	M	M				M	M	P
	1800										J	J	J			J	J	M	M			J	J	J	M		K	K	K	K	M	M	M	M				M	M	P
	2200										J	J	N			J	J	M	P			J	J	J	Q		K	K	K	P	Q	M	M	M				M	M	P
	2700										J	J	N			J	J	M	P			J	J	J	Q		K	K	K	P	Q	M	M	M				M	M	P
	3300										J	J				J	J	M	P			J	J	J			K	K	K	P	Q	M	M	M			X	M	M	P
	3900										J	J				J	J	M	P			J	J	M			K	K	K	P	Q	M	M	M	X	X	X	M	M	P
	4700										J	J				J	J	M	P			J	J	M			K	K	K	P	Q	M	M	M	X	X	X	M	M	P
	5600															M	M	M				J	J				K	K	M	P	X	M	M	M	X	X	X	M	M	P
	6800															M	M					J	J				K	K	M	M		M	M	M	X	X	X	M	M	P
	8200															M	M					J	J				K	K	M	M		M	M	M	X	X	X	M	M	P
Cap (µF)	0.010															M	M					J	J				K	M	M			M	M	M	X	X	X	M	M	P
	0.012																										K	M	M			M	M	M	X	X	X	M	M	P
	0.015																										M	M				M	M	M	X	X	X	M	M	Y
	0.018																										M	M				P	M		X	X	X	M	Y	Y
	0.022																										M	M				P			X	X	X	M	Y	Y
	0.027																										M	M				P			X	X		M	P	
	0.033																										M	M				P			X	X		P		
	0.039																										M	M				P			Y	Y		P		
	0.047																										M	M				P						P		
	0.068																										M	M										P		
	0.082																																					Q		
	0.1																																					Q		
	WVDC	25	50	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200	50	100	200
SIZE		0201		0402			0603				0805					1206						1210					1812					1825			2220			2225		

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

RoHS COMPLIANT

Standard X7R MLCC

Standard X7R Dielectric



X7R formulations are classified as "temperature stable" ceramics and fall into EIA Class II materials. X7R is the most popular of these intermediate dielectric constant materials. Its temperature variation of capacitance is within ±15% from -55°C to +125°C. This capacitance change is non-linear.

Capacitance for X7R varies under the influence of electrical operating conditions such as voltage and frequency.

X7R dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx7r.pdf

HOW TO ORDER

0805	5	C	103	M	A	T	2	A
Size (L" x W")	**Voltage** 6 = 6.3V Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric** X7R = C	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** J = ± 5%* K = ±10% M = ± 20% *≤1µF only	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn 7 = Gold Plated* Z = FLEXITERM®** *Optional termination **See FLEXITERM® X7R section	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

SIZE		0201			0402			0603							0805							1206								1210								1812				1825		2220				2225	
	WVDC	10	16	25	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
Cap (pF)	100	A	A	A								G	G	G		J	J	J	J	J	J								K																			
	150	A	A	A								G	G	G		J	J	J	J	J	J								K																			
	220	A	A	A			C					G	G	G		J	J	J	J	J	J								K																			
	330	A	A	A			C					G	G	G		J	J	J	J	J	J								K																			
	470	A	A				C					G	G	G		J	J	J	J	J	J								K																			
	680	A	A				C					G	G	G		J	J	J	J	J	J								K																			
	1000	A	A				C					G	G	G		J	J	J	J	J	J								K																			
	1500	A					C					G	G			J	J	J	J	J	J		J	J	J	J	J	J	M	J	J	J	J	J	J	M												
	2200	A					C					G	G			J	J	J	J	J	J		J	J	J	J	J	J	M	J	J	J	J	J	J	M												
	3300	A				C	C					G	G			J	J	J	J	J	J		J	J	J	J	J	J	M	J	J	J	J	J	J	M												
	4700	A				C	C					G	G			J	J	J	J	J	J		J	J	J	J	J	J	M	J	J	J	J	J	J	M												
	6800	A			C	C						G	G			J	J	J	J	J	J		J	J	J	J	J	J	M	J	J	J	J	J	J	M												
Cap (µF	0.010	A			C	C						G	G	G		J	J	J	J	J	J		J	J	J	J	J	J	M	J	J	J	J	J	J	M	K	K	K	K	M	M		X	X	X	M	P
	0.015				C						G	G				J	J	J	J	J	M		J	J	J	J	J	J	P	J	J	J	J	J	J	Q	K	K	K	P	M	M		X	X	X	M	P
	0.022				C						G	G				J	J	J	J	J	M		J	J	J	J	J	J		J	J	J	J	J	J		K	K	K	P	M	M		X	X	X	M	P
	0.033										G	G				J	J	J	J	N			J	J	J	J	J	J	M	J	J	J	J	J	J	Q	K	K	K	X	M	M		X	X	X	M	P
	0.047									G	G	G				J	J	J	J	N			J	J	J	J	J	J		J	J	J	J	J	J		K	K	K	Z	M	M		X	X	X	M	P
	0.068									G	G	G				J	J	J	J	N			J	J	J	J	J	J	P	J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.10					C			G	G	G	G				J	J	J	J	N			J	J	J	J	J	M		J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.15							G	G							J	J	J	J	N	N		J	J	J	J	J	M		J	J	J	J	J	Z		K	K	P		M	M		X	X	X	M	P
	0.22							G	G			J*				J	J	J	J	N	N		J	J	J	J	M			J	J	J	J	P			K	K	P		M	M		X	X	X	M	P
	0.33															N	N	N	N	N	N		J	J	M	P	Q			J	J	M	Q				K	M	X		M	M		X	X	X	M	P
	0.47											J*				N	N	N	N				M	M	Q	Q	Q			M	M	P	Q				K	P			M	M		X	X		M	P
	0.68															N	N	N	N				M	M	Q	Q	Q			M	M	P	X				M	Q			M	P		X	X		M	P
	1.0									J*	J*					N	N	N					M	M	Q	Q	Q			N	N	P	X	Z			M	X			M	P		X	X		M	P
	1.5																						P	Q	Q	Q				N	N	Z	Z	Z			Z	Z			M			X	X		M	X
	2.2							J*											P*				Q	Q	Q					X	X	Z	Z	Z			Z							X	X		M	
	3.3																													X	X	Z	Z				Z							X	Z			
	4.7															P*	P*						Q*	Q*	Q*					Z	Z	Z	Z				Z							X	Z			
	10														P*								Q*	Q*						Z	Z	Z*													Z				
	22																					Q*								Z*	Z*														Z				
	47																																																
	100																																																
	WVDC	10	16	25	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
SIZE		0201			0402			0603							0805							1206								1210								1812				1825		2220				2225	

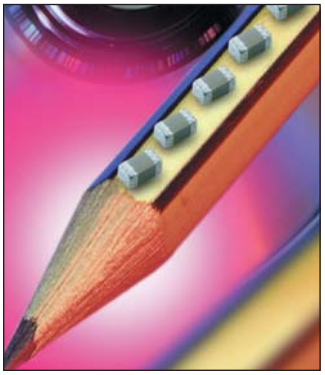
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

*Optional Specifications – Contact factory

RoHS COMPLIANT

FLEXITERM® MLCC

X7R FLEXITERM® for Board Flexure Applications



With increased requirements from the automotive industry for additional component robustness, AVX recognized the need to produce a MLCC with enhanced mechanical strength. It was noted that many components may be subject to severe flexing and vibration when used in various under the hood automotive and other harsh environment applications.

To satisfy the requirement for enhanced mechanical strength, AVX had to find a way of ensuring electrical integrity is maintained whilst external forces are being applied to the component. It was found that the structure of the termination needed to be flexible and after much research and development, AVX launched FLEXITERM®. FLEXITERM® is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor with an X7R dielectric. **The industry standard for flexure is 2mm minimum. Using FLEXITERM®, AVX provides up to 5mm of flexure without internal cracks. Beyond 5mm, the capacitor will generally fail "open".**

As well as for automotive applications FLEXITERM® will provide Design Engineers with a satisfactory solution when designing PCB's which may be subject to high levels of board flexure.

APPLICATIONS

- **High Flexure Stress Circuit Boards**
- **Variable Temperature Applications**
- **Automotive Applications**

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/softterm.pdf

HOW TO ORDER

0805	5	C	104	K	A	Z	2	A
Style	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0603	Z = 10V	C = X7R	2 Sig Digits +	J = ± 5%*	A=Commercial	Z = FLEXITERM®	2 = 7" reel	A = Std. Product
0805	Y = 16V		Number of Zeros	K = ±10%	4 = Automotive	For FLEXITERM®	4 = 13" reel	
1206	3 = 25V		e.g., 104 = 100nF	M = ± 20%		with Tin/Lead		
1210	5 = 50V					termination see		
1812	1 = 100V			*≤1µF only		AVX LD Series		
2220	2 = 200V							

RoHS COMPLIANT

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

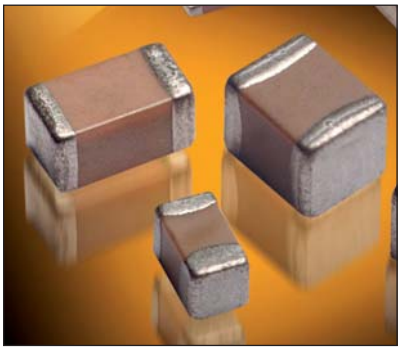
	0603					0805						1206					1210				1812				2220		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
101																											
121																											
151																											
181																											
221																											
271	J	J	J	J	J	J																					
331	J	J	J	J	J	J	J	J	J	J	J																
391	J	J	J	J	J	J	J	J	J	J	J																
471	J	J	J	J	J	J	J	J	J	J	J																
561	J	J	J	J	J	J	J	J	J	J	J																
681	J	J	J	J	J	J	J	J	J	J	J																
821	J	J	J	J	J	J	J	J	J	J	J																
102	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J											
122	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
152	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
182	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
222	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
272	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
332	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
392	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
472	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
562	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
682	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
822	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
103	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
123	J	J	J			J	J	J	J	J	M	J	J	J	J	J											
153	J	J	J			J	J	J	J	J	M	J	J	J	J	J											
183	J	J	J			J	J	J	J	J	M	J	J	J	J	J											
223	J	J	J			J	J	J	J	J	M	J	J	J	J	J				K							
273	J	J	J			J	J	J	J	J	M	J	J	J	J	J				K							
333	J	J	J			J	J	J	J	J	M	J	J	J	J	J				K							
393	J	J	J			J	J	J	J	J	M	J	J	J	M	J				K							
473	J	J	J			J	J	J	J	J	M	J	J	J	M	J				K							
563	J	J	J			J	J	J	J	J	N	J	J	J	M	J	K	K	K	M	K	K	K	K			
683	J	J	J			J	J	J	J	J	N	J	J	J	M	J	K	K	K	M	K	K	K	K			
823	J	J	J			J	J	J	J	J	N	J	J	J	P	J	K	K	K	M	K	K	K	K			
104	J	J	J			J	J	J	J	J	N	J	J	J	Q	J	K	K	K	P	K	K	K	K	X	X	X
124						J	J	J	N	N		J	J	P	Q		K	K	K	Q	K	K	K	K			
154						M	M	N	N	N		J	J	P	Q		K	K	K	Q	K	K	K	M	X	X	X
184						M	M	N	N	N		J	M	P	Q		M	M	M	Q	K	K	K	M			
224						M	M	N	N	N		J	M	P	Q		M	M	M	Q	M	M	M	X	X	X	X
274						N	N	N	N	N		J	M	P	Q		P	P	P	Q	M	M	M	X			
334						N	N	N	N	N		J	M	P	Q		P	P	P	Q	M	M	M	X	X	X	X
394						N	N	N	N	N		M	M	P	Q		P	P	P	Q	X	X	X	X			
474						N	N	N	N	N		M	M	P	Q		P	P	P	Q	X	X	X	X	X	X	X
564						N	N	N				M	Q	Q	Q		P	Q	Q	Q	X	X	X	Z			
684						N	N	N				M	Q	Q	Q		P	X	X	X	X	X	X	Z	X	X	X
824						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z			
105						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z	X	X	X
155												Q	Q				P	Z	Z	Z			Z	Z	X	X	X
185												Q	Q				Z	Z	Z	Z			Z	Z			
225												Q	Q				Z	Z	Z	Z			Z	Z	X	X	X
335																	Z	Z	Z				Z				Z
475																	Z	Z	Z				Z				Z
106																									Z	Z	
226																									Z		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
	0603					0805						1206					1210				1812				2220		

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

*Optional Specifications – Contact factory

Standard X7S MLCC

X7S Dielectric



X7S formulations are classified as “temperature stable” ceramics and fall into EIA Class II materials. Its temperature variation of capacitance is within ±22% from –55°C to +125°C. This capacitance change is non-linear.

Capacitance for X7S varies under the influence of electrical operating conditions such as voltage and frequency.

X7S dielectric chip usage covers the broad spectrum of industrial applications where known changes in capacitance due to applied voltages are acceptable.

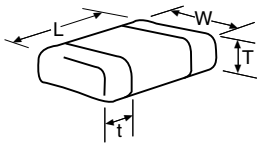
Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx7s.pdf

HOW TO ORDER

1206	Z	Z	105	M	A	T	2	A
Size (L" x W")	**Voltage** 4 = 4V 6 = 6.3V Z = 10V 3 = 25V	**Dielectric** Z = X7S	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10% M = ± 20%	**Failure Rate** A = N/A	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass.	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

SIZE		0402	0603		0805	1206		1210
WVDC		6.3	6.3	25	4	6.3	10	6.3
Cap (pF)	100							
	150							
	220							
	330							
	470							
	680							
	1000							
	1500							
	2200							
	3300							
	4700							
	6800							
Cap (µF	0.010							
	0.015							
	0.022							
	0.033	C						
	0.047	C						
	0.068	C						
	0.10	C						
	0.15							
	0.22			G				
	0.33		G					
	0.47		G					
	0.68		G					
	1.0		G					
	1.5				N	Q		
	2.2				N	Q		
	3.3				N	Q		
	4.7				N	Q	Q	
	10							
	22							Z
	47							
	100							
WVDC		6.3	6.3	25	4	6.3	10	6.3
SIZE		0402	0603		0805	1206		1210

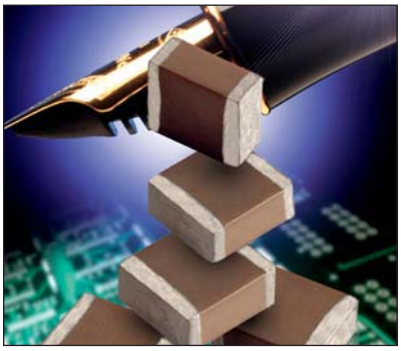


RoHS COMPLIANT

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

Standard X5R MLCC

X5R Dielectric



- General Purpose Dielectric for Ceramic Capacitors
- EIA Class II Dielectric
- Temperature variation of capacitance is within ±15% from -55°C to +85°C
- Well suited for decoupling and filtering applications
- Available in High Capacitance values (up to 100µF)

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx5r.pdf

HOW TO ORDER

1206	4	D	107	M	A	T	2	A
Size (L" x W")	**Voltage** 4 = 4V, 6 = 6.3V, Z = 10V, Y = 16V, 3 = 25V, D = 35V, 5 = 50V	**Dielectric** D = X5R	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10%, M = ± 20%	**Failure Rate** A = N/A	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel, 4 = 13" Reel, 7 = Bulk Cass., 9 = Bulk	**Special Code** A = Std.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

SIZE		0201					0402						0603							0805							1206							1210							1812			
	WVDC	4	6.3	10	16	25	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
Cap (pF)	100					A																																					
	150					A																																					
	220					A						C																															
	330					A						C																															
	470					A						C																															
	680					A						C																															
	1000				A	A						C																															
	1500				A							C																															
	2200			A	A							C																															
	3300			A								C																															
	4700			A							C								G																								
	6800			A							C								G																								
Cap (µF)	0.010			A							C						G	G	G																								
	0.015										C						G	G	G																								
	0.022		A*							C	C						G	G	G						N																		
	0.033									C							G	G	G						N																		
	0.047		A*							C	C						G	G	G						N																		
	0.068									C							G	G	G						N																		
	0.10		A*						C	C	C						G		G				N		N																		
	0.15																G						N	N																		
	0.22	A*	A					C*								G	G						N	N						Q												
	0.33															G	G						N																			
	0.47						C*	C*								G							N						Q	Q												
	0.68															G							N																			
	1.0	A					C*	C*	C*					G	G	G	J*					N	N		P*				Q	Q				X	X	X						
	1.5																																										
	2.2						C*	C*					G*	G*	J*	J*					N	N	N					Q	Q				Z	X								
	3.3												J*	J*	J*	J*				N	N				Q	Q																
	4.7						C*						J*	J*						N	N	N*	N*		Q	Q	Q	Q					Q	Z								
	10												K	J*						N*	N*	N*	*		Q	Q	Q	Q*				X	Z	Z*				Z			
	22																			N*	*				Q*	Q*	Q*					Z	Z	Z	Z*						
	47																			*					Q*							Z									
	100																															Z*	Z*									
	WVDC	4	6.3	10	16	25	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
SIZE		0201					0402						0603							0805							1206							1210							1812			

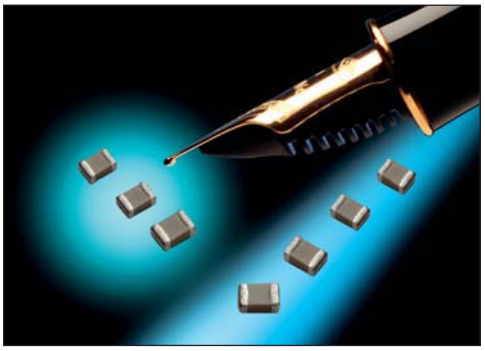
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

= Under development
= *Optional Specifications Contact factory

*Optional Specifications – Contact factory

RoHS COMPLIANT

MLCC Low Profile
General Specifications



AVX introduces the LT series comprising a range of low profile products in our X5R and X7R dielectric. X5R is a Class II dielectric with temperature varation of capacitance within ±15% from –55°C to +85°C. Offerings include 0201, 0402, 0603, 0805 1206, and 1210 packages in compact, low profile designs. The LT series is ideal for decoupling and filtering applications where height clearance is limited.

AVX is also expanding the low profile products in our X7R dielectric. X7R is a Class II dielectric with temperature variation of capacitance within ±15% from -55ºC to +125ºC. Please contact the factory for availability of any additional values not listed.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/lt02-06.pdf

HOW TO ORDER

LT05	Z	D	475	M	A	T	2	S
Size LT01 - 0201 LT02 - 0402 LT03 - 0603 LT05 - 0805 LT06 - 1206 LT10 - 1210	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V	**Dielectric** X5R = D X7R = C	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** See table below

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.

SIZE			LT01	LT02				LT03				LT05				LT06			LT10	
		WVDC	4	4	6.3	10	16	4	6.3	16	25	6.3	10	16	25	10	16	25	16	25
Cap	104	0.10	Z		Q		S													
(µF)		0.22									X									
		0.47									X							X		
	105	1.0		C		S				S	X			X	X					
		1.5																		
		2.2		S					S	X				X						
		4.7						S	X				S	X			W	W	W	
	106	10						X/W				X	X				W		W	
		22																		
		47																		
		WVDC	4	4	6.3	10	16	4	6.3	16	25	6.3	10	16	25	10	16	25	16	25
SIZE			LT01	LT02				LT03				LT05				LT06			LT10	

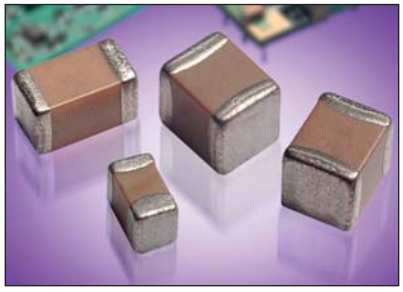
= X7R

Letter	J	Z	Q	C	S	X	W
Max. Thickness	0.15 (0.006)	0.22 (0.009)	0.25 (0.010)	0.36 (0.014)	0.56 (0.022)	0.95 (0.038)	1.02 (0.040)
	PAPER						EMBOSSED

RoHS COMPLIANT

Standard Y5V MLCC

Y5V Dielectric



Y5V formulations are for general-purpose use in a limited temperature range. They have a wide temperature characteristic of +22% –82% capacitance change over the operating temperature range of –30°C to +85°C.

These characteristics make Y5V ideal for decoupling applications within limited temperature range.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cy5v.pdf

HOW TO ORDER

0805	3	G	104	Z	A	T	2	A
Size (L" x W")	**Voltage** 6 = 6.3V, Z = 10V, Y = 16V, 3 = 25V, 5 = 50V	**Dielectric** Y5V = G	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** Z = +80 –20%	**Failure Rate** A = Not Applicable	**Terminations** T = Plated Ni and Sn	**Packaging** 2 = 7" Reel, 4 = 13" Reel	**Special Code** A = Std. Product

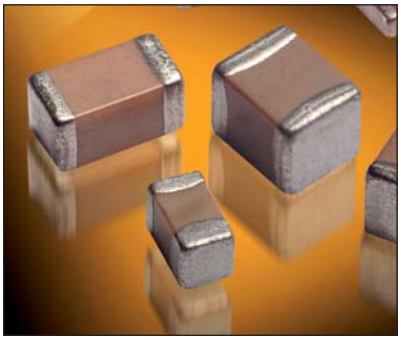
SIZE		0201		0402					0603				0805				1206				1210			
	WVDC	6.3	10	6	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50
Cap (pF)	820		A																					
	1000		A																					
	2200																							
	4700		A																					
Cap (µF)	0.010	A	A																					
	0.022	A																						
	0.047	A				C																		
	0.10				C	C					G	G				K								
	0.22									G														
	0.33									G														
	0.47					C				G	G													
	1.0			C	C				G	G				N	N	N		M	M	M				N
	2.2				C									N										
	4.7												N					P				N	N	
	10.0												N				Q	Q			X	Q	Q	
	22.0																Q				X			
	47.0																							
	WVDC	6.3	10	6	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50	10	16	25	50
SIZE		0201		0402					0603				0805				1206				1210			

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

RoHS COMPLIANT

High Voltage MLCC (RoHS)

Applications from 600V to 5000V



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chip capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/dc blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

Larger physical sizes than normally encountered chips are used to make high voltage MLC chip products. Special precautions must be taken in applying these chips in surface mount assemblies. The temperature gradient during heating or cooling cycles should not exceed 4ºC per second. The preheat temperature must be within 50ºC of the peak temperature reached by the ceramic bodies through the soldering process. Chip sizes 1210 and larger should be reflow soldered only. Capacitors may require protective surface coating to prevent external arcing.

For 1825, 2225 and 3640 sizes, AVX offers leaded version in either thru-hole or SMT configurations (for details see section on high voltage leaded MLC chips).

NEW 630V RANGE

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aphvc.pdf

HOW TO ORDER

1808	A	A	271	K	A	1	1	A
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code**	**Capacitance Tolerance**	**Test Level**	**Termination***	**Packaging**	**Special Code**
0805	C = 600V/630V	C0G = A	(2 significant digits	C0G:	A = Standard	1 = Pd/Ag	1 = 7" Reel	A = Standard
1206	A = 1000V	X7R = C	+ no. of zeros)	J = ±5%		T = NiGuard	3 = 13"	
1210	S = 1500V		Examples:	K = ±10%		Nickel	Reel	
1808	G = 2000V		10 pF = 100	M = ±20%		Barrier	9 = Bulk	
1812	W = 2500V		100 pF = 101	X7R:		Solderable		
1825	H = 3000V		1,000 pF = 102	K = ±10%		Plate		
2220	J = 4000V		22,000 pF = 223	M = ±20%				
2225	K = 5000V		220,000 pF = 224	Z = +80%, -20%				
3640 ***			1 µF = 105					

***Note:** Terminations with 5% minimum lead (Pb) is available for LD style. Leaded terminations are also available.

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.
*** AVX offers nonstandard chip sizes. Contact factory for details.

HIGH VOLTAGE C0G CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	10pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	330pF	1200 pF	2700 pF	3300 pF	5600 pF	0.012 µF	0.012 µF	0.018 µF	0.047 µF
1000	min.	10pF	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	180pF	560 pF	1500 pF	2200 pF	3300 pF	8200 pF	0.010 µF	0.010 µF	0.022 µF
1500	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	270 pF	680 pF	820 pF	1800 pF	4700 pF	4700 pF	5600 pF	0.010 µF
2000	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	120 pF	270 pF	330 pF	1000 pF	1800 pF	2200 pF	2700 pF	6800 pF
2500	min.	—	—	—	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	180 pF	470 pF	1200 pF	1500 pF	1800 pF	3900 pF
3000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	120 pF	330 pF	820 pF	1000 pF	1200 pF	2700 pF
4000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	47 pF	150 pF	330 pF	470 pF	560 pF	1200 pF
5000	min.	—	—	—	—	—	—	10 pF	10 pF	10 pF
	max.	—	—	—	—	—	—	220 pF	270 pF	820 pF

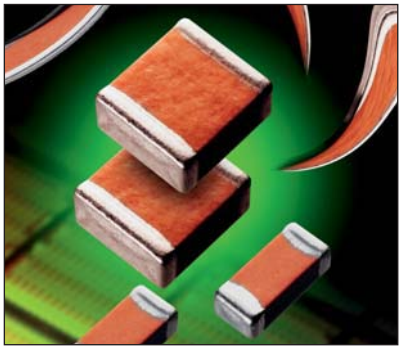
HIGH VOLTAGE X7R CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	100pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF	0.010 µF	0.010 µF	0.010 µF
	max.	6800pF	0.022 µF	0.056 µF	0.068 µF	0.120 µF	0.270 µF	0.270 µF	0.330 µF	0.560 µF
1000	min.	100pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF
	max.	1500pF	6800 pF	0.015 µF	0.018 µF	0.039 µF	0.100 µF	0.120 µF	0.150 µF	0.220 µF
1500	min.	—	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	—	2700 pF	5600 pF	6800 pF	0.015 µF	0.056 µF	0.056 µF	0.068 µF	0.100 µF
2000	min.	—	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	—	1500 pF	3300 pF	3300 pF	8200 pF	0.022 µF	0.027 µF	0.033 µF	0.027 µF
2500	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	2200 pF	5600 pF	0.015 µF	0.018 µF	0.022 µF	0.022 µF
3000	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	1800 pF	3900 pF	0.010 µF	0.012 µF	0.015 µF	0.018 µF
4000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	6800 pF
5000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	3300 pF

RoHS COMPLIANT

High Voltage FLEXITERM®

For 600V to 3000V Applications



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chip capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

To make high voltage chips, larger physical sizes than are normally encountered are necessary. These larger sizes require that special precautions be taken in applying these chips in surface mount assemblies. In response to this, and to follow from the success of the FLEXITERM® range of low voltage parts, AVX is delighted to offer a FLEXITERM® high voltage range of capacitors, FLEXITERM®.

The FLEXITERM® layer is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor, giving customers a solution where board flexure or temperature cycle damage are concerns.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/flexitermhv.pdf

HOW TO ORDER

1808	A	C	272	K	A	Z	1	A
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code** (2 significant digits + no. of zeros)	**Capacitance Tolerance**	**Test Level**	**Termination***	**Packaging**	**Special Code**
0805	C = 600V/630V	C0G = A	Examples:	C0G:		Z = FLEXITERM®	1 = 7" Reel	A = Standard
1206	A = 1000V	X7R = C	10 pF = 100	J = ±5%		100% Tin	3 = 13" Reel	
1210	S = 1500V		100 pF = 101	K = ±10%		(RoHS Compliant)	9 = Bulk	
1808	G = 2000V		1,000 pF = 102	M = ±20%				
1812	W = 2500V		22,000 pF = 223	X7R:				
1825	H = 3000V		220,000 pF = 224	K = ±10%				
2220			1 µF = 105	M = ±20%				
2225				Z = +80%, -20%				
***								

Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations. Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

*** AVX offers nonstandard chip sizes. Contact factory for details.

HIGH VOLTAGE C0G CAPACITANCE VALUES

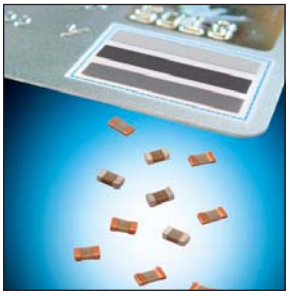
VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225
600/630	min.	10pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	330pF	1200 pF	2700 pF	3300 pF	5600 pF	0.012 µF	0.012 µF	0.018 µF
1000	min.	10pF	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF
	max.	180pF	560 pF	1500 pF	2200 pF	3300 pF	8200 pF	0.010 µF	0.010 µF
1500	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	270 pF	680 pF	820 pF	1800 pF	4700 pF	4700 pF	5600 pF
2000	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	120 pF	270 pF	330 pF	1000 pF	1800 pF	2200 pF	2700 pF
2500	min.	—	—	—	10 pF	10 pF	10 pF	100 pF	100 pF
	max.	—	—	—	180 pF	470 pF	1200 pF	1500 pF	1800 pF
3000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF
	max.	—	—	—	120 pF	330 pF	820 pF	1000 pF	1200 pF

HIGH VOLTAGE X7R CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225
600/630	min.	100pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF	0.010 µF	0.010 µF
	max.	6800pF	0.022 µF	0.056 µF	0.068 µF	0.120 µF	0.270 µF	0.270 µF	0.330 µF
1000	min.	100pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	1500pF	6800 pF	0.015 µF	0.018 µF	0.039 µF	0.100 µF	0.120 µF	0.150 µF
1500	min.	—	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	—	2700 pF	5600 pF	6800 pF	0.015 µF	0.056 µF	0.056 µF	0.068 µF
2000	min.	—	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF
	max.	—	1500 pF	3300 pF	2300 pF	8200 pF	0.022 µF	0.027 µF	0.033 µF
2500	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	2200 pF	5600 pF	0.015 µF	0.018 µF	0.022 µF
3000	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	1800 pF	2200 pF	0.010 pF	0.012 µF	0.015 µF

UltraThin Ceramic Capacitors

UT023D103MAT2C



The Ultrathin (UT) series of ceramic capacitors is a new product offering from AVX. The UT series was designed to meet the stringent thickness requirements of our customers. AVX developed a new termination process (FCT - Fine Copper Termination) that provides unbeatable flatness and repeatability. The series includes products < 0.35mm in height and is targeted for applications such as Smart cards, Memory modules, High Density SIM cards, Mobile phones, MP3 players, and embedded solutions.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/ut.pdf

HOW TO ORDER

UT	02	3	D	103	M	A	T	2	C
Style Ultra Thin	**Case Size 0402**	**Rated Voltage 25V**	**Temperature Characteristic X5R**	**Coded Cap 0.01µF**	**Cap Tolerance ± 20%**	**Termination Style** Commercial	**Termination** 100% Sn	**Packaging** 7" Reel = 15,000 pcs 13" Reel = 50,000 pcs	**Thickness** 0.30mm max

PART DIMENSIONS

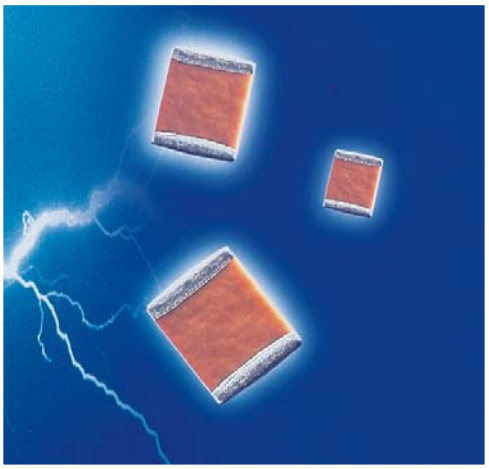
mm (inches)

L	W	T	BL
1.00 ± 0.10 (0.039±0.004)	0.50 ± 0.10 (0.020 ± 0.004)	0.25 ± 0.05 (0.010 ± 0.002)	0.25 ± 0.10 (0.010 ± 0.004)

PERFORMANCE CHARACTERISTICS

Capacitance Value	0.01µF
Capacitance Tolerance	±20%
Dissipation Factor Range	3.0%
Operating Temperature	-55°C to +85°C
Temperature Coefficient	±15%
Rated Voltage	25V
Insulation Resistance at 25ºC and Rated Voltage	100,000 Mohms
Test Frequency	1 Vrms @ 1 KHz

Tip & Ring
Multilayer Ceramic Chip Capacitors



AVX "Tip & Ring" or "ring detector" Multilayer Ceramic Chip Capacitors are designed as a standard telecom filter to block -48 Volts DC telephone line voltage and pass subscriber's AC signal pulse (16 to 25Hz, 70 to 90Vrms). The ringer capacitors replace large leaded film capacitors and are ideal for telecom/modem applications. Using AVX "Tip & Ring" capacitors not only saves valuable real estate on the board and reduces the weight of overall product, but also features standard surface mounting capabilities so critical to new and compact designs.

The AVX "Tip & Ring" capacitors are offered in standard EIA sizes and standard values. They offer excellent high frequency performance, low ESR and improved temperature performance over film capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/apt&r.pdf

HOW TO ORDER

1812	P	C	104	K	A	T	1	A
AVX Style 0805 1206 1210 1808 1812 1825 2220 2225	**Voltage** 250 VDC Telco Rating	**Temperature Coefficient** X7R	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** K = ±10% M = ±20%	**Test Level** A = Standard	**Termination** T = Plated Ni and Sn (RoHS Compliant) Z = FLEXITERM® 100% Tin (RoHS Compliant)	**Packaging** 2 = 7" Reel 4 = 13" Reel 6 = Bulk	**Special Code** A = Standard

Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

RoHS COMPLIANT

PERFORMANCE CHARACTERISTICS

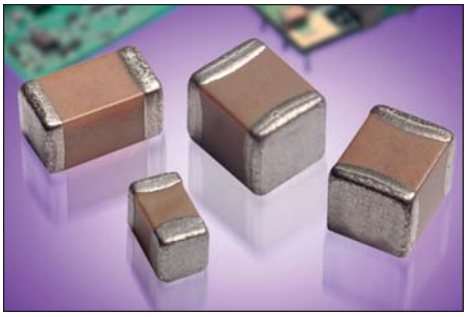
Capacitance Range	1000 pF to 1.2 µF (25°C, 1.0 ±0.2 Vrms at 1kHz)
Capacitance Tolerances	±10%, ±20%
Dissipation Factor	2.5% max. (25°C, 1.0 ±0.2 Vrms at 1kHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	X7R ±15% (0 VDC)
Voltage Rating	250 VDC Telco rating
Insulation Resistance	1000 megohm-microfarad min.
Dielectric Strength	Minimum 200% rated voltage for 5 seconds at 50 mA max. current

CAPACITANCE RANGE (µF)

Size	0805	1206	1210	1808	1812	1825	2220	2225
min.	0.0010	0.0010	0.0010	0.010	0.10	0.33	0.47	0.47
max.	0.027	0.082	0.22	0.27	0.47	1.0	1.0	1.2

Tin/Lead Termination MLCC

LD Series NP0 Dielectric, Tin/Lead



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	A	101	J	A	B	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
LD02 - 0402	Y = 16V	C0G (NP0) = A	2 Sig. Digits +	B = ±.10 pF (<10pF)	A = Not	B = 5% min	2 = 7" Reel	A = Std. Product
LD03 - 0603	3 = 25V		Number of Zeros	C = ±.25 pF (<10pF)	Applicable	lead	4 = 13" Reel	
LD04 - 0504*	5 = 50V			D = ±.50 pF (<10pF)			7 = Bulk Cass.	
LD05 - 0805	1 = 100V			F = ±1% (≥ 10 pF)			9 = Bulk	
LD06 - 1206	2 = 200V			G = ±2% (≥ 10 pF)				
LD10 - 1210	7 = 500V			J = ±5%			**Contact Factory For Multiples**	
LD12 - 1812				K = ±10%				
LD13 - 1825				M = ±20%				
LD14 - 2225								

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

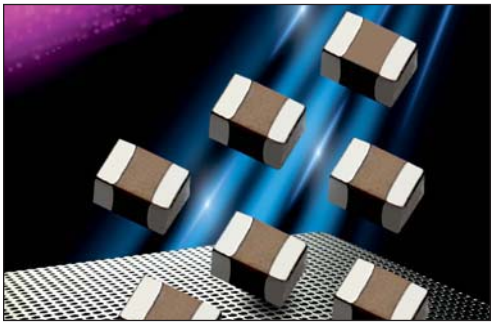
NP0 Dielectric

SIZE		LD02			LD03				LD05					LD06						LD10					LD12					LD13			LD14		
	WVDC	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
Cap (pF)	0.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.0	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	1.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	2.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	2.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	3.3	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	3.9	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	4.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	5.6	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	6.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	8.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J																
	10	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	12	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	15	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	18	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	22	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	27	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	33	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	39	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	47	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	56	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	68	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	82	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	100	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	120	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	150	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	180	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	J															
	220	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M	M															
	270	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	M															
	330	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	M															
	390	C	C	C	G	G	G		J	J	J	J	M	J	J	J	J	J	M	M															
	470	C	C	C	G	G	G		J	J	J	J	M	J	J	J	J	J	M	M															
	560				G	G	G		J	J	J	J	M	J	J	J	J	J	M	M	J	J	J	J	M	M									
	680				G	G	G		J	J	J	J		J	J	J	J	J	P	M	J	J	J	J	J	M									
	820				G	G	G		J	J	J	J		J	J	J	J	M		M	J	J	J	J	J	M									
	1000				G	G	G		J	J	J	J		J	J	J	J	Q	Q	M	J	J	J	J	M	M	K	K	K	K	M	M	M	M	P
	1200								J	J	J			J	J	J	J	Q	Q	M	J	J	J	M	M	M	K	K	K	K	M	M	M	M	P
	1500								J	J	J			J	J	J	J	M	Q	M	J	J	J	M	M	M	K	K	K	K	M	M	M	M	P
	1800								J	J	J	M	M	J	J	J	M	P	P	M	J	J	J	M	Q	M	K	K	K	K	P	Q	M	M	P
	2200								J	J	J	N		J	J	M	M	P	P	M	J	J	J	M	Q	M	K	K	K	K	P	Q	M	M	P
	2700								J	J	J	N		J	J	M	M	P	P	M	J	J	J	M	Q	M	K	K	K	K	P	Q	M	M	P
	3300								J	J				J	J	M	M	P	P	M	J	J	J	J	M	M	K	K	K	P	Q	M	M	P
	3900								J	J				J	J	M	M	P	P	M	J	J	J	M	M	M	K	K	K	P	Q	M	M	P
	4700								J	J				J	J	M	M	P	P	M	J	J	J	M	M	M	K	K	K	P	Q	M	M	P
	5600													J	J	M					J	J					K	K	M	M	P	X	M	M	M	P
	6800													M	M						J	J					K	K	M	M	X		M	M	P	P
	8200													M	M						J	J					K	K	M	M			M	M	P	P
Cap (µF)	0.010													M	M						J	J					K	M	M	M			M	M	P	P
	0.012																				J	J					K	M	M				M	M	P	P
	0.015																										M	M	M				M	M	P	Y
	0.018																										M	M	M				M	M	Y	Y
	0.022																										M	M	M				M	Y	Y	Y
	0.027																										M	M	M				P	Y	Y	Y
	0.033																										M	M					P			
	0.039																										M	M					P			
	0.047																										M	M					P			
	0.068																										M	M					P			
	0.082																																Q			
	0.1																																Q			
	WVDC	16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
SIZE		LD02			LD03				LD05					LD06						LD10					LD12					LD13			LD14		

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

Tin/Lead Termination MLCC

LD Series X7R Dielectric, Tin/Lead



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	C	101	J	A	B	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
LD02 - 0402	6 = 6.3V	X7R = C	2 Sig. Digits +	J = ±5%	A = Not	B = 5% min lead	2 = 7" Reel	A = Std. Product
LD03 - 0603	Z = 10V		Number of Zeros	K = ±10%	Applicable	X = FLEXITERM®	4 = 13" Reel	
LD04 - 0504*	Y = 16V			M = ±20%		with 5% min	7 = Bulk Cass.	
LD05 - 0805	3 = 25V					lead	9 = Bulk	
LD06 - 1206	5 = 50V							
LD10 - 1210	1 = 100V						**Contact Factory For Multiples**	
LD12 - 1812	2 = 200V							
LD13 - 1825	7 = 500V							
LD14 - 2225								
LD20 - 2220								

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

X7R Dielectric

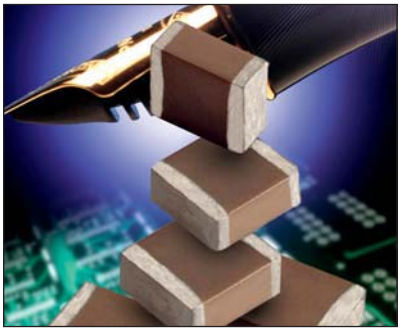
SIZE		LD02			LD03							LD05							LD06								LD10							LD12				LD13		LD20				LD14	
	WVDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
Cap (pF)	100																																											
	150																																											
	220			C																																								
	330			C					G	G	G		J	J	J	J	J	J							K																			
	470			C					G	G	G		J	J	J	J	J	J							K																			
	680			C					G	G	G		J	J	J	J	J	J							K																			
	1000			C					G	G	G		J	J	J	J	J	J							K																			
	1500			C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	M		J	J	J	J	J	J	M											
	2200			C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	M		J	J	J	J	J	J	M											
	3300		C	C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	M		J	J	J	J	J	J	M											
	4700		C	C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	M		J	J	J	J	J	J	M											
	6800	C	C						G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	M		J	J	J	J	J	J	M											
Cap (µF)	0.010	C						G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	M	P	J	J	J	J	J	J	M	K	K	K	K	M	M		X	X	X	M	P
	0.015	C					G	G				J	J	J	J	J	J	M	J	J	J	J	J	J	M		J	J	J	J	J	J	P	K	K	K	P	M	M		X	X	X	M	P
	0.022	C					G	G				J	J	J	J	J	J	M	J	J	J	J	J	J	M	Q	J	J	J	J	J	J	Q	K	K	K	P	M	M		X	X	X	M	P
	0.033					G	G	G				J	J	J	J	J	N		J	J	J	J	J	J	M		J	J	J	J	J	J	Q	K	K	K	X	M	M		X	X	X	M	P
	0.047					G	G	G				J	J	J	J	J	N		J	J	J	J	J	J	M		J	J	J	J	J	J		K	K	K	Z	M	M		X	X	X	M	P
	0.068					G	G	G				J	J	J	J	J	N		J	J	J	J	J	J	P		J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.10		C*			G	G	G				J	J	J	J	N	N		J	J	J	J	J	M	P		J	J	J	J	J	M	Z	K	K	K	Z	M	M		X	X	X	M	P
	0.15				G	G						J	J	J	J	N	N		J	J	J	J	J	Q			J	J	J	J	M	Z		K	K	P		M	M		X	X	X	M	P
	0.22				G	G						J	J	J	J	N	N		J	J	J	J	J	Q			J	J	J	J	P	Z		K	K	P		M	M		X	X	X	M	P
	0.33											N	N	N	N	N	N		J	J	M	P	Q				J	J	J	J	Z			K	M	X		M	M		X	X	X	M	P
	0.47						J*					N	N	N	N	N	N		M	M	M	Q	Q				M	M	P	X	Z			K	P			M	M		X	X	X	M	P
	0.68											N	N	N					M	M	Q	Q	Q				M	M	P	X	Z			M	Q			M	P		X	X		M	P
	1.0					J*	J*					N	N	N*					M	M	Q	Q	Q				N	N	P	X	Z			M	X			M	P		X	X		M	P
	1.5																		P	Q	Q						N	N	Z	Z	Z			Z	Z						X	X		M	X
	2.2				J*									P*					Q	Q	Q						X	X	Z	Z	Z			Z							X	X			
	3.3												P*	P*					Q*	Q*	Q*						X	X	Z	Z				Z							X	Z			
	4.7																		Q*	Q*							X	X	Z	Z											X	Z			
	10											P*							Q*	Q*							Z	Z														Z				
	22																		Q*								Z	Z													Z				
	47																																												
	100																																												
	WVDC	16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500	10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
SIZE		LD02			LD03							LD05							LD06								LD10							LD12				LD13		LD20				LD14	

= Under development

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

Tin/Lead Termination MLCC

LD Series X5R Dielectric, Tin/Lead



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	D	101	J	A	B	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
LD02 - 0402	4 = 4V	X5R = D	2 Sig. Digits +	J = ±5%	A = Not	B = 5% min	2 = 7" Reel	A = Std. Product
LD03 - 0603	6 = 6.3V		Number of Zeros	K = ±10%	Applicable	lead	4 = 13" Reel	
LD04 - 0504*	Z = 10V			M = ±20%			7 = Bulk Cass.	
LD05 - 0805	Y = 16V						9 = Bulk	
LD06 - 1206	3 = 25V							
LD10 - 1210	D = 35V						**Contact Factory For Multiples**	
LD12 - 1812	5 = 50V							

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers. Contact factory for non-specified capacitance values.

SIZE		LD02						LD03							LD05						LD06						LD10							LD12			
	WVDC	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
Cap (pF)	100																																				
	150																																				
	220						C																														
	330						C																														
	470						C																														
	680						C																														
	1000						C																														
	1500						C																														
	2200						C																														
	3300						C							G																							
	4700					C								G																							
	6800					C								G																							
Cap (µF)	0.010					C								G																							
	0.015					C						G	G	G																							
	0.022				C	C						G	G	G						N																	
	0.033				C							G	G	G						N																	
	0.047				C	C						G	G	G						N																	
	0.068				C							G		G						N																	
	0.10			C	C	C						G		G				N		N																	
	0.15											G						N	N	N																	
	0.22		C*								G	G						N	N	N					Q												
	0.33										G	G						N																			
	0.47	C*	C*								G							N						Q	Q							X					
	0.68										G							N																			
	1.0	C*	C*	C*					G	G	G	J*					N	N		P*				Q	Q						X	X	X				
	1.5																																				
	2.2	C*	C*					G*	G*	J*	J*					N	N	N					Q	Q						Z	X					
	3.3							J*	J*	J*	J*				N	N					Q	Q															
	4.7	E*						J*	J*	J*					N	N	N*	N*			Q	Q	Q	Q						Q	Z						
	10							K*	K*						N*	N*	N*	K*			Q	Q	Q	Q*					X	Z	Z					Z	
	22														P*	K*					Q*	Q*	Q*					Z	Z	Z	Z						
	47																				Q*							Z*									
	100																										Z*	Z*									
	WVDC	4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
SIZE		LD02						LD03							LD05						LD06						LD10							LD12			

= Under development = *Optional Specifications – Contact factory

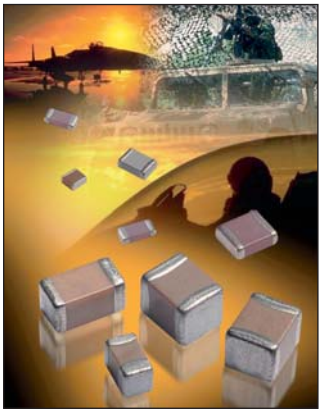
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

*Optional Specifications – Contact factory

NOTE: Contact factory for non-specified capacitance values

APS for COTS-Plus Applications

APS Series NP0 Dielectric



As part of our continuing support to high reliability customers, AVX has launched an Automotive Plus Series of parts (APS) qualified and manufactured in accordance with automotive AEC-Q200 standard. Each production batch is quality tested to an enhanced requirement and shipped with a certificate of conformance. On a quarterly basis a reliability package is issued to all APS customers.

A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components containing BME electrode and copper terminations with a Ni/Sn plated overcoat.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat (FLEXITERM®).
- X7R for Hybrid applications.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

We are also able to support customers who require an AEC-Q200 grade component finished with Tin/Lead.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aps.pdf

HOW TO ORDER

AP03	5	A	104	K	Q	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
AP03=0603 AP05=0805 AP06=1206 AP10=1210 AP12=1812	3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	NP0 = A	2 Significant Digits + Number of Zeros e.g. 10µF = 106	J = ±5% K = ±10% M = ±20%	Q = APS	T = Plated Ni and Sn** B = 5% min lead	2 = 7" Reel 4 = 13" Reel	A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

APS MLCC – NP0

		0603			0805			1206					1210				1812	
		25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
100	10pF	G	G	G	J	J	J	J	J	J	J	J						
120	12	G	G	G	J	J	J	J	J	J	J	J						
150	15	G	G	G	J	J	J	J	J	J	J	J						
180	18	G	G	G	J	J	J	J	J	J	J							
220	22	G	G	G	J	J	J	J	J	J	J							
270	27	G	G	G	J	J	J	J	J	J	J							
330	33	G	G	G	J	J	J	J	J	J	J							
390	39	G	G	G	J	J	J	J	J	J	J							
470	47	G	G	G	J	J	J	J	J	J	J							
510	51	G	G	G	J	J	J	J	J	J	J							
560	56	G	G	G	J	J	J	J	J	J	J							
680	68	G	G	G	J	J	J	J	J	J	J							
820	82	G	G	G	J	J	J	J	J	J	J							
101	100	G	G	G	J	J	J	J	J	J	J							
121	120	G	G	G	J	J	J	J	J	J	J							
151	150	G	G	G	J	J	J	J	J	J	J							
181	180	G	G	G	J	J	J	J	J	J	J							
221	220	G	G	G	J	J	J	J	J	J	J							
271	270	G	G	G	J	J	J	J	J	J	J							
331	330	G	G	G	J	J	J	J	J	J	J							
391	390	G	G		J	J	J	J	J	J	J							
471	470	G	G		J	J	J	J	J	J	J							
561	560				J	J	J	J	J	J	J							
681	680				J	J	J	J	J	J	J							
821	820				J	J	J	J	J	J	J							
102	1000				J	J	J	J	J	J	J		J	J	J	J		
122	1200							J	J	J			J	J	M	M		
152	1500							J	M	M			J	J	M	M		
182	1800							J	M	M			J	J	M	M		
222	2200							J	M	M			J	J	M	M		
272	2700							J	M	Q			J	J	M			
332	3300							J	M	Q			J	J	P		K	K
392	3900												J	J	P		K	K
472	4700												J	J	P		K	K
103	10nF																	
		25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
		0603			0805			1206					1210				1812	

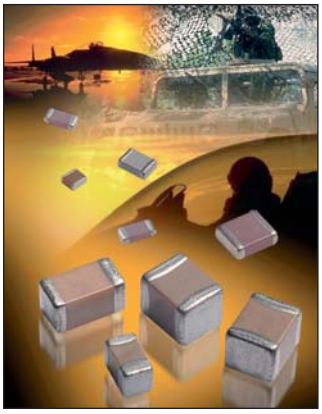
Letter	G	J	K	M	N	P	Q	X
Max. Thickness	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)
	PAPER		PLASTIC TAPE					

AEC-Q200 qualified
TS 16949, ISO 9001 certified

RoHS COMPLIANT

APS for COTS-Plus Applications

APS Series X7R Dielectric



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A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components containing BME electrode and copper terminations with a Ni/Sn plated overcoat.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat (FLEXITERM®).
- X7R for Hybrid applications.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

We are also able to support customers who require an AEC-Q200 grade component finished with Tin/Lead.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aps.pdf

HOW TO ORDER

AP03	5	C	104	K	Q	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
AP03=0603 AP05=0805 AP06=1206 AP10=1210 AP12=1812 AP20=2220	Y = 16V 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	X7R = C	2 Significant Digits + Number of Zeros e.g. 10µF = 106	J = ±5% K = ±10% M = ±20%	Q = APS	T = Plated Ni and Sn** Z = FLEXITERM®** U = Conductive Epoxy** B = 5% min lead X = FLEXITERM® with 5% min lead	2 = 7" Reel 4 = 13" Reel	A = Std. Product

**RoHS compliant

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X7R

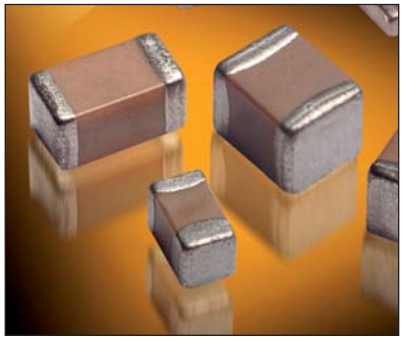
		0603					0805					1206						1210				1812		2220	
		16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
102	Cap 1	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
182	(nF) 1.8	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
222	2.2	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
332	3.3	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
472	4.7	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
103	10	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
123	12	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
153	15	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
183	18	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
223	22	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
273	27	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
333	33	G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
473	47	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	K	K	K		
563	56	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
683	68	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
823	82	G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
104	100	G	G	G			J	J	M	M		J	J	J	M	J		K	K	K	M	K	K		
124	120						J	J	M			J	J	M	M			K	K	K	P	K	K		
154	150						M	N	M			J	J	M	M			K	K	K	P	K	K		
224	220						M	N	M			J	M	M	Q			M	M	M	P	M	M		
334	330						N	N	M			J	M	P	Q			P	P	P	Q	X	X		
474	470						N	N	M			M	M	P	Q			P	P	P	Q	X	X		
684	680						N	N				M	Q	Q	Q			P	P	Q	X	X	X		
105	Cap 1						N	N				M	Q	Q	Q			P	Q	Q	X	X	X		
155	(µF) 1.5											Q	Q					P	Q	Z	Z	X	X		
225	2.2											Q	Q					X	Z	Z	Z	Z	Z		
335	3.3																	X	Z	Z		Z			
475	4.7																	X	Z	Z		Z			
106	10																								Z
226	22																							Z	
		16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
		0603					0805					1206						1210				1812		2220	

= Under development

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

High Voltage MLCC (Tin/Lead)

Applications from 600V to 5000V



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages, a full range of values that we are offering in this "B" termination.

Larger physical sizes than normally encountered chips are used to make high voltage MLC chip product. Special precautions must be taken in applying these chips in surface mount assemblies. The temperature gradient during heating or cooling cycles should not exceed 4ºC per second. The preheat temperature must be within 50ºC of the peak temperature reached by the ceramic bodies through the soldering process. Chip sizes 1210 and larger should be reflow soldered only. Capacitors may require protective surface coating to prevent external arcing.

For 1825, 2225 and 3640 sizes, AVX offers leaded version in either thru-hole or SMT configurations (for details see section on high voltage leaded MLC chips).

NEW 630V RANGE

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/hvtinterm.pdf

HOW TO ORDER

LD08	A	A	271	K	A	B	1	A
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code** (2 significant digits + no. of zeros)	**Capacitance Tolerance**	**Test Level**	**Termination**	**Packaging**	**Special Code**
LD05 - 0805	C = 600V/630V	C0G = A	Examples:	C0G:	A = Standard	B = 5% Min Pb	1 = 7" Reel	A = Standard
LD06 - 1206	A = 1000V	X7R = C	10 pF = 100	J = ±5%			3 = 13" Reel	
LD10 - 1210	S = 1500V		100 pF = 101	K = ±10%			9 = Bulk	
LD08 - 1808	G = 2000V		1,000 pF = 102	M = ±20%				
LD12 - 1812	W = 2500V		22,000 pF = 223	X7R:				
LD13 - 1825	H = 3000V		220,000 pF = 224	K = ±10%				
LD20 - 2220	J = 4000V		1 µF = 105	M = ±20%				
LD14 - 2225	K = 5000V			Z = +80%, -20%				
LD40 - 3640 ***								

Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations. Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

*** AVX offers nonstandard chip sizes. Contact factory for details.

HIGH VOLTAGE C0G CAPACITANCE VALUES

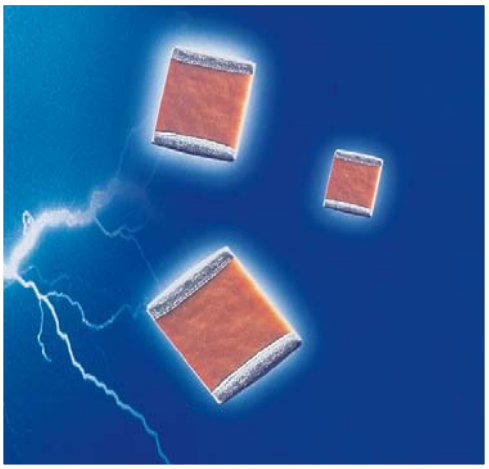
VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	10pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	330pF	1200 pF	2700 pF	3300 pF	5600 pF	0.012 µF	0.012 µF	0.018 µF	0.047 µF
1000	min.	10pF	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	180pF	560 pF	1500 pF	2200 pF	3300 pF	8200 pF	0.010 µF	0.010 µF	0.022 µF
1500	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	270 pF	680 pF	820 pF	1800 pF	4700 pF	4700 pF	5600 pF	0.010 µF
2000	min.	—	10 pF	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF	100 pF
	max.	—	120 pF	270 pF	330 pF	1000 pF	1800 pF	2200 pF	2700 pF	6800 pF
2500	min.	—	—	—	10 pF	10 pF	10 pF	100 pF	100 pF	100 pF
	max.	—	—	—	180 pF	470 pF	1200 pF	1500 pF	1800 pF	3900 pF
3000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	120 pF	330 pF	820 pF	1000 pF	1200 pF	2700 pF
4000	min.	—	—	—	10 pF	10 pF	10 pF	10 pF	10 pF	100 pF
	max.	—	—	—	47 pF	150 pF	330 pF	470 pF	560 pF	1200 pF
5000	min.	—	—	—	—	—	—	10 pF	10 pF	10 pF
	max.	—	—	—	—	—	—	220 pF	270 pF	820 pF

HIGH VOLTAGE X7R CAPACITANCE VALUES

VOLTAGE		0805	1206	1210	1808	1812	1825	2220	2225	3640
600/630	min.	100pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF	0.010 µF	0.010 µF	0.010 µF
	max.	6800pF	0.022 µF	0.056 µF	0.068 µF	0.120 µF	0.270 µF	0.270 µF	0.330 µF	0.560 µF
1000	min.	100pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	1000 pF	0.010 µF
	max.	1500pF	6800 pF	0.015 µF	0.018 µF	0.039 µF	0.100 µF	0.120 µF	0.150 µF	0.220 µF
1500	min.	—	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF	1000 pF
	max.	—	2700 pF	5600 pF	6800 pF	0.015 µF	0.056 µF	0.056 µF	0.068 µF	0.100 µF
2000	min.	—	10 pF	100 pF	100 pF	100 pF	100 pF	1000 pF	1000 pF	1000 pF
	max.	—	1500 pF	3300 pF	3300 pF	8200 pF	0.022 µF	0.027 µF	0.033 µF	0.027 µF
2500	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	2200 pF	5600 pF	0.015 µF	0.018 µF	0.022 µF	0.022 µF
3000	min.	—	—	—	10 pF	10 pF	100 pF	100 pF	100 pF	1000 pF
	max.	—	—	—	1800 pF	3900 pF	0.010 µF	0.012 µF	0.015 µF	0.018 µF
4000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	6800 pF
5000	min.	—	—	—	—	—	—	—	—	100 pF
	max.	—	—	—	—	—	—	—	—	3300 pF

Tip & Ring Tin/Lead Termination "B"

Multilayer Ceramic Chip Capacitors



AVX Corporation will support customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers.

AVX "Tip & Ring" or "ring detector" Multilayer Ceramic Chip Capacitors are designed as a standard telecom filter to block -48 Volts DC telephone line voltage and pass subscriber's AC signal pulse (16 to 25Hz, 70 to 90 VRMS). The ringer capacitors replace large leaded film capacitors and are ideal for telecom/modem applications. Using AVX "Tip and Ring" capacitors not only saves valuable real estate on the board and reduces the weight of the overall product, but also features standard surface mounting capabilities, so critical to new and compact designs.

The AVX "Tip & Ring" capacitors are offered in standard EIA sizes and standard values. They offer excellent high frequency performance, low ESR and improved temperature performance over film capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/apt&rb.pdf

HOW TO ORDER

LD12	P	C	104	K	A	B	1	A
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance Code**	**Capacitance Tolerance**	**Test Level**	**Termination**	**Packaging**	**Special Code**
LD05 - 0805 LD06 - 1206 LD10 - 1210 LD08 - 1808 LD12 - 1812 LD13 - 1825 LD20 - 2220 LD14 - 2225	250 VDC Telco Rating	X7R	(2 significant digits + no. of zeros) Examples: 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	K = ±10% M = ±20%	A = Standard	B = 5% Min Pb X = FLEXITERM® 5% min. Pb	1 = 7" Reel 3 = 13" Reel 9 = Bulk	A = Standard

Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

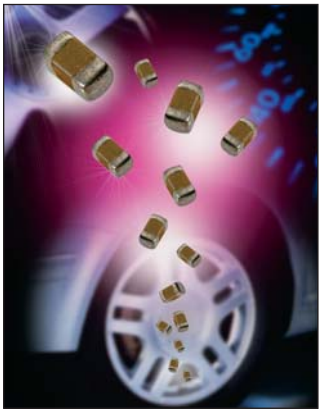
PERFORMANCE CHARACTERISTICS

Capacitance Range	1000 pF to 1.2 µF (25°C, 1.0 ±0.2 Vrms at 1kHz)
Capacitance Tolerances	±10%, ±20%
Dissipation Factor	2.5% max. (25°C, 1.0 ±0.2 Vrms at 1kHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	X7R ±15% (0 VDC)
Voltage Rating	250 VDC Telco rating
Insulation Resistance	1000 megohm-microfarad min.
Dielectric Strength	Minimum 200% rated voltage for 5 seconds at 50 mA max. current

CAPACITANCE RANGE (µF)

STYLE (SIZE)	LD05 (0805)	LD06 (1206)	LD10 (1210)	LD08 (1808)	LD12 (1812)	LD13 (1825)	LD20 (2220)	LD14 (2225)
min.	0.0010	0.0010	0.0010	0.010	0.10	0.33	0.47	0.47
max.	0.027	0.082	0.22	0.27	0.47	1.0	1.0	1.2

Automotive MLCC
NP0 Dielectric



AVX Corporation has supported the Automotive Industry requirements for Multilayer Ceramic Capacitors consistently for more than 10 years. Products have been developed and tested specifically for automotive applications and all manufacturing facilities are QS9000 and VDA 6.4 approved.

As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- Contains BME electrode and copper terminations with a Ni/Sn plated overcoat.
- BME electrode with epoxy finish for conductive glue mounting.
- BME electrode and soft terminations with a Ni/Sn plated overcoat.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	A	104	K	4	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0603	3 = 25V	NP0 = A	2 Significant Digits	F = ±1% (≥10pF)	4 = Automotive	T = Plated Ni	2 = 7" Reel	A = Std. Product
0805	5 = 50V		+ Number of Zeros	G = ±2% (≥10pF)		and Sn	4 = 13" Reel	
1206	1 = 100V		e.g. 10µF = 106	J = ±5% (≤1µF)				
1210	2 = 200V			K = ±10%				
1812	7 = 500V			M = ±20%				

Contact factory for availability of Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – NP0

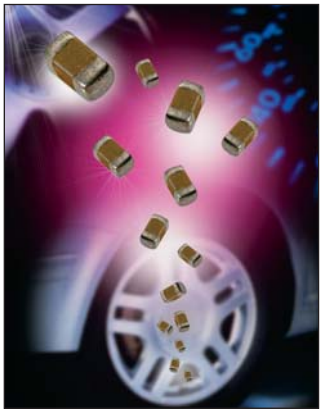
	0603			0805			1206					1210				1812	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
100 10pF	G	G	G	J	J	J	J	J	J	J	J						
120 12	G	G	G	J	J	J	J	J	J	J	J						
150 15	G	G	G	J	J	J	J	J	J	J	J						
180 18	G	G	G	J	J	J	J	J	J	J							
220 22	G	G	G	J	J	J	J	J	J	J							
270 27	G	G	G	J	J	J	J	J	J	J							
330 33	G	G	G	J	J	J	J	J	J	J							
390 39	G	G	G	J	J	J	J	J	J	J							
470 47	G	G	G	J	J	J	J	J	J	J							
510 51	G	G	G	J	J	J	J	J	J	J							
560 56	G	G	G	J	J	J	J	J	J	J							
680 68	G	G	G	J	J	J	J	J	J	J							
820 82	G	G	G	J	J	J	J	J	J	J							
101 100	G	G	G	J	J	J	J	J	J	J							
121 120	G	G	G	J	J	J	J	J	J	J							
151 150	G	G	G	J	J	J	J	J	J	J							
181 180	G	G	G	J	J	J	J	J	J	J							
221 220	G	G	G	J	J	J	J	J	J	J							
271 270	G	G	G	J	J	J	J	J	J	J							
331 330	G	G	G	J	J	J	J	J	J	J							
391 390	G	G		J	J	J	J	J	J	J							
471 470	G	G		J	J	J	J	J	J	J							
561 560				J	J	J	J	J	J	J							
681 680				J	J	J	J	J	J	J							
821 820				J	J	J	J	J	J	J							
102 1000				J	J	J	J	J	J	J		J	J	J	J		
122 1200							J	J	J	J		J	J	M	M		
152 1500							J	M	M	M		J	J	M	M		
182 1800							J	M	M	M		J	J	M	M		
222 2200							J	M	M	M		J	J	M	M		
272 2700							J	M	Q			J	J	M			
332 3300							J	M	Q			J	J	P		K	K
392 3900												J	J	P		K	K
472 4700												J	J	P		K	K
103 10nF																	
	25V	50V	100V	25V	50V	100V	25V	50V	100V	200V	500V	25V	50V	100V	200V	50V	100V
	0603			0805			1206					1210				1812	

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

RoHS COMPLIANT

Automotive MLCC

X7R Dielectric



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As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components containing BME electrode and copper terminations with a Ni/Sn plated overcoat.
- X7R dielectric components, BME electrode with epoxy finish for conductive glue mounting.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	C	104	K	4	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0402	Y = 16V	X7R = C	2 Significant Digits	J = ±5%	4 = Automotive	T = Plated Ni and Sn		A = Std. Product
0603	3 = 25V		+ Number of Zeros	K = ±10%		Z = FLEXITERM®	2 = 7" Reel	
0805	5 = 50V		e.g. 10µF = 106	M = ±20%		U = Conductive Epoxy	4 = 13" Reel	
1206	1 = 100V							
1210	2 = 200V							
1812	7 = 500V							
2220								

NOTE: Contact factory for non-specified capacitance values. 0402 case size available in T termination only.
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X7R

		0402			0603					0805					1206						1210				1812		2220	
		16V	25V	50V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
221	Cap .22	C	C	C																								
271	(nF) .27	C	C	C																								
331	.33	C	C	C																								
391	.39	C	C	C																								
471	.47	C	C	C																								
561	.56	C	C	C																								
681	.68	C	C	C																								
821	.82	C	C	C																								
102	1	C	C	C	G	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
182	1.8	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
222	2.2	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
332	3.3	C	C	C	G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
472	4.7	C	C		G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
103	10	C			G	G	G	G		J	J	J	J	J	J	J	J	J	J	J	K	K	K	K	K	K		
123	12				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
153	15				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
183	18				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
223	22				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
273	27				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
333	33				G	G	G			J	J	J	M		J	J	J	J	J		K	K	K	K	K	K		
473	47				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	K	K	K		
563	56				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
683	68				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
823	82				G	G	G			J	J	J	M		J	J	J	M	J		K	K	K	M	K	K		
104	100				G	G	G			J	J	M	M		J	J	J	M	J		K	K	K	M	K	K		
124	120									J	J	M			J	J	M	M			K	K	K	P	K	K		
154	150									M	N	M			J	J	M	M			K	K	K	P	K	K		
224	220									M	N	M			J	M	M	Q			M	M	M	P	M	M		
334	330									N	N	M			J	M	P	Q			P	P	P	Q	X	X		
474	470									N	N	M			M	M	P	Q			P	P	P	Q	X	X		
684	680									N	N				M	Q	Q	Q			P	P	Q	X	X	X		
105	Cap 1									N	N				M	Q	Q	Q			P	Q	Q	X	X	X		
155	(µF) 1.5														Q	Q					P	Q	Z	Z	X	X		
225	2.2														Q	Q					X	Z	Z	Z	Z	Z		
335	3.3																				X	Z	Z		Z			
475	4.7																				X	Z	Z		Z			
106	10																											Z
226	22																										Z	
		16V	25V	50V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	500V	16V	25V	50V	100V	50V	100V	25V	50V
		0402			0603					0805					1206						1210				1812		2220	

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

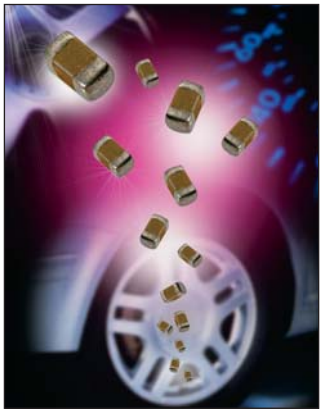
= Under development

AEC-Q200 qualified
TS 16949, ISO 9001 certified

RoHS COMPLIANT

FLEXITERM® MLCC

X7R FLEXITERM® Automotive Series for Board Flexure Applications



AVX Corporation has supported the Automotive Industry requirements for Multilayer Ceramic Capacitors consistently for more than 10 years. Products have been developed and tested specifically for automotive applications and all manufacturing facilities are QS9000 and VDA 6.4 approved.

As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components, BME electrode with epoxy finish for conductive glue mounting.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	C	104	K	4	Z	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0603	Z = 10V	X7R = C	2 Significant Digits	J = ±5%*	4 = Automotive	Z = FLEXITERM®	2 = 7" Reel	A = Std. Product
0805	Y = 16V		+ Number of Zeros	K = ±10%		U = Conductive Epoxy	4 = 13" Reel	
1206	3 = 25V		e.g. 10µF = 106	M = ±20%				
1210	5 = 50V							
1812	1 = 100V			*≤ 1µF only				
2220	2 = 200V							

NOTE: Contact factory for non-specified capacitance values.

AUTOMOTIVE MLCC – X7R

	0603					0805						1206					1210				1812				2220		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
101																											
121																											
151																											
181																											
221																											
271	J	J	J	J	J	J																					
331	J	J	J	J	J	J	J	J	J	J	J																
391	J	J	J	J	J	J	J	J	J	J	J																
471	J	J	J	J	J	J	J	J	J	J	J																
561	J	J	J	J	J	J	J	J	J	J	J																
681	J	J	J	J	J	J	J	J	J	J	J																
821	J	J	J	J	J	J	J	J	J	J	J																
102	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J	J											
122	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
152	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
182	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
222	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
272	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
332	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
392	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
472	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
562	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
682	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
822	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
103	J	J	J	J		J	J	J	J	J	J	J	J	J	J	J											
123	J	J	J			J	J	J	J	M		J	J	J	J	J											
153	J	J	J			J	J	J	J	M		J	J	J	J	J											
183	J	J	J			J	J	J	J	M		J	J	J	J	J											
223	J	J	J			J	J	J	J	M		J	J	J	J	J				K							
273	J	J	J			J	J	J	J	M		J	J	J	J	J				K							
333	J	J	J			J	J	J	J	M		J	J	J	J	J				K							
393	J	J	J			J	J	J	J	M		J	J	J	M	J				K							
473	J	J	J			J	J	J	J	M		J	J	J	M	J				K							
563	J	J	J			J	J	J	J	N		J	J	J	M	J	K	K	K	M	K	K	K	K			
683	J	J	J			J	J	J	J	N		J	J	J	M	J	K	K	K	M	K	K	K	K			
823	J	J	J			J	J	J	J	N		J	J	J	P	J	K	K	K	M	K	K	K	K			
104	J	J	J			J	J	J	J	N		J	J	J	Q	J	K	K	K	P	K	K	K	K	X	X	X
124						J	J	J	N			J	J	P	Q		K	K	K	Q	K	K	K	K			
154						M	M	N	N			J	J	P	Q		K	K	K	Q	K	K	K	M	X	X	X
184						M	M	N	N			J	M	P	Q		M	M	M	Q	K	K	K	M			
224						M	M	N	N			J	M	P	Q		M	M	M	Q	M	M	M	X	X	X	X
274						N	N	N	N			J	M	P	Q		P	P	P	Q	M	M	M	X			
334						N	N	N	N			J	M	P	Q		P	P	P	Q	M	M	M	X	X	X	X
394						N	N	N	N			M	M	P	Q		P	P	P	Q	X	X	X	X			
474						N	N	N	N			M	M	P	Q		P	P	P	Q	X	X	X	X	X	X	X
564						N	N	N				M	Q	Q	Q		P	Q	Q	Q	X	X	X	Z			
684						N	N	N				M	Q	Q	Q		P	X	X	X	X	X	X	Z	X	X	X
824						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z			
105						N	N	N				M	Q	Q	Q		P	Z	Z	Z	X	X	X	Z	X	X	X
155												Q	Q				P	Z	Z	Z			Z	Z	X	X	X
185												Q	Q				Z	Z	Z	Z			Z	Z			
225												Q	Q				Z	Z	Z	Z			Z	Z	X	X	X
335																	Z	Z	Z				Z				
475																	Z	Z	Z				Z				
106																									Z	Z	
226																									Z		
	16V	25V	50V	100V	200V	10V	16V	25V	50V	100V	200V	16V	25V	50V	100V	200V	16V	25V	50V	100V	16V	25V	50V	100V	25V	50V	100V
	0603					0805						1206					1210				1812				2220		

= Under development

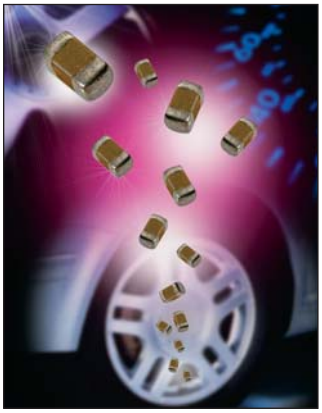
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

AEC-Q200 qualified
TS 16949, ISO 9001 certified

RoHS COMPLIANT

High Voltage FLEXITERM®

AEC-Q200 X7R For 600V to 5000V Applications



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chip capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

To make high voltage chips, larger physical sizes than are normally encountered are necessary. These larger sizes require that special precautions be taken in applying these chips in surface mount assemblies. In response to this, and to follow from the success of the FLEXITERM® range of low voltage parts, AVX is delighted to offer a FLEXITERM® high voltage range of capacitors, FLEXITERM®.

The FLEXITERM® layer is designed to enhance the mechanical flexure and temperature cycling performance of a standard ceramic capacitor, giving customers a solution where board flexure or temperature cycle damage are concerns.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/flexitermhv.pdf

HOW TO ORDER

1808	A	C	272	K	4	Z	1	A
AVX Style 0805 1206 1210 1808 1812 1825 2220 2225 ***	**Voltage** C = 600V/630V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V	**Temperature Coefficient** C0G = A X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level**	**Termination*** Z = FLEXITERM® 100% Tin (RoHS Compliant)	**Packaging** 1 = 7" Reel 3 = 13" Reel 9 = Bulk	**Special Code** A = Standard

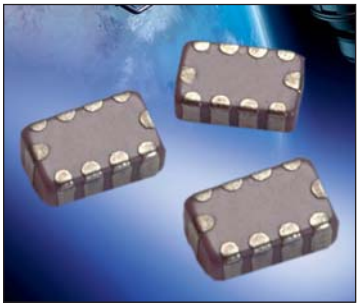
Notes: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations. Contact factory for availability of Termination and Tolerance options for Specific Part Numbers.

*** AVX offers nonstandard chip sizes. Contact factory for details.

Size	1206			1210						1812					2220	
	600/630	1000	2000	600/630	1000	1500	2000	2500	3000	600/630	1000	2000	2500	3000	600/630	1500
(pF) 100	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
120	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
150	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
180	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
220	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
270	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
330	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
390	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
470	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
560	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
680	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
820	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1000	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
1200	■	■	■	■	■	■	■	■		■	■	■	■		■	■
1500	■	■		■	■	■	■			■	■	■	■		■	■
1800	■	■		■	■	■				■	■	■	■		■	■
2200	■	■		■	■	■				■	■	■	■		■	■
2700	■	■		■	■					■	■	■			■	■
3300	■	■		■	■					■	■	■			■	■
3900	■	■		■	■					■	■	■			■	■
4700	■	■		■	■					■	■	■			■	■
5600	■			■	■					■	■				■	■
6800	■			■	■					■	■				■	■
8200	■			■	■					■	■				■	■
0.01	■			■	■					■	■				■	■
0.012				■						■	■				■	■
0.015				■						■	■				■	■
0.018				■						■	■				■	■
0.022				■						■	■				■	■
0.027										■					■	
0.033										■					■	
0.039										■					■	
0.047										■					■	
0.056																
0.068																
0.082																
(µF) 0.1																
	600/630	1000	2000	600/630	1000	1500	2000	2500	3000	600/630	1000	2000	2500	3000	600/630	1500
Size	**1206**			**1210**						**1812**					**2220**	

Standard Capacitor Arrays

Standard NP0, X7R and X5R Dielectric



AVX is the market leader in the development and manufacture of capacitor arrays. The smallest array option available from AVX, the 0405 2-element device, has been an enormous success in the Telecommunications market. The array family of products also includes the 0612 4-element device as well as 0508 2-element and 4-element series, all of which have received widespread acceptance in the marketplace.

AVX capacitor arrays are available in X5R, X7R and NP0 (C0G) ceramic dielectrics to cover a broad range of capacitance values. Voltage ratings from 6.3 Volts up to 100 Volts are offered. AVX also now offers a range of automotive capacitor arrays qualified to AEC-Q200 (see separate table).

Key markets for capacitor arrays are Mobile and Cordless Phones, Digital Set Top Boxes, Computer Motherboards and Peripherals as well as Automotive applications, RF Modems, Networking Products, etc.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/caparray.pdf

HOW TO ORDER (Capacitor Array - IPC)

W	2	A	4	3	C	103	M	A	T	2A
Style	**Case Size**	**Array**	**Number of Caps**	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging & Quantity Code**
W = RoHS L = Tin/Lead	1 = 0405 2 = 0508 3 = 0612 5 = 0306			6 = 6V Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100	A = NP0 C = X7R D = X5R	2 Sig. Digits + No. of Zeros	J = ±5% K = ±10% M = ±20%	A = Commercial	T = Ni Barrier* Z = FLEXITERM®* B = 5% min lead X = FLEXITERM® with 5% min lead	2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)

*RoHS compliant

NP0/C0G

SIZE		0405			0508				0508				0612			
# Elements		2			2				4				4			
Soldering		Reflow Only			Reflow/Wave				Reflow/Wave				Reflow/Wave			
Packaging		All Paper			All Paper				Paper/Embossed				Paper/Embossed			
Length	MM	1.00 ± 0.15			1.30 ± 0.15				1.30 ± 0.15				1.60 ± 0.150			
	(in.)	(0.039 ± 0.006)			(0.051 ± 0.006)				(0.051 ± 0.006)				(0.063 ± 0.006)			
Width	MM	1.37 ± 0.15			2.10 ± 0.15				2.10 ± 0.15				3.20 ± 0.20			
	(in.)	(0.054 ± 0.006)			(0.083 ± 0.006)				(0.083 ± 0.006)				(0.126 ± 0.008)			
Max. Thickness	MM	0.66			0.94				0.94				1.35			
	(in.)	(0.026)			(0.037)				(0.037)				(0.053)			
WVDC		16	25	50	16	25	50	100	16	25	50	100	16	25	50	100
1R0	Cap (pF) 1.0															
1R2	1.2															
1R5	1.5															
1R8	1.8															
2R2	2.2															
2R7	2.7															
3R3	3.3															
3R9	3.9															
4R7	4.7															
5R6	5.6															
6R8	6.8															
8R2	8.2															
100	10															
120	12															
150	15															
180	18															
220	22															
270	27															
330	33															
390	39															
470	47															
560	56															
680	68															
820	82															
101	100															
121	120															
151	150															
181	180															
221	220															
271	270															
331	330															
391	390															
471	470															
561	560															
681	680															
821	820															
102	1000															
122	1200															
152	1500															
182	1800															
222	2200															
272	2700															
332	3300															
392	3900															
472	4700															
562	5600															
682	6800															
822	8200															

X7R/X5R

SIZE		0306				0405					0508						0508						0612					
# Elements		4				2					2						4						4					
Soldering		Reflow Only				Reflow Only					Reflow/Wave						Reflow/Wave						Reflow/Wave					
Packaging		All Paper				All Paper					All Paper						Paper/Embossed						Paper/Embossed					
Length	MM	1.60 ± 0.15				1.00 ± 0.15					1.30 ± 0.15						1.30 ± 0.15						1.60 ± 0.150					
	(in.)	(0.063 ± 0.006)				(0.039 ± 0.006)					(0.051 ± 0.006)						(0.051 ± 0.006)						(0.063 ± 0.006)					
Width	MM	0.81 ± 0.15				1.37 ± 0.15					2.10 ± 0.15						2.10 ± 0.15						3.20 ± 0.20					
	(in.)	(0.032 ± 0.006)				(0.054 ± 0.006)					(0.083 ± 0.006)						(0.083 ± 0.006)						(0.126 ± 0.008)					
Max. Thickness	MM	0.50				0.66					0.94						0.94						1.35					
	(in.)	(0.020)				(0.026)					(0.037)						(0.037)						(0.053)					
WVDC		6	10	16	25	6	10	16	25	50	6	10	16	25	50	100	6	10	16	25	50	100	6	10	16	25	50	100
101	Cap (pF) 100																											
121	120																											
151	150																											
181	180																											
221	220																											
271	270																											
331	330																											
391	390																											
471	470																											
561	560																											
681	680																											
821	820																											
102	1000																											
122	1200																											
152	1500																											
182	1800																											
222	2200																											
272	2700																											
332	3300																											
392	3900																											
472	4700																											
562	5600																											
682	6800																											
822	8200																											
103	Cap (µF) 0.010																											
123	0.012																											
153	0.015																											
183	0.018																											
223	0.022																											
273	0.027																											
333	0.033																											
393	0.039																											
473	0.047																											
563	0.056																											
683	0.068																											
823	0.082																											
104	0.10																											
124	0.12																											
154	0.15																											
184	0.18																											
224	0.22																											
274	0.27																											
334	0.33																											
474	0.47																											
564	0.56																											
684	0.68																											
824	0.82																											
105	1.0																											
125	1.2																											
155	1.5																											
185	1.8																											
225	2.2																											
335	3.3																											
475	4.7																											
106	10																											
226	22																											
476	47																											
107	100																											

= Currently available X7R
= Currently available X5R
= Under development X7R, contact factory for advance samples
= Under development X5R, contact factory for advance samples

RoHS COMPLIANT

FLEXISAFE™ MLC Chips

For Ultra Safety Critical Applications

AVX have developed a range of components specifically for safety critical applications.

Utilizing the award-winning FLEXITERM® layer in conjunction with the cascade design previously used for high voltage MLCCs, a range of ceramic capacitors is now available for customers who require components designed with an industry leading set of safety features.

The FLEXITERM® layer protects the component from any damage to the ceramic resulting from mechanical stress during PCB assembly or use with end customers. Board flexure type mechanical damage accounts for the majority of MLCC failures. The addition of the cascade structure protects the component from low insulation resistance failure resulting from other common causes for failure; thermal stress damage, repetitive strike ESD damage and placement damage. With the inclusion of the cascade design structure to complement the FLEXITERM® layer, the FLEXISAFE™ range of capacitors has unbeatable safety features.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/flexisafe.pdf

HOW TO ORDER

FS03	5	C	104	K	Q	Z	2	A
Size FS03 = 0603 FS05 = 0805 FS06 = 1206 FS10 = 1210	**Voltage** Y = 16V 3 = 25V 5 = 50V 1 = 100V	**Dielectric** X7R = C	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros e.g. 10µF =106	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Commercial 4 = Automotive Q = APS	**Terminations** Z = FLEXITERM® X = FLEXITERM® with 5% min lead	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

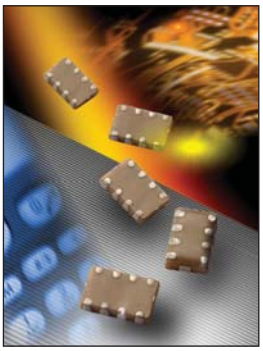
FLEXISAFE™ X7R RANGE

Capacitance		0603				0805			1206			1210		
Code	nF	16	25	50	100	16	25	50	16	25	50	16	25	50
102	1	■	■	■	■	■	■	■	■	■	■			
182	1.8	■	■	■	■	■	■	■	■	■	■			
222	2.2	■	■	■	■	■	■	■	■	■	■			
332	3.3	■	■	■	■	■	■	■	■	■	■			
472	4.7	■	■	■	■	■	■	■	■	■	■			
103	10	■	■	■	■	■	■	■	■	■	■			
123	12	■	■	■		■	■	■	■	■	■			
153	15	■	■	■		■	■	■	■	■	■			
183	18	■	■	■		■	■	■	■	■	■			
223	22	■	■	■		■	■	■	■	■	■			
273	27					■	■	■	■	■	■			
333	33					■	■	■	■	■	■			
473	47					■	■	■	■	■	■			
563	56					■	■	■	■	■	■			
683	68					■	■	■	■	■	■			
823	82					■	■	■	■	■	■			
104	100					■	■	■	■	■	■			
124	120								■	■	■			
154	150								■	■	■	■	■	■
224	220											■	■	■
334	330											■	■	■
474	470											■	■	■

■ Qualified

Automotive Capacitor Arrays

AEC-Q200 Series NP0/C0G, X7R Dielectric and X8R Dielectric



As the market leader in the development and manufacture of capacitor arrays AVX is pleased to offer a range of AEC-Q200 qualified arrays to compliment our product offering to the Automotive Industry. Both the AVX 0612 and 0508 4-element capacitor array styles are qualified to the AEC-Q200 automotive specifications.

AEC-Q200 is the Automotive Industry qualification standard and a detailed qualification package is available on request.

All AVX automotive capacitor array production facilities are certified to ISO/TS 16949:2002.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/caparray.pdf

HOW TO ORDER

W	3	A	4	Y	C	104	K	4	T	2A
Style W = RoHS L = Tin/Lead	**Case Size** 1 = 0405 2 = 0508 3 = 0612	**Array**	**Number of Caps**	**Voltage** Z = 10V Y = 16V 3 = 25V 5 = 50V 1 = 100V	**Dielectric** A = NP0 C = X7R F = X8R	**Capacitance Code (In pF)** Significant Digits + Number of Zeros e.g. 10µF=106	**Capacitance Tolerance** *J = ±5% *K = ±10% M = ±20%	**Failure Rate** 4 = Automotive	**Terminations** T = Plated Ni and Sn** Z = FLEXITERM®** B = 5% min lead X = FLEXITERM® with 5% min lead	**Packaging & Quantity Code** 2A = 7" Reel (4000) 4A = 13" Reel (10000) 2F = 7" Reel (1000)

**RoHS compliant

*Contact factory for availability by part number for K = ±10% and J = ±5% tolerance.

NP0/C0G

SIZE		0405	0508	0508				0612			
No. of Elements		2	2	4				4			
	WVDC	50	50	16	25	50	100	16	25	50	100
1R0	Cap 1.0										
1R2	(pF) 1.2										
1R5	1.5										
1R8	1.8										
2R2	2.2										
2R7	2.7										
3R3	3.3										
3R9	3.9										
4R7	4.7										
5R6	5.6										
6R8	6.8										
8R2	8.2										
100	10										
120	12										
150	15										
180	18										
220	22										
270	27										
330	33										
390	39										
470	47										
560	56										
680	68										
820	82										
101	100										
121	120										
151	150										
181	180										
221	220										
271	270										
331	330										
391	390										
471	470										
561	560										
681	680										
821	820										
102	1000										
122	1200										
152	1500										
182	1800										
222	2200										
272	2700										
332	3300										
392	3900										
472	4700										
562	5600										
682	6800										
822	8200										

= NP0/C0G
= Under development

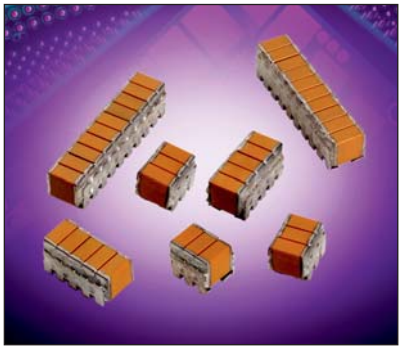
X7R / X8R

	SIZE	0508					0508				0612					X8R 0405
	No. of Elements	2					4				4					2
	WVDC	10	16	25	50	100	16	25	50	100	10	16	25	50	100	16
101	Cap 100															
121	(pF) 120															
151	150															
181	180															
221	220															
271	270															
331	330															
391	390															
471	470															
561	560															
681	680															
821	820															
102	1000															
122	1200															
152	1500															
182	1800															
222	2200															
272	2700															
332	3300															
392	3900															
472	4700															
562	5600															
682	6800															
822	8200															
103	Cap 0.010															
123	(µF) 0.012															
153	0.015															
183	0.018															
223	0.022															
273	0.027															
333	0.033															
393	0.039															
473	0.047															
563	0.056															
683	0.068															
823	0.082															
104	0.10															
124	0.12															
154	0.15															
224	0.22															

= X7R
= X8R
= Under development

RoHS COMPLIANT

TurboCap™
High-CV SMPS Capacitors



The TurboCap™, MLC capacitors from AVX Corporation are characterized with very high capacitance in a small volume. By vertical stacking of the ceramic elements, the footprint required for mounting the capacitors is greatly reduced. TurboCaps™ are ideally suited as filters in the input and output stages of switch mode power supplies (SMPS). With their ultra-low ESR, these capacitors are designed to handle high ripple current at high frequencies and high power levels. The DIP leads in either thru-hole or surface mount configurations offer superior stress relief to the ceramic elements. The leads effectively decouple the parts from the board and minimize thermally or mechanically induced stresses encountered during assembly, temperature cycling or other environmental conditions.

Check for up-to-date CV Tables at
http://www.avx.com/docs/Catalogs/turbocap.pdf

HOW TO ORDER

ST12	5	C	186	M	A	N	03
AVX Style ST12 ST20	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Temperature Coefficient** X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 1 pF = 105 10 pF = 106 100 pF = 107	**Capacitance Tolerance** M = ±20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out	**Number of Leads Per Side** 03 = 3 05 = 5 10 = 10

CAPACITANCE (µF)

	ST12		ST20			
			Voltage			
Cap (µF)	**50V**	**100V**	**25V**	**50V**	**100V**	**500V**
.82						
1.3						
2.7						
8.2		...03				
12		...05				
14					...03	
18	...03					
22		...10			...05	
27	...05			...03		
47				...05	...10	
50	...10					
68			...03			
100			...05	...10		
220			...10			

Development

Numbers inside shaded areas refer to the number of leads per side (the last two digits of the part number.

MH Series

Lead Free Ceramic Capacitor in Molded SM Leadframe

AVX is pleased to introduce the MH range of multi layer ceramic capacitors. The MH components are surface mount molded parts with a multi layer ceramic insert.

MH capacitors combine the ceramic attributes of very low ESR, non polar construction, excellent high frequency behavior, excellent voltage stress capabilities and wide temperature range; with the enhanced mechanical protection of a molded case.

The MH range provides a lead free solution to customers who have previously been unable to use large case ceramic capacitors because of mechanical stressing concerns.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/mh.pdf

HOW TO ORDER

MH	V	1	1	C	225	M	A	T	2	A
MH Series	**Case Size**	**MLCC Count**	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Dielectric** C = X7R	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** T = Tin Plated	**Packaging** 2 = 7" Reel 4 = 13" Reel 6 = Waffle Pack	**Special Code** A = Standard

MH X7R TARGET RANGE

	Cap µF	25V	50V	100V
105	1.0			
125	1.2			
155	1.5			
185	1.8			
225	2.2			
275	2.7			
335	3.3			
395	3.9			
475	4.7			
565	5.6			
685	6.8			
825	8.2			
106	10			
126	12			
156	15			
186	18			
226	22			
276	27			
336	33			
396	39			
476	47			

RoHS COMPLIANT

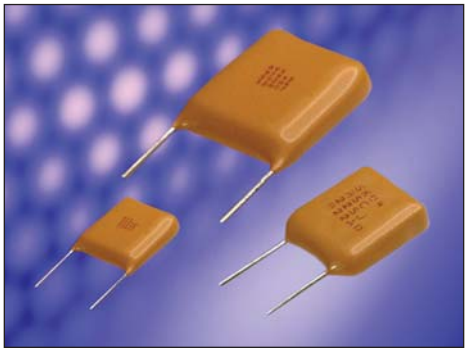
LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

TS 16949, ISO 14001 Certified Manufacture

Leaded SMPS MLCC

SK Series for Output Filtering



AVX SK styles are conformally coated MLC capacitors for input or output filtering in switch mode power supplies. They are specially processed to handle high currents and are low enough in cost for commercial SMPS application.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sk.pdf

HOW TO ORDER

SK	01	3	E	125	Z	A	A	*
Style	**Size**	**Voltage** 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** Z5U = E X7R = C C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) 22 nF = 223 220 nF = 224 1 µF = 105 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80, -20% Z5U: M = ±20% Z = +80, -20% P = GMV (+100, -0%)	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging, which is AVX standard packaging. SK01, SK*3, SK*4, SK*5, SK*6, SK*9 & SK*0 are available taped and reel per EIA-468. Use suffix "TR1" if tape & reel is required.

Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

*Hi-Rel screening for C0G and X7R only. Screening consists of 100% Group A (B Level), Subgroup 1 per MIL-PRF-49470.

C0G Capacitance Range (µF)

Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.	200 WVDC min./max.	500 WVDC min./max.
SK01	.001/0.015	.001/0.012	.001/0.010	.0010/0.0056	.0010/0.0018
SK03/SK53	.01/0.056	.01/0.047	.01/0.039	.001/0.022	.001/0.0068
SK04/SK54	.01/0.12	.01/0.10	.01/0.082	.01/0.047	.001/0.015
SK05/SK55	.01/0.18	.01/0.15	.01/0.12	.01/0.068	.001/0.022
SK06/SK56	.10/0.56	.01/0.47	.01/0.39	.01/0.22	.01/0.068
SK07	.10/0.68	.01/0.56	.01/0.47	.01/0.27	.01/0.082
SK08	.82/1.20	.68/1.10	.56/0.82	.33/0.47	.10/0.15
SK09/SK59	.10/0.27	.01/0.22	.01/0.18	.01/0.10	.001/0.039
SK10/SK60	.10/0.68	.01/0.56	.01/0.47	.01/0.27	.01/0.082

X7R Capacitance Range (µF)

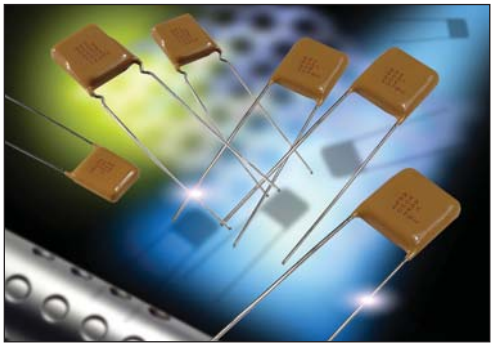
Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.	200 WVDC min./max.	500 WVDC min./max.
SK01	.01/0.39	.01/0.33	.01/0.27	.01/0.12	.001/0.047
SK03/SK53	.10/2.2	.10/1.8	.01/1.5	.01/0.56	.01/0.27
SK04/SK54	.10/4.7	.10/3.3	.10/2.7	.01/1.0	.01/0.47
SK05/SK55	.10/6.8	.10/5.6	.10/3.9	.10/1.8	.01/0.68
SK06/SK56	1.0/15	1.0/10	.10/5.6	.10/3.9	.10/1.5
SK07	1.0/18	1.0/14	1.0/8.2	.10/4.7	.10/2.2
SK08	22/33	15/22	10/15	5.6/8.2	2.2/3.9
SK09/SK59	.10/8.2	.10/5.6	.10/3.3	.10/2.2	.10/1.2
SK10/SK60	1.0/18	1.0/12	.10/6.8	.10/4.7	.10/2.2

Z5U Capacitance Range (µF)

Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.	200 WVDC min./max.
SK01	.10/1.2	.10/0.82	.10/0.47	.10/0.33
SK03/SK53	.10/5.6	.10/3.30	.10/2.20	.10/1.50
SK04/SK54	1.0/10.0	1.0/8.20	.10/4.70	.10/3.30
SK05/SK55	1.0/18.0	1.0/10.00	1.0/6.80	.10/4.70
SK06/SK56	1.0/47.0	1.0/39.00	1.0/22.00	1.0/15.00
SK07	1.0/68.0	1.0/47.00	1.0/27.00	1.0/18.00
SK08	82/120.0	56/100.00	33/47.00	22/33.00
SK09/SK59	1.0/27.0	1.0/18.00	1.0/10.00	1.0/6.80
SK10/SK60	1.0/56.0	1.0/39.00	1.0/22.00	1.0/18.00

Leaded SMPS MLCC

SE Series of Extended Ranges



AVX SE styles offer capacitance extension to popular SK ranges. The CV product for SE-series, X7R capacitors (TCC: ±15% over -55 to +125°C) compares favorably to high CV ranges offered by other suppliers in much less stable Y5U dielectric (TCC: +22/-56% over -30 to +85°C). SE style capacitors are conformally coated and are designed for input and output filtering applications in switch mode power supplies.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/se.pdf

HOW TO ORDER

SE	01	3	C	125	M	A	A	*
Style	**Size**	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Temperature Coefficient** X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 22 nF = 223 220 nF = 224 1 µF = 105 100 µF = 107	**Capacitance Tolerance** X7R: K = ±10% M = ±20% Z = +80, -20%	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging, which is AVX standard packaging. Parts available tape and reel per EIA-468. Use suffix "TR1" if tape & reel is required.

Note: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

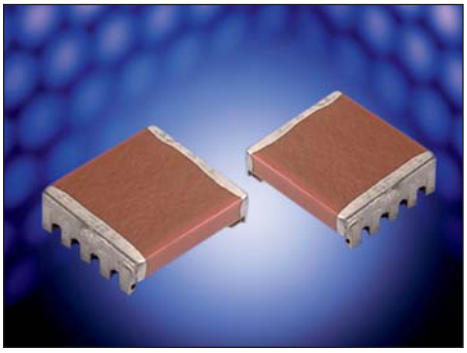
*Hi-Rel screening consists of 100% Group A, Subgroup 1 per MIL-PRF-39014.

X7R Capacitance Range (µF)

Style	25 WVDC min./max.	50 WVDC min./max.	100 WVDC min./max.
SE01	0.47/1.5	0.39/1.0	0.33/0.68
SE03/SE53	2.7/6.8	2.2/4.7	1.8/3.3
SE04/SE54	5.6/12	3.9/10	3.3/6.8
SE05/SE55	8.2/18	6.8/12	4.7/10.0
SE06/SE56	18/39	12/27	6.8/15

Commercial SMT SMPS Capacitors

RH Series for I/O Filtering in DC-DC Converters



This range of uncoated MLC capacitors are processed for input and output filter capacitors in high frequency DC-DC converter applications above 10 Watts e.g. telecomms and instrumentation, where high volume and low cost is required. These products are available in surface mount 'J' leaded versions and can be supplied in bulk and tape/reel packaging.

- 0.047 µF to 47.0 µF
- 25V to 500 VDC
- -55ºC to +125ºC
- Low ESR/ESL
- X7R Dielectric

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rh.pdf

HOW TO ORDER

RH	31	5	C	225	M	A	3	0	A	3
Style Code	**Size Code**	**Voltage Code** 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric Code** C = X7R	**Capacitance Code** 2 Sig. Digits + Number of Zeros Examples: 105 = 1 µF 104 = 0.1 µF	**Capacitance Tolerance** K = ±10% M = ±20%	**Specification Code** A = Non customized	**Package Code** 3 = Waffle Pack A = Tape & Reel	**Lead Dia. Code** 0 = Standard R = RoHS Compliant	**Lead Space Code** A = Standard	**Lead Style Code** 3 = 'J' Lead

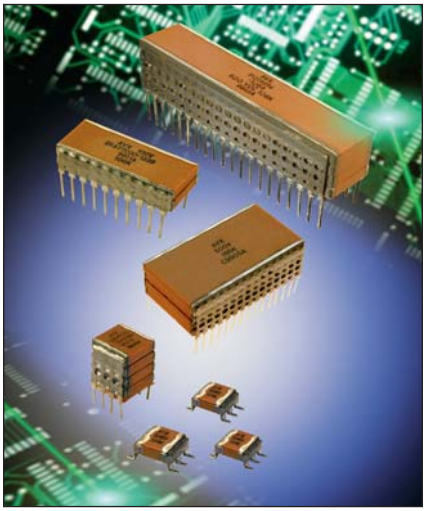
X7R Stable Dielectric

	RH21/RH22 Style					RH31/RH32 Style				RH41/RH42 Style				RH51/RH52 Style				RH61/RH62 Style			
	Voltage DC																				
Cap µF	25	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500
0.047																					
0.056																					
0.068									RH31												
0.082																					
0.1																					
0.12																					
0.15									RH32				RH41								
0.18																					
0.22																					
0.27								RH31													
0.33													RH42								
0.39												RH41					RH51				
0.47																					
0.56								RH32									RH52				
0.68																					RH61
0.78																RH51					
0.82							RH31					RH42									
1																					
1.2																					RH62
1.5			RH21			RH31										RH52				RH61	
1.8											RH41										
2.2							RH32														
2.7										RH41											
3															RH51						RH62
3.3		RH21	RH22			RH32															
3.9											RH42			RH51							
4.4																					
4.7										RH42											
5.6															RH52				RH61		
6.8																					
8.2														RH52				RH61			
10																					
12																			RH62		
15		RH21	RH22															RH62			
18																					
22																					
27																					
33		RH22																			
39																					
47																					

For availability of further parts in the RH21/RH22 Series, contact manufacturing.

Stacked Leaded MLC Capacitors

SM Series



The SMPS capacitors are designed for high current, high-power and high-temperature applications. These capacitors have very low ESR (Equivalent Series Resistance) and ESL (Equivalent Series Inductance). SMPS Series capacitors offer design and component engineers a proven technology specifically designed for programs requiring high reliability performance in harsh environments.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rm01-06.pdf

HOW TO ORDER AVX Styles: SM-1, SM-2, SM-3, SM-4, SM-5, SM-6

SM0	1	7	C	106	M	A	N	650
AVX Style Size SM0 = Uncoated SM5 = Epoxy Coated	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out P = P Style Leads Z = Z Style Leads	**Height** Max Dimension "A" 120 = 0.120" 240 = 0.240" 360 = 0.360" 480 = 0.480" 650 = 0.650"

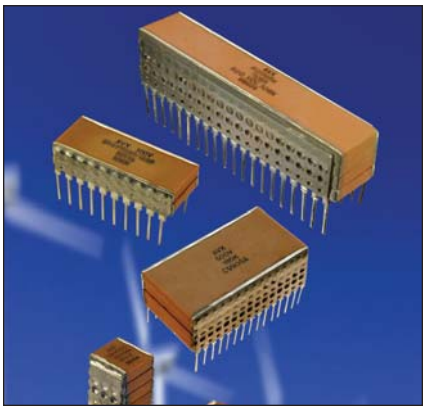
Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

CAPABILITY

Case code	Voltage	X7R Cap range Min µF	X7R Cap range Max µF	Tolerances	Configurations
5	50	1.2	5.4	10 & 20%	N, J, L Leads
	100	0.68	3.3	10 & 20%	N, J, L Leads
	200	0.47	1.5	10 & 20%	N, J, L Leads
	500	0.15	0.68	10 & 20%	N, J, L Leads
4	50	6.8	15.0	10 & 20%	N, J, L Leads
	100	3.9	8.2	10 & 20%	N, J, L Leads
	200	1.8	3.9	10 & 20%	N, J, L Leads
	500	0.8	1.8	10 & 20%	N, J, L Leads
3	50	18.0	47.0	10 & 20%	N, J, L Leads
	100	10.0	27.0	10 & 20%	N, J, L Leads
	200	4.7	12.0	10 & 20%	N, J, L Leads
	500	2.5	5.4	10 & 20%	N, J, L Leads
2	50	120.0	150.0	10 & 20%	N, J, L Leads
	100	68.0	82.0	10 & 20%	N, J, L Leads
	200	33.0	39.0	10 & 20%	N, J, L Leads
	500	15.0	18.0	10 & 20%	N, J, L Leads
1	50	56.0	100.0	10 & 20%	N, J, L Leads
	100	33.0	56.0	10 & 20%	N, J, L Leads
	200	15.0	27.0	10 & 20%	N, J, L Leads
	500	6.8	12.0	10 & 20%	N, J, L Leads
6	50	180.0	270.0	10 & 20%	N, J, L Leads
	100	100.0	180.0	10 & 20%	N, J, L Leads
	200	47.0	120.0	10 & 20%	N, J, L Leads
	500	22.0	39.0	10 & 20%	N, J, L Leads

Stacked Leaded MLC Capacitors

RM Series



The SMPS capacitors are designed for high current, high-power and high-temperature applications. These capacitors have very low ESR (Equivalent Series Resistance) and ESL (Equivalent Series Inductance). SMPS Series capacitors offer design and component engineers a proven technology specifically designed for programs requiring high reliability performance in harsh environments.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rm01-06.pdf

HOW TO ORDER AVX Styles: RM-1, RM-2, RM-3, RM-4, RM-5, RM-6

RM0	1	7	C	106	M	A	N	650
AVX Style Size RM0 = Uncoated RM5 = Epoxy Coated	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out P = P Style Leads Z = Z Style Leads	**Height** Max Dimension "A" 120 = 0.120" 240 = 0.240" 360 = 0.360" 480 = 0.480" 650 = 0.650"

Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

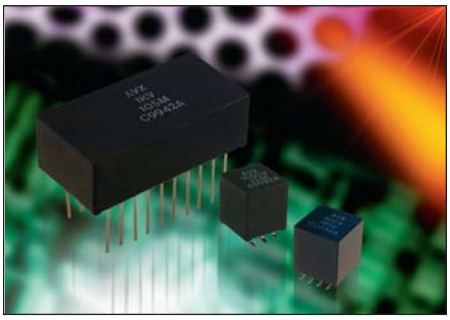
RoHS COMPLIANT

CAPABILITY

Case code	Voltage	X7R Cap range Min µF	X7R Cap range Max µF	Tolerances	Configurations
5	50	1.2	5.4	10 & 20%	N, J, L Leads
	100	0.68	3.3	10 & 20%	N, J, L Leads
	200	0.47	1.5	10 & 20%	N, J, L Leads
	500	0.15	0.68	10 & 20%	N, J, L Leads
4	50	6.8	15.0	10 & 20%	N, J, L Leads
	100	3.9	8.2	10 & 20%	N, J, L Leads
	200	1.8	3.9	10 & 20%	N, J, L Leads
	500	0.8	1.8	10 & 20%	N, J, L Leads
3	50	18.0	47.0	10 & 20%	N, J, L Leads
	100	10.0	27.0	10 & 20%	N, J, L Leads
	200	4.7	12.0	10 & 20%	N, J, L Leads
	500	2.5	5.4	10 & 20%	N, J, L Leads
2	50	120.0	150.0	10 & 20%	N, J, L Leads
	100	68.0	82.0	10 & 20%	N, J, L Leads
	200	33.0	39.0	10 & 20%	N, J, L Leads
	500	15.0	18.0	10 & 20%	N, J, L Leads
1	50	56.0	100.0	10 & 20%	N, J, L Leads
	100	33.0	56.0	10 & 20%	N, J, L Leads
	200	15.0	27.0	10 & 20%	N, J, L Leads
	500	6.8	12.0	10 & 20%	N, J, L Leads
6	50	180.0	270.0	10 & 20%	N, J, L Leads
	100	100.0	180.0	10 & 20%	N, J, L Leads
	200	47.0	120.0	10 & 20%	N, J, L Leads
	500	22.0	39.0	10 & 20%	N, J, L Leads

SMPS Stacked MLC Capacitors

SM9 Style Encapsulated in DAP (Diallyl Phthalate) Case



As the world's leading manufacturer and innovator in application specific multilayer ceramic (ASMLC) capacitors, AVX offers a unique technological and production capability to the field. AVX actively pursues and satisfies the high reliability and custom needs of a variety of governmental and industrial customers. Successful involvement in missile programs, extensive work in ultra-high reliability telecommunications and sophisticated capacitor design applications – all have established AVX as the source for advanced and high reliability ASMLC capacitors. **Advanced Products are ISO9001 certified organizations for design and manufacturing of MLC capacitors.**

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sm9.pdf

HOW TO ORDER AVX Styles: SM91, SM92, SM93, SM94, SM95, SM96

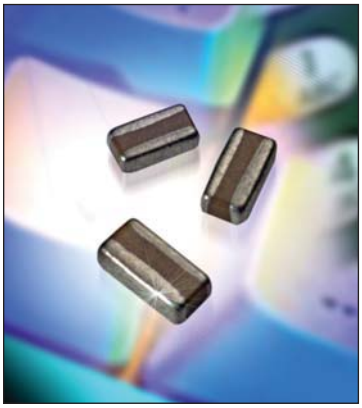
SM9	1	7	C	106	M	A	N	650
AVX Style SM9 = Plastic Case	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R = C Z5U = E	**Capacitance Code** (2 significant digits + number of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20% Z5U: Z = +80%, -20% P = GMV (+100, -0%)	**Test Level** A = Standard B = Hi-Rel*	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out	**Height** Max Dimension "A" 270 = 0.270" 390 = 0.390" 530 = 0.530" 660 = 0.660" 800 = 0.800"

Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

*Hi-Rel screening for C0G and X7R only. Screening consists of 100% Group A (B Level), Subgroup 1 per MIL-PRF-49470.

Low Inductance Capacitors (RoHS)

LICC 0612/0508/0306/0204 LICC (Low Inductance Chip Capacitors)

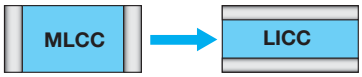


The key physical characteristic determining equivalent series inductance (ESL) of a capacitor is the size of the current loop it creates. The smaller the current loop, the lower the ESL.

A standard surface mount MLCC is rectangular in shape with electrical terminations on its shorter sides. A Low Inductance Chip Capacitor (LICC) sometimes referred to as Reverse Geometry Capacitor (RGC) has its terminations on the longer sides of its rectangular shape. The image on the right shows the termination differences between an MLCC and an LICC.

When the distance between terminations is reduced, the size of the current loop is reduced. Since the size of the current loop is the primary driver of inductance, an 0306 with a smaller current loop has significantly lower ESL then an 0603. The reduction in ESL varies by EIA size, however, ESL is typically reduced 60% or more with an LICC versus a standard MLCC.

AVX LICC products are available with a lead-free finish of plated Nickel/Tin.



Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/licc.pdf

HOW TO ORDER

0612	Z	D	105	M	A	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Thickness**
0204	4 = 4V	C = X7R	2 Sig. Digits +	K = ±10%	A = N/A	T = Plated Ni	Available	Thickness
0306	6 = 6.3V	D = X5R	Number of Zeros	M = ±20%		and Sn	2 = 7" Reel	mm (in)
0508	Z = 10V	W = X6S					4 = 13" Reel	0.35 (0.014)
0612	Y = 16V	Z = X7S						0.56 (0.022)
	3 = 25V							0.61 (0.024)
	5 = 50V							0.76 (0.030)
								1.02 (0.040)
								1.27 (0.050)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

SIZE	0204				0306						0508					0612				
WVDC	4	6.3	10	16	4	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
CAP 0.001																				
(µF) 0.0022																				
0.0047																				
0.010																				
0.015																				
0.022																				
0.047																				
0.068																				
0.10																				
0.15																				
0.22																				
0.47																				
0.68																				
1.0																				
1.5																				
2.2																				
3.3																				
4.7																				
10																				

Solid = X7R **= X5R**

= X7S **= X6S**

mm (in.)

0204	
Code	Thickness
C	0.35 (0.014)

mm (in.)

0306	
Code	Thickness
A	0.61 (0.024)

mm (in.)

0508	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
A	1.02 (0.040)

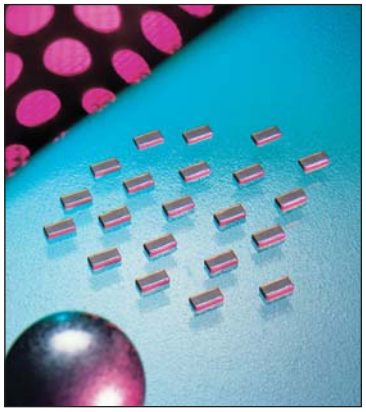
mm (in.)

0612	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
W	1.02 (0.040)
A	1.27 (0.050)

RoHS COMPLIANT

Low Inductance Capacitors (Tin/Lead)

LICC 0612/0508/0306 Tin/Lead Termination "B"



The key physical characteristic determining equivalent series inductance (ESL) of a capacitor is the size of the current loop it creates. The smaller the current loop, the lower the ESL.

A standard surface mount MLCC is rectangular in shape with electrical terminations on its shorter sides. A Low Inductance Chip Capacitor (LICC) sometimes referred to as Reverse Geometry Capacitor (RGC) has its terminations on the longer sides of its rectangular shape. The image on the right shows the termination differences between an MLCC and an LICC.

When the distance between terminations is reduced, the size of the current loop is reduced. Since the size of the current loop is the primary driver of inductance, an 0306 with a smaller current loop has significantly lower ESL then an 0603. The reduction in ESL varies by EIA size, however, ESL is typically reduced 60% or more with an LICC versus a standard MLCC.

AVX LICC products are available with a lead termination for high reliability military and aerospace applications that must avoid tin whisker reliability issues.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/licc.pdf

HOW TO ORDER

LD18	Z	D	105	M	A	B	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Thickness**
LD15 = 0204	4 = 4V	C = X7R	2 Sig. Digits +	K = ±10%	A = N/A	B = 5% min lead	Available	Thickness
LD16 = 0306	6 = 6.3V	D = X5R	Number of Zeros	M = ±20%			2 = 7" Reel	mm (in)
LD17 = 0508	Z = 10V	W = X6S					4 = 13" Reel	0.35 (0.014)
LD18 = 0612	Y = 16V							0.56 (0.022)
	3 = 25V							0.61 (0.024)
	5 = 50V							0.76 (0.030)
								1.02 (0.040)
								1.27 (0.050)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

SIZE	LD15				LD16						LD17					LD18				
WVDC	4	6.3	10	16	4	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
Cap 1000						A	A	A	A		S	S	S	S	V	S	S	S	S	V
(pF) 2200						A	A	A	A		S	S	S	S	V	S	S	S	S	V
4700						A	A	A	A		S	S	S	S	V	S	S	S	S	V
Cap 0.010						A	A	A	A		S	S	S	S	V	S	S	S	S	V
(µF) 0.015						A	A	A	A		S	S	S	S	V	S	S	S	S	W
0.022						A	A	A	A		S	S	S	S	V	S	S	S	S	W
0.047						A	A	A			S	S	S	V	A	S	S	S	S	W
0.068						A	A	A			S	S	S	A	A	S	S	S	V	W
0.10	C	C				A	A	A			S	S	V	A	A	S	S	S	V	W
0.15						A	A				S	S	V			S	S	S	W	W
0.22						A	A				S	S	A			S	S	V		
0.47											V	V	A			S	S	V		
0.68											A	A				V	V	W		
1.0					A						A	A				V	V	A		
1.5											A					W	W			
2.2																A	A			
3.3																A				
4.7																				
10																				
WVDC	4	6.3	10	16	4	6.3	10	16	25	50	6.3	10	16	25	50	6.3	10	16	25	50
SIZE	0204				0306						0508					0612				

Solid = X7R

= X5R

= X7S

= X6S

mm (in.)

0204	
Code	Thickness
C	0.35 (0.014)

mm (in.)

0306	
Code	Thickness
A	0.61 (0.024)

mm (in.)

0508	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
A	1.02 (0.040)

mm (in.)

0612	
Code	Thickness
S	0.56 (0.022)
V	0.76 (0.030)
W	1.02 (0.040)
A	1.27 (0.050)

IDC Low Inductance Capacitors (RoHS)

0612/0508 Interdigitated Capacitors

Inter-Digitated Capacitors (IDCs) are used for both semiconductor package and board level decoupling. The equivalent series inductance (ESL) of a single capacitor or an array of capacitors in parallel determines the response time of a Power Delivery Network (PDN). A designer can use many standard MLCCs in parallel to reduce ESL or a low ESL Inter-Digitated Capacitor (IDC) device.

IDCs are typically used on packages of semiconductor products with power levels of 15 watts or greater. Inter-Digitated Capacitors are used on CPU, GPU, ASIC, and ASSP devices produced on 0.13µ, 90nm, 65nm, and 45nm processes. IDC devices are used on both ceramic and organic package substrates. These low ESL surface mount capacitors can be placed on the bottom side or the top side of a package substrate.

IDCs are used for board level decoupling of systems with speeds of 300MHz or greater. Low ESL IDCs free up valuable board space by reducing the number of capacitors required versus standard MLCCs. There are additional benefits to reducing the number of capacitors beyond saving board space including higher reliability from a reduction in the number of components and lower placement costs based on the need for fewer capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/w2lw3l.pdf

HOW TO ORDER

W	3	L	1	6	D	225	M	A	T	3	A
Style	**IDC Case Size** 2 = 0508 3 = 0612	**Low Inductance**	**Number of Terminals** 1 = 8 Terminals	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V	**Dielectric** C = X7R D = X5R Z = X7S	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** M = ±20%	**Failure Rate** A = N/A	**Terminations** T = Plated Ni and Sn	**Packaging** Available 1 = 7" Reel 3 = 13" Reel	**Thickness** Max. Thickness mm (in.) A = 0.95 (0.037) S = 0.55 (0.022)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

SIZE		Thin 0508					0508					Thin 0612				0612			
Length	MM (in.)	2.03 ± 0.20 (0.080 ± 0.008)					2.03 ± 0.20 (0.080 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)				3.20 ± 0.20 (0.126 ± 0.008)			
Width	MM (in.)	1.27 ± 0.20 (0.050 ± 0.008)					1.27 ± 0.20 (0.050 ± 0.008)					1.60 ± 0.20 (0.063 ± 0.008)				1.60 ± 0.20 (0.063 ± 0.008)			
Terminal Pitch	MM (in.)	0.50 ± 0.05 (0.020 ± 0.002)					0.50 ± 0.05 (0.020 ± 0.002)					0.80 ± 0.10 (0.031 ± 0.004)				0.80 ± 0.10 (0.031 ± 0.004)			
Thickness	MM (in.)	0.55 MAX. (0.022) MAX.					0.95 MAX. (0.037) MAX.					0.55 MAX. (0.022) MAX.				0.95 MAX. (0.037) MAX.			
WVDC		4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	4	6.3	10	16
Cap (µF)	0.01																		
	0.033																		
	0.047																		
	0.068																		
	0.10																		
	0.22																		
	0.33																		
	0.47																		
	0.68																		
	1.0																		
	1.5																		
	2.2																		
	3.3																		

RoHS COMPLIANT

Consult factory for additional requirements

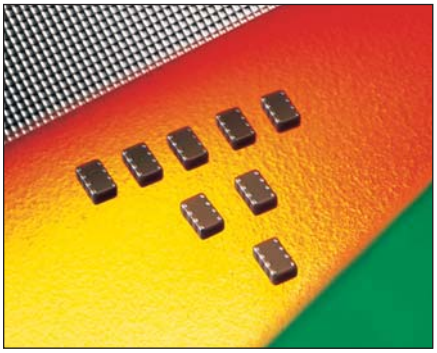
= X7R

= X5R

= X7S

IDC Low Inductance Capacitors (Tin/Lead)

0612/0508 Interdigitated Capacitors



Inter-Digitated Capacitors (IDCs) are used for both semiconductor package and board level decoupling. The equivalent series inductance (ESL) of a single capacitor or an array of capacitors in parallel determines the response time of a Power Delivery Network (PDN). A designer can use many standard MLCCs in parallel to reduce ESL or a low ESL Inter-Digitated Capacitor (IDC) device.

IDCs are typically used on packages of semiconductor products with power levels of 15 watts or greater. Inter-Digitated Capacitors are used on CPU, GPU, ASIC, and ASSP devices produced on 0.13µ, 90nm, 65nm, and 45nm processes. IDC devices are used on both ceramic and organic package substrates. These low ESL surface mount capacitors can be placed on the bottom side or the top side of a package substrate.

IDCs are used for board level decoupling of systems with speeds of 300MHz or greater. Low ESL IDCs free up valuable board space by reducing the number of capacitors required versus standard MLCCs. There are additional benefits to reducing the number of capacitors beyond saving board space including higher reliability from a reduction in the number of components and lower placement costs based on the need for fewer capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/l2l-l3l.pdf

HOW TO ORDER

L	3	L	1	6	D	225	M	A	B	3	A
Style	**IDC Case Size** 2 = 0508 3 = 0612	**Low Inductance**	**Number of Terminals** 1 = 8 Terminals	**Voltage** 4 = 4V 6 = 6.3V Z = 10V Y = 16V 3 = 25V	**Dielectric** C = X7R D = X5R Z = X7S	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** M = ±20%	**Failure Rate** A = N/A	**Terminations** B = 5% min. Lead	**Packaging** Available 1 = 7" Reel 3 = 13" Reel	**Thickness** Max. Thickness mm (in.) A = 0.95 (0.037) S = 0.55 (0.022)

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

SIZE		Thin 0508					0508					Thin 0612				0612			
Length	MM (in.)	2.03 ± 0.20 (0.080 ± 0.008)					2.03 ± 0.20 (0.080 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)				3.20 ± 0.20 (0.126 ± 0.008)			
Width	MM (in.)	1.27 ± 0.20 (0.050 ± 0.008)					1.27 ± 0.20 (0.050 ± 0.008)					1.60 ± 0.20 (0.063 ± 0.008)				1.60 ± 0.20 (0.063 ± 0.008)			
Terminal Pitch	MM (in.)	0.50 ± 0.05 (0.020 ± 0.002)					0.50 ± 0.05 (0.020 ± 0.002)					0.80 ± 0.10 (0.031 ± 0.004)				0.80 ± 0.10 (0.031 ± 0.004)			
Thickness	MM (in.)	0.55 MAX. (0.022) MAX.					0.95 MAX. (0.037) MAX.					0.55 MAX. (0.022) MAX.				0.95 MAX. (0.037) MAX.			
WVDC		4	6.3	10	16	25	4	6.3	10	16	25	4	6.3	10	16	4	6.3	10	16
Cap (µF)	0.01																		
	0.033																		
	0.047																		
	0.068																		
	0.10																		
	0.22																		
	0.33																		
	0.47																		
	0.68																		
	1.0																		
	1.5																		
	2.2																		
	3.3																		

Consult factory for additional requirements

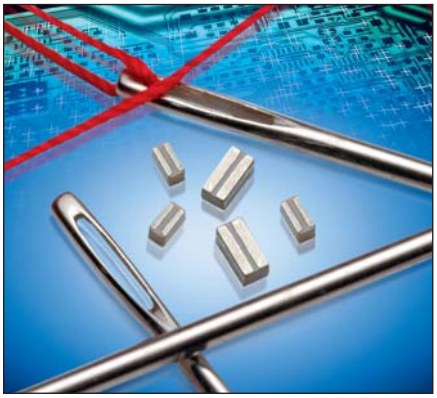
= X7R

= X5R

= X7S

LGA Low Inductance Capacitors

0204/0306/0805 Land Grid Arrays



Land Grid Array (LGA) capacitors are the latest family of low inductance MLCCs from AVX. These new LGA products are the third low inductance family developed by AVX. The innovative LGA technology sets a new standard for low inductance MLCC performance. *Electronic Products* awarded its 2006 Product of the Year Award to the LGA Decoupling capacitor.

Our initial 2 terminal versions of LGA technology deliver the performance of an 8 terminal IDC low inductance MLCC with a number of advantages including:

- Simplified layout of 2 large solder pads compared to 8 small pads for IDCs
- Opportunity to reduce PCB or substrate contribution to system ESL by using multiple parallel vias in solder pads
- Advanced FCT manufacturing process used to create uniformly flat terminations on the capacitor that resist "tombstoning"
- Better solder joint reliability

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/lga2t.pdf

APPLICATIONS

Semiconductor Packages

- **Microprocessors/CPUs**
- **Graphics Processors/GPUs**
- **Chipsets**
- **FPGAs**
- **ASICs**

Board Level Device Decoupling

- **Frequencies of 300 MHz or more**
- **ICs drawing 15W or more**
- **Low voltages**
- **High speed buses**

HOW TO ORDER

LG	1	2	6	Z	104	M	A	T	2	S	1
Style	**Case Size** 1 = 0204 2 = 0306 C = 0805	**Number of Terminals** 2	**Working Voltage** 4 = 4V 6 = 6.3V Z = 10V	**Temperature Characteristic** C = X7R D = X5R Z = X7S W = X6S	**Coded Cap**	**Cap Tolerance** M = 20%	**Termination Style** A = "U" Land	**Termination** 100% Sn* *Contact factory for other termination finishes	**Packaging Tape & Reel** 2 = 7" Reel 4 = 13" Reel	**Thickness** S = 0.55mm max	**Number of Capacitors**

SIZE		LG12 (0204)						LG22 (0306)								LGC2 (0805)							
Length	mm (in.)	0.50 (0.020)						0.76 (0.030)								2.06 (0.081)							
Width	mm (in.)	1.00 (0.039)						1.60 (0.063)								1.32 (0.052)							
Temp. Char.		X5R (D)		X7S (Z)		X6S (W)		X7R (C)		X5R (D)		X7S (Z)		X6S (W)		X7R (C)		X5R (D)		X7S (Z)		X6S (W)	
Working Voltage		6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	10 (Z)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)	6.3 (6)	4 (4)
Cap (µF)	0.010 (103)																						
	0.022 (223)																						
	0.047 (473)																						
	0.100 (104)																						
	0.220 (224)																						
	0.330 (334)																						
	0.470 (474)																						
	1.000 (105)																						
	2.200 (225)																						

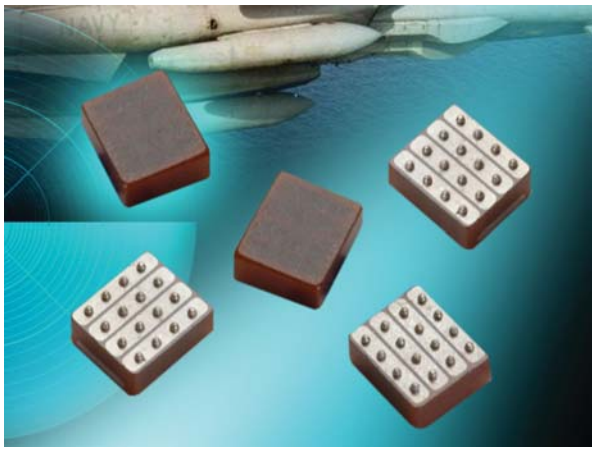
Please contact AVX for values

RoHS COMPLIANT

= X7R = X5R = X7S = X6S

Low Inductance Capacitors

LICA® (Low Inductance Decoupling Capacitor Arrays)



LICA® arrays utilize up to four separate capacitor sections in one ceramic body. These designs exhibit a number of technical advancements:

Low Inductance features–

- Low resistance platinum electrodes in a low aspect ratio pattern
- Double electrode pickup and perpendicular current paths
- C4 "flip-chip" technology for minimal interconnect inductance

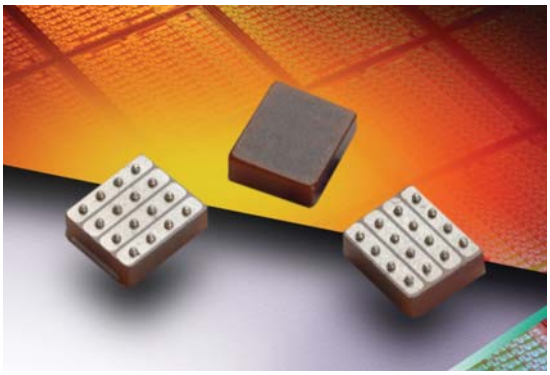
Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/licc.pdf

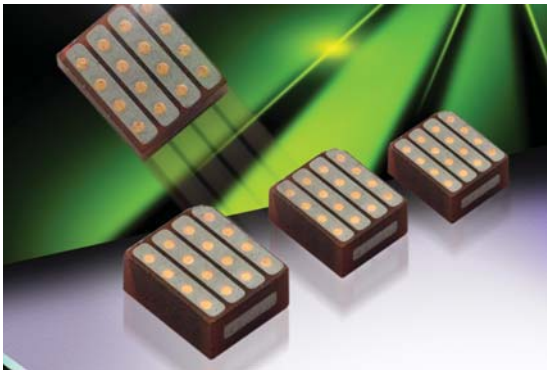
HOW TO ORDER

LICA	3	T	102	M	3	F	C	4	A	A
Style & Size	**Voltage** 9 = 5V Z = 10V 3 = 25V	**Dielectric** D = X5R T = T55T S = High K T55T	**Cap/Section (EIA Code)** 102 = 1000 pF 103 = 10 nF 104 = 100 nF	**Capacitance Tolerance** M = ±20% P = GMV	**Height Code** 6 = 0.500mm 3 = 0.650mm 1 = 0.875mm 5 = 1.100mm 7 = 1.600mm	**Termination** F = C4 Solder Balls- 97Pb/3Sn H = C4 Solder Balls Low ESR G = Lead Free SAC R = Cr-Cu-Au N = Cr-Ni-Au V = Eutectic Lead-Tin Bump-37%Pb/63%Sn X = None	**Reel Packaging** M = 7" Reel R = 13" Reel 6 = 2"x2" Waffle Pack 8 = 2"x2" Black Waffle Pack 7 = 2"x2" Waffle Pack w/ termination facing up A = 2"x2" Black Waffle Pack w/ termination facing up C = 4"x4" Waffle Pack w/ clear lid	**# of Caps/Part** 1 = one 2 = two 4 = four	**Inspection Code** A = Standard B = COTS-Plus X = MIL-PRF-123	**Code Face** A = Bar B = No Bar C = Dot, S55S Dielectrics D = Triangle

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

TERMINATION OPTIONS





LICA COMMON PART NUMBER LIST

Part Number	Voltage	Thickness (mm)	Capacitors per Package
LICA3T193M3FC4AA	**25**	**0.650**	**4**
LICA3T153P3FC4AA	**25**	**0.650**	**4**
LICA3T134M1FC1AA	**25**	**0.875**	**1**
LICA3T104P1FC1AA	**25**	**0.875**	**1**
LICA3T333M1FC4AA	**25**	**0.875**	**4**
LICA3T263P3FC4AA	**25**	**0.650**	**4**
LICA3T244M5FC1AA	**25**	**1.100**	**1**
LICA3T194P5FC1AA	**25**	**1.100**	**1**
LICA3T394M7FC1AB	**25**	**1.600**	**1**
LICA3T314P7FC1AB	**25**	**1.600**	**1**
Extended Range			
LICAZT623M3FC4AB	**10**	**0.650**	**4**
LICA3T104M3FC1A	**25**	**0.650**	**1**
LICA3T803P3FC1A	**25**	**0.650**	**1**
LICA3T423M3FC2A	**25**	**0.650**	**2**
LICA3T333P3FC2A	**25**	**0.650**	**2**
LICA3S253M3FC4A	**25**	**0.650**	**4**
LICAZD753M3FC4AD	**10**	**0.650**	**4**
LICAZD504M3FC1AB	**10**	**0.650**	**1**
LICAZD604M7FC1AB	**10**	**1.600**	**1**
LICA3D193M3FC4AB	**25**	**0.650**	**4**

TAJ Series
Standard Tantalum Capacitors

- General purpose SMT chip tantalum series
- 6 case sizes available
- Low profile options available
- CV range: 0.10-2200µF / 2.5-50V

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taj.pdf

HOW TO ORDER

TAJ C 106 M 035 R NJ –

Type
TAJ

Case Size
C

Capacitance Code
pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
002=2.5Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc
050=50Vdc
063=63Vdc

Packaging
R = 7" T/R
(Lead Free since production date 1/1/04)
S = 13" T/R
(Lead Free since production date 1/1/04)
A = Gold Plating 7" Reel
B = Gold Plating 13" Reel
H = Tin/Lead 7" reel
(Contact Manufacturer)
K = Tin/Lead 13" reel
(Contact Manufacturer)
H, K = Non RoHS

Specification Suffix
NJ = Standard Suffix

Additional characters may be added for special requirements
V = Dry pack Option (selected codes only)

Capacitance		Rated voltage DC (V_R) to 85°C									
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)	63V
0.10	104								A	A	
0.15	154								A	A/B	
0.22	224								A	A/B	
0.33	334								A	B	
0.47	474							A	A/B	A/B/C	
0.68	684						A	A	A/B	A/B/C	
1.0	105					A	A	A	A/B	A(M)/B/C	
1.5	155				A	A	A	A/B	A/B/C	C/D	
2.2	225			A	A	A/B	A/B	A/B	A/B/C	C/D	
3.3	335			A	A	A/B	A/B	A/B/C	B/C	C/D	
4.7	475		A	A	A/B	A/B	A/B/C	A/B/C	B/C/D	C/D	
6.8	685		A	A/B	A/B	A/B/C	A/B/C	B/C	C/D	C/D	
10	106		A	A/B	A/B/C	A/B/C	A(M)*/B/C	B/C/D	C/D/E	D/E/V	
15	156		A/B	A/B	A/B/C	A(M)/B/C	B/C/D	C/D	C/D	D/E/V	E(M)*
22	226		A	A/B/C	A/B/C	B/C/D	B/C/D	C/D	D/E	V	V(M)*
33	336	A	A/B	A/B/C	A/B/C/D	B/C/D	C/D	D/E	D/E/V		
47	476	A	A/B	A/B/C/D	B/C/D	C/D	C/D/E	D/E	E/V		
68	686	A	A/B/C	B/C/D	B/C/D	C/D	C(M)/D/E	E/V	V(M)		
100	107	A/B	A/B/C	B/C/D	B(M)/C/D/E	C/D/E	D/E/V	E(M)/V			
150	157	B	B/C	B(M)/C/D	C/D/E	D/E/V	E/V	V(M)			
220	227	B/D	B(M)/C/D	C/D/E	C/D/E	E/V					
330	337	D	C/D/E	C/D/E	D/E/V	V					
470	477	C/D	C/D/E	D/E/V	E/V						
680	687	C/D/E	D/E	E/V							
1000	108	D(M)/E	D/E/V	E(M)/V(M)							
1500	158	D/E/V(M)	E/V(M)								
2200	228	V(M)									

Non preferred Ratings - not recommended for new designs, higher voltage or smaller case size substitution are offered.

Released codes (M tolerance only)

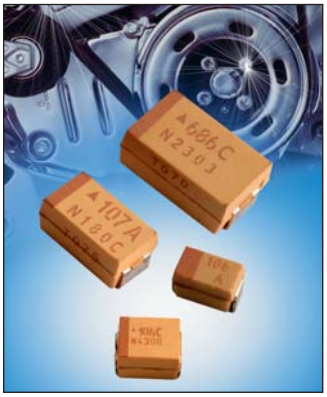
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TAJ Low Profile

Low Profile Tantalum Capacitors



- General purpose SMT chip tantalum series
- CV range: 0.10-1000µF / 2.5-50V
- 9 case sizes in low profile option available

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tajlp.pdf

HOW TO ORDER

TAJ C 107 M 010 R NJ –

Type

Case Size

Capacitance Code
pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
002=2.5Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc
050=50Vdc

Packaging
R = 7" T/R (Lead Free since production date 1/1/04)
S = 13" T/R (Lead Free since production date 1/1/04)
A = Gold Plating 7" Reel
B = Gold Plating 13" Reel

Specification Suffix
NJ = Standard Suffix

Additional characters may be added for special requirements
V = Dry pack Option (selected codes only)

Capacitance		Rated voltage DC (V_R) to 85°C								
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104						R/S		R/S	S
0.15	154						R/S	R	R/S	S
0.22	224						R/S	R	R/S	S
0.33	334						R/S	R	R/S	S/T
0.47	474						R/S	R/S	R/S/T	S/T
0.68	684					R/S	R/S/T	R/S	P/S/T	
1.0	105				R/S	R/S/T	R/S/T	P/R/S	P/S/T	W
1.5	155			R/S	R/S	R/S	P/R/S/T	P/S/T	T	W
2.2	225		R/S	R/S	R/S	R/S/T	P/R/S/T	T	T	
3.3	335		R/S	R/S	R/S/T	R/S/T	T	T/W	W	Y
4.7	475	R	R/S	R/S/T	R/S/T	K/P/S/T	T	T/W	W	Y
6.8	685	R	R/S/T	R/S/T	P/R/S/T	S/T	T	W	Y	Y
10	106	R/S	R/S/T	P/R/S/T	K/P/R(M)/S/T	T/W	W	W	X/Y	
15	156	R	R/S/T	K/P/R/S/T	S/T/W	T(M)/W	W	Y	Y	
22	226	P/R	K/P/R/S/T	K/P(M)/S/T/W	T/W	W	W/Y	Y	Y	
33	336	K/P/S	K/P(M)/S/T/W	T/W	W	W/Y	X/Y	Y		
47	476	P(M)/S	T/W	T/W	W/Y	W/X/Y	X/Y	Y		
68	686	T	T/W	W	W/Y	F/X/Y	Y			
100	107	T/W	T(M)/W	W/Y	W/X/Y	F(M)/Y				
150	157	T(M)/W	W/Y	W/X/Y	F/X(M)/Y	Y(M)				
220	227	W/Y	W/X/Y	F/X/Y	Y					
330	337	W(M)/Y	F/X/Y	Y						
470	477	F/Y	Y	Y						
680	687	Y	Y(M)							
1000	108	Y(M)								

Released codes (M tolerance only)

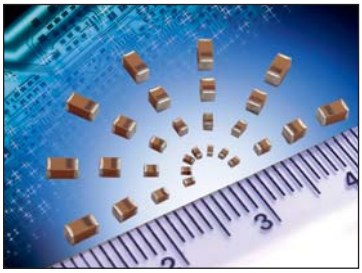
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TACmicrochip®

Small Case Size Tantalum Capacitors



- The world's smallest surface mount tantalum capacitor
- CV range: 0.47 - 150µF / 2 - 25V
- 5 case sizes available
- Low profile options available
- Industrial and hi-rel medical applications

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tac.pdf

HOW TO ORDER

TAC	L	226	M	004	R	TA
Type TACmicrochip®	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 002=2Vdc 003=3Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 050=50Vdc	**Packaging** R, P = 7" Standard Tin Termination Plastic Tape X, Q = 4¼" Standard Tin Termination Plastic Tape A = 7" Gold Termination Plastic Tape F = 4¼" Gold Termination Plastic Tape	**Alternative characters may be used for special requirements**

Capacitance		Voltage Rating DC (V_R) at 85°C								
µF	Code	2.0V	3.0V	4.0V	6.3V	10V	16V	20V	25V	50V
0.10 0.15 0.22	104 154 224							K*		
0.33 0.47 0.68	334 474 684					K(M)/L K(M)/L	L L			
1.0 1.5 2.2	105 155 225		K(M)/L	L L	K/L L K(M)/L	K/L L L	L L		R	A*
3.3 4.7 6.8	335 475 685	K(M)/L K(M)/L K(M)/L	K(M)/L K(M)/L L	L L L	L L L/R	L/R L/R L/R	R*	R(M) R(M)	A*	
10 15 22	106 156 226	K(M)/L R	L R L(M)/R	L/R L(M)/R L(M)/R	L(M)/R L(M)/R R	L/R R R	R			
33 47 68	336 476 686	R R R(M)	R R R(M)	R R A(M)	R A/R(M) A(M)*	A(M)/B*/R(M) B				
100 150 220	107 157 227	A(M)	A(M)/R(M)	A(M)/R(M)	A(M)					

Released codes (M tolerance only)

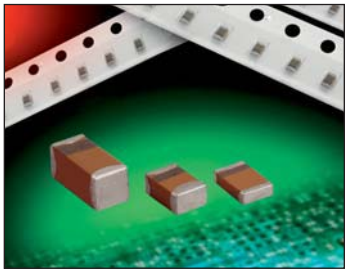
*Codes under development - subject to change

Standard Height Profile: A, B, K, L, R Case
Low Profile: H, J, T, U, V Case

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TACmicrochip® Low Profile

Low Profile Small Case Size Tantalum Capacitors



- The world's smallest surface mount tantalum capacitor
- CV range: 1.0-220µF / 2-16V
- 5 case sizes available in low profile option
- Industrial and hi-rel medical applications

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taclp.pdf

HOW TO ORDER

TAC	U	475	M	004	R	TA
Type TACmicrochip®	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 002=2Vdc 003=3Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc	**Packaging** R = 7" Standard Tin Termination Plastic Tape X = 4¼" Standard Tin Termination Plastic Tape A = 7" Gold Termination Plastic Tape F = 4¼" Gold Termination Plastic Tape	**Alternative characters may be used for special requirements**

Capacitance		Voltage Rating DC (V_R) at 85°C					
µF	Code	2.0V	3.0V	4.0V	6.3V	10V	16V
1.0 1.5 2.2	105 155 225					U(M)	U(M)
3.3 4.7 6.8	335 475 685			U(M)	U(M)		
10 15 22	106 156 226	U(M)		J(M)	H H	H/V(M) V(M)	
33 47 68	336 476 686		H(M)	H	T*	T	
100 150 220	107 157 227		T(M)		T(M)		

Released codes (M tolerance only)

*Codes under development - subject to change

Standard Height Profile: A, B, K, L, R Case
Low Profile: H, J, T, U, V Case

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TLC Series

Consumer Series Small Case Size Tantalum Capacitors

- High capacitance vs. voltage ratio
- Super high volumetric efficiency
- CV range: 0.47-220µF / 2-35V
- 10 case sizes available
- Consumer applications (portable handheld electronics, cellular phones, digital equipments etc.)

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlc.pdf

HOW TO ORDER

TLC — **Type**

L — **Case Size**

226 — **Capacitance Code**
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

M — **Tolerance**
M=±20%

006 — **Rated DC Voltage**
002=2Vdc
003=3Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc

R — **Packaging**
R, P = 7" Standard Tin Termination Plastic Tape
X, Q = 4¼" Standard Tin Termination Plastic Tape
A = 7" Gold Termination Plastic Tape
F = 4¼" Gold Termination Plastic Tape

TA — **Standard Suffix**
OR
4000 — **ESR in mΩ**

Capacitance		Voltage Rating DC (V_R) to 40°C								
µF	Code	2.0V	3.0V	4.0V	6.3V	10V	16V	20V	25V	35V
0.33	334						J*		L	
0.47	474					N*	K			
0.68	684									
1.0	105						J*	J*	L	L*/R
1.5	155									
2.2	225					J*/K	J*	H/L*	H/R	
3.3	335						L			
4.7	475			K/N*	K/U	J/K*				R*
6.8	685		K	K		U				
10	106		K	J/K/Z	J/K/Z	J*/U/Z*	V	R		A*
15	156	K	K*	K*/Z*		H/L				
22	226	J	J	J*	L/U*	L*/M			T*	
33	336			L	H/L/L(4000)	H				
47	476	L	L	H/L	H	C*/Q*/R				
68	686			R	R	A*/R*				
100	107		H*	C*/H*/Q*	R	R*/T				
150	157			R*	R*					
220	227	R*	S*	A*/R*/T						
330	337									
470	477	A*		A*						
680	687									

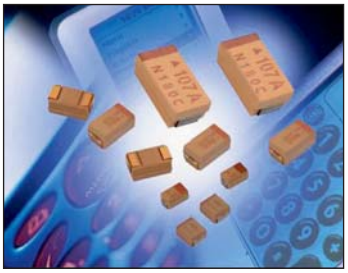
Released Codes

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TLJ Series

High CV Consumer Series Tantalum Capacitors



- High Volumetric Efficiency
- 3x reflow 260°C compatible
- 13 case sizes available including low profile codes
- Environmentally friendly
- Consumer applications (e.g. mobiles phones, PDA etc.)
- CV range: 10-680µF / 2.5-20V

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlj.pdf

HOW TO ORDER

TLJ	W	157	M	010	R	0200
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 16Vdc 020 = 20Vdc	**Packaging** R = 7" T/R S = 13" T/R	**ESR in mΩ**

Capacitance		Rated Voltage DC to 40°C / 0.5DC to 85°C / 0.2DC to 125°C						
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	35V (V)
6.8	685							
10	106				R(2000,3000)	P(4500)*/S(2200)	T(1000)	
15	156				R(2000)			
22	226			N(5400)/R(3500)	K(1800)/N(3800) R(3800)	T(1000)		
33	336		N(8000)/R(3000)	K(1700)/N(8000) P(3000)/R(3000)	K(1500)/N(9600) P(3500) R(3500)/S(1500)	T(1000)		
47	476		K(1500)/N(4000) P(3000)/R(3000)	K(1500)/N(8300) P(700,900,1800,2500) R(3200)/S(1500)	A(600)/G(1500) P(3200)/R(3200) S(1500)/T(600)			
68	686		K(1200)/N(8000) P(3000) R(2900)/S(1500)	A(500)/G(800) S(1500)/T(600)	A(1500)			
100	107		A(500)/G(800) N(5200)/P(2700) S(1400)	A(500,800)/G(800) P(5400)/S(1400)* T(800)	A(1400) H(900)/T(900)			
150	157		A(800)/T(800)	A(900)/G(2500) H(900)/T(1200)	B(500) W(150,200)			
220	227	T(1100)	A(1100)/G(3000) H(900)/T(1100)	B(500)/T(2000) W(200)	B(1100)/F(300)			
330	337		T(2700)/W(200)	F(300)				
470	477							
680	687			Y(150)				
1000	108							
1500	158			V(200)*				

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TLN Series

Tantalum Solid Electrolytic Chip Capacitors Undertab Series

- Undertab terminations layout:
  - High Volumetric Efficiency
  - High PCB assembly density
  - High capacitance in smaller dimensions
- 3x reflow 260°C compatible
- Consumer applications (e.g. PCMCIA/USB wireless express cards, mobiles, MP3 etc.)
- 7 case sizes available
- CV range 47-1000µF / 4-10V

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlnunder.pdf

HOW TO ORDER

TLN	S	227	M	004	R	3000
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = 7" T/R S = 13" T/R	**ESR in mΩ**

Capacitance		Rated Voltage DC to 40°C / 0.5DC to 85°C/ 0.2DC to 125°C		
µF	Code	4V (G)	6.3V (J)	10V (A)
33	336			N(9600)*
47	476		N(8300)*	K(1500)/N(9600) R(4000)
68	686	N(3000)*	N(8300)*	K(7200)*/S(6000)
100	107	N(5200)*	K(5400)/R(2000) S(5400)	K(9600)/L(7200)* S(7200)
150	157	K(4000)*/R(4000)*	K(8300)/L(5400)* S(5400)	G(6000)/L(9600) S(7200)*/T(6000)*
220	227	K(3000)/L(3000)* S(3000)	G(3000)/L(8300) S(8300)*/T(3000)*	G(7200)*/H(6000)* T(7200)
330	337	G(4000)*/L(4000)* S(5200)*	G(5400)*/H(3000)* T(5400)	H(7200)*/T(9600)*
470	477	G(5200)*/H(3000)* T(4000)*	H(5400)*/T(8300)*	H(9600)*
680	687	H(4000)*/T(5200)*	H(8300)*	
1000	108	H(5200)*	Y(150)	

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TPS Series
Low ESR Tantalum Capacitors

- Low ESR series of robust MnO_2 solid electrolyte capacitors
- CV range: 0.15-1500µF / 2.5-50V
- 14 case sizes available
- Power supply applications

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tps.pdf

HOW TO ORDER

TPS C 107 M 010 R 0100 –

Type

Case Size

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K = ±10%
M = ±20%

Rated DC Voltage
002 = 2.5Vdc
004 = 4Vdc
006 = 6.3Vdc
010 = 10Vdc
016 = 16Vdc
020 = 20Vdc
025 = 25Vdc
035 = 35Vdc
050 = 50Vdc
063 = 63Vdc

Packaging
R = 7" T/R
(Lead Free since production date 1/1/04)
S = 13" T/R
(Lead Free since production date 1/1/04)
A = Gold Plating 7" Reel
B = Gold Plating 13" Reel
H = Tin/Lead 7" reel
(Contact Manufacturer)
K = Tin/Lead 13" reel
(Contact Manufacturer)
H, K = Non RoHS

ESR in mΩ

Additional characters may be added for special requirements
V = Dry pack Option
(selected codes only)

Capacitance		Rated Voltage DC (V_R) to 85°C									
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)	63V
0.15	154									A(9000)	
0.22	224								A(6000)	A(7000)	
0.33	334								A(6000)		
0.47	474							A(7000)	A(6000) B(4000)	C(2300)	
0.68	684							A(6000)	A(6000)		
1	105				R(9000)		A(3000), R(6000) S(6000), T(2000)	R(2500,4000)	A(3000) B(2000)	C(2500)	
1.5	155							A(3000) B(1800)	B(2500)	C(1500,2000)	
2.2	225			R(7000)	A(1800)	A(1800,3500) T(2000)	A(3000)	B(900,1200,2500)	A(1500), B(750, 1500,2000), C(1000)	D(1200)	
3.3	335				T(1500)	A(3500)	A(2500) B(1300)	A(1000,1500) B(750,1500,2000)	B(1000) C(700)	D(800)	
4.7	475			S(4000)	A(1400) R(3000,5000)	A(2000) B(800,1500)	A(1800) B(750,1000)	B(700,900,1500)	B(700,1500) C(600), D(700)	D(300,500,700)	
6.8	685			A(1800)	A(1800) T(1800)	A(1500) B(600,1200)	A(1000) B(600,1000) C(700)	B(700) C(500,600,700)	C(350) D(150,400,500)	D(200, 300, 500,600)	
10	106		R(3000)	A(1500) R(1000,1500,3000) T(1000)	A(900,1800) P(2000)[M] T(1000,2000)	B(500,800), C(500) T(800,1000) W(500,600)	B(500,1000) C(500,700) W(500)	B(1800) C(300,500)	D(125,300) E(200), Y(250)	E(400,500)	E(500)*
15	156			A(700,1500)	A(1000) B(450,600) T(1200)	B(500,800)	B(500) C(400,450)	C(220,300) D(100,300)	C(350,450) D(100,300) Y(250)	E(250) V(250)	
22	226			A(500,900) B(375,600) S(900)	A(900) B(400,500,700) C(300), T(800)	B(400,600) C(150,250,300,375) W(500)	B(400,600) C(100,150,400) D(200,300)	C(275,400) D(100,200,300)	D(125,200,300,400) E(125,200,300) Y(200)		
33	336			A(600) B(250,350,450,600) T(800)	A(700) B(250,425,500,650) C(150,375,500) W(350)	B(350,500) C(100,150,225,300) D(200), W(140,175, 250,400,500) Y(300,400)	C(300) D(100,200)	D(100,200,300) E(100,175, 200,300) Y(200)	D(200,300) E(100,250,300) V(200)		
47	476		A(500)	A(800) B(250,350,500) C(300), T(1200)	B(250,350,500,650) C(200,350) D(100) W(125,150,250)	C(110,350) D(80,100,150,200) W(200) X(180), Y(250)	D(75,100,200) E(80,100,125) E(70,125,150,	D(125,150,250) 200,250)	E(200,250) V(150,200)		
68	686			B(250,350,500) C(150,200) W(110,125,250)	B(600) C(80,100,200,300) D(100,150), W(100,150) Y(100,200)	C(125,200) D(70,100,150) F(200), X(150) Y(150,200,250)	D(70,150, 200,300) E(125,150,200)	E(125,200) V(80,95,150,200)	V(150,200)[M]		
100	107	B(200)	B(200,250, 350,500) W(100)	B(250,400) C(75,150) W(100,150) Y(100)	B(400)[M] C(75,100,150,200) D(50,65,80,100,125, 150), E(125) W(150) X(85,150,200) Y(100,150,200)	C(200) D(60,100,125,150) E(55,100,125,150) F(150,200)[M] Y(100,150,200)	D(85,100,150) E(100,150,200) V(60,85,100,200)	V(100)			
150	157	B(150)	B(250) C(70,80)	C(50,90,150,200,250) D(50,125), Y(40,50)	D(50,85,100), E(100) F(200), X(100)[M] Y(100,150,200)	D(60,85,100,125,150) E(100), V(45,75) Y(200)[M]	V(80)				
220	227	B(150, 200,600) D(45)	D(40,50,100) Y(40,50,75)	C(70,100,125,250) D(50,100,125) E(100), F(200) Y(100,150)	D(40,50,100,150) E(50,60,70,100, 125,150) Y(100,150,200)	E(100,150) V(50,75,100,150)					
330	337	Y(40)	C(100) D(35,45,100) F(200) X(100)	C(80,100) D(45,50,70,100) E(50,100,125,150) V(100), Y(100,150)	D(50,65,100,150) E(40,50,60,100) V(40,60,100)						
470	477	D(35) F(200) Y(100)	D(45,100) E(35,45,100)	D(45,60,100,200) E(45,50,60,100,200) V(40,55,100), Y(150)	E(45,50,60,100,200) V(40,60,100)						
680	687	D(35,50) E(35,50) Y(100)	D(45,60,100) E(40,60,100)	E(45,60,100) V(35,40,50)							
1000	108	E(30,40) Y(100)[M]	E(40,60) V(25,35,40,50)	E(100)[M], V(40,50)[M]							
1500	158	D(100) E(50) V(30,40)[M]	E(50,75) V(50,75)[M]								

Released codes (M tolerance only)
Engineering samples - please contact manufacturer
*Codes under development – subject to change
ESR limits quoted in brackets (milliohms)

NOTE: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TPM Multianode

Ultra Low ESR Tantalum Capacitors

- Multi-anode construction
- Super low ESR
- CV range: 10-2200µF / 2.5-50V
- 4 case sizes available
- "Mirror" multi-anode construction used with D case capacitors reduces ESL to half

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tpm.pdf

HOW TO ORDER

TPM E 108 M 004 R 0018

Type

Case Size

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
002=2.5Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc
035=35Vdc
050=50Vdc

Packaging
R = 7" T/R Lead Free
S = 13" T/R Lead Free
H = Tin/Lead 7" reel (Contact Manufacturer)
K = Tin/Lead 13" reel (Contact Manufacturer)
H, K = Non RoHS

ESR in mΩ

Capacitance		Rated Voltage DC (V_R) to 85°C								
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
6.8	685									
10	106									D(140) E(120)
15	156									E(75,100)
22	226								D(70) E(60,100)	E(75,100)
33	336							D(65)	E(50,65)	
47	476							D(55)	E(55,65)	
68	686							E(45,55)		
100	107				Y(45)(M)		E(35,45)			
150	157				Y(45)(M)	E(30,40)	E(35)			
220	227			Y(30)(M)	D(35)	E(25,40)				
330	337		D(25,35)	D(25,35)	D(35) E(23,35)	E(50)*				
470	477		D(25,35)	D(30) E(18,23,30)	E(23,30)					
680	687		D(25) E(18,23)	E(18,23), V(23)						
1000	108	D(25)	D(25,45) E(18,23), V(18)	E(25)(M) V(20)(M)						
1500	158	E(12,15,18)	E(15,18)							
2200	228	E(18)(M)								

Released codes (M tolerance only)

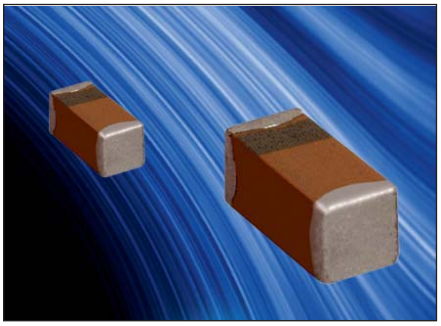
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TPC Series

Low ESR Small Case Size Tantalum Capacitors



- Low ESR TACmicrochip® capacitor
- Smallest and low profile tantalum
- CV range: 1.0-100µF / 3-25V
- 4 case sizes available
- Power supply applications

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tpc.pdf

HOW TO ORDER

TPC	R	106	M	010	R	1800

Type
TACmicrochip®

Case Size

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
003=3Vdc
004=4Vdc
006=6.3Vdc
010=10Vdc
016=16Vdc
020=20Vdc
025=25Vdc

Packaging
R, P = 7" Standard Tin Termination Plastic Tape
X, Q = 4¼" Standard Tin Termination Plastic Tape
A, M = 7" Gold Termination Plastic Tape
F, N = 4¼" Gold Termination Plastic Tape

ESR in mΩ

Capacitance		Voltage Rating DC (V_R) at 85°C						
µF	Code	3.0V	4.0V	6.3V	10V	16V	20V	25V
1.0	105				L(5000)			R(3000)
1.5	155							
2.2	225			K(8000)/L(5000)	L(5000)	L(5000)		
3.3	335				L(5000)			
4.7	475	K(8000)			L(5000)(M)		R(1500)(M)*	
6.8	685							
10	106			L(4000)(M)	H(2500) L(4000)(M),R(1800)	R(1800)		
15	156			R(1800)	R(1500)			
22	226		L(5000)(M)/R(1800)	R(1500)	R(1500)			
33	336	R(1800)	H(1500)(M)/R(1500)		R(1500)(M)			
47	476	R(1500)		R(1800)(M)				
68	686							
100	107		R(1000)(M)					

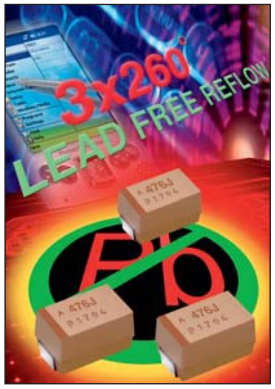
Codes shown are examples of ESR values offered on certain CV and case size.
Other codes and ESR values available upon request.

Released codes (M tolerance only)

*Code under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards

TCJ Series
Polymer Tantalum Capacitors



- Conductive polymer electrode reduces ignition failure mode
- Lower ESR
- 3x reflow 260°C compatible
- CV range: 1.0-220µF / 2.5-35V
- 11 case sizes available

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tcj.pdf

HOW TO ORDER

TCJ	A	226	M	004	R	0300
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M=±20%	**Rated DC Voltage** 002=2.5Vdc 004=4Vdc 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc	**Packaging** R=7" T/R S=13" T/R	**ESR in mΩ**

Capacitance		Rated Voltage DC (V_R) to 85°C						
µF	Code	2.5V (e)	4V (G)	6.3V (J)	10V (A)	16V (C)	25V (E)	35V (V)
1.0	105						P(500)	
4.7	475				K(500), R(500)			
6.8	685					A(200)		
10	106			A(300), R(500)	A(300)	A(200), B(200) T(150,200)		C(200)
15	156		A(300)	A(300)	A(200)	B(150)		
22	226		A(300)	A(300), K(400) S(400), T(150)	B(300), T(150)	B(150)	Y(70)*	
33	336		A(300)	A(200) B(70,200) T(150)	B(70,200) C(100) T(70,150)			
47	476		A(200), T(80)	A(200), B(70) K(400), P(500) T(80,120)	B(70), C(100)			
68	686	A(250)	A(250), B(70) T(80)	B(55), C(100) W(70)				
100	107	A(200), B(70)	A(200), B(70) G(300), T(150)	B(45,70)				
150	157	B(70)	B(70)	A(200), B(45,70) H(200), W(40,70) Y(25,40)*				
220	227		B(45,70)	B(200)				

Available Ratings, (ESR ratings in mOhms in brackets)

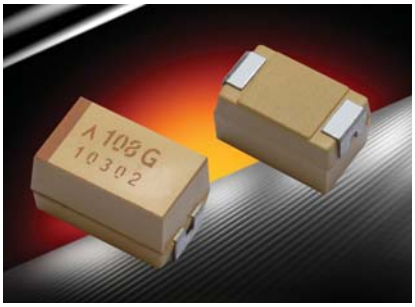
Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TCM Series

Tantalum Solid Electrolytic Chip Capacitors
Conductive Polymer Multianode



- Conductive polymer multianode
- Extremely Low ESR
- Reduced ignition failure mode
- 3x reflow 260°C compatible
- Volumetric efficiency
- High frequency capacitance retention

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tcm.pdf

HOW TO ORDER

TCM	E	108	M	004	R	0010
Type	**Case Size** See table above	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M=±20%	**Rated DC Voltage** 004=4Vdc 006=6.3Vdc 010=10Vdc 035=35Vdc	**Packaging** R = 7" T/R S = 13" T/R	**ESR in mΩ**

CAPACITANCE AND RATED VOLTAGE, VR (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated Voltage DC (V_R) to 85°C			
µF	Code	4V (G)	6.3V (J)	10V (A)	35V (V)
22	226				E(25)
33	336				
47	476				
68	686				
100	107				
150	157				
220	227				
330	337		E*	E*	
470	477		E*	E*	
680	687				
1000	108	E(10,12)			
1500	158				

Available Ratings, (ESR ratings in mOhms in brackets)

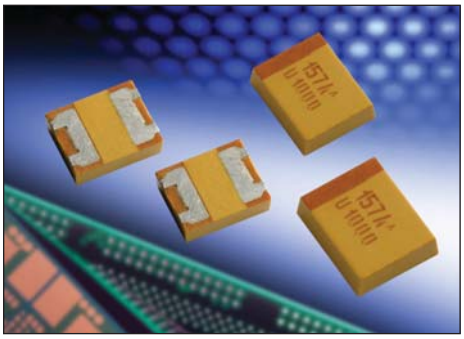
Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TCN Series

Tantalum Solid Electrolytic Chip Capacitors Undertab Series with Conductive Polymer Electrode



- Conductive polymer electrode reduces ignition failure mode
- Lower ESR
- Undertab terminations layout:
  - High Volumetric Efficiency
  - High PCB assembly density
  - High capacitance in smaller dimensions
- 3x reflow 260°C compatible
- Consumer applications (e.g. mobiles, MP3 etc.)
- 3 case sizes available

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tcn.pdf

HOW TO ORDER

TCN	L	157	M	006	R	0200
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** M = ±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = 7" T/R S = 13" T/R	**ESR in mΩ**

Capacitance		Rated Voltage DC to 85°C / 0.66DC to 105°C		
µF	**Code**	**4V (G)**	**6.3V (J)**	**10V (A)**
15	156			N(500)*
22	226			N(500)*
33	336	N(500)*	K(500)*/N(500)*	K(500)*/N(500)*
47	476	N(500)*	K(500)*/T(120)	K(500)*/S(500)*
68	686	K(500)*/N(500)*	K(500)*/S(500)*	G(150)*/L(150)* S(500)*
100	107	K(500)*/S(500)*	G(200)*/L(200)*	G(150)*/L(150)* S(150)*/T(150)*
150	157	G(200)*/L(200)* S(500)*	G(200)/K(200)* L(200)/S(200)* T(200)	G(150)*/H(150)* T(150)*
220	227	G(200)*/L(150)* S(200)*/T(150)*	H(200)*/T(200)	H(150)*
330	337	H(150)*/T(150)*	H(200)*/T(200)*	
470	477	H(150)*		

Available Ratings, (ESR ratings in mOhms in brackets)

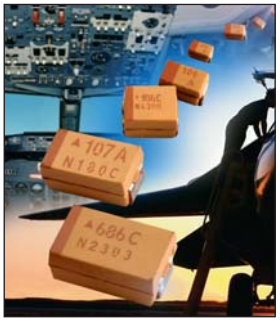
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TRJ Series

Professional Series Tantalum Capacitors



- Improved reliability – 2x standard
- DCL reduced by 25% to 0.0075 CV
- Robust against higher thermo-mechanical stresses during assembly process
- CV range: 0.10-470µF / 6.3-50V
- 5 case sizes available
- 117 low ESR parts released
- Automotive, medical, aerospace, military and other high-end applications

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/trj.pdf

HOW TO ORDER

TRJ B 105 * 035 R RJ –

Type
TRJ

Case Size
B

Capacitance Code
pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

Tolerance
K=±10%
M=±20%

Rated DC Voltage
006 = 6.3V
010 = 10V
016 = 16V
020 = 20V
025 = 25V
035 = 35V
050 = 50V

Packaging/ Termination Plating
R = 7" T/R
S = 13" T/R
A = Gold Plating 7" Reel
B = Gold Plating 13" Reel
H = Tin/Lead 7" reel (Contact Manufacturer)
K = Tin/Lead 13" reel (Contact Manufacturer)
H, K = Non RoHS

Standard Suffix
OR
0100
Low ESR in mΩ

Additional characters may be added for special requirements
V = Dry pack Option (selected codes only)

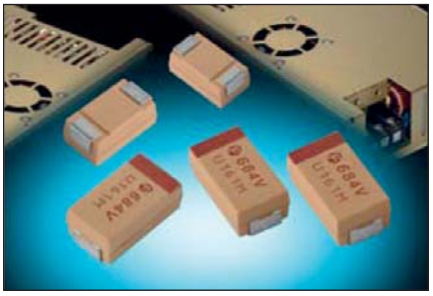
Capacitance		Rated Voltage DC (V_R) to 85°C						
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104						A	
0.15	154						A, A(6000)	
0.22	224						A, A(6000)	A, A(7000)
0.33	334						A, A(6000)	A
0.47	474					A, A(7000)	A, A(4000)	B
0.68	684					A, A(6000)	A, A(6000)	B, B(2000)
1.0	105				A, A(3000)	A, A(3000)	A, B, A(3000), B(2000)	C, B, B(2000)
1.5	155				A, A(3000)	A, A(3000)	A, B A(2000), B(2500)	C, C(1500)
2.2	225			A, A(3500)	A, A(3000)	A, B, A(1600), B(1200)	B, B(2000)	C, D, C(1000), D(1200)
3.3	335			A, A(3500)	A, B, A(2500), B(1300	B, B(2000)	B, C, B(1000), C(800))	C, D, C(1000), D(800)
4.7	475		A, A(2000)	A, B, A(2000), B(1500)	A, B, A(1800), B(1000)	B, B(1000)	B, C, B(1500), C(600)	D, D(600)
6.8	685		A, A(1800)	A, B, A(1500), B(1200)	B, B(1000)	B, C, B(1000), C(600)	C, C(600)	D, D(700)
10	106	A, A(1500)	A, B, A(1800), B(800)	B, B(800)	B, C, B(1000), C(500)	C, C(600)	C, D, C(600), D(400)	E, E(400)
15	156	A, B, A(1500), B(700)	A, B, A(1000), B(600)	B, B(800)	B, C, B(500), C(400)	C, D, C(500), D(300)	D, D(350)	
22	226	A, B, A(900), B(600)	B, B(700)	B, C, B(600), C(350)	C, D, C(400), D(300	D, D(300)	D, D(400)	
33	336	B, B(600)	B, C, B(650), C(300)	C, C(300)	C, D, C(300), D(250)	D, D(400)	E, E(250)	
47	476	B, C, B(500), C(250)	C, C(300)	C, D, C(350), D(200)	D, D(200)	D, E, D(250), E(150)		
68	686	C, C(200)	C, C(300)	D, D(150)	D, E, D(200), E(200)			
100	107	C, C(300)	C, D, C(200), D(150)	D, E, D(150), E(150)	E, E(150)			
150	157	C, D, C(300), D(150)	D, E, D(150), E(150)	E, E(150)				
220	227	D, D(150)	D, E, E(150)					
330	337	E, E(150)	E, E(100)					
470	477	E, E(200)						

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

TAW Series

Tantalum Solid Electrolytic Fused Capacitors



- Thin film fuse connected in series with capacitor
- Protection from possible damaging from high DC leakage current (short circuit failure)
- CV range: 6.8-100µF / 10-50V
- Application: servers

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taw.pdf

HOW TO ORDER

TAW	D	476	*	010	R	0500
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 050=50Vdc	**Packaging** R = 7" T/R S = 13" T/R	**ESR in mΩ**

Capacitance		Rated Voltage DC (V_R) to 85°C					
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	50V (T)
1.0	105						
2.2	225						
4.7	475						
6.8	685						D(700)
10	106					D(600)	D(700)
22	226					D(600)	
33	336			D(600)	D(500)		
47	476		D(500)	D(800)			
100	107		D(500)				

Available Ratings (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

SMPS Stacked MLC Capacitors

SMX Style for High Temperatures Applications up to 200ºC

SMX-style, stacked Switch Mode Power Supply Capacitors (SMPS) utilizing Multilayer Ceramic (MLCC) construction are ideally suited for high temperature applications up to 200ºC. This product is intended for downhole oil exploration, including logging while drilling, geophysical probes, as well as space and aerospace electronics. The high temperature solder utilized in the construction of SMX-style parts assures reliable operation in harsh environments. The wide product offering provides designers a solution for high capacitance value and high voltage capacitors rated at 200ºC. The SMX-style capacitors are ideally suited for applications as DC filters in high power, high frequency motor drives, high pulsed-current circuitry, as well as low power electronics.

SMX-style, SMPS capacitors are characterized with excellent performance in comparison to wet tantalum products. The main benefits of SMX-product over wet tantalum capacitors include:

- Much lower ESR and lower losses
- Excellent capacitance retention with frequency
- Excellent high frequency performance
- Low DC leakage current
- Much higher current handling capabilities

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/smx.pdf

HOW TO ORDER AVX Styles: SMX1, SMX2, SMX3, SMX4, SMX5, SMX6

SMX	1	7	C	106	M	A	N	650
AVX Style SMX = Uncoated	**Size**	**Voltage** 3 = 25V 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R/X9U = C	**Capacitance Code** (2 significant digits + number of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** A = Standard	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out P = P Style Leads Z = Z Style Leads	**Height** Max Dimension "A" 120 = 0.120" 240 = 0.240" 360 = 0.360" 480 = 0.480" 650 = 0.650"

Note: Capacitors with X7R/X9U dielectric is not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

Max Capacitance (µF) Available Versus Style with Height (A) of 0.120" - 3.05mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN120					SMX2 _ _ _ _ _ _ AN120					SMX3 _ _ _ _ _ _ AN120					SMX4 _ _ _ _ _ _ AN120					SMX5 _ _ _ _ _ _ AN120					SMX6 _ _ _ _ _ _ AN120				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	1.0	.70	.40	.18	.068	1.2	1.0	.60	.26	.10	.50	.40	.20	.09	.033	.16	.13	.07	.02	.01	.05	.04	.02	.01	.0039	3.2	2.4	1.3	.50	.20
X7R/X9U	22	12	7.0	2.6	1.0	33	18	11	4.0	1.5	11	6.0	3.6	1.3	.50	3.3	1.8	1.1	.40	.15	1.2	.68	.40	.16	.056	68	40	24	9.4	3.3

Max Capacitance (µF) Available Versus Style with Height (A) of 0.240" - 6.10mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN240					SMX2 _ _ _ _ _ _ AN240					SMX3 _ _ _ _ _ _ AN240					SMX4 _ _ _ _ _ _ AN240					SMX5 _ _ _ _ _ _ AN240					SMX6 _ _ _ _ _ _ AN240				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	2.0	1.4	.80	.36	.13	2.4	2.0	1.2	.52	.20	1.0	.80	.40	.18	.068	.33	.26	.14	.05	.02	.10	.08	.05	.02	.0078	6.4	4.8	2.6	1.0	.40
X7R/X9U	44	24	14	5.2	2.0	66	36	22	8.0	3.0	22	12	7.2	2.6	1.0	6.6	3.6	2.2	.80	.30	2.4	1.3	.80	.32	.110	130	80	48	18	6.6

Max Capacitance (µF) Available Versus Style with Height (A) of 0.360" - 9.14mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN360					SMX2 _ _ _ _ _ _ AN360					SMX3 _ _ _ _ _ _ AN360					SMX4 _ _ _ _ _ _ AN360					SMX5 _ _ _ _ _ _ AN360					SMX6 _ _ _ _ _ _ AN360				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	3.0	2.1	1.2	.54	.22	3.6	3.0	1.8	.78	.30	1.5	1.2	.60	.27	.10	.48	.39	.21	.07	.03	.15	.12	.07	.03	.011	10	7.2	3.9	1.5	.60
X7R/X9U	68	36	21	7.8	3.0	100	54	33	12	4.5	33	18	10	3.9	1.5	10	5.4	3.3	1.2	.47	3.6	2.0	1.2	.48	.160	200	120	72	28	10

Max Capacitance (µF) Available Versus Style with Height (A) of 0.480" - 12.2mm

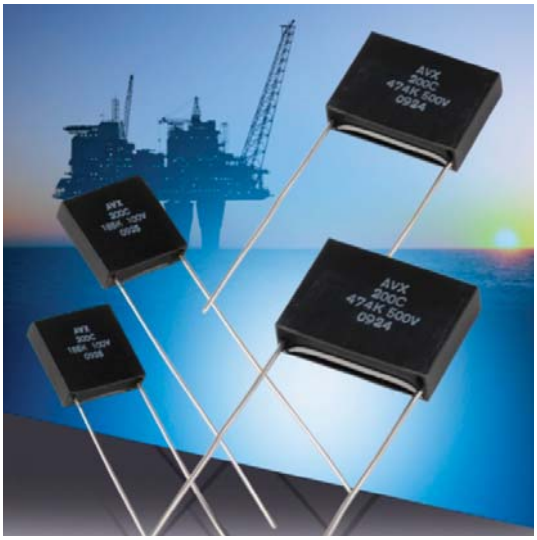
AVX STYLE	SMX1 _ _ _ _ _ _ AN480					SMX2 _ _ _ _ _ _ AN480					SMX3 _ _ _ _ _ _ AN480					SMX4 _ _ _ _ _ _ AN480					SMX5 _ _ _ _ _ _ AN480					SMX6 _ _ _ _ _ _ AN480				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	4.0	2.8	1.6	.72	.27	4.8	4.0	2.2	1.0	.40	2.0	1.6	.80	.36	.130	.64	.52	.28	.10	.04	.20	.16	.10	.04	.015	13	9.6	5.2	2.0	.80
X7R/X9U	88	48	28	10	4.0	130	72	44	16	6.0	44	24	14	5.2	2.0	13	7.2	4.4	1.6	.60	4.8	2.7	1.6	.64	.22	270	160	96	37	13

Max Capacitance (µF) Available Versus Style with Height (A) of 0.650" - 16.5mm

AVX STYLE	SMX1 _ _ _ _ _ _ AN650					SMX2 _ _ _ _ _ _ AN650					SMX3 _ _ _ _ _ _ AN650					SMX4 _ _ _ _ _ _ AN650					SMX5 _ _ _ _ _ _ AN650					SMX6 _ _ _ _ _ _ AN650				
	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V	25V	50V	100V	200V	500V
C0G	5.0	3.5	2.0	.90	.34	6.0	5.0	3.0	1.3	.50	2.5	2.0	1.0	.45	.160	.82	.65	.35	.12	.05	.25	.20	.12	.05	.019	16	12	6.5	2.5	1.0
X7R/X9U	110	60	35	13	5.0	160	90	55	20	7.5	56	30	18	6.5	2.5	16	9.0	5.5	2.0	.80	6.0	3.4	2.0	.80	.28	340	200	120	47	16

SMPS Molded Radial MLC Capacitors

SXP Sytle for High Temperature Applications up to 200ºC



SXP-style, encapsulated radial leaded MLC capacitors are ideally suited for high temperature applications up to 200ºC. This product is intended for downhole oil exploration, including logging while drilling, geophysical probes, as well as space, aerospace and hybrid automotive applications. This product supplements the SMX family of capacitors and offers mechanical protection to the ceramic element in extreme harsh environments. The high temperature solder utilized in the construction of SXP-style parts assures reliable operation in high temperature and rugged environments. The SXP-style capacitors are ideally suited for applications as DC filters in high power, high frequency motor drives, high pulsed-current circuitry, as well as standard electronic equipment designed for high temperature applications.

SXP-style, switch mode power supply capacitors are characterized with excellent performance. The main benefits of SXP product include:

- Low ESR, low ESL
- Low DC leakage
- Excellent high frequency performance

HOW TO ORDER

SMP	3	1	C	104	M	A	A
AVX Style	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V A = 1000V	**Temperature Coefficient** C0G = A X7R/X9U = C	**Capacitance Code** (2 significant digits + number of zeros) 100 pF = 101 22,000 pF = 223 1µF = 105	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20% **Tighter tolerances available upon request**	**Test Level** A = Standard	**Leads** A = Standard Tin/Lead (min. 5% Pb)

CAPACITANCE RANGE

C0G

Style	50V	100V	200V	500V	1000V
SXP1 (MIN)	1000pF	1000pF	1000pF	100pF	100pF
(MAX)	.047µF	.027µF	8200pF	4700pF	2200pF
SXP2 (MIN)	.01µF	1000pF	1000pF	100pF	100pF
(MAX)	.10µF	.056µF	.018µF	8200pF	4700pF
SXP3 (MIN)	.01µF	1000pF	1000pF	1000pF	1000pF
(MAX)	.15µF	.068µF	.022µF	.012µF	6800pF
SXP4 (MIN)	.01µF	.01µF	1000pF	1000pF	1000pF
(MAX)	.39µF	.22µF	.068µF	.033µF	.018µF

X7R

Style	50V	100V	200V	500V	1000V
SXP1 (MIN)	.1µF	.01µF	.01µF	.01µF	.01µF
(MAX)	1.2µF	.68µF	.27µF	.12µF	.033µF
SXP2 (MIN)	.1µF	.1µF	.01µF	.01µF	.01µF
(MAX)	2.2µF	1.2µF	.56µF	.22µF	.068µF
SXP3 (MIN)	.01µF	.1µF	.01µF	.01µF	.01µF
(MAX)	3.3µF	1.8µF	.82µF	.33µF	.10µF
SXP4 (MIN)	1µF	.1µF	.1µF	.01µF	.01µF
(MAX)	10µF	5.6µF	2.2µF	1.0µF	.27µF

THJ Series

High Temperature Tantalum Capacitors

- Improved reliability – 2x standard
- 175°C @ 0.5V_R continuous operation
- CV range: 0.10-220µF / 6.3-50V
- 5 case sizes available
- Low ESR options on approval
- High temperature automotive and industry applications

RoHS COMPLIANT

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/thj.pdf

HOW TO ORDER

THJ	B	105	*	035	R	JN	–
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 006=6.3Vdc 010=10Vdc 016=16Vdc 020=20Vdc 025=25Vdc 035=35Vdc 050=50Vdc	**Packaging** R = 7" T/R S = 13" T/R A = Gold Plating 7" Reel B = Gold Plating 13" Reel H = Tin/Lead 7" reel (Contact Manufacturer) K = Tin/Lead 13" reel (Contact Manufacturer) H, K = Non RoHS	**Standard Suffix** OR **0100** **Low ESR in mΩ**	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only)

Capacitance		Rated voltage (V_R) to 85°C (Voltage Code)						
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.10	104						A	
0.15	154						A	
0.22	224						A	
0.33	334						A	
0.47	474					A	B	
0.68	684					A	B	
1.0	105					A	A/B	
1.5	155				A		C	
2.2	225			A		B	C	
3.3	335		A	A	B		C	D
4.7	475	A	A	A/B			C	D
6.8	685	A	A	A/B		C	D	
10	106	A	B	B		C	D	D/E
15	156	B	B	B	C		D	
22	226	B	B	C		D	D, D(3000)	
33	336	B	C	C	D	D	E	
47	476	C	C	C/D				
68	686	C	D	D				
100	107	D	D	E				
150	157	D						
220	227		E					

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

THJ Series

High Temperature Tantalum Chip Capacitor with Extension to 200ºC

- SMD 200ºC tantalum capacitor
- 200°C @ 0.33VR 1000hrs continuous operation
- Leakage current after 200ºC 1000hrs less than 1mA
- 3x reflow 260°C
- Gold plated termination for hybrid assembly
- Oil drilling, aerospace, automotive applications
- CV range: 100-220µF / 10-16V

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/thj.pdf

HOW TO ORDER

THJ	E	107	*	016	A	JH
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Tolerance** K=±10% M=±20%	**Rated DC Voltage** 010=10Vdc 016=16Vdc	**Packaging** A = Gold Plating 7" Reel B = Gold Plating 13" Reel	**Standard Suffix**

Capacitance		Rated voltage (V_R) to 85°C (Voltage Code)						
µF	Code	6.3V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
33 47 68	336 476 686							
100 150 220	107 157 227		E	E				
330 470 680	337 477 687							

Available Ratings

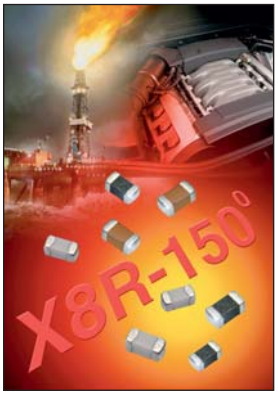
Engineering samples - please contact manufacturer

*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supplyhigher ratings in the same case size, to the same reliability standards

Standard X8R MLCC

X8R Dielectric



AVX has developed a range of multilayer ceramic capacitors designed for use in applications up to 150ºC. These capacitors are manufactured with an X8R dielectric material which has a capacitance variation of ±15% between -55ºC and +150ºC.

The need for X8R performance has been driven by customer requirements for parts that operate at elevated temperatures. They provide a highly reliable capacitor with low loss and stable capacitance over temperature.

They are ideal for automotive under the hood sensors, measure while drilling and log while drilling. Typical applications include wire line logging tools such as gamma ray receivers, acoustic transceivers and micro-resistivity tools. They can also be used as bulk capacitors for high temperature camera modules.

X8R capacitors are available as standard and Automotive AEC-Q200 qualified parts. Optional termination systems, tin, FLEXITERM® and conductive epoxy for hybrid applications are available. Providing this series with our FLEXITERM® termination system provides further advantage to customers by way of enhanced resistance to both, temperature cycling and mechanical damage.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx8r.pdf

HOW TO ORDER

0805	5	F	104	K	4	T	2	A
Size 0603 0805 1206	**Voltage** 25V = 3 50V = 5	**Dielectric** X8R = F	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros e.g. 10µF = 106	**Capacitance Tolerance** J = ± 5% K = ±10% M = ± 20%	**Failure Rate** 4 = Automotive A = Not Applicable	**Terminations** T = Plated Ni and Sn Z = FLEXITERM® U = Conductive Epoxy for Hybrid apps	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

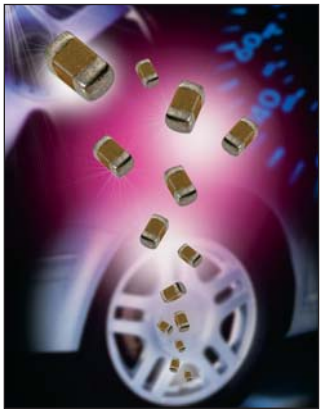
SIZE		0603		0805		1206	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
		25V	50V	25V	50V	25V	50V
		0603		0805		1206	

= AEC-Q200 Qualified

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

RoHS COMPLIANT

Automotive MLCC
X8R Dielectric



AVX Corporation has supported the Automotive Industry requirements for Multilayer Ceramic Capacitors consistently for more than 10 years. Products have been developed and tested specifically for automotive applications and all manufacturing facilities are QS9000 and VDA 6.4 approved.

As part of our sustained investment in capacity and state of the art technology, we are now transitioning from the established Pd/Ag electrode system to a Base Metal Electrode system (BME).

AVX is using AEC-Q200 as the qualification vehicle for this transition. A detailed qualification package is available on request and contains results on a range of part numbers including:

- X7R dielectric components containing BME electrode and copper terminations with a Ni/Sn plated overcoat.
- X7R dielectric components, BME electrode with epoxy finish for conductive glue mounting.
- X7R dielectric components BME electrode and soft terminations with a Ni/Sn plated overcoat.
- NP0 dielectric components containing Pd/Ag electrode and silver termination with a Ni/Sn plated overcoat.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cauto.pdf

HOW TO ORDER

0805	5	F	104	K	4	T	2	A
Size	**Voltage**	**Dielectric**	**Capacitance Code (In pF)**	**Capacitance Tolerance**	**Failure Rate**	**Terminations**	**Packaging**	**Special Code**
0603	3 = 25V	X8R = F	2 Significant Digits	J = ±5%	4 = Automotive	T = Plated Ni and Sn	2 = 7" Reel	A = Std. Product
0805	5 = 50V		+ Number of Zeros	K = ±10%		Z = FLEXITERM®	4 = 13" Reel	
1206			e.g. 10µF = 106	M = ±20%		U = Conductive Epoxy		

NOTE: Contact factory for non-specified capacitance values.
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X8R

SIZE		0603		0805		1206	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
SIZE		0603		0805		1206	

= AEC-Q200 Qualified

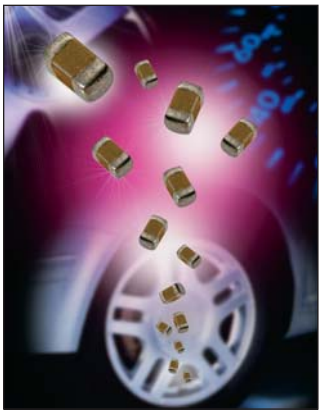
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

AEC-Q200 qualified
TS 16949, ISO 9001 certified

RoHS COMPLIANT

FLEXITERM® MLCC

X8R FLEXITERM® Automotive Series



AVX has developed a range of multilayer ceramic capacitors designed for use in applications up to 150ºC. These capacitors are manufactured with an X8R dielectric material which has a capacitance variation of ±15% between -55ºC and +150ºC.

The need for X8R performance has been driven by customer requirements for parts that operate at elevated temperatures. They provide a highly reliable capacitor with low loss and stable capacitance over temperature and are ideal for automotive under the hood sensors.

X8R capacitors are available as Automotive AEC-Q200 qualified parts. Optional termination systems, tin, FLEXITERM® and conductive epoxy for hybrid applications are available. Providing this series with our FLEXITERM® termination system provides further advantage to customers by way of enhanced resistance to both, temperature cycling and mechanical damage.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cx8r.pdf

HOW TO ORDER

0805	5	F	104	K	4	Z	2	A
Size 0603 0805 1206	**Voltage** 3 = 25V 5 = 50V	**Dielectric** X8R = F	**Capacitance Code (In pF)** 2 Significant Digits + Number of Zeros e.g. 10µF = 106	**Capacitance Tolerance** J = ±5%* K = ±10% M = ±20%	**Failure Rate** 4 = Automotive	**Terminations** Z = FLEXITERM® U = Conductive Epoxy	**Packaging** 2 = 7" Reel 4 = 13" Reel	**Special Code** A = Std. Product

*≤ 1µF only

NOTE: Contact factory for non-specified capacitance values.
Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

AUTOMOTIVE MLCC – X8R

SIZE		0603		0805		1206	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
SIZE		0603		0805		1206	

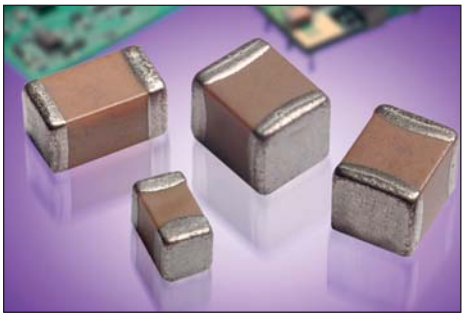
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

AEC-Q200 qualified
TS 16949, ISO 9001 certified

RoHS COMPLIANT

Tin/Lead Termination MLCC

LD Series X8R Dielectric, Tin/Lead



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tinterm.pdf

HOW TO ORDER

LD05	5	F	101	J	A	B	2	A
Size LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206	**Voltage** 3 = 25V 5 = 50V	**Dielectric** X8R = F	**Capacitance Code (In pF)** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** B = 5% min lead	**Packaging** 2 = 7" Reel 4 = 13" Reel 7 = Bulk Cass. 9 = Bulk **Contact Factory For Multiples**	**Special Code** A = Std. Product

*LD04 has the same CV ranges as LD03.

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

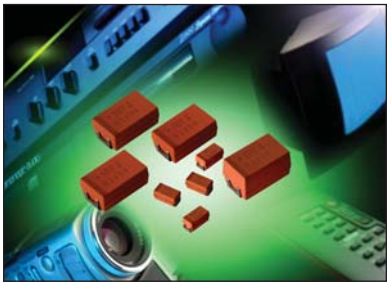
X8R Dielectric

SIZE		LD03		LD05		LD06	
	WVDC	25V	50V	25V	50V	25V	50V
271	Cap 270	G	G				
331	(pF) 330	G	G	J	J		
471	470	G	G	J	J		
681	680	G	G	J	J		
102	1000	G	G	J	J	J	J
152	1500	G	G	J	J	J	J
182	1800	G	G	J	J	J	J
222	2200	G	G	J	J	J	J
272	2700	G	G	J	J	J	J
332	3300	G	G	J	J	J	J
392	3900	G	G	J	J	J	J
472	4700	G	G	J	J	J	J
562	5600	G	G	J	J	J	J
682	6800	G	G	J	J	J	J
822	8200	G	G	J	J	J	J
103	Cap 0.01	G	G	J	J	J	J
123	(µF) 0.012	G	G	J	J	J	J
153	0.015	G	G	J	J	J	J
183	0.018	G	G	J	J	J	J
223	0.022	G	G	J	J	J	J
273	0.027	G	G	J	J	J	J
333	0.033	G	G	J	J	J	J
393	0.039	G	G	J	J	J	J
473	0.047	G	G	J	J	J	J
563	0.056	G		N	N	M	M
683	0.068	G		N	N	M	M
823	0.082			N	N	M	M
104	0.1			N	N	M	M
124	0.12			N	N	M	M
154	0.15			N	N	M	M
184	0.18			N		M	M
224	0.22			N		M	M
274	0.27					M	M
334	0.33					M	M
394	0.39					M	
474	0.47					M	
684	0.68						
824	0.82						
105	1						
	WVDC	25V	50V	25V	50V	25V	50V
SIZE		LD03		LD05		LD06	

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

NOJ Series

Standard OxiCap® Niobium Oxide Capacitors



- Non-burn safe technology
- Reliability level: 0.5%/1000 hrs.
- 6 case sizes available
- Environmentally friendly
- IBM global approval received in 2004
- Electra Award received in 2005
- CV range: 4.7-1000µF / 1.8-10V

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/noj.pdf

HOW TO ORDER

NOJ	D	107	M	006	R	WJ	–
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**Specification Suffix** WJ = Standard Suffix	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only) with exception of D, E, V cases

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C				
µF	Code	1.8V (x)	2.5V (e)	4V (G)	6.3V (J)	10V (A)
4.7	475				A	A
6.8	685				A	A
10	106				A	A/B
15	156			A	A/B	A/B
22	226		A	A/B	A/B	B/C
33	336		A/B	A/B	B/C	C
47	476	A	A/B	A/B/C	B/C	C
68	686	B	B/C	B/C	B/C	C
100	107	B/C	B/C	B/C	B/C/D	D
150	157	C	C	C/D	C/D	E*
220	227	C	C	C/D	C/D/E	V*
330	337	C	C/D	D	D/E	
470	477		D/E	D/E	E/V	
680	687		E	E/V		
1000	108		V	V		

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

Released codes

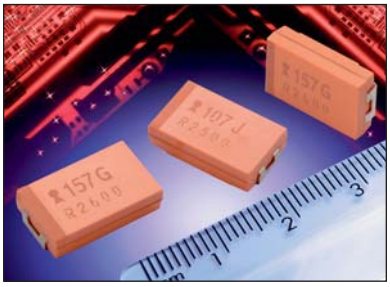
Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

NOJ Low Profile

Low Profile OxiCap® Niobium Oxide Capacitors



- Non-burn safe technology
- Reliability level: 0.5%/1000 hrs.
- CV range: 2.2-470µF / 1.8-10V
- 7 case sizes in low profile available
- IBM global approval received in 2004
- Electra Award received in 2005

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nojlp.pdf

HOW TO ORDER

NOJ	Y	107	M	006	R	WJ	–
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**Specification Suffix** WJ = Standard Suffix	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only) with exception of X, Y cases

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C				
µF	Code	1.8V (x)	2.5V (e)	4V (G)	6.3V (J)	10V (A)
1.0	105					
1.5	155					
2.2	225					P
3.3	335					P
4.7	475				P/S	T
6.8	685			P/S	P/S/T	T
10	106		P/S	P/S/T	P/T	T
15	156	P/S	P/S/T	P/T		
22	226	P/S/T	P/T	T	T	
33	336	T	T	T	W	
47	476	T	T	W	W	
68	686		W	W	X/Y	
100	107	W	W	W/X	F/Y	
150	157		X	Y	F/Y	
220	227	X	Y	F/Y	Y	
330	337	Y	Y	Y		
470	477	Y				

Released codes

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

NLJ Series

Niobium Oxide Capacitors High CV Consumer Series

- High Volumetric efficiency
- Environmentally friendly
- 3x reflow 260°C compatible
- Consumer applications
- OxiCap® non-burn technology
- RoHS compliance
- Lead-free solution
- 10 case sizes available
- CV range: 22-1000µF / 4-10V

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nlj.pdf

HOW TO ORDER

NLJ	A	476	M	006	R	1600
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = 7" T/R S = 13" T/R	**ESR in mΩ**

Capacitance		Rated Voltage DC to 40°C / 0.5DC to 85°C / 0.33DC to 105°C		
µF	Code	4V (G)	6.3V (J)	10V (A)
6.8	685			K(4000)*/P(5000)*
10	106		K(4000)*	K(2200)*/P(6000)*
15	156	K(4000)*/P(4000)*	P(3500)*	L(2800)*/S(2000)*
22	226	P(4000)	L(2500)*/S(1800)	A(3000)*/G(3000)* L(2200)*
33	336	A(3000)*/S(1700)*	G(2200)/L(2500)*	A(1700)/T(1800)*
47	476	A(2600)*/G(2600)* L(1600)*	A(1600)/T(1600)	B(1000)/H(1000)* W(400)
68	686	A(1500)*/T(1500)*	H(900)*	B(1400)*
100	107	H(900)*	B(1700)/W(600)	C(1200)/Y(1200)
150	157	B(1500)/W(400)		
220	227			D(1000)
330	337		C(500)/Y(500)	
470	477	C(500)/Y(500)		
680	687		D(500)	
1000	108	D(500)		

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

NOS Series

Low ESR OxiCap® Niobium Oxide Capacitors

- Low ESR Nb0 capacitors
- Non-burn safe technology
- Reliability level: 0.2%/1000 hrs.
- CV range: 10-1000µF / 1.8-6.3V
- 9 case sizes available
- IBM global approval received in 2004
- Electra Award received in 2005

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nos.pdf

HOW TO ORDER

NOS	D	107	M	006	R	0100	–
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**	**Additional characters may be added for special requirements** V = Dry pack Option (selected codes only) with exception of D, E, X, Y, V cases

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C / 0.5 DC to 125°C			
µF	Code	1.8V (x)	2.5V (e)	4.0V (G)	6.3V (J)
4.7	475				
6.8	685				
10	106				A(800, 1000, 2000)
15	156			A(1500)	B(600)
22	226		A(900)	B(600)	B(600)
33	336			B(600)	B(600) C(500) W(250)
47	476		B(500)	B(500) C(300) W(150)	B(500) C(300)
68	686		C(200) W(150)	C(200)	C(75,200) X(100) Y(100)
100	107	B(350) W(150)	C(150)	C(70,150) X(100)	C(150) D(80,100) Y(100)
150	157		C(65,150) X(100)	C(90,150) Y(100)	D(50,70,100) Y(100)
220	227	C(125) X(100)	C(80,125) Y(100)	D(40,60,100) Y(100)	D(45,60,100) E(80,100)
330	337	Y(100)	D(35,50,100) Y(100)	D(35,55,100) E(100)/Y(150)	E(80,100)
470	477	Y(100)	D(35,55,100) E(100)	D(100) E(75,100)	V(75)
680	687		E(60)	V(75)	
1000	108		V(50)		

Available Ratings, (ESR ratings in mOhms in brackets)
Engineering samples - please contact manufacturer
*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

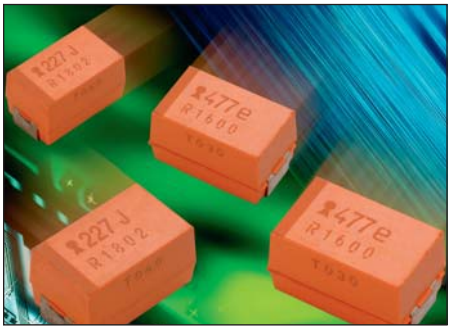
LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

NOM Series

Ultra Low ESR OxiCap® Niobium Oxide Capacitors



- Multi-anode construction
- Super low ESR
- Non-burn safe technology
- CV range: 220-680µF / 1.8-6.3V
- IBM global approval received in 2004
- Electra award received in 2005

Electra Award 2005

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nom.pdf

HOW TO ORDER

NOM	E	227	M	006	R	0040
Type	**Case Size**	**Capacitance Code** 1st two digits represent significant figures, 3rd digit represents multiplier in pF	**Tolerance** M=±20%	**Rated DC Voltage** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc	**Packaging** R = Lead Free 7" Reel S = Lead Free 13" Reel	**ESR in mΩ**

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C / 0.5 DC to 125°C			
µF	Code	1.8V (x)	2.5V (e)	4.0V (G)	6.3V (J)
220	227				E(40)
330	337			E(35)	E(23,35)
470	477		E(30)	E(23,30)	
680	687	E(23)	E(23)		

Available Ratings, (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

LEAD-FREE

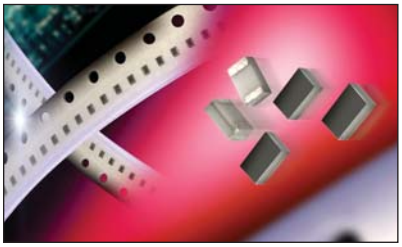
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

NON-BURN NON-SMOKE

Accu-F RF Capacitors

Thin Film Low ESR High Q Capacitors



The use of very low-loss dielectric materials, silicon dioxide and silicon oxynitride, in conjunction with highly conductive electrode metals results in low ESR and high Q. These high-frequency characteristics change at a slower rate with increasing frequency than for ceramic microwave capacitors.

Because of the thin-film technology, the above-mentioned frequency characteristics are obtained without significant compromise of properties required for surface mounting.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/accuf-p.pdf

HOW TO ORDER

0402	3	J	4R7	A	A	W	TR
Size 0603 0805	**Voltage** 1 = 100V 5 = 50V 3 = 25V	**Temperature Coefficient** (1) J = 0±30ppm/°C (-55°C to +125°C) K = 0±60ppm/°C (-55°C to +125°C)	**Capacitance** Capacitance expressed in pF. (2 significant digits + number of zeros) **for values <10pF,** letter R denotes decimal point. Example: 68pF = 680 8.2pF = 8R2	**Tolerance** **for C≤2.0pF*** P = ±0.02pF Q = ±0.03pF A = ±0.05pF B = ±0.1pF C = ±0.25pF **for C≤3.0pF** Q = ±0.03pF A = ±0.05pF B = ±0.1pF C = ±0.25pF **for C≤5.6pF** A = ±0.05pF B = ±0.1pF C = ±0.25pF **for 5.6pF<C<10pF** B = ±0.1pF C = ±0.25pF D = ±0.5pF **for C≥10pF** F = ±1% G = ±2% J = ±5%	**Specification Code** A = Accu-F® technology	**Termination Code** W = Nickel/Solder Coated ***Accu-F***® Sn63, Pb37	**Packaging Code** TR = Tape & Reel

(1) TC's shown are per EIA/IEC Specifications.

* Tolerances as tight as ±0.01pF are available. Please consult the factory.

TEMP. COEFFICIENT CODE "J" = 0±30ppm/°C (-55°C to +125°C)(2)

Size Code	0603			0805		
Voltage	100	50	25	100	50	25
Cap in pF(1) — Cap code						
0.1 — 0R1	■	■	■	■	■	■
0.2 — 0R2	■	■	■	■	■	■
0.3 — 0R3	■	■	■	■	■	■
0.4 — 0R4	■	■	■	■	■	■
0.5 — 0R5	■	■	■	■	■	■
0.6 — 0R6	■	■	■	■	■	■
0.7 — 0R7	■	■	■	■	■	■
0.8 — 0R8	■	■	■	■	■	■
0.9 — 0R9	■	■	■	■	■	■
1.0 — 1R0	■	■	■	■	■	■
1.2 — 1R2	■	■	■	■	■	■
1.5 — 1R5	■	■	■	■	■	■
1.8 — 1R8	■	■	■	■	■	■
2.2 — 2R2	■	■	■	■	■	■
2.7 — 2R7	■	■	■	■	■	■
3.3 — 3R3	■	■	■	■	■	■
3.9 — 3R9	■	■	■	■	■	■
4.7 — 4R7	■	■	■	■	■	■
5.6 — 5R6		■	■	■	■	■
6.8 — 6R8		■	■	■	■	■
8.2 — 8R2		■	■	■	■	■
10 — 100		■	■	■	■	■
12 — 120		■	■		■	■
15 — 150		■	■		■	■
18 — 180			■		■	■
22 — 220			■		■	■
27 — 270						■
33 — 330						■
39 — 390						■
47 — 470						■
56 — 560						
68 — 680						
82 — 820						
100 — 101						
120 — 121						
150 — 151						

TEMP. COEFFICIENT CODE "K" = 0±60ppm/°C (-55°C to +125°)(2)

Size Code	0603			0805		
Voltage	100	50	25	100	50	25
Cap in pF(1) — Cap code						
0.1 — 0R1	■	■	■	■	■	■
0.2 — 0R2	■	■	■	■	■	■
0.3 — 0R3	■	■	■	■	■	■
0.4 — 0R4	■	■	■	■	■	■
0.5 — 0R5	■	■	■	■	■	■
0.6 — 0R6	■	■	■	■	■	■
0.7 — 0R7	■	■	■	■	■	■
0.8 — 0R8	■	■	■	■	■	■
0.9 — 0R9	■	■	■	■	■	■
1.0 — 1R0	■	■	■	■	■	■
1.2 — 1R2	■	■	■	■	■	■
1.5 — 1R5	■	■	■	■	■	■
1.8 — 1R8	■	■	■	■	■	■
2.2 — 2R2	■	■	■	■	■	■
2.7 — 2R7	■	■	■	■	■	■
3.3 — 3R3	■	■	■	■	■	■
3.9 — 3R9	■	■	■	■	■	■
4.7 — 4R7	■	■	■	■	■	■
5.6 — 5R6		■	■	■	■	■
6.8 — 6R8		■	■	■	■	■
8.2 — 8R2		■	■	■	■	■
10 — 100		■	■	■	■	■
12 — 120		■	■	■	■	■
15 — 150		■	■	■	■	■
18 — 180			■		■	■
22 — 220			■		■	■
27 — 270						■
33 — 330						■
39 — 390						■
47 — 470						■
56 — 560						■
68 — 680						■
82 — 820						■
100 — 101						■
120 — 121						
150 — 151						

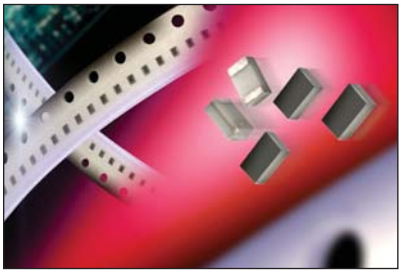
(1) For capacitance values higher than listed in table, please consult factory.
(2) TC shown is per EIA/IEC Specifications.

RoHS COMPLIANT

Intermediate values are available within the indicated range.

Accu-P RF Capacitors

Thin Film Low ESR High Q Capacitors



As in the Accu-F® series the use of very low-loss dielectric materials (silicon dioxide and silicon oxynitride) in conjunction with highly conductive electrode metals results in low ESR and high Q. At high frequency these characteristics change at a slower rate with increasing frequency than conventional ceramic microwave capacitors. Using thin-film technology, the above-mentioned frequency characteristics are obtained without significant compromise of properties required for surface mounting. The use of high thermal conductivity materials results in excellent RF power handling capabilities.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/accuf-p.pdf

HOW TO ORDER

0402	3	J	4R7	A	B	S	TR

Size
0201
0402
0603
0805
1210

Voltage
1 = 100V
5 = 50V
3 = 25V
Y = 16V
Z = 10V

Temperature Coefficient (1)
J = 0±30ppm/°C (-55°C to +125°C)
K = 0±60ppm/°C (-55°C to +125°C)

Capacitance
Capacitance expressed in pF. (2 significant digits + number of zeros)
for values <10pF, letter R denotes decimal point.
Example:
68pF = 680
8.2pF = 8R2

Tolerance

for C≤2.0pF*
P = ±0.02pF
Q = ±0.03pF
A = ±0.05pF
B = ±0.1pF
C = ±0.25pF

for C≤3.0pF
Q = ±0.03pF
A = ±0.05pF
B = ±0.1pF
C = ±0.25pF

for C≤5.6pF
A = ±0.05pF
B = ±0.1pF
C = ±0.25pF

for 5.6pF<C<10pF
B = ±0.1pF
C = ±0.25pF
D = ±0.5pF

for C≥10pF
F = ±1%
G = ±2%
J = ±5%

Specification Code
B = Accu-P® technology

Termination Code
W = Nickel/Solder Coated ***Accu-P® 0402*** Sn90, Pb10
T = Nickel/High Temperature Solder Coated ***Accu-P® 0805**, 1210**** Sn96, Ag4
Nickel/Solder Coated ***Accu-P® 0603*** Sn63, Pb37
S = Nickel/Lead Free Solder Coated ***Accu-P® 0201, 0402, 0603* Sn100

**RoHS Compliant

Packaging Code
TR = Tape & Reel

(1) TC's shown are per EIA/IEC Specifications.

* Tolerances as tight as ±0.01pF are available. Please consult the factory.

TEMP. COEFFICIENT CODE:

"J" = 0±30ppm/°C (-55°C to +125°C)(2)

Size Code			0201					0402					0603			0805			1210	
Voltage			100	50	25	16	10	100	50	25	16	10	100	50	25	100	50	25	100	50
Cap in pF(1)		Cap code																		
0.1	–	0R1																		
0.2	–	0R2																		
0.3	–	0R3																		
0.4	–	0R4																		
0.5	–	0R5																		
0.6	–	0R6																		
0.7	–	0R7																		
0.8	–	0R8																		
0.9	–	0R9																		
1.0	–	1R0																		
1.1	–	1R1																		
1.2	–	1R2																		
1.3	–	1R3																		
1.4	–	1R4																		
1.5	–	1R5																		
1.6	–	1R6																		
1.7	–	1R7																		
1.8	–	1R8																		
1.9	–	1R9																		
2.0	–	2R0																		
2.1	–	2R1																		
2.2	–	2R2																		
2.3	–	2R3																		
2.4	–	2R4																		
2.5	–	2R5																		
2.6	–	2R6																		
2.7	–	2R7																		
2.8	–	2R8																		
2.9	–	2R9																		
3.0	–	3R0																		
3.1	–	3R1																		
3.2	–	3R2																		
3.3	–	3R3																		
3.4	–	3R4																		
3.5	–	3R5																		
3.6	–	3R6																		
3.7	–	3R7																		
3.8	–	3R8																		
3.9	–	3R9																		
4.0	–	4R0																		
4.1	–	4R1																		
4.2	–	4R2																		
4.3	–	4R3																		
4.4	–	4R4																		
4.5	–	4R5																		
4.6	–	4R6																		
4.7	–	4R7																		
5.1	–	5R1																		
5.6	–	5R6																		
6.2	–	6R2																		
6.8	–	6R8																		
7.5	–	7R5																		
8.2	–	8R2																		
9.1	–	9R1																		
10.0	–	100																		
11.0	–	110																		
12.0	–	120																		
13.0	–	130																		
14.0	–	140																		
15.0	–	150																		
16.0	–	160																		
17.0	–	170																		
18.0	–	180																		
19.0	–	190																		
20.0	–	200																		
21.0	–	210																		
22.0	–	220																		
24.0	–	240																		
27.0	–	270																		
30.0	–	300																		
33.0	–	330																		
39.0	–	390																		
47.0	–	470																		
56.0	–	560																		
68.0	–	680																		

Intermediate values are available within the indicated range.

"K" = 0±60ppm/°C (-55°C to +125°C)(2)

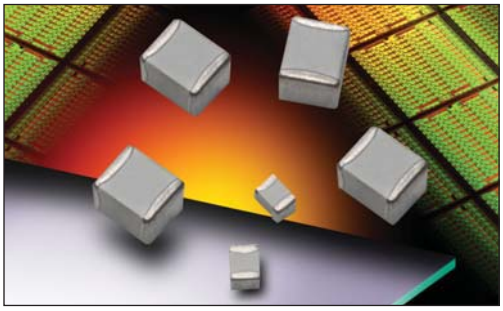
Size Code			0805			1210	
Voltage			100	50	25	100	50(3)
Cap in pF(1)		Cap code					
0.1	–	0R1					
0.2	–	0R2					
0.3	–	0R3					
0.4	–	0R4					
0.5	–	0R5					
0.6	–	0R6					
0.7	–	0R7					
0.8	–	0R8					
0.9	–	0R9					
1.0	–	1R0					
1.1	–	1R1					
1.2	–	1R2					
1.3	–	1R3					
1.4	–	1R4					
1.5	–	1R5					
1.6	–	1R6					
1.7	–	1R7					
1.8	–	1R8					
1.9	–	1R9					
2.0	–	2R0					
2.1	–	2R1					
2.2	–	2R2					
2.3	–	2R3					
2.4	–	2R4					
2.5	–	2R5					
2.6	–	2R6					
2.7	–	2R7					
2.8	–	2R8					
2.9	–	2R9					
3.0	–	3R0					
3.1	–	3R1					
3.2	–	3R2					
3.3	–	3R3					
3.4	–	3R4					
3.5	–	3R5					
3.6	–	3R6					
3.7	–	3R7					
3.8	–	3R8					
3.9	–	3R9					
4.0	–	4R0					
4.1	–	4R1					
4.2	–	4R2					
4.3	–	4R3					
4.4	–	4R4					
4.5	–	4R5					
4.6	–	4R6					
4.7	–	4R7					
5.1	–	5R1					
5.6	–	5R6					
6.2	–	6R2					
6.8	–	6R8					
7.5	–	7R5					
8.2	–	8R2					
9.1	–	9R1					
10.0	–	100					
11.0	–	110					
12.0	–	120					
13.0	–	130					
14.0	–	140					
15.0	–	150					
16.0	–	160					
17.0	–	170					
18.0	–	180					
19.0	–	190					
20.0	–	200					
21.0	–	210					
22.0	–	220					
24.0	–	240					
27.0	–	270					
30.0	–	300					
33.0	–	330					
39.0	–	390					
47.0	–	470					
56.0	–	560					
68.0	–	680					

(1) For capacitance values higher than listed in table, please consult factory.
(2) TC shown is per EIA/IEC Specifications.
(3) For 50 volt range, please consult factory.
☐ These values are produced with "K" temperature coefficient code only.

RoHS COMPLIANT
Pb: Free

SQCA/CB RF Capacitors

Ceramic (0505/1111) Low ESR High Q Capacitors



SQCA (0505) & SQCB (1111) are AVX's Ultra Low ESR microwave capacitors. Suitable for RF Power Amplifiers, they come in non-mag termination for MRI applications. They offer very High Q & resonant frequency and power handling capability.

RoHS COMPLIANT

Pb: Free

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sq.pdf

HOW TO ORDER

SQ	CB	7	M	100	J	A	T	1A
AVX Style	**Case Size**	**Voltage Code**	**Temperature Coefficient Code**	**Capacitance**	**Capacitance Tolerance Code**	**Failure Rate Code**	**Termination Style Code**	**Packaging Code**
SQ	CA = 0505 CB = 1111	5 = 50V E = 150V 2 = 200V V = 250V 9 = 300V 7 = 500V	M = +90±20ppm/°C A = 0±30ppm/°C C = 15% ("J" Termination only)	EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	B = ±.1 pF C = ±.25 pF D = ±.5 pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20% N = ±30%	A = Not Applicable	*1 = Pd/Ag *7 = Ag/Ni/Au J = Nickel Barrier Tin/Lead (60/40) *T = 100% Tin *RoHS Compliant	1A = 7" Reel Unmarked 6A = Waffle Pack Unmarked ME = 7" Reel Marked WE = Waffle Pack Unmarked *Vertical T&R available *500 piece reels available

Case Size A

TABLE I: TC: M (+90±20PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	150, 250
0.2	B	150, 250
0.3	B,C	150, 250
0.4	B,C	150, 250
0.5	B, C, D	150, 250
0.6	B, C, D	150, 250
0.7	B, C, D	150, 250
0.8	B, C, D	150, 250
0.9	B, C, D	150, 250
1.0	B, C, D	150, 250
1.1	B, C, D	150, 250
1.2	B, C, D	150, 250
1.3	B, C, D	150, 250
1.4	B, C, D	150, 250
1.5	B, C, D	150, 250
1.6	B, C, D	150, 250
1.7	B, C, D	150, 250
1.8	B, C, D	150, 250
1.9	B, C, D	150, 250
2.0	B, C, D	150, 250
2.2	B, C, D	150, 250
2.4	B, C, D	150, 250
2.7	B, C, D	150, 250
3.0	B, C, D	150, 250
3.3	B, C, D	150, 250
3.6	B, C, D	150, 250
3.9	B, C, D	150, 250
4.3	B, C, D	150, 250
4.7	B, C, D	150, 250
5.1	B, C, D	150, 250
5.6	B, C, D	150, 250
6.2	B, C, D	150, 250
6.8	B, C, J, K	150, 250
7.5	B, C, J, K	150, 250
8.2	B, C, J, K	150, 250
9.1	B, C, J, K	150, 250
10	F, G, J, K	150, 250
11	F, G, J, K	150, 250
12	F, G, J, K	150, 250
13	F, G, J, K	150, 250
15	F, G, J, K	150, 250
16	F, G, J, K	150, 250
18	F, G, J, K	150, 250
20	F, G, J, K	150, 250
22	F, G, J, K	150, 250
24	F, G, J, K	150, 250
27	F, G, J, K	150, 250
30	F, G, J, K	150, 250
33	F, G, J, K	150, 250
36	F, G, J, K	150, 250
39	F, G, J, K	150, 250
43	F, G, J, K	150, 250
47	F, G, J, K	150, 250
51	F, G, J, K	150, 250
56	F, G, J, K	150, 250
62	F, G, J, K	150, 250
68	F, G, J, K	150, 250
75	F, G, J, K	150, 250
82	F, G, J, K	150, 250
91	F, G, J, K	150, 250
100	F, G, J, K	150, 250

TABLE II: TC: A (0±30PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	150
0.2	B	150
0.3	B,C	150
0.4	B,C	150
0.5	B, C, D	150
0.6	B, C, D	150
0.7	B, C, D	150
0.8	B, C, D	150
0.9	B, C, D	150
1.0	B, C, D	150
1.1	B, C, D	150
1.2	B, C, D	150
1.3	B, C, D	150
1.4	B, C, D	150
1.5	B, C, D	150
1.6	B, C, D	150
1.7	B, C, D	150
1.8	B, C, D	150
1.9	B, C, D	150
2.0	B, C, D	150
2.2	B, C, D	150
2.4	B, C, D	150
2.7	B, C, D	150
3.0	B, C, D	150
3.3	B, C, D	150
3.6	B, C, D	150
3.9	B, C, D	150
4.3	B, C, D	150
4.7	B, C, D	150
5.1	B, C, D	150
5.6	B, C, D	150
6.2	B, C, D	150
6.8	B, C, J, K	150
7.5	B, C, J, K	150
8.2	B, C, J, K	150
9.1	B, C, J, K	150
10	F, G, J, K	150
11	F, G, J, K	150
12	F, G, J, K	150
13	F, G, J, K	150
15	F, G, J, K	150
16	F, G, J, K	150
18	F, G, J, K	150
20	F, G, J, K	150
22	F, G, J, K	150
24	F, G, J, K	150
27	F, G, J, K	150
30	F, G, J, K	150
33	F, G, J, K	150
36	F, G, J, K	150
39	F, G, J, K	150
43	F, G, J, K	150
47	F, G, J, K	150
51	F, G, J, K	150
56	F, G, J, K	150
62	F, G, J, K	150
68	F, G, J, K	150
75	F, G, J, K	150
82	F, G, J, K	150
91	F, G, J, K	150
100	F, G, J, K	150
110	F, G, J, K	50
120	F, G, J, K	50
130	F, G, J, K	50
150	F, G, J, K	50
160	F, G, J, K	50
180	F, G, J, K	50
200	F, G, J, K	50
220	F, G, J, K	50
240	F, G, J, K	50
270	F, G, J, K	50
300	F, G, J, K	50
330	F, G, J, K	50
360	F, G, J, K	50
390	F, G, J, K	50
430	F, G, J, K	50
470	F, G, J, K	50
510	F, G, J, K	50
560	F, G, J, K	50
620	F, G, J, K	50
680	F, G, J, K	50
750	F, G, J, K	50
820	F, G, J, K	50
910	F, G, J, K	50
1000	F, G, J, K	50

Case Size A

TABLE III: TC: C (±15%)

Cap. pF	Cap. Tol.	WVDC
1000	K, M, N	50
1200	K, M, N	50
1500	K, M, N	50
1800	K, M, N	50
2000	K, M, N	50
2200	K, M, N	50
2700	K, M, N	50
3300	K, M, N	50
3900	K, M, N	50
4700	K, M, N	50
5100	K, M, N	50
5600	K, M, N	50
6800	K, M, N	50
8200	K, M, N	50
10000	K, M, N	50

Case Size B

TABLE IV: TC: M (+90±20PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	500
0.2	B	500
0.3	B,C	500
0.4	B,C	500
0.5	B, C, D	500
0.6	B, C, D	500
0.7	B, C, D	500
0.8	B, C, D	500
0.9	B, C, D	500
1.0	B, C, D	500
1.1	B, C, D	500
1.2	B, C, D	500
1.3	B, C, D	500
1.4	B, C, D	500
1.5	B, C, D	500
1.6	B, C, D	500
1.7	B, C, D	500
1.8	B, C, D	500
1.9	B, C, D	500
2.0	B, C, D	500
2.2	B, C, D	500
2.4	B, C, D	500
2.7	B, C, D	500
3.0	B, C, D	500
3.3	B, C, D	500
3.6	B, C, D	500
3.9	B, C, D	500
4.3	B, C, D	500
4.7	B, C, D	500
5.1	B, C, D	500
5.6	B, C, D	500
6.2	B, C, D	500
6.8	B, C, J, K	500
7.5	B, C, J, K	500
8.2	B, C, J, K	500
9.1	B, C, J, K	500
10	F, G, J, K	500
11	F, G, J, K	500
12	F, G, J, K	500
13	F, G, J, K	500
15	F, G, J, K	500
16	F, G, J, K	500
18	F, G, J, K	500
20	F, G, J, K	500
22	F, G, J, K	500
24	F, G, J, K	500
27	F, G, J, K	500
30	F, G, J, K	500
33	F, G, J, K	500
36	F, G, J, K	500
39	F, G, J, K	500
43	F, G, J, K	500
47	F, G, J, K	500
51	F, G, J, K	500
56	F, G, J, K	500
62	F, G, J, K	500
68	F, G, J, K	500
75	F, G, J, K	500
82	F, G, J, K	500
91	F, G, J, K	500
100	F, G, J, K	500
110	F, G, J, K	300
120	F, G, J, K	300
130	F, G, J, K	300
150	F, G, J, K	300
160	F, G, J, K	300
180	F, G, J, K	300
200	F, G, J, K	300
220	F, G, J, K	200
240	F, G, J, K	200
270	F, G, J, K	200
300	F, G, J, K	200
330	F, G, J, K	200
360	F, G, J, K	200
390	F, G, J, K	200
430	F, G, J, K	200
470	F, G, J, K	200
510	F, G, J, K	150
560	F, G, J, K	150
620	F, G, J, K	150
680	F, G, J, K	150
750	F, G, J, K	150
820	F, G, J, K	150
910	F, G, J, K	150
1000	F, G, J, K	150

TABLE V: TC: A (0±30PPM/°C)

Cap. pF	Cap. Tol.	WVDC
0.1	B	500
0.2	B	500
0.3	B,C	500
0.4	B,C	500
0.5	B, C, D	500
0.6	B, C, D	500
0.7	B, C, D	500
0.8	B, C, D	500
0.9	B, C, D	500
1.0	B, C, D	500
1.1	B, C, D	500
1.2	B, C, D	500
1.3	B, C, D	500
1.4	B, C, D	500
1.5	B, C, D	500
1.6	B, C, D	500
1.7	B, C, D	500
1.8	B, C, D	500
1.9	B, C, D	500
2.0	B, C, D	500
2.2	B, C, D	500
2.4	B, C, D	500
2.7	B, C, D	500
3.0	B, C, D	500
3.3	B, C, D	500
3.6	B, C, D	500
3.9	B, C, D	500
4.3	B, C, D	500
4.7	B, C, D	500
5.1	B, C, D	500
5.6	B, C, D	500
6.2	B, C, D	500
6.8	B, C, J, K	500
7.5	B, C, J, K	500
8.2	B, C, J, K	500
9.1	B, C, J, K	500
10	F, G, J, K	500
11	F, G, J, K	500
12	F, G, J, K	500
13	F, G, J, K	500
15	F, G, J, K	500
16	F, G, J, K	500
18	F, G, J, K	500
20	F, G, J, K	500
22	F, G, J, K	500
24	F, G, J, K	500
27	F, G, J, K	500
30	F, G, J, K	500
33	F, G, J, K	500
36	F, G, J, K	500
39	F, G, J, K	500
43	F, G, J, K	500
47	F, G, J, K	500
51	F, G, J, K	500
56	F, G, J, K	500
62	F, G, J, K	500
68	F, G, J, K	500
75	F, G, J, K	500
82	F, G, J, K	500
91	F, G, J, K	500
100	F, G, J, K	500
110	F, G, J, K	300
120	F, G, J, K	300
130	F, G, J, K	300
150	F, G, J, K	300
160	F, G, J, K	300
180	F, G, J, K	300
200	F, G, J, K	300
220	F, G, J, K	200
240	F, G, J, K	200
270	F, G, J, K	200
300	F, G, J, K	200
330	F, G, J, K	200
360	F, G, J, K	200
390	F, G, J, K	200
430	F, G, J, K	200
470	F, G, J, K	200
510	F, G, J, K	150
560	F, G, J, K	150
620	F, G, J, K	150
680	F, G, J, K	150
750	F, G, J, K	150
820	F, G, J, K	150
910	F, G, J, K	150
1000	F, G, J, K	150
1100	F, G, J, K	50
1200	F, G, J, K	50
1300	F, G, J, K	50
1500	F, G, J, K	50
1600	F, G, J, K	50
1800	F, G, J, K	50
2000	F, G, J, K	50
2200	F, G, J, K	50
2400	F, G, J, K	50
2700	F, G, J, K	50
3000	F, G, J, K	50
3300	F, G, J, K	50
3600	F, G, J, K	50
3900	F, G, J, K	50
4300	F, G, J, K	50
4700	F, G, J, K	50
5000	F, G, J, K	50
5100	F, G, J, K	50

TABLE VI: TC: C (±15%)

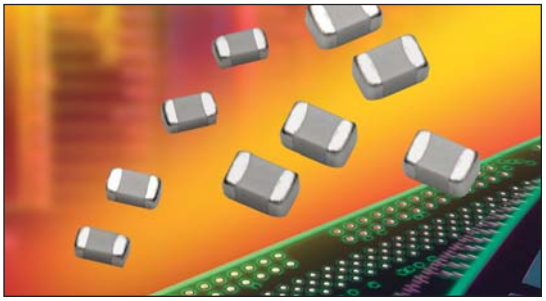
Cap. pF	Cap. Tol.	WVDC
5000	K, M, N	50
6800	K, M, N	50
8200	K, M, N	50
10000	K, M, N	50
12000	K, M, N	50
15000	K, M, N	50
18000	K, M, N	50
27000	K, M, N	50
33000	K, M, N	50
39000	K, M, N	50
47000	K, M, N	50
68000	K, M, N	50
82000	K, M, N	50
100000	K, M, N	50

RoHS COMPLIANT

Pb: Free

SQCS/CF RF Capacitors

Ceramic (0603/0805) Ultra Low ESR High Q Capacitors



SQCS (0603) & SQCF (0805) are AVX's Ultra Low ESR microwave capacitors suitable for Base Station infrastructure applications requiring High Q and power handling capability.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sq.pdf

HOW TO ORDER

SQ	CS	V	A	100	J	A	T	1A
AVX Style SQ	**Case Size** CS = 0603 CF = 0805	**Voltage Code** V = 250V	**Temperature Coefficient Code** A = 0±30ppm/°C	**Capacitance** EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	**Capacitance Tolerance Code** A = ±.05 pF B = ±.1 pF C = ±.25 pF D = ±.5 pF F = ±1% G = ±2% J = ±5%	**Failure Rate Code** A = Not Applicable	**Termination Style Code** **1 = Pd/Ag **7 = Ag/Ni/Au J = Nickel Barrier Tin/Lead (60/40) **T = 100% Tin (Standard) **RoHS Compliant	**Packaging Code** 1A = 7" Reel Unmarked ME = 7" Reel Marked *Vertical T&R available *500 piece reels available

TABLE I: TC: A (0±30PPM/°C) CASE SIZE S

Cap. pF	Cap. Tol.	WVDC
0.1	A, B	250
0.2	A, B	250
0.3	A, B	250
0.4	A, B	250
0.5	A, B, C	250
0.6	A, B, C	250
0.7	A, B, C	250
0.8	A, B, C	250
0.9	A, B, C	250
1.0	A, B, C	250
1.1	A, B, C	250
1.2	A, B, C	250
1.3	A, B, C	250
1.4	A, B, C	250
1.5	A, B, C	250
1.6	A, B, C	250
1.7	A, B, C	250
1.8	A, B, C	250
1.9	A, B, C	250
2.0	A, B, C	250
2.2	A, B, C	250
2.4	A, B, C	250
2.7	A, B, C	250
3.0	A, B, C	250
3.3	A, B, C	250
3.6	A, B, C	250
3.9	A, B, C	250
4.3	A, B, C	250
4.7	A, B, C	250
5.1	A, B, C	250
5.6	A, B, C	250
6.2	A, B, C	250
6.8	B, C, D	250
7.5	B, C, D	250
8.2	B, C, D	250
9.1	B, C, D	250
10	F, G, J	250
11	F, G, J	250
12	F, G, J	250
13	F, G, J	250
15	F, G, J	250
16	F, G, J	250
18	F, G, J	250
20	F, G, J	250
22	F, G, J	250
24	F, G, J	250
27	F, G, J	250
30	F, G, J	250
33	F, G, J	250
36	F, G, J	250
39	F, G, J	250
43	F, G, J	250
47	F, G, J	250
51	F, G, J	250
56	F, G, J	250
62	F, G, J	250
68	F, G, J	250
75	F, G, J	250
82	F, G, J	250
91	F, G, J	250
100	F, G, J	250

TABLE II: TC: A (0±30PPM/°C) CASE SIZE F

Cap. pF	Cap. Tol.	WVDC
0.1	A, B	250
0.2	A, B	250
0.3	A, B	250
0.4	A, B	250
0.5	A, B, C	250
0.6	A, B, C	250
0.7	A, B, C	250
0.8	A, B, C	250
0.9	A, B, C	250
1.0	A, B, C	250
1.1	A, B, C	250
1.2	A, B, C	250
1.3	A, B, C	250
1.4	A, B, C	250
1.5	A, B, C	250
1.6	A, B, C	250
1.7	A, B, C	250
1.8	A, B, C	250
1.9	A, B, C	250
2.0	A, B, C	250
2.2	A, B, C	250
2.4	A, B, C	250
2.7	A, B, C	250
3.0	A, B, C	250
3.3	A, B, C	250
3.6	A, B, C	250
3.9	A, B, C	250
4.3	A, B, C	250
4.7	A, B, C	250
5.1	A, B, C	250
5.6	A, B, C	250
6.2	A, B, C	250
6.8	B, C, D	250
7.5	B, C, D	250
8.2	B, C, D	250
9.1	B, C, D	250
10	F, G, J	250
11	F, G, J	250
12	F, G, J	250
13	F, G, J	250
15	F, G, J	250
16	F, G, J	250
18	F, G, J	250
20	F, G, J	250
22	F, G, J	250
24	F, G, J	250
27	F, G, J	250
30	F, G, J	250
33	F, G, J	250
36	F, G, J	250
39	F, G, J	250
43	F, G, J	250
47	F, G, J	250
51	F, G, J	250
56	F, G, J	250
62	F, G, J	250
68	F, G, J	250
75	F, G, J	250
82	F, G, J	250
91	F, G, J	250
100	F, G, J	250
110	F, G, J	250
120	F, G, J	250
150	F, G, J	250
180	F, G, J	250
200	F, G, J	250
220	F, G, J	250
240	F, G, J	250

RoHS COMPLIANT
Pb: Free

U Series RF Capacitors (RoHS)

C0G (NP0) Ceramic Low ESR Capacitors

"U" Series capacitors are C0G (NP0) chip capacitors specially designed for "Ultra" low ESR for applications in the communications market. Max ESR and effective capacitance are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0402, 0603, 0805, and 1210.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/useries.pdf

HOW TO ORDER

0805	1	U	100	J	A	T	2	A
Case Size	**Voltage Code**	**Dielectric = Ultra Low ESR**	**Capacitance**	**Capacitance Tolerance Code**	**Failure Rate Code**	**Termination**	**Packaging Code**	**Special Code**
0402 0603 0805 1210	5 = 50V 1 = 100V 2 = 200V		EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	B = ±0.1pF C = ±0.25pF D = ±0.5pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	A = Not Applicable	T = Plated Ni and Sn	2 = 7" Reel 4 = 13" Reel 9 = Bulk	A = Standard

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
0.2	B,C	50V	N/A	N/A	N/A
0.3	↓	↓	↓	↓	↓
0.4	↓	↓	↓	↓	↓
0.5	B,C	↓	↓	↓	↓
0.6	B,C,D	↓	↓	↓	↓
0.7	↓	↓	↓	↓	↓
0.8	↓	↓	↓	↓	↓
0.9	B,C,D	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
1.0	B,C,D	50V	200V	200V	200V
1.1	↓	↓	↓	↓	↓
1.2	↓	↓	↓	↓	↓
1.3	↓	↓	↓	↓	↓
1.4	↓	↓	↓	↓	↓
1.5	↓	↓	↓	↓	↓
1.6	↓	↓	↓	↓	↓
1.7	↓	↓	↓	↓	↓
1.8	↓	↓	↓	↓	↓
1.9	↓	↓	↓	↓	↓
2.0	↓	↓	↓	↓	↓
2.1	↓	↓	↓	↓	↓
2.2	↓	↓	↓	↓	↓
2.4	↓	↓	↓	↓	↓
2.7	↓	↓	↓	↓	↓
3.0	↓	↓	↓	↓	↓
3.3	↓	↓	↓	↓	↓
3.6	↓	↓	↓	↓	↓
3.9	↓	↓	↓	↓	↓
4.3	↓	↓	↓	↓	↓
4.7	↓	↓	↓	↓	↓
5.1	↓	↓	↓	↓	↓
5.6	↓	↓	↓	↓	↓
6.2	B,C,D	↓	↓	↓	↓
6.8	B,C,J,K,M	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
7.5	B,C,J,K,M	50V	200V	200V	200V
8.2	↓	↓	↓	↓	↓
9.1	B,C,J,K,M	↓	↓	↓	↓
10	F,G,J,K,M	↓	↓	↓	↓
11	↓	↓	↓	↓	↓
12	↓	↓	↓	↓	↓
13	↓	↓	↓	↓	↓
15	↓	↓	↓	↓	↓
18	↓	↓	200V	↓	↓
20	↓	↓	100V	↓	↓
22	↓	↓	↓	↓	↓
24	↓	↓	↓	↓	↓
27	↓	↓	↓	↓	↓
30	↓	50V	↓	↓	↓
33	↓	N/A	↓	↓	↓
36	↓	↓	↓	↓	↓
39	↓	↓	↓	↓	↓
43	↓	↓	↓	↓	↓
47	↓	↓	↓	↓	↓
51	↓	↓	↓	↓	↓
56	↓	↓	↓	↓	↓
68	↓	↓	↓	↓	↓
75	↓	↓	↓	↓	↓
82	↓	↓	↓	↓	↓
91	↓	↓	↓	↓	↓

Cap (pF)	Available Tolerance	Size 0402	0603	0805	1210
100	F,G,J,K,M	N/A	100V	200V	200V
110	↓	↓	50V	↓	↓
120	↓	↓	50V	↓	↓
130	↓	↓	N/A	200V	↓
140	↓	↓	↓	100V	↓
150	↓	↓	↓	↓	↓
160	↓	↓	↓	100V	↓
180	↓	↓	↓	N/A	↓
200	↓	↓	↓	↓	↓
220	↓	↓	↓	↓	↓
270	↓	↓	↓	↓	↓
300	↓	↓	↓	↓	↓
330	↓	↓	↓	↓	↓
360	↓	↓	↓	↓	↓
390	↓	↓	↓	↓	↓
430	↓	↓	↓	↓	200V
470	↓	↓	↓	↓	100V
510	↓	↓	↓	↓	↓
560	↓	↓	↓	↓	↓
620	↓	↓	↓	↓	↓
680	↓	↓	↓	↓	↓
750	↓	↓	↓	↓	↓
820	↓	↓	↓	↓	↓
910	↓	↓	↓	↓	↓
1000	F,G,J,K,M	↓	↓	↓	↓

RoHS COMPLIANT

U Series RF Capacitors (Tin/Lead)

C0G (NP0) Ceramic Low ESR Capacitors

"U" Series capacitors are C0G (NP0) chip capacitors specially designed for "Ultra" low ESR for applications in the communications market. Max ESR and effective capacitance are met on each value producing lot to lot uniformity. Sizes available are EIA chip sizes 0402, 0603, 0805, and 1210.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/useries.pdf

HOW TO ORDER

LD05	1	U	100	J	A	B	2	A
Case Size	**Voltage Code**	**Dielectric = Ultra Low ESR**	**Capacitance**	**Capacitance Tolerance Code**	**Failure Rate Code**	**Termination**	**Packaging Code**	**Special Code**
LD02 = 0402 LD03 = 0603 LD05 = 0805 LD10 = 1210	5 = 50V 1 = 100V 2 = 200V		EIA Capacitance Code in pF. First two digits = significant figures or "R" for decimal place. Third digit = number of zeros or after "R" significant figures.	B = ±0.1pF C = ±0.25pF D = ±0.5pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	A = Not Applicable	B = 5% min lead	2 = 7" Reel 4 = 13" Reel 9 = Bulk	A = Standard

	Available	Size			
Cap (pF)	Tolerance	LD02	LD03	LD05	LD10
0.2	B,C	50V	N/A	N/A	N/A
0.3	↓	↓	↓	↓	↓
0.4	↓	↓	↓	↓	↓
0.5	B,C	↓	↓	↓	↓
0.6	B,C,D	↓	↓	↓	↓
0.7	↓	↓	↓	↓	↓
0.8	↓	↓	↓	↓	↓
0.9	B,C,D	↓	↓	↓	↓

	Available	Size			
Cap (pF)	Tolerance	LD02	LD03	LD05	LD10
1.0	B,C,D	50V	200V	200V	200V
1.1	↓	↓	↓	↓	↓
1.2	↓	↓	↓	↓	↓
1.3	↓	↓	↓	↓	↓
1.4	↓	↓	↓	↓	↓
1.5	↓	↓	↓	↓	↓
1.6	↓	↓	↓	↓	↓
1.7	↓	↓	↓	↓	↓
1.8	↓	↓	↓	↓	↓
1.9	↓	↓	↓	↓	↓
2.0	↓	↓	↓	↓	↓
2.1	↓	↓	↓	↓	↓
2.2	↓	↓	↓	↓	↓
2.4	↓	↓	↓	↓	↓
2.7	↓	↓	↓	↓	↓
3.0	↓	↓	↓	↓	↓
3.3	↓	↓	↓	↓	↓
3.6	↓	↓	↓	↓	↓
3.9	↓	↓	↓	↓	↓
4.3	↓	↓	↓	↓	↓
4.7	↓	↓	↓	↓	↓
5.1	↓	↓	↓	↓	↓
5.6	↓	↓	↓	↓	↓
6.2	B,C,D	↓	↓	↓	↓
6.8	B,C,J,K,M	↓	↓	↓	↓

	Available	Size			
Cap (pF)	Tolerance	LD02	LD03	LD05	LD10
7.5	B,C,J,K,M	50V	200V	200V	200V
8.2	↓	↓	↓	↓	↓
9.1	B,C,J,K,M	↓	↓	↓	↓
10	F,G,J,K,M	↓	↓	↓	↓
11	↓	↓	↓	↓	↓
12	↓	↓	↓	↓	↓
13	↓	↓	↓	↓	↓
15	↓	↓	↓	↓	↓
18	↓	↓	200V	↓	↓
20	↓	↓	100V	↓	↓
22	↓	↓	↓	↓	↓
24	↓	↓	↓	↓	↓
27	↓	↓	↓	↓	↓
30	↓	50V	↓	↓	↓
33	↓	N/A	↓	↓	↓
36	↓	↓	↓	↓	↓
39	↓	↓	↓	↓	↓
43	↓	↓	↓	↓	↓
47	↓	↓	↓	↓	↓
51	↓	↓	↓	↓	↓
56	↓	↓	↓	↓	↓
68	↓	↓	↓	↓	↓
75	↓	↓	↓	↓	↓
82	↓	↓	↓	↓	↓
91	↓	↓	↓	↓	↓

	Available	Size			
Cap (pF)	Tolerance	LD02	LD03	LD05	LD10
100	F,G,J,K,M	N/A	100V	200V	200V
110	↓	↓	50V	↓	↓
120	↓	↓	50V	200V	↓
130	↓	↓	N/A	100V	↓
140	↓	↓	↓	↓	↓
150	↓	↓	↓	100V	↓
160	↓	↓	↓	N/A	↓
180	↓	↓	↓	↓	↓
200	↓	↓	↓	↓	↓
220	↓	↓	↓	↓	↓
270	↓	↓	↓	↓	↓
300	↓	↓	↓	↓	↓
330	↓	↓	↓	↓	↓
360	↓	↓	↓	↓	↓
390	↓	↓	↓	↓	200V
430	↓	↓	↓	↓	100V
470	↓	↓	↓	↓	↓
510	↓	↓	↓	↓	↓
560	↓	↓	↓	↓	↓
620	↓	↓	↓	↓	↓
680	↓	↓	↓	↓	↓
750	↓	↓	↓	↓	↓
820	↓	↓	↓	↓	↓
910	↓	↓	↓	↓	↓
1000	F,G,J,K,M	↓	↓	↓	↓

RoHS COMPLIANT

Pb: Free

HQ Series, High Q, High RF Power Chips

For 600V to 7200V Application

Hi-Q®, High RF Power, Surface Mount and Leaded MLC Capacitors from AVX Corporation are characterized with ultra-low ESR and dissipation factor at high frequencies. They are designed to handle high power and high voltage levels for applications in RF power amplifiers, inductive heating, high magnetic field environments (MRI coils), medical and industrial electronics.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/hi-q.pdf

HOW TO ORDER

HQCC	A	A	271	J	A	T	1	A
AVX Style HQCC HQCE	**Voltage** C = 600V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V M = 7200V	**Temperature Coefficient** C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 4.7 pF = 4R7 10 pF = 100 100 pF = 101 1,000 pF = 102	**Capacitance Tolerance** C = ±0.25pF (<13pF) D = ±0.50pF (<25pF) F = ±1% (≥25pF) G = ±2% (≥13pF) J = ±5% K = ±10% M = ±20%	**Test Level** A = Standard	**Termination*** 1 = Pd/Ag T = Plated Ni and Sn (RoHS Compliant) J = 5% Min Pb M = Microstip (non-mag) A = Axial (non-mag)	**Packaging** 1 = 7" Reel 3 = 13" Reel 9 = Bulk	**Special Code** A = Standard

DIELECTRIC PERFORMANCE CHARACTERISTICS

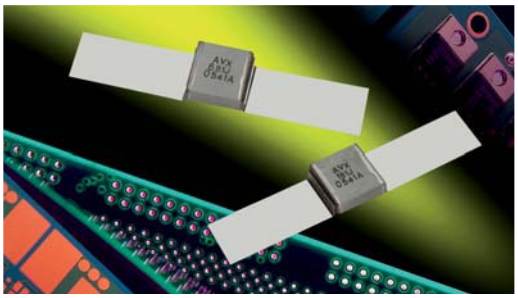
Capacitance Range	3.3pF to 6,800pF (25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Capacitance Tolerances	±0.25pF, ±0.50pF, ±1%, ±2%, ±5%, ±10%, ±20%
Dissipation Factor 25°C	0.1% Max (+25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	C0G: 0 ± 30 ppm/°C (-55°C to +125°C)
Voltage Ratings	600, 1000, 1500, 2000, 2500, 3000, 4000, 5000, 7200VDC
Insulation Resistance	100K MΩ min. @ +25°C and 500VDC 10K MΩ min. @ +125°C and 500VDC
Dielectric Strength	120% of rated WVDC

HIGH VOLTAGE CAPACITANCE VALUES (pF)

Style	600 WDC min./max.	1000 WVDC min./max.	1500 WVDC min./max.	2000 WVDC min./max.	2500 WVDC min./max.	3000 WVDC min./max.	4000 WVDC min./max.	5000 WVDC min./max.	7200 WVDC min./max.
HQCC	2,200 - 2,700	1,500 - 1,800	820 - 1,200	470 - 680	330 - 390	4.7 - 270	3.3 - 6.8		
HQCE	3.3 - 6,800	3.3 - 4,700	3.3 - 2,700	3.3 - 1,800	3.3 - 1,000	3.3 - 680	3.3 - 390	3.3 - 180	3.3 - 100

RoHS COMPLIANT

HQL Series, High Q, High RF Power
Ribbon Leaded MLC Capacitors



Hi-Q®, High RF Power, Ribbon Leaded MLC Capacitors from AVX Corporation are characterized with ultra-low ESR and dissipation factor at high frequencies. The HQL-style parts are constructed using non-magnetic materials. They are designed to handle high power and high voltage levels for applications in RF power amplifiers, inductive heating, high magnetic field environments (MRI coils), medical and industrial electronics.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/hi-ql.pdf

HOW TO ORDER

HQLC	A	A	271	J	A	A
AVX Style HQLC HQLE	**Voltage** C = 600V/630 A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V M = 7200V	**Temperature Coefficient** C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 4.7 pF = 4R7 10 pF = 100 100 pF = 101 1,000 pF = 102	**Capacitance Tolerance** C = ±0.25pF (<13pF) D = ±0.50pF (<25pF) F = ±1% (≥25pF) G = ±2% (≥13pF) J = ±5% K = ±10% M = ±20%	**Test Level** A = Standard	**Lead Style** A = Axial Ribbon M = Microstrip

DIELECTRIC PERFORMANCE CHARACTERISTICS

Capacitance Range	3.3pF to 6,800pF (25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Capacitance Tolerances	±0.25pF, ±0.50pF, ±1%, ±2%, ±5%, ±10%, ±20%
Dissipation Factor 25°C	0.1% Max (+25°C, 1.0 ±0.2 Vrms at 1kHz, for ≤ 1000 pF use 1MHz)
Operating Temperature Range	-55°C to +125°C
Temperature Characteristic	C0G: 0 ± 30 ppm/°C (-55°C to +125°C)
Voltage Ratings	600, 1000, 1500, 2000, 2500, 3000, 4000, 5000, 7200VDC
Insulation Resistance	100K MΩ min. @ +25°C and 500VDC 10K MΩ min. @ +125°C and 500VDC
Dielectric Strength	120% of rated WVDC

HIGH VOLTAGE CAPACITANCE VALUES (pF)

Style	600 WDC min./max.	1000 WVDC min./max.	1500 WVDC min./max.	2000 WVDC min./max.	2500 WVDC min./max.	3000 WVDC min./max.	4000 WVDC min./max.	5000 WVDC min./max.	7200 WVDC min./max.
HQLC	2,200 - 2,700	1,500 - 1,800	820 - 1,200	470 - 680	330 - 390	4.7 - 270	3.3 - 6.8		
HQLE	3.3 - 6,800	3.3 - 4,700	3.3 - 2,700	3.3 - 1,800	3.3 - 1,000	3.3 - 680	3.3 - 390	3.3 - 180	3.3 - 100

RoHS COMPLIANT
Pb: Free

GX Series
Ultra Broad Band Capacitor

ADVANTAGES

- Ultra-Broadband performance
- Ultra-Low Insertion Loss
- X5R & X7S Characteristics
- Low Return Loss

APPLICATIONS

- Semi-Conductor Data Communications Customers
- Receiver Optical Sub-Assemblies
- Transimpedance Amplifier Customers
- Test Equipment Manufactures

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/gx.pdf

The GX Series was developed specifically to address DC Blocking issues from ~16KHz (-3dB roll-off) to 40GHz. Most applications will experience resonance-free insertion loss of <0.5dB thru at least 40GHz. Insertion loss at higher frequencies is in part dependent on installation parameters. Using AVX's patented precision thin film termination process, the part is designed to be completely orientation insensitive with a standard EIA 0402 footprint to minimize board space requirements. Both Ni/Sn and Ni/Au terminations are available to cover a wide range of attachment processes. All GX parts are RoHS compliant.

Au terminated units are wire bondable. Users may, therefore, find these devices equally useful in bypass applications when wire bonding is a necessary part of the manufacturing process.

More information can be obtained by contacting the factory or your local AVX representative.

HOW TO ORDER

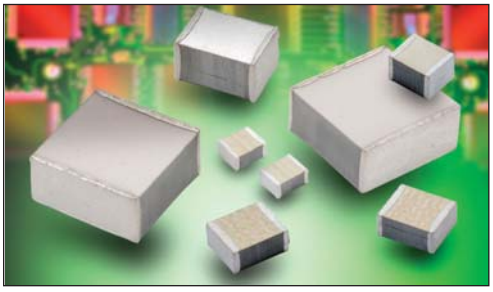
GX	02	YD	104	K	A	T	2
Style	**Case Size** 02 = 0402	**Voltage/Dielectric** YD = 16Vdc/X5R ZZ = 10Vdc/X7S	**Capacitance** 104 = 0.1µF EIA Cap Code in pF	**Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Std	**Termination** T = Ni-Sn (Standard) 7 = Ni-Au	**Packaging** 2 = 4000 pcs, 7" T&R 2-500 = 500 pcs, 7" T&R 2-1000 = 1000 pcs, 7" T&R

ELECTRICAL SPECIFICATIONS

Capacitance	0.1 µF ± 10%, 0.1 µF ± 20%
Voltage Rating/Operating Temperature	16 VDC @ 85°C; 10 VDC @ 125°C
Dielectric Withstanding Voltage	250% WVDC
Insulation Resistance	10,000 Meg Ohms @ 25°C; 1,000 Meg Ohms @ 125°C
Temperature Coefficient	16 VDC X5R (± 15%); 10 VDC X7S (± 22%)

Film Chip Capacitors

CB-PET Series High Temperature PET Dielectric



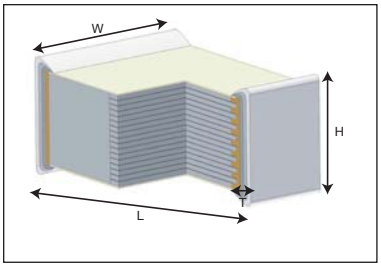
Film chip capacitor using a naked and stacked construction with metallized High Temperature PET (polyethylene terephtalate).

- Use of high temperature dielectric films makes these capacitors suitable for IR or vapor phase reflow processes. This chip is built without specific encapsulation.
- The intrinsic elasticity of the dielectric film allows an excellent compatibility of the capacitor with all types of material for printed circuit boards.
- The self-healing property of film technology results in a safe open failure mode and better overall reliability.
- Excellent thermal shock resistance
- Low dissipation factor, ESR & ESL
- No piezoelectric effect
- Available in tape and reel suitable for automatic placement
- Non-polar construction

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cb-petht.pdf

HOW TO ORDER

CB	04	2	G	0104	K	--
Type	**Size**	**Dielectric**	**Voltage**	**Capacitance EIA Code**	**Tolerance**	**Suffix Packaging**
SMD Lead Free	04 = 2220 05 = 2824 16 = 4030 17 = 5040 18 = 6054	2 = PET-HT	D = 50/63V E = 100V G = 250V I = 400V K = 630V	1st digit: 0 2nd & 3rd digit: the 2nd significant figures of the capacitance value 4th digit: the number of zeros to be added to the capacitance value	K = 10% J = 5%	-- = Bulk BC = tape & reel diameter: 330mm



millimeters (inches)

Size Code	Equivalent Size	Length (L)	Width (W)
04	2220	5.8±0.50 (0.228±0.020)	5.0±0.50 (0.197±0.020)
05	2824	7.2±0.50 (0.283±0.020)	6.1±0.50 (0.240±0.020)
16	4030	10.5±0.60 (0.413±0.024)	7.6±0.80 (0.299±0.031)
17	5040	12.8±0.60 (0.504±0.024)	10.2±0.80 (0.402±0.031)
18	6054	15.3±0.60 (0.602±0.024)	13.7±0.80 (0.539±0.031)

VOLTAGE (Vdc / Vac)											
Capacitance		**63 Vdc / 40 Vac**		**100 Vdc / 63 Vac**		**250 Vdc - 160 Vac**		**400 Vdc / 200 Vac**		**630 Vdc / 250 Vac**	
Value	Cap Code	Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max
0.010µF	0103							2220	2.4	2220	2.8
0.015	0153							2220	2.4	2220	4.0
0.022	0223							2220	3.0	2824	3.4
0.033	0333							2220	4.2	2824	5.0
0.047	0473					2220	3.0	2824	4.5	4030	3.6
0.068	0683					2220	4.1	4030	3.6	4030	5.2
0.100	0104					2220	4.55	4030	4.7	5040	5.0
0.150	0154					2824	4.3	5040	4.6	5040	6.9
0.220	0224			2220	3.3	2824	4.9	6054	4.0	6054	5.8
0.330	0334	2220	3.3	2220	4.0	4030	5.6	6054	5.6		
0.470	0474	2220	3.5	2824	4.4	4030	6.15				
0.680	0684	2220	4.0	2824	5.2	5040	6.5				
1.0µF	0105	2220	4.0	2824	5.7	6054	6.0				
1.5	0155	2824	5.4	4030	6.1	6054	7.0				
2.2	0225	4030	5.7	5040	5.5						
3.3	0335	6054	5.5	6054	5.2						
4.7	0475	6054	4.9	6054	7.1						

For other values : upon request

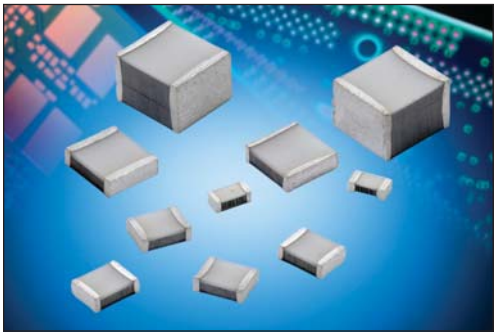
ISO/TS 16949 TS 95138 REGISTERED

LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

Film Chip Capacitors

CB-PEN Series PEN Dielectric



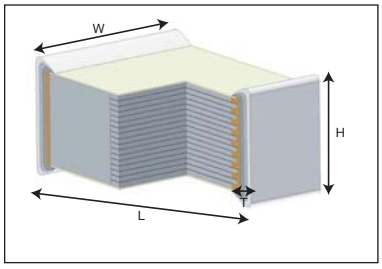
Film chip capacitor using a naked and stacked construction with metallized PEN (polyethylene naphtalate).

- Use of high temperature dielectric films makes these capacitors suitable for IR or vapor phase reflow processes. This chip is built without specific encapsulation.
- The intrinsic elasticity of the dielectric film allows an excellent compatibility of the capacitor with all types of material for printed circuit boards.
- The self-healing property of film technology results in a safe open circuit failure mode and better overall reliability.
- Excellent thermal shock resistance
- Low dissipation factor, ESR & ESL
- No piezoelectric effect
- Available in tape and reel suitable for automatic placement
- Non-polar construction.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cb-pen.pdf

HOW TO ORDER

CB	01	7	D	0103	J	BA
Type	**Size**	**Dielectric**	**Voltage**	**Capacitance EIA Code**	**Tolerance**	**Suffix Packaging**
SMD Lead Free	01 = 1206 02 = 1210 03 = 1812 04 = 2220 05 = 2824 16 = 4030 17 = 5040 18 = 6054	7 = PEN	C = 25V D = 50/63V E = 100V G = 250V I = 400V K = 630V	1st digit: 0 2nd & 3rd digit: the 2nd significant figures of the capacitance value 4th digit: the number of zeros to be added to the capacitance value	K = 10% J = 5%	-- = Bulk BA = tape & reel diameter: 180mm BC = tape & reel diameter: 330mm



millimeters (inches)

Size Code	Equivalent Size	Length (L)	Width (W)
01	1206	3.3±0.30 (0.130±0.012)	1.6±0.30 (0.063±0.012)
02	1210	3.3±0.30 (0.130±0.012)	2.5±0.30 (0.098±0.012)
03	1812	4.7±0.50 (0.185±0.020)	3.2±0.50 (0.126±0.020)
04	2220	5.8±0.50 (0.228±0.020)	5.0±0.50 (0.197±0.020)
05	2824	7.2±0.50 (0.283±0.020)	6.1±0.50 (0.240±0.020)
16	4030	10.5±0.60 (0.413±0.024)	7.6±0.80 (0.299±0.031)
17	5040	12.8±0.60 (0.504±0.024)	10.2±0.80 (0.402±0.031)
18	6054	15.3±0.60 (0.602±0.024)	13.7±0.80 (0.539±0.031)

VOLTAGE (Vdc / Vac)															
Capacitance		25 Vdc / 16 Vac		50-63 Vdc / 40 Vac				100 Vdc - 63 Vac		250 Vdc / 160 Vac		400 Vdc / 200 Vac		630 Vdc / 250 Vac	
Value	Cap Code	Size Code	H max	Size Code		H max		Size Code	H max	Size Code	H max	Size Code	H max	Size Code	H max
0.001µF	0102	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0015	0152	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0022	0222	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0033	0332	1206	1.15	1206	1812	1.15	1.9	1206	1.15	1812	2.0	1812	2.0	1812	2.0
0.0047	0472	1206	1.15	1206	1812	1.15	2.0	1206	1.15	1812	2.0	1812	2.0	1812	2.5
0.0068	0682	1206	1.15	1206	1812	1.15	2.0	1206	1.15	1812	2.0	1812	2.0	2220	2.0
0.010	0103	1206	1.15	1206	1812	1.15	2.0	1206	1.15	1812	2.0	2220	1.9	2220	2.4
0.015	0153	1206	1.15	1206	1812	1.15	2.4	1210	1.8	1812	2.4	2220	2.2	2220	3.4
0.022	0223	1206	1.15	1206	1812	1.15	2.0	1210	1.8	1812	2.9	2220	2.8	2824	3.4
0.033	0333	1210	1.8	1210	1812	1.8	2.0	1812	2.0	2220	2.2	2220	3.9	2824	4.8
0.047	0473	1210	1.8	1210	1812	1.8	2.7	1812	2.6	2220	2.9	2824	3.2	4030	4.0
0.068	0683	1210	1.8	1210	1812	1.8	2.0	1812	2.0	2220	4.0	2824	4.4	4030	5.5
0.100	0104	1210	2.3	1210	1812	2.3	2.8	1812	3.0	2220	4.5	4030	5.3	5040	5.2
0.150	0154			1812		2.0		2220	3.3	2824	4.7	4030	6.0	5040**	6.9
0.220	0224			1812		3.0		2220	4.0	2824	5.7	5040	5.0	6054	6.0
0.330	0334			2220		4.0		2220	4.2	4030	6.1	6054	5.9		
0.470	0474			2220		4.0		2824*	4.5	5040	5.5	6054	6.5		
0.680	0684			2220		3.9		2824*	4.5	6054	4.6				
1	0105			2824*		4.7		4030	6.0	6054	6.4				
1.5	0155			2824*		4.7		5040	5.5						
2.2	0225			4030		6.1		5040	6.9						
3.3	0335			6054		5.3		6054	7.1						
4.7	0475			6054		7.2									

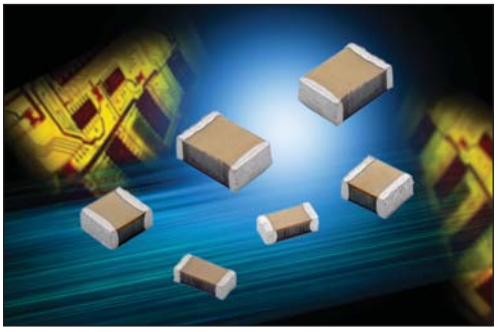
For other values: upon request
*Special length: 7.3 +0.7/-0.3 (0.287 +0.028/-0.012)
**Only available in tolerance 10%

50V
63V

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT
RoHS COMPLIANT

Film Chip Capacitors

CB-PPS Series PPS Dielectric



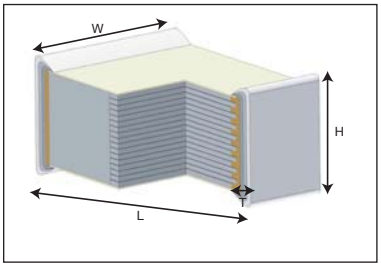
Film chip capacitor using a naked and stacked construction with metallized PPS (polyphenylene sulfide film).

- Applicable for both flow and reflow soldering
- Very constant Capacitance value with temperature
- Low dielectric absorption
- The intrinsic elasticity of the dielectric film provides an excellent compatibility of the capacitor with all types of material for printed circuit boards
- Excellent thermal shock resistance
- Low dissipation factor, ESR and ESL
- No piezoelectric effect
- Available in tape and reel suitable for automatic placement
- Non-polar construction.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cb-pps.pdf

HOW TO ORDER

CB	02	8	B	0104	G	--
Type SMD Lead Free	**Size** 01 = 1206 02 = 1210 03 = 1812	**Dielectric** 8 = PPS	**Voltage** B = 16V D = 50V	**Capacitance EIA Code** 1st digit: 0 2nd & 3rd digit: the 2nd significant figures of the capacitance value 4th digit: the number of zeros to be added to the capacitance value	**Tolerance** G = 2% J = 5% K = 10%	**Suffix Packaging** -- = Bulk BA = tape & reel diameter: 180mm



millimeters (inches)

Size Code	Equivalent Size	Length (L)	Width (W)
01	1206	3.3±0.30 (0.130±0.012)	1.6±0.30 (0.063±0.012)
02	1210	3.3±0.30 (0.130±0.012)	2.5±0.30 (0.098±0.012)
03	1812	4.5±0.50 (0.177±0.020)	3.2±0.50 (0.126±0.020)

VOLTAGE (Vdc / Vac)					
Capacitance		16 Vdc / 10 Vac		50 Vdc / 40 Vac	
Value	Cap Code	Size Code	H max	Size Code	H max
0.001µF	0102	1206	1.15	1206	1.15
0.0015	0152	1206	1.15	1206	1.15
0.0022	0222	1206	1.15	1206	1.15
0.0033	0332	1206	1.15	1206	1.15
0.0047	0472	1206	1.15	1206	1.15
0.0068	0682	1206	1.15	1206	1.15
0.010	0103	1206	1.15	1206	1.15
0.015	0153	1206	1.15	1210	1.8
0.022	0223	1206	1.15	1210	1.8
0.033	0333	1206	1.15	1210	2.1
0.047	0473	1210	1.8	1812	2.4
0.068	0683	1210	1.8	1812	2.4
0.100	0104	1210	1.8	1812	2.4
0.150	0154	1812	2.3		
0.180	0184	1812	2.5		

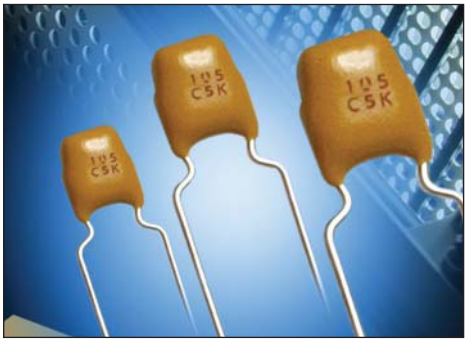
For other values : upon request

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

SR Series

SkyCap® Radial Conformal Coated NP0 Dielectric



AVX SR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SR21	5	A	104	F	A	R
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SR15 SR20 SR21 SR22 SR27 SR30 SR40 SR50	5 = 50V 1 = 100V 2 = 200V	A = C0G (NP0)	First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	C = ±.25pF D = ±.5pF F = ±1% (>50pF only) G = ±2% (>25pF only) J = ±5% K = ±10%	A = Not Applicable	R = RoHS

C0G (NP0) Dielectric

AVX Style		SR15			SR20			SR21			SR22			SR27			SR30		SR40		SR50	
AVX "Insertable"		SR07			SR29			SR59			N/A			N/A			SR65		SR75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
1.0-9.9	SR151A1R0DAR																					
10	SR151A100KAR																					
15	SR_____A150KAR																					
22	SR_____A220KAR																					
33	SR_____A330KAR																					
39	SR_____A390KAR																					
47	SR_____A470KAR																					
68	SR_____A680KAR																					
100	SR151A101KAR																					
150	SR_____A151KAR																					
220	SR_____A221KAR																					
330	SR_____A331KAR																					
390	SR_____A391KAR																					
470	SR_____A471KAR																					
680	SR_____A681KAR																					
1000	SR211A102KAR																					
1500	SR_____A152KAR																					
2200	SR_____A222KAR																					
3900	SR_____A392KAR																					
4700	SR_____A472KAR																					
6800	SR_____A682KAR																					
8200	SR-----A822KAR																					
10,000	SR305A103KAR																					
15,000	SR-----A153KAR																					
22,000	SR_____A223KAR																					
33,000	SR_____A333KAR																					
39,000	SR_____A393KAR																					
47,000	SR_____A473KAR																					
68,000	SR_____A683KAR																					
100,000	SR_____A104KAR																					

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

***Other capacitance values available upon special request.**

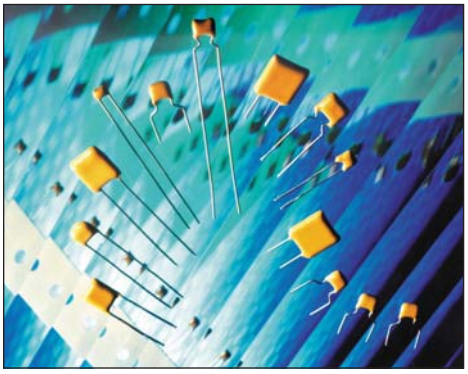
NOTE: Capacitance Ranges available for SR12 same as SR15
SR62 same as SR21
SR64 same as SR30
SR89 same as SR21

= Industry preferred values

= SR20 only

SR Series

SkyCap® Radial Conformal Coated X7R Dielectric



AVX SR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SR21 **5** **C** **104** **M** **A** **R**

AVX Style
SR15
SR20
SR21
SR22
SR27
SR30
SR40
SR50

Voltage
5 = 50V
1 = 100V
2 = 200V

Temperature Coefficient
C = X7R

Capacitance
First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)

Capacitance Tolerance
J = ±5%
K = ±10%
M = ±20%

Failure Rate
A = Not Applicable

Leads
R = RoHS

X7R Dielectric

AVX Style		SR15			SR20			SR21			SR22		SR27		SR30			SR40			SR50		
AVX "Insertable"		SR07			SR29			SR59			N/A		N/A		SR65			SR75			N/A		
Width (W)		3.81 (.150)			5.08 (.200)			5.08 (.200)			5.08 (.200)		6.604 (.260)		7.62 (.300)			10.16 (.400)			12.70 (.500)		
Height (H)		3.81 (.150)			5.08 (.200)			5.08 (.200)			5.08 (.200)		6.35 (.250)		7.62 (.300)			10.16 (.400)			12.70 (.500)		
Thickness (T)		2.54 (.100)			3.175 (.125)			3.175 (.125)			3.175 (.125)		4.06 (.160)		3.81 (.150)			3.81 (.150)			5.08 (.200)		
Lead Spacing (L.S.)		2.54 (.100)			2.54 (.100)			5.08 (.200)			6.35 (.250)		7.62 (.300)		5.08 (.200)			5.08 (.200)			10.16 (.400)		
Lead Diameter (L.D.)		.508 (.020)			.508 (.020)			.508 (.020)			.508 (.020)		.508 (.020)		.508 (.020)			.508 (.020)			.635 (.025)		
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 100	50	WVDC 100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50
470	SR_____C471KAR																						
1000	SR155C102KAR																						
1500	SR_____C152KAR																						
2200	SR_____C222KAR																						
3300	SR_____C332KAR																						
4700	SR_____C472KAR																						
6800	SR_____C682KAR																						
10,000	SR215C103KAR																						
15,000	SR_____C153KAR																						
22,000	SR_____C223KAR																						
33,000	SR_____C333KAR																						
47,000	SR_____C473KAR																						
68,000	SR_____C683KAR																						
100,000	SR215C104KAR																						
150,000	SR_____C154KAR																						
220,000	SR215C224KAR																						
330,000	SR_____C334KAR																						
390,000	SR_____C394KAR																						
470,000	SR305C474KAR																						
1.0 µF	SR305C105KAR																						
2.2 µF	SR405C225KAR																						
2.7 µF	SR505C275KAR																						
4.7 µF	SR505C475KAR																						

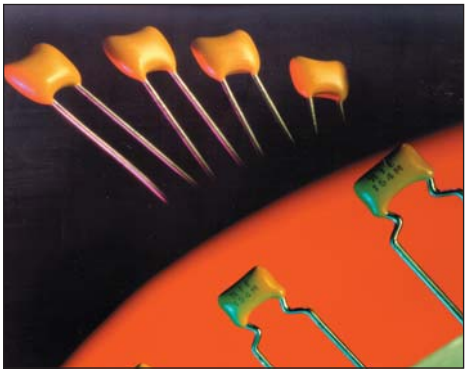
For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory. ***Other capacitance values available upon special request.**

= Industry preferred values
= SR20 only
= Extended range
= Extended range, SR20 only
= Extended range with 0.150" thickness maximum

NOTE: Capacitance Ranges available for SR12 same as SR15
SR62 same as SR21
SR64 same as SR30
SR89 same as SR21

SR Series

SkyCap® Radial Conformal Coated Z5U Dielectric



AVX SR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SR21	5	E	104	M	A	R
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SR15 SR20 SR21 SR22 SR27 SR30 SR40 SR50	5 = 50V 1 = 100V	E = Z5U	First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	M = ±20% Z = +80% -20%	A = Not Applicable	R = RoHS

Z5U Dielectric

AVX Style		SR15		SR20		SR21		SR22		SR27		SR30		SR40		SR50	
AVX "Insertable"		SR07		SR29		SR59		N/A		N/A		SR65		SR75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
10,000 47,000 100,000	SR155E103ZAR SR_____E473ZAR SR215E104ZAR																
150,000 220,000 330,000	SR_____E154ZAR SR215E224ZAR SR215E334ZAR																
470,000 680,000	SR215E474ZAR SR_____E684ZAR																
1.0 µF 1.5 µF 2.2 µF	SR_____105ZAR SR30E155ZAR SR30E225ZAR																
3.3 µF 4.7 µF	SR30E335ZAR SR30E475ZAR																

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

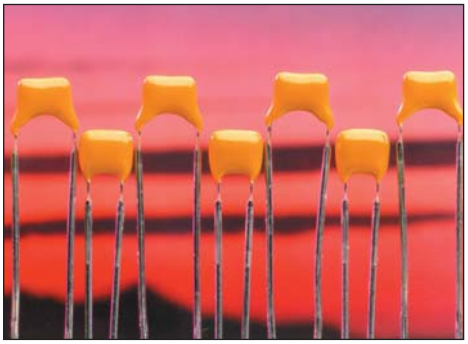
***Other capacitance values available upon special request.**

= Industry preferred values

= SR20 only

SL Series

SkyCap® Radial Conformal Coated NP0 Dielectric



AVX SL Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SL21 | **5** | **A** | **104** | **F** | **A** | **B**

AVX Style
SL15
SL20
SL21
SL22
SL27
SL30
SL40
SL50

Voltage
5 = 50V
1 = 100V
2 = 200V

Temperature Coefficient
A = C0G (NP0)

Capacitance
First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)

Capacitance Tolerance
C = ±.25pF
D = ±.5pF
F = ±1% (>50pF only)
G = ±2% (>25pF only)
J = ±5%
K = ±10%

Failure Rate
A = Not Applicable

Leads
B = Tin/Lead

C0G (NP0) Dielectric

	AVX Style	SL15			SL20			SL21			SL22			SL27			SL30		SL40		SL50	
	AVX "Insertable"	SL07			SL29			SL59			N/A			N/A			SL65		SL75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
1.0-9.9	SL151A1R0DAB																					
10	SL151A100KAB																					
15	SL_____A150KAB																					
22	SL_____A220KAB																					
33	SL_____A330KAB																					
39	SL_____A390KAB																					
47	SL_____A470KAB																					
68	SL_____A680KAB																					
100	SL151A101KAB																					
150	SL_____A151KAB																					
220	SL_____A221KAB																					
330	SL_____A331KAB																					
390	SL_____A391KAB																					
470	SL_____A471KAB																					
680	SL_____A681KAB																					
1000	SL211A102KAB																					
1500	SL_____A152KAB																					
2200	SL_____A222KAB																					
3900	SL_____A392KAB																					
4700	SL_____A472KAB																					
6800	SL_____A682KAB																					
8200	SL-----A822KAB																					
10,000	SL305A103KAB																					
15,000	SL-----A153KAB																					
22,000	SL_____A223KAB																					
33,000	SL_____A333KAB																					
39,000	SL_____A393KAB																					
47,000	SL_____A473KAB																					
68,000	SL_____A683KAB																					
100,000	SL_____A104KAB																					

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

***Other capacitance values available upon special request.**

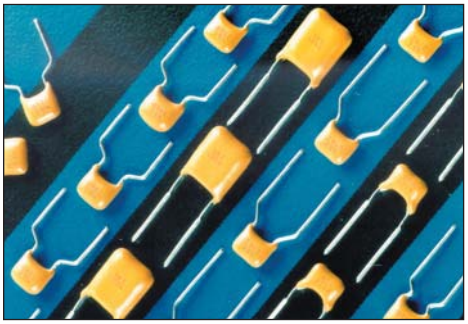
NOTE: Capacitance Ranges available for SL12 same as SL15
SL62 same as SL21
SL64 same as SL30
SL89 same as SL21

= Industry preferred values

= SL20 only

SL Series

SkyCap® Radial Conformal Coated X7R Dielectric



AVX SL Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SL21	5	C	104	M	A	B
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SL15 SL20 SL21 SL22 SL27 SL30 SL40 SL50	5 = 50V 1 = 100V 2 = 200V	C = X7R	First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	J = ±5% K = ±10% M = ±20%	A = Not Applicable	B = Tin/Lead

X7R Dielectric

AVX Style		SL15			SL20			SL21			SL22		SL27		SL30			SL40			SL50		
AVX "Insertable"		SL07			SL29			SL59			N/A		N/A		SL65			SL75			N/A		
Width (W)		3.81 (.150)			5.08 (.200)			5.08 (.200)			5.08 (.200)		6.604 (.260)		7.62 (.300)			10.16 (.400)			12.70 (.500)		
Height (H)		3.81 (.150)			5.08 (.200)			5.08 (.200)			5.08 (.200)		6.35 (.250)		7.62 (.300)			10.16 (.400)			12.70 (.500)		
Thickness (T)		2.54 (.100)			3.175 (.125)			3.175 (.125)			3.175 (.125)		4.06 (.160)		3.81 (.150)			3.81 (.150)			5.08 (.200)		
Lead Spacing (L.S.)		2.54 (.100)			2.54 (.100)			5.08 (.200)			6.35 (.250)		7.62 (.300)		5.08 (.200)			5.08 (.200)			10.16 (.400)		
Lead Diameter (L.D.)		.508 (.020)			.508 (.020)			.508 (.020)			.508 (.020)		.508 (.020)		.508 (.020)			.508 (.020)			.635 (.025)		
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 100	50	WVDC 100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50
470	SL_____C471KAB																						
1000	SL155C102KAB																						
1500	SL_____C152KAB																						
2200	SL_____C222KAB																						
3300	SL_____C332KAB																						
4700	SL_____C472KAB																						
6800	SL_____C682KAB																						
10,000	SL215C103KAB																						
15,000	SL_____C153KAB																						
22,000	SL_____C223KAB																						
33,000	SL_____C333KAB																						
47,000	SL_____C473KAB																						
68,000	SL_____C683KAB																						
100,000	SL215C104KAB																						
150,000	SL_____C154KAB																						
220,000	SL215C224KAB																						
330,000	SL_____C334KAB																						
390,000	SL_____C394KAB																						
470,000	SL305C474KAB																						
1.0 µF	SL305C105KAB																						
2.2 µF	SL405C225KAB																						
2.7 µF	SL505C275KAB																						
4.7 µF	SL505C475KAB																						

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

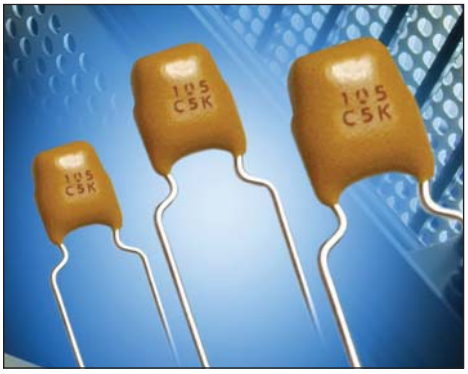
***Other capacitance values available upon special request.**

= Industry preferred values
= SL20 only
= Extended range
= Extended range, SL20 only
= Extended range with 0.150" thickness maximum

NOTE: Capacitance Ranges available for SL12 same as SL15
SL62 same as SL21
SL64 same as SL30
SL89 same as SL21

SL Series

SkyCap® Radial Conformal Coated Z5U Dielectric



AVX SL Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 500V, with lower voltages available as well.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

SL21	5	E	104	M	A	B
AVX Style	**Voltage**	**Temperature Coefficient**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
SL15 SL20 SL21 SL22 SL27 SL30 SL40 SL50	5 = 50V 1 = 100V	E = Z5U	First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	M = ±20% Z = +80% -20%	A = Not Applicable	B = Tin/Lead

Z5U Dielectric

AVX Style		SL15		SL20		SL21		SL22		SL27		SL30		SL40		SL50	
AVX "Insertable"		SL07		SL29		SL59		N/A		N/A		SL65		SL75		N/A	
Cap. in.* pF	Industry Preferred Values in Blue	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50
10,000 47,000 100,000	SL155E103ZAB SL_____E473ZAB SL215E104ZAB																
150,000 220,000 330,000	SL_____E154ZAB SL215E224ZAB SL215E334ZAB																
470,000 680,000	SL215E474ZAB SL_____E684ZAB																
1.0 µF 1.5 µF 2.2 µF	SL_____105ZAB SL30E155ZAB SL30E225ZAB																
3.3 µF 4.7 µF	SL30E335ZAB SL30E475ZAB																

For other styles, voltages, tolerances and lead lengths see Part No. Codes or contact factory.

***Other capacitance values available upon special request.**

= Industry preferred values

= SL20 only

AR Series (Automotive)

SkyCap® Radial Conformal Coated C0G (NP0) Dielectric

AVX AR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and X8R dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 200V.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

AR21 — **AVX Style**

5 — **Voltage**
5 = 50V
1 = 100V
2 = 200V

A — **Temperature Coefficient**
A = C0G (NP0)

100 — **Capacitance**
First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)

F — **Capacitance Tolerance**
C = ±.25pF
D = ±.5pF
F = ±1% (>50pF only)
G = ±2% (>25pF only)
J = ±5%
K = ±10%

4 — **Failure Rate**
4 = AEC-Q200

R — **Leads**
R = RoHS

C0G (NP0) Dielectric

EIA Characteristic — **Dimensions: Millimeters (Inches)**

AVX Style		AR15			AR20			AR21		
AVX "Insertable"		AR07			AR29			AR59		
Cap in pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50
1	AR-----A1R0D4R			■	■	■	■	■	■	■
10	AR-----A100K4R			■	■	■	■	■	■	■
15	AR-----A150K4R			■	■	■	■	■	■	■
22	AR-----A220K4R			■	■	■	■	■	■	■
33	AR-----A330K4R			■	■	■	■	■	■	■
39	AR-----A390K4R			■	■	■	■	■	■	■
47	AR-----A470K4R			■	■	■	■	■	■	■
68	AR-----A680K4R			■	■	■	■	■	■	■
100	AR-----A101K4R			■	■	■	■	■	■	■
150	AR-----A151K4R			■	■	■	■	■	■	■
220	AR-----A221K4R			■	■	■	■	■	■	■
330	AR-----A331K4R			■	■	■	■	■	■	■
390	AR-----A391K4R			■	■	■	■	■	■	■
470	AR-----A471K4R			■	■	■	■	■	■	■
680	AR-----A681K4R			■	■	■	■	■	■	■
1,000	AR-----A102K4R			■	■	■	■	■	■	■
1,500	AR-----A152K4R				■	■	■	■	■	■
2,200	AR-----A222K4R				■	■	■		■	■
3,900	AR-----A392K4R					■	■		■	■
4,700	AR-----A472K4R					■	■			■
6800	AR-----A682K4R						■			■
8200	AR-----A822K4R						■			■

Notes:
"Insertable" make reference to alternative AVX style using the same range of capacitance available on the matrix.
For others Styles, voltages, tolerance and lead lengths see Skycap catalog or contact factory.
Others capacitance values available upon special request.
Others styles available: AR12, AR14, AR62, AR89.

AR Series (Automotive)

SkyCap® Radial Conformal Coated X7R Dielectric

AVX AR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and X8R dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 200V.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

AR21	5	C	104	M	4	R
AVX Style	**Voltage** 5 = 50V 1 = 100V	**Temperature Coefficient** C = X7R	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** 4 = AEC-Q200	**Leads** R = RoHS

X7R Dielectric

EIA Characteristic **Dimensions: Millimeters (Inches)**

	AVX Style	AR15		AR20		AR21		AR30		AR40	
	AVX "Insertable"	AR07		AR29		AR59		AR65		AR75	
Cap in pF	Industry Preferred Values in Blue	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
470	AR-----C471K4R	■	■								
1000	AR-----C102K4R	■	■	■	■	■	■				
1500	AR-----C152K4R	■	■	■	■	■	■				
2200	AR-----C222K4R	■	■	■	■	■	■				
3300	AR-----C332K4R	■	■	■	■	■	■				
4700	AR-----C472K4R	■	■	■	■	■	■				
6800	AR-----C682K4R	■	■	■	■	■	■				
10,000	AR-----C103K4R	■	■	■	■	■	■				
15,000	AR-----C153K4R	■	■	■	■	■	■				
22,000	AR-----C223K4R	■	■	■	■	■	■				
33,000	AR-----C333K4R	■	■	■	■	■	■				
47,000	AR-----C473K4R	■	■	■	■	■	■				
68,000	AR-----C683K4R	■	■	■	■	■	■				
100,000	AR-----C104K4R	■	■	■	■	■	■				
150,000	AR-----C154K4R				■		■				
220,000	AR-----C224K4R				■		■				
330,000	AR-----C334K4R								■		
390,000	AR-----C394K4R								■		
470,000	AR-----C474K4R								■		
680,000	AR-----C684K4R								■	■	
1.0 uF	AR-----C105K4R								■	■	
4,700,000	AR-----C475K4R								■		
6,800,000	AR-----C685K4R										
10.0 uF	AR-----C106K4R										

Notes:
"Insertable" make reference to alternative AVX style using the same range of capacitance available on the matrix.
For others Styles, voltages, tolerance and lead lengths see Skycap catalog or contact factory.
Others capacitance values available upon special request.
Others styles available: AR12, AR14, AR62, AR89, AR32, AR38.

AR Series (Automotive)

SkyCap® Radial Conformal Coated X8R Dielectric

AVX AR Series is a conformally coated radial leaded capacitor. We offer NP0, X7R, and X8R dielectrics standard. Alternative dielectrics are also available upon request. Voltages range from 50V to 200V.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/skycap.pdf

HOW TO ORDER

AR21	5	F	104	M	4	R
AVX Style	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Temperature Coefficient** F = X8R	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** 4 = AEC-Q200	**Leads** R = RoHS

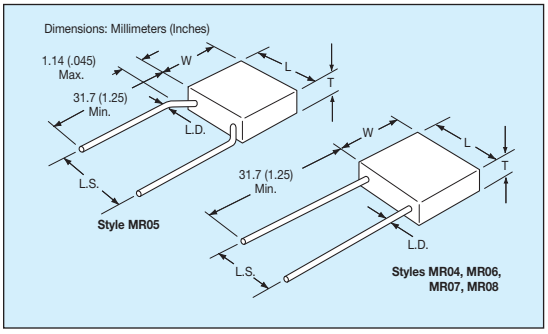
X8R Dielectric

EIA Characteristic **Dimensions: Millimeters (Inches)**

AVX Style		AR20			AR21		
AVX "Insertable"		AR29			AR59		
Cap in pF	Industry Preferred Values in Blue	WVDC 200	100	50	WVDC 200	100	50
1,000	AR_____F102K4R						
10,000	AR_____F103K4R						
100,000	AR_____F104K4R						
330,000	AR_____F334K4R						

Notes:
"Insertable" make reference to alternative AVX style using the same range of capacitance available on the matrix.
For others Styles, voltages, tolerance and lead lengths see Skycap catalog or contact factory.
Others capacitance values available upon special request.
Others styles available: AR14, AR62, AR89.

MR Series
Molded Radial MLCC NP0 Dielectric



AVX MR series is a molded radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltage available are 50, 100, & 200 VDC. AVX also offers military grade molded radials per MIL-PRF-39014, MIL-C-11015, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rceralam.pdf

HOW TO ORDER

MR05	1	A	561	J	A	A
AVX Style	**Voltage**	**Dielectric**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
MR04 MR05 MR06 MR07 MR08	5 = 50V 1 = 100V 2 = 200V	A = C0G (NP0)	First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	D = ±.5pF (>10pF only) F = ±1% (>50pF only) G = ±2% (>25pF only) J = ±5% K = ±10%	A = Not Applicable	A = Standard Solderable T[1] = Trimmed Leads .230" ± .030"

[1] Trimmed lead length for the MR05 style will be measured from the bend in the lead (seating plane).

C0G (NP0) Dielectric

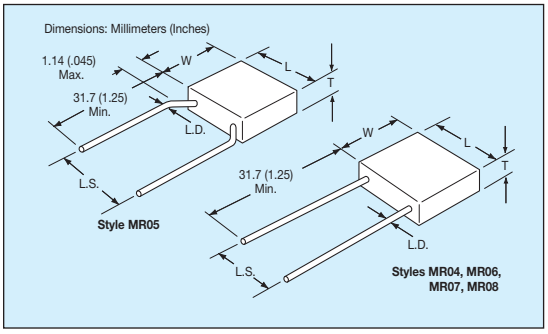
Cap. in pF	AVX Style / Typical AVX Part Nos.	MR04 WVDC			MR05 WVDC			MR06 WVDC			MR07 WVDC			MR08 WVDC		
1.0 to 9.1	MR_____5A1R0DAA MR_____5A9R1DAA	■	■	■	■	■	■									
10 12 15	MR_____5A100KAA MR_____5A120KAA MR_____5A150KAA	■	■	■	■	■	■									
18 22 27	MR_____5A180KAA MR_____5A220KAA MR_____5A270KAA	■	■	■	■	■	■									
33 39 47	MR_____5A330KAA MR_____5A390KAA MR_____5A470KAA	■	■	■	■	■	■									
56 68 82	MR_____5A560KAA MR_____5A680KAA MR_____5A820KAA	■	■	■	■	■	■									
100 120 150	MR_____5A101KAA MR_____5A121KAA MR_____5A151KAA	■	■	■	■	■	■									
180 220 270	MR_____5A181KAA MR_____5A221KAA MR_____5A271KAA	■	■	■	■	■	■									
330 390 470	MR_____5A331KAA MR_____5A391KAA MR_____5A471KAA	■	■	■	■	■	■									
560 680 820	MR_____5A561KAA MR_____5A681KAA MR_____5A821KAA	■	■	■	■	■	■									
1000 1200 1500	MR_____5A102KAA MR_____5A122KAA MR_____5A152KAA	■	■	■	■	■	■									
1800 2200 2700	MR_____5A182KAA MR_____5A222KAA MR_____5A272KAA		■	■		■	■	■			■	■	■			
3300 3900 4700	MR_____5A332KAA MR_____5A392KAA MR_____5A472KAA		■	■		■	■	■			■	■	■			
5600 6800 8200	MR_____5A562KAA MR_____5A682KAA MR_____5A822KAA			■			■		■			■	■			
10,000 12,000 15,000	MR_____5A103KAA MR_____5A123KAA MR_____5A153KAA								■	■		■	■			
18,000 22,000 27,000	MR_____5A183KAA MR_____5A223KAA MR_____5A273KAA									■		■	■			
33,000 39,000 47,000	MR_____5A333KAA MR_____5A393KAA MR_____5A473KAA											■	■			
56,000 68,000 82,000	MR_____5A563KAA MR_____5A683KAA MR_____5A823KAA											■	■			
100,000 120,000 150,000	MR_____5A104KAA MR_____5A124KAA MR_____5A154KAA												■		■	■

For trimmed leads see "How To Order".
For other tolerances see "How To Order".
For other voltages see "How To Order".

■ = Industry preferred values

MR Series

Molded Radial MLCC X7R Dielectric



AVX MR series is a molded radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltage available are 50, 100, & 200 VDC. AVX also offers military grade molded radials per MIL-PRF-39014, MIL-C-11015, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rceralam.pdf

HOW TO ORDER

MR05	1	C	561	J	A	A
AVX Style	**Voltage**	**Dielectric**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
MR04 MR05 MR06 MR07 MR08	5 = 50V 1 = 100V 2 = 200V	C = X7R	First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	J = ±5% K = ±10% M = ±20%	A = Not Applicable T = CECC	A = Standard Solderable T[1] = Trimmed Leads .230" ± .030"

[1] Trimmed lead length for the MR05 style will be measured from the bend in the lead (seating plane).

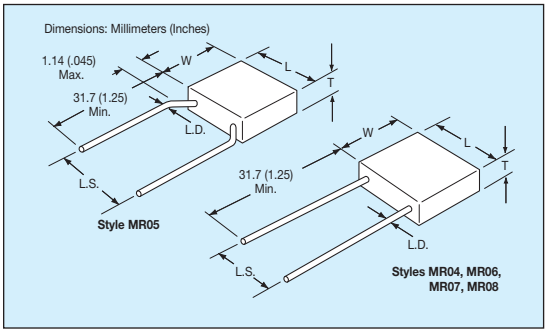
X7R Dielectric

Cap. in pF	AVX Style / Typical AVX Part Nos.	MR04 WVDC			MR05 WVDC			MR06 WVDC			MR07 WVDC			MR08 WVDC		
100 120 150	MR_____5C101KAA MR_____5C121KAA MR_____5C151KAA	■	■	■	■	■	■									
180 220 270	MR_____5C181KAA MR_____5C221KAA MR_____5C271KAA	■	■	■	■	■	■									
330 390 470	MR_____5C331KAA MR_____5C391KAA MR_____5C471KAA	■	■	■	■	■	■									
560 680 820	MR_____5C561KAA MR_____5C681KAA MR_____5C821KAA	■	■	■	■	■	■									
1000 1200 1500	MR_____5C102KAA MR_____5C122KAA MR_____5C152KAA	■	■	■	■	■	■									
1800 2200 2700	MR_____5C182KAA MR_____5C222KAA MR_____5C272KAA	■	■	■	■	■	■									
3300 3900 4700	MR_____5C332KAA MR_____5C392KAA MR_____5C472KAA	■	■	■	■	■	■									
5600 6800 8200	MR_____5C562KAA MR_____5C682KAA MR_____5C822KAA	■	■	■	■	■	■				■	■	■			
10,000 12,000 15,000	MR_____5C103KAA MR_____5C123KAA MR_____5C153KAA	■	■	■	■	■	■	■			■	■	■			
18,000 22,000 27,000	MR_____5C183KAA MR_____5C223KAA MR_____5C273KAA		■	■		■	■	■			■	■	■			
33,000 39,000 47,000	MR_____5C333KAA MR_____5C393KAA MR_____5C473KAA		■	■		■	■	■			■	■	■			
56,000 68,000 82,000	MR_____5C563KAA MR_____5C683KAA MR_____5C823KAA		■	■		■	■				■	■	■			
100,000 120,000 150,000	MR_____5C104KAA MR_____5C124KAA MR_____5C154KAA			■			■		■		■	■	■			
180,000 220,000 270,000	MR_____5C184KAA MR_____5C224KAA MR_____5C274KAA								■	■	■	■	■			
330,000 390,000 470,000	MR_____5C334KAA MR_____5C394KAA MR_____5C474KAA								■	■	■	■	■			
560,000 680,000 820,000	MR_____5C564KAA MR_____5C684KAA MR_____5C824KAA								■	■		■	■	■		
1.0 µF 1.2 µF 1.5 µF	MR_____5C105KAA MR_____5C125KAA MR_____5C155KAA									■		■	■	■		
1.8 µF 2.0 µF 2.2 µF	MR_____5C185KAA MR_____5C205KAA MR_____5C225KAA											■	■			
2.7 µF 3.3 µF 3.9 µF	MR_____5C275KAA MR_____5C335KAA MR_____5C395KAA												■		■	■
4.7 µF	MR_____5C475KAA															■

For trimmed leads see "How To Order".
For other tolerances see "How To Order".
For other voltages see "How To Order".

■ = Industry preferred values

MR Series
Molded Radial MLCC Z5U Dielectric



AVX MR series is a molded radial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltage available are 50, 100, & 200 VDC. AVX also offers military grade molded radials per MIL-PRF-39014, MIL-C-11015, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/rceralam.pdf

HOW TO ORDER

MR05	1	A	561	Z	A	A
AVX Style	**Voltage**	**Dielectric**	**Capacitance**	**Capacitance Tolerance**	**Failure Rate**	**Leads**
MR04 MR05 MR06 MR07 MR08	5 = 50V 1 = 100V	A = C0G (NP0) C = X7R E = Z5U	First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	M = ±20% Z = +80% -20%	A = Not Applicable	A = Standard Solderable T[1] = Trimmed Leads .230" ± .030"

[1] Trimmed lead length for the MR05 style will be measured from the bend in the lead (seating plane).

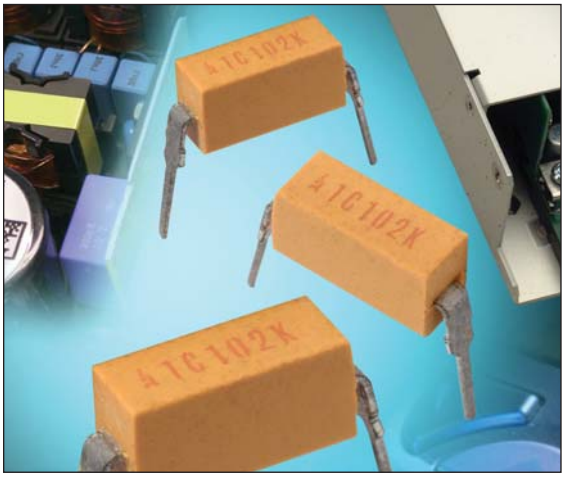
Z5U Dielectric

	AVX Style	MR04		MR05		MR06		MR07		MR08	
Cap. in pF	Typical AVX Part Nos.	WVDC 100	50	100	50	100	50	100	50	100	50
10,000 12,000 15,000	MR____5E103ZAA MR____5E123ZAA MR____5E153ZAA										
18,000 22,000 27,000	MR____5E183ZAA MR____5E223ZAA MR____5E273ZAA										
33,000 39,000 47,000	MR____5E333ZAA MR____5E393ZAA MR____5E473ZAA										
56,000 68,000 82,000	MR____5E563ZAA MR____5E683ZAA MR____5E823ZAA										
100,000 120,000 150,000	MR____5E104ZAA MR____5E124ZAA MR____5E154ZAA										
180,000 220,000 270,000	MR____5E184ZAA MR____5E224ZAA MR____5E274ZAA										
330,000 390,000 470,000	MR____5E334ZAA MR____5E394ZAA MR____5E474ZAA										
560,000 680,000 820,000	MR____5E564ZAA MR____5E684ZAA MR____5E824ZAA										
1.0 µF 1.2 µF 1.5 µF	MR____5E105ZAA MR____5E125ZAA MR____5E155ZAA										
1.8 µF 2.2 µF 2.7 µF	MR____5E185ZAA MR____5E225ZAA MR____5E275ZAA										
3.3 µF 3.9 µF 4.7 µF	MR____5E335ZAA MR____5E395ZAA MR____5E475ZAA										
5.6 µF 6.8 µF 8.2 µF	MR____5E565ZAA MR____5E685ZAA MR____5E825ZAA										
10.0 µF	MR____5E106ZAA										

= Industry preferred values

For trimmed leads see "How To Order".
For other tolerances see "How To Order".
For other voltages see "How To Order".

MD Series
2 Pin DIP



AVX MD series is a Molded 2 Pin DIP capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50 and 100Vdc.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/dipguard.pdf

HOW TO ORDER

MD01 — **AVX Style**
MD01
CKR22*
CKS22**
MD02
CKR23*
CKS23*
MD03
CKR24*
CKS24**

5 — **Voltage**
5 = 50V
1 = 100V

E — **Temperature Coefficient**
A = C0G (NP0)
C = X7R
E = Z5U

104 — **Capacitance**
First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104.

M — **Capacitance Tolerance**

C0G (NP0):	X7R:	Z5U:
F = ±1%	J = ±5%	M = ±20%
J = ±5%	K = ±10%	Z = +80% -20%
K = ±10%	M = ±20%	

A — **Failure Rate**
A = Not Applicable

B — **Assembly Method**
A = Hand Assembled
B = Automated Assembly

C0G (NP0)

EIA Characteristic		C0G (NP0)	
AVX Style		MD01	
Cap. in pF*		WVDC 100	50
10	MD015A100KAB		
15	MD015A150KAB		
22	MD015A220KAB		
33	MD015A330KAB		
47	MD015A470KAB		
68	MD015A680KAB		
100	MD015A101KAB		
150	MD015A151KAB		
220	MD015A221KAB		
330	MD015A331KAB		
470	MD015A471KAB		
680	MD015A681KAB		
1000	MD015A102KAB		
1500	MD015A152KAB		
2200	MD015A222KAB		
3300	MD015A332KAB		
AVX Style		MD02	
Cap. in pF*		WVDC 100	50
4700	MD025A472KAB		
6800	MD025A682KAB		
10000	MD025A103KAB		

For other voltages and tolerances see Part No. Codes.

X7R

EIA Characteristic		X7R	
AVX Style		MD01	
Cap. in pF*		WVDC 100	50
220	MD015C221KAB		
330	MD015C331KAB		
470	MD015C471KAB		
680	MD015C681KAB		
1000	MD015C102KAB		
1500	MD015C152KAB		
2200	MD015C222KAB		
3300	MD015C332KAB		
4700	MD015C472KAB		
6800	MD015C682KAB		
10,000	MD011C103KAB		
15,000	MD015C153KAB		
22,000	MD015C223KAB		
33,000	MD015C333KAB		
47,000	MD015C473KAB		
68,000	MD015C683KAB		
100,000	MD015C104KAB		
AVX Style		MD02	
Cap. in pF*		WVDC 100	50
150,000	MD025C154KAB		
220,000	MD025C224KAB		
AVX Style		MD03	
Cap. in pF*		WVDC 100	50
330,000	MD035C334KAA		
470,000	MD035C474KAA		
680,000	MD035C684KAA		
1,000,000	MD035C105KAA		

For other voltages and tolerances see Part No. Codes.

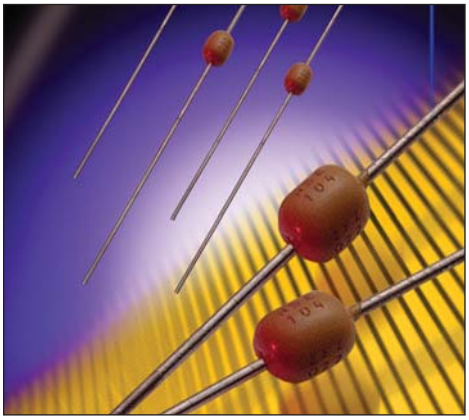
Z5U

EIA Characteristic		Z5U	
AVX Style		MD01	
Cap. in pF*		WVDC 100	50
10,000	MD015E103ZAB		
15,000	MD015E153ZAB		
22,000	MD015E223ZAB		
33,000	MD015E333ZAB		
47,000	MD015E473ZAB		
68,000	MD015E683ZAB		
100,000	MD015E104ZAB		
150,000	MD015E154ZAB		
220,000	MD015E224ZAB		
330,000	MD015E334ZAB		
AVX Style		MD02	
Cap. in pF*		WVDC 100	50
470,000	MD025E474ZAB		
AVX Style		MD03	
Cap. in pF*		WVDC 100	50
680,000	MD035E684ZAA		
1,000,000	MD035E105ZAA		

For other voltages and tolerances see Part No. Codes.
*Other capacitance values available upon special request.
= Industry preferred values

SA Series

SpinGuard® Axial Conformal Coated NP0 Dielectric



AVX SA series is a conformally coated axial leaded capacitor. We offer NP0, X7R, X5R, and Z5U dielectrics. Voltages available are 10, 50, 100, and 200Vdc. Lower voltages available upon request.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/spingrd.pdf

HOW TO ORDER

SA10	5	A	104	F	A	R
Conformal Axial Size SA05 SA10 SA11 SA20 SA30 SA40	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** A = C0G (NP0)	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** C = ±.25pF D = ±.5pF F = ±1% G = ±2% J = ±5% K = ±10%	**Failure Rate** A = Not Applicable	**Leads** Standard (Solderable) R = RoHS Compliant A = Standard Solderable

NP0 Dielectric

Cap. in pF	AVX Style / Typical AVX Part Nos.	SA05 WVDC 200	SA05 WVDC 100	SA10 WVDC 200	SA10 WVDC 100	SA10 WVDC 50	SA11 WVDC 100	SA11 WVDC 50	SA20 WVDC 100	SA20 WVDC 50	SA30 WVDC 100	SA30 WVDC 50	SA40 WVDC 100	SA40 WVDC 50
1.0* + 9.1*	SA102A1R0DAR + SA102A9R1DAR	■		■										
10 12 15	SA102A100JAR SA102A120JAR SA102A150JAR	■		■										
18 22 27	SA102A180JAR SA102A220JAR SA102A270JAR	■		■										
33 39 47	SA102A330JAR SA102A390JAR SA102A470JAR	■		■										
56 68 82	SA102A560JAR SA102A680JAR SA102A820JAR	■		■										
100 120 150	SA102A101JAR SA102A121JAR SA101A151JAR	■		■										
180 220 270	SA101A181JAR SA101A221JAR SA101A271JAR		■		■									
330 390 470	SA101A331JAR SA101A391JAR SA101A471JAR		■		■									
560 680 820	SA101A561JAR SA101A681JAR SA101A821JAR		■		■									
1000 1200 1500	SA105A102JAR SA201A122JAR SA201A152JAR				■	■	■		■					
1800 2200 2700	SA205A182JAR SA301A222JAR SA301A272JAR						■	■	■	■	■			
3300 3900 4700	SA301A332JAR SA301A392JAR SA305A472JAR							■		■	■	■	■	
5600 6800 8200	SA401A562JAR SA401A682JAR SA405A822JAR												■	■
10,000 12,000	SA405A103JAR SA405A123JAR													■

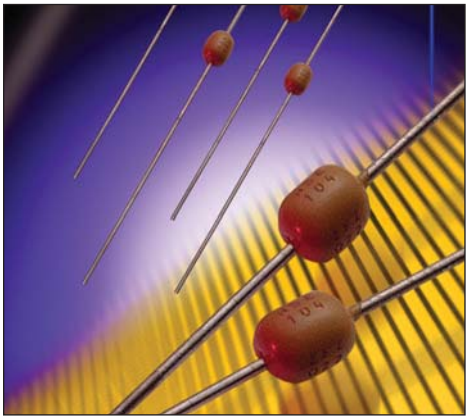
For other tolerances see Part No. Codes
For other voltages see Part No. Codes
AVX Style

■ = Industry preferred values

*"C&D" Tolerance Only

SA Series

SpinGuard® Axial Conformal Coated X7R Dielectric



AVX SA series is a conformally coated axial leaded capacitor. We offer NP0, X7R, X5R, and Z5U dielectrics. Voltages available are 10, 50, 100, and 200Vdc. Lower voltages available upon request.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/spingrd.pdf

HOW TO ORDER

SA10	5	C	104	K	A	R
Conformal Axial Size SA05 SA10 SA11 SA20 SA30 SA40	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** C = X7R	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Leads** Standard (Solderable) R = RoHS Compliant A = Standard Solderable

X7R Dielectric

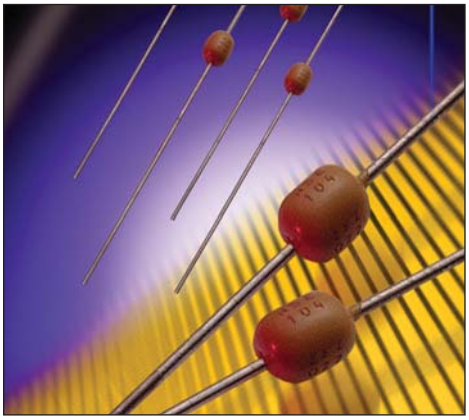
AVX Style		SA05			SA10			SA11		SA20		SA30		SA40	
Cap. in pF	Typical AVX Part Nos.	WVDC 200	100	50	200	100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50	WVDC 100	50
220 270 330	SA102C221KAR SA102C271KAR SA102C331KAR														
390 470 560	SA102C391KAR SA102C471KAR SA101C561KAR														
680 820 1000	SA101C681KAR SA101C821KAR SA101C102KAR														
1200 1500 1800	SA101C122KAR SA101C152KAR SA101C182KAR														
2200 2700 3300	SA101C222KAR SA101C272KAR SA101C332KAR														
3900 4700 5600	SA101C392KAR SA101C472KAR SA101C562KAR														
6800 8200 10,000	SA101C682KAR SA105C822KAR SA105C103KAR														
12,000 15,000 18,000	SA105C123KAR SA105C153KAR SA105C183KAR														
22,000 27,000 33,000	SA105C223KAR SA105C273KAR SA105C333KAR														
39,000 47,000 56,000	SA105C393KAR SA105C473KAR SA115C563KAR														
68,000 82,000 100,000	SA115C683KAR SA115C823KAR SA115C104KAR														
120,000 150,000 180,000	SA305C124KAR SA305C154KAR SA305C184KAR														
220,000 270,000 330,000	SA305C224KAR SA305C274KAR SA305C334KAR														
470,000 1,000,000	SA405C474KAR SA305C105KAR														

For other tolerances see Part No. Codes
For other voltages see Part No. Codes
AVX Style

= Industry preferred values

SA Series

SpinGuard® Axial Conformal Coated X5R Dielectric



AVX SA series is a conformally coated axial leaded capacitor. We offer NP0, X7R, X5R, and Z5U dielectrics. Voltages available are 10, 50, 100, and 200Vdc. Lower voltages available upon request.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/spingrd.pdf

HOW TO ORDER

SA10	5	D	104	K	A	R
Conformal Axial Size SA10	**Voltage** Z = 10V	**Dielectric** D = X5R	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Leads** Standard (Solderable) R = RoHS Compliant A = Standard Solderable

Dimensions: Millimeters (Inches)

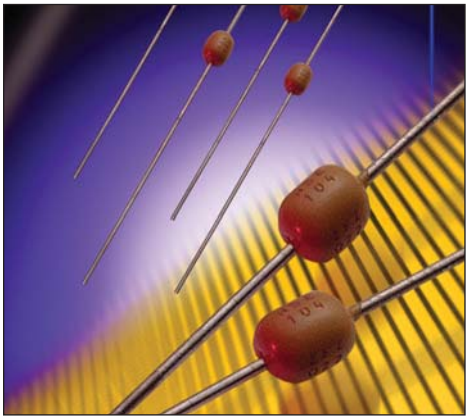
	AVX Style	SA10
	Length (L)	4.32 (.170")
	Diameter (D)	2.54 (.100")
	Lead Diameter	.445 (.0175")
	Lead Length	25.4 (1.00")
Cap. in µF	Typical AVX Part Nos.	WVDC 10
1.8	SA10ZD185KAR	
2.7	SA10ZD275KAR	
3.3	SA10ZD335KAR	
4.7	SA10ZD475KAR	

For other tolerances see Part No. Codes
For other voltages see Part No. Codes
AVX Style

= Industry preferred values

SA Series

SpinGuard® Axial Conformal Coated Z5U Dielectric



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HOW TO ORDER

SA10	5	E	104	Z	A	R
Conformal Axial Size SA05 SA10 SA11 SA20 SA30 SA40	**Voltage** 5 = 50V 1 = 100V	**Dielectric** E = Z5U	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** M = ±20% Z = +80% -20%	**Failure Rate** A = Not Applicable	**Leads** Standard (Solderable) R = RoHS Compliant A = Standard Solderable

Z5U Dielectric

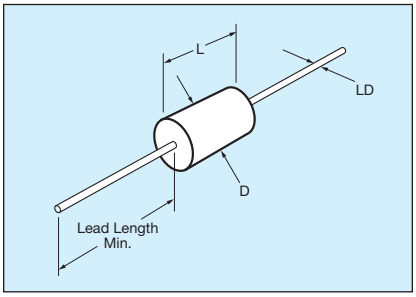
AVX Style		SA05	SA10		SA11		SA20		SA30		SA40	
Cap. in pF	Typical AVX Part Nos.	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50	WVDC 100	WVDC 50
10,000 15,000 22,000	SA105E103ZAR SA105E153ZAR SA105E223ZAR											
33,000 47,000 68,000	SA105E333ZAR SA105E473ZAR SA105E683ZAR											
*100,000 150,000 220,000	SA105E104ZAR SA105E154ZAR SA105E224ZAR											
330,000 470,000 680,000	SA115E334ZAR SA305E474ZAR SA305E684ZAR											
820,000 1,000,000	SA305E824ZAR SA305E105ZAR											

For other tolerances see Part No. Codes
For other voltages see Part No. Codes
AVX Style

= Industry preferred values

***Preferred Industry Decoupling Capacitor — Insertable on .300" centers.**
SA105E104ZAA

MA Series
Molded Axial NP0 Dielectric



AVX MA series is a molded axial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50V, 100V, and 200Vdc. AVX also offers military grade molded axials per MIL-C-11015, MIL-PRF-39014, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aceralam.pdf

HOW TO ORDER

MA10	5	A	104	J	A	A
Molded Axial Size MA10 MA20 MA30 MA40 MA50 MA60	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** A = C0G (NP0)	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** F = ±1% J = ±5% K = ±10% M = ±20% D = ±.5pF <10pF only	**Failure Rate** A = Not Applicable	**Leads** A = Standard

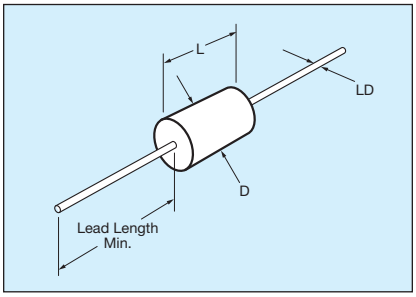
‡ C tolerance available C0G (NP0) from 1.0 to 9.1 pF only. Minimum tolerance for values 10 pF - 100 pF is D or F whichever is greater.

NP0 Dielectric

	AVX Style	MA10			MA20			MA30			MA40			MA50			MA60		
Cap. in pF	Typical AVX Part Nos.	WVDC			WVDC			WVDC			WVDC			WVDC			WVDC		
		200	100	50	200	100	50	200	100	50	200	100	50	200	100	50	200	100	50
1.0 to 9.1	MA_____5A1R0DAA MA_____5A9R1DAA	■	■	■															
10 12 15	MA_____5A100KAA MA_____5A120KAA MA_____5A150KAA	■	■	■															
18 22 27	MA_____5A180KAA MA_____5A220KAA MA_____5A270KAA	■	■	■															
33 39 47	MA_____5A330KAA MA_____5A390KAA MA_____5A470KAA	■	■	■															
56 68 82	MA_____5A560KAA MA_____5A680KAA MA_____5A820KAA	■	■	■															
100 120 150	MA_____5A101KAA MA_____5A121KAA MA_____5A151KAA	■	■	■	■	■	■	■	■	■									
180 220 270	MA_____5A181KAA MA_____5A221KAA MA_____5A271KAA	■	■	■	■	■	■	■	■	■	■	■	■						
330 390 470	MA_____5A331KAA MA_____5A391KAA MA_____5A471KAA		■	■	■	■	■	■	■	■	■	■	■						
560 680 820	MA_____5A561KAA MA_____5A681KAA MA_____5A821KAA		■	■		■	■	■	■	■	■	■	■						
1000 1200 1500	MA_____5A102KAA MA_____5A122KAA MA_____5A152KAA			■		■	■	■	■	■	■	■	■	■	■	■			
1800 2200 2700	MA_____5A182KAA MA_____5A222KAA MA_____5A272KAA						■		■	■		■	■	■	■	■			
3300 3900 4700	MA_____5A332KAA MA_____5A392KAA MA_____5A472KAA								■	■		■	■	■	■	■	■	■	■
5600 6800 8200	MA_____5A562KAA MA_____5A682KAA MA_____5A822KAA									■		■	■	■	■	■	■	■	■
10,000 12,000 15,000	MA_____5A103KAA MA_____5A123KAA MA_____5A153KAA												■		■	■	■	■	■
18,000 22,000 27,000	MA_____5A183KAA MA_____5A223KAA MA_____5A273KAA														■	■	■	■	■
33,000 39,000 47,000	MA_____5A333KAA MA_____5A393KAA MA_____5A473KAA															■		■	■
56,000 68,000 82,000	MA_____5A563KAA MA_____5A683KAA MA_____5A823KAA																	■	■
100,000 120,000 150,000	MA_____5A104KAA MA_____5A124KAA MA_____5A154KAA																		■

For other tolerances see Part No. Codes
For other voltages see Part No. Codes.
AVX Style

MA Series
Molded Axial X7R Dielectric



AVX MA series is a molded axial leaded capacitor. We offer NP0, X7R, and Z5U dielectrics. Voltages available are 50V, 100V, and 200Vdc. AVX also offers military grade molded axials per MIL-C-11015, MIL-PRF-39014, and MIL-PRF-20.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aceralam.pdf

HOW TO ORDER

MA10	5	C	104	J	A	A
Molded Axial Size MA10 MA20 MA30 MA40 MA50 MA60	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** C = X7R	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Failure Rate** A = Not Applicable	**Leads** A = Standard

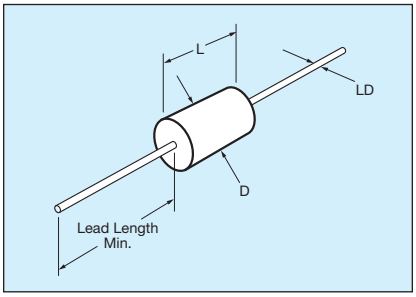
‡ C tolerance available C0G (NP0) from 1.0 to 9.1 pF only. Minimum tolerance for values 10 pF - 100 pF is D or F whichever is greater.

X7R Dielectric

Cap. in pF	AVX Style / Typical AVX Part Nos.	MA10 WVDC 200	MA10 100	MA10 50	MA20 200	MA20 100	MA20 50	MA30 200	MA30 100	MA30 50	MA40 200	MA40 100	MA40 50	MA50 200	MA50 100	MA50 50	MA60 200	MA60 100	MA60 50
220	MA_____5C221KAA	■	■	■	■	■	■												
270	MA_____5C271KAA	■	■	■	■	■	■												
330	MA_____5C331KAA	■	■	■	■	■	■												
390	MA_____5C391KAA	■	■	■	■	■	■												
470	MA_____5C471KAA	■	■	■	■	■	■												
560	MA_____5C561KAA	■	■	■	■	■	■	■	■	■									
680	MA_____5C681KAA	■	■	■	■	■	■	■	■	■									
820	MA_____5C821KAA	■	■	■	■	■	■	■	■	■									
1000	MA_____5C102KAA	■	■	■	■	■	■	■	■	■	■	■	■						
1200	MA_____5C122KAA	■	■	■	■	■	■	■	■	■	■	■	■						
1500	MA_____5C152KAA		■	■	■	■	■	■	■	■	■	■	■						
1800	MA_____5C182KAA		■	■	■	■	■	■	■	■	■	■	■						
2200	MA_____5C222KAA		■	■	■	■	■	■	■	■	■	■	■						
2700	MA_____5C272KAA		■	■	■	■	■	■	■	■	■	■	■						
3300	MA_____5C332KAA		■	■		■	■	■	■	■	■	■	■	■	■	■			
3900	MA_____5C392KAA		■	■		■	■	■	■	■	■	■	■	■	■	■			
4700	MA_____5C472KAA		■	■		■	■	■	■	■	■	■	■	■	■	■			
5600	MA_____5C562KAA		■	■		■	■	■	■	■	■	■	■	■	■	■			
6800	MA_____5C682KAA			■		■	■		■	■	■	■	■	■	■	■			
8200	MA_____5C822KAA			■		■	■		■	■	■	■	■	■	■	■			
10,000	MA_____5C103KAA			■		■	■		■	■	■	■	■	■	■	■	■	■	■
12,000	MA_____5C123KAA			■		■	■		■	■	■	■	■	■	■	■	■	■	■
15,000	MA_____5C153KAA			■		■	■		■	■	■	■	■	■	■	■	■	■	■
18,000	MA_____5C183KAA			■		■	■		■	■	■	■	■	■	■	■	■	■	■
22,000	MA_____5C223KAA						■		■	■		■	■	■	■	■	■	■	■
27,000	MA_____5C273KAA						■		■	■		■	■	■	■	■	■	■	■
33,000	MA_____5C333KAA						■		■	■		■	■	■	■	■	■	■	■
39,000	MA_____5C393KAA						■		■	■		■	■	■	■	■	■	■	■
47,000	MA_____5C473KAA						■		■	■		■	■	■	■	■	■	■	■
56,000	MA_____5C563KAA									■		■	■	■	■	■	■	■	■
68,000	MA_____5C683KAA									■		■	■		■	■	■	■	■
82,000	MA_____5C823KAA									■		■	■		■	■	■	■	■
100,000	MA_____5C104KAA												■		■	■	■	■	■
120,000	MA_____5C124KAA												■		■	■	■	■	■
150,000	MA_____5C154KAA												■		■	■	■	■	■
180,000	MA_____5C184KAA												■		■	■	■	■	■
220,000	MA_____5C224KAA												■		■	■	■	■	■
270,000	MA_____5C274KAA												■		■	■	■	■	■
330,000	MA_____5C334KAA														■	■		■	■
390,000	MA_____5C394KAA														■	■		■	■
470,000	MA_____5C474KAA														■	■		■	■
560,000	MA_____5C564KAA															■		■	■
680,000	MA_____5C684KAA															■		■	■
820,000	MA_____5C824KAA															■		■	■
1.0 µF	MA_____5C105KAA															■		■	■
1.2 µF	MA_____5C125KAA																		■
1.5 µF	MA_____5C155KAA																		■
1.8 µF	MA_____5C185KAA																		■
2.2 µF	MA_____5C225KAA																		■
2.7 µF	MA_____5C275KAA																		■
3.3 µF	MA_____5C335KAA																		■
3.9 µF	MA_____5C395KAA																		■

For other tolerances see Part No. Codes
For other voltages see Part No. Codes.
AVX Style

MA Series
Molded Axial Z5U Dielectric



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Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aceralam.pdf

HOW TO ORDER

MA10	5	E	104	Z	A	A
Molded Axial Size MA10 MA20 MA30 MA40 MA50 MA60	**Voltage** 5 = 50V 1 = 100V 2 = 200V	**Dielectric** E = Z5U	**Capacitance** First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)	**Capacitance Tolerance** M = ±20% Z = +80% -20%	**Failure Rate** A = Not Applicable	**Leads** A = Standard

‡ C tolerance available C0G (NP0) from 1.0 to 9.1 pF only. Minimum tolerance for values 10 pF - 100 pF is D or F whichever is greater.

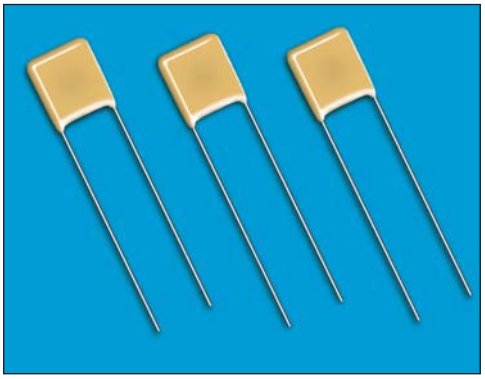
Z5U Dielectric

	AVX Style	MA10			MA20			MA30			MA40			MA50			MA60		
Cap. in pF	Typical AVX Part Nos.	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50	WVDC 200	100	50
1000 1200 1500	MA___5E102ZAA MA___5E122ZAA MA___5E152ZAA	■	■	■															
1800 2200 2700	MA___5E182ZAA MA___5E222ZAA MA___5E272ZAA	■	■	■															
3300 3900 4700	MA___5E332ZAA MA___5E392ZAA MA___5E472ZAA	■	■	■	■	■	■												
5600 6800 8200	MA___5E562ZAA MA___5E682ZAA MA___5E822ZAA		■	■	■	■	■	■	■	■									
10,000 12,000 15,000	MA___5E103ZAA MA___5E123ZAA MA___5E153ZAA		■	■	■	■	■	■	■	■	■	■	■						
18,000 22,000 27,000	MA___5E183ZAA MA___5E223ZAA MA___5E273ZAA		■	■		■	■	■	■	■	■	■	■						
33,000 39,000 47,000	MA___5E333ZAA MA___5E393ZAA MA___5E473ZAA			■		■	■		■	■	■	■	■	■	■	■			
56,000 68,000 82,000	MA___5E563ZAA MA___5E683ZAA MA___5E823ZAA			■			■		■	■	■	■	■	■	■	■			
100,000 120,000 150,000	MA___5E104ZAA MA___5E124ZAA MA___5E154ZAA						■			■		■	■	■	■	■	■	■	■
180,000 220,000 270,000	MA___5E184ZAA MA___5E224ZAA MA___5E274ZAA									■		■	■		■	■	■	■	■
330,000 390,000 470,000	MA___5E334ZAA MA___5E394ZAA MA___5E474ZAA									■			■		■	■	■	■	■
560,000 680,000 820,000	MA___5E564ZAA MA___5E684ZAA MA___5E824ZAA												■			■	■	■	■
1.0 µF 1.2 µF 1.5 µF	MA___5E105ZAA MA___5E125ZAA MA___5E155ZAA												■			■		■	■
1.8 µF 2.2 µF 2.7 µF	MA___5E185ZAA MA___5E225ZAA MA___5E275ZAA															■		■	■
3.3 µF 3.9 µF 4.7 µF	MA___5E335ZAA MA___5E395ZAA MA___5E475ZAA																		■
5.6 µF 6.8 µF 8.2 µF	MA___5E565ZAA MA___5E685ZAA MA___5E825ZAA																		■

For other tolerances see Part No. Codes
For other voltages see Part No. Codes.
AVX Style

Leaded High Voltage MLCC

SV Series Radial Capacitors – C0G Dielectric



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC radial leaded capacitors meet these performance characteristics. The added advantage of these capacitors lies in special internal design minimizing the electric field stresses within the MLC. These special design criteria result in significant reduction of partial discharge activity within the dielectric and having, therefore, a major impact on long-term reliability of the product. The SV high voltage radial capacitors are conformally coated with high insulation resistance, high dielectric strength epoxy eliminating the possibility of arc flashover.

The SV high voltage radial MLC designs exhibit low ESRs at high frequency. The same criteria governing the high voltage design carries the added benefits of extremely low ESR in relatively low capacitance and small packages. These capacitors are designed and are ideally suited for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sv.pdf

HOW TO ORDER

SV01	A	A	102	K	A	A	*
AVX Style	**Voltage** C = 600V/630V A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V	**Temperature Coefficient** C0G = A	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging which is AVX standard packaging. Use suffix "TR1" if tape and reel is required. Parts are reel packaged per EIA-468.

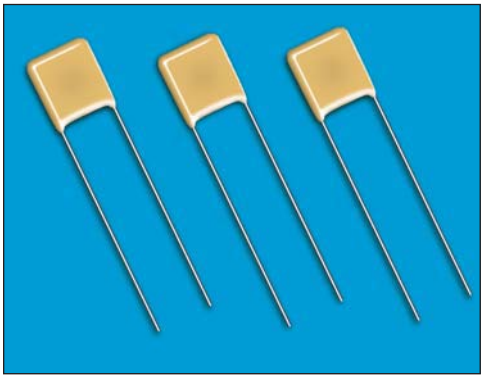
*Hi-Rel screening consists of 100% Group A, Subgroup 1 per MIL-PRF-49467. (Except partial discharge testing is not performed and DWV is at 120% rated voltage).

C0G								
Style	**600/630V min./max.**	**1000V min./max.**	**1500V min./max.**	**2000V min./max.**	**2500V min./max.**	**3000V min./max.**	**4000V min./max.**	**5000V min./max.**
SV01	100 pF / 1500 pF	100 pF / 1000 pF	10 pF / 330 pF	10 pF / 220 pF	10 pF / 120 pF	10 pF / 82 pF	–	–
SV02/SV52	100 pF / 6800 pF	100 pF / 4700 pF	100 pF / 1500 pF	10 pF / 1000 pF	10 pF / 680 pF	10 pF / 560 pF	10 pF / 150 pF	10 pF / 100 pF
SV03/SV53	100 pF / 0.012 µF	100 pF / 8200 pF	100 pF / 2700 pF	100 pF / 1800 pF	10 pF / 1000 pF	10 pF / 680 pF	10 pF / 390 pF	10 pF / 220 pF
SV04/SV54	100 pF / 3900 pF	100 pF / 2700 pF	10 pF / 820 pF	10 pF / 560 pF	10 pF / 270 pF	10 pF / 180 pF	10 pF / 100 pF	10 pF / 68 pF
SV05/SV55	1000 pF / 0.027 µF	1000 pF / 0.018 µF	100 pF / 6800 pF	100 pF / 4700 pF	100 pF / 2700 pF	100 pF / 1500 pF	10 pF / 1000 pF	10 pF / 560 pF
SV06/SV56	100 pF / 0.012 µF	100 pF / 0.010 µF	100 pF / 3300 pF	100 pF / 2200 pF	10 pF / 1200 pF	10 pF / 820 pF	10 pF / 470 pF	10 pF / 390 pF
SV07/SV57	1000 pF / 0.056 µF	1000 pF / 0.033 µF	1000 pF / 0.015 µF	100 pF / 0.010 µF	100 pF / 5600 pF	100 pF / 3900 pF	100 pF / 2200 pF	10 pF / 1200 pF
SV08/SV58	1000 pF / 0.082 µF	1000 pF / 0.047 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 0.010 µF	100 pF / 6800 pF	100 pF / 3300 pF	100 pF / 2200 pF
SV09/SV59	1000 pF / 0.150 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 4700 pF	100 pF / 3300 pF
SV10	1000 pF / 0.100 µF	1000 pF / 0.056 µF	1000 pF / 0.022 µF	1000 pF / 0.012 µF	100 pF / 8200 pF	100 pF / 5600 pF	100 pF / 3300 pF	100 pF / 2200 pF
SV11	1000 pF / 0.150 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 4700 pF	100 pF / 3300 pF
SV12	0.01 µF / 0.220 µF	0.01 µF / 0.15 µF	1000 pF / 0.056 µF	1000 pF / 0.033 µF	1000 pF / 0.022 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 5600 pF
SV13/SV63	100 pF / 0.018 µF	100 pF / 0.012 µF	100 pF / 4700 pF	100 pF / 2700 pF	100 pF / 1800 pF	100 pF / 1000 pF	10 pF / 470 pF	10 pF / 390 pF
SV14/SV64	1000 pF / 0.039 µF	1000 pF / 0.022 µF	100 pF / 8200 pF	100 pF / 5600 pF	100 pF / 3300 pF	100 pF / 1800 pF	10 pF / 820 pF	10 pF / 680 pF
SV15/SV65	1000 pF / 0.056 µF	1000 pF / 0.033 µF	1000 pF / 0.015 µF	100 pF / 0.01 µF	100 pF / 5600 pF	100 pF / 2700 pF	100 pF / 1800 pF	100 pF / 1200 pF
SV16/SV66	1000 pF / 0.120 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.027 µF	1000 pF / 0.015 µF	100 pF / 8200 pF	100 pF / 4700 pF	100 pF / 3300 pF
SV17/SV67	1000 pF / 0.150 µF	1000 pF / 0.10 µF	1000 pF / 0.056 µF	1000 pF / 0.039 µF	1000 pF / 0.022 µF	1000 pF / 0.012 µF	100 pF / 6800 pF	100 pF / 4700 pF

Note: Contact factory for other voltage ratings or values.

Leaded High Voltage MLCC

SV Series Radial Capacitors – X7R Dielectric



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC radial leaded capacitors meet these performance characteristics. The added advantage of these capacitors lies in special internal design minimizing the electric field stresses within the MLC. These special design criteria result in significant reduction of partial discharge activity within the dielectric and having, therefore, a major impact on long-term reliability of the product. The SV high voltage radial capacitors are conformally coated with high insulation resistance, high dielectric strength epoxy eliminating the possibility of arc flashover.

The SV high voltage radial MLC designs exhibit low ESRs at high frequency. The same criteria governing the high voltage design carries the added benefits of extremely low ESR in relatively low capacitance and small packages. These capacitors are designed and are ideally suited for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sv.pdf

HOW TO ORDER

SV01	A	A	102	K	A	A	*
AVX Style	**Voltage** A = 1000V S = 1500V G = 2000V W = 2500V H = 3000V J = 4000V K = 5000V	**Temperature Coefficient** X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105	**Capacitance Tolerance** K = ±10% M = ±20% Z = +80 -20%	**Test Level** A = Standard B = Hi-Rel*	**Leads** A = Tin/Lead R = RoHS Compliant	**Packaging** (See Note 1)

Note 1: No suffix signifies bulk packaging which is AVX standard packaging. Use suffix "TR1" if tape and reel is required. Parts are reel packaged per EIA-468.

Note: Capacitors with X7R dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

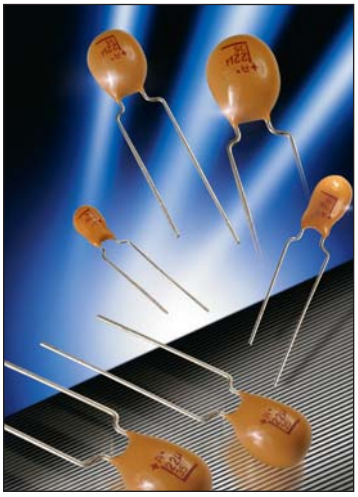
*Hi-Rel screening consists of 100% Group A, Subgroup 1 per MIL-PRF-49467. (Except partial discharge testing is not performed and DWV is at 120% rated voltage).

X7R								
Style	**600/630V min./max.**	**1000V min./max.**	**1500V min./max.**	**2000V min./max.**	**2500V min./max.**	**3000V min./max.**	**4000V min./max.**	**5000V min./max.**
SV01	1000 pF / 0.018 µF	1000 pF / 0.012 µF	100 pF / 5600 pF	100 pF / 3900 pF	–	–	–	–
SV02/SV52	1000 pF / 0.082 µF	1000 pF / 0.047 µF	1000 pF / 0.015 µF	100 pF / 6800 pF	100 pF / 3900 pF	100 pF / 2700 pF	–	–
SV03/SV53	1000 pF / 0.180 µF	1000 pF / 0.082 µF	1000 pF / 0.018 µF	1000 pF / 0.01 µF	100 pF / 6800 pF	100 pF / 4700 pF	100 pF / 1800 pF	–
SV04/SV54	1000 pF / 0.056 µF	1000 pF / 0.033 µF	100 pF / 6800 pF	100 pF / 3900 pF	100 pF / 2200 pF	100 pF / 1800 pF	100 pF / 820 pF	–
SV05/SV55	0.01 µF / 0.470 µF	0.01 µF / 0.22 µF	1000 pF / 0.056 µF	1000 pF / 0.027 µF	1000 pF / 0.018 µF	1000 pF / 0.012 µF	100 pF / 4700 pF	–
SV06/SV56	0.01 µF / 0.180 µF	0.01 µF / 0.10 µF	1000 pF / 0.033 µF	1000 pF / 0.012 µF	100 pF / 8200 pF	100 pF / 6800 pF	100 pF / 2700 pF	100 pF / 1200 pF
SV07/SV57	0.01 µF / 0.820 µF	0.01 µF / 0.39 µF	0.01 µF / 0.10 µF	1000 pF / 0.047 µF	1000 pF / 0.033 µF	1000 pF / 0.027 µF	1000 pF / 0.01 µF	100 pF / 6800 pF
SV08/SV58	0.01 µF / 1.20 µF	0.01 µF / 0.68 µF	0.01 µF / 0.18 µF	1000 pF / 0.082 µF	1000 pF / 0.068 µF	1000 pF / 0.047 µF	1000 pF / 0.018 µF	1000 pF / 0.012 µF
SV09/SV59	0.10 µF / 1.80 µF	0.10 µF / 1.00 µF	0.01 µF / 0.27 µF	0.01 µF / 0.12 µF	0.01 µF / 0.10 µF	1000 pF / 0.068 µF	1000 pF / 0.027 µF	1000 pF / 0.018 µF
SV10	0.01 µF / 1.50 µF	0.01 µF / 0.82 µF	0.01 µF / 0.22 µF	0.01 µF / 0.10 µF	1000 pF / 0.082 µF	1000 pF / 0.056 µF	1000 pF / 0.022 µF	1000 pF / 0.022 µF
SV11	0.10 µF / 2.20 µF	0.10 µF / 1.2 µF	0.01 µF / 0.39 µF	0.01 µF / 0.18 µF	0.01 µF / 0.15 µF	0.01 µF / 0.10 µF	1000 pF / 0.039 µF	1000 pF / 0.027 µF
SV12	0.10 µF / 3.90 µF	0.10 µF / 2.20 µF	0.01 µF / 0.56 µF	0.01 µF / 0.27 µF	0.01 µF / 0.22 µF	0.01 µF / 0.15 µF	1000 pF / 0.056 µF	1000 pF / 0.033 µF
SV13/SV63	0.01 µF / 0.270 µF	0.01 µF / 0.10 µF	1000 pF / 0.033 µF	1000 pF / 0.012 µF	1000 pF / 0.01 µF	100 pF / 6800 pF	100 pF / 2700 pF	–
SV14/SV64	0.01 µF / 0.470 µF	0.01 µF / 0.18 µF	1000 pF / 0.068 µF	1000 pF / 0.022 µF	1000 pF / 0.018 µF	1000 pF / 0.015 µF	100 pF / 5600 pF	–
SV15/SV65	0.01 µF / 0.680 µF	0.01 µF / 0.33 µF	0.01 µF / 0.10 µF	1000 pF / 0.033 µF	1000 pF / 0.027 µF	1000 pF / 0.022 µF	1000 pF / 8200 pF	100 pF / 4700 pF
SV16/SV66	0.01 µF / 1.80 µF	0.01 µF / 1.0 µF	0.01 µF / 0.27 µF	0.01 µF / 0.12 µF	0.01 µF / 0.10 µF	1000 pF / 0.068 µF	1000 pF / 0.027 µF	1000 pF / 0.018 µF
SV17/SV67	0.01 µF / 2.20 µF	0.01 µF / 1.2 µF	0.01 µF / 0.39 µF	0.01 µF / 0.15 µF	0.01 µF / 0.12 µF	1000 pF / 0.082 µF	1000 pF / 0.039 µF	1000 pF / 0.027 µF

Note: Contact factory for other voltage ratings or values.

TAP Series

Dipped Radial Tantalum Capacitors



TAP is a professional grade device manufactured with a flame retardant coating and featuring low leakage current and impedance, very small physical sizes and exceptional temperature stability. It is designed and conditioned to operate to +125°C and is available loose or taped and reeled for auto insertion. The 15 case sizes with wide capacitance and working voltage ranges means the TAP can accommodate almost any application.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tap.pdf

HOW TO ORDER

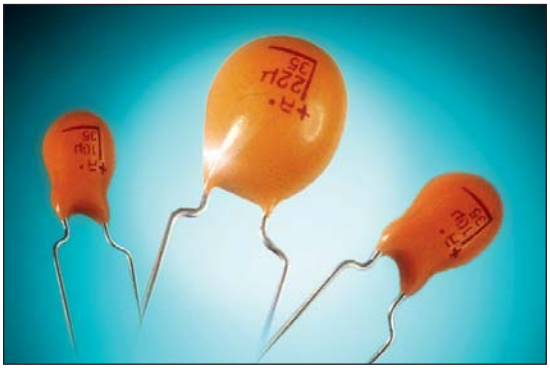
TAP	475	M	035	SCS
Type	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** K = ±10% M = ±20% (For J = ±5% tolerance, please consult factory)	**Rated DC Voltage**	**Suffix indicating wire form and packaging**

Capacitance Range (letter denotes case size)								
Capacitance		Rated voltage DC (V_R)						
µF	Code	6.3V	10V	16V	20V	25V	35V	50V
0.1	104						A	A
0.15	154						A	A
0.22	224						A	A
0.33	334						A	A
0.47	474						A	A
0.68	684						A	B
1.0	105				A	A	A	C
1.5	155			A	A	A	A	D
2.2	225		A	A	A	A	B	E
3.3	335	A	A	A	B	B	C	F
4.7	475	A	A	B	C	C	E	G
6.8	685	A	B	C	D	D	F	H
10	106	B	C	D	E	E	F	J
15	156	C	D	E	F	F	H	K
22	226	D	E	F	H	H	K	L
33	336	E	F	F	J	J	M	
47	476	F	G	J	K	M	N	
68	686	G	H	L	N	N		
100	107	H	K	N	N			
150	157	K	N	N				
220	227	M	P	R				
330	337	P	R					

Values outside this standard range may be available on request.
AVX reserves the right to supply capacitors to a higher voltage rating, in the same case size, than that ordered.

TEP Series

Dipped Radial Capacitors – Tin/Lead Finish



TEP is a Tin–Lead finish version of the conformally coated tantalum radial leaded capacitor (TAP), It is a professional grade device manufactured with a flame retardant coating and featuring low leakage current and impedance, very small physical sizes and exceptional temperature stability, available in bulk and T&R packaging for auto insertion. The wide range of Capacitance, working voltages and case sizes enables TEP to accommodate to almost any application.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tep.pdf

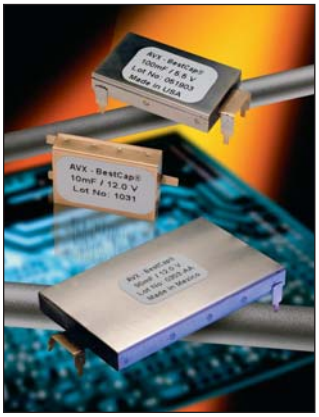
HOW TO ORDER

TEP	106	M	016	SCS
Type	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** K = ±10% M = ±20% (For J = ±5% tolerance, please consult factory)	**Rated DC Voltage**	**Suffix indicating wire form and packaging**

Capacitance Range (letter denotes case size)								
Capacitance		Rated voltage DC (V_R)						
µF	Code	6.3V	10V	16V	20V	25V	35V	50V
0.1	104						A	A
0.15	154						A	A
0.22	224						A	A
0.33	334						A	A
0.47	474						A	A
0.68	684						A	B
1.0	105				A	A	A	C
1.5	155			A	A	A	A	D
2.2	225		A	A	A	A	B	E
3.3	335	A	A	A	B	B	C	F
4.7	475	A	A	B	C	C	E	G
6.8	685	A	B	C	D	D	F	H
10	106	B	C	D	E	E	F	J
15	156	C	D	E	F	F	H	K
22	226	D	E	F	H	H	K	L
33	336	E	F	F	J	J	M	
47	476	F	G	J	K	M	N	
68	686	G	H	L	N	N		
100	107	H	K	N	N			
150	157	K	N	N				
220	227	M	P	R				
330	337	P	R					

Values outside this standard range may be available on request.
AVX reserves the right to supply capacitors to a higher voltage rating, in the same case size, than that ordered.

BestCap®
Pulse Supercapacitors



AVX's BestCap® technology provides excellent high power pulse characteristics based upon the combination of very high capacitance and ultra-low ESR, together with extremely low leakage current.

Based on a unique patented aqueous chemistry and an innovative design, this series offers high capacitance, even with short pulse applications such as in GSM, GPRS, Edge and PCS based systems.

While BestCap® technology offers more efficient energy savings in battery circuits than conventional supercapacitors, its Low ESR results in a high current handling capability, making this an ideal solution for any portable or wireless device requiring high power availability.

The Low Profile versions are ideally suited to PCMCIA, PDA, DSC and similar applications.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/bestcap.pdf

HOW TO ORDER

BZ	0	1	5	A	503	Z	A	B	XX
BestCap®	**Standard**	**Case Size** 1 = 28mmx17mm 2 = 48mmx30mm 5 = 20mmx15mm 9 = 17mmx15mm	**Rated Voltage** 3 = 3.6V 4 = 4.5V 5 = 5.5V 9 = 9.0V C = 12.0V F = 15.0V	**Series** A = Maximum Capacitance B = Low Profile	**Capacitance Code (Farad Code)**	**Capacitance Tolerance** Z = (-20/+80)%	**Lead Format** A, C, H, L N or S	**Packaging** B = Bulk	**Not Used For Standard Product (Consult Factory For Special Requirements)**

A-SERIES – MAXIMUM CAPACITANCE

Capacitance		Rated Voltage DC at 25°C							
mF	Code	3.6V		5.5V		9.0V		12.0V	
		Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles
10	103							BZ05	C, N, S
22	223							BZ01	A, C, H, S
33	333			BZ05	C, N, S	BZ01	A, C, H, S		
47	473								
50	503			BZ01	A, C, H, S				
68	683			BZ05	S				
70	703	BZ01	A, C, H, S						
90	903							BZ02	A, H, L
100	104			BZ01	A, H, S				
120	124					BZ02	A, H, L		
140	144	BZ01	A, H, S						
150	154								
200	204			BZ02	A, H, L				
280	284	BZ02	A, H, L						
400	404			BZ02	A, H, L				
560	564	BZ02	A, H, L						
1000	105			BZ12	A, H, L				

B-SERIES – LOW PROFILE

Capacitance		Rated Voltage DC at 25°C											
mF	Code	3.6V		4.5V		5.5V		9.0V		12.0V		15.0V	
		Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles	Case Size	Lead Styles
6.8	682											BZ05	C, N, S
15	153			BZ09	N, S	BZ05	C, N, S			BZ01	A, H, S		
22	223			BZ05	N, S			BZ01	A, H, S				
30	303					BZ01	C, S						
33	333			BZ01	C, S	BZ05	S						
47	473			BZ15	N, S								
50	503	BZ01	C, S										
60	603					BZ01	A, H, S						
100	104	BZ11	C, S										

TLN PulseCap™ Series

Tantalum Solid Electrolytic Chip Capacitors

- Large case size for maximum capacitance
- 3x reflow 260°C compatible
- Low profile solution
- Consumer applications (e.g. PCMCIA/USB wireless express cards etc.)
- CV range: 1000-3300µF / 4-10V
- 2 case sizes available

RoHS COMPLIANT

LEAD-FREE

LEAD-FREE COMPATIBLE COMPONENT

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tlnpulse.pdf

HOW TO ORDER

TLN	6	228	M	006	R	0055
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures, 3rd digit represents multiplier	**Tolerance** M = ±20%	**Rated DC Voltage** 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc	**Packaging** R = Standard	**ESR in mΩ**

Capacitance		Voltage Rating DC (V_R) to 85°C		
µF	Code	4V (G)	6.3V (J)	10V (A)
1000	108			4(100)*/6(55)
1500	158		4(100)	6(55)
2200	228		6(55)	
3300	338	6(55)		

Available Codes (ESR ratings in mOhms in brackets)

Engineering samples - please contact manufacturer

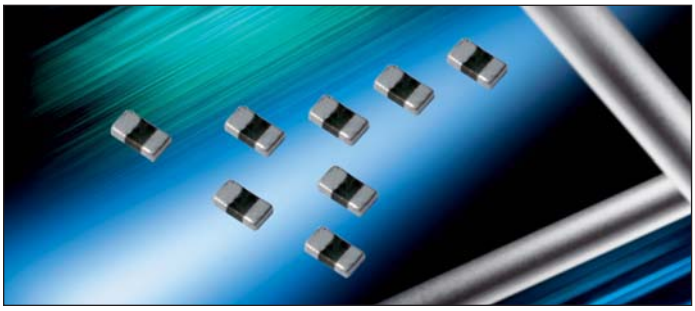
*Codes under development – subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

Sub pF Varistor

AVX Multilayer Ceramic Transient Voltage Suppressors

ESD Protection for any Circuit Sensitive to Capacitance



Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/aguard-sub.pdf

GENERAL DESCRIPTION

AVX offers ultra-low capacitance ESD protection in the Sub 1pF range for use in circuits that are sensitive to capacitance. The Sub pF Varistor (SPV) is available in 0.8pF and 0.4pF capacitance values in a compact 0402 low profile package. SPV devices provide excellent response time to ESD strikes to protect sensitive circuits from over voltage conditions.

The development of new information processing technologies call for ever increasing digital system speeds. Higher speeds necessitate the use of ultra-low capacitance values in order to minimize signal distortion.

FEATURES

- High Reliability
- Capacitance <1pF
- Bi-Directional protection
- Fastest response time to ESD strikes
- Multi-strike capability
- Low insertion loss
- Low profile 0402 case size

APPLICATIONS

- Antennas
- Optics
- HDMI
- RF circuits
- FlexRay
- Portable devices
- Analog sensors
- Any circuit sensitive to capacitance

HOW TO ORDER

VC	H4	AG	10	0R8	M	A	T	W	A
Varistor Chip	**Chip Size** Thin 0402	**Varistor Series** AntennaGuard	**Working Voltage** 10 = 10V 15 = 15V	**Capacitance** 0R8 = 0.8pF 0R4 = 0.47pF	**Tolerance** M = ±20%	**N/A**	**Termination** T = Ni/Sn Alloy	**Reel Size** W = 7"	**Reel Quantity** A = 10k

ANTENNAGUARD CATALOG PART NUMBERS/ELECTRICAL VALUES

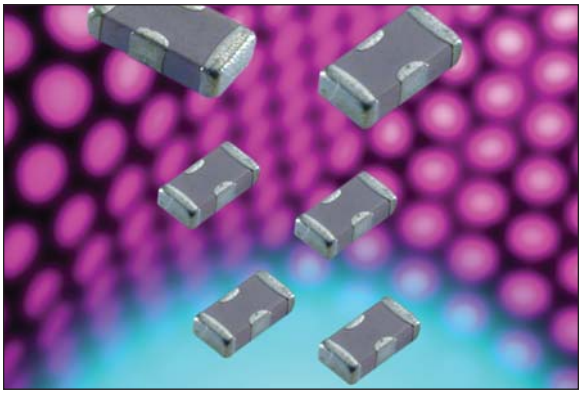
AVX Part Number	V_W (DC)	V_B	I_L	Cap	Cap Tolerance	3db Freq (MHz)	Case Size
VCH4AG100R8MA	≤10	125	<10 nA	0.8	±20%	5800	LP 0402
VCH4AG150R8MA	≤15	125	<10 nA	0.96 pF Max	Max	5800	LP 0402
VCH4AG150R4MA	≤15	135	<100 nA	0.47 pF Max	±20%	6700	LP 0402

V_W (DC) DC Working Voltage (V)
V_B Typical Breakdown Voltage (V @ $1mA_{DC}$)
I_L Typical leakage current at the working voltage
Cap Typical capacitance (pF) @ frequency specified and $0.5V_{RMS}$
Freq Frequency at which capacitance is measured (M = 1MHz)

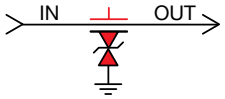
TransFeed, Feedthrough Filter

AVX Multilayer Ceramic Transient Voltage Suppressors

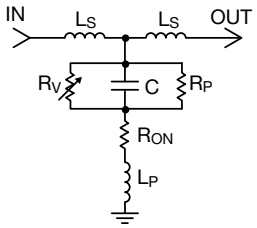
TVS Protection and EMI Attenuation in a Single Chip



Schematic Diagram



Electrical Model



AVX has combined the best electrical characteristics of its TransGuard® Transient Voltage Suppressors (TVS) and its Feedthru Capacitors into a single chip for state-of-the-art overvoltage circuit protection and EMI reduction over a broad range of frequencies. This unique combination of multilayer ceramic construction in a feedthru configuration gives the circuit designer a single 0805 chip that responds to transient events faster than any TVS device on the market today, and provides significant EMI attenuation when in the off-state.

The reduction in parallel inductance, typical of the feedthru chip construction when compared to the construction of standard TVS or ceramic capacitor chips, gives the TransFeed product two very important electrical advantages: (1) faster "turn-on" time. Calculated response times of <200 pSec are not unusual with this device, and measured response times range from 200 – 250 pSec; (2) the second electrical advantage of lower parallel inductance, coupled with optimal series inductance, is the enhanced attenuation characteristics of the TransFeed product. Typical applications include filtering/protection on Microcontroller I/O Lines, Interface I/O Lines, Power Line Conditioning and Power Regulation.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tfeed.pdf

HOW TO ORDER

V	2	F	1	05	A	150	Y	2	E	D	P
Varistor	**Chip Size** 2 = 0805 3 = 0612	**Feedthru Capacitor**	**No. of Elements**	**Voltage** 05 = 5.6VDC 09 = 9.0VDC 14 = 14.0VDC 18 = 18.0VDC	**Energy Rating** X = 0.05J A = 0.1J C = 0.3J	**Varistor Clamping Voltage** 150 = 18V 200 = 22V 300 = 32V 400 = 42V 500 = 50V	**Capacitance Tolerance** Y = +100/-50%	**DC Resistance** 1 = 0.150 Ohms 2 = 0.200 Ohms 3 = 0.250 Ohms	**Feedthru Current** D = 500 mA E = 750 mA F = 1.0 Amp	**Packaging Code Pcs./Reel** D = 1,000 R = 4,000 T = 10,000	**Termination Finish** P = Ni/Sn Alloy (Plated) M = Ni/Sn Pb (Plated)

TRANSFEED ELECTRICAL SPECIFICATIONS

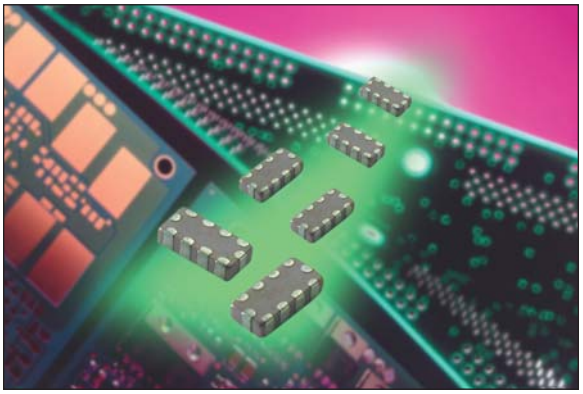
AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Breakdown Voltage	Clamping Voltage	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap	DC Resistance	Maximum Feedthru Current
V2F105A150Y2E _ _	5.6	4.0	8.5±20%	18	35	0.10	30	800	0.200	0.75
V2F105C150Y1F _ _	5.6	4.0	8.5±20%	18	35	0.30	120	2500	0.150	1.00
V2F109A200Y2E _ _	9.0	6.4	12.7±15%	22	25	0.10	30	575	0.200	0.75
V2F109C200Y1F _ _	9.0	6.4	12.7±15%	22	25	0.30	120	1800	0.150	1.00
V2F114A300Y2E _ _	14.0	10.0	18.5±12%	32	15	0.10	30	300	0.200	0.75
V2F114C300Y1F _ _	14.0	10.0	18.5±12%	32	15	0.30	120	900	0.150	1.00
V2F118A400Y2E _ _	18.0	13.0	25.5±10%	42	10	0.10	30	200	0.200	0.75
V2F118C400Y1F _ _	18.0	13.0	25.5±10%	42	10	0.30	120	500	0.150	1.00
V2F118X500Y3D _ _	18.0	13.0	25.5±10%	50	10	0.05	20	75	0.250	0.50

Termination Finish Code
Packaging Code

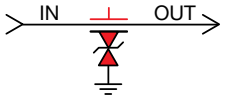
TransFeed Array Filter

AVX Multilayer Ceramic Transient Voltage Suppressors

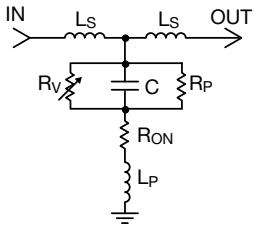
TVS Protection and EMI Attenuation in a Single Chip



Schematic Diagram



Electrical Model



AVX has combined the best electrical characteristics of its TransGuard® Transient Voltage Suppressors (TVS) and its Feedthru Capacitors into a single chip for state-of-the-art overvoltage circuit protection and EMI reduction over a broad range of frequencies. This unique combination of multilayer ceramic construction in a feedthru configuration gives the circuit designer a single 0805 chip that responds to transient events faster than any TVS device on the market today, and provides significant EMI attenuation when in the off-state.

The reduction in parallel inductance, typical of the feedthru chip construction when compared to the construction of standard TVS or ceramic capacitor chips, gives the TransFeed product two very important electrical advantages: (1) faster "turn-on" time. Calculated response times of <200 pSec are not unusual with this device, and measured response times range from 200 – 250 pSec; (2) the second electrical advantage of lower parallel inductance, coupled with optimal series inductance, is the enhanced attenuation characteristics of the TransFeed product. Typical applications include filtering/protection on Microcontroller I/O Lines, Interface I/O Lines, Power Line Conditioning and Power Regulation.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tfeed.pdf

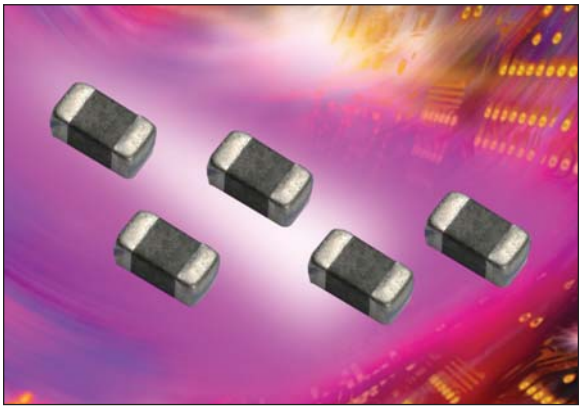
HOW TO ORDER

V	3	F	4	18	X	500	Y	3	G	D	P
Array	**Chip Size** 2 = 0805 3 = 0612	**Feedthru Capacitor**	**No. of Elements**	**Voltage** 18 = 18.0VDC	**Energy Rating** X = 0.05J A = 0.1J	**Varistor Clamping Voltage** 400 = 42V 500 = 50V	**Capacitance Tolerance** Y = +100/-50%	**DC Resistance** 3 = 0.250 Ohms	**Feedthru Current** G = 200 mA	**Packaging Code Pcs./Reel** D = 1,000 R = 4,000 T = 10,000	**Termination Finish** P = Ni/Sn Alloy (Plated) M = Ni/Sn Pb (Plated)

AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Breakdown Voltage	Clamping Voltage	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap	DC Resistance	Maximum Feedthru Current
V3F418A400Y3G _ _	18.0	13.0	25.5±10%	42	10	0.10	20	150	0.200	0.30
V3F418X500Y3G _ _	18.0	13.0	25.5±10%	50	10	0.05	15	65	0.250	0.20

Termination Finish Code
Packaging Code

TransGuard®
Transient Voltage Suppressors



TransGuard® acts as an EMI filter in the "off state" and a transient voltage suppressor in the "on state". They are bidirectional and therefore act as back to back zener diodes, but offer other advantages, for example, fast turn-on time (sub 1ns) and repetitive strike capability. Package options include EIA case sizes 0402, 0603, 0805, 1206, 1210, 1812 and 2220, as well as axial leaded configuration.

DESC drawing Series AA55562

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tguard.pdf

PART NUMBER IDENTIFICATION

Surface Mount Devices

Important: For part number identification only, not for construction of part numbers.
The information below only defines the numerical value of part number digits, and cannot be used to construct a desired set of electrical limits. Please refer to the TransGuard® part number data for the correct electrical ratings.

V	C	1206	05	D	150	R	M

Product Designator
V = Varistor

Case Style
C = Chip

Case Size Designator

Size	Length	Width
0402	1.00±0.10mm (0.040"±0.004")	0.5±0.10mm (0.020"±0.004")
0603	1.60±0.15mm (0.063"±0.006")	0.8±0.15mm (0.032"±0.006")
0805	2.01±0.2mm (0.079"±0.008")	1.25±0.2mm (0.049"±0.008")
1206	3.20±0.2mm (0.126"±0.008")	1.60±0.2mm (0.063"±0.008")
1210	3.20±0.2mm (0.126"±0.008")	2.49±0.2mm (0.098"±0.008")

Working Voltage
03 = 3.3 VDC
05 = 5.6 VDC
09 = 9.0 VDC
12 = 12.0 VDC
14 = 14.0 VDC
18 = 18.0 VDC
26 = 26.0 VDC
30 = 30.0 VDC
48 = 48.0 VDC
60 = 60.0 VDC

Energy
A = 0.1J
B = 0.2J
C = 0.3J
D = 0.4J
E = 0.5J
F = 0.7J
G = 0.9J
H = 1.2J
J = 1.5J
K = 0.6J
L = 0.8J
M = 1.0J
N = 1.1J
P = 3.0J
Q = 1.3J
R = 1.7J
S = 1.9-2.0J
T = 0.01J
U = 4.0-5.0J
V = 0.02J
W = 6.0J
X = 0.05J
Y = 12.0J
Z = 25.0J

Clamping* Voltage
100 = 12V
150 = 18V
200 = 22V
250 = 27V
300 = 32V
390 = 42V
400 = 42V
500 = 50V
560 = 60V
580 = 60V
620 = 67V
650 = 67V
101 = 100V
121 = 120V

Packaging (Pcs/Reel)

Style	"D"	"R"	"T"	"W"
VC0402	N/A	N/A	N/A	10,000
VC0603	1,000	4,000	10,000	N/A
VC0805	1,000	4,000	10,000	N/A
VC1206	1,000	4,000	10,000	N/A
VC1210	1,000	2,000	10,000	N/A

Termination Finish
M = Ni/Sn Pb (Plated)

Marking
All standard surface mount TransGuard® chips will **not** be marked.

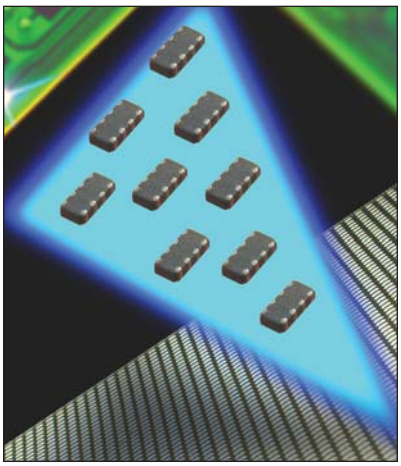
ELECTRICAL CHARACTERISTICS RANGE

Range	Working Voltage (DC)	Breakdown Voltage	Clamping Voltage	Test Current For V_c	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap
Lowest Value	3.3	5.0±20%	12	1	100	0.05	20	65
Highest Value	65	82.0±10%	135	10	10	4.80	800	5000

* Please check the AVX website for actual clamping to working voltage available on these devices.

MultiGuard TVS Array

AVX Multilayer Ceramic Transient Voltage Suppression Arrays – ESD Protection for CMOS and Bi Polar Systems



AVX's Transient Voltage Suppression (TVS) Arrays address six trends in today's electronic circuits: (1) mandatory ESD protection, (2) mandatory EMI control, (3) signal integrity improvement, (4) PCB downsizing, (5) reduced component placement costs, and (6) protection from induced slow speed transient voltages and currents.

AVX's MultiGuard products offer numerous advantages, which include a faster turn-on-time (<1nS), repetitive strike capability, and space savings. In some cases, MultiGuard consumes less than 75% of the PCB real estate required for the equivalent number of discrete chips. This size advantage, coupled with the savings associated with placing only one chip, makes MultiGuard the TVS component of choice for ESD protection of I/O lines in portable equipment and programming ports in cellular phones. Other applications include differential data line protection, ASIC protection and LCD driver protection for portable computing devices.

Where multiple lines require the ESD protection, the 4-element 0612 or 0508 chip is an ideal solution. While the 2-element 0405 MultiGuard is the smallest TVS array, the 4-element 0508 MultiGuard is the smallest 4-element TVS device available in the market today.

Available with standard working voltage of 5.6V up to 18V with low capacitance in the 3 case sizes, AVX MultiGuard arrays offer a very broad range of integrated TVS solutions to the design community.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tguard.pdf

HOW TO ORDER

MG	04	2	L	14	A	300	T	P
MultiGuard	**Case Size** 04 = 0405 05 = 0508 06 = 0612	**Configuration** 2 = 2 Elements 4 = 4 Elements	**Style** S = Standard Construction L = Low Capacitance	**Working Voltage** 05 = 5.6VDC 09 = 9.0VDC 14 = 14.0VDC 18 = 18.0VDC	**Energy Rating** A = 0.10 Joules V = 0.02 Joules X = 0.05 Joules	**Clamping Voltage** 150 = 18V 200 = 22V 300 = 32V 400 = 42V 500 = 50V	**Packaging** (PCS/REEL) D = 1,000 R = 4,000 T = 10,000	**Termination Finish** P = Ni/Sn Alloy (Plated) M = Ni/Sn Pb (Plated)

ELECTRICAL CHARACTERISTICS PER ELEMENT

	AVX Part Number	Working Voltage (DC)	Working Voltage (AC)	Breakdown Voltage	Clamping Voltage	Test Current For V_c	Maximum Leakage Current	Transient Energy Rating	Peak Current Rating	Typical Cap
2 **Element** 0405 **Chip**	MG042S05X150 _ _	5.6	4.0	8.5±20%	18	1	35	0.05	15	300
	MG042L14V400 _ _	14.0	10.0	18.5±12%	32	1	15	0.02	15	45
	MG042L18V500 _ _	18.0	14.0	N/A	50	1	10	0.02	15	40
2 **Element** 0508 **Chip**	MG052S05A150 _ _	5.6	4.0	8.5±20%	18	1	35	0.10	30	825
	MG052S09A200 _ _	9.0	6.4	12.7±15%	22	1	25	0.10	30	550
	MG052S14A300 _ _	14.0	10.0	19.5±12%	32	1	15	0.10	30	425
	MG052S18A400 _ _	18.0	14.0	25.5±10%	42	1	10	0.10	30	225
	MG052L18X500 _ _	≤18.0	≤14.0	N/A	50	1	10	0.10	20	50
4 **Element** 0508 **Chip**	MG054S05X150 _ _	5.6	4.0	8.5±20%	18	1	35	0.05	15	400
	MG054S09X200 _ _	9.0	6.4	12.7±15%	22	1	25	0.05	15	300
	MG054S14X300 _ _	14.0	10.0	19.5±12%	32	1	15	0.05	15	150
	MG054S18X400 _ _	18.0	14.0	25.5±10%	42	1	10	0.05	15	120
	MG054L18V500 _ _	≤18.0	≤14.0	N/A	50	1	10	0.02	15	50
4 **Element** 0612 **Chip**	MG064S05A150 _ _	5.6	4.0	8.5±20%	18	1	35	0.10	30	825
	MG064S09A200 _ _	9.0	6.4	12.7±15%	22	1	25	0.10	30	550
	MG064S14A300 _ _	14.0	10.0	19.5±12%	32	1	15	0.10	30	425
	MG064S18A400 _ _	18.0	14.0	25.5±10%	42	1	10	0.05	15	120
	MG064L18X500 _ _	≤18.0	≤14.0	N/A	50	1	10	0.10	20	75

└ Termination Finish Code
└ Packaging Code

V_W (DC)	DC Working Voltage (V)
V_W (AC)	AC Working Voltage (V)
V_B	Typical Breakdown Voltage (V @ $1mA_{DC}$)
V_B Tol	V_B Tolerance is ± from Typical Value
V_C	Clamping Voltage (V @ I_{VC})
I_{VC}	Test Current for V_C (A, 8x20µS)
I_L	Maximum Leakage Current at the Working Voltage (µA)
E_T	Transient Energy Rating (J, 10x1000µS)
I_P	Peak Current Rating (A, 8x20µS)
Cap	Typical Capacitance (pF) @ 1MHz and 0.5 V_{RMS}

NB12, Surface Mount Thermistors

NC 12 – NC 20

Chip thermistors are a high quality and low cost device especially developed for surface mounting applications. They are widely used for temperature compensation but can also achieve temperature control of printed circuits. Its silver - palladium - platinum metallization provides a high degree of resistance to dewetting of the terminations during soldering (typically 260°C / 30 s).

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nb12-20.pdf

HOW TO ORDER

NC 20 — **Type**

K 0 — **Material Code**
K

0103 — **Resistance**
10,000 Ω

M — **Tolerance**
M (±20%)
J (±5%)
K (±10%)

BA — **Suffix: Packaging**
– –: Bulk
BA: Plastic tape (180mm diam. reel)
BE: Plastic tape (1/2 reel)
BC: Plastic tape (330mm diam. reel)
BB: Cardboard tape (180mm diam. reel)
BF: Cardboard tape (1/2 reel)
BD: Cardboard tape (330mm diam. reel)

TABLE OF VALUES (Min/Max)

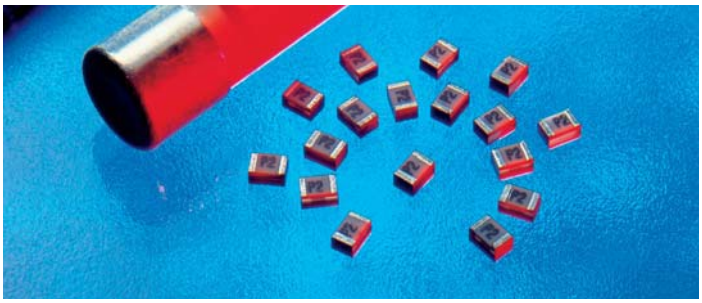
NC 12 IEC SIZE : 0805

Types	Rn at 25°C (Ω)	Material Code	B (K) ($\Delta B/B$ (1) ± 5% (2) ± 3%)	α at 25°C (%/°C)
NC 12 KC 0 180 NC 12 KC 0 101	18 100	KC	3470 ± 5%	– 3.9
NC 12 MC 0 121 NC 12 MC 0 332	120 3,300	MC	3910 ± 3%	– 4.4
NC 12 J 0 0332 NC 12 J 0 0562	3,300 5,600	J	3480 ± 3%	– 3.9
NC 12 K 0 0682 NC 12 K 0 0123	6,800 12,000	K	3630 ± 3%	– 4.0
NC 12 L 0 0153 NC 12 L 0 0183	15,000 18,000	L	3790 ± 3%	– 4.2
NC 12 M 0 0223 NC 12 M 0 0393	22,000 39,000	M	3950 ± 3%	– 4.4
NC 12 N 0 0473 NC 12 N 0 0563	47,000 56,000	N	4080 ± 3%	– 4.6
NC 12 L 2 0683	68,000	L2	3805 ± 3%	– 4.1
NC 12 N 0 0823	82,000	N	4080 ± 3%	– 4.6
NC 12 P 0 0104 NC 12 P 0 0184	100,000 180,000	P	4220 ± 3%	– 4.7
NC 12 Q 0 0224	220,000	Q	4300 ± 3%	-4.7

NC 20 IEC SIZE : 1206

Types	Rn at 25°C (Ω)	Material Code	B (K) ($\Delta B/B$ (1) ± 5% (2) ± 3%)	α at 25°C (%/°C)
NC 20 KC 0 100 NC 20 KC 0 101	10 100	KC	3470 ± 5%	– 3.9
NC 20 MC 0 121 NC 20 MC 0 152	120 1,500	MC	3910 ± 3%	– 4.4
NC 20 I 0 0182 NC 20 I 0 0332	1,800 3,300	I	3250 ± 5%	– 3.7
NC 20 J 0 0392 NC 20 J 0 0682	3,900 6,800	J	3480 ± 3%	– 3.9
NC 20 K 0 0822 NC 20 K 0 0153	8,200 15,000	K	3630 ± 3%	– 4.0
NC 20 L 0 0183 NC 20 L 0 0223	18,000 22,000	L	3790 ± 3%	– 4.2
NC 20 M 0 0273 NC 20 M 0 0473	27,000 47,000	M	3950 ± 3%	– 4.4
NC 20 N 0 0563 NC 20 N 0 0104	56,000 100,000	N	4080 ± 3%	– 4.6
NC 20 P 0 0124 NC 20 P 0 0224	120,000 220,000	P	4220 ± 3%	– 4.7
NC 20 Q 0 0274 NC 20 Q 0 0474	270,000 470,000	Q	4300 ± 3%	– 4.7
NC 20 R 0 0564 NC 20 R 0 0105	560,000 1,000,000	R	4400 ± 3%	– 4.8

Surface Mount Fuse



Accu-Guard® II is a version of Accu-Guard® fuses for a wider range of current and voltage ratings. Constructed on alumina substrates, Accu-Guard® II fuses display superior electrical, mechanical and environmental properties.Accu-Guard® II dimensions are standard 0402, 0603, 0805, 1206 and 0612 chip sizes.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/fuses.pdf

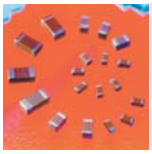
HOW TO ORDER

F	1206	A	0R20	F	W	TR
Product Fuse	**Size** See table for standard sizes	**Fuse Version** A=Accu-Guard® B=Accu-Guard® II C=Accu-Guard® II 0603 D=Accu-Guard® II 0612 E=Accu-Guard® II 0402, 0603	**Rated Current** Current expressed in Amps. Letter R denotes decimal point. e.g. 0.20A=0R20 1.75A=1R75	**Fuse Speed** F=Fast	**Termination** S=Nickel/Lead-Free Solder coated (Sn 100) W=Nickel/solder coated (Sn 63, Pb 37)	**Packaging** TR=Tape and reel

Type	Part Number	Current Rating A	Resistance 10% x I rated, 25°C Ω (max.)	Voltage Drop @1 x I rated, 25°C mV (max.)	Fusing Current (within 5 sec), 25°C A	Pre-Arc I^2t @ 50A A^2-sec	Rated Voltage V
F0402E	F0402E0R25FSTR	0.25	0.650	220	0.625	0.00005*	32
	F0402E0R50FSTR	0.50	0.250	180	1.25	0.0003	32
	F0402E0R75FSTR	0.75	0.200	180	1.875	0.003	32
	F0402E1R00FSTR	1.00	0.130	160	2.50	0.008	32
	F0402E1R50FSTR	1.50	0.060	140	3.75	0.03	32
	F0402E2R00FSTR	2.00	0.040	120	5.00	0.06	32
F0603E	F0603E0R25FSTR	0.25	0.650	220	0.625	0.00005*	32
	F0603E0R37FSTR	0.375	0.450	220	0.940	0.0001	32
	F0603E0R50FSTR	0.50	0.250	180	1.25	0.0003	32
	F0603E0R75FSTR	0.75	0.200	180	1.875	0.003	32
	F0603E1R00FSTR	1.00	0.130	160	2.50	0.008	32
	F0603E1R25FSTR	1.25	0.090	140	3.125	0.01	32
	F0603E1R50FSTR	1.50	0.060	140	3.75	0.03	32
	F0603E1R75FSTR	1.75	0.050	120	4.375	0.04	32
	F0603E2R00FSTR	2.00	0.040	120	5.00	0.06	32
	F0603E2R50FSTR	2.50	0.035	100	6.25	0.12	32
	F0603E3R00FSTR	3.00	0.030	100	7.50	0.25	32
F0603C	F0603C0R25FWTR	0.25	0.800	280	0.50	0.00003*	32
	F0603C0R37FWTR	0.375	0.500	280	0.75	0.0001	32
	F0603C0R50FWTR	0.50	0.320	280	1.00	0.0002	32
	F0603C0R75FWTR	0.75	0.300	280	1.50	0.0015	32
	F0603C1R00FWTR	1.00	0.200	240	2.00	0.004	32
	F0603C1R25FWTR	1.25	0.170	240	2.50	0.007	32
	F0603C1R50FWTR	1.50	0.110	240	3.00	0.012	32
	F0603C1R75FWTR	1.75	0.090	240	3.50	0.02	24
	F0603C2R00FWTR	2.00	0.075	240	4.00	0.03	24
	F0603C2R50FWTR	2.50	0.055	200	5.00	0.05	16
	F0603C3R00FWTR	3.00	0.045	200	6.00	0.1	16
F0805B	F0805B0R25FWTR	0.25	0.750	280	0.50	0.00003*	63
	F0805B0R50FWTR	0.50	0.350	280	1.00	0.0002	63
	F0805B0R75FWTR	0.75	0.270	280	1.50	0.001	63
	F0805B1R00FWTR	1.00	0.220	280	2.00	0.003	63
	F0805B1R25FWTR	1.25	0.170	280	2.50	0.007	63
	F0805B1R50FWTR	1.50	0.120	240	3.00	0.010	63
	F0805B2R00FWTR	2.00	0.080	220	4.00	0.030	63
	F0805B2R50FWTR	2.50	0.060	220	5.00	0.050	63
	F0805B3R00FWTR	3.00	0.050	220	6.00	0.10	63
F1206B	F1206B0R25FWTR	0.25	0.750	280	0.50	0.00003	63
	F1206B0R50FWTR	0.50	0.350	280	1.00	0.0002	63
	F1206B1R00FWTR	1.00	0.180	240	2.00	0.003	63
	F1206B1R50FWTR	1.50	0.120	240	3.00	0.010	63
	F1206B2R00FWTR	2.00	0.080	220	4.00	0.030	63
	F1206B3R00FWTR	3.00	0.050	220	6.00	0.10	63
F0612D	F0612D4R00FWTR	4.00	0.040	260	10	0.10	32
	F0612D5R00FWTR	5.00	0.025	200	12.5	0.25	32

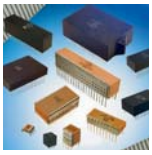
*Current is limited to less than 50A at 32V due to internal fuse resistance.

CERAMIC CAPACITORS



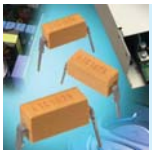
Surface Mount Multilayer Ceramic Capacitors

MIL PRF 123*
MIL PRF 55681 (CDR)
DSCC 03029 (0402)*
DSCC 05002 (0603)*
DSCC 05007 (1206)*
AEC Q200 (Automotive)
Professional Series (APS)
LD Series (Tin/Lead Termination)
DSCC 03028(0603)*
DSCC 05001 (0805)*
DSCC 05006(0805)*
ESCC 3009
CECC 32101
Medical Grade



Switch Mode Power Supply Capacitors (SMPS)

DSCC 87106/88011
MIL PRF 49470 (M and T Levels)
CECC 30601
CECC 30701
TurboCap™



Leaded Multilayer Ceramic Capacitors

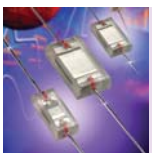
MIL PRF 20
MIL C 11015
MIL PRF 123
MIL PRF 39014
ESCC 3001
CECC 30601
CECC 30701

High Voltage

DSCC 87046
DSCC 87043
DSCC 87040
DSCC 87077
DSCC 87070
AEC Q200*
DSCC 87114
DSCC 87047
DSCC 87076
DSCC 89044
DSCC 87081
MIL 49467 (Compliant)

Leaded Capacitor Arrays (SIP)

DSCC 87112
DSCC 87116
DSCC 87119
DSCC 89086
DSCC 87120
DSCC 87122
DSCC 88019



Glass Capacitor

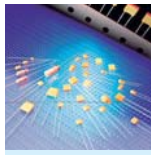
MIL PRF 23269
MIL C 11272

TANTALUM CAPACITORS

Surface Mount Tantalum Capacitors

MIL PRF 55365 (CWR)
MIL PRF 55365 (T Level - Space)
SRC 9000 (NASA)*
ESCC 3012
CECC 30801

DSCC 07016 (Low ESR)*
DSCC 95158*
DSCC 04053 (Fused)*
DSCC 09009 (Module)*
COTS-Plus Tin/Lead Termination
Medical Grade
HRC 5000



Leaded Tantalum Capacitors

CECC 30201
Dipped Radial

Niobium Oxide / OxiCap®

COTS-Plus

Wet Tantalum

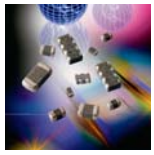
DSCC 93026*

RF CAPACITORS

Surface Mount Multilayer Ceramic Capacitors

MIL PRF 55681 (CDR11-14)
DSCC 06019*
DSCC 06022*

CIRCUIT PROTECTION

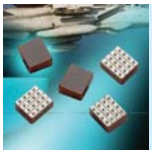


MLV Transient Voltage Suppressors

DSCC AA555682

*New Addition

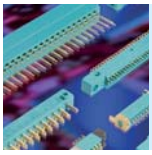
LOW INDUCTANCE/SIGNAL INTEGRITY_



Low Inductance Capacitor Array
MIL C 123 Compliant
LD Series (Tin/Lead)

EMI Filters
MIL PRF 28861
NASA SSQ 21215-21218
MIL PRF 15733
Medical Grade

CONNECTORS_

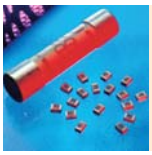


MIL C 55074 Hermaphrocom Style
M55032 Din
Rack and Panel

ESTABLISHED RELIABILITY PRODUCTS_

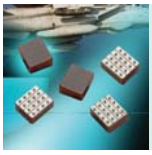
Film Capacitors
High Voltage Film
Medium Power Film
DC Filtering Caps

EMI Filters (SMD)
Feedthru Cap and Array
High Current Filters
Transfeed (Transient + Feed Thru)



Circuit Protection
Transient Protection
Thermistor
Fuse

Pulse Power
BestCap® Supercapacitor
PulseCap™



Signal Integrity
Low Inductance Capacitors
Low Inductance Arrays

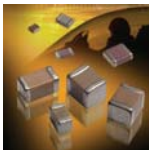
TESTING CAPABILITIES_

DPA
Solderability
Group A
Group B
Group C
Source Inspection
Thermal Shock
Life Test

Low Voltage Humidity
Volt Temperature Limits
Moisture Sensitivity
Temperature Cycling
X-Ray Analysis
Ultrasonic Scan
CSAM Scanning
SEM (Scanning Electron Microscope)

Terminal Strength
Matched Pairs
Failure Analysis
NAVAR Solderability
Resistance to Solder Heat
Thermal Shock

HALT Testing
Low Voltage Breakdown
ESR Testing
Pulse Testing
Barometric Testing
Salt Fog
First Article



Surge Testing
Hi Frequency Testing
Low Frequency Testing
Power Testing
Lightning Strikes (DO 160)
RF Characterization
Transient Analysis
Shake And Vibration
Weibull Testing
PMAE Test

TAZ Series

CWR09 - MIL-PRF-55365/4 Established Reliability, COTS-Plus & Space Level

This is the original high reliability molded tantalum chip series and the case sizes still represent the most flexible of surface mount form factors. TAZ offers nine case sizes, eight of which (A through H) are fully qualified to MIL-PRF-55365/4, and also includes the original sub-miniature R case (non-QPL).

This series is fully interchangeable with CWR06 conformal types, while offering the advantages of molded body / compliant termination construction (ensuring no TCE mismatch with any substrate). This construction is compatible with a wide range of SMT board assembly processes including wave or reflow solder, conductive epoxy or compression bonding techniques.

The parts also carry full polarity and capacitance / voltage marking. The five smaller cases are characterized by their low profile construction, with the A case being the world's smallest molded military tantalum chip.

All 4V to 50V ratings are qualified to MIL-PRF-55365 Weibull "B", "C", "D" and "T" levels, with all surge options ("A", "B" & "C") available.

For Space Level applications, AVX SRC 9000 qualification is recommended (see ratings table for part number availability).

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these are "H", "K", "C" and "B" termination, respectively, per MIL-PRF-55365). In addition, the molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of NASA SP-R-0022A.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taz.pdf

HOW TO ORDER

COTS-PLUS & MIL QPL (CWR09):

TAZ	H	686	*	006	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A M = MIL (JAN) CWR09	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level Z = Non-ER	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

CWR09 P/N CROSS REFERENCE:

CWR09	D	^	686	*	@	+	□
Type	**Voltage Code** C = 4Vdc D = 6Vdc F = 10Vdc H = 15Vdc J = 20Vdc K = 25Vdc M = 35Vdc N = 50Vdc	**Termination Finish** H = Solder Plated K = Solder Fused C = Hot Solder Dipped B = Gold Plated	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level A = Non-ER	**Surge Test Option** A = 10 cycles, +25°C B = 10 cycles, -55°C & +85°C C = 10 cycles, -55°C & +85°C before Weibull If blank, None required	**Packaging** Bulk = Standard \TR = 7" T&R \TR13 = 13" T&R \W = Waffle

SPACE LEVEL OPTIONS TO SRC9000*:

TAZ	H	686	*	006	C	□	L	@	9	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf.	**Qualification Level** 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated	**Surge Test Option** 00 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

*Contact factory for AVX SRC9000 Space Level SCD details.

Capacitance		Rated Voltage DC (V_R) at 85°C							
µF	Code	4V (C)	6V (D)	10V (F)	15V (H)	20V (J)	25V (K)	35V (M)	50V (N)
0.10	104								A
0.15	154								A
0.22	224							A	B
0.33	334	R		R			A		B
0.47	474			R		A		B	C
0.68	684				A	B	B	C	D
1.0	105			A/R		B	C	D	E
1.5	155		A		B	C	D	E	F
2.2	225	A/R		B	C	D	E		F
3.3	335		B	C	D	E		F	G
4.7	475	B	C	D	E		F	G	H
6.8	685	C	D	E		F	G	H	
10	106	D	E		F		G		
15	156	E		F		G	H		
22	226		F		G	H			
33	336	F		G	H				
47	476		G	H					
68	686	G	H						
100	107	H							
150	157								
220	227								

* Z, B Reliability Levels only available.

TAZ Series
CWR19 - MIL-PRF-55365/11

An extended range of capacitor ratings beyond CWR09 that is fully qualified to MIL-PRF-55365/11, this series represents the most flexible of surface mount form factors, offering nine case sizes (the original A through H of CWR09) and adds the new X case size.

The molded body / compliant termination construction ensures no TCE mismatch with any substrate. This construction is compatible with a wide range of SMT board assembly processes including wave or reflow solder, conductive epoxy or compression bonding techniques. The parts also carry full polarity and capacitance / voltage marking.

The four smaller cases are characterized by their low profile construction, with the A case being the world's smallest molded military tantalum chip.

The series is qualified to MIL-PRF-55365 Weibull "B", "C", "D" and "T" levels, with all surge options ("A", "B" & "C") available.

For Space Level applications, AVX SRC 9000 qualification is recommended (see ratings table for part number availability).

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these are "H", "K", "C" and "B" termination, respectively, per MIL-PRF-55365). In addition, the molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of NASA SP-R-0022A.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taz.pdf

HOW TO ORDER

COTS-PLUS & MIL QPL (CWR19):

TAZ	H	227	*	006	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A M = MIL (JAN) CWR09	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level Z = Non-ER	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

CWR09 P/N CROSS REFERENCE:

CWR19	D	^	227	*	@	H	+	□
Type	**Voltage Code** C = 4Vdc D = 6Vdc F = 10Vdc H = 15Vdc J = 20Vdc K = 25Vdc M = 35Vdc N = 50Vdc	**Termination Finish** H = Solder Plated K = Solder Fused C = Hot Solder Dipped B = Gold Plated	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level A = Non-ER	**Case Size**	**Surge Test Option** A = 10 cycles, +25°C B = 10 cycles, -55°C & +85°C C = 10 cycles, -55°C & +85°C before Weibull Z = None required	**Packaging** Bulk = Standard \TR = 7" T&R \TR13 = 13" T&R \W = Waffle

SPACE LEVEL OPTIONS TO SRC9000*:

TAZ	H	227	*	006	C	□	L	@	9	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf.	**Qualification Level** 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated	**Surge Test Option** 00 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

*Contact factory for AVX SRC9000 Space Level SCD details.

Capacitance		Rated voltage DC (V_R) at 85°C						
µF	**Code**	**4V (C)**	**6V (D)**	**10V (F)**	**15V (H)**	**20V (J)**	**25V (K)**	**35V (M)**
0.10	104							
0.15	154							
0.22	224							
0.33	334							A
0.47	474						A	
0.68	684					A		
1.0	105				A	A	B	
1.5	155				A	B		
2.2	225			A	A	B	D	
3.3	335	A	A	A	B	D	E	
4.7	475	A	A	B/C	B/C/D	E		
6.8	685	A	B	B/C/D	D/E	E	F	G
10	106	B	B	B/C/D/E	D/E	E/F		H
15	156	B	B/D/E	D/E	E/F	F	G	
22	226	B/D	D/E	E	F	G	G/H	
33	336	D/E	E	F	F/G	H	H	
47	476	E	F	F/G	G/H	H/X		
68	686	E	F/G	G	G/H			
100	107	F	G	G/H	H			
150	157	G	G	H/X				
220	227	H	H	H				
330	337	H	H					

TAZ Series

CWR29 - MIL-PRF-55365/11 Established Reliability, COTS-Plus & Space Level

A low ESR version of CWR09 and CWR19 that is fully qualified to MIL-PRF-55365/11, the CWR29 series represents the most flexible of surface mount form factors and the optimum power handing for all filtering applications. It is offered in nine case sizes (the original A through H of CWR09 and adding the new X case size).

The molded body / compliant termination construction ensures no TCE mismatch with any substrate. This construction is compatible with a wide range of SMT board assembly processes including wave or reflow solder, conductive epoxy or compression bonding techniques. The parts also carry full polarity and capacitance / voltage marking.

The five smaller cases are characterized by their low profile construction, with the A case being the world's smallest molded military tantalum chip.

The series is qualified to MIL-PRF-55365 Weibull "B", "C", "D" and "T" levels, with all surge options ("A", "B" & "C") available.

For Space Level applications, AVX SRC 9000 qualification is recommended (see ratings table for part number availability).

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these are "H", "K", "C" and "B" termination, respectively, per MIL-PRF-55365). In addition, the molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of NASA SP-R-0022A.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taz.pdf

HOW TO ORDER

COTS-PLUS & MIL QPL (CWR29):

TAZ	H	227	*	006	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A M = MIL (JAN) CWR09	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level Z = Non-ER	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

CWR09 P/N CROSS REFERENCE:

CWR29	D	^	227	*	@	H	+	□
Type	**Voltage Code** C = 4Vdc D = 6Vdc F = 10Vdc H = 15Vdc J = 20Vdc K = 25Vdc M = 35Vdc N = 50Vdc	**Termination Finish** H = Solder Plated K = Solder Fused C = Hot Solder Dipped B = Gold Plated	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level A = Non-ER	**Case Size**	**Surge Test Option** A = 10 cycles, +25°C B = 10 cycles, -55°C & +85°C C = 10 cycles, -55°C & +85°C before Weibull Z = None required	**Packaging** Bulk = Standard \TR = 7" T&R \TR13 = 13" T&R \W = Waffle

SPACE LEVEL OPTIONS TO SRC9000*:

TAZ	H	227	*	006	C	□	L	@	9	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf.	**Qualification Level** 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated	**Surge Test Option** 00 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

*Contact factory for AVX SRC9000 Space Level SCD details.

Capacitance		Rated voltage DC (V_R) at 85°C							
µF	Code	4V (C)	6V (D)	10V (F)	15V (H)	20V (J)	25V (K)	35V (M)	50V (N)
0.10	104								A
0.15	154								A
0.22	224							A	B
0.33	334						A	A	B
0.47	474					A	A	B	C
0.68	684				A	A/B	B	C	D
1.0	105			A	A	A/B	B/C	D	E
1.5	155		A		A/B	B/C	D	E	F
2.2	225	A		A/B	A/C	B/D	D/E		F
3.3	335	A	A/B	A/C	B/D	D/E	E	F	G
4.7	475	A/B	A/C	B/C/D	B/C/D/E	E	F	G	H
6.8	685	A/C	B/D	B/C/D/E	D/E	E/F	F/G	G/H	
10	106	B/D	B/E	B/C/D/E	D/E/F	E/F	G	H	
15	156	B/E	B/D/E	D/E/F	E/F	F/G	G/H		
22	226	B/D	D/E/F	E	F/G	G/H	G/H		
33	336	D/E/F	E	F/G	F/G/H	H	H		
47	476	E	F/G	F/G/H	G/H	H/X			
68	686	E/G	F/G/H	G	G/H				
100	107	F/H	G	G/H	H				
150	157	G	G	H/X					
220	227	H	H	H					
330	337	H	H						

TAZ Series

Extended Range – 63V COTS-Plus

The TAZ part has fully molded, compliant leadframe construction designed for use in applications utilizing solder (Reflow, Wave or Vapor Phase), conductive adhesive or thermal compression bonding techniques. Each chip is marked with polarity, capacitance code and rated voltage. The 63 volt rated parts are ideal for avionic output power supply filtering. Many systems utilize a 28 volt bus and this new rating surpasses the recommended

50% derating for optimized reliability in these applications. The series has Weibull "B" level and all surge options ("A", "B" & "C) available. There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (These are "H", "K", "C" and "B" termination respectively per MIL-PRF-55365).

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/taz.pdf

HOW TO ORDER

TAZ	H	685	*	063	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 63 = 63Vdc	**Standard or Low ESR Range** C = Std ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A S = Standard Conformance	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. Z = Non - ER	**Qualification Level** 0 = NA	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 7 = Matte Sn 8 = Hot Solder Dipped 9 = Gold Plated	**Surge Test Option** 00 = None 23 = 10 Cycles, +25ºC 24 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

*Contact factory for AVX SRC9000 Space Level SCD details.

CAPACITANCE AND RATED VOLTAGE, V_R (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

Capacitance		Rated voltage DC (V_R) at 85ºC
µF	Code	63V
0.68	684	D
1.0	105	E
1.5	155	F
2.2	225	F
3.3	335	G
4.7	475	H
6.8	685	H

TCP Series
Low ESR Tantalum Modules

TCP Series tantalum modules represents the highest packing density for high capacitance / voltage available in surface mount tantalum.

These modules feature stacked assemblies of CWR29 capacitors which provide ultra low ESR and utilize established reliability capacitors (Weibull Grade voltage conditioning) in accordance with MIL-PRF-55365. They can also be supplied with SRC9000 Space Level components.

The stacked construction of fully molded capacitors is compatible with a wide range of SMT board assembly processes including wave or reflow solder or conductive epoxy.

There are two termination finishes available: hot solder dipped ("C") and gold plated ("B").

The molding compound has been selected to meet the requirements of UL94V-0 and outgassing requirements of NASA SP-R-0022A.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tcp.pdf

HOW TO ORDER

TC	2H	945	K	050	L	R	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** L = Low ESR	**Packaging** B = Bulk R = 7" T&R	**Inspection Level** S = Std. Conformance L = Group A D = DSCC DWG	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. Z = Non-ER	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** 8 = Hot Solder Dipped 9 = Gold Plated	**Surge Test Option** 00 = None 23 = 10 Cycles, +25ºC 24 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

Capacitance		Rated voltage DC (V_R) to 85ºC						
µF	Code	6V	10V	15V	20V	25V	35V	50V
9.4	945							2H (200)
18.8	196							4H (100)
20	206						2H (200)	
28.2	286							6H (67)
40	406						4H (100)	
60	606						6H (67)	
66	666					2H (85)		
94	946				2H (75)			
132	137					4H (43)		
188	197				4H (38)			
198	207					6H (28)		
200	207			2H (63)				
282	287				6H (25)			
400	407			4H (31)				
440	447		2H (50)					
600	607			6H (21)				
660	667	2H (50)						
880	887		4H (25)					
1,320	138	4H (25)	6H (17)					
1,980	208	6H (17)						

TBJ Series

CWR11 - MIL-PRF-55365/8 Established Reliability, COTS-Plus & Space Level

Fully qualified to MIL-PRF-55365/8, the CWR11 is the military version of EIA-535BAAC, with four case sizes designed for maximum packaging efficiency on 8mm & 12mm tape for high volume production (ensuring no TCE mismatch with any substrate). This construction is compatible with a wide range of SMT board assembly processes including wave or reflow solder, conductive epoxy or compression bonding techniques. The part also carries full polarity, capacitance / voltage and JAN brand marking.

The series is qualified to MIL-PRF-55365 Weibull "B", "C", "D" and "T" levels, with all surge options ("A", "B" & "C") available.

For Space Level applications, AVX SRC9000 qualification is recommended (see ratings table for part number availability).

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these are "H", "K", "C" and "B" termination, respectively, per MIL-PRF-55365).

The molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of NASA SP-R-0022A.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tbj.pdf

HOW TO ORDER

COTS-PLUS & MIL QPL (CWR11):

TBJ — Type
D — Case Size
686 — Capacitance Code: pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)
***** — Capacitance Tolerance: M = ±20%, K = ±10%, J = ±5%
006 — Voltage Code: 004 = 4Vdc, 006 = 6.3Vdc, 010 = 10Vdc, 015 = 15Vdc, 020 = 20Vdc, 025 = 25Vdc, 035 = 35Vdc, 050 = 50Vdc
C — Standard or Low ESR Range: C = Std ESR, L = Low ESR
□ — Packaging: B = Bulk, R = 7" T&R, S = 13" T&R, W = Waffle
— Inspection Level: S = Std. Conformance, L = Group A, M = MIL (JAN) CWR09
@ — Reliability Grade: Weibull: B = 0.1%/1000 hrs. 90% conf., C = 0.01%/1000 hrs. 90% conf., D = 0.001%/1000 hrs. 90% conf., T = T Level, Z = Non-ER
0 — Qualification Level: 0 = N/A, 9 = SRC9000
^ — Termination Finish: H = Solder Plated, 0 = Fused Solder Plated, 8 = Hot Solder Dipped, 9 = Gold Plated, 7 = Matte Sn (COTS-Plus only)
++ — Surge Test Option: 00 = None, 23 = 10 Cycles, +25°C, 24 = 10 Cycles, -55°C & +85°C, 45 = 10 cycles, -55°C & +85°C before Weibull

CWR09 P/N CROSS REFERENCE:

CWR11 — Type
D — Voltage Code: C = 4Vdc, D = 6Vdc, F = 10Vdc, H = 15Vdc, J = 20Vdc, K = 25Vdc, M = 35Vdc, N = 50Vdc
^ — Termination Finish: H = Solder Plated, K = Solder Fused, C = Hot Solder Dipped, B = Gold Plated
686 — Capacitance Code: pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)
***** — Capacitance Tolerance: M = ±20%, K = ±10%, J = ±5%
@ — Reliability Grade: Weibull: B = 0.1%/1000 hrs. 90% conf., C = 0.01%/1000 hrs. 90% conf., D = 0.001%/1000 hrs. 90% conf., T = T Level, A = Non-ER
+ — Surge Test Option: A = 10 cycles, +25°C, B = 10 cycles, -55°C & +85°C, C = 10 cycles, -55°C & +85°C before Weibull, Z = None required
□ — Packaging: Bulk = Standard, \TR = 7" T&R, \TR13 = 13" T&R, \W = Waffle

SPACE LEVEL OPTIONS TO SRC9000*:

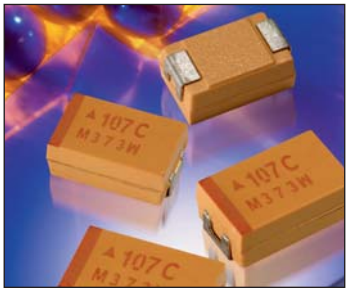
TBJ — Type
D — Case Size
686 — Capacitance Code: pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)
***** — Capacitance Tolerance: M = ±20%, K = ±10%, J = ±5%
006 — Voltage Code: 004 = 4Vdc, 006 = 6Vdc, 010 = 10Vdc, 015 = 15Vdc, 020 = 20Vdc, 025 = 25Vdc, 035 = 35Vdc, 050 = 50Vdc
C — Standard or Low ESR Range: C = Std ESR, L = Low ESR
□ — Packaging: B = Bulk, R = 7" T&R, S = 13" T&R, W = Waffle
L — Inspection Level: L = Group A
@ — Reliability Grade: Weibull: B = 0.1%/1000 hrs. 90% conf., C = 0.01%/1000 hrs. 90% conf., D = 0.001%/1000 hrs. 90% conf.
9 — Qualification Level: 9 = SRC9000
^ — Termination Finish: H = Solder Plated, 0 = Fused Solder Plated, 8 = Hot Solder Dipped, 9 = Gold Plated
++ — Surge Test Option: 00 = 10 Cycles, -55°C & +85°C, 45 = 10 cycles, -55°C & +85°C before Weibull

*Contact factory for AVX SRC9000 Space Level SCD details.

Capacitance		Rated voltage DC (V_R) to 85°C							
µF	Code	4V (C)	6V (D)	10V (F)	15V (H)	20V (J)	25V (K)	35V (M)	50V (N)
0.10	104							A	A
0.15	154							A	B
0.22	224							A	B
0.33	334						A	A	B
0.47	474					A	A	B	C
0.68	684				A	A	B	B	C
1.0	105			A	A	A	B	B	C
1.5	155		A	A	A	B	B	C	D
2.2	225	A	A	A	B	B	C	C	D
3.3	335		A	B	B	B	C	C	D
4.7	475	A	B	B	B	C	C	D	D
6.8	685	B	B	B		C	D	D	
10	106	B	B		C		D		
15	156	B	C	C		D	D		
22	226		C		D	D			
33	336	C		D	D				
47	476		D	D					
68	686	D	D						
100	107	D							
150	157								
220	227								
330	337								

TBJ Series

COTS-Plus – DSCC Dwgs 07016 & 95158 Weibull Grade & Space Level



TBJ COTS-Plus series, based on the CWR11 form factor, is a high reliability series encompassing the current range of EIA Low ESR ratings. Qualifications include DSCC 95158 and DSCC 07016, the latter having the widest range of case sizes, capacitance / voltage ratings and also offering Weibull Grade "B" and "C" reliability and all MIL-PRF-55365 surge test options ("A", "B" & "C").

For Space Level applications, AVX SRC 9000 qualification is recommended (see ratings table for part number availability).

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these correspond to "H", "K", "C" and "B" termination, respectively, per MIL-PRF-55365).

The molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of NASA SP-R-0022A.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tbj.pdf

HOW TO ORDER

COTS-PLUS & DSCC DWG (95158 & 07016):

TBJ — **Type**

D — **Case Size**

686 — **Capacitance Code**
pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)

***** — **Capacitance Tolerance**
M = ±20%
K = ±10%
J = ±5%

006 — **Voltage Code**
004 = 4Vdc
006 = 6Vdc
010 = 10Vdc
015 = 15Vdc
020 = 20Vdc
025 = 25Vdc
035 = 35Vdc
050 = 50Vdc

C — **Standard or Low ESR Range**
C = Std ESR
L = Low ESR

□ — **Packaging**
B = Bulk
R = 7" T&R
S = 13" T&R
W = Waffle

# — **Inspection Level**
S = Std. Conformance
L = Group A
D = DSCC DWG

@ — **Reliability Grade**
Weibull:
B = 0.1%/1000 hrs. 90% conf.
C = 0.01%/1000 hrs. 90% conf.
D = 0.001%/1000 hrs. 90% conf.
T = T Level
Z = Non-ER

0 — **Qualification Level**
0 = N/A
9 = SRC9000

^ — **Termination Finish**
H = Solder Plated
0 = Fused Solder Plated
8 = Hot Solder Dipped
9 = Gold Plated
7 = Matte Sn (COTS-Plus only)

++ — **Surge Test Option**
00 = None
23 = 10 Cycles, +25°C
24 = 10 Cycles, -55°C & +85°C
45 = 10 cycles, -55°C & +85°C before Weibull

DSCC DWG P/N CROSS REFERENCE:

07016 — **DSCC DWG 07016**

-001 — **Dash Number**

K — **Capacitance Tolerance**
K = ±10%
M = ±20%

B — **Reliability Grade**
B = B Weibull
C = C Weibull
D = D Weibull

C — **Termination Finish**
B = Gold Plated (10 microinch minimum)
H = Solder Plated (50 microinch minimum)
C = Hot Solder Dip (60 microinch minimum)

A — **Surge Test Option**
A = 10 cycles, +25°C
B = 10 cycles, -55°C & +85°C
C = 10 cycles, -55°C & +85°C before Weibull
Z = None required Per MIL-PRF-55365

95158 — **DSCC DWG 95158**

-01 — **Dash Number**

K — **Capacitance Tolerance**
K = ±10%
M = ±20%

H — **Termination Finish**
B = Gold Plated (10 microinch minimum)
H = Solder Plated (100 microinch minimum)

SPACE LEVEL OPTIONS TO SRC9000*:

TBJ — **Type**

D — **Case Size**

686 — **Capacitance Code**
pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)

***** — **Capacitance Tolerance**
M = ±20%
K = ±10%
J = ±5%

006 — **Voltage Code**
004 = 4Vdc
006 = 6Vdc
010 = 10Vdc
015 = 15Vdc
020 = 20Vdc
025 = 25Vdc
035 = 35Vdc
050 = 50Vdc

C — **Standard or Low ESR Range**
C = Std ESR
L = Low ESR

□ — **Packaging**
B = Bulk
R = 7" T&R
S = 13" T&R
W = Waffle

L — **Inspection Level**
L = Group A

@ — **Reliability Grade**
Weibull:
B = 0.1%/1000 hrs. 90% conf.
C = 0.01%/1000 hrs. 90% conf.
D = 0.001%/1000 hrs. 90% conf.

9 — **Qualification Level**
9 = SRC9000

^ — **Termination Finish**
H = Solder Plated
0 = Fused Solder Plated
8 = Hot Solder Dipped
9 = Gold Plated

++ — **Surge Test Option**
00 = 10 Cycles, -55°C & +85°C
45 = 10 cycles, -55°C & +85°C before Weibull

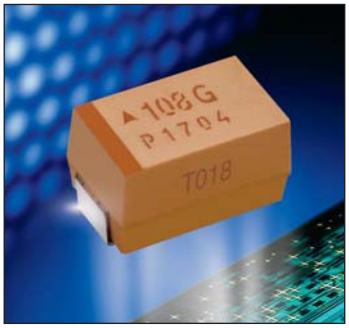
*Contact factory for AVX SRC9000 Space Level SCD details.

Capacitance		Rated Voltage DC (V_R) to 85°C							
µF	Code	4V (G)	6V (J)	10V (A)	16V (C)	20V (D)	25V (E)	35V (V)	50V (T)
0.15	154								A(15000)
0.22	224								A(18000)
0.47	474							A(12000)	A(9500)/B(9500)
0.68	684						A(10000)	A(8000)	A(7900)
1.0	105						A(8000)	A(7500)	A(6600)/B(7000)
1.5	155					A(6500)	A(3000,7500)	A(7500)/B(5200)	C(2000)/D(1500)
2.2	225				A(5500)	A(3000)	A(7000)/B(2000)	B(2000)	D(1200)
3.3	335		A(8000)		A(3500,5000)		B(2000)	B(1000)	D(800)
4.7	475		A(6000)	A(5000)	A(2000)	A(1800,4000) B(1000)	A(3100) B(700,1500)	B(1500) C(600)/D(450)	D(300) E(300)
6.8	685		A(5000)	A(4000)	A(1500/B(1200)	B(1000)	B(700,2800) C(200)	C(350)/D(400) E(300)	D(300,600) E(400)
10	106		A(4000)	A(1800,3000)	A(3000)/B(900)	B(500,1000) C(700)	C(300,500)	C(1600)/D(125,300) E(250)	E(400)
15	156		A(3500)	A(1000,3200) B(600)	B(500,800)	B(500)/C(450) D(275)	D(275)/E(200)	C(450)/D(100,300) E(250)	E(250)
22	226		A(3000)/B(600)	B(500,700) C(300)	B(600)/C(175,375) B(500)	B(600)/C(400) D(275)	C(275,400) D(100,200)/E(225)	D(400)/D(125) E(125,300)	
33	336	A(3000)	B(600)	A(700)/B(425,650) C (500)	C(100,300) D(250)	C(300) D(100, 200)	D(90,300) E(90,175)	D(200,300) E(300)	
47	476		C(300)	C(200,350) D(200)	C(110,350) D(80,150)	D(100,200) E(150)	D(175,250)	E(250)/V(200)	
68	686	A(1500)	B(500)/C(200) D(175)	C(80,300) D(150)/E(150)	D(150)	D(70,200) E(125,200)	V(95)		
100	107	A(1400) B(900)	C(75,150)	C(75,200) D(50,100)/E(100)	D(50,125) E(100)	V(60)			
150	157		D(125)/E(125)	D(50,100)/E(100)	D(60,150)/V(45)				
220	227		D(50,125) E(100)	D(50,150) E(50,100)	V(50)				
330	337		E(50,150)	D(50,150) E(50,100)/V(40)					
470	477		E(50,200)/V(40)	E(50,200)/V(40)					
1000	108	E(200)							

NOTE: EIA standards for Low ESR solid tantalum capacitors allow an ESR movement of 1.25 times initial limit post mounting.

TBM Multianode

Tantalum Ultra Low ESR COTS-Plus Weibull Grade & Space Level



TBM COTS-Plus series uses an internal multi-anode design to achieve ultra-low ESR which improves performance in high ripple power applications.

TBM is available with Weibull Grade "B" reliability and all MIL-PRF-55365 surge test options ("A", "B" & "C").

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these correspond to "H", "K", "C" and "B" termination, respectively, per MIL-PRF-55365).

The molding compound has been selected to meet the requirements of UL94V-0 (Flame Retardancy) and outgassing requirements of NASA SP-R-0022A.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tbm.pdf

HOW TO ORDER

COTS-PLUS:

TBM	E	477	*	006	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A D = DSCC DWG (Pending)	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. T = T Level Z = Non-ER	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25ºC 24 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

SPACE LEVEL OPTIONS TO SRC9000*:

TBM	H	227	*	006	C	□	L	@	9	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc 010 = 10Vdc 016 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf.	**Qualification Level** 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated	**Surge Test Option** 00 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

***Qualifications Pending**

Capacitance		Rated Voltage DC (V_R) to 85°C							
µF	Code	2.5V (e)	4V (G)	6V (J)	10V (A)	15V (C)	20V (D)	25V (E)	35V (V)
10	106								
15	156								
22	226								E(60)
33	336								E(50)
47	476								E(55)
68	686							E(45)	
100	107						E(35)		
150	157					E(30)			
220	227					E(25)			
330	337				E(23)				
470	477			E(18)	E(23)				
680	687		E(18)	E(18), V(23)					
1000	108		E(18), V(18)						
1500	158	E(12)	E(15)						

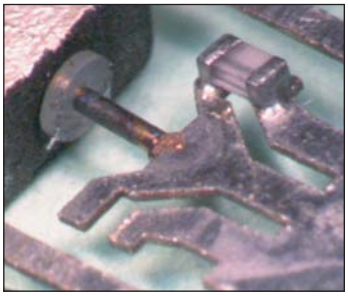
NOTE: EIA standards for Low ESR solid tantalum capacitors allow an ESR movement of 1.25 times initial limit post mounting.

TBW Series

Tantalum Fused DSCC Dwg 04053 COTS-Plus Weibull Grade & Space Level

TBW Fused Tantalum Capacitors offer protection from possible damaging short circuit failure modes. This is accomplished with an internal fuse in series with the capacitor. See the photograph on the right. The AVX fused tantalum offers lower ESR limits than competitive fused tantalum capacitors, and is available with Weibull and surge testing per MIL-PRF-55365.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tbw.pdf



Anode, fuse and leadframe assembly

HOW TO ORDER

COTS-PLUS & DSCC DWG (04053):

TBW	D	686	*	006	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A D = DSCC DWG	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. Z = Non-ER	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25ºC 24 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

DSCC DWG P/N CROSS REFERENCE:

04053	-01
DSCC DWG 04053	**Dash Number**

NOTE: DSCC DWG 04053 specifies 20% capacitance tolerance and solder plated termination options only. For 10% capacitance tolerance, solder fused finish, Weibull grading and MIL surge options, order using AVX part number above.

SPACE LEVEL OPTIONS TO SRC9000*:

TBW	D	686	*	006	C	□	L	@	9	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 015 = 15Vdc 020 = 20Vdc 025 = 25Vdc 035 = 35Vdc 050 = 50Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf.	**Qualification Level** 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated	**Surge Test Option** 00 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

***Qualifications Pending**

Capacitance	Rated Voltage DC (V_R) to 85°C							
µF	**4**	**6**	**10**	**16**	**20**	**25**	**35**	**50**
0.47								C
0.68								C
1								C
1.5			–	–	–	–	C	C
2.2			–	–	–	C	C	D
3.3			–	–	–	C	C	D
4.7		–	–	–	C	C	D	D
6.8		–	–	C	C	C	D	
10		–	C	C	C	C/D	E	E(20%)
15		C	C	C	D	D	D/E	–
22		C	C	C/D	D	D/E	E	–
33		C	C/D	D	E		–	–
47		C/D	C/D	D/E	E	–	–	–
68	C	C/D	D	E	–	–	–	–
100	C	D/E	D/E		–	–	–	–
150	D	D	D/E	–	–	–	–	–
220	D	D/E	E	–	–	–	–	–
330	E	E						
470	E							

TBC Series
CWR15 Military Approved Microchip

AVX announces the world's smallest military approved tantalum chip capacitors. The CWR15 offers 0603, 0805 and 1206 case sizes in capacitance voltage combinations previously only available in much larger packages. The revolutionary AVX TACmicrochip® technology offers designers significant opportunity to downsize circuits for military and aerospace applications. The product is manufactured in the AVX Tantalum high reliability facility in Biddeford, Maine which is also home to the CWR09, CWR11, CWR19 and CWR29 product lines.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tbc.pdf

HOW TO ORDER

COTS-PLUS & MIL QPL (CWR29):

TBC	L	685	*	004	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 020 = 20Vdc	**Standard or Low ESR Range** C = Std ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A M = MIL (JAN) CWR15	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. Z = Non-ER	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

CWR15 P/N CROSS REFERENCE:

CWR15	F	C	685	*	–	L	+
Type	**Voltage Code** C = 4Vdc D = 6Vdc F = 10Vdc	**Termination Finish** H = Solder Plated K = Solder Fused B = Gold Plated	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Product Level Designator** Weibull: B = 0.1 C = 0.01 D = 0.001	**Case Size**	**Surge Test Option** A = +25°C after Weibull B = -55°C & +85°C after Weibull C = -55°C & +85°C before Weibull

SPACE LEVEL OPTIONS TO SRC9000*:

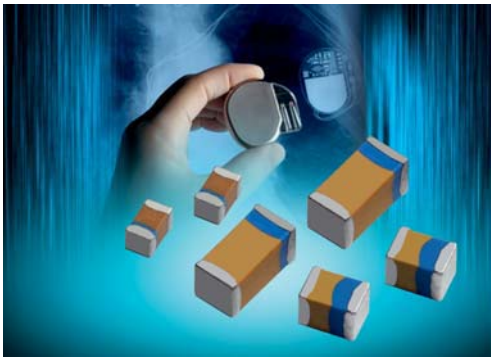
TBC	L	685	*	004	C	□	L	@	9	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 020 = 20Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf.	**Qualification Level** 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 9 = Gold Plated	**Surge Test Option** 00 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

*Contact factory for AVX SRC9000 Space Level SCD details.

Capacitance		Voltage Rating DC (V_R) at 85°C				
µF	Code	4V (C)	6V (D)	10V (F)	15V (H)	20V (J)
0.33	334					
0.47	474			L		L
0.68	684			L		
1.0	105			L		
1.5	155			L		
2.2	225			L		
3.3	335		L	R		
4.7	475		L	R		
6.8	685	L	R	R		
10	106	R	R	R		
15	156	R	R	A		
22	226	R	A			
33	336	R	A			
47	476		A			
68	686	A				

Further extensions of the CWR15 product are planned for later in 2009. A new case size will be added, and the voltage range will be extended to 20 volts. Ratings of 100 µF at 4 volts to 10 µF at 20 volts will be included in this extension of the product line.

TBC Series
COTS-Plus



TBC COTS-Plus series extends the range of CWR15. TBC is available with Weibull grade "B" reliability and all MIL-PRF-55365 surge test options ("A", "B" & "C").

For Space Level applications, AVX SRC9000 ratings are available as shown in the rating table.

There are four termination finishes available: solder plated, fused solder plated, hot solder dipped and gold plated (these correspond to "H", "K", "C" and "B" termination, respectively, per MIL-PRF 55365).

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/tbc.pdf

HOW TO ORDER
COTS-PLUS:

TBC	L	685	*	004	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 020 = 20Vdc	**Standard or Low ESR Range** C = Std ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf. Z = Non-ER None required	**Qualification Level** 0 = N/A 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25ºC 24 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

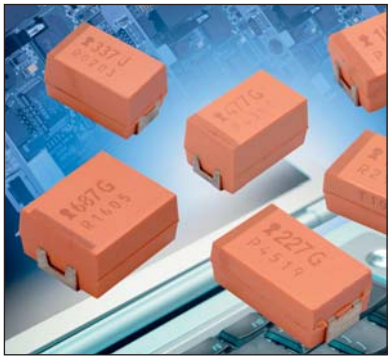
SPACE LEVEL OPTIONS TO SRC9000*:

TBC	L	685	*	004	C	□	L	@	9	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20% K = ±10% J = ±5%	**Voltage Code** 004 = 4Vdc 006 = 6Vdc 010 = 10Vdc 020 = 20Vdc	**Standard or Low ESR Range** C = Std ESR L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** L = Group A	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf. D = 0.001%/1000 hrs. 90% conf.	**Qualification Level** 9 = SRC9000	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 9 = Gold Plated	**Surge Test Option** 00 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

*Contact factory for AVX SRC9000 Space Level SCD details.

Capacitance		Voltage Rating DC (V_R) at 85°C						
µF	Code	3V	4V	6V	10V	16V	20V	25V
0.33 0.47 0.68	334 474 684				K / L L	L L	L	L
1.0 1.5 2.2	105 155 225			K	L L L	L L		
3.3 4.7 6.8	335 475 685			 L R	L / R L / R R		R R	
10 15 22	106 156 226	R	R R R	R R / A	R A	R		
33 47 68	336 476 686	R	R A	A A				

NBS Series
COTS-Plus



NBS, Niobium Oxide COTS-Plus Capacitors offer a non-burn solution for Military and Space applications. Niobium Oxide COTS-Plus Capacitors may be specified with failure rate grading to Weibull "B" or "C" and surge current tested in accordance with Mil-PRF-55365 options A or B.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nbs.pdf

HOW TO ORDER

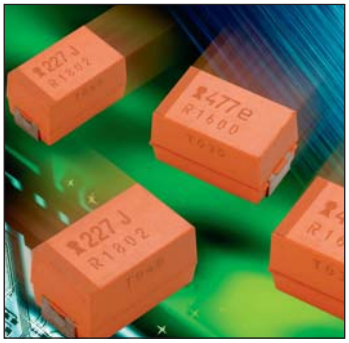
NBS	E	227	*	006	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20%	**Voltage Code** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc	**Standard or Low ESR Range** L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A D = DSCC DWG	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf.	**Qualification Level** 0 = N/A	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25°C 24 = 10 Cycles, -55°C & +85°C 45 = 10 cycles, -55°C & +85°C before Weibull

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105°C / 0.5 DC to 125°C			
µF	**Code**	**1.8V (x)**	**2.5V (e)**	**4.0V (G)**	**6.3V (J)**
4.7	475				
6.8	685				
10	106				A(1000,2000)
15	156			A(1500)	B(600)
22	226		A(900)	B(600)	B(600)
33	336		B(600)*	B(600)	B(600)/C(500)
47	476		B(500)	B(500)/C(300)	C(300)
68	686		C(200)	C(200)	C(75,200)
100	107	B(350)	C(150)	C(70,150)	C(150)/D(80,100)
150	157		C(65,150)	C(90,150)	D(50,70,100)
220	227	C(125)	C(80,125)	D(60,150)	D(60,100) E(80,100)
330	337		D(35,50,100)	D(55,100)/E(100)	E(80,100)
470	477		D(55,100)/E(100)	D(35,40,100) E(75,100)	V(75)
680	687		E(60)	V(75)	
1000	108		V(50)		
1500	158				

***Please Contact Manufacturer**

NBM Multianode

OxiCap® Ultra Low ESR Capacitor COTS-Plus Weibull Grade



NBM OxiCap® capacitors are the COTS-Plus version of the popular NOM Low ESR multianode capacitor. Capacitors are available to Weibull failure rates B and C along with surge current testing per Mil-PRF-55365. Niobium oxide technology offers non-burn characteristics along with excellent reliability and reduced derating.

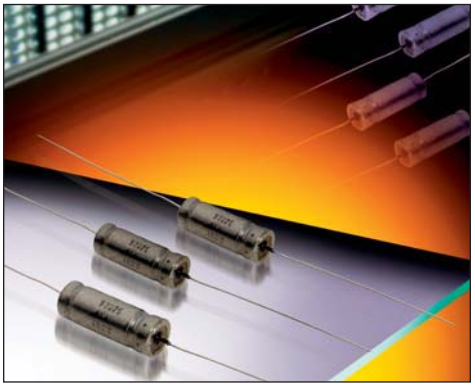
Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/nbm.pdf

HOW TO ORDER

NBM	E	227	*	006	C	□	#	@	0	^	++
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance** M = ±20%	**Voltage Code** 001 = 1.8Vdc 002 = 2.5Vdc 004 = 4Vdc 006 = 6.3Vdc	**Standard or Low ESR Range** L = Low ESR	**Packaging** B = Bulk R = 7" T&R S = 13" T&R W = Waffle	**Inspection Level** S = Std. Conformance L = Group A D = DSCC DWG	**Reliability Grade** Weibull: B = 0.1%/1000 hrs. 90% conf. C = 0.01%/1000 hrs. 90% conf.	**Qualification Level** 0 = N/A	**Termination Finish** H = Solder Plated 0 = Fused Solder Plated 8 = Hot Solder Dipped 9 = Gold Plated 7 = Matte Sn (COTS-Plus only)	**Surge Test Option** 00 = None 23 = 10 Cycles, +25ºC 24 = 10 Cycles, -55ºC & +85ºC 45 = 10 cycles, -55ºC & +85ºC before Weibull

Capacitance		Rated Voltage DC (V_R) to 85°C / 0.66 DC to 105ºC / 0.5 DC to 125ºC			
µF	Code	1.8V (x)	2.5V (e)	4.0V (G)	6.3V (J)
150	157				
220	227				E(40)
330	337			E(35)	E(23)
470	477		E(30)	E(23)	
680	687	E(23)	E(23)		
1000	108				

TWA Series
Wet Electrolytic Tantalum Capacitor



The TWA series is an axial leaded wet electrolytic tantalum capacitor and represents a new level of high CV (capacitance / voltage) previously unavailable in this technology. TWA incorporates a novel, very high capacitance cathode system that allows for higher CV designs, well beyond values specified in the Mil-PRF-39006 drawing. TWA products are listed in DSCC 93026 Rev. P, which includes new high capacitance / voltage ratings.

This design includes a welded tantalum can and header assembly that provides a hermetic seal to withstand the harsh shock and vibration requirements of 39006.

Customized capacitance and voltage packages are possible and welcomed. Contact the factory about design possibilities beyond those contained in this catalog.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/twa.pdf

HOW TO ORDER

TWA	D	227	*	35	□	□	S	Z	00	00
Type	**Case Size**	**Capacitance Code** pF code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow)	**Capacitance Tolerance**	**Voltage Code**	**Insulation Sleeve** C = Without Sleeve S = With Sleeve	**Packaging** B = Tray Pack	**Qualification** D = DSCC 93026 S = COTS-Plus	**Reliability** Z = Non-ER	**Termination Finish** 00 = Tin/Lead 90/10	**Custom Test Options** 00 = Standard

DSCC PART IDENTIFICATION NUMBER (PIN):

93026	-XX	*	□
Drawing Number	**Dash Number**	**Capacitance Tolerance** K = 10% M = ±20%	**Insulation Sleeve** C = Without Sleeve S = With Sleeve

VOLTAGE RATINGS (Operating Temperature -55ºC to 125ºC)

Voltage (DC)								
Rated Voltage: (Ur)	85ºC	25	30	50	60	75	100	125
Derated Voltage: (Uc)	125ºC	15	20	30	40	50	65	85
Surge Voltage: (Us)	85ºC	28.8	34.5	57.5	69	86.3	115	144

Capacitance		Voltage Rating DC (V_R) at 85°C						
µF	Code	25V	30V	50V	60V	75V	100V	125V
10 15 33	106 156 336					A	A	A
47 68 100	476 686 107		A	A	A		B	B D
110 120 150	107 127 157	A			B	B	D	E
220 330 390	227 337 397			B	D	D	E	
470 560 680	477 567 687	B	B	D E	E	E		
1000 1200 1500	108 128 158	D	D E		E			
1800 2200	106 155	E E						

HOW TO ORDER

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/mil123.pdf

Military Type Designation: Capacitors, Fixed, Ceramic Dielectric, (Temperature Stable and General Purpose), High Reliability

M123	A	01	BX	B	103	K	C
Mil-Spec Number	Modification Spec.	Slash Sheet Number	Temperature Characteristic	Voltage	Capacitance Code	Capacitance Tolerance	Termination

Temperature Characteristic

Capacitance change with reference to 25°C over temperature range -55°C to +125°C		
Symbol	Without Voltage	With Rated DC Voltage
BP	0 ± 30 ppm/°C	0 ±30 ppm/°C
BX	±15, -15%	±15, -25%

Voltage
B = 50
C = 100

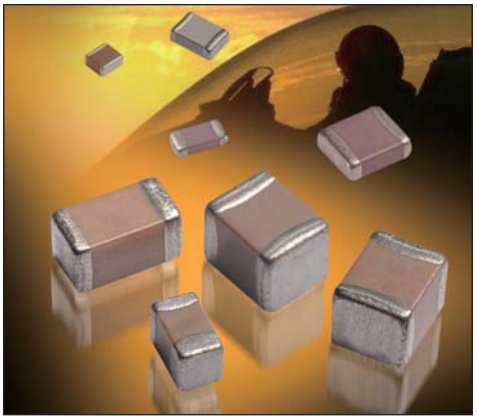
Capacitance Code

Capacitance Tolerance
C = ±0.25pF
D = ±0.5pF
F = ±1%
J = ±5%
K = ±10%

Termination
C = Copper, solder coated (type C-4 or C-5 of MIL-STD-1276)
W = Copper clad steel, solder coated, 60 micro inches minimum.

CROSS REFERENCE MIL-SPEC TEST REQUIREMENTS

TEST DESCRIPTION	MIL-PRF-123	MIL-PRF-39014	MIL-PRF-20	MIL-PRF-55681
NDT (Non-Destructive Test)	100% Ultrasonic Scan or Neutron-Radiography	No	No	No
Pre-Cap Visual (Pre-Encapsulation Visual Examination)	100%	No	No	No
D.P.A. (Destructive Physical Analysis)	Lot by Lot—Pre-Termination Lot by Lot—Finished Product	No	No	No
Pre-Cap Terminal Strength (Pre-Encapsulation Pull Test)	Lot by Lot	No	No	No
Life Test (Lot by Lot)	Lot by Lot—1000 Hours	No	No	No
Low Voltage Humidity	Lot by Lot	No	No	No
Thermal Shock 100 Cycles	Lot by Lot	No	No	No



AVX Corp.'s M123 Series MIL-qualified ceramic capacitors are designed for high performance applications in BX and BR voltage levels, and for temperature stable applications in BP and BG voltage levels. The M123A10-M123A13 have been tested in accordance with MIL-PRF-123 specifications and are available in a wide range of values and tolerances.

M123 Series capacitors offer design and component engineers a proven technology for SMD processing and applications requiring space-level reliability. They are designed for use in critical frequency applications, timing circuits, and applications where absolute stability is required (BP and BG), as well as in applications where a wider capacitance variation in temperature, voltage, frequency, and life span can be tolerated (BX and BR).

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/mil123.pdf

HOW TO ORDER

Military Type Designation: Capacitors, Fixed, Ceramic Dielectric, (Temperature Stable and General Purpose), High Reliability

M123	A	01	BX	B	103	K	S
Mil-Spec Number	Modification Spec.	Slash Sheet Number	Temperature Characteristic	Voltage	Capacitance Code	Capacitance Tolerance	Termination

Temperature Characteristic

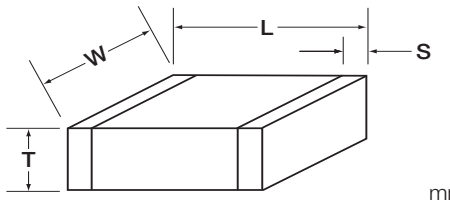
Capacitance change with reference to 25ºC over temperature range -55ºC to +125ºC		
Symbol	Without Voltage	With Rated DC Voltage
BP	0 ± 30 ppm/ºC	0 ±30 ppm/ºC
BX	±15, -15%	±15, -25%

Voltage
B = 50
C = 100

Capacitance Tolerance
C = ±0.25pF
D = ±0.5pF
F = ±1%
J = ±5%
K = ±10%

Termination
G = Silver – Nickel - Gold
M = Palladium/Silver
S = Silver – Nickel – Solder Coated
Z = Silver – Nickel – Solder Plated (tin/lead alloy with a minimum of 4 percent lead)

DIMENSIONS

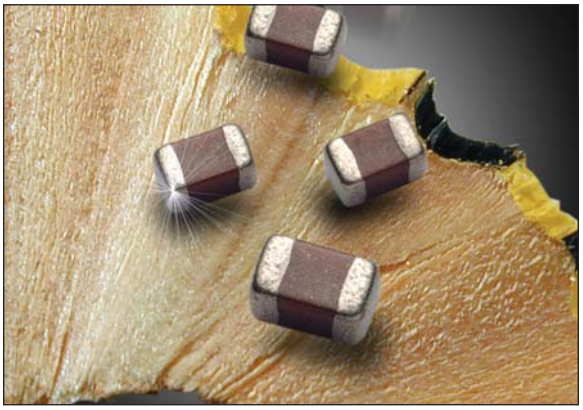


mm (inches)

(L) Length	(W) Width	(T) Thickness	(S) Termination Band
CKS51, /10, 0805 Size Chip			
2.03 (0.080) ± 0.381 (0.015)	1.27 (0.050) ± 0.381 (0.015)	0.508 (0.020) Min. 1.40 (0.055) Max.	0.508 (0.020) ± 0.254 (0.010)
CKS52, /11, 1210 Size Chip			
3.05 (0.120) ± 0.381 (0.015)	2.54 (0.100) ± 0.381 (0.015)	0.508 (0.020) Min. 1.65 (0.065) Max.	0.508 (0.020) ± 0.254 (0.010)
CKS52, /12, 1808 Size Chip			
4.57 (0.180) ± 0.381 (0.015)	2.03 (0.080) ± 0.381 (0.015)	0.508 (0.020) Min. 1.65 (0.065) Max.	0.508 (0.020) ± 0.254 (0.010)
CKS54, /13, 2225 Size Chip			
5.59 (0.220) ± 0.381 (0.015)	6.35 (0.250) ± 0.381 (0.015)	0.508 (0.020) Min. 1.78 (0.070) Max.	0.508 (0.020) ± 0.254 (0.010)
CKS55, /21, 1206 Size Chip			
3.05 (0.120) ± 0.381 (0.015)	1.52 (0.0600) ± 0.381 (0.015)	0.508 (0.020) Min. 1.65 (0.065) Max.	0.508 (0.020) ± 0.254 (0.010)
CKS56, /22, 1812 Size Chip			
4.57 (0.180) ± 0.381 (0.015)	3.18 (0.125) ± 0.381 (0.015)	0.508 (0.020) Min. 2.03 (0.080) Max.	0.508 (0.020) ± 0.254 (0.010)
CKS56, /23, 1825 Size Chip			
4.57 (0.180) ± 0.381 (0.015)	6.35 (0.250) ± 0.381 (0.015)	0.508 (0.020) Min. 2.03 (0.080) Max.	0.508 (0.020) ± 0.254 (0.010)

Slash Sheet	Case Size	Dielectric	Cap Range
10	0805	BP	1.0-680
		BX	330-470000
11	1210	BP	300-3,300
		BX	5,600-100,000
12	1808	BP	300-1,000
		BX	5,600-100,000
13	2225	BP	1,100-10,000
		BX	120,000-1,000,000
21	1206	BP	1.0-2,200
		BX	4,700-39,000
22	1812	BP	1,200-10,000
		BX	27,000-180,000
23	1825	BP	3,900-20,000
		BX	56,000-470,000

MIL-PRF-55681 Chips
CDR01-CDR06



The CDR01 through CDR06 series (MIL-PRF-55681) of high reliability, high frequency capacitors are available in BP and BX, voltage/temperature options. They are offered in 50 and 100V versions and capacitance tolerance varies with capacitance and voltage specifications. Failure rates are between "S" = 0.001% and "M" = 1.0%.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cdr01-06.pdf

HOW TO ORDER

CDR01	BP	101	B	K	S	M
MIL Style CDR01 CDR02 CDR03 CDR04 CDR05 CDR06	**Voltage Temperature Limits** BP = 0 ± 30 ppm/ºC without voltage; 0 ± 30 ppm/ºC with rated voltage from -55ºC to +125ºC BX = ±15% without voltage; +15 -25% with rated voltage from -55ºC to +125ºC	**Capacitance** Two digit figures followed by multiplier (number of zeros to be added) e.g. 101 = 100pF	**Rated Voltage** A = 50V B = 100V	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20%	**Termination Finish** M = Palladium Silver N = Silver Nickel Gold S = Solder-Coated U = Base Metallization/Barrier Metal/Solder Coated* W = Base Metallization/Barrier Metal/Tinned (Tin or Tin/Lead Alloy)	**Failure Rate Level** M = 1.0% P = .1% R = .01% S = .001%

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

*Solder shall have a melting point of 200ºC or less.

PACKAGING

Bulk is standard packaging. Tape and reel per RS481 is available upon request.

CDR01 thru CDR06 to MIL-PRF-55681

Military Type Designation	Capacitance in pF	Capacitance tolerance	Rated temperature and voltage-temperature limits	WVDC
AVX Style 0805/CDR01				
CDR01BP100B---	10	J,K	BP	100
CDR01BP120B---	12	J	BP	100
CDR01BP150B---	15	J,K	BP	100
CDR01BP180B---	18	J	BP	100
CDR01BP220B---	22	J,K	BP	100
CDR01BP270B---	27	J	BP	100
CDR01BP330B---	33	J,K	BP	100
CDR01BP390B---	39	J	BP	100
CDR01BP470B---	47	J,K	BP	100
CDR01BP560B---	56	J	BP	100
CDR01BP680B---	68	J,K	BP	100
CDR01BP820B---	82	J	BP	100
CDR01BP101B---	100	J,K	BP	100
CDR01B--121B---	120	J,K	BP,BX	100
CDR01B--151B---	150	J,K	BP,BX	100
CDR01B--181B---	180	J,K	BP,BX	100
CDR01BX221B---	220	K,M	BX	100
CDR01BX271B---	270	K	BX	100
CDR01BX331B---	330	K,M	BX	100
CDR01BX391B---	390	K	BX	100
CDR01BX471B---	470	K,M	BX	100
CDR01BX561B---	560	K	BX	100
CDR01BX681B---	680	K,M	BX	100
CDR01BX821B---	820	K	BX	100
CDR01BX102B---	1000	K,M	BX	100
CDR01BX122B---	1200	K	BX	100
CDR01BX152B---	1500	K,M	BX	100
CDR01BX182B---	1800	K	BX	100
CDR01BX222B---	2200	K,M	BX	100
CDR01BX272B---	2700	K	BX	100
CDR01BX332B---	3300	K,M	BX	100
CDR01BX392A---	3900	K	BX	50
CDR01BX472A---	4700	K,M	BX	50
AVX Style 1805/CDR02				
CDR02BP221B---	220	J,K	BP	100
CDR02BP271B---	270	J	BP	100
CDR02BX392B---	3900	K	BX	100
CDR02BX472B---	4700	K,M	BX	100
CDR02BX562B---	5600	K	BX	100
CDR02BX682B---	6800	K,M	BX	100
CDR02BX822B---	8200	K	BX	100
CDR02BX103B---	10,000	K,M	BX	100
CDR02BX123A---	12,000	K	BX	50
CDR02BX153A---	15,000	K,M	BX	50
CDR02BX183A---	18,000	K	BX	50
CDR02BX223A---	22,000	K,M	BX	50

Add appropriate failure rate

Add appropriate termination finish

Capacitance Tolerance

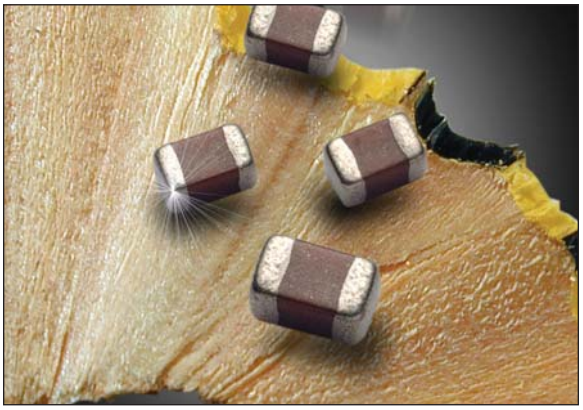
Military Type Designation	Capacitance in pF	Capacitance tolerance	Rated temperature and voltage-temperature limits	WVDC
AVX Style 1808/CDR03				
CDR03BP331B---	330	J,K	BP	100
CDR03BP391B---	390	J	BP	100
CDR03BP471B---	470	J,K	BP	100
CDR03BP561B---	560	J	BP	100
CDR03BP681B---	680	J,K	BP	100
CDR03BP821B--	820	J	BP	100
CDR03BP102B---	1000	J,K	BP	100
CDR03BX123B--	12,000	K	BX	100
CDR03BX153B---	15,000	K,M	BX	100
CDR03BX183B---	18,000	K	BX	100
CDR03BX223B---	22,000	K,M	BX	100
CDR03BX273B---	27,000	K	BX	100
CDR03BX333B---	33,000	K,M	BX	100
CDR03BX393A---	39,000	K	BX	50
CDR03BX473A---	47,000	K,M	BX	50
CDR03BX563A---	56,000	K	BX	50
CDR03BX683A---	68,000	K,M	BX	50
AVX Style 1812/CDR04				
CDR04BP122B---	1200	J	BP	100
CDR04BP152B---	1500	J,K	BP	100
CDR04BP182B---	1800	J	BP	100
CDR04BP222B---	2200	J,K	BP	100
CDR04BP272B---	2700	J	BP	100
CDR04BP332B---	3300	J,K	BP	100
CDR04BX393B---	39,000	K	BX	100
CDR04BX473B---	47,000	K,M	BX	100
CDR04BX563B---	56,000	K	BX	100
CDR04BX823A---	82,000	K	BX	50
CDR04BX104A---	100,000	K,M	BX	50
CDR04BX124A---	120,000	K	BX	50
CDR04BX154A---	150,000	K,M	BX	50
CDR04BX184A---	180,000	K	BX	50
AVX Style 1825/CDR05				
CDR05BP392B---	3900	J,K	BP	100
CDR05BP472B---	4700	J,K	BP	100
CDR05BP562B---	5600	J,K	BP	100
CDR05BX683B---	68,000	K,M	BX	100
CDR05BX823B---	82,000	K	BX	100
CDR05BX104B---	100,000	K,M	BX	100
CDR05BX124B---	120,000	K	BX	100
CDR05BX154B---	150,000	K,M	BX	100
CDR05BX224A---	220,000	K,M	BX	50
CDR05BX274A---	270,000	K	BX	50
CDR05BX334A---	330,000	K,M	BX	50
AVX Style 2225/CDR06				
CDR06BP682B---	6800	J,K	BP	100
CDR06BP822B---	8200	J,K	BP	100
CDR06BP103B---	10,000	J,K	BP	100
CDR06BX394A---	390,000	K	BX	50
CDR06BX474A---	470,000	K,M	BX	50

Add appropriate failure rate

Add appropriate termination finish

Capacitance Tolerance

MIL-PRF-55681 Chips
CDR31-CDR35



The CDR31 through CDR35 series (MIL-PRF-55681) of high reliability, high frequency capacitors are available in BP and BX, voltage/temperature options. They have a metric dimension body size and are offered in 50 and 100V versions. Capacitance tolerance varies with capacitance and voltage specifications and failure rates are between "S" = 0.001% and "M" = 1.0%.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cdr31-35.pdf

HOW TO ORDER

CDR31	BP	101	B	K	S	M
MIL Style CDR31 CDR32 CDR33 CDR34 CDR35	**Voltage Temperature Limits** BP = 0 ± 30 ppm/ºC without voltage; 0 ± 30 ppm/ºC with rated voltage from -55ºC to +125ºC BX = ±15% without voltage; +15 -25% with rated voltage from -55ºC to +125ºC	**Capacitance** Two digit figures followed by multiplier (number of zeros to be added) e.g. 101 = 100pF	**Rated Voltage** A = 50V B = 100V	**Capacitance Tolerance** C = ±.25 pF D = ±.5 pF F = ±1% J = ±5% K = ±10% M = ±20%	**Termination Finish** M = Palladium Silver N = Silver Nickel Gold S = Solder-Coated Y = 100% Tin U = Base Metallization/Barrier Metal/Solder Coated* W = Base Metallization/Barrier Metal/Tinned (Tin or Tin/Lead Alloy)	**Failure Rate Level** M = 1.0% P = .1% R = .01% S = .001%

NOTE: Contact factory for availability of Termination and Tolerance Options for Specific Part Numbers.

*Solder shall have a melting point of 200ºC or less.

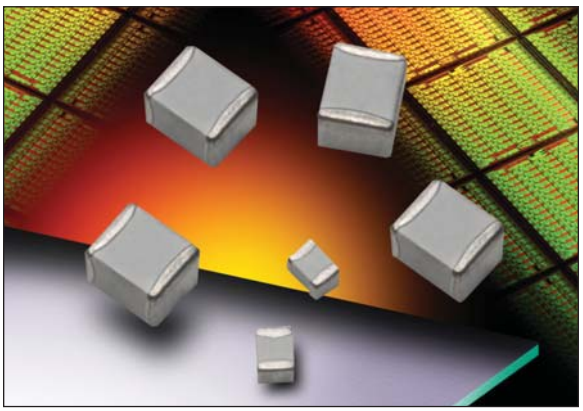
PACKAGING

Bulk is standard packaging. Tape and reel per RS481 is available upon request.

CDR31 thru CDR35 to MIL-PRF-55681

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
CDR31	BP	1.0 - 2.4	B,C	100
CDR31	BP	2.7 - 9.1	B,C,D	100
CDR31	BP	10.0 - 470	F,J,K	100
CDR31	BP	510 - 680	F,J,K	50
CDR31	BX	470 - 4,700	K,M	100
CDR31	BX	5,600 - 18,000	K,M	100
CDR32	BP	1.0 - 2.4	B,C	100
CDR32	BP	2.7 - 9.1	B,C,D	100
CDR32	BP	10.0 - 1,000	F,J,K	100
CDR32	BP	1,100 - 2,200	F,J,K	50
CDR32	BX	4,700 - 15,000	K,M	100
CDR32	BX	18,000 - 39,000	K,M	50
CDR33	BP	1,000 - 2,200	F,J,K	100
CDR33	BP	2,700 - 3,300	F,J,K	50
CDR33	BX	15,000 - 27,000	K,M	100
CDR33	BX	39,000 - 100,000	K,M	50
CDR34	BP	2,200 - 4,700	F,J,K	100
CDR34	BP	5,100 - 10,000	F,J,K	50
CDR34	BX	27,000 - 56,000	K,M	100
CDR34	BX	100,000 - 180,000	K,M	50
CDR35	BP	4,700 - 10,000	F,J,K	100
CDR35	BP	11,000 - 22,000	F,J,K	50
CDR35	BX	56,000 - 150,000	K,M	100
CDR35	BX	180,000 - 470,000	K,M	50

Additional Surface Mount MLCC with DSCC Approvals



These additional ranges of surface mount multilayer ceramic capacitors provide additional capability in 0603 and 0402 case sizes. DSCC 03028 covers 0603 case size BP and BR dielectric and DSCC 03029 is for 0402 case size in BP and BR dielectric.

For RF surface mount capacitor versions DSCC 06019 covers 0605 case size for BP and BG dielectric. DSCC 06022 is for 1210 case size and BP and BG dielectric devices.

DSCC 05002 covers RF capacitors in 0603 case size, C0G dielectric.

DSCC 03028 0603 Case Size

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
DSCC 03028	BP	0.5 - 9.1	C,D	6.3/10/16/25/50/100
DSCC 03028	BP	10 - 330	F,G,J	6.3/10/16/25/50/100
DSCC 03028	BP	390 - 1,000	F,G,J	6.3/10/16/25/50
DSCC 03028	BP	1,200 - 1,500	F,G,J	6.3/10/16/25
DSCC 03028	BR	100 - 1,000	K,M	6.3/10/16/25/50/100/200
DSCC 03028	BR	1,200 - 12,000	K,M	6.3/10/16/25/50/100
DSCC 03028	BR	15,000 - 39,000	K,M	6.3/10/16/25/50
DSCC 03028	BR	47,000	K,M	6.3/10/16/25
DSCC 03028	BR	56,000 - 100,000	K,M	6.3/10/16
DSCC 03028	BR	120,000 - 220,000	K,M	6.3/10

DSCC 03029 0402 Case Size

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
DSCC 03029	BP	0.5 - 9.1	C,D	6.3/10/16/25/50
DSCC 03029	BP	10 - 220	F,G,J	6.3/10/16/25/50
DSCC 03029	BP	270 - 330	F,G,J	6.3/10/16
DSCC 03029	BR	100 - 3,300	K,M	6.3/10/16/25/50
DSCC 03029	BR	3,900 - 4,700	K,M	6.3/10/16/25

DSCC 06019 RF Capacitor 0605 Case Size

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
DSCC 06019	BP,BG	0.1 - 0.2	B	50/150
DSCC 06019	BP,BG	0.3 - 0.4	B,C	50/150
DSCC 06019	BP,BG	0.5 - 6.2	B,C,D	50/150
DSCC 06019	BP,BG	6.8 - 9.1	B,C,J,K,M	50/150
DSCC 06019	BP,BG	10 - 100	F,G,J,K,M	50/150
DSCC 06019	BP,BG	110 - 1,000	F,G,J,K,M	50

DSCC 06022 RF Capacitor 1210 Case Size

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
DSCC 06022	BP,BG	0.1 - 0.2	B	200/500
DSCC 06022	BP,BG	0.3 - 0.4	B,C	200/500
DSCC 06022	BP,BG	0.5 - 6.2	B,C,D	200/500
DSCC 06022	BP,BG	6.8 - 9.1	B,C,J,K,M	200/500
DSCC 06022	BP,BG	10 - 100	F,G,J,K,M	200/500
DSCC 06022	BP,BG	110 - 200	F,G,J,K,M	200/300
DSCC 06022	BP,BG	220 - 470	F,G,J,K,M	200
DSCC 06022	BP,BG	510 - 620	F,G,J,K,M	100
DSCC 06022	BP,BG	680 - 1,000	F,G,J,K,M	50
DSCC 06022	BP	1,100 - 5,100	F,G,J,K,M	50

DSCC 05002 0603 Case Size

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
DSCC 05002	C0G	0.1 - 0.2	A,B	50/100/200/250
DSCC 05002	C0G	0.3 - 1	A,B,C	50/100/200/250
DSCC 05002	C0G	1.1 - 6.2	A,B,C,D	50/100/200/250
DSCC 05002	C0G	6.8 - 100	B,C,J,K,M	50/100/200/250

HOW TO ORDER

03028 — **Case Size**
03028 (0403)
03029 (0402)
05002 (0603)
05006 (0805)
05007 (1206)
06022 (1210)
06019 (0605)

BX — **Voltage Temperature Limits**
BP = 0 ± 30 ppm/ºC without voltage; 0 ± 30 ppm/ºC with rated voltage from -55ºC to +125ºC
BR = ±15% without voltage; +15 -40% with rated voltage from -55ºC to +125ºC
BX = ±15% without voltage; +15 -25% with rated voltage from -55ºC to +125ºC

102 — **Capacitance**
EIA Capacitance Code in pF
First two digits = significant figures or "R" for decimal place
Third digit = number of zeros or after "R" significant figures.

B — **Rated Voltage**
W = 6.3V
X = 10V
Y = 16V
Z = 25V
A = 50V
B = 100V
C = 200V

J — **Capacitance Tolerance**
B = ±.1 pF
C = ±.25 pF
D = ±.5 pF
F = ±1%
G = ±2%
J = ±5%
K = ±10%
M = ±20%

U — **Termination Finish**
M = Palladium Silver
U = Solder Coated (4% Lead min) Melting Point of 200ºC
Z = Tin/Lead Alloy with 4% Lead

— — **Options**
C = Full Group G
L = 2000 Hour Life
M = 1000 Hour Life
H = Low Voltage Humidity

Extended Range Surface Mount MLCC to DSCC Drawings

These extended range surface mount, multilayer ceramic capacitors provide options for lower voltages and higher capacitance versions to DSCC drawings. Dielectric options are BP, BR and BX. DSCC 05006 covers 0805 case size and DSCC 05007 provides the 1206 case size capability.

DSCC 05006 0805 Case Size

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
DSCC 05006	BP	0.5	C,D	16/25/50/100/200
DSCC 05006	BP	1 - 8.2	C,D	16/25/50/200
DSCC 05006	BP	10 - 470	F,G,J	16/25/50/200
DSCC 05006	BP	560 - 680	F,G,J	16/25/100/200
DSCC 05006	BP	820 - 1,000	F,G,J	16/25/50/100
DSCC 05006	BP	1,200 - 3,900	F,G,J	16/25/50
DSCC 05006	BP	4,700 - 5,600	F,G,J	16/25
DSCC 05006	BP	6,800 - 8,200	F,G,J	16
DSCC 05006	BR	330 - 22,000	K,M	10/16/25/50/100/200
DSCC 05006	BR	33,000 - 47,000	K,M	10/16/25/50/100
DSCC 05006	BR	68,000 - 100,000	K,M	10/16/25/50/100
DSCC 05006	BR	150,000	K,M	10/16/25/50
DSCC 05006	BR	220,000	K,M	10/16/25
DSCC 05006	BR	330,000 - 470,000	K,M	10/16
DSCC 05006	BR	680,000 - 1µF	K,M	10

DSCC 05007 1206 Case Size

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
DSCC 05007	BP	0.5 - 8.2	C,D	16/25/50/100/200
DSCC 05007	BP	10 - 680	F,G,J	16/25/50/100/200
DSCC 05007	BP	820 - 1,000	F,G,J	16/25/50/100
DSCC 05007	BP	1,200 - 3,900	F,G,J	16/25/50
DSCC 05007	BP	4,700 - 5,600	F,G,J	16/25
DSCC 05007	BP	6,800 - 8,200	F,G,J	16
DSCC 05007	BR	1,500 - 6,800	K,M	10/16/25/50/100/200
DSCC 05007	BR	10,000	K,M	10/16/25/50/100
DSCC 05007	BR	15,000 - 33,000	K,M	10/16/25/50
DSCC 05007	BR	47,000	K,M	10/16/25
DSCC 05007	BR	68,000	K,M	10/16
DSCC 05007	BR	100,000	K,M	10/16/25
DSCC 05007	BR	150,000 - 220,000	K,M	10

HOW TO ORDER

03028 — **Case Size**
03028 (0403)
03029 (0402)
05002 (0603)
05006 (0805)
05007 (1206)
06022 (1210)
06019 (0605)

BX — **Voltage Temperature Limits**
BP = 0 ± 30 ppm/ºC without voltage; 0 ± 30 ppm/ºC with rated voltage from -55ºC to +125ºC
BR = ±15% without voltage; +15 -40% with rated voltage from -55ºC to +125ºC
BX = ±15% without voltage; +15 -25% with rated voltage from -55ºC to +125ºC

102 — **Capacitance**
EIA Capacitance Code in pF
First two digits = significant figures or "R" for decimal place
Third digit = number of zeros or after "R" significant figures.

B — **Rated Voltage**
W = 6.3V
X = 10V
Y = 16V
Z = 25V
A = 50V
B = 100V
C = 200V

J — **Capacitance Tolerance**
B = ±.1 pF
C = ±.25 pF
D = ±.5 pF
F = ±1%
G = ±2%
J = ±5%
K = ±10%
M = ±20%

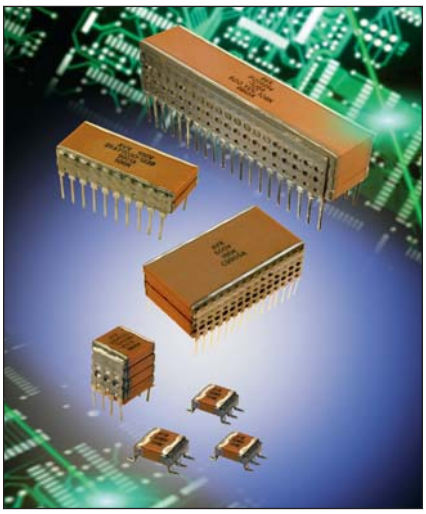
U — **Termination Finish**
M = Palladium Silver
U = Solder Coated (4% Lead min) Melting Point of 200ºC
Z = Tin/Lead Alloy with 4% Lead

— — **Options**
C = Full Group G
L = 2000 Hour Life
M = 1000 Hour Life
H = Low Voltage Humidity

Stacked Leaded MLC Capacitors

SM0 Series

AVX IS QUALIFIED TO MIL-PRF-49470/1 AND MIL-PRF-49470/2



The SMPS capacitors are designed for high current, high-power and high-temperature applications. These capacitors have very low ESR (Equivalent Series Resistance) and ESL (Equivalent Series Inductance). SMPS Series capacitors offer design and component engineers a proven technology specifically designed for programs requiring high reliability performance in harsh environments.

MIL-PRF-49470 SMPS Series capacitors are primarily used in input/output filters of high-power and high-voltage power supplies as well as in bus filters and DC snubbers for high power inverters and other high-current applications. These capacitors are available with through-hole and surface mount leads. The operating temperature is -55°C to +125°C.

The MIL-PRF-49470 capacitors are preferred over the DSCC drawing 87106 capacitors. MIL-PRF-49470 specification was created to produce a robust replacement for DSCC 87106. MIL-PRF-49470 offers two product levels.

Level "B" is the standard reliability. Level "T" is the high reliability suitable for space application.

AVX is qualified to supply MIL-PRF-49470/1 parts. These are unencapsulated ceramic dielectric, switch mode power supply capacitors. AVX is also qualified to supply MIL-PRF-49470/2 parts. These are encapsulated ceramic dielectric, switch mode power supply capacitors.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sm01-06.pdf

HOW TO ORDER AVX Styles: SM-1, SM-2, SM-3, SM-4, SM-5, SM-6

SM0	1	7	C	106	M	B	N	650
AVX Style Size SM0 = Uncoated SM5 = Epoxy Coated	**Size**	**Voltage** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Temperature Coefficient** C0G = A X7R = C	**Capacitance Code** (2 significant digits + no. of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** B = Hi-Rel*	**Termination** N = Straight Lead J = Leads formed in L = Leads formed out	**Height** Max Dimension "A" 120 = 0.120" 240 = 0.240" 360 = 0.360" 480 = 0.480" 650 = 0.650"

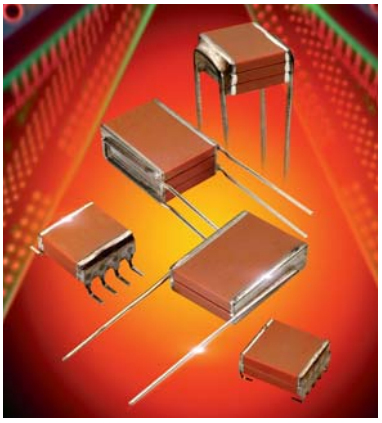
Note: Capacitors with X7R and Z5U dielectrics are not intended for applications across AC supply mains or AC line filtering with polarity reversal. Contact plant for recommendations.

*Hi-Rel screening for C0G and X7R only. Screening consists of 100% Group A (B Level), Subgroup 1 per MIL-PRF-49470.

SIZE CODE		CASE CODE 1				CASE CODE 2				CASE CODE 3				CASE CODE 4				CASE CODE 5				CASE CODE 6			
CAP		WVDC				WVDC				WVDC				WVDC				WVDC				WVDC			
µF	Code	BX	BX	BR	BQ	BX	BX	BR	BQ	BX	BX	BR	BQ	BX	BX	BR	BQ	BX	BX	BR	BQ	BX	BX	BR	BQ
		50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500	50	100	200	500
0.15	154																								
0.18	184																								
0.22	224																								
0.27	274																								
0.33	334																								
0.39	394																								
0.47	474																								
0.56	564																								
0.68	684																								
0.82	824																								
1.0	105																								
1.2	125																								
1.5	155																								
1.8	185																								
2.2	225																								
2.7	275																								
3.3	335																								
3.9	395																								
4.7	475																								
5.6	565																								
6.8	685																								
8.2	825																								
10	106																								
12	126																								
15	156																								
18	186																								
22	226																								
27	276																								
33	336																								
39	396																								
47	476																								
56	566																								
68	686																								
82	826																								
100	107																								
120	127																								
150	157																								
180	187																								
220	227																								
270	277																								

Stacked Leaded MLC Capacitors

CH-CV Series



10nF to 180 µF
50V to 500 VDC
-55ºC to +125ºC
50-500V ESCC 3001/030
BS9100 approved
Low ESR/ESL
1B/C0G and 2C1/X7R Dielectrics
1-3kV ESCC 3001/034

This range allows SMPS engineers to select the best volumetric solution for input and output filter applications in high reliability designs. Utilizing advanced multilayer ceramic techniques to minimize ESR/ESL giving high current handling properties appropriate for filtering, smoothing and decoupling circuits. CH-CV series parts are qualified for ESA.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/ch&cvca.pdf

HOW TO ORDER

CV	52	5	C	106	M	G	3	0	A	2
Style Code	**Size Code**	**Voltage Code** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric Code** A = C0G C = X7R	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20% P = -0 +100%	**Specification Code** A = Non-customized G = 9100	**Finish Code** 3 = Uncoated 8 = Coated (classified as uninsulated)	**Lead Dia. Code** 0 = Standard	**Lead Space Code** A = Standard	**Lead Style Code** 2 = 2 Terminal 4 = 4 Terminal This style is only available in 3 & 4 chip assemblies

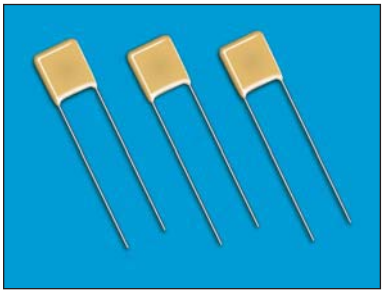
CH	52	5	C	106	M	G	3	0	A	0
Style Code	**Size Code**	**Voltage Code** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric Code** A = C0G C = X7R	**Capacitance Code** (2 significant digits + no. of zeros) Examples: 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** J = ±5% K = ±10% M = ±20% P = -0 +100%	**Specification Code** A = Non-customized G = 9100	**Finish Code** 3 = Uncoated 8 = Coated (classified as uninsulated)	**Lead Dia. Code** 0 = Standard	**Lead Space Code** A = Standard	**Lead Style Code** 0 = Straight dual in line 4 = 4 Terminal

CAPACITANCE VALUE

		C0G Min Cap µF	C0G Max Cap µF	X7R Min Cap µF	X7R Max Cap µF
CH/CV41-44	50	0.068	0.39	1.8	12
	100	0.047	0.33	1.0	10
	200	0.033	0.27	0.33	2.2
	500	0.01	0.068	0.12	1.0
CH/CV51-54	50	0.12	0.68	3.9	22
	100	0.10	0.47	2.2	15
	200	0.068	0.39	0.68	3.9
	500	0.022	0.1	0.27	1.5
CH/CV61-64	50	0.22	1.2	6.8	39
	100	0.15	1.0	4.7	33
	200	0.12	0.68	1.0	10
	500	0.033	0.22	0.47	3.3
CH/CV71-74	50	0.39	2.2	12	68
	100	0.27	1.8	8.2	47
	200	0.22	1.2	2.2	12
	500	0.068	0.39	0.82	5.6
CH/CV76-79	50	0.39	2.2	12	68
	100	0.27	1.8	8.2	47
	200	0.22	1.2	2.2	12
	500	0.068	0.39	0.82	5.6
CH/CV81-84	50	0.39	2.7	15	82
	100	0.27	2.2	12	47
	200	0.22	1.8	2.2	12
	500	0.068	0.56	0.82	5.6
CH/CV86-89	50	0.68	3.9	22	120
	100	0.56	3.3	15	68
	200	0.39	2.7	3.9	27
	500	0.12	0.82	1.5	8.2
CH/CV91-94	50	1.2	5.6	39	180
	100	1.0	4.7	33	150
	200	0.82	3.9	8.2	39
	500	0.22	1.5	2.7	18

Leaded SMPS MLCC

BR Series (CECC) for Output Filtering



AVX also offers ESA qualified and CECC approved SMPS capacitors, the BR series. These are coated radial capacitors that are offered in ranges from 50V to 500V and available in C0G and X7R type dielectrics. These capacitors are designed to withstand the harsh conditions found in input and output filtering requirements for today's demanding switch mode power supply applications. Customized and custom versions are also available.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/smpscecc.pdf

HOW TO ORDER

BR	84	1	C	156	K	T	A
Style Code	**Size Code**	**Voltage Code** 5 = 50V 1 = 100V 2 = 200V 7 = 500V	**Dielectric Code** A = C0G C = X7R	**Capacitance Code** 2 Sig. Digits + Number of Zeros	**Capacitance Tolerance** G = ±2% C0G only J = ±5% C0G only K = ±10% M = ±20% P = -0 +100%	**Specification Code** T = CECC	**Lead Length Code** A = 31.7mm min.

Note: If tape and reel is required, add TR to the end of the part number.

CECC Offering

	1B/C0G CECC 30 601 801 Issue 1				2C1/X7R CECC 30 701 801 Issue 1			
	50V	**100V**	**200V**	**500V**	**50V**	**100V**	**200V**	**500V**
BR40	683-104	473-683	333-473	4R5-153	185-275	125-185	334-474	473-154
BR50	124-224	104-154	683-104	820-333	395-475	225-395	684-105	104-394
BR84	104-564	104-474	104-334	223-104	475-186	475-156	105-335	474-155

High Voltage Ceramic Capacitors

Type HP/HW

Type HD/HE

SELECTION GUIDE

Main Signal Component	Application	Series	Type	Size	Finish
Pulses AC or DC	High Energy Pulses or AC or DC	Molded discs with connections	HP	30 40 50 60	Epoxy potted
		Uncoated discs with connections	HW	30 40 50 60	Uncoated
AC	AC Voltage dividers at line frequency	Molded discs with connectors	HD	30 40 60	Epoxy potted
		Uncoated discs with connectors	HE	30 40 60	Uncoated

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/hp-hw-hk.pdf

GENERAL CHARACTERISTICS

HIGH VOLTAGE / AC USES

- The main applications include live line indicators, AC dividers, grading systems for power distribution network, protection for HV switches and power circuit breakers. Coupling, by-passing high frequency circuits also use HV ceramic disc capacitors.
- These applications require:
  - a high internal resistance.
  - a high dielectric strength.
  - low or moderate losses at working frequencies (from 50 Hz up to 10 kHz).

  The active power (or losses) being:

  $Wa = 2\Pi FC \cdot tg\ \delta \cdot V^2 = k\ (C \cdot tg\ \delta)\ (F \cdot V^2)$

  This shows that improved performances are obtained when:
  - Good dielectric properties (low tg δ) and
  - No long term overvoltage are present and
  - Capacitors free of "partial discharge" (corona) effect, up to rated rms voltage.

  TPC is able to perform "discharge free test" and may guarantee a rate as low as 5 picocoulombs at V_{rms} upon request.
- High voltage capacitors for AC uses are mainly made of type II dielectrics. Most of these materials except strontium titanate exhibit a significant non-linearity. Consequently, the capacitance value depends on the voltage across the component and on the frequency of the applied signal.

HIGH ENERGY PULSES

- Laser pulses circuitry, high energy/high voltage test equipment (HV accelerators, physics research) require products especially adapted to their specific requirements.
- Because of the high energy involved, the design of the capacitors have to provide:
  - a very low ESR (equivalent series resistance) to mini-mize the lossed energy.

    $$W = \int^{ip} (ESR \cdot I^2)\ di$$

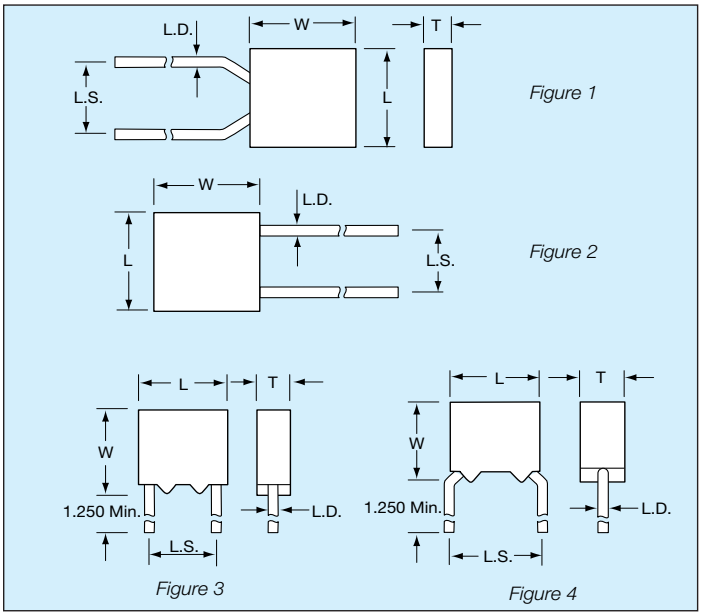
  - a very low ESL (equivalent series inductance) to keep the correct pulse shape.

    Typically due to the design of the electrodes, the products exhibit:
    - ESR: ~ 10 mΩ
    - ESL: < 30 nH
    - peak current up to 50 kA
  - a high withstanding of very large $\frac{dV}{dt}$ or short signal rise time.
  - a high energy density J

    $J = \frac{1}{2}\ k\ \varepsilon_o\ \varepsilon_r\ E^2$ (with E = V/m)

    even under high electric field, (implying that ε_r is very little voltage dependent).

    Through the use of almost linear or non-voltage dependent capacitors, the stored energy can reach 50 to 100 J/liter for the HP/HW products.
- To ensure these properties, traditional ferroelectric type II capacitors cannot be used due to their electrostrictive and piezoelectric properties. The capacitors use quasi "paraelectric", strontium-based, ceramic material.
- The main applications are coupling, decoupling, multipliers circuits, HV DC power supplies, high voltage dividers.



The CKR series of multilayer ceramic capacitors are molded radial and molded axial leaded devices. They provide a rugged construction and are designed specifically for military applications. Terminations are Tin/Lead for improved solderability. Available to military specifications MIL-PRF-39014, MIL-PRF-20 and MIL-C-11014.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/ckr04-24.pdf

HOW TO ORDER

Military Type Designation: Styles CKR04, CKR05, CKR06, CKR08, CKR11, CKR12, CKR14, CKR15, CKR16

Dash Number Option: MIL-PRF-39014/01 (Appropriate Dash Number)

CKR05 — **Style**
CK = General purpose, ceramic dielectric, fixed capacitors
R = Established Reliability Parts
05 = Remaining two numbers identify shape and dimension
11 = Remaining two numbers identify shape and dimension

BX — **Voltage-Temperature Limits**
First letter identifies temperature range.
B = -55ºC to +125ºC
Second letter identifies voltage-temperature coefficient.

Capacitance Change with Reference to 25°C		
Second Letter	No Voltage	Rated Voltage
X	+15, -15%	+15, -25%
R Axial Only	+15, -15%	+15, -40%

104 — **Capacitance**
First two digits are the significant figures of capacitance. Third digit indicates the additional number of zeros. For example, order 100,000 pF as 104. (For values below 10pF use "R" in place of decimal point, e.g., 1R4 = 1.4pF.)

K — **Capacitance Tolerance**
K = ±10%
M = ±20%

S — **Military Failure Rate**
M = 1% per 1000 hours
P = 0.1% per 1000 hours
R = 0.01% per 1000 hours
S = 0.001% per 1000 hours
Note:
AVX reserves the right to substitute a lower failure rate part per MIL-PRF-39014. Substitutability for failure rate levels shall be as follows:

Failure Rate Level	Will Replace Failure Rate Level
S (STD) (X-ray)	R, P, M, L
R (STD) (No X-ray)	P, M, L
P	M,L
M	L

(V) — **Standoff Option**
To order standoff option, place "V" at the end of the part number.
Example:
CKR05BX104KSV

PACKAGING REQUIREMENTS

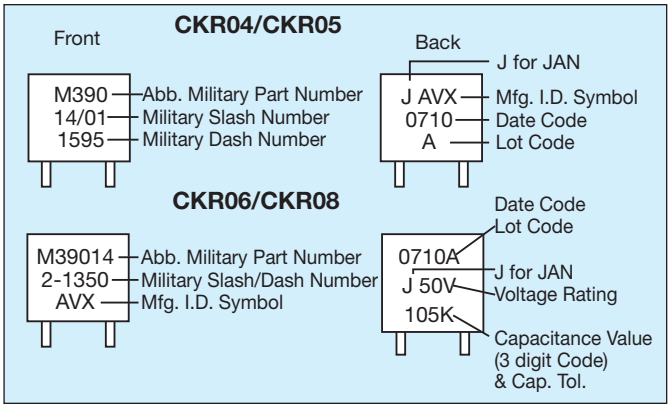
Packaging: 100 Pcs/bag; Radial Tape and Reel Packaging available upon request (2500 pcs./reel).

SIZE SPECIFICATIONS

Dimensions: Millimeters (Inches)

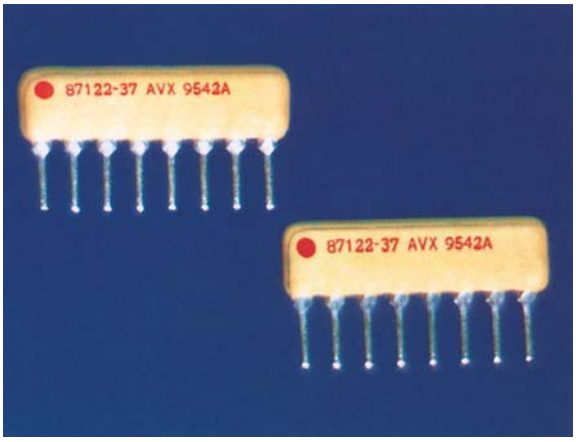
Per Mil Spec	Case Size				
MIL-PRF-39014	Length (L)	Width (W)	Thickness (T)	Lead Spacing (L.S.)	Lead Diameter (L.D.)
CKR04 *(Fig. 2)*	4.83±.25 (.190±.010)	4.83±.25 (.190±.010)	2.29±.25 (.090±.010)	2.54±.38 (.100±.015)	.64±.05 (.025±.002)
CKR05 *(Fig. 1, 4)*	4.83±.25 (.190±.010)	4.83±.25 (.190±.010)	2.29±.25 (.090±.010)	5.08±.38 (.200±.015)	.64±.05 (.025±.002)
CKR06 *(Fig. 2, 3)*	7.37±.25 (.290±.010)	7.37±.25 (.290±.010)	2.29±.25 (.090±.010)	5.08±.38 (.200±.015)	.64±.05 (.025±.002)
CKR08 *(Fig. 2)*	7.37±.25 (.290±.010)	7.37±.25 (.290±.010)	3.68±.38 (.145±.015)	5.08±.38 (.200±.015)	.64±.05 (.025±.002)

MARKING RADIAL LEAD



Single-In-Line Packages (SIP)

Capacitor Arrays



SIP-style, MLC ceramic capacitor arrays are Single-In-Line, conformally coated packages. These capacitor networks incorporate multiple capacitors into a single substrate and, therefore, offer excellent TC tracking. The utilization of SIP capacitor arrays minimizes board real estate and reduces component count in the assembly. Various circuit configurations and capacitance/voltage values are available.

HOW TO ORDER

SP	A	1	1	A	561	K	A	A
AVX Style	**Circuit**	**Lead Style**	**Voltage** 5 = 50V 1 = 100V	**Temperature Coefficient** C0G = A X7R = C Z5U = E	**Capacitance Code** (2 significant digits + no. of zeros) 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 µF = 105 10 µF = 106 100 µF = 107	**Capacitance Tolerance** C0G: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20%	**Test Level** A = Standard	**Number of Leads** 2 = 2 3 = 3 4 = 4 5 = 5 6 = 6 7 = 7 8 = 8 9 = 9 A = 10 B = 11 C = 12 D = 13 E = 14

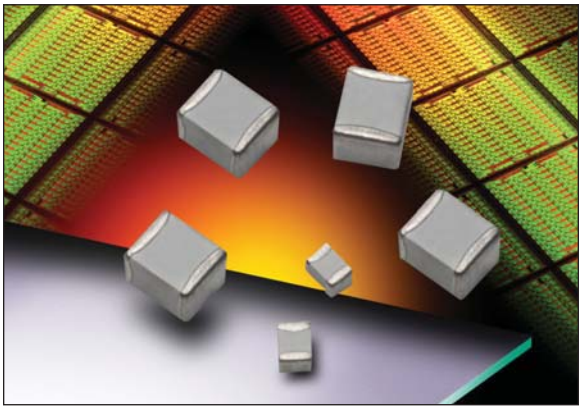
Maximum Capacitance*		
	50V	**100V**
C0G	2200 pF	1500 pF
X7R	0.10 µF	0.033 µF
Z5U	0.39 µF	0.10 µF

*For dimensions, voltages, or capacitance values not specified, please contact factory.

AVX IS QUALIFIED TO THE FOLLOWING DSCC DRAWINGS

SPECIFICATION #	DESCRIPTION	CIRCUIT	LEADS	CAPACITANCE RANGE
87112	BX-100 VDC	A	8	1000 pF - 0.1 µF
87116	C0G-100 VDC	A	8	10 pF - 820 pF
87119	BX-100 VDC	C	10	1000 pF - 0.1 µF
87120	C0G-100 VDC	C	10	10 pF - 1000 pF
87122	BX-100 VDC	B	8	1000 pF - 0.1 µF
88019	BX-100 VDC	A	10	1000 pF - 0.1 µF
89086	C0G-100 VDC	B	8	10 pF - 820 pF

MIL-PRF-55681 Chips
CDR11-CDR14



The CDR11 through CDR14 series (MIL-PRF-55681) of high reliability, high frequency capacitors are available in BG and BP, voltage/temperature options. They are offered in versions from 50 to 500V. Case sizes are 0605 for CDR11 & 12 and 1111 for CDR13 & 14. Failure rate are between "S" = 0.001% and "M" = 1.0%.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/cdr11-14.pdf

HOW TO ORDER

CDR12	BG	101	A	K	U	S
MIL Style CDR11 CDR12 CDR13 CDR14	**Voltage Temperature Limits** BG = +90 ± 20 ppm/ºC with and without rated voltage from -55ºC to +125ºC BP = 0 ± 30 ppm/ºC with and without rated voltage from -55ºC to +125ºC	**Capacitance** EIA Capacitance Code in pF First two digits = significant figures or "R" for decimal place Third digit = number of zeros or after "R" significant figures.	**Rated Voltage** A = 50V B = 100V C = 200V D = 300V E = 500V	**Capacitance Tolerance** B = ±.1 pF C = ±.25 pF D = ±.5 pF F = ±1% G = ±2% J = ±5% K = ±10% M = ±20%	**Termination Finish (Military Designations) Code** M = Palladium Silver (CDR11 & 13 only) N = Silver, Nickel, Gold (CDR11 & 13 only) S = Solder-Coated, Final (CDR12 & 14 only) U = Base Metallization/Barrier Metal/Solder Coated* (CDR12 & 14 only) W = Base Metallization/Barrier Metal/Tinned (Tin or Tin/Lead Alloy) (CDR12 & 14 only) Y = 100% Tin Z = Base Metallization, Barrier Metal (Tin/Lead Alloy with 4% Lead Min.)	**Failure Rate Level** M = 1.0% P = .1% R = .01% S = .001%

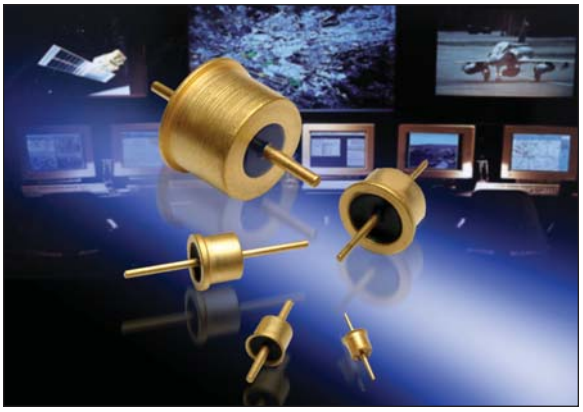
PACKAGING

Standard packaging = Waffle Pack (maximum quantity is 80)

CDR11 thru CDR14 to MIL-PRF-55681

Type	Dielectric	Capacitance pF	Tolerance	Voltage WVDC
CDR11/12	BG,BP	0.1 - 0.2	B	50
CDR11/12	BG,BP	0.3 - 0.4	B,C	50
CDR11/12	BG,BP	0.5 - 6.2	B,C,D	50
CDR11/12	BG,BP	6.8 - 9.1	B,C,J,K,M	50
CDR11/12	BG,BP	10 - 100	F,G,J,K,M	50
CDR11/12	BP	110 - 1,000	F,G,J,K,M	50
CDR13/14	BG,BP	0.1 - 0.2	B	200/500
CDR13/14	BG,BP	0.3 - 0.4	B,C	200/500
CDR13/14	BG,BP	0.5 - 6.2	B,C,D	200/500
CDR13/14	BG,BP	6.8 - 9.1	B,C,J,K,M	200/500
CDR13/14	BG,BP	10 - 100	F,G,J,K,M	200/500
CDR13/14	BG,BP	110 - 200	F,G,J,K,M	200/300
CDR13/14	BG,BP	220 - 470	F,G,J,K,M	200
CDR13/14	BG,BP	510 - 620	F,G,J,K,M	100
CDR13/14	BG,BP	680 - 1,000	F,G,J,K,M	50
CDR13/14	BP	1,100 - 5,100	F,G,J,K,M	50

Solder-in Style EMI Filter



AVX solder-in style C and L section filters, utilize patented conductive polymer technology to provide effective attenuation in the RF to microwave frequency spectrum from 10MHz to 50GHz. Designed in accordance with MIL-PRF-28861, they perform well in high impedance circuits where large capacitance values are not practical. They are ideal for filtering signal/data lines of high impedance source and load systems. These filters are designed to be soldered into a package, bracket or bulkhead (and maintain hermeticity).

CHARACTERISTICS

- Miniature and Microminiature versions for Aerospace applications
- High temperature construction, withstands 300ºC installation temperatures
- Rugged monolithic discoidal capacitor construction
- Custom lead lengths and capacitance values available on request
- Glass hermetic seal on one end with epoxy on the opposite end
- High purity gold plating provides excellent solderability or compatibility with thermal and ultrasonic wire bonding
- Rated DC current up to 10A
- NASA SSQ 21215-21218

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/zs-zr.pdf

HOW TO ORDER

ZS	2	C	2	B	103	H

Style
ZZ = (.118 Dia.) M28861/12
ZYS* = (.105 Dia.)
ZXS* = (.075 Dia.)
ZZS* = (.120 Dia.)
ZS* = (.128 Dia.) M28861/12
ZR* = (.128 Dia.) M28861/12
YS* = (.165 Dia.) M28861/15
YR* = (.165 Dia.) M28861/15
XS* = (.250 Dia.) M28861/14
XR* = (.250 Dia.) M28861/14
WS* = (.400 Dia.) M28861/13
WR* = (.400 Dia.) M28861/13

Circuit
1 = C Section (Feed Thru)
2 = L-Section
8 = Grounded Feed Thru

Voltage
A = 100 VDC
B = 200 VDC
C = 50 VDC
E = 400 VDC/230 VAC OR 400 VDC
K = 250 VDC
L = 300 VDC OR 200 VDC/115 VAC
M = 350 VDC
N = 70 VDC
Y = 300 VDC
Z = 400 VDC
X = 500 VDC

*Glass Seal Orientation:
S = Standard
R = Reverse
N = No Glass (Epoxy both Sides)
M = Mid Flange

Options
1 = Copper (std. for non-hermetic)
2 = Nickel Iron (std.)
3 = Special
4 = Aluminum compatible with seating flange (std. lead)
5 = Aluminum compatible with seating flange (special lead)
D = Aluminum compatible with centering flange (std. lead)
E = Aluminum compatible with centering flange (special lead)
F = Aluminum compatible special design
Y = Solder

MIL-28861 Screening
B = Class B
S = Class S

3 Digit Capacitor Code (in pF)

H = Polyimide
Y = Solder
Z = Braze

Style	Capacitance Range (in pF if not indicated)					Current Rating	Circuit Available
	50VDC	100VDC	200VDC/115VAC	400VDC/230VAC	500VDC		
ZXS	5-5,600	5-1,800	5-1,000	–	–	1.5A	C
ZYS	5-22,000	5-8,200	5-4,700	5-2,700	–	2.5A	C
ZZS	5-27,000	5-10,000	5-5,600	5-3,300	5-1,800	5A	C, L
ZZ	5-27,000	5-10,000	5-5,600	5-3,300	5-1,800	5A	C
ZS/ZR	5-33,000	5-12,000	5-6,800	5-3,900	5-2,200	5A	C, L
YS/YR	5-68,000	5-27,000	5-18,000	5-10,000	5-6,800	5A	C, L
XS/XR	5pF-.39µF	5pF-.15µF	5pF-.1µF	5pF-.056µF	5pF-.033µF	10A	C, L
WS/WR	5pF-1.8µF	5pF-.68µF	5pF-.39µF	5pF-.22µF	5pF-.15µF	15A	C, L

Bolt-in Style EMI Filter

AVX bolt-in style Pi filters, utilize discoidal capacitor technology to provide effective attenuation in the RF to microwave frequency spectrum from 10MHz to 26GHz.

Some versions offer large hex sizes which mean much higher capacitance levels are available and that a 125 VAC/400Hz rating can be offered for certain values.

In the "L" section version an internal ferrite bead element provides both inductance and series resistance which improves insertion loss and provides superior transient performance. They are ideal for filtering signal/data lines of high impedance source and load systems. These filters are designed to be mounted in a tapped bulkhead or with a standard nut and lock-washer provided.

CHARACTERISTICS (Varies with series)

- Miniature and Subminiature versions available
- Rugged monolithic discoidal capacitor construction
- Epoxy seal at both ends
- Conservatively rated for 125VAC/400Hz
- Pi design offers steeper insertion loss
- NASA SSQ 21215-21218

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/sbbolt.pdf

HOW TO ORDER

SB	2	A	1	–	103
Style	**Circuit**	**Voltage Rating**	**Options**	**MIL-28861 Screening**	3 Digit Capacitor Code (in pF)
SXD = 1-64 Epoxy Sealed SYD = 2-56 Epoxy Sealed SZD = 2-56 Epoxy Sealed SA = 4-40 Epoxy Sealed SG = 6-32 Epoxy Sealed SB = 8-32 Epoxy Sealed SM = 8-32 Hermetic Sealed SH = 10-32 Epoxy Sealed SJ = 12-28 Epoxy Sealed SC = 12-32 Epoxy Sealed (.187 HEX) SP = 12-32 Epoxy Sealed (.250 HEX) SN = 12-32 Hermetic Sealed SL = ¼-28 Epoxy Sealed SD = 5/16-24 Epoxy Sealed SF = 5/16-32 Epoxy Sealed	1 = Feed Thru (C) 2 = L-Section (L) 3 = PI-Section (π) 8 = Grounded Feed Thru	A = 100 VDC B = 200 VDC C = 50 VDC F = 500 VDC G = 1000 VDC H = 150 VDC J = 600 VDC K = 250 VDC L = 200 VDC/125 VAC M = 350 VDC N = 70 VDC X = 500 VDC Y = 300 VDC	1 = Copper 2 = Steel 3 = Special Lead Design 4 = Beryllium Copper G = Olean Exact Equivalent	B = Class B S = Class S	

Style	Capacitance Range (in pF if not indicated)					Current Rating	Circuit Available
	50VDC	100VDC	200VDC/115VAC	400VDC/230VAC	500VDC		
SXD	5-5,600	5-1,800	5-1,000	–	–	3A	C, L
SYD	5-6,200	5-2,200	5-1,200	–	–	3A	C, L
SZD	5-22,000	5-8,200	5-4,700	5-2,700	–	5A	C, L
SA	5-33,000	5-12,000	5-6,800	5-3,900	5-2,200	5A	C, L
SG	5-33,000	5-12,000	5-6,800	5-3,900	5-2,200	5A	C, L
SB/SM	5-33,000	5-12,000	5-6,800	5-3,900	5-2,200	10A	C, L, π
SH	5pF-.33μF	5pF-.12μF	5pF-.082μF	5pF-.047μF	5pF-.027μF	10A	C, L, π
SJ/SC/SP/SN	5pF-.33μF	5pF-.12μF	5pF-.082μF	5pF-.047μF	5pF-.027μF	10A	C, L, π
SL/SD/SF	5pF-1.5μF	5pF-.56μF	5pF-.39μF	5pF-.22μF	5pF-.12μF	25A	C, L, π

Cylindrical Style EMI Filter

AVX cylindrical style EMI filters offer effective filtering from 14KHz to 10GHz. Sealing options include epoxy sealed at both ends to optimize volumetric efficiency and cost, and a glass to metal hermetic seal version for severe moisture environments. They are designed for bulkhead mounting in a slotted hole with a nut and lockwasher supplied. These are ideal for low to medium impedance circuits where large amounts of capacitance to ground can be tolerated. In the "L" section version, an internal wound toroidal or ferrite bead element provides both inductance and series resistance which improves insertion loss at lower current ratings as well as superior transient performance.

CHARACTERISTICS (Varies with series)

- High DC current rating up to 25A
- Impervious to high moisture, solvents and other severe environmental conditions
- High capacitance values
- A 230VAC "T" section can handle very high pulse currents
- NASA SSQ 21215-21218

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/gkcyl.pdf

HOW TO ORDER

G	K	2	A	A	–	S07	X

Basic Style
A = Button Type (.410 Dia.)
B = Button Type (.375 Dia.)
C = Extended Button
G = .375 Dia.
J = .690 Dia.
H = .410 Dia.
Q = Special

Thread Type
K = ¼-28 Herm. Seal
L = ¼-28 Epoxy Seal
M = 8-32 Herm. Seal
N = 12-32 Herm. Seal
T = ¼-28 Post Terminal (Both Ends)
V = ¼-28 Post and Flag Terminal
X = ¼-28 Hex Adapter
Y = 5/8-24 Epoxy Sealed
D = 5/16-24
F = 5/16-32
Z = Special

Circuit
0 = Feed Thru Lead (Without Capacitor)
1 = Feed Thru Capacitor
2 = L-Section Filter
3 = PI Filter
4 = T-Section
5 = Double L-Section
6 = Five Element Cap Input
7 = Five Element IND Input
8 = Grounded Feed Thru

Voltage
A = 100 VDC
B = 200 VDC
C = 50 VDC
E = 400 VDC/230 VAC
F = 500 VDC
G = 1000 VDC
H = 150 VDC
J = 600 VDC
K = 250 VDC
L = 200 VDC/125 VAC (EXCEPT JD SERIES 300 VDC/125 VAC)
M = 350 VDC
N = 70 VDC
X = 500 VDC
Y = 300 VDC
W = 400 VDC

Thread Length
A = .187
B = .312
C = Special

MIL-28861 Screening
B = Class B
S = Class S

Plating Finish
G = Gold
S = Silver

Feed Thrus and BK2, CK2

XXX
Capacitance in Picofarads

Circuit
S = Standard L (Inductor on Thread End)
R = Reverse L (Capacitor at Thread End)
P = PI Circuit
T = T Circuit

All Other Circuit Types

Current Rating

Code	Current	Code	Current
01	.06 Amp	09	2
02	.1	10	3
03	.15	11	5
04	.25	12	10
05	.3	16	4
06	.45	17	6
07	.5	18	.75
08	1	19	1.5

Style	Capacitance Range					Current Rating	Circuit Available
	50VDC	100VDC	200VDC/115VAC	400VDC/230VAC	500VDC		
BL	5pF-1.5µF	5pF-.56µF	5pF-.39µF	5pF-.22µF	5pF-.12µF	15A	C, L
BK	5pF-1.5µF	5pF-.56µF	5pF-.39µF	5pF-.22µF	5pF-.12µF	15A	C, L
AK	5pF-1.8µF	5pF-.68µF	5pF-.39µF	5pF-.27µF	5pF-.15µF	15A	C, L
CK	5pF-1.5µF	5pF-.56µF	5pF-.39µF	5pF-.22µF	5pF-.12µF	15A	C, L
GK	5pF-1.5µF	5pF-.56µF	5pF-.39µF	5pF-.22µF	5pF-.12µF	Up to 15A	C, L, π, T
HK	5pF-1.8µF	5pF-.68µF	5pF-.39µF	5pF-.27µF	5pF-.15µF	Up to 15A	C, L, π, T
JD	5pF-1.8µF	5pF-.68µF	5pF-.39µF	5pF-.27µF	5pF-.15µF	Up to 15A	C, L, π, T

Custom EMI Filter Assemblies

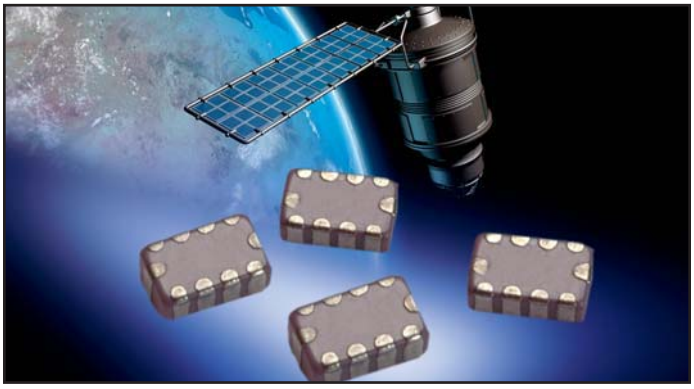
AVX filters has expanded its portfolio of custom and customized filters and filter plates/filter assemblies. These designs are suitable for use in low frequency to high frequency applications and can be configured in a variety of capacitive and inductive filter elements. Also available are high current assemblies and filter assemblies that are geared toward harsh environments such as high temperature, high shock and vibration. All of these solutions are ideal for industrial, avionic, downhole exploration and space level applications.

HOW TO ORDER

MFB	007	Q	–	001	T1	XX
Bracket Array	**Number of Filters** 001 - 999	**Hermeticity** Q = Hermetic (Glass Both Sides) H = Hermetic (Glass One Side) N = No Hermeticity Requirements		**Customer Dash Number***	**Customer ID Code**	**Customer Drawing**

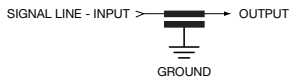
Feedthru 0805/1206 Capacitors

W2F/W3F Series



GENERAL DESCRIPTION

Available in both a standard 0805 and 1206 size, AVX's line of feedthru capacitors are ideal choices for EMI suppression, broadband I/O filtering, or Vcc power line conditioning. The unique construction of a feedthru capacitor provides low parallel inductance and offers excellent decoupling capability for all high di/dt environments and provides significant noise reduction in digital circuits to <5 GHz. A large range of capacitor values are available in either NP0 or X7R ceramic dielectrics.



Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/w2f-w3f.pdf

HOW TO ORDER

W	3	F	1	5	C	223	8	A	T	3	A
Style	**Size** 2=0805 3=1206	**Feedthru**	**Number of Elements**	**Voltage*** 1=100v 5=50v	**Dielectric** A=NP0 C=X7R	**Capacitance Code**	**Capacitance Tolerance** 8=+50/-20%	**Failure Rate** A=Not Applicable	**Terminations** T=Plated	**Packaging Code (Reel Size)** 1=7" Reel Embossed Tape 3=13" Reel Embossed Tape	**Quantity Code (Pcs./Reel)** F=1,000 A=2,000, 4,000 or 10,000

*Note: NP0 available in 100V only and X7R available in 50V only.

PERFORMANCE CHARACTERISTICS

	NP0	X7R
Capacitance Tolerance	+50%, -20%	+50%, -20%
Voltage Rating	100V	50V
Current Rating	300mA	300mA
Insulation Resistance	1000MΩ	1000MΩ
DC Resistance	<0.6Ω	<0.6Ω
Operating Temperature Range	-55 to +125°C	

CAPACITOR VALUES

Part Number	Size	Voltage	Dielectric	Capacitance
W2F11A 220 8ATxx	0805	100V	NP0	22pF
W2F11A 470 8ATxx	0805	100V	NP0	47pF
W2F11A 101 8ATxx	0805	100V	NP0	100pF
W2F11A 221 8ATxx	0805	100V	NP0	220pF
W2F11A 471 8ATxx	0805	100V	NP0	470pF
W2F15C 102 8ATxx	0805	50V	X7R	1000pF
W2F15C 222 8ATxx	0805	50V	X7R	2200pF
W2F15C 472 8ATxx	0805	50V	X7R	4700pF
W2F15C 103 8ATxx	0805	50V	X7R	10000pF
W2F15C 223 8ATxx	0805	50V	X7R	22000pF
W2F15C 473 8ATxx	0805	50V	X7R	47000pF
W3F11A 220 8ATxx	1206	100V	NP0	22pF
W3F11A 470 8ATxx	1206	100V	NP0	47pF
W3F11A 101 8ATxx	1206	100V	NP0	100pF
W3F11A 221 8ATxx	1206	100V	NP0	220pF
W3F11A 471 8ATxx	1206	100V	NP0	470pF
W3F15C 102 8ATxx	1206	50V	X7R	1000pF
W3F15C 222 8ATxx	1206	50V	X7R	2200pF
W3F15C 472 8ATxx	1206	50V	X7R	4700pF
W3F15C 103 8ATxx	1206	50V	X7R	10000pF
W3F15C 223 8ATxx	1206	50V	X7R	22000pF
W3F15C 473 8ATxx	1206	50V	X7R	47000pF

High Current Feedthru Filter

W2H/W3H Series

High current feedthru capacitors are designed as a broadband EMI filter that is specially structured to have high current handling capability. These SMT feedthru filters offer an optimized frequency response with high attenuation across a wide RF spectrum due to optimized parallel and series inductances. These W2H/W3H feedthru filters can actually replace discrete L/C filter networks.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/w2h-w3h.pdf

HOW TO ORDER

W2H1	5	C	473	8	A	T	1A
Size & Style W2H1=0805 W3H1=0612	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Dielectric** A = NP0 C = X7R	**Capacitance Code**	**Capacitance Tolerance** 8 = +50/-20% M = ±20%	**Failure Rate** A=Not Applicable	**Terminations** T = Plated Ni And Sn	**Packaging** 1A = 7" Reel 4000 pcs 3A = 13" Reel 4000 pcs

ELECTRICAL PARAMETERS

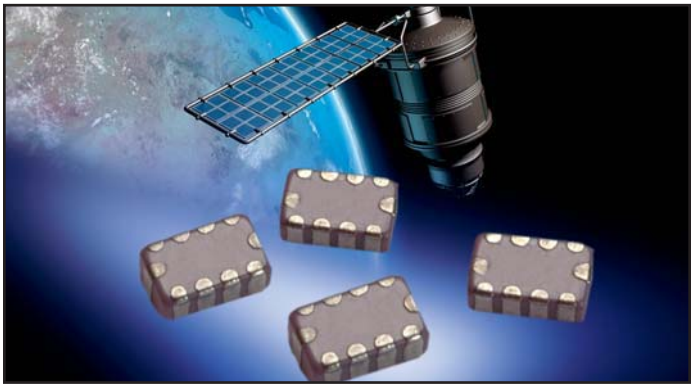
Insulation Resistance	1000 mOhms Minimum
DC Resistance	<150 mOhms
Operating Temperature	-55C to +125C

CAPACITOR VALUES

Part Number	Size	Dielectric	Capacitance	Tolerance	Voltage	Current
W2H13C 104 8AT	0805	X7R	100,000pF	+50%, -20%	25V	2A
W2H15C 473 8AT	0805	X7R	47,000pF	+50%, -20%	50V	2A
W2H15C 223 8AT	0805	X7R	22,000pF	+50%, -20%	50V	1A
W2H15C 103 8AT	0805	X7R	10,000pF	+50%, -20%	50V	1A
W2H15C 102 8AT	0805	X7R	1,000pF	+50%, -20%	50V	1A
W2H11A 471 8AT	0805	NP0	470pF	+50%, -20%	100V	0.5A
W2H11A 221 8AT	0805	NP0	220pF	+50%, -20%	100V	0.5A
W2H11A 101 8AT	0805	NP0	100pF	+50%, -20%	100V	0.5A
W2H11A 470 8AT	0805	NP0	47pF	+50%, -20%	100V	0.5A
W2H11A 220 8AT	0805	NP0	22pF	+50%, -20%	100V	0.5A
W3H13C 104 8AT	0612	X7R	100,000pF	+50%, -20%	25V	up to 5A
W3H15C 473 8AT	0612	X7R	47,000pF	+50%, -20%	50V	up to 5A
W3H15C 223 8AT	0612	X7R	22,000pF	+50%, -20%	50V	up to 4A
W3H15C 103 8AT	0612	X7R	10,000pF	+50%, -20%	50V	up to 3A
W3H11A 471 8AT	0612	NP0	470pF	+50%, -20%	100V	up to 4A
W3H11A 221 8AT	0612	NP0	220pF	+50%, -20%	100V	up to 4A
W3H11A 101 8AT	0612	NP0	100pF	+50%, -20%	100V	up to 4A
W3H11A 470 8AT	0612	NP0	47pF	+50%, -20%	100V	up to 3A
W3H11A 220 8AT	0612	NP0	22pF	+50%, -20%	100V	up to 3A

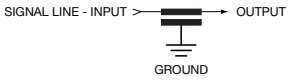
Tin/Lead Feedthru 0805/1206 Capacitors

L2F/L3F Series



GENERAL DESCRIPTION

Available in both a standard 0805 and 1206 size, AVX's line of feedthru capacitors are ideal choices for EMI suppression, broadband I/O filtering, or Vcc power line conditioning. The unique construction of a feedthru capacitor provides low parallel inductance and offers excellent decoupling capability for all high di/dt environments and provides significant noise reduction in digital circuits to <5 GHz. A large range of capacitor values are available in either NP0 or X7R ceramic dielectrics.



Check for up-to-date CV Tables at
www.avx.com/docs/catalogs/l2f-l3f.pdf

HOW TO ORDER

L	3	F	1	5	C	223	8	A	B	3	A
Style	**Size** 2=0805 3=1206	**Feedthru**	**Number of Elements**	**Voltage*** 1=100v 5=50v	**Dielectric** A=NP0 C=X7R	**Capacitance Code**	**Capacitance Tolerance** 8=+50/-20%	**Failure Rate** A=Not Applicable	**Terminations** B=Tin/Lead min 5%	**Packaging Code (Reel Size)** 1=7" Reel Embossed Tape 3=13" Reel Embossed Tape	**Quantity Code (Pcs./Reel)** F=1,000 A=2,000, 4,000 or 10,000

*Note: NP0 available in 100V only and X7R available in 50V only.

PERFORMANCE CHARACTERISTICS

	NP0	X7R
Capacitance Tolerance	+50%, -20%	+50%, -20%
Voltage Rating	100V	50V
Current Rating	300mA	300mA
Insulation Resistance	1000MΩ	1000MΩ
DC Resistance	<0.6Ω	<0.6Ω
Operating Temperature Range	-55 to +125°C	

CAPACITOR VALUES

Part Number	Size	Voltage	Dielectric	Capacitance
L2F11A 220 8ATxx	0805	100V	NP0	22pF
L2F11A 470 8ATxx	0805	100V	NP0	47pF
L2F11A 101 8ATxx	0805	100V	NP0	100pF
L2F11A 221 8ATxx	0805	100V	NP0	220pF
L2F11A 471 8ATxx	0805	100V	NP0	470pF
L2F15C 102 8ATxx	0805	50V	X7R	1000pF
L2F15C 222 8ATxx	0805	50V	X7R	2200pF
L2F15C 472 8ATxx	0805	50V	X7R	4700pF
L2F15C 103 8ATxx	0805	50V	X7R	10000pF
L2F15C 223 8ATxx	0805	50V	X7R	22000pF
L2F15C 473 8ATxx	0805	50V	X7R	47000pF
L3F11A 220 8ATxx	1206	100V	NP0	22pF
L3F11A 470 8ATxx	1206	100V	NP0	47pF
L3F11A 101 8ATxx	1206	100V	NP0	100pF
L3F11A 221 8ATxx	1206	100V	NP0	220pF
L3F11A 471 8ATxx	1206	100V	NP0	470pF
L3F15C 102 8ATxx	1206	50V	X7R	1000pF
L3F15C 222 8ATxx	1206	50V	X7R	2200pF
L3F15C 472 8ATxx	1206	50V	X7R	4700pF
L3F15C 103 8ATxx	1206	50V	X7R	10000pF
L3F15C 223 8ATxx	1206	50V	X7R	22000pF
W3F15C 473 8ATxx	1206	50V	X7R	47000pF

Tin/Lead High Current Feedthru Filter

L2H/L3H Series

High current feedthru capacitors are designed as a broadband EMI filter that is specially structured to have high current handling capability. These SMT feedthru filters offer an optimized frequency response with high attenuation across a wide RF spectrum due to optimized parallel and series inductances. These W2H/W3H feedthru filters can actually replace discrete L/C filter networks.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/l2h-l3h.pdf

HOW TO ORDER

L2H1	5	C	473	8	A	B	1A
Size & Style L2H1 = 0805 L3H1 = 0612	**Voltage** 3 = 25V 5 = 50V 1 = 100V	**Dielectric** A = NP0 C = X7R	**Capacitance Code**	**Capacitance Tolerance** 8 = +50/-20% M = ±20%	**Failure Rate** A = Not Applicable	**Terminations** B = Tin/Lead min 5% Lead	**Packaging** 1A = 7" Reel 4000 pcs 3A = 13" Reel 4000 pcs

ELECTRICAL PARAMETERS

Insulation Resistance	1000 mOhms Minimum
DC Resistance	<150 mOhms
Operating Temperature	-55C to +125C

CAPACITOR VALUES

Part Number	Size	Dielectric	Capacitance	Tolerance	Voltage	Current
L2H13C 104 8AB	0805	X7R	100,000pF	+50%, -20%	25V	2A
L2H15C 473 8AB	0805	X7R	47,000pF	+50%, -20%	50V	2A
L2H15C 223 8AB	0805	X7R	22,000pF	+50%, -20%	50V	1A
L2H15C 103 8AB	0805	X7R	10,000pF	+50%, -20%	50V	1A
L2H15C 102 8AB	0805	X7R	1,000pF	+50%, -20%	50V	1A
L2H11A 471 8AB	0805	NP0	470pF	+50%, -20%	100V	0.5A
L2H11A 221 8AB	0805	NP0	220pF	+50%, -20%	100V	0.5A
L2H11A 101 8AB	0805	NP0	100pF	+50%, -20%	100V	0.5A
L2H11A 470 8AB	0805	NP0	47pF	+50%, -20%	100V	0.5A
L2H11A 220 8AB	0805	NP0	22pF	+50%, -20%	100V	0.5A
L3H13C 104 8AB	0612	X7R	100,000pF	+50%, -20%	25V	up to 5A
L3H15C 473 8AB	0612	X7R	47,000pF	+50%, -20%	50V	up to 5A
L3H15C 223 8AB	0612	X7R	22,000pF	+50%, -20%	50V	up to 4A
L3H15C 103 8AB	0612	X7R	10,000pF	+50%, -20%	50V	up to 3A
L3H11A 471 8AB	0612	NP0	470pF	+50%, -20%	100V	up to 4A
L3H11A 221 8AB	0612	NP0	220pF	+50%, -20%	100V	up to 4A
L3H11A 101 8AB	0612	NP0	100pF	+50%, -20%	100V	up to 4A
L3H11A 470 8AB	0612	NP0	47pF	+50%, -20%	100V	up to 3A
L3H11A 220 8AB	0612	NP0	22pF	+50%, -20%	100V	up to 3A

Feedthru Array Filters – W2F4/W3F4 Series

EMI Filtering, Broadband Filtering, LCD Filtering

Available in a 4-Element 0508 and 0612 Feedthru Array package, AVX's line of Feedthrus is an ideal choice for EMI suppression, broadband I/O filtering, LCD filtering and V_{CC} power line conditioning. The unique construction of the Feedthru capacitor provides low parallel inductance and offers excellent decoupling capability for all high di/dt environments and provides significant noise reduction in digital circuits up to 5 GHz. A range of filtering characteristics is available. The Feedthru Array contains four elements with a common ground connection, making it an ideal choice for multi-line designs. Additional benefits of the multi-element array package are reduced placement costs, reduced component counts and PCB space savings. Feedthru filters can be used to meet IEC, MIL-STD-461E, FCC, and SAE radiated and conducted emission requirements.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/w2f4-w3f4.pdf

FREQUENCY CHARACTERISTICS

Part Number	Roll Off Frequency	Center Frequency	10 db Point	20 db Range	
W3F41A2208AT	270 MHz	2640 MHz	970 MHz	1780 MHz	3500 MHz
W3F41A4708AT	65 MHz	2000 MHz	185 MHz	600 MHz	3400 MHz
W3F41A1018AT	65 MHz	2030 MHz	185 MHz	560 MHz	3500 MHz
W3F45C2218AT	35 MHz	1885 MHz	120 MHz	470 MHz	3300 MHz
W3F45C4718AT	20 MHz	1860 MHz	60 MHz	220 MHz	3500 MHz
W2F43A2208AT	208 MHz	4750 MHz	616 MHz	1407 MHz	7300 MHz
W2F43A4708AT	110 MHz	2750 MHz	330 MHz	900 MHz	4600 MHz
W2F43A1018AT	60 MHz	1300 MHz	179 MHz	501 MHz	7200 MHz

CAPACITOR VALUES & PERFORMANCE CHARACTERISTICS

Part Number	Typical Capacitance	Insulation Resistance	Temperature Characteristics
W3F41A2208AT	22pF	> 1000 M_	NP0
W3F41A4708AT	47pF	> 1000 M_	NP0
W3F41A1018AT	100pF	> 1000 M_	NP0
W3F45C2218AT	220pF	> 1000 M_	X7R
W3F45C4718AT	470pF	> 1000 M_	X7R
W2F43A2208AT	22pF	> 1000 M_	NP0
W2F43A4708AT	47pF	> 1000 M_	NP0
W2F43A1018AT	100pF	> 1000 M_	NP0

CASE SIZE & VOLTAGE RATINGS

Part Number	Case Size	Current Rating	DC Resistance	Voltage Rating
W3F41A2208AT W3F41A4708AT W3F41A1018AT	0612	300 mA	< 0.6_	100 V
W3F45C2218AT W3F45C4718AT	0612	300 mA	< 0.6_	50 V
W2F43A2208AT W2F43A4708AT W2F43A1018AT	0508	50 mA	< 3.0_	25 V

APPLICATIONS

DC voltage filtering for:

- DC link
- Resonant filtering
- Active correction (FACTS, UPFC, DVR...)
- Speed converters (drives and traction)
- Windmills
- Substation

PACKAGING

Rectangular stainless steel case sandblasted. Grounding is via a threaded screw located on the cover of the case.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

PART NUMBER / HOW TO ORDER

D	K	T	F	M	1	B	M	B	5	8	5	7

Section and Option
1 340x117 2 terminals
2 340x117 4 terminals
3 340x165 2 terminals
4 340x165 4 terminals

Terminal Type
A, B, C or D
See drawings

Fixing
W=without
M=brackets

Voltage
A = 1200 to 1500V
B = 1850V
C = 2000V
D = 2250V
E = 2500V
F = 2750V
G = 3000V
H = 3500V
I = 4000V
J = 4500V
K = 5000V
L = 5500V
M = 6000V

Capacitance
EIA Code

ELECTRICAL CHARACTERISTICS – STANDARD PRODUCTS

Capacitance range C_n	610µF to 15600µF
Tolerance on C_n	±10%
DC voltage range	1200V to 5000V
Maximum hot-spot temperature	85°C
Life duration at nominal voltage and 70°C hot-spot temperature	100000 hours
Stray inductance	<400nH
Test voltage between terminals	$1.5V_n$ during 10s
Test voltage between short terminals and case	$10kV_{rms}$ (at 50Hz during 1mn)
Standard reference	Conforms with IEC 61071 and 61881, 61373, 60068 and 60077

ELECTRICAL CHARACTERISTICS – CUSTOM PRODUCTS

Capacitance range C_n	83µF to 15300µF
Tolerance on C_n (±5% or ±2% available for specific requirements)	±10%
DC voltage range	1200V to 6000V
Maximum hot-spot temperature	85°C
Life duration at nominal voltage and 70°C hot-spot temperature	100,000 hours
Stray inductance On option low inductance for IGBT and other applications	200nH to 430nH down to 40nH
Test voltage between terminals	$1.5V_n$ during 10s
Test voltage between short terminals and case	$10kV_{rms}$ (at 50Hz during 1mn)
Standard reference	Conforms with IEC 61071, 61881 and 61373, IEC 60068 and IEC 60077

TABLE OF VALUES

Base 340mm x 117mm (Length x Width)

Height millimeters (inches)	V_n = 1200 to 1500V			V_n = 1850V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**1900**	0.60	DKTFMXXXA1907	**1420**	0.64	DKTFMXXXB1427
290 (11.42)	**2850**	0.48	DKTFMXXXA2857	**2140**	0.49	DKTFMXXXB2147
365 (14.37)	**3800**	0.42	DKTFMXXXA3807	**2850**	0.42	DKTFMXXXB2857
440 (17.32)	**4750**	0.39	DKTFMXXXA4757	**3560**	0.38	DKTFMXXXB3567
515 (20.28)	**5700**	0.37	DKTFMXXXA5707	**4270**	0.36	DKTFMXXXB4277
590 (23.23)	**6750**	0.36	DKTFMXXXA6757	**4980**	0.35	DKTFMXXXB4987
705 (27.76)	**8100**	0.35	DKTFMXXXA8107	**6050**	0.33	DKTFMXXXB6057
815 (32.09)	**9500**	0.34	DKTFMXXXA9507	**7120**	0.32	DKTFMXXXB7127

Height millimeters (inches)	V_n = 2000V			V_n = 2250V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**1260**	0.67	DKTFMXXXC1267	**1000**	0.73	DKTFMXXXD1007
290 (11.42)	**1880**	0.51	DKTFMXXXC1887	**1500**	0.55	DKTFMXXXD1507
365 (14.37)	**2510**	0.44	DKTFMXXXC2517	**2000**	0.47	DKTFMXXXD2007
440 (17.32)	**3140**	0.40	DKTFMXXXC3147	**2500**	0.42	DKTFMXXXD2507
515 (20.28)	**3770**	0.37	DKTFMXXXC3777	**3000**	0.39	DKTFMXXXD3007
590 (23.23)	**4400**	0.36	DKTFMXXXC4407	**3500**	0.37	DKTFMXXXD3507
705 (27.76)	**5340**	0.34	DKTFMXXXC5347	**4250**	0.36	DKTFMXXXD4257
815 (32.09)	**6280**	0.33	DKTFMXXXC6287	**5000**	0.35	DKTFMXXXD5007

Height millimeters (inches)	V_n = 2500V			V_n = 2750V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**810**	0.79	DKTFMXXXE0817	**675**	0.86	DKTFMXXXF6756
290 (11.42)	**1220**	0.60	DKTFMXXXE1227	**1010**	0.64	DKTFMXXXF1017
365 (14.37)	**1620**	0.50	DKTFMXXXE1627	**1350**	0.53	DKTFMXXXF1357
440 (17.32)	**2030**	0.44	DKTFMXXXE2037	**1680**	0.47	DKTFMXXXF1687
515 (20.28)	**2440**	0.41	DKTFMXXXE2447	**2020**	0.44	DKTFMXXXF2027
590 (23.23)	**2840**	0.39	DKTFMXXXE2847	**2360**	0.41	DKTFMXXXF2367
705 (27.76)	**3450**	0.37	DKTFMXXXE3457	**2860**	0.39	DKTFMXXXF2867
815 (32.09)	**4060**	0.36	DKTFMXXXE4067	**3370**	0.37	DKTFMXXXF3377

Height millimeters (inches)	V_n = 3000V			V_n = 3500V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**570**	0.92	DKTFMXXXG0577	**365**	0.62	DKTFMXXXH3656
290 (11.42)	**850**	0.68	DKTFMXXXG0857	**545**	0.48	DKTFMXXXH5456
365 (14.37)	**1140**	0.56	DKTFMXXXG1147	**730**	0.41	DKTFMXXXH0737
440 (17.32)	**1420**	0.50	DKTFMXXXG1427	**910**	0.38	DKTFMXXXH0917
515 (20.28)	**1700**	0.46	DKTFMXXXG1707	**1090**	0.35	DKTFMXXXH1097
590 (23.23)	**1990**	0.43	DKTFMXXXG1997	**1280**	0.34	DKTFMXXXH1287
705 (27.76)	**2410**	0.40	DKTFMXXXG2417	**1550**	0.33	DKTFMXXXH1557
815 (32.09)	**2840**	0.39	DKTFMXXXG2847	**1820**	0.32	DKTFMXXXH1827

TABLE OF VALUES

Base 340mm x 165mm (Length x Width)

Height millimeters (inches)	V_n = 1200 to 1500V			V_n = 1850V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**3100**	0.78	DKTFMXXXA3107	**2110**	0.92	DKTFMXXXB2117
290 (11.42)	**4630**	0.60	DKTFMXXXA4637	**3170**	0.69	DKTFMXXXB3177
365 (14.37)	**6200**	0.52	DKTFMXXXA6207	**4230**	0.58	DKTFMXXXB4237
440 (17.32)	**7700**	0.47	DKTFMXXXA7707	**5290**	0.52	DKTFMXXXB5297
515 (20.28)	**9300**	0.44	DKTFMXXXA9307	**6340**	0.48	DKTFMXXXB6347
590 (23.23)	**10800**	0.42	DKTFMXXXA1088	**7400**	0.46	DKTFMXXXB7407
705 (27.76)	**13200**	0.40	DKTFMXXXA1328	**8980**	0.43	DKTFMXXXB8987
815 (32.09)	**15500**	0.39	DKTFMXXXA1558	**10600**	0.42	DKTFMXXXB1068

Height millimeters (inches)	V_n = 2000V			V_n = 2250V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**1680**	1.00	DKTFMXXXC1687	**1420**	1.08	DKTFMXXXD1427
290 (11.42)	**2520**	0.75	DKTFMXXXC2527	**2140**	0.80	DKTFMXXXD2147
365 (14.37)	**3360**	0.63	DKTFMXXXC3367	**2850**	0.66	DKTFMXXXD2857
440 (17.32)	**4200**	0.56	DKTFMXXXC4207	**3570**	0.58	DKTFMXXXD3577
515 (20.28)	**5040**	0.51	DKTFMXXXC5047	**4280**	0.53	DKTFMXXXD4287
590 (23.23)	**5880**	0.48	DKTFMXXXC5887	**5000**	0.50	DKTFMXXXD5007
705 (27.76)	**7140**	0.45	DKTFMXXXC7147	**6070**	0.47	DKTFMXXXD6077
815 (32.09)	**8400**	0.44	DKTFMXXXC8407	**7140**	0.45	DKTFMXXXD7147

Height millimeters (inches)	V_n = 2500V			V_n = 2750V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**1130**	1.18	DKTFMXXXE1137	**955**	1.27	DKTFMXXXF9556
290 (11.42)	**1700**	0.87	DKTFMXXXE1707	**1430**	0.93	DKTFMXXXF1437
365 (14.37)	**2260**	0.71	DKTFMXXXE2267	**1910**	0.76	DKTFMXXXF1917
440 (17.32)	**2830**	0.63	DKTFMXXXE2837	**2380**	0.66	DKTFMXXXF2387
515 (20.28)	**3400**	0.57	DKTFMXXXE3407	**2860**	0.60	DKTFMXXXF2867
590 (23.23)	**3950**	0.53	DKTFMXXXE3957	**3340**	0.56	DKTFMXXXF3347
705 (27.76)	**4820**	0.49	DKTFMXXXE4827	**4060**	0.52	DKTFMXXXF4067
815 (32.09)	**5670**	0.47	DKTFMXXXE5677	**4770**	0.49	DKTFMXXXF4777

Height millimeters (inches)	V_n = 3000V			V_n = 3500V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**800**	1.37	DKTFMXXXG0807*	**555**	1.60	DKTFMXXXH5556*
290 (11.42)	**1200**	0.99	DKTFMXXXG1207	**833**	1.15	DKTFMXXXH8336
365 (14.37)	**1600**	0.81	DKTFMXXXG1607	**1110**	0.92	DKTFMXXXH1117
440 (17.32)	**2000**	0.70	DKTFMXXXG2007	**1390**	0.79	DKTFMXXXH1397
515 (20.28)	**2400**	0.63	DKTFMXXXG2407	**1660**	0.71	DKTFMXXXH1667
590 (23.23)	**2800**	0.59	DKTFMXXXG2807	**1940**	0.65	DKTFMXXXH1947
705 (27.76)	**3400**	0.54	DKTFMXXXG3407	**2360**	0.59	DKTFMXXXH2367
815 (32.09)	**4000**	0.51	DKTFMXXXG4007	**2780**	0.56	DKTFMXXXH2787

* see particular Irms current value on page 20

TABLE OF VALUES

Base 340mm x 165mm (Length x Width)

Height millimeters (inches)	V_n = 4000V			V_n = 4500V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**438**	1.78	DKTFMXXXI4386*	**335**	1.08	DKTFMXXXJ3356
290 (11.42)	**657**	1.26	DKTFMXXXI6576	**503**	0.80	DKTFMXXXJ5036
365 (14.37)	**876**	1.00	DKTFMXXXI8766	**670**	0.67	DKTFMXXXJ0677
440 (17.32)	**1090**	0.87	DKTFMXXXI1097	**839**	0.59	DKTFMXXXJ8396
515 (20.28)	**1310**	0.77	DKTFMXXXI1317	**1000**	0.54	DKTFMXXXJ1007
590 (23.23)	**1530**	0.70	DKTFMXXXI1537	**1170**	0.50	DKTFMXXXJ1177
705 (27.76)	**1860**	0.64	DKTFMXXXI1867	**1420**	0.47	DKTFMXXXJ1427
815 (32.09)	**2190**	0.59	DKTFMXXXI2197	**1680**	0.45	DKTFMXXXJ1687

Height millimeters (inches)	V_n = 5000V			V_n = 5500V		
	C (µF)	Rs (mΩ)	Part Number	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**266**	1.19	DKTFMXXXK2666	**224**	1.28	DKTFMXXXL2246
290 (11.42)	**400**	0.87	DKTFMXXXK0407	**336**	0.93	DKTFMXXXL3366
365 (14.37)	**532**	0.72	DKTFMXXXK5326	**448**	0.76	DKTFMXXXL4486
440 (17.32)	**666**	0.63	DKTFMXXXK6666	**560**	0.67	DKTFMXXXL0567
515 (20.28)	**800**	0.57	DKTFMXXXK0807	**672**	0.60	DKTFMXXXL6726
590 (23.23)	**932**	0.53	DKTFMXXXK9326	**785**	0.56	DKTFMXXXL7856
705 (27.76)	**1130**	0.50	DKTFMXXXK1137	**953**	0.52	DKTFMXXXL9536
815 (32.09)	**1330**	0.47	DKTFMXXXK1337	**1120**	0.49	DKTFMXXXL1127

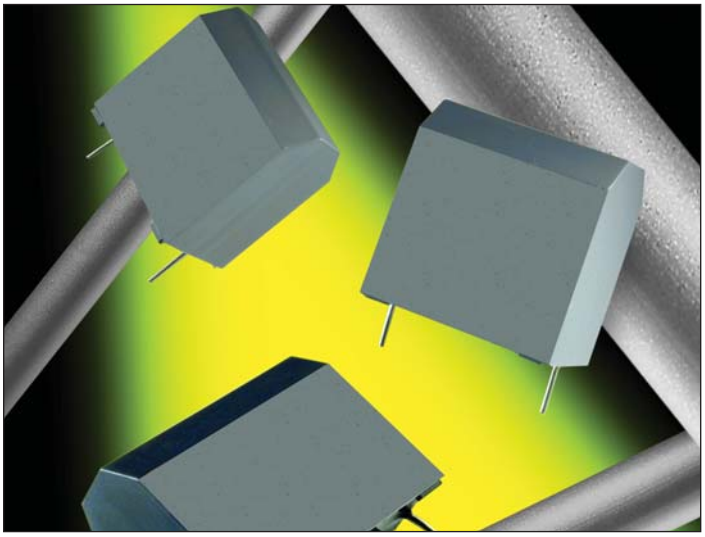
Height millimeters (inches)	V_n = 6000V		
	C (µF)	Rs (mΩ)	Part Number
215 (8.465)	**188**	1.38	DKTFMXXXM1886*
290 (11.42)	**282**	1.00	DKTFMXXXM2826
365 (14.37)	**376**	0.81	DKTFMXXXM3766
440 (17.32)	**470**	0.70	DKTFMXXXM0477
515 (20.28)	**564**	0.64	DKTFMXXXM5646
590 (23.23)	**659**	0.59	DKTFMXXXM6596
705 (27.76)	**800**	0.54	DKTFMXXXM0807
815 (32.09)	**940**	0.51	DKTFMXXXM0947

* see particular Rms current value

Particular Rms Current Value	
Part Number	I_{rms} max (A)
DKTFMXXXG0807	244
DKTFMXXXH5556	204
DKTFMXXXI4386	181
DKTFMXXXM1886	244

Medium Power Film Capacitors

FFB (RoHS Compliant)



Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

PACKAGING MATERIAL

Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F2 = in accordance with NF F 16-101).

STANDARDS

IEC 61071-1, IEC 61071-2:	Power electronic capacitors
IEC 60384-16:	Fixed metallized polypropylene film dielectric DC capacitors
IEC 60384-16-1:	Fixed metallized polypropylene film dielectric DC capacitors Assessment level E
IEC 60384-17:	Fixed metallized polypropylene film dielectric AC and pulse capacitors
IEC 60384-17-1:	Fixed metallized polypropylene film dielectric AC and pulse capacitors Assessment level E
IEC 60384-2:	Fixed metallized polyester capacitors

The FFB series uses a non-impregnated metallized polypropylene or polyester dielectric with the controlled self-healing process, specially treated to have a very high dielectric strength in operating conditions up to 105°C.

The FFB has been designed for printed circuit board mounting. Its performance allows the FFB to be a very interesting alternative to electrolytic technology as it can withstand much higher levels of surge voltage.

APPLICATIONS

The FFB capacitor is particularly designed for DC filtering, low reactive power.

HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

$\theta_{hot\ spot} = \theta_{ambient} + (P_d + P_t) \times R_{th}$

with P_d (Dielectric losses) = $Q \times tg\delta_0$

$Q \times tg\delta_0 \Rightarrow [\ ½ \times C_n \times (V_{peak\ to\ peak})^2 \times f\ ] \times tg\delta_0$

$tg\delta_0$ (tan delta)

For polypropylene, $tg\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.

For polyester, $tg\delta_0$ values are shown in graph 4 on page 3.

P_t (Thermal losses) = $R_s \times (I_{rms})^2$

where C_n in Farad, I_{rms} in Ampere, f in Hertz, V in Volt, R_s in Ohm, θ in °C, R_{th} in °C/W

WORKING TEMPERATURE

(according to the power to be dissipated) -55°C to +105°C

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to electrolytics) is how the capacitor reacts at the end of its lifetime. Unlike aluminum, electrolytic film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2%, with no risk of short circuit.

Please note that this is theoretical, however, as the capacitor continues to be functional even after this 2% decrease.

HOW TO ORDER

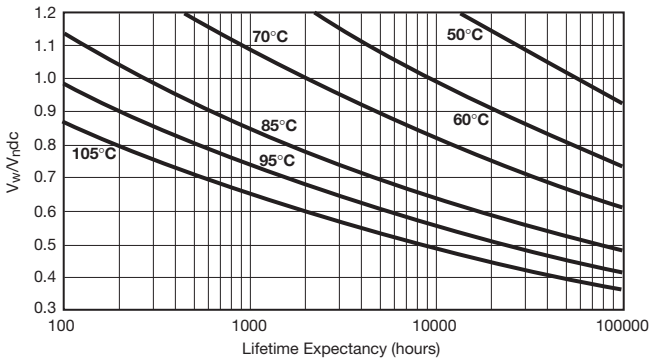
FFB	1	4	D	0336	K	– –
Series	**Case Size** 1 2 3 4 5	**Dielectric** 4 = Polyester 6 = Polypropylene	**Voltage Code** D = 75Vdc E = 100Vdc H = 300Vdc I = 400Vdc J = 525Vdc A = 720Vdc C = 900Vdc L = 1100Vdc	**Capacitance Code** 0 + pF code 0336 = 33µF 0686 = 68µF 0117 = 110µF etc.	**Capacitance Tolerances** K = ±10%	**Lead Styles** – – = 2 Leaded JC = 4 Leaded **Consult Factory for Special Options**

POLYESTER DIELECTRIC FOR LOW VOLTAGE DC FILTERING

ELECTRICAL CHARACTERISTICS – POLYESTER DIELECTRIC

Climatic category	55/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x $V_n$dc
Capacitance range C_n	6.2µF to 110µF
Tolerance on C_n	±10%
Rated DC voltage $V_n$dc	75 to 400 V
Dielectric	polyester
Max Stray Inductance	20nH

LIFETIME EXPECTANCY vs VOLTAGE AND HOT SPOT TEMPERATURE – POLYESTER DIELECTRIC



Vw = Permanent working or operating DC voltage.

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (µF)	Case Style	I_{rms} max. (A)	R_S (mΩ)	R_{th} (°C/W)	Typical Weight (g)
$V_n$dc 75V Vrms max.: 45 volts Voltage Code: D						
FFB14D0336K--	33	PO	3	3	40.7	15
FFB24D0476K--	47	18	4.3	2	33.3	20
FFB34D0686K--	68	19	6.2	1.7	29.9	25
FFB44D0826K--	82	26	7.4	1.6	26.7	32
FFB54D0117K--	110	R68 (2 terminals)	10	1.4	22.9	40
FFB54D0117KJC	110	R68 (4 terminals)	10	1.4	22.9	40
$V_n$dc 100V Vrms max.: 60 volts Voltage Code: E						
FFB14E0206K--	20	PO	2.6	3	40.5	15
FFB24E0276K--	27	18	3.5	2.5	33.3	20
FFB34E0396K--	39	19	5	2	29.8	25
FFB44E0476K--	47	26	6	1.7	26.6	32
FFB54E0686K--	68	R68 (2 terminals)	9	1.4	22.8	40
FFB54E0686KJC	68	R68 (4 terminals)	9	1.4	22.8	40
$V_n$dc 300V Vrms max.: 90 volts Voltage Code: H						
FFB14H0755K--	7.5	PO	2.4	16	40.7	15
FFB24H0116K--	11	18	3.6	11	33.5	20
FFB34H0166K--	16	19	5.2	8	29.9	25
FFB44H0186K--	18	26	6	7	27.1	32
FFB54H0276K--	27	R68 (2 terminals)	9	5	22.9	40
FFB54H0276KJC	27	R68 (4 terminals)	9	5	22.9	40
$V_n$dc 400V Vrms max.: 105 volts Voltage Code: I						
FFB14I0625K--	6.2	PO	2.5	17	40.5	15
FFB24I0755K--	7.5	18	3.1	14	33.5	20
FFB34I0126K--	12	19	5	9	29.9	25
FFB44I0156K--	15	26	6.2	7	26.4	32
FFB54I0206K--	20	R68 (2 terminals)	8.2	5.5	22.8	40
FFB54I0206KJC	20	R68 (4 terminals)	8.2	5.5	22.8	40

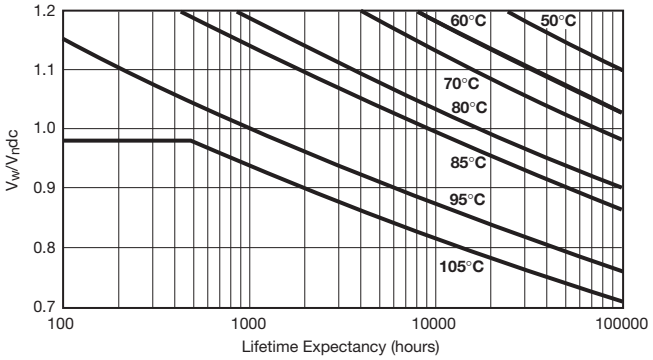
POLYPROPYLENE DIELECTRIC FOR INDUSTRIAL DC FILTERING

These capacitors have been designed principally for high and medium power DC filtering applications.

ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Climatic category	55/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x $V_n$dc
Capacitance range C_n	1.5µF to 13µF
Tolerance on C_n	±10%
Rated DC voltage $V_n$dc	525 to 1100 V
Dielectric	polypropylene

LIFETIME EXPECTANCY vs VOLTAGE AND HOT SPOT TEMPERATURE – POLYPROPYLENE DIELECTRIC

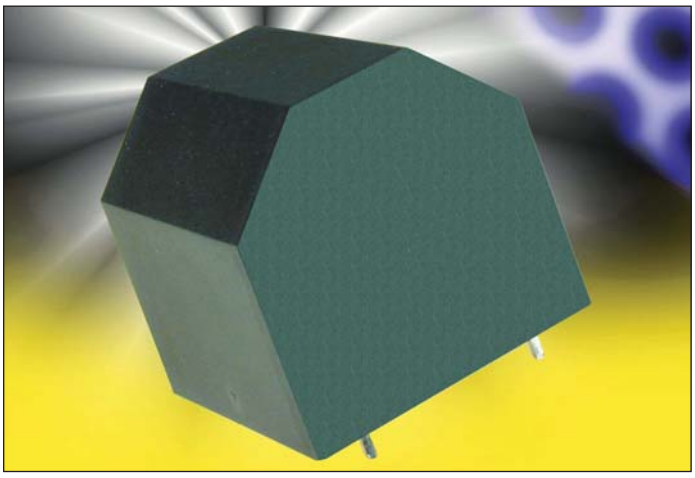


Vw = Working DC Voltage • Vn = Rated DC Voltage

RATINGS AND PART NUMBER REFERENCE – POLYPROPYLENE DIELECTRIC

Part Number	Capacitance (µF)	Case Style	I_{rms} max. (A)	R_S (mΩ)	R_{th} (°C/W)	Typical Weight (g)
$V_n$dc 525V Vrms max.: 105 volts Voltage Code: J						
FFB16J0395K--	3.9	PO	5.1	30	45.7	15
FFB26J0565K--	5.6	18	7.4	21	36.4	20
FFB36J0825K--	8.2	19	10.9	15	32.6	25
FFB46J0106K--	10	26	12	12	29.8	32
FFB56J0136K--	13	R68 (2 terminals)	12	9	24.3	40
FFB56J0136KJC	13	R68 (4 terminals)	16.7	9	24.3	40
$V_n$dc 720V Vrms max.: 120 volts Voltage Code: A						
FFB16A0335K--	3.3	PO	5.0	31	45.0	15
FFB26A0435K--	4.3	18	6.5	24	36.2	20
FFB36A0625K--	6.2	19	9.4	17	32.7	25
FFB46A0755K--	7.5	26	11.4	14	29.9	32
FFB56A0106K--	10	R68 (2 terminals)	12	11	24.2	40
FFB56A0106KJC	10	R68 (4 terminals)	15.2	11	24.2	40
$V_n$dc 900V Vrms max.: 150 volts Voltage Code: C						
FFB16C0205K--	2	PO	3.6	41	45.7	15
FFB26C0275K--	2.7	18	4.9	30	36.6	20
FFB36C0395K--	3.9	19	7.2	21	32.9	25
FFB46C0515K--	5.1	26	9.3	16	29.7	32
FFB56C0685K--	6.8	R68 (2 terminals)	12	12	24.1	40
FFB56C0685KJC	6.8	R68 (4 terminals)	12.5	12	24.1	40
$V_n$dc 1100V Vrms max.: 180 volts Voltage Code: L						
FFB16L0155K--	1.5	PO	3.3	45	45.2	15
FFB26L0185K--	1.8	18	3.9	40	36.5	20
FFB36L0245K--	2.4	19	5.3	28	33.4	25
FFB46L0305K--	3	26	6.6	23	30.2	32
FFB56L0475K--	4.7	R68 (2 terminals)	10.3	15	24.1	40
FFB56L0475KJC	4.7	R68 (4 terminals)	10.3	15	24.1	40

DC FILTERING



Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

APPLICATIONS

The FFV3 capacitors are particularly designed for DC filtering, low reactive power.

STANDARDS

IEC 61071-1, IEC 61071-2: Power electronic capacitors
IEC 60384-16: Fixed metallized polypropylene film dielectric DC capacitors
IEC 60384-16-1: Fixed metallized polypropylene film dielectric DC capacitors Assessment level E
IEC 60384-17: Fixed metallized polypropylene film dielectric AC and pulse capacitors
IEC 60384-17-1: Fixed metallized polypropylene film dielectric AC and pulse capacitors Assessment level E
IEC 60384-2: Fixed metallized polyester capacitors

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to electrolytics) is how the capacitor reacts at the end of its lifetime. Unlike aluminum, electrolytics film capacitors do not have a catastrophic failure mode. Film capacitors simply experience a parametric loss of capacitance of about 2%, with no risk of short circuit.

Please note that this is theoretical, however, as the capacitor continues to be functional even after this 2% decrease.

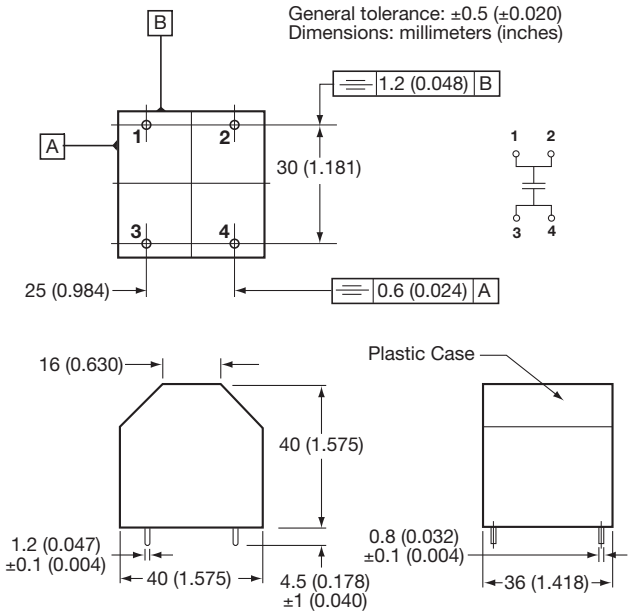
PACKAGING MATERIAL

Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F2 = in accordance with NF F 16-101).

The series uses a non-impregnated metallized polypropylene or polyester dielectric, with the controlled self-healing process, specially treated to have a very high dielectric strength in operating conditions up to 105°C.

The FFV3 has been designed for printed circuit board mounting.



HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

$\theta_{hot\ spot} = \theta_{ambient} + (P_d + P_t) \times (R_{th} + 7.4)$

$\theta_{hot\ spot} = \theta_{case} + (P_d + P_t) \times R_{th}$

with P_d (Dielectric losses) = $Q \times tg\delta_0$

$\Rightarrow [\ ½ \times C_n \times (V_{peak\ to\ peak})^2 \times f\ ] \times tg\delta_0$

$tg\delta_0$ (tan delta)

For polypropylene, $tg\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures. For polyester, $tg\delta_0$ values are shown in graph 4 on page 3.

P_t (Thermal losses) = $R_s \times (I_{rms})^2$

where C_n in Farad, I_{rms} in Ampere, f in Hertz
V in Volt, R_s in Ohm, θ in °C
R_{th} in °C/W, R_{th} : R_{th} case/hot spot in °C/W

Medium Power Film Capacitors

FFV3 (RoHS Compliant) for Low Voltage Applications

HOW TO ORDER

FFV3	4	D	K	– –
Series	**Dielectric** 4 = Polyester 6 = Polypropylene	**Voltage Code** D = 75Vdc J = 500Vdc E = 100Vdc A = 700Vdc F = 160Vdc C = 900Vdc H = 300Vdc L = 1100Vdc I = 400Vdc	**Capacitance Tolerances** K = ±10%	**Lead Styles** – – = Standard **Consult Factory for Special Options**

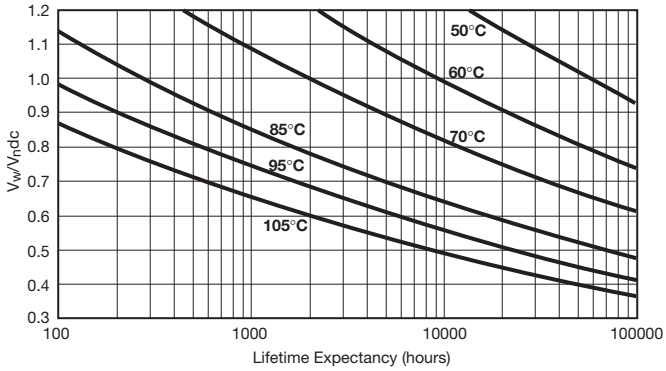
ELECTRICAL CHARACTERISTICS – POLYESTER DIELECTRIC

Climatic category	40/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x $V_n$dc during 10s
Test voltage between terminals and case @ 25°C “	@ 4 kVrms @ 50 Hz during 1 min.
Capacitance range C_n	30µF to 160µF
Tolerance on C_n	±10%
Rated DC voltage $V_n$dc	75 to 400 V
Dielectric	polyester
Max Stray Inductance	15nH

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (µF)	$I_{rms\ max.}$ (A)	$(I^2t)_{10\ shots}$ (A^2s)	$(I^2t)_{1000\ shots}$ (A^2s)	R_s (mΩ)	R_{th} (°C/W)	Typical Weight (g)
$V_n$dc = 75 V Vrms = 45 v max Voltage Code: D							
FFV34D0137K--	130	23	370	37	0.56	5.60	90
FFV34D0167K--	160	28	560	56	0.47	5.00	90
$V_n$dc = 100 V Vrms = 60 v max Voltage Code: E							
FFV34E0806K--	80	19	250	25	0.67	6.16	90
FFV34E0107K--	100	24	390	39	0.55	5.42	90
$V_n$dc = 160 V Vrms = 75 v max Voltage Code: F							
FFV34F0556K--	55	17	180	18	0.77	6.56	90
FFV34F0656K--	65	20	260	26	0.66	5.97	90
$V_n$dc = 300 V Vrms = 90 v max Voltage Code: H							
FFV34H0406K--	40	20	150	15	2.80	9.58	90
FFV34H0506K--	50	26	230	23	2.25	8.46	90
$V_n$dc = 400 V Vrms = 105 v max Voltage Code: I							
FFV34I0306K--	30	17	110	11	2.93	9.92	90
FFV34I0406K--	40	23	200	20	2.21	8.41	90

LIFETIME EXPECTANCY vs V_W/V_n AND HOT SPOT TEMPERATURE POLYESTER DIELECTRIC



Vw = Permanent working or operating DC voltage.

DC FILTERING

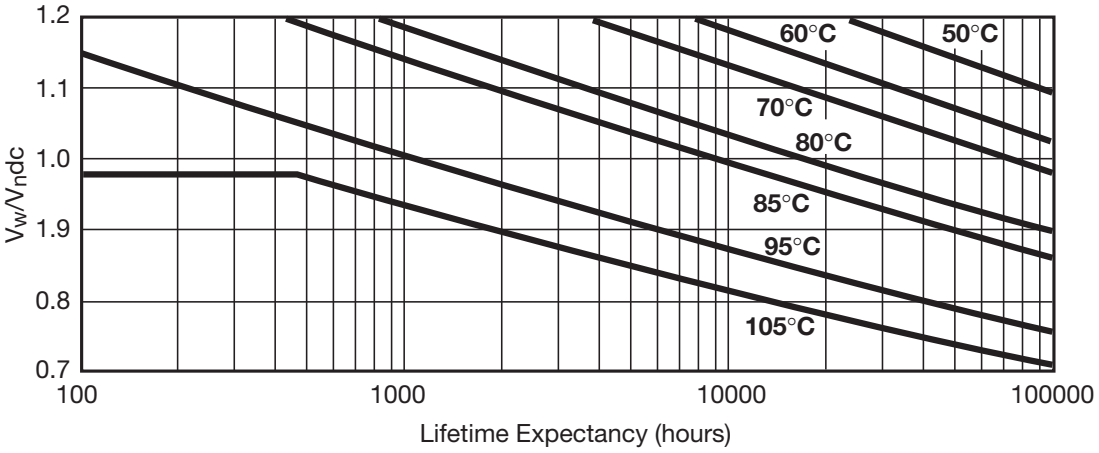
ELECTRICAL CHARACTERISTICS – POLYPROPYLENE DIELECTRIC

Climatic category	40/105/56 (IEC 60068)
Test voltage between terminals @ 25°C	1.5 x $V_n$dc during 10s
Test voltage between terminals and case @ 25°C “	@ 4 kVrms @ 50 Hz during 1 min.
Capacitance range C_n	6µF to 25µF
Tolerance on C_n	±10%
Rated DC voltage $V_n$dc	500 to 1100 V
Dielectric	polypropylene
Max Stray Inductance	15nH

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (µF)	$I_{rms\ max.}$ (A)	$(I^2t)_{10\ shots}$ (A^2s)	$(I^2t)_{1000\ shots}$ (A^2s)	R_s (mΩ)	R_{th} (°C/W)	Typical Weight (g)
$V_n$dc = 500 V Vrms = 105 v max Voltage Code: J							
FFV36J0206K--	20	27	3200	320	5.88	3.53	90
FFV36J0256K--	25	33	5000	500	4.72	3.14	90
$V_n$dc = 700 V Vrms = 120 v max Voltage Code: A							
FFV36A0146K--	14	21	2000	200	7.34	3.73	90
FFV36A0206K--	20	30	4200	420	5.15	3.05	90
$V_n$dc = 900 V Vrms = 150 v max Voltage Code: C							
FFV36C0106K--	10	19	1600	160	8.21	3.37	90
FFV36C0136K--	13	25	2800	280	6.33	2.91	90
$V_n$dc = 1100 V Vrms = 180 v max Voltage Code: L							
FFV36L0605K--	6	13	800	80	11.4	3.71	90
FFV36L0905K--	9	20	1900	190	7.61	2.92	90

LIFETIME EXPECTANCY vs V_W/V_n AND HOT SPOT TEMPERATURE POLYPROPYLENE DIELECTRIC



Vw = Permanent working or operating DC voltage.

DC FILTERING

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

GENERAL DESCRIPTION

The FFG series uses a non-impregnated metallized dielectric, which features a controlled self-healing process.

PACKAGING MATERIAL

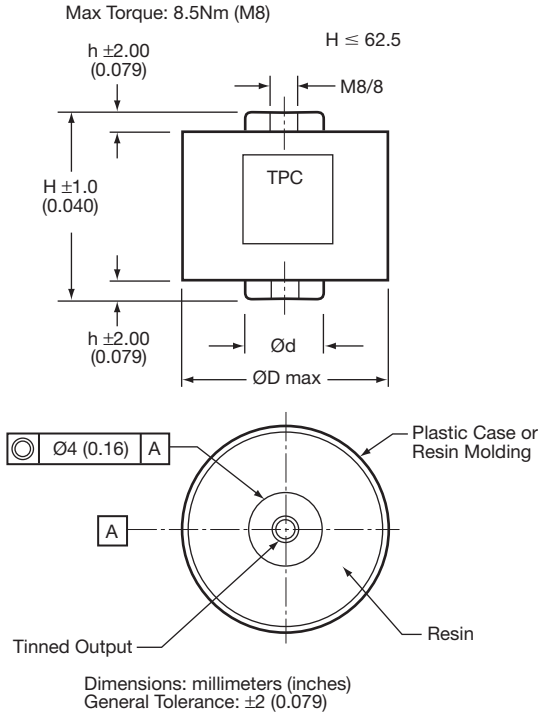
Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F1 = in accordance with NF F 16-101).

STANDARDS

IEC 61071-1, IEC 61071-2: Power electronic capacitors
IEC 60068-1: Environmental testing
UL 94: Fire requirement

DIMENSIONS (CASE SIZES)

plastic case – Outputs: threaded insert M8 filled with thermosetting resin



Dimensions: millimeters (inches)
General Tolerance: ±2 (0.079)

HOT SPOT CALCULATION

$\theta_{hot\ spot} = \theta_{terminal} + (P_d + P_t) \times R_{th}$

with P_d (Dielectric losses) = Q x $tg\delta_0$ and $tg\delta_0$ = 2.10, where $Q = \frac{I^2_{rms}}{C.2.\pi.f}$

P_t (Thermal losses) = R_s x I_{rms}^2

where C_n in Farad, V in Volt, R_{th} in °C/W; I_{rms} in Ampere, R_s in Ohm; f in Hertz, θ in °C

HOW TO ORDER

FFG	8	6	K	0376	K	– –
Series FFG = Standard FFH = RoHS Compliant	**Case Size** 8	**Dielectric** 6 = Polypropylene	**Voltage Code** K = 600Vdc B = 800Vdc C = 900Vdc L = 1000Vdc U = 1200Vdc N = 1900Vdc	**Capacitance Code** 0 + pF code 0376 = 36µF 0256 = 25µF 0505 = 5µF etc.	**Capacitance Tolerances** K = ±10%	**Voltage Range** – – = < 1kV J7 = ≥ 1kV

Medium Power Film Capacitors

FFG (FFH RoHS Compliant)

ELECTRICAL CHARACTERISTICS

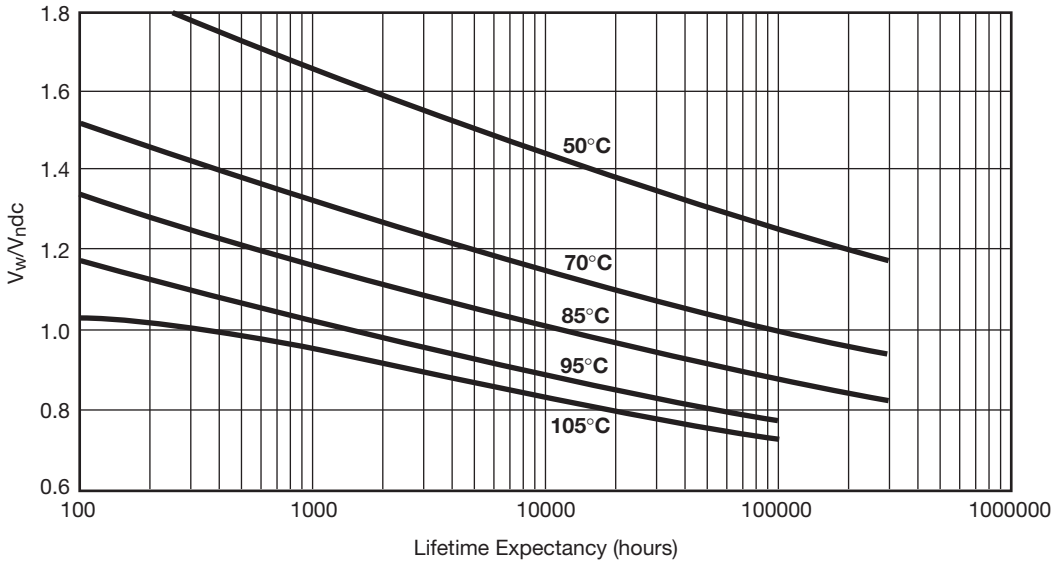
Operating temperature:	–40°C + 105°C
Storage temperature:	–55°C + 85°C
Capacitance range:	5µF to 160µF
Rated DC voltage Vndc:	600 to 900 V
Capacitance tolerance:	±10%
Test voltage between terminals:	@ 25°C: 1.5 x $U_n$dc during 10s
Test voltage between terminals and case:	@ 25°C: @ 4 kVrms @ 50 Hz during 1 mn (test type)
Dielectric	Polypropylene

RATINGS AND PART NUMBER REFERENCE (600V TO 900V)

Part Number	Cn (µF)	Height ±1 (±0.039)	h ±2 (±0.079)	D max)	d ±0.50	I^2t max (±0.020)	I_{rms} max (A^2s)	R_S (mΩ) (A)	R_{th} (°C/W)	Typical Weight (g
$U_n$dc 600 V (Voltage Code K)										
FFG86K0376K--	37	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	4	28	1.3	10.1	190
FFG86K0586K--	58	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	10	44	1	6.4	260
FFG86K0806K--	80	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	20	61	0.7	4.9	320
FFG86K0167K--	160	62.5 (2.461)	5 (0.197)	92 (3.622)	22 (0.866)	32	76	0.8	5.8	475
$U_n$dc 800 V (Voltage Code B)										
FFG86B0236K--	23	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	3	26	1.7	10.1	190
FFG86B0376K--	37	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	8	43	1.2	6.5	260
FFG86B0516K--	51	52 (2.072)	5 (0.197)	82 (3.228	22 (0.866)	15	59	0.9	4.8)	320
FFG86B0107K--	100	62.5 (2.461)	5 (0.197)	92 (3.622)	22 (0.866)	24	73	1	5.9	475
$U_n$dc 900 V (Voltage Code C)										
FFG86C0166K--	16	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	2.8	27	2	9.8	190
FFG86C0266K--	26	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	7	44	1.3	6.5	260
FFG86C0356K--	35	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	13	60	1	4.8	320
FFG86C0706K--	70	62.5 (2.461)	5 (0.197)	92 (3.622)	22 (0.866)	20	75	1.2	5.8	475

Dimensions millimeters (inches)

LIFETIME EXPECTANCY vs HOT SPOT TEMPERATURE AND VOLTAGE



Vw = Permanent working or operating DC voltage.

ELECTRICAL CHARACTERISTICS

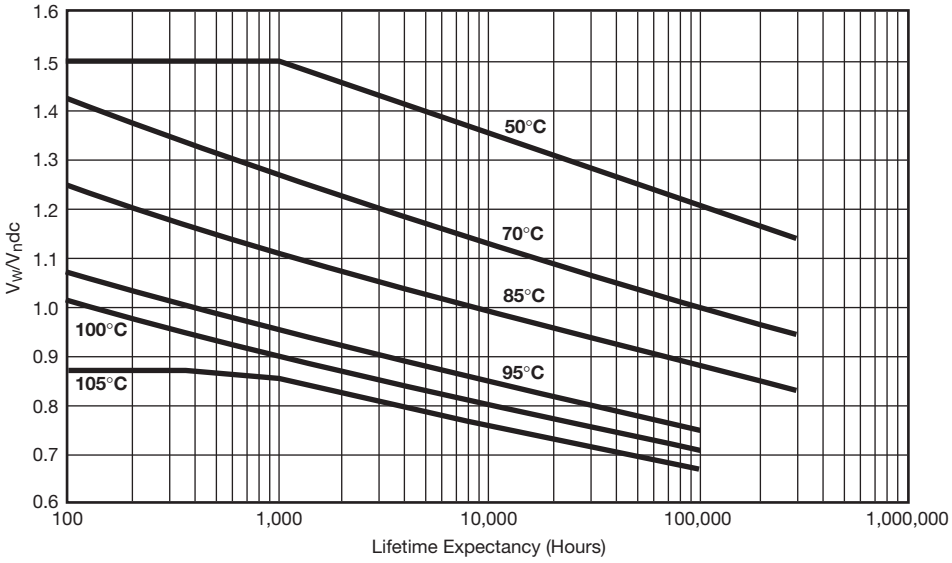
Operating temperature:	–40°C + 105°C
Storage temperature:	–55°C + 85°C
Capacitance range:	5µF to 160µF
Rated DC voltage Vndc:	1000 to 1900 V
Capacitance tolerance:	±10%
Test voltage between terminals:	@ 25°C: 1.5 x $U_n$dc during 10s
Test voltage between terminals and case:	@ 25°C: @ 4 kVrms @ 50 Hz during 1 mn (test type)
Dielectric	Polypropylene

RATINGS AND PART NUMBER REFERENCE (600V TO 900V)

Part Number	Cn (µF)	Height ±1 (±0.039)	h ±2 (±0.079)	D max)	d ±0.50	I²t max (±0.020)	I_{rms} max (A²s)	R_s (mΩ) (A)	R_{th} (°C/W)	Typical Weight (g
$U_n$dc 1000 V (Voltage Code K)										
FFG86L0256KJ7	25	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	1.9	21	3.6	9.9	190
FFG86L0406KJ7	40	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	5	34	2.32	6.4	260
FFG86L0556KJ7	55	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	9.5	46	1.74	4.7	320
FFG86L0117KJ7	110	62.5 (2.461)	5 (0.197)	92 (3.622)	22 (0.866)	14.9	58	1.86	5.7	475
$U_n$dc 1200 V (Voltage Code U)										
FFG86U0176KJ7	17	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	1.3	19	4.33	9.9	190
FFG86U0276KJ7	27	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	3.3	30	2.8	6.5	260
FFG86U0376KJ7	37	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	6.2	41	2.1	4.8	320
FFG86U0766KJ7	76	62.5 (2.461)	5 (0.197)	92 (3.622)	22 (0.866)	10.3	53	2.2	5.6	475
$U_n$dc 1900 V (Voltage Code N)										
FFG86N0505KJ7	5	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	1.7	19	2.77	11.3	190
FFG86N0905KJ7	9	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	5.5	35	1.63	6.6	260
FFG86N0126KJ7	12	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	9.9	46	1.27	5	320
FFG86N0256KJ7	25	62.5 (2.461)	5 (0.197)	92 (3.622)	22 (0.866)	18	63	1.2	5.2	475

Dimensions millimeters (inches)

LIFETIME EXPECTANCY vs HOT SPOT TEMPERATURE AND VOLTAGE



Vw = Permanent working or operating DC voltage.

Medium Power Film Capacitors

FFVE/FFVI (FFWE/FFWI RoHS Compliant)

GENERAL DESCRIPTION

The FFV capacitor is specifically designed for DC filtering, low reactive power.

The series uses a non-impregnated metallized polypropylene or polyester dielectric, which features a controlled self-healing process, specially treated to have a very high dielectric strength in operating conditions up to 105°C.

The FFV special design gives this series a very low level of stray inductance (18 nH to 40 nH).

Furthermore, the performance levels of the FFVE capacitor makes them a very interesting alternative to electrolytic technology, because they can withstand much higher levels of surge voltage, very high rms current ratings, and longer lifetimes.

PACKAGING MATERIAL

Self-extinguishing plastic case (V0 = in accordance with UL 94) filled thermosetting resin.

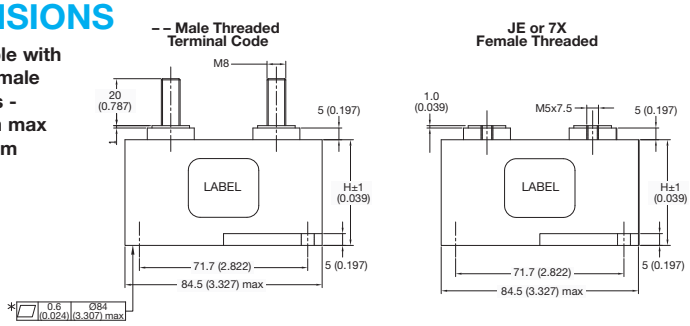
Self-extinguishing thermosetting resin (V0 = in accordance with UL 94; I3F1 = in accordance with NF F 16-101).

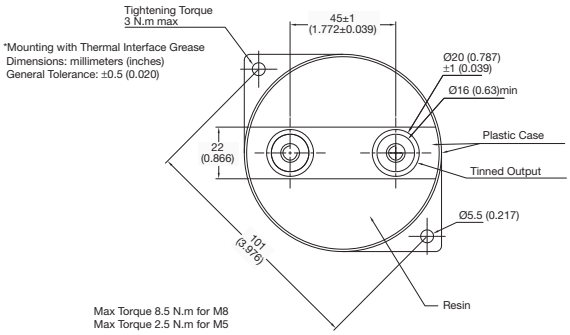
FFVE capacitors meet the Level 2 requirement of the fire behavior standard NF F 16-102.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

DIMENSIONS

Also available with threaded female connections - M5 x 7.5mm max Torque 2.5Nm





HOW TO ORDER

FFVE	4	H	0187	K	– –
Series	**Dielectric**	**Voltage Code**	**Capacitance Code**	**Capacitance Tolerances**	**Terminal Code**
FFVE = Standard FFVI = Standard FFWE = RoHS Compliant FFWI = RoHS Compliant	4 = Polyester 6 = Polypropylene	H = 300V C = 900V I = 400V L = 1000V (FFVE/FFWE) J = 500V L = 1100V (FFVI/FFWI) K = 600V U = 1200V A = 700V N = 1900V B = 800V	0 + pF code 0187 = 180µF 0356 = 35µF etc.	K = ±10%	JE = Female Threaded – – = Male Threaded • FFVE/FFWE – Polyester • FFVE/FFWE – Polypropylene < 1kv • FFVI/FFWI 7X = Female Threaded J7 = Male Threaded • FFVE/FFWE – Polypropylene ≥ 1kv

HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

$\theta_{hot\ spot} = \theta_{ambient} + (P_d + P_t) \times R_{th}$

with P_d (Dielectric losses) = $Q \times tg\delta_0$

$Q \times tg\delta_0 \Rightarrow [\ ½ \times C_n \times (V_{peak\ to\ peak})^2 \times f\ ] \times tg\delta_0$

$tg\delta_0$ (tan delta)

For polypropylene, $tg\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures. For polyester, $tg\delta_0$ values are shown in graph 4 on page 3.

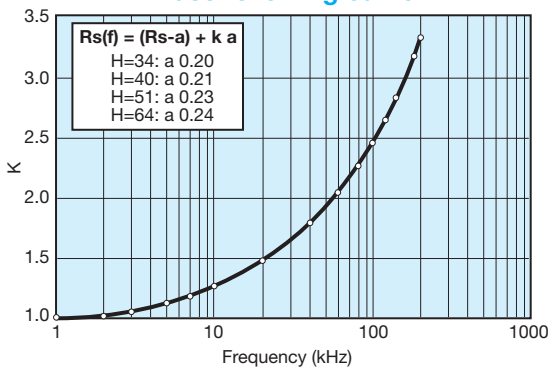
P_t (Thermal losses) = $R_s \times (I_{rms})^2$

where C_n in Farad, I_{rms} in Ampere, f in Hertz, V in Volt, R_s in Ohm, θ in °C, R_{th} in °C/W

θ_{case} = bottom center of case

Rs(f) vs FREQUENCY

For frequency higher than 1 kHz use following curve



ELECTRICAL CHARACTERISTICS – FFVE/FFWE POLYESTER DIELECTRIC

The FFVE for low voltage DC filtering are polyester dielectric capacitors.

Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	100µF to 400µF
Capacitance tolerance	±10%
Rated DC voltage	300 to 400 V
Test voltage between terminals @ 25°C	1.5 x $V_n$dc 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polyester

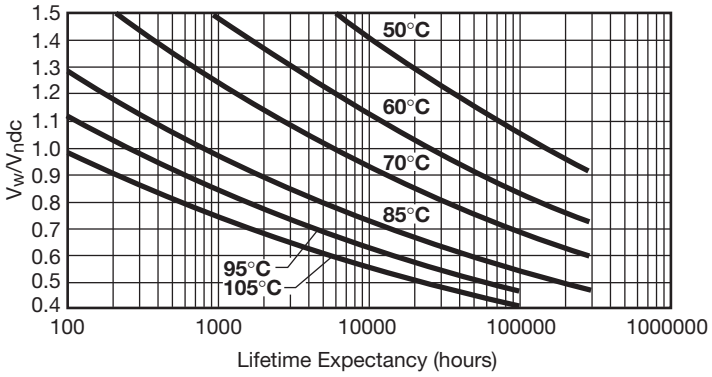
RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number*	Capacitance (µF)	Height	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
$V_n$dc 300 volts (Voltage Code H)							
FFVE4H0187K--	180	34 (1.339)	100	18	0.8	4.7	300
FFVE4H1956K--	195	34 (1.339)	100	18	0.8	4.4	300
FFVE4H0257K--	250	40 (1.575)	100	25	0.6	5.2	350
FFVE4H0357K--	350	51 (2.008)	100	32	0.8	7.2	420
FFVE4H0407K--	400	51 (2.008)	110	32	0.8	7.1	420
$V_n$dc 400 volts (Voltage Code I)							
FFVE4I0107K--	100	34 (1.339)	80	18	0.7	4.7	300
FFVE4I0127K--	120	34 (1.339)	100	18	0.6	4.1	300
FFVE4I0157K--	150	40 (1.575)	100	25	0.7	5.0	350
FFVE4I0187K--	180	51 (2.008)	80	32	1.0	8.5	420
FFVE4I0227K--	220	51 (2.008)	100	32	0.9	7.2	420

*Change "--" to "JE" for female connectors M5 x 7.5mm

Dimensions millimeters (inches)

LIFETIME EXPECTANCY FFVE POLYESTER



V_W: permanent working or operating DC voltage.

ELECTRICAL CHARACTERISTICS – FFVE/FFWE POLYPROPYLENE DIELECTRIC

The FFVE for low voltage DC filtering are polyester dielectric capacitors.

Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	12µF to 220µF
Capacitance tolerance	±10%
Rated DC voltage	600 to 1900 V
Test voltage between terminals @ 25°C	1.5 x $V_n$dc 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polypropylene

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

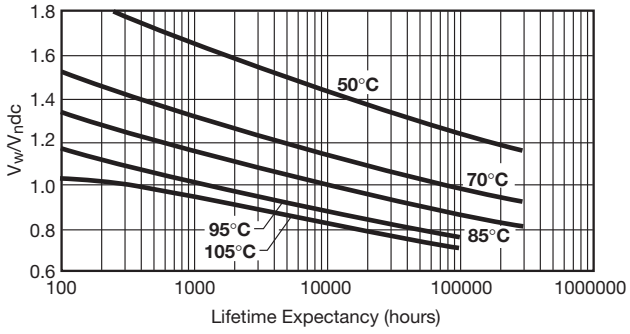
Part Number*	Capacitance (µF)	Height	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
$V_n$dc 600 volts (Voltage Code K)							
FFVE6K0256K--	25	34 (1.339)	90	18	0.7	4.3	300
FFVE6K0107K--	100	40 (1.575)	100	25	0.6	4.8	350
FFVE6K0157K--	150	51 (2.008)	110	32	0.9	6.9	420
FFVE6K0227K--	220	64 (2.520)	100	40	1.0	8.4	500
$V_n$dc 800 volts (Voltage Code B)							
FFVE6B0666K--	66	40 (1.575)	100	25	0.7	4.7	350
FFVE6B0107K--	100	51 (2.008)	90	32	1.0	6.7	420
FFVE6B0147K--	140	64 (2.520)	100	40	1.3	8.4	500
$V_n$dc 900 volts (Voltage Code C)							
FFVE6C0126K--	12	34 (1.339)	70	18	0.9	4.4	300
FFVE6C0386K--	38	34 (1.339)	100	18	1.6	3.9	300
FFVE6C0476K--	47	40 (1.575)	100	25	0.8	4.6	350
FFVE6C0706K--	70	51 (2.008)	100	32	1.2	6.7	420
FFVE6C0107K--	100	64 (2.520)	90	40	1.1	8.2	500
$V_n$dc 1000 volts (Voltage Code L)							
FFVE6L0666KJ7	66	40 (1.575)	70	25	1.5	5.1	350
FFVE6L0107KJ7	100	51 (2.008)	64	32	2.0	7.3	420
FFVE6L0147KJ7	140	64 (2.520)	51	40	2.5	9.2	500
$V_n$dc 1200 volts (Voltage Code U)							
FFVE6U0476KJ7	47	40 (1.575)	66	25	1.7	4.9	350
FFVE6U0706KJ7	70	51 (2.008)	59	32	2.4	7.2	420
FFVE6U0107KJ7	100	64 (2.520)	49	40	2.9	8.9	500
$V_n$dc 1900 volts (Voltage Code N)							
FFVE6N0156KJ7	15	40 (1.575)	73	25	1.1	5.2	350
FFVE6N0246KJ7	24	51 (2.008)	73	32	1.3	6.5	420
FFVE6N0356KJ7	35	64 (2.520)	67	40	1.6	8.4	500

*Change "--" to "JE" for female connectors M5 x 7.5mm
*Change "J7" to "7X" for female connectors M5 x 7.5mm

Dimensions millimeters (inches)

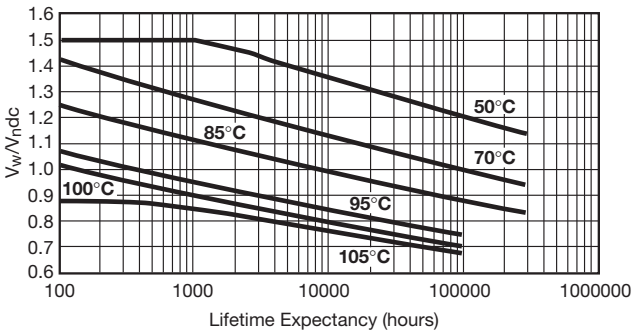
LIFETIME EXPECTANCY FOR FFVE POLYPROPYLENE

-- and JE



V_W: permanent working or operating DC-voltage.

J7 and 7X



V_W: permanent working or operating DC-voltage.

ELECTRICAL CHARACTERISTICS – FFVI/FFWI POLYPROPYLENE DIELECTRIC

The FFVE for low voltage DC filtering are polyester dielectric capacitors.

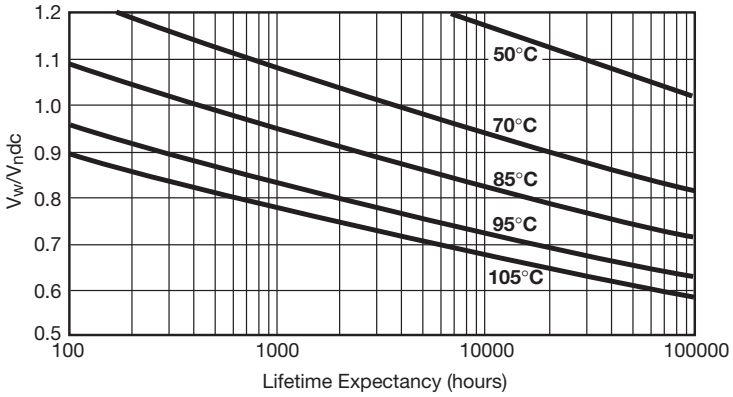
Working temperature	-40°C to +105°C (according to the power to be dissipated)
Capacitance range	47µF to 275µF
Capacitance tolerance	±10%
Rated DC voltage	500 to 1100V
Test voltage between terminals @ 25°C	1.25 x $V_n$dc 10s
Insulation voltage between shorted terminals and earth	7 kVrms/60sec/50Hz
Dielectric	Polypropylene

RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number*	Capacitance (µF)	Height	Irms max. (A)	Ls max. (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
$V_n$dc 500 volts (Voltage Code J)							
FFVI6J1256K--	125	40 (1.575)	90	25	0.6	5.0	350
FFVI6J0207K--	200	51 (2.008)	90	32	0.8	6.7	420
FFVI6J2756K--	275	64 (2.520)	90	40	0.9	8.7	500
$V_n$dc 700 volts (Voltage Code A)							
FFVI6A0107K--	100	40 (1.575)	100	25	0.6	4.8	350
FFVI6A0157K--	150	51 (2.008)	100	32	0.9	6.9	420
FFVI6A0227K--	220	64 (2.520)	100	40	1.0	8.4	500
$V_n$dc 900 volts (Voltage Code C)							
FFVI6C0666K--	66	40 (1.575)	100	25	0.7	4.7	350
FFVI6C0107K--	100	51 (2.008)	90	32	1.0	6.7	420
FFVI6C0147K--	140	64 (2.520)	100	40	1.3	8.4	500
$V_n$dc 1100 volts (Voltage Code L)							
FFVI6L0476K--	47	40 (1.575)	100	25	0.8	4.6	350
FFVI6L0706K--	70	51 (2.008)	100	32	1.2	6.7	420
FFVI6L0107K--	100	64 (2.520)	90	40	1.1	8.2	500

Dimensions millimeters (inches)

LIFETIME EXPECTANCY FOR FFVI



V_w: permanent working or operating DC-voltage.

Medium Power Film Capacitors

FFVS (RoHS Compliant)

Low Inductance Range Capacitor for Power Electronics

FFVS series is a specific range of DC filtering capacitors designed for use in high frequency, high ripple applications beyond the limits of standard FFVE or FFVI.

Typical applications include DC power supply for induction heating, resonant DC power supply for scanner, X-ray machines, etc.

Due to the sophisticated internal design, stray inductance is extremely low, between 8 and 13nH.

FFVS products are RoHs compliant.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

PACKAGING MATERIAL

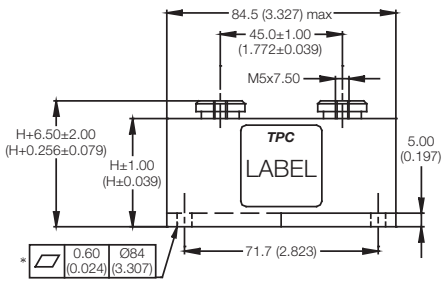
Self extinguishing plastic case (V0: in accordance with UL 94) filled thermosetting resin.

Self extinguishing thermosetting resin (V0: in accordance with UL 94; I3F1: in accordance with NF F 16-101).

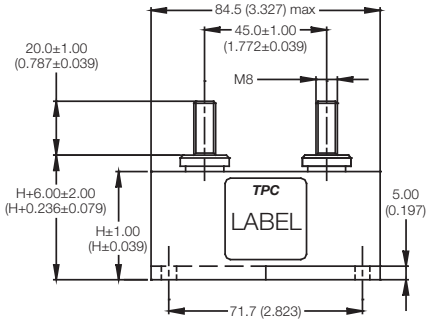
DIMENSIONS

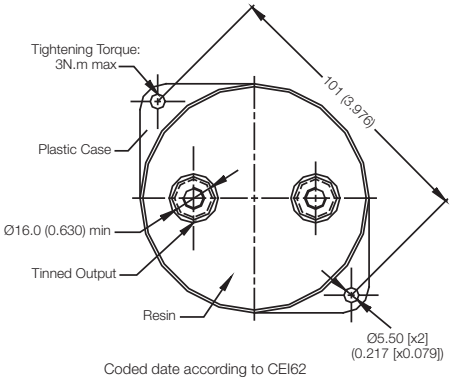
Threaded female terminals version M5 x 7.5mm are also available, To order, the suffix becomes "JE" instead of "--"

Threaded Female Terminal Code JE



Threaded Male Terminal Code --





Coded date according to CEI62
Max Torque M5: 2.5Nm
Max Torque M8: 8.5Nm
* Mounting with Thermal interface Grease
Dimensions in millimeters (inches)
General Tolerance ±0.5 (±0.002)

HOW TO ORDER

FFVS	6	K	0226	K	– –
Series	**Dielectric**	**Voltage Code**	**Capacitance Code**	**Capacitance Tolerances**	**Terminal Code**
	6 = Polypropylene	K = 600V B = 800V C = 900V L = 1000V U = 1200V N = 1900V	Capacitance Values with 2 significant digits: 0 + pF code 0226 = 22µF 0147 = 140µF etc. Capacitance Values with 3 significant digits: 1956 = 195µF 1286 = 138µF 1356 = 135µF	K = ±10%	– – = Male Threaded JE = Female Threaded

HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

$\theta_{hot\ spot} = \theta_{ambient} + (P_d + P_t) \times R_{th}$

with P_d (Dielectric losses) = Q x $tg\delta_0$

Q x $tg\delta_0 \Rightarrow [\ ½ \times C_n \times (V_{peak\ to\ peak})^2 \times f\ ] \times tg\delta_0$

$tg\delta_0$ (tan delta)

For polypropylene, $tg\delta_0 = 2 \times 10^{-4}$ for frequencies up to 1MHz and is independent of temperatures.

For polyester, $tg\delta_0$ values are shown in graph 4 on page 3.

P_t (Thermal losses) = $R_s \times (I_{rms})^2$

where C_n in Farad, V in Volt, R_{th} in °C/W, I_{rms} in Ampere, R_s in Ohm, f in Hertz, θ in °C

θ_{case} = bottom center of case

Medium Power Film Capacitors

FFVS (RoHS Compliant)

Low Inductance Range Capacitor for Power Electronics

ELECTRICAL CHARACTERISTICS

Working temperature	-40°C +105°C (according to the power to be dissipated)
Capacitance range C_N	22 µF to 200 µF
Tolerance on C_N	± 10 %
Rated dc voltage U_N dc	600V to 1900V
Test voltage between terminals @ 25°C: 1.5 x $U_N$dc during 10s	
Insulation voltage between shorted terminals and earth (type test) @ 4 kVrms @ 50Hz during 1 min.	

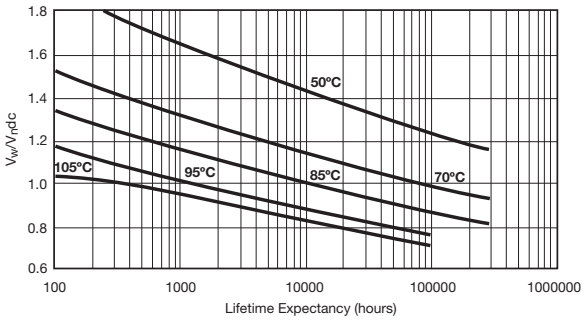
RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (µF)	Height mm (inches)	I_{rms} (A)	I^2t (A^2s)	L_s max.	R_S (mΩ) (nH)	R_{th} (°C/W)	Typical Weight (g)
$U_n$dc 600 volts (Voltage Code K)								
FFVS6K0226K--	22	34 (1.339)	78	11.5	8	0.74	4.2	320
FFVS6K0906K--	90	40 (1.575)	84	24	9	0.60	4.9	345
FFVS6K0147K--	140	51 (2.008)	82	23.5	11	0.83	6.8	405
FFVS6K1956K--	195	64 (2.520)	84	24	13	1.04	8.6	475
$U_n$dc 800 volts (Voltage Code B)								
FFVS6B0586K--	58	40 (1.575)	83	19	9	0.72	4.9	345
FFVS6B0926K--	92	51 (2.008)	83	19	11	0.99	6.7	405
FFVS6B1286K--	128	64 (2.520)	84	19.5	13	1.25	8.5	475
$U_n$dc 900 volts (Voltage Code C)								
FFVS6C0306K--	30	34 (1.339)	56	7	8	1.55	4.2	320
FFVS6C0406K--	40	40 (1.575)	85	16.5	9	0.85	5.0	345
FFVS6C0656K--	65	51 (2.008)	86	17	11	1.15	6.7	405
FFVS6C0906K--	90	64 (2.520)	87	17	13	1.46	8.5	475
$U_n$dc 1000 volts (Voltage Code L)								
FFVS6L0536K--	53	40 (1.575)	61	9.5	9	1.56	4.9	345
FFVS6L0956K--	95	51 (2.008)	63	11	11	1.98	6.7	405
FFVS6L1356K--	135	64 (2.520)	65	11.5	13	2.42	8.3	475
$U_n$dc 1200 volts (Voltage Code U)								
FFVS6U0406K--	40	40 (1.575)	57	7.5	9	1.77	4.9	345
FFVS6U0656K--	65	51 (2.008)	57	7.5	11	2.38	6.8	405
FFVS6U0866K--	86	64 (2.520)	58	7	13	3.02	8.5	475
$U_n$dc 1900 volts (Voltage Code N)								
FFVS6N0146K--	14	40 (1.575)	66	12.5	10	1.05	4.9	345
FFVS6N0226K--	22	51 (2.008)	68	13.5	13	1.26	6.3	405
FFVS6N0326K--	32	64 (2.520)	68	13.5	16	1.58	8.1	475

Dimensions millimeters (inches)

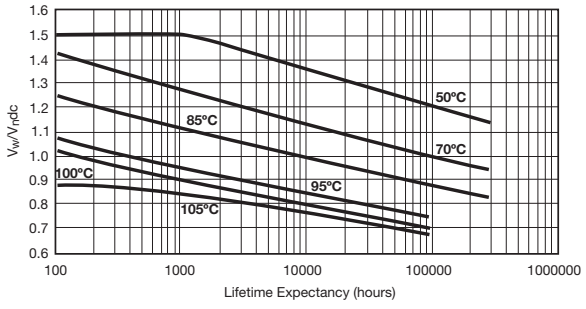
LIFETIME EXPECTANCY

FFVS for 600V, 800V and 900V



V_W: permanent working or operating DC-voltage.

FFVS for 1000V, 1200V and 1900V

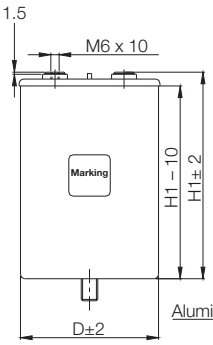


V_W: permanent working or operating DC-voltage.

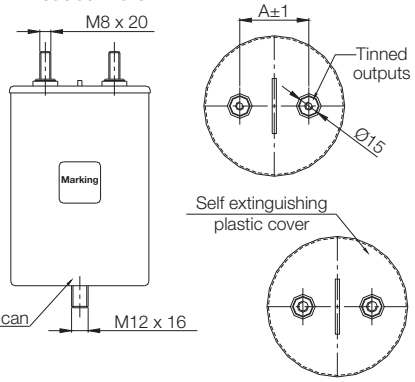
Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

DIMENSIONS

Terminal Code JE
Threaded Female



Terminal Code --
Threaded Male



MARKING

Capacitance value
Nominal dc voltage
Maximum rms current
Batch number
Coded date according IEC62

Max Torque M6 = 4.5.Nm
Max Torque M8 = 8.5Nm
Max Torque M12 = 15Nm

USUAL APPLICATIONS

The FFLI capacitor is specifically designed for DC filtering,

PACKAGING MATERIAL

Aluminium cylindrical case filled thermosetting resin.

Self extinguishing thermosetting resin (V0 : in accordance with UL 94 ; M2F1 : in accordance with NF F 16-101).

Self extinguishing plastic cover (V0 : in accordance with UL 94)

ROHS components

LIFETIME EXPECTANCY

One unique feature of this technology (as opposed to electrolytics) is how the capacitor reacts at the end of its lifetime. With an electrolytic there is a strong risk of explosion of the case. However with our line of film capacitors, the capacitor will simply experience at the end of life a loss of capacitance of about 5%, with no risk of explosion.

Please note that this is theoretical, however, the capacitor continues to be functional even after this 5% decrease.

Expected life time for FFLI range:
100 000 Hrs / $U_n$dc / Hot-spot temperature = 65°C.

STANDARDS

IEC 61071: Power electronic capacitors
IEC 60068-1: Environmental testing
IEC 61373: Shocks and vibrations
UL 94: Fire requirements
UL810: Capacitors

HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

For all applications, the hot spot temperature must be lower than 95°C.

$$\theta_{hot\ spot} = \theta_{ambient} + [tg\delta \cdot Q + R_S \cdot (I_{rms})^2] \cdot R_{th}$$

With:

Q : Reactive power in Var
R_S in Ohm
I_{rms} in Ampere
R_{th} : Rth ambient / hot spot in °C/W
tg $\delta_0 \cdot (10^{-4})$ is the tangent of loss angle for polypropylene dielectric. Polypropylene has a constant dielectric losses factor of $2x10^{-4}$ irrespective of temperature and frequency (up to 1 MHz).
θ Ambient : Ambient Temperature in °C

HOW TO ORDER

FFLI	6	L	0337	K	– –
Series	**Dielectric** 6 = Polypropylene	**Voltage Code** L = 1000V U = 1200V Q = 1400V	**Capacitance Code** Capacitance Values with 2 significant digits: 0 + pF code 0397 = 390µF 0167 = 160µF etc.	**Capacitance Tolerances** K = ±10%	**Terminal Code** – – = Male Threaded JE = Female Threaded

ELECTRICAL CHARACTERISTICS

Dry with controlled self-healing metallized polypropylene dielectric.

Climatic Category	40/95/56 (IEC68)
Working temperature	-40°C / + 95°C (according to the power dissipated)
Storage temperature	-40°C / +85°C
Test voltage between terminals	@ 25°C: 1.5 x $U_n$dc during 10s
Test voltage between terminals and case	@ 25°C:@ 4 kVrms @ 50Hz during 1 min.
Dielectric	Polypropylene

RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (µF)	D	H1	A	I_{rms} (A)	I^2t (A^2s)	L_S max. (nH)	R_S (mΩ)	R_{th} (°C/W)	Typical Weight (g)
$U_n$dc 800V										
FFLI6B0297K--	290	75 (2.953)	105 (4.134)	32 (1.260)	50	13	60	4.1	4.1	500
FFLI6B0397K--	390	85 (3.346)	105 (4.134)	32 (1.260)	62	23	60	2.9	3.6	600
FFLI6B0507K--	500	75 (2.953)	155 (6.102)	32 (1.260)	45	13	85	5.6	3.6	600
FFLI6B0687K--	680	85 (3.346)	155 (6.102)	32 (1.260)	53	24	85	4.3	3.3	900
FFLI6B0817K--	810	85 (3.346)	180 (7.087)	32 (1.260)	50	23	100	5.1	3.1	1100
FFLI6B1007K--	1000	100 (3.937)	155 (6.102)	50 (13.78)	65	52	85	3.2	3.0	1200
FFLI6B1207K--	1200	100 (3.937)	180 (7.087)	50 (13.78)	61	52	100	3.7	2.9	1500
FFLI6B1357K--	1350	116 (4.567)	155 (6.102)	50 (13.78)	77	95	85	2.5	2.6	1700
FFLI6B1607K--	1600	116 (4.567)	180 (7.087)	50 (13.78)	72	93	100	3.0	2.6	2000
FFLI6B1907K--	1900	116 (4.567)	240 (9.449)	50 (13.78)	110	300	140	1.4	2.4	2600
FFLI6B2407K--	2400	116 (4.567)	290 (11.42)	50 (13.78)	100	300	170	1.6	2.2	3200
FFLI6B3007K--	3000	116 (4.567)	340 (13.39)	50 (13.78)	100	320	200	1.9	2.0	3800
$U_n$dc 1000V										
FFLI6L0197K--	190	75 (2.953)	105 (4.134)	32 (1.260)	46	8	60	4.5	4.1	200
FFLI6L0267K--	260	85 (3.346)	105 (4.134)	32 (1.260)	56	15	60	3.4	3.6	300
FFLI6L0337K--	330	75 (2.953)	155 (6.102)	32 (1.260)	40	8	85	6.8	3.6	600
FFLI6L0457K--	450	85 (3.346)	155 (6.102)	32 (1.260)	48	16	85	5.2	3.3	900
FFLI6L0547K--	540	85 (3.346)	180 (7.087)	32 (1.260)	45	16	100	6.1	3.1	1100
FFLI6L0657K--	650	100 (3.937)	155 (6.102)	50 (13.78)	60	33	85	3.8	3.0	1200
FFLI6L0787K--	780	100 (3.937)	180 (7.087)	50 (13.78)	55	33	100	4.5	2.9	1500
FFLI6L0907K--	900	116 (4.567)	155 (6.102)	50 (13.78)	72	64	85	2.9	2.6	1700
FFLI6L1107K--	1100	116 (4.567)	180 (7.087)	50 (13.78)	68	66	100	3.4	2.6	2000
FFLI6L1307K--	1300	116 (4.567)	240 (9.449)	50 (13.78)	100	210	140	1.5	2.4	2600
FFLI6L1807K--	1800	116 (4.567)	290 (11.42)	50 (13.78)	95	200	170	1.9	2.2	3200
FFLI6L2207K--	2200	116 (4.567)	340 (13.39)	50 (13.78)	95	200	200	2.2	2.0	3800
$U_n$dc 1150V										
FFLI6U0157K--	150	75 (2.953)	105 (4.134)	32 (1.260)	44	6	60	5.0	4.1	500
FFLI6U0207K--	200	85 (3.346)	105 (4.134)	32 (1.260)	53	11	60	3.9	3.6	600
FFLI6U0267K--	260	75 (2.953)	155 (6.102)	32 (1.260)	39	7	85	7.4	3.6	600
FFLI6U0357K--	350	85 (3.346)	155 (6.102)	32 (1.260)	45	12	85	5.9	3.3	900
FFLI6U0437K--	430	85 (3.346)	180 (7.087)	32 (1.260)	43	12	100	6.8	3.1	1100
FFLI6U0537K--	530	100 (3.937)	155 (6.102)	50 (13.78)	57	27	85	4.1	3.0	1200
FFLI6U0637K--	630	100 (3.937)	180 (7.087)	50 (13.78)	53	27	100	4.9	2.9	1500
FFLI6U0727K--	720	116 (4.567)	155 (6.102)	50 (13.78)	69	51	85	3.2	2.6	1700
FFLI6U0867K--	860	116 (4.567)	180 (7.087)	50 (13.78)	64	50	100	3.8	2.6	2000
FFLI6U1007K--	1000	116 (4.567)	240 (9.449)	50 (13.78)	95	160	140	1.7	2.4	2600
FFLI6U1307K--	1300	116 (4.567)	290 (11.42)	50 (13.78)	90	160	170	2.0	2.2	3200
FFLI6U1607K--	1600	116 (4.567)	340 (13.39)	50 (13.78)	90	160	200	2.3	2.0	3800
$U_n$dc 1400V										
FFLI6Q1056K--	105	75 (2.953)	105 (4.134)	32 (1.260)	41	5	60	5.8	4.1	500
FFLI6Q0147K--	140	85 (3.346)	105 (4.134)	32 (1.260)	50	8	60	4.5	3.6	600
FFLI6Q1856K--	185	75 (2.953)	155 (6.102)	32 (1.260)	35	5	85	8.8	3.6	600
FFLI6Q0257K--	250	85 (3.346)	155 (6.102)	32 (1.260)	42	9	85	6.7	3.3	900
FFLI6Q0307K--	300	85 (3.346)	180 (7.087)	32 (1.260)	40	9	100	7.9	3.1	1100
FFLI6Q0367K--	360	100 (3.937)	155 (6.102)	50 (13.78)	52	18	85	4.8	3.0	1200
FFLI6Q0447K--	440	100 (3.937)	180 (7.087)	50 (13.78)	50	19	100	5.6	2.9	1500
FFLI6Q0507K--	500	116 (4.567)	155 (6.102)	50 (13.78)	65	36	85	3.7	2.6	1700
FFLI6Q0607K--	600	116 (4.567)	180 (7.087)	50 (13.78)	60	35	100	4.3	2.6	2000
FFLI6Q0707K--	700	116 (4.567)	240 (9.449)	50 (13.78)	90	120	140	1.9	2.4	2600
FFLI6Q0907K--	900	116 (4.567)	290 (11.42)	50 (13.78)	90	120	170	2.3	2.2	3200
FFLI6Q1107K--	1100	116 (4.567)	340 (13.39)	50 (13.78)	85	120	200	2.7	2.0	3800

*Change "--" to "JE" for female terminals

Dimensions millimeters (inches)

DC FILTERING

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

APPLICATIONS

FFLC series is specifically designed for DC filtering, low reactive power.

PACKAGING MATERIAL

Non-painted rectangular resin filled aluminum case

FFLC capacitors meet the level 2 requirement of flammability standard NF F 16 102.

4 x M10 terminals*

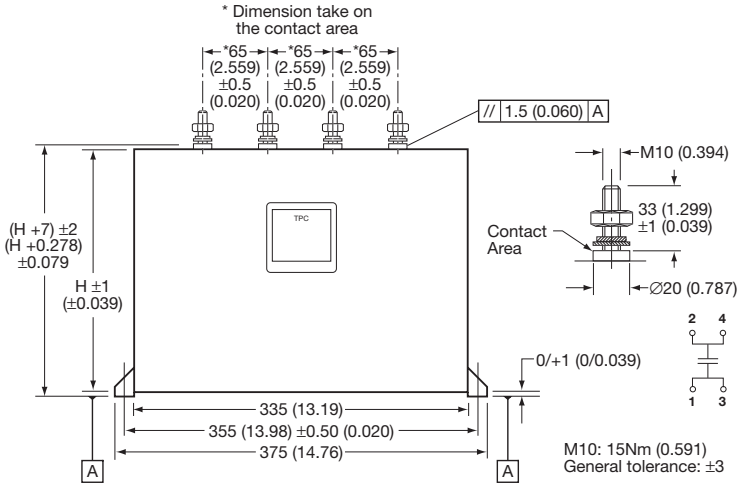
NEW *Available with M10 X 12 female terminal upon request*

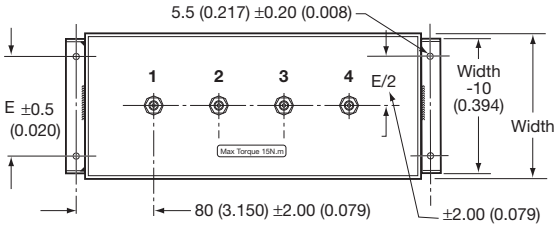
STANDARDS

IEC 61071-1: Power electronic capacitors
IEC 61071-2: Power electronic capacitors
IEC 60068-1: Environmental testing
IEC 60077: Rules for electric traction equipment
UL 94: Fire requirements
NF F 16-101
NF F 16-102: Fire and smoke requirements
IEC 61881: Railway applications, rolling stock equipment, capacitors for power electronics

DIMENSIONS

Terminal Code – – for male threaded
Terminal Code JE for female threaded





Width	E
170	100
145	100
95	50

HOW TO ORDER

FFLC	6	A	8807	K	– –
Series	**Dielectric** 6 = Polypropylene	**Voltage Code** A = 680Vdc L = 1000Vdc U = 1200Vdc	**Capacitance Code** 4 diget pF code 1st 3 digets are capacitance, last digit is multiplier, e.g. 8807 = 8800µF 5067 = 5060µF 2247 = 2240µF etc.	**Capacitance Tolerances** K = ±10%	**Terminal Code** – – = Male Terminal JE = Female Terminal

Medium Power Film Capacitors

FFLC (RoHS Compliant)

ELECTRICAL CHARACTERISTICS

Climatic Category	40/85/56 (IEC 60068)	
Test Voltage Between Terminals	@ 25°C: 1.5 x $U_N$dc for 10s	
Test Voltage Between Terminals and Case	@ 25°C: @ 4 kVrms @ 50Hz for 1 min.	
Capacitance range C_n	1120µF to 8800µF (other values available upon request)	
Tolerance on C_n	±10%	
Rated DC voltage $V_n$dc	680 to 1200 V	
FFLC overvoltage:	(V_S): V_S = 2 $V_n$dc and limited at 1800V	
Maximum overvoltage	Peak value	Maximum duration
	1.67 Vndc	100 ms 1 time per week
	1.25 Vndc	100 ms 1 time per day
	1.1 Vndc	1 min 1 time per day
Maximum rms current I_{rms} max	140 Arms to 300 Arms	
Stray inductance L_s*	28 nH to 40 nH	
Dielectric	Polypropylene	

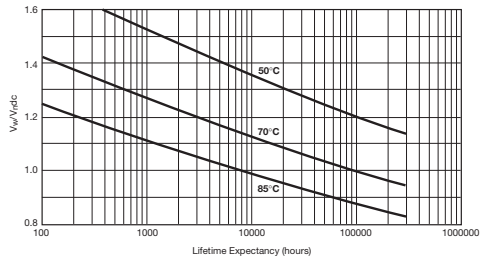
RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (µF)	Height mm (in)	Width mm (in)	Irms (A)	Ls* (nH)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
$U_N$dc 680 V (Voltage Code A)								
FFLC6A8807K--	8800	240 (9.449)	170 (6.693)	220	40	0.58	1.2	18000
FFLC6A7157K--	7150	240 (9.449)	145 (5.709)	230	38	0.50	1.2	13200
FFLC6A6507K--	6500	240 (9.449)	145 (5.709)	210	38	0.55	1.3	15500
FFLC6A5607K--	5600	170 (6.693)	170 (6.693)	140	35	0.88	1.8	15500
FFLC6A4557K--	4550	170 (6.693)	145 (5.709)	150	30	0.77	1.8	11300
FFLC6A4187K--	4180	240 (9.449)	95 (3.740)	300	35	0.34	1.0	10300
FFLC6A2667K--	2660	170 (6.693)	95 (3.740)	170	28	0.49	1.6	7300
$U_N$dc 1000 V (Voltage Code L)								
FFLC6L5067K--	5060	240 (9.449)	170 (6.693)	250	40	0.61	1.2	17200
FFLC6L3207K--	3200	170 (6.693)	170 (6.693)	150	35	0.89	1.9	12400
FFLC6L4307K--	4300	240 (9.449)	145 (5.709)	300	38	0.52	1.1	15500
FFLC6L2737K--	2730	170 (6.693)	145 (5.709)	170	30	0.75	1.6	11300
FFLC6L2537K--	2530	240 (9.449)	95 (3.740)	300	35	0.36	0.8	10300
FFLC6L1607K--	1600	170 (6.693)	95 (3.740)	170	28	0.51	1.2	7300
$U_N$dc 1200 V (Voltage Code U)								
FFLC6U3527K--	3520	240 (9.449)	170 (6.693)	250	40	0.71	1.2	18800
FFLC6U2247K--	2240	170 (6.693)	170 (6.693)	150	35	1.1	1.9	12700
FFLC6U3007K--	3000	240 (9.449)	145 (5.709)	300	38	0.60	1.1	15500
FFLC6U1907K--	1900	170 (6.693)	145 (5.709)	170	30	0.87	1.6	11300
FFLC6U1757K--	1750	240 (9.449)	95 (3.740)	300	35	0.41	0.8	10300
FFLC6U1127K--	1120	170 (6.693)	95 (3.740)	170	28	0.59	1.2	7300

*Very low stray inductance for high frequency applications on request.

Dimensions millimeters (inches)

LIFETIME EXPECTANCY vs HOT SPOT TEMPERATURE AND VOLTAGE



V_W: permanent working or operating DC-voltage.

HOT SPOT CALCULATION

See Hot Spot Temperature, page 3.

$$\theta_{hot\ spot} = \theta_{ambient} + (P_d + P_t) \times R_{th}$$

with P_d (Dielectric losses) = $Q \times tg\delta_0$

$$\Rightarrow [\ ½ \times C_n \times (V_{peak\ to\ peak})^2 \times f\ ] \times (2 \times 10^{-4})$$

P_t (Thermal losses) = $R_s \times (I_{rms})^2$

where C_n in Farad, V in Volt, R_{th} in °C/W, I_{rms} in Ampere, R_s in Ohm, f in Hertz, θ in °C

Medium Power Film Capacitors

FSM (FSN RoHS Compliant)

New Design can use FFV Range

APPLICATIONS

Recovery capacitor for G.T.O. switching (secondary snubber or clamp capacitor).

High current DC filtering.

FEATURES

Metallized polypropylene dielectric specially treated to withstand high DC voltage stresses up to 85°C.

Controlled self-healing.

Internal geometry and connections specially developed for high currents (Irms up to 100 A).

No liquid impregnant.

Special metallization for DC voltage and high currents.

PACKAGING MATERIAL

Self-extinguishing rectangular plastic case (in accordance with UL 94 VO) (12 kV/50 Hz isolation).

Filled with thermosetting resin.

M8 outputs.

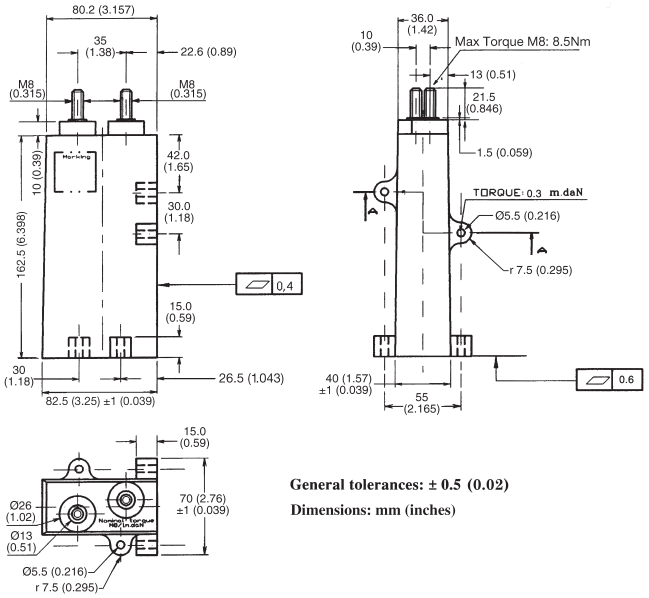
Fixing in two planes.

Vibrations and shocks resistant to IEC 60077.

Average weight 0.95 kg.

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

DIMENSIONS



General tolerances: ± 0.5 (0.02)
Dimensions: mm (inches)

MARKING

Logo TPC
FSM
Capacitance and tolerance in clear
Nominal voltage in clear
RMS current in clear
Date of manufacture (IEC coding)

ELECTRICAL CHARACTERISTICS

Climatic category	40/085/56
Working temperature	-40°C to +85°C (according to the power to be dissipated)
Capacitance range C_n	20µF to 54µF
Tolerance on C_n	±10%
Rated DC voltage $V_n$dc	750 to 1350 V
Allowable overvoltages	V_s = 1.1 $V_n$dc – 1/3 of the time 1.3 $V_n$dc – 1 min./day 2 $V_n$dc – 100 ms/day for $V_n$dc = ≤ 1150 V 1.75 $V_n$dc – 100 ms/day for $V_n$dc = 1350 V
DC test voltage between terminals	10s at 20°C ± 15°C $V_e$dc – 1.5 $V_n$dc (IEC 61071)
RMS current	Irms max. = 65 to 105 A
Impulse current	I^2.t max. = 100 to 270 A^2s
Tangent of loss angle	Tgδ: see table of values
Series inductance L_s	≤ 25 nH
Thermal resistance	Rth ambient/hot spot = 9.2°C/W Rth case/hot spot = 3.3°C/W
Dielectric	Polypropylene

HOW TO ORDER

FSM	2	6	A	0546	K	– –
Series FSM = Standard FSN = RoHS Compliant	**Case Size** 2 = Standard	**Dielectric** 6 = Polypropylene	**Voltage Code** A = 750Vdc C = 900Vdc L = 1000Vdc U = 1150Vdc V = 1350Vdc	**Capacitance Code** 0 + pF code 0546 = 54µF 0336 = 33µF 0206 = 20µF etc.	**Capacitance Tolerances** K = ±10%	**Voltage Range** – – = Standard (Male Threaded)

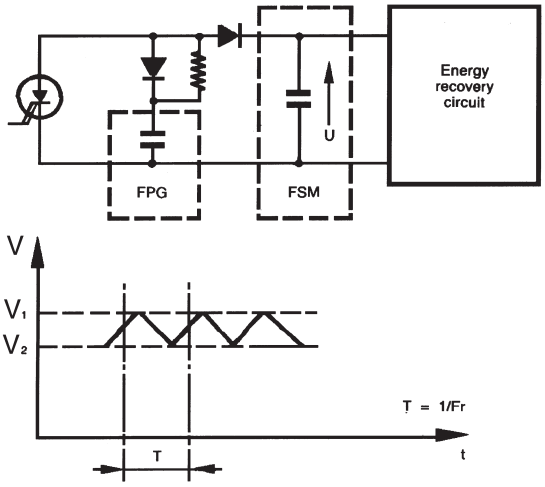
Medium Power Film Capacitors

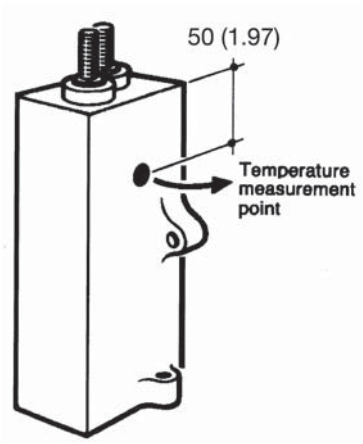
FSM (FSN RoHS Compliant)

New Design can use FFV Range

1) RECOVERY OF G.T.O. SWITCHING ENERGY

Typical application





Choice of voltage:

$V_1 \leq V_n dc$

Repetitive surge:

1.1 $V_n dc$ – 1/3 of the time

Non-repetitive surge:

1.3 $V_n dc$ – 1 min./day

Occasional max. surge:

2 $V_n dc$ – 100 ms/day for $V_n dc$ = ≤ 1150 V

1.75 $V_n dc$ – 100 ms/day for $V_n dc$ = 1350 V

RMS current limits:

The currents given in the tables are maximum. The thermal limits of the dielectric (85°C) must be respected.

The self-heating can be calculated from the series resistance, Tgδ and the thermal resistance given in the table of values

$\Delta Ø = P \times Rth \leq 85°C - Ø$ ambient

Rth: is given for still air with the capacitor not being subjected to any other heat source.

$$P = (I_{rms})^2 \times R_s + \frac{\pi}{2} \times C\,(V_1 - V_2)^2 \times f_r \times 10^{-4}$$

Temperature measuring point*

Measurement of the case temperature (ΘB) together with the losses gives the temperature of the hot spot.

$\Theta = (RthB \times P) + \Theta B \leq 85°C$

*Important for series/parallel operations.

Important

Due to the modular nature of this capacitors series parallel assemblies can be made to increase the capacitance and/or voltage.

Ensure that suitable sized connections are used so that the capacitors will not be overheated. The inductance of the connections must be low enough to ensure equal current sharing of capacitors in parallel.

For series assemblies, connect resistor across each capacitor. Optimal resistance value will be:

R # 30 MΩ/C in µF

(1.5 MΩ for C = 20 µF).

2) DC FILTERING

Nominal Capacitance

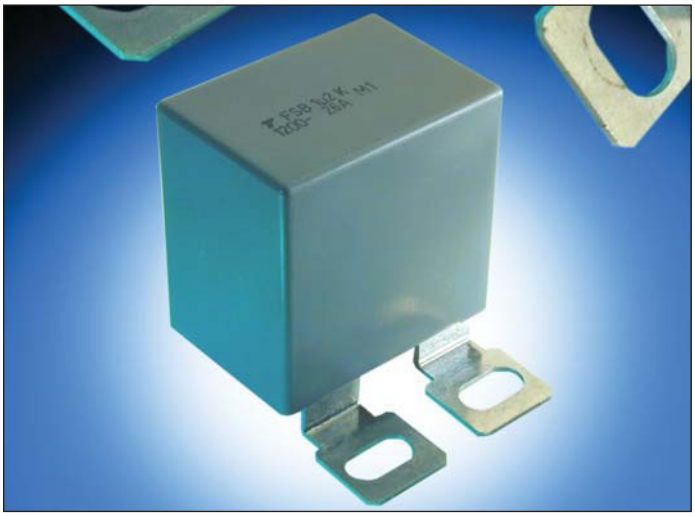
RATINGS AND PART NUMBER REFERENCE – POLYESTER DIELECTRIC

Part Number	Capacitance (µF)	$V_n dc$ (V)	Irms max.* (A)	$(I^2.t)$ max. (A^2s)	Tgδ (f→kHz) (10^{-4})	Rs (mΩ)	Typical Weight (g)
FSM26A0546K--	54	750	105	270	2 + 3.4 f	1	9500
FSM26C0446K--	42	900	100	220	2 + 2.8 f	1.05	9500
FSM26L0336K--	33	1000	95	170	2 + 2.3 f	1.1	9500
FSM26U0286K--	28	1150	85	150	2 + 2 f	1.15	9500
FSM26V0206K--	20	1350	65	100	2 + 1.6 f	1.25	9500

*Function of power dissipation

Medium Power Film Capacitors

FSB (RoHS Compliant)



GENERAL DESCRIPTION

Metallized polypropylene dielectric capacitor with controlled self-healing.

Reinforced metallization developed for high impulse currents.

APPLICATIONS

- IGBT protection
- IGBT clamping

PACKAGING MATERIAL

- Plastic case backfilled with thermosetting resin

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

HOW TO ORDER

FSB	1	6	U	0154	J	– –
Series	**Case Size** 1 = PO Style 2 = 18 Style 3 = 19 Style 4 = 26 style 5 = R28 Style (2 terminal or 4 terminal)	**Dielectric** 6 = Polypropylene	**Voltage Code** B = 850Vdc U = 1200Vdc M = 1600Vdc N = 2000Vdc	**Capacitance Code** 0 + pF code 0154 = 0.15µF 0334 = 0.33µF 0255 = 2.5µF etc.	**Capacitance Tolerances** J = ± 5% K = ±10% (Case size 6 only)	**Voltage Range** – – = 2 Terminal JC = 4 Terminal (Case Size 5 option only)

ELECTRICAL CHARACTERISTICS

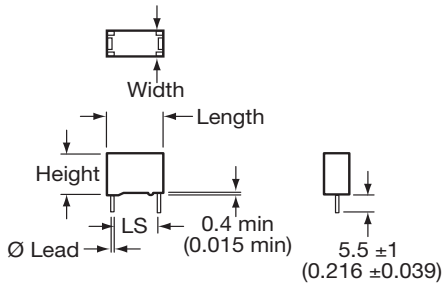
Capacitance Range C_n	0.10µF to 2.5µF
Tolerance on C_n	±5%: FSB1...5 ±10%: FSB6
Rated DC Voltage $V_n$dc	850 to 2000 V
Stray Inductance	≤ 25 nH
RMS Current	I_{rms} max. = up to 28A The currents shown in the tables are maximum. It is necessary to maintain operation within the maximum temperature of the dielectric 85°C. See “Hot spot temperature calculation”
Insulation Resistance	R_i x C ≥ 30,000 s
Impulse Current	$I^2.t$ max. = up to 1.69 A^2s Spikes or peak currents in the capacitors may cause a deterioration of the bonding between the metallization and the connections. These bonds are capable of withstanding only a limited amount of energy for each spike. The table shows the maximum energy permitted in the form ($I^2.t$), where I is in Amperes, and t is in seconds.

Note: The formula ($I^2.t$) replaces dv/dt which is less easy to use as it is not an expression of energy (I = C.dv/dt).
This type of capacitor has been designed to withstand high ($I^2.t$) values.

Variation of Capacitance with Temperature	$\frac{\Delta C}{C}$ ≤ ±2% between -40 and +85°C
Climatic Category	40/085/56 (IEC 68)
Test Voltage Between Terminals @ 25°C	1.6 $V_n$dc during 10s
Withstanding Voltage Between Terminals and Case @ 25°C	@ 3 kVrms @ 50Hz during 1 min.

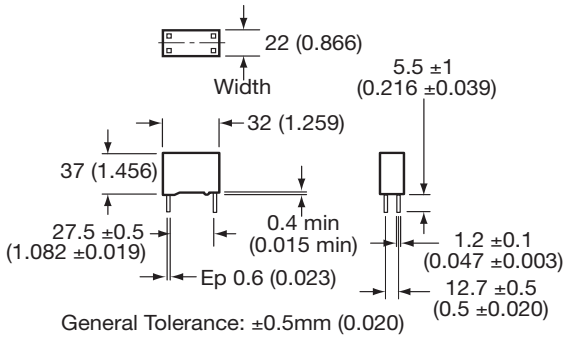
GENERAL DESCRIPTION

STYLE: P0; 18; 19; 26; R68
ALL CASE SIZES
2 TERMINALS VERSION



General Tolerance: ±0.5mm (0.020)

STYLE: R68
CASE SIZE 5 ONLY
4 TERMINALS VERSION



General Tolerance: ±0.5mm (0.020)

DIMENSIONS: millimeters (inches)

Case Size	Case Style	Length mm ±0.40 (inches)	Width mm ±0.40 (inches)	Height mm ±0.30 (inches)	Dimensions lead mm +10% -0.05 (inches)	LS mm ±0.40 (inches)
1	**PO**	31.1 (1.230)	13.0 (0.051)	22.4 (0.880)	Ø 0.80 (0.031)	27.5 (1.083)
2	**18**	31.1 (1.230)	14.6 (0.580)	25.7 (1.010)	Ø 0.80 (0.031)	27.5 (1.083)
3	**19**	31.1 (1.230)	17.3 (0.068)	29.8 (1.170)	Ø 0.80 (0.031)	27.5 (1.083)
4	**26**	31.1 (1.230)	20.8 (0.820)	31.3 (1.230)	Ø 1.00 (0.039)	27.5 (1.083)
5	**R68 2 Terminals Version**	32.5 (1.280)	22.0 (0.870)	37.0 (1.460)	Ø 1.00 (0.039)	27.5 (1.083)
	R68 4 Terminals Version	32.5 (1.280)	22.0 (0.870)	37.0 (1.460)	1.20 x 0.60 (0.047 x 0.023)	27.5 (1.083)

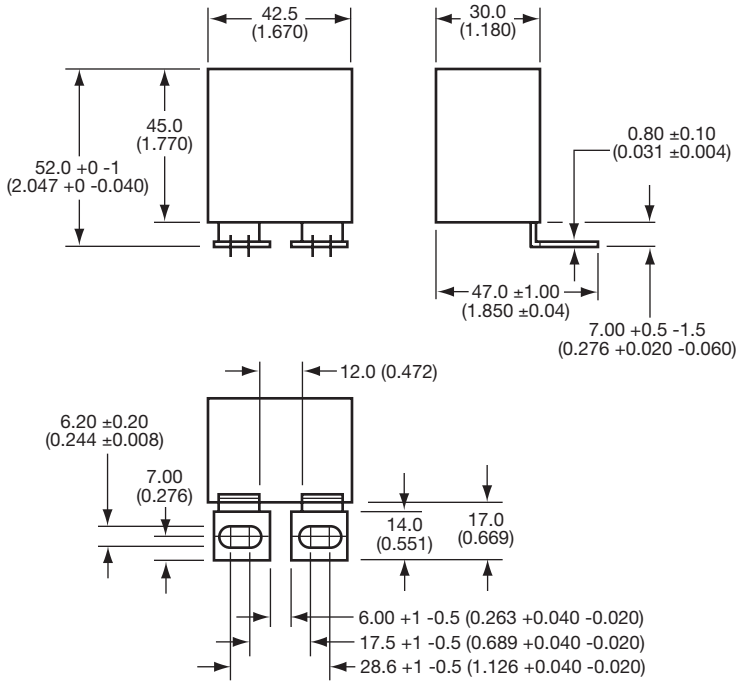
RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (µF)	Case Style	(I²t) (A²s)	Irms (A)	Rs (mΩ)	Rth (hotspot/amb.)	Typical Weight (g)
$U_N$dc = 1200V Vpeak = 1600V Vrms = 560V Vs = 2000V (Voltage Code U)							
FSB16U0154J--	0.15	P0	0.05	3	14.3	45.9	15
FSB26U0274J--	0.27	18	0.15	7.6	8.4	36.8	20
FSB36U0394J--	0.39	19	0.31	11	6.2	32.2	25
FSB46U0474J--	0.47	26	0.41	12	5.6	29.4	32
FSB56U0684J--	0.68	R68 (2 terminals)	0.94	12	3.8	23.7	40
FSB56U0684JJC	0.68	R68 (4 terminals)	0.94	16.7	3.8	23.7	40
$U_N$dc = 1600V Vpeak = 2000V Vrms = 630V Vs = 2300V (Voltage Code M)							
FSB16M0134J--	0.13	P0	0.05	4.6	13.3	44.9	15
FSB26M0184J--	0.18	18	0.1	6.4	9.9	35.9	20
FSB36M0244J--	0.24	19	0.18	8.5	7.8	32.4	25
FSB46M0334J--	0.33	26	0.35	11.7	5.6	28.6	32
FSB56M0434J--	0.43	R68 (2 terminals)	0.59	12	4.6	23.8	40
FSB56M0434JJC	0.43	R68 (4 terminals)	0.59	15.2	4.6	23.8	40
$U_N$dc = 2000V Vpeak = 2400V Vrms = 700V Vs = 2600V (Voltage Code N)							
FSB16N0104J--	0.1	P0	0.05	4.2	14.3	44.6	15
FSB26N0134J--	0.13	18	0.08	5.5	11.3	35.7	20
FSB36N0184J--	0.18	19	0.15	7.6	8.5	32.1	25
FSB46N0224J--	0.22	26	0.22	9.3	6.8	29.1	32
FSB56N0304J--	0.3	R68 (2 terminals)	0.41	12	5.3	23.8	40
FSB56N0304JJC	0.3	R68 (4 terminals)	0.41	12.7	5.3	23.8	40

CASE SIZE 6

Plastic case resin filled

Dimensions: millimeters (inches)



GENERAL TOLERANCES: ±0.50mm (±0.020 inches)

RATINGS AND PART NUMBER REFERENCE

Part Number	Capacitance (µF)	(I²t) (A²s)	$I_{rms\ max.}$ (A)	R_s (mΩ)	R_{th} (°C/W)	Typical Weight (g)
FSB 850V $V_n$dc = 850V V_{peak} = 1200V V_{rms} = 450V V_S = 1500V (Voltage Code B)						
FSB66B0205K--	2	0.99	25	3.4	19.1	87
FSB66B0225K--	2.2	1.19	28	3.1	18.6	87
FSB66B0255K--	2.5	1.54	28	2.7	17.8	87
FSB 1200V $V_n$dc = 1200V V_{peak} = 1600V V_{rms} = 560V V_S = 2000V (Voltage Code U)						
FSB66U0105K--	1	1.47	25	3.6	17.2	87
FSB66U0125K--	1.2	1.69	26	3.4	17.5	87
FSB66U0155K--	1.5	1	26	3.4	17.5	87
FSB 2000V $V_n$dc = 2000V V_{peak} = 2400V V_{rms} = 700V V_S = 2600V (Voltage Code N)						
FSB66N0474K--	0.47	0.41	22	6.3	19.4	87
FSB66N0564K--	0.56	0.62	23	5.2	17.9	87
FSB66N0684K--	0.68	0.91	24	4.4	17.3	87

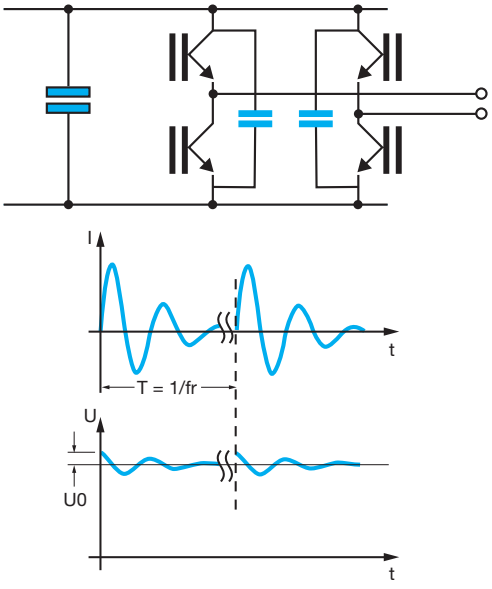
STANDARDS

IEC 61071-1, IEC 61071-2: Power electronic capacitors

TANGENT OF LOSS ANGLE (TANδ_0) FOR POLYPROPYLENE DIELECTRIC

Polypropylene has a constant dielectric loss factor of $2x10^{-4}$ irrespective of temperature and frequency (up to 1 MHz).

IGBT SNUBBER



With

L = stray inductance IGBT + capacitor

R = serial resistance IGBT + capacitor

HOT SPOT TEMPERATURE CALCULATION

See Hot Spot Temperature, page 3.

$\theta_{hot\ spot} = \theta_{ambient} + (P_d + P_t) \times R_{th}$

with P_d (Dielectric losses) = $Q \times tg\delta_0$

$\Rightarrow [\frac{1}{2} \times C_n \times (V_{ripple\ peak\ to\ peak})^2 \times f] \times (2 \times 10^{-4})$

P_t (Thermal losses) = $R_s \times (I_{rms})^2$

Rth : Rth ambient / hot spot in °C/W

where C_n in Farad, I_{rms} in Ampere, f in Hertz, V in Volt, R_s in Ohm, θ in °C

Due to the design of the capacitor and its technology, the thermal impedance between the terminations and the core of the capacitor is low, it is necessary to take care that the capacitor is never overheated by use of wrongly sized connections.

Do not use the capacitor as a heat sink.

Due to the complexity of the IGBT / capacitor thermal exchanges, we recommend that thermal measurements shall be made on the different components. We would be pleased to advise you on specific applications.

WORKING TEMPERATURE

(according to the power to be dissipated) -40°C to +85°C

MARKING

TPC logo

Capacitance and tolerance in clear

Nominal DC voltage in clear

RMS current in clear

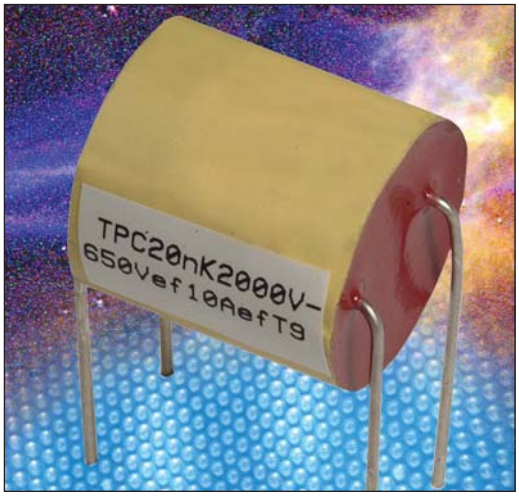
Date of manufacture (IEC coding)

$$Ieff = \sqrt{\left[\frac{C\beta_0^2 \times U_0}{2j\beta}\right]^2 \times \frac{1}{T} \times \left[\frac{e^{-2\alpha \times T}}{\beta^2 + \alpha^2} \times [\beta \sin(2\beta \times T) - \alpha \times \cos(2\beta \times T)] + \frac{1}{\alpha} \times e^{-2\alpha \times T} + \frac{\alpha}{\beta^2 + \alpha^2} - \frac{1}{\alpha}\right]}$$

with $\beta 0 = \sqrt{\frac{1}{LC}}$; $\alpha = \frac{R}{2L}$; $\beta = \sqrt{\beta_0^2 - \alpha^2}$

Medium Power Film Capacitors

FSV (RoHS Compliant)



GENERAL DESCRIPTION

Metallized dielectric capacitor and metal foil, low serial inductance and high RMS current.

APPLICATIONS

- Protection of semi conductors
- High frequency decoupling
- Tunning

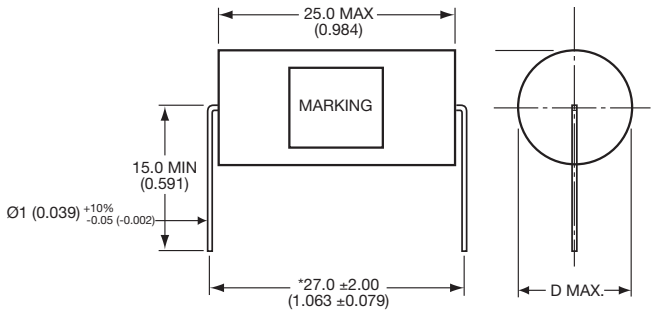
PACKAGING MATERIAL

- Cylindrical with polyester tape wrapping, sealed with polyurethane resin
- Radial connections

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

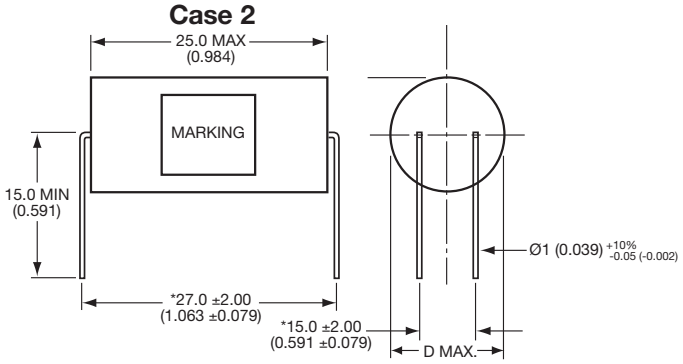
DIMENSIONS

Case 1



*PITCH DIMENSION AT 2.00mm (0.079) LENGTH OF LEADS

Case 2



*PITCH DIMENSION AT 2.00mm (0.079) LENGTH OF LEADS

HOW TO ORDER

FSV	1	6	K	0683	K	– –
Series	**Case Size** Case Size 1 Case Size 2	**Dielectric** 6 = Polypropylene	**Voltage Code** K = 600Vdc B = 800Vdc L = 1000Vdc U = 1200Vdc R = 1500Vdc N = 2000Vdc	**Capacitance Code** 0 + pF code 0683 = 0.068µF 0333 = 0.033µF 0203 = 0.020µF etc.	**Capacitance Tolerances** K = ±10%	**Voltage Range** – – = Standard

ELECTRICAL CHARACTERISTICS

Capacitance Range Cn	0.010µF to 0.15µF
Tolerance on Cn	10%
Rated DC Voltage Vndc	600 to 2000 V
Rated AC Voltage	300 to 650 Vrms
Test Voltage between terminals @ 25°C	1.5 Vndc during 10s
High dV/dt	10000 V/µs
RMS Current	Irms max = up to 23A The currents shown in the tables are maximum. It is necessary to respect the thermal limits of the dielectric 85°C See "Hot spot temperature calculation"
Working Temperature	-40°C +85°C (according to the power to be dissipated)
Climatic Category	40/085/56 (IEC 60068)
Hot Spot Calculation	*See Hot Spot Temperature page 3* For all applications, the temperature in the hot spot capacitor must be lower than 85°C Θ Hot spot = Θ ambient + ($\tan\delta_0$ x Q + R_S I_{rms}^2) x R_{th} With tg δ o = 2.10^{-4} Q in vars Rs in Ω Irms in A Rth in °C/W
Dieleictric	Polypropylene

RATINGS AND PART NUMBER REFERENCE

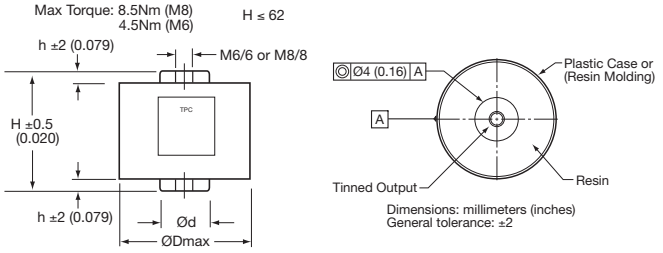
Part Number	Capacitance (µF)	D max. mm (in)	Irms A	Rs (mΩ)	Rth °C/W	Typical Weight (g)
FSV 600 V Vndc = 600V Vrms = 300V (Voltage Code K)						
FSV16K0683K--	0.068	22 (0.866)	10	2.5	35	15
FSV26K0104K--	0.10	25 (0.984)	15	2.1	25	25
FSV26K0154K--	0.15	30 (1.181)	23	1.8	17	25
FSV 800 V Vndc = 800V Vrms = 400V (Voltage Code B						
FSV16B0473K--	0.047	22 (0.866)	10	2.6	33	15
FSV26B0683K--	0.068	25 (0.984)	15	2.2	23	25
FSV26B0823K--	0.082	28 (1.102)	18	2.1	21	25
FSV26B0104K--	0.100	30 (1.181)	23	1.9	16	25
FSV 1000 V Vndc = 1000V Vrms = 450V (Voltage Code L)						
FSV16L0333K--	0.033	22 (0.866)	8	2.8	31	15
FSV26L0473K--	0.047	25 (0.984)	12	2.3	22	25
FSV26L0683K--	0.068	30 (1.181)	17	2.0	16	25
FSV 1200 V Vndc = 1200V Vrms = 500V (Voltage Code U)						
FSV16U0223K--	0.022	22 (0.866)	7	3.2	34	15
FSV26U0333K--	0.033	25 (0.984)	10	2.2	23	25
FSV26U0473K--	0.047	30 (1.181)	14	2.1	16	25
FSV 1500 V Vndc = 1500V Vrms = 600V (Voltage Code R)						
FSV16R0153K--	0.015	22 (0.866)	5	3.5	34	15
FSV26R0223K-	0.022	25 (0.984)	8	2.8	22	25
FSV26R0333K-	0.033	30 (1.181)	12	2.2	16	25
FSV 2000 V Vndc = 2000V Vrms = 650V (Voltage Code N)						
FSV16N0103K--	0.010	22 (0.866)	5	3.4	34	15
FSV26N0153K--	0.015	25 (0.984)	7	2.9	21	25
FSV26N0203K--	0.020	27 (1.063)	10	2.4	16	25
FSV26N0223K--	0.022	30 (1.181)	11	2.4	14	25

PROTECTION

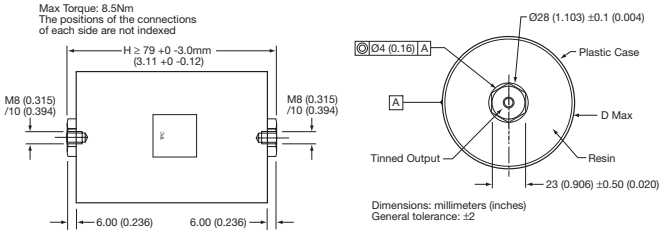
Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

DIMENSIONS

Plastic Case Style M6 / 6 or M8 / 8



Plastic Case Style M8 / 10



MARKING

Logo
Withstanding surge voltage
Capacitance and tolerance in clear
Nominal DC voltage in clear
RMS current in clear
Date of manufacture (IEC coding)

APPLICATIONS

Protection of thyristors.
Protection of gate turn-off thyristor (G.T.O.).
Clamping (Secondary snubber).

TECHNOLOGY

Metallized polypropylene dielectric capacitor with controlled self-healing.
Reinforced metallization developed for high impulse currents.
Axial connections specially developed to reduce series inductance and to provide rigid mechanical mounting.

PACKAGING MATERIAL

Cylindrical in plastic case filled with thermosetting resin.
Outputs: threaded inserts either M6 or M8.

HOT SPOT TEMPERATURE CALCULATION

See Hot Spot Temperature page 3.

$$\theta_{hot\ spot} = \theta_{terminals} + (P_d + P_t) \times R_{th}$$

with

P_d (Dielectric losses) = $Q \times tg\delta_0$
$\Rightarrow [\ ½ \times C_n \times (V_{peak\ to\ peak})^2 \times f\ ] \times (2 \times 10^{-4})$
P_t (Thermal losses) = $R_s \times (I_{rms})^2$

where

C_n in Farads
V in Volts
I_{rms} in Amperes
R_s in Ohms
f in Hertz
θ in °C
R_{th} in °C/W

Due to the design of the capacitor and its technology, the thermal impedance between the terminations and the core of the capacitor is low, it is necessary to take care that the capacitor is never overheated by use of incorrect sized connections.

In the case where the series diodes are screwed to the capacitor, cooling of the diodes must be taken in account.

Do not use the capacitor as a heat sink.

Due to the complexity of the diode/capacitor thermal exchanges, we recommend that thermal measurements shall be made on the different components. We would be pleased to advise you on specific problems.

WORKING TEMPERATURE

(according to the power to be dissipated) -40°C to +85°C

HOW TO ORDER

FPX	6	6	N	0105	J	– –
Series FPX = Standard FPY = RoHS Compliant	**Case Size** Case Size 6 Case Size 8 (See Case Style)	**Dielectric** 6 = Polypropylene	**Voltage Code** N = 2000V P = 2500V X = 3500V Z = 4500V Y = 4600V	**Capacitance Code** 0 + pF code 0105 = 1.0µF 0335 = 3.5µF 0504 = 0.5µF etc.	**Capacitance Tolerances** K = ±5%	**Terminal Code** – – = Standard

ELECTRICAL CHARACTERISTICS

Capacitance range C_n	0.5µF to 6µF
Tolerance on C_n	±5%
Rated DC voltage $V_n$dc Peak voltage V_{peak} Allowable overvoltage V_s (for 10 s/day)	1000 to 3000 V 1600 to 4000 V 2000 to 4600 V
Stray inductance	5 to 20 nH
RMS current	I_{rms} max. = up to 160 A The currents shown in the tables are maximum. It is necessary to respect the thermal limits of the dielectric 85°C see "Hot spot temperature calculation"
Insulation resistance	R_i x C ≥ 30,000 s
Impulse current	$I^2.t$ maxi. = up to 729 $A^2.s$ Spikes or peak currents in the capacitors may cause a deterioration of the bonding between the metallization and the connections. These bonds are capable of withstanding only a limited amount of energy for each spike. The table shows the maximum energy permitted in the form ($I^2.t$), where I is in Ampere, and t is in seconds.

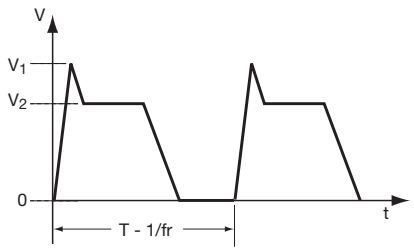
Note: The formula ($I^2.t$) replaces dV/dt which is less easy to use as it is not an expression of energy (I = C.dV/dt).
This type of capacitor has been designed to withstand high ($I^2.t$) values.

Variation of capacitance with temperature	$\frac{\Delta C}{C}$ ≤ ±2% between -40 and 85°C
Climatic category	40/085/56 (IEC 60068)
Test voltage between terminals @ 25°C	V_s for 10s
Test voltage between terminals and case @ 25°C (Type test)	@ 7 kVrms @ 50 Hz for 1 min.
Dielctric	Polypropylene

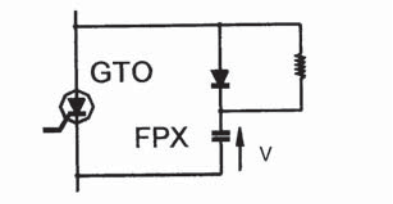
PROTECTION

APPLICATIONS NOTES

G.T.O.

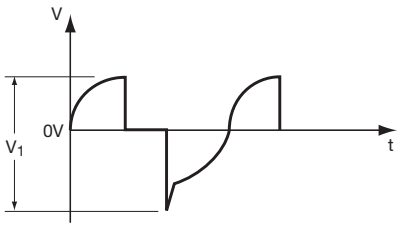


Choice of voltage: $V_1 \leq V_{peak}$
$V_2 \leq V_n$dc

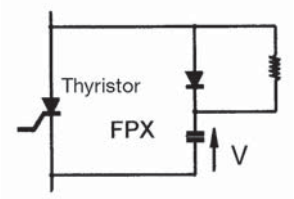


Nominal DC voltage ($V_n$dc) and peak voltage (V_{peak}) are given in the tables.

THYRISTOR

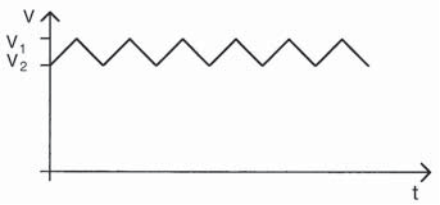


Choice of voltage: $V_1 \leq V_{peak}$
Note that V_1 is the voltage peak to peak and cannot be symmetrical vs 0 V

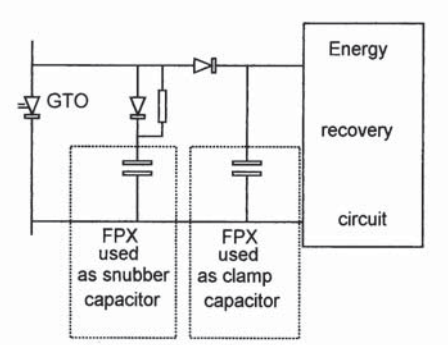


Peak voltage is given in the tables.

CLAMPING



Choice of voltage: $V_1 \leq V_{peak}$
$V_2 \leq V_n$dc



Nominal DC voltage ($V_n$dc) and peak voltage (V_{peak}) are given in the tables.

Medium Power Film Capacitors

FPX/FPY (RoHS Compliant) Table of Values

PROTECTION

Dimensions: millimeters (inches)

Part Number	Cn (µF)	Dimensions					I^2t max. ($A^2.s$)	I_{rms} max. (A)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
		Case Style	H* ±0.5 (±0.020)	h ±2 (±0.079)	D max.	d ±0.5 (±0.020)					
FPX 2000V V_ndc = 1000V V_{peak} = 1600V V_{rms} = 560V V_s = 2000V (Voltage Code N)											
FPX66N0105J--	1	Plastic case M6/6	52 (2.072)	5 (0.197)	40 (1.575	18 (0.709)	2	15	2.4	14)	120
FPX86N0205J--	2	Plastic case M8/8	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	8	30	1.2	6.1	190
FPX86N0305J--	3	Plastic case M8/8	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	18	45	0.9	4.5	260
FPX86N0355J--	3.5	Plastic case M8/8	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	25	50	0.85	4.5	260
FPX86N0405J--	4	Plastic case M8/8	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	32	60	0.75	3.5	320
FPX86N0505J--	5	Plastic case M8/8	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	50	70	0.65	2.5	320
FPX 2500V V_ndc = 1300V V_{peak} = 2000V V_{rms} = 700V V_s = 2500V (Voltage Code P)											
FPX66P0504J--	0.5	Plastic case M6/6	52 (2.072)	5 (0.197)	40 (1.575)	18 (0.709)	1	15	3	14	120
FPX86P0105J--	1	Plastic case M8/8	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	3	20	2.3	10.5	190
FPX86P0155J--	1.5	Plastic case M8/8	52 (2.072)	5 (0.197)	60 (2.362)	22 (0.866)	7	30	1.5	6.1	190
FPX86P0205J--	2	Plastic case M8/8	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	12.7	40	1.1	4.5	260
FPX86P0255J--	2.5	Plastic case M8/8	52 (2.072)	5 (0.197)	72 (2.835)	22 (0.866)	20	60	0.89	3.7	260
FPX86P0305J--	3	Plastic case M8/8	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	28	60	0.85	3.2	320
FPX86P0355J--	3.5	Plastic case M8/8	52 (2.072)	5 (0.197)	82 (3.228)	22 (0.866)	39	65	0.78	2.9	320
FPX 3500V V_ndc = 2000V V_{peak} = 2400V V_{rms} = 850V V_s = 3500V (Voltage Code X)											
FPX86X0205J--	2	Plastic case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	23	41	1.24	6.1	310
FPX86X0305J--	3	Plastic case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	50	62	0.92	3.9	475
FPX86X0355J--	3.5	Plastic case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	70	72	0.83	3.4	475
FPX86X0405J--	4	Plastic case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	85	80	0.78	3.1	475
FPX 2000V V_ndc = 1000V V_{peak} = 1600V V_{rms} = 560V V_s = 2000V (Voltage Code Z)											
FPX86Z0904J--	0.9	Plastic case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	15	40	1.5	6.2	310
FPX86Z0105J--	1	Plastic case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	15	38	1.4	6.2	310
FPX86Z0205J--	2	Plastic case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	70	75	0.85	3.1	475
FPX 4600V V_ndc = 3000V V_{peak} = 4000V V_{rms} = 1400V V_s = 4600V (Voltage Code Y)											
FPX86Y0504J--	0.5	Plastic case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	7	40	1.7	12	310
FPX86Y0684J--	0.68	Plastic case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	14	35	1.59	6.2	310
FPX86Y1254J--	1.25	Plastic case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	50	65	1	3.3	475
FPX86Y0155J--	1.5	Plastic case M8/10	79 (3.110)	6 (0.236)	98 (3.858)	–	32	60	1.4	8.3	630
FPX86Y0175J--	1.7	Plastic case M8/10	79 (3.110)	6 (0.236)	98 (3.858)	–	40	70	1.3	7.4	630
FPX86Y0205J--	2	Plastic case M8/10	79 (3.110)	6 (0.236)	98 (3.858)	–	56	80	1.1	6.3	630
FPX86Y0255J--	2.5	Plastic case M8/10	118 (4.646)	6 (0.236)	98 (3.858)	–	200	130	0.8	1.1	1020
FPX86Y0275J--	2.7	Plastic case M8/10	118 (4.646)	6 (0.236)	98 (3.858)	–	232	140	0.7	1.1	1020
FPX86Y0305J--	3	Plastic case M8/10	143 (5.630)	6 (0.236)	98 (3.858)	–	128	100	0.9	1.5	1280
FPX86Y0355J--	3.5	Plastic case M8/10	143 (5.630)	6 (0.236)	98 (3.858)	–	170	110	0.8	1.4	1280
FPX86Y0405J--	4	Plastic case M8/10	143 (5.630)	6 (0.236)	98 (3.858)	–	224	115	0.8	1.4	1280
FPX86Y0455J--	4.5	Plastic case M8/10	163 (6.417)	6 (0.236)	98 (3.858)	–	522	120	0.6	1.7	1500
FPX86Y0505J--	5	Plastic case M8/10	163 (6.417)	6 (0.236)	98 (3.858)	–	600	130	0.6	1.7	1500
FPX86Y0605J--	6	Plastic case M8/10	163 (6.417)	6 (0.236)	98 (3.858)	–	729	160	0.5	1.7	1500

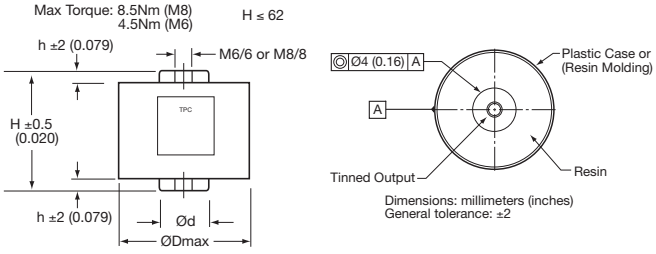
* Tol: +0 / -3mm for H ≥ 118mm

PROTECTION

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf

DIMENSIONS

millimeters (inches)



MARKING

Logo

Withstanding surge voltage

Capacitance and tolerance in clear

Nominal DC voltage in clear

RMS current in clear

Date of manufacture (IEC coding)

PACKAGING MATERIAL

Cylindrical in either plastic case (preferred packaging) or a resin molding.

Outputs: threaded inserts either M6 or M8.

Filled with thermosetting resin.

Metallized polypropylene dielectric capacitor with controlled self-healing.

Reinforced metallization on margins developed for high impulse currents.

Axial connections specially developed to reduce series inductance and to provide rigid mechanical mounting.

APPLICATIONS

Protection of gate turn-off thyristor (G.T.O.).

Medium frequency tuning.

HOT SPOT TEMPERATURE CALCULATION

See Hot Spot Temperature page 3.

$$\theta_{hot\ spot} = \theta_{terminals} + (P_d + P_t) \times R_{th}$$

with

P_d (Dielectric losses) = $Q \times tg\delta_0$

$\Rightarrow [\frac{1}{2} \times C_n \times (V_{peak\ to\ peak})^2 \times f] \times (2 \times 10^{-4})$

P_t (Thermal losses) = $R_s \times (I_{rms})^2$

where

C_n	in Farads
V	in Volts
I_{rms}	in Amperes
R_s	in Ohms
f	in Hertz
θ	in °C
R_{th}	in °C/W

Due to the design of the capacitor and its technology, the thermal impedance between the terminations and the core of the capacitor is low, it is necessary to take care that the capacitor is never overheated by use of incorrect sized connections.

In the case where the series diodes are screwed to the capacitor, cooling of the diodes must be taken in account.

Do not use the capacitor as a heat sink.

Due to the complexity of the diode/capacitor thermal exchanges, we recommend that thermal measurements shall be made on the different components. We would be pleased to advise you on specific problems.

WORKING TEMPERATURE

(according to the power to be dissipated) -40°C to +85°C

HOW TO ORDER

FPG	**8**	**6**	**R**	**0105**	**J**	**– –**
Series FPG = Standard FPH = RoHS Compliant	**Case Size** Case Size 8	**Dielectric** 6 = Polypropylene	**Voltage Code** R = 1500V N = 2000V P = 2500V W = 2600V X = 3500V Z = 4500V Y = 4600V	**Capacitance Code** 0 + pF code 0105 = 1.0µF 0405 = 4.0µF 0604 = 0.6µF etc.	**Capacitance Tolerances** K = ±5%	**Terminal Code** – – = Standard

ELECTRICAL CHARACTERISTICS

Capacitance range C_n	0.12µF to 6µF
Tolerance on C_n	±5%
Rated DC voltage $V_n$dc Peak voltage V_{peak} Allowable overvoltage V_s (for 10 s/day)	800 to 3000 V 1200 to 4000 V 1500 to 4600 V
Nominal RMS voltage $V_n$dc	500 to 1400 V
Stray inductance	≈ 10 nH
RMS current	I_{rms} max. = up to 80 A The currents shown in the tables are maximum. It is necessary to respect the thermal limits of the dielectric 85°C see "Hot spot temperature calculation"
Insulation resistance	R_i x C ≥ 30,000 s
Impulse current	I^2.t max. given in the tables Spikes or peak currents in the capacitors may cause a deterioration of the bonding between the metallization and the connections. These bonds are capable of withstanding only a limited amount of energy for each spike. The table shows the maximum energy permitted in the form (I^2.t), where I is in Ampere, and t is in seconds.

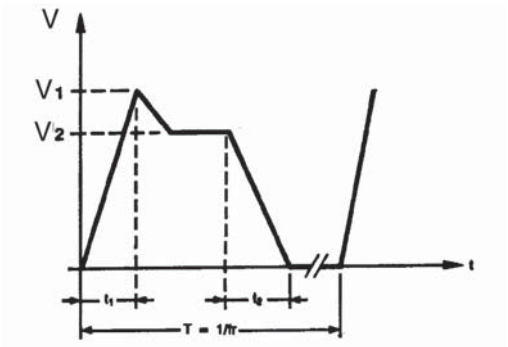
Note: The formula (I^2.t) replaces dV/dt which is less easy to use as it is not an expression of energy (I = C.dV/dt).
This type of capacitor has been designed to withstand high (I^2.t) values.

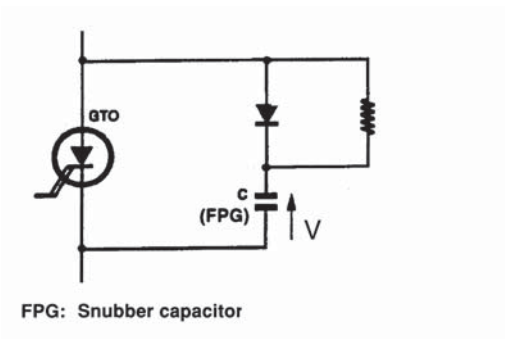
Variation of capacitance with temperature	$\frac{\Delta C}{C}$ ≤ ±2% between -40 and 85°C
Climatic category	40/085/56 (IEC 60068)
Test voltage between terminals @ 25°C	V_s during 10s
Test voltage between terminals and case @ 25°C (Type test)	@ 4 kVrms @ 50 Hz during 1 min.
Dielectric	Polypropylene

PROTECTION

APPLICATION NOTES

G.T.O. PROTECTION





FPG: Snubber capacitor

Choice of voltage: $V_1 \leq V_{peak}$
$V_2 \leq V_n$dc
Maximum overvoltage ≤ V_s (10 s/day)

Nominal DC voltage ($V_n$dc) and peak voltage (V_{peak}) are given in the table of values.

Medium Power Film Capacitors

FPG/FPH (RoHS Compliant) Table of Values

PROTECTION

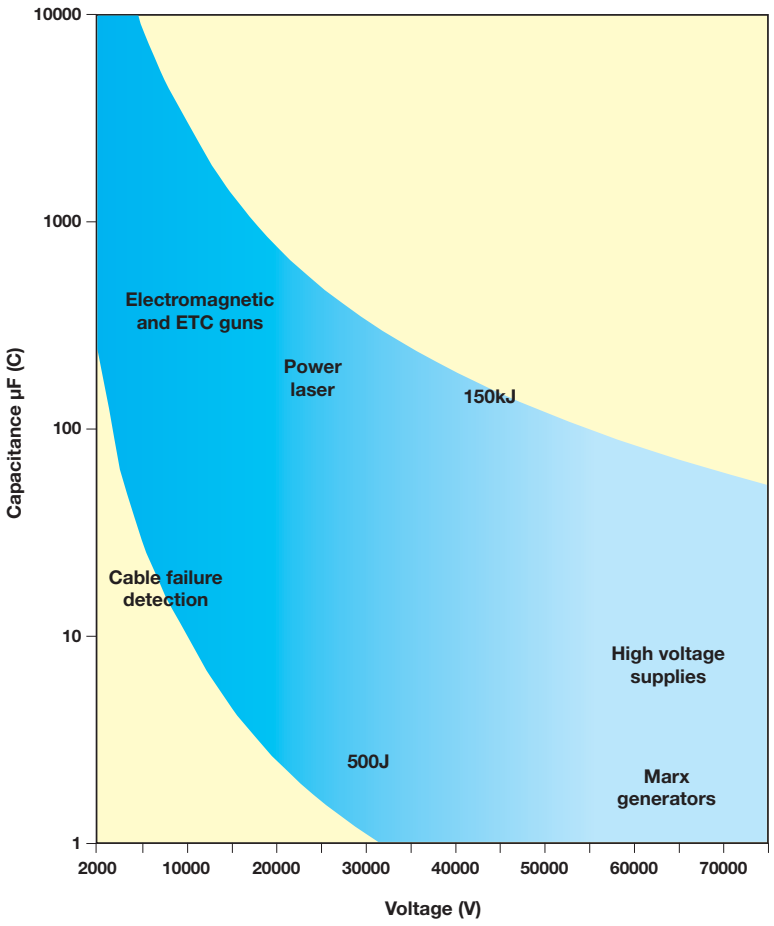
Dimensions: millimeters (inches)

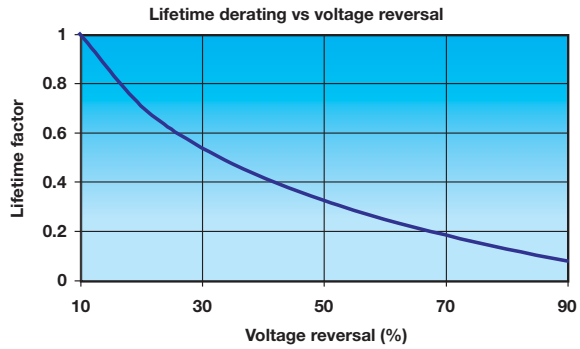
Part Number	Cn (µF)	Dimensions					I²t max. (A².s)	I_{rms} max. (A)	Rs (mΩ)	Rth (°C/W)	Typical Weight (g)
		Case Style	H* ±0.5 (±0.020)	h ±2 (±0.079)	D max.	d ±0.5 (±0.020)					
FPG 1500V Vndc = 800V Vpeak = 1200V Vrms = 500V Vs = 1500V (Voltage Code R)											
FPG66R0105J--	1	Plastic Case M6/6	52 (2.047)	5 (0.197)	40 (1.575)	18 (0.709)	2	15	2.4	14	120
FPG66R0155J--	1.5	Plastic Case M6/6	52 (2.047)	5 (0.197)	55 (2.165)	18(0.709)	4.6	20	1.6	10.5	160
FPG86R0205J--	2	Plastic Case M8/8	52 (2.047)	5 (0.197)	60 (2.362)	22 (0.866)	8	30	1.2	6.1	190
FPG86R0305J--	3	Plastic Case M8/8	52 (2.047)	5 (0.197)	72 (2.835)	22 (0.866)	18	45	0.9	4.5	260
FPG86R0355J--	3.5	Plastic Case M8/8	52 (2.047)	5 (0.197)	72 (2.835)	22 (0.866)	25	50	0.85	4.5	260
FPG86R0405J--	4	Plastic Case M8/8	52 (2.047)	5 (0.197)	82 (1.575)	22 (0.866)	32	60	0.75	3.5	320
FPG86R0505J--	5	Plastic Case M8/8	52 (2.047)	5 (0.197)	82 (3.622)	22 (0.866)	50	70	0.65	2.5	320
FPG86R0605J--	6	Plastic Case M8/8	52 (2.047)	5 (0.197)	92 (3.622)	22 (0.866)	73	75	0.6	2.5	400
FPG 2000V Vndc = 1000V Vpeak = 1600V Vrms = 600V Vs = 2000V (Voltage Code N)											
FPG66N0504J--	0.5	Plastic Case M6/6	52 (2.047)	5 (0.197)	40 (1.575)	18 (0.709)	1	15	3	14	120
FPG86N0105J--	1	Plastic Case M8/8	52 (2.047)	5 (0.197)	60 (2.362)	22 (0.866)	3	20	2.3	10.5	190
FPG86N0155J--	1.5	Plastic Case M8/8	52 (2.047)	5 (0.197)	60 (2.362)	22 (0.866)	7	30	1.5	6.1	190
FPG86N0205J--	2	Plastic Case M8/8	52 (2.047)	5 (0.197)	72 (2.835)	22 (0.866)	12.7	40	1.1	4.5	260
FPG86N0255J--	2.5	Plastic Case M8/8	52 (2.047)	5 (0.197)	72 (2.835)	22 (0.866)	20	60	0.89	3.7	260
FPG86N0305J--	3	Plastic Case M8/8	52 (2.047)	5 (0.197)	82 (3.228)	22 (0.866)	28	60	0.85	3.2	320
FPG86N0355J--	3.5	Plastic Case M8/8	52 (2.047)	5 (0.197)	82 (3.228)	22 (0.866)	39	65	0.78	2.9	320
FPG86N0405J--	4	Plastic Case M8/8	52 (2.047)	5 (0.197)	92 (3.622)	22 (0.866)	50	70	0.7	2.5	400
FPG 2500V Vndc = 1300V Vpeak = 2000V Vrms = 700V Vs = 2500V (Voltage Code P)											
FPG66P0474J--	0.47	Plastic Case M6/6	62 (2.441)	5 (0.197)	40 (1.575)	18 (0.709)	0.7	15	6	25	160
FPG66P0105J--	1	Plastic Case M6/6	62 (2.441)	5 (0.197)	55 (2.165)	18 (0.709)	2	18	3	13	180
FPG66P0155J--	1.5	Plastic Case M6/6	62 (2.441)	5 (0.197)	60 (2.362)	22 (0.866)	4.5	25	2	10	220
FPG86P0205J--	2	Plastic Case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	8	35	1.5	6.5	310
FPG86P0255J--	2.5	Plastic Case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	12.5	40	1.3	4.8	310
FPG86P0305J--	3	Plastic Case M8/8	62 (2.441)	5 (0.197)	82 (3.228)	22 (0.866)	18	50	1.15	4.4	410
FPG86P0405J--	4	Plastic Case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	32	65	0.95	3.4	475
FPG 2600V Vndc = 1750V Vpeak = 2000V Vrms = 800V Vs = 2600V (Voltage Code W)											
FPG66W0474J--	0.47	Plastic Case M6/6	62 (2.441)	5 (0.197)	40 (1.575)	18 (0.709)	1.4	12	4.04	28	160
FPG66W0105J--	1	Plastic Case M6/6	62 (2.441)	5 (0.197)	55 (2.165)	18 (0.709)	5.7	21	2.17	10.9	180
FPG66W0155J--	1.5	Plastic Case M6/6	62 (2.441)	5 (0.197)	60 (2.362)	18 (0.709)	12.9	31	1.55	7.7	220
FPG86W0205J--	2	Plastic Case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	23	41	1.24	6.1	310
FPG86W0255J--	2.5	Plastic Case M8/8	62 (2.441)	5 (0.197)	82 (3.228)	22 (0.866)	36	51	1.05	4.5	410
FPG86W0305J--	3	Plastic Case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	50	62	0.92	3.9	475
FPG86W0355J--	3.5	Plastic Case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	70	72	0.83	3.4	475
FPG86W0395J--	3.9	Plastic Case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	85	80	0.78	3.1	475
FPG 3500V Vndc = 2000V Vpeak = 2400V Vrms = 1000V Vs = 3500V (Voltage Code X)											
FPG66X0334J--	0.33	Plastic Case M6/6	62 (2.441)	5 (0.197)	40 (1.575)	18 (0.709)	2	15	2.5	28	160
FPG66X0504J--	0.5	Plastic Case M6/6	62 (2.441)	5 (0.197)	55 (2.165)	18 (0.709)	5	19	2.5	11.2	180
FPG86X0105J--	1	Plastic Case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	15	38	1.4	6.2	310
FPG86X0155J--	1.5	Plastic Case M8/8	62 (2.441)	5 (0.197)	82 (3.228)	22 (0.866)	40	56	1.03	3.9	410
FPG86X0205J--	2	Plastic Case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	70	75	0.85	3.1	475
FPG 4500V Vndc = 2500V Vpeak = 3200V Vrms = 1200V Vs = 4500V (Voltage Code Z)											
FPG66Z0224J--	0.22	Plastic Case M6/6	62 (2.441)	5 (0.197)	40 (1.575)	18 (0.709)	1.5	15	3.8	25	160
FPG66Z0474J--	0.47	Plastic Case M6/6	62 (2.441)	5 (0.197)	60 (2.362)	18 (0.709)	7	24	2.16	8.5	220
FPG86Z0684J--	0.68	Plastic Case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	14	35	1.59	6.2	310
FPG86Z0105J--	1	Plastic Case M8/8	62 (2.441)	5 (0.197)	82 (3.228)	22 (0.866)	30	52	1.18	4	410
FPG86Z1254J--	1.25	Plastic Case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22 (0.866)	50	65	1	3.3	475
FPG 4600 V Vndc = 3000 V Vpeak = 4000 V Vrms = 1400 V Vs = 4600 V (Voltage Code Y)											
FPG66Y0124J--	0.12	Plastic Case M6/6	62 (2.441)	5 (0.197)	40 (1.575)	18 (0.709)	0.8	15	6	28	160
FPG66Y0224J--	0.22	Plastic Case M6/6	62 (2.441)	5 (0.197)	60 (2.362)	18 (0.709)	3	20	3.48	11	220
FPG86Y0334J--	0.33	Plastic Case M8/8	62 (2.441)	5 (0.197)	72 (2.835)	22 (0.866)	6.8	25	2.42	7.7	310
FPG86Y0474J--	0.47	Plastic Case M8/8	62 (2.441)	5 (0.197)	82 (3.228)	22 (0.866)	13.8	35	1.79	5.2	410
FPG86Y0604J--	0.60	Plastic Case M8/8	62 (2.441)	5 (0.197)	92 (3.622)	22(0.866)	22	45	1.47	4.2	475

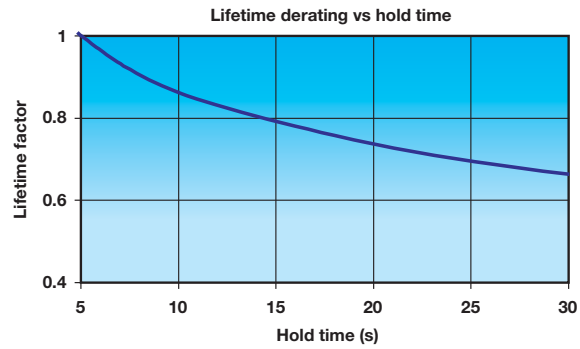
DISFIM High Voltage Film Capacitors

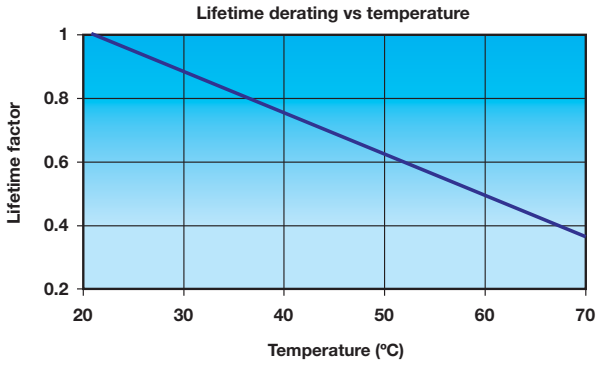
Controlled self-healing film capacitor technology, is ideal for discharge applications. DISFIM capacitors range from 2kV to 75kV and the maximum energy per can is 150kJ. Each capacitor is divided into several million elementary capacitances. The weak points in the dielectric are insulated and the capacitor continues to work without a short circuit or risk of explosion. They are designed to lose less than 5% of their capacitance during their lifetime.

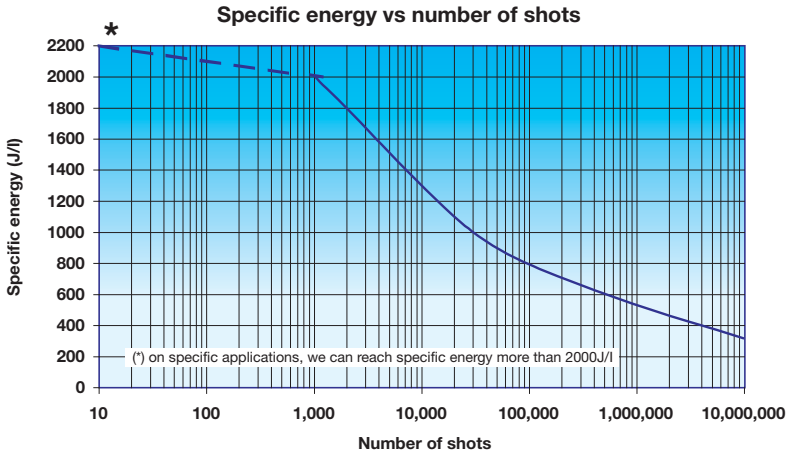
Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/filmcaps.pdf





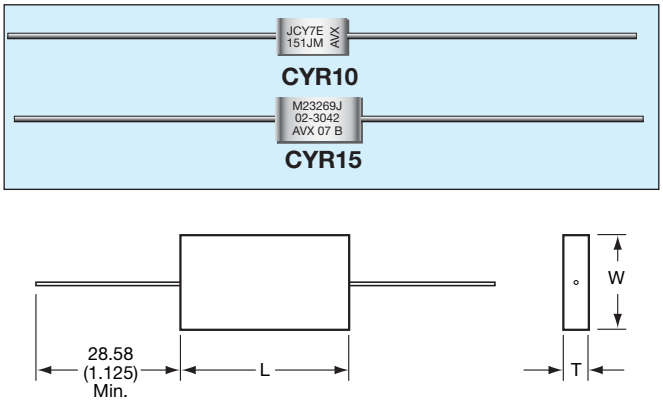






Glass Dielectric Capacitors

MIL-PRF-23269



Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/glasscaps.pdf

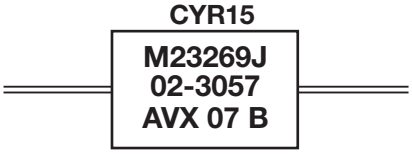
MARKING

CYR10

J = JAN Trademark
C = Capacitor
Y = Glass Dielectric
7 = Last digit of year
A = 4 week lot code

0R5 = Capacitance code – 0R5 = 0.5pF
J = Capacitance tolerance – J = ±5%, G = ±2%, F = ±1%
M = Failure level
AVX = AVX Corporation

CYR15



M23269 = Military specification established reliability glass capacitor
J = JAN Trademark
02 = Case size (CYR15)
3 = Failure rate (M level)

057 = Dash Number – (capacitance in pF and capacitance tolerance)
AVX = AVX Corporation
07 = Year
B = Lot Code

DIMENSIONS:

millimeters (inches)

Case Size	L	W	T	Lead Dia. +0.1(+0.004) -0.03(±0.001)
CYR10	8.74 ± 1.19 (0.344 ± 0.047)	4.37 ± .79 (0.172 ± 0.031)	1.98 ± .79 (0.078 ± 0.031)	.51 (0.020)
CYR15	11.91 ± 1.19 (0.469 ± 0.047)	6.76 ± .79 (0.266 ± 0.031)	2.77 ± 1.19 (0.109 ± 0.047)	.51 (0.020)

Note: Standard leads are solder-coated Dumet.

HOW TO ORDER

M23269 / **01** – **3** **001**

Style
Military Specification
Established Reliability
Glass Capacitor

Case Size
01 = CYR10
02 = CYR15

Failure Rate
3 = M level 1%/1000 hrs.
7 = S level .001%/1000 hrs.
(100 volt rating only)

Capacitance Code
Capacitance value coded in accordance with MIL-PRF-23269 –
(see Part Number section)

RATINGS & PART NUMBER REFERENCE

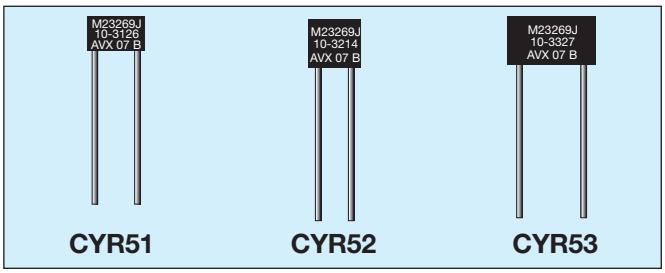
Cap. Value (pF)	Part Number* Capacitance Tolerance		
CYR10 M23269/01-			
500 Volts**	±.25pF	±.5pF	±5%
.5	*001	–	–
1.0	002	–	–
1.5	003	–	–
2.2	004	*005	–
2.7	006	–	–
3.0	007	008	–
3.3	009	–	–
3.6	010	011	–
3.9	012	–	–
4.3	013	014	–
4.7	015	–	–
5.1	016	–	–
5.6	017	–	*018
6.2	019	–	020
6.8	021	–	022
7.5	023	–	024
8.2	025	–	026
9.1	027	–	028
10	029	–	030
11	031	–	032
12	033	–	034

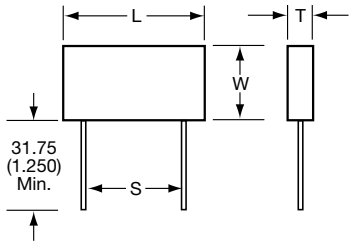
* Add first digit to indicate failure rate.
** S LEVEL = 100V rating for all values.

Cap. Value (pF)	Part Number* Capacitance Tolerance		
CYR10 M23269/01- (cont'd.)			
500 Volts**	±1%	±2%	±5%
13	–	*035	*036
15	–	037	038
16	–	039	040
18	–	041	042
20	–	043	044
22	–	045	046
24	–	047	048
27	*049	050	051
30	052	053	054
33	055	056	057
36	058	059	060
39	061	062	063
43	064	065	066
47	067	068	069
51	070	071	072
56	073	074	075
62	076	077	078
68	079	080	081
75	082	083	084
82	085	086	087
91	088	089	090
100	091	092	093
110	094	095	096
120	097	098	099
130	100	101	102
150	103	104	105
160	106	107	108
180	109	110	111
200	112	113	114

Cap. Value (pF)	Part Number* Capacitance Tolerance		
CYR10 M23269/01- (cont'd.)			
300 Volts**	±1%	±2%	±5%
220	115	116	117
240	118	119	120
270	121	122	123
300	124	125	126
CYR15 M23269/02-			
500 Volts**	±1%	±2%	±5%
220	*001	*002	*003
240	004	005	006
270	007	008	009
300	010	011	012
330	013	014	015
360	016	017	018
390	019	020	021
430	022	023	024
470	025	026	027
510	028	029	030
300 Volts**	±1%	±2%	±5%
560	031	032	033
620	034	035	036
680	037	038	039
750	040	041	042
820	043	044	045
910	046	047	048
1,000	049	050	051
1,100	052	053	054
1,200	055	056	057

Glass Dielectric Capacitors
MIL-PRF-23269

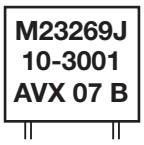




Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/glasscaps.pdf

MARKING

CYR51, 52, 53



M23269 = Military specification established reliability glass capacitor
J = JAN Trademark
10 = Slash sheet for case sizes – CYR51, CYR52, CYR53
3 = Failure rate (M level)
001 = Capacitance value coded in accordance with MIL-C-23269
AVX = AVX Corporation
07 = Year
B = Lot Code

DIMENSIONS:

millimeters (inches)

Case Size	L ±0.13 (±0.005)	W ±0.25 (±0.010)	T ±0.13 (±0.005)	S ±0.51 (±0.020)	Lead Dia. ±0.051 (±0.002)
CYR51	7.62 (0.300)	5.08 (0.200)	2.92 (0.115)	5.08 (0.200)	.51 (0.020)
CYR52	7.62 (0.300)	7.62 (0.300)	2.92 (0.115)	5.08 (0.200)	.51 (0.020)
CYR53	12.70 (0.500)	7.62 (0.300)	2.92 (0.115)	10.16 (0.400)	.51 (0.020)

Note: Leads are solderable and weldable gold-plated Dumet, per MIL-STD-1276, Type D.

CROSS REFERENCE

MIL-C-23269 Style	MIL-C-11272 Style
CYR10	CY10
CYR15	CY15
CYR20	CY20
CYR30	CY30
CYR51	CY06
CYR52	CY07
CYR53	CY08

HOW TO ORDER

M23269 / **10** – **3** **001**

Style
Military Specification
Established Reliability
Glass Capacitor

Case Size
Slash sheet
CYR51
CYR52
CYR53

Failure Rate
3 = M level, 1%/1000 hrs.

Capacitance Code
Capacitance value coded in accordance with MIL-C-23269 –
(see Part Number section)

RATINGS & PART NUMBER REFERENCE

Cap. Value (pF)	Part Number Capacitance Tolerance		
CYR51 M23269/10-			
300 Volts	±.25pF	±2%	±5%
1	3001	—	—
1.5	3002	—	—
2.2	3003	—	—
2.7	3004	—	—
3.0	3005	—	—
3.3	3006	—	—
3.6	3007	—	—
3.9	3008	—	—
4.3	3009	—	—
4.7	3010	—	—
5.1	3011	—	3012
5.6	3013	—	3014
6.2	3015	—	3016
6.8	3017	—	3018
7.5	3019	—	3020
8.2	3021	—	3022
9.1	3023	—	3024
10	3025	—	3026
11	3027	—	3028
12	3029	—	3030
13	3031	3032	3033
15	3034	3035	3036
16	3037	3038	3039
18	3040	3041	3042
20	3043	3044	3045
22	3046	3047	3048
24	3049	3050	3051

*Add first digit to indicate failure rate.

Cap. Value (pF)	Part Number Capacitance Tolerance		
CYR51 M23269/10- (cont'd)			
300 Volts	±1%	±2%	±5%
27	3052	3053	3054
30	3055	3056	3057
33	3058	3059	3060
36	3061	3062	3063
39	3064	3065	3066
43	3067	3068	3069
47	3070	3071	3072
51	3073	3074	3075
56	3076	3077	3078
62	3079	3080	3081
68	3082	3083	3084
75	3085	3086	3087
82	3088	3089	3090
91	3091	3092	3093
100	3094	3095	3096
110	3097	3098	3099
120	3100	3101	3102
130	3103	3104	3105
150	3106	3107	3108
160	3109	3110	3111
180	3112	3113	3114
200	3115	3116	3117
220	3118	3119	3120
240	3121	3122	3123
270	3124	3125	3126
300	3127	3128	3129
330	3130	3131	3132
360	3133	3134	3135
390	3136	3137	3138
430	3139	3140	3141
470	3142	3143	3144
510	3145	3146	3147
560	3148	3149	3150

Cap. Value (pF)	Part Number Capacitance Tolerance		
CYR52 M23269/10-			
300 Volts	±1%	±2%	±5%
620	3201	3202	3203
680	3204	3205	3206
750	3207	3208	3209
820	3210	3211	3212
910	3213	3214	3215
1,000	3216	3217	3218
CYR53 M23269/10-			
1,100	3301	3302	3303
1,200	3304	3305	3306
1,300	3307	3308	3309
1,500	3310	3311	3312
1,600	3313	3314	3315
1,800	3316	3317	3318
2,000	3319	3320	3321
2,200	3322	3323	3324
2,400	3325	3326	3327

MIL-C-55074

Hermaphrocon™ Connecting System

FEATURES:

- Designed for mobile, transportable, and semi-permanent military communications facilities (telephone, telegraph, teletype, radio, etc.)
- High-reliability Hermaphrocon™ connectors are designed for speedy, foolproof interconnections under extreme field conditions, are impossible to mismate, even in the dark
- Hermaphrocon™ plugs mate interchangeably with both receptacles and plugs, permitting connection of either cable end to any other cable end of distribution box
- Redundant Hermaphrocon™ design provides 104 contacts for 52 cable conductors (52 pairs) assures circuit continuity with up to 50% contact damage (jumpers linking redundant contact pairs are welded for reliability)
- Rugged, waterproof Hermaphrocon™ connectors resist wear and damage caused by dragging on the ground or through water, even without covers

SPECIFICATIONS:

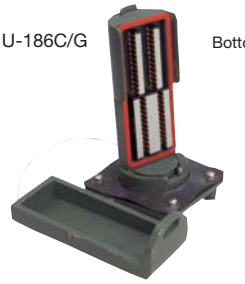
- PLUG, ELECTRICAL U-185B/G CONNECTOR
- RECEPTACLE, ELECTRICAL U-186C/G CONNECTOR
- RECEPTACLE, ELECTRICAL U-187A/G CONNECTOR
- CONTACT ASSEMBLY, ELECTRICAL MX-3227/G (as applicable)
- HOUSINGS: Die-cast aluminum alloy with protective finish per MIL-F-14072
- GASKETS AND GLANDS: Silicone rubber
- INSULATORS: Fortron-PPS-Black
- INSULATION RESISTANCE: 1000 megohms, minimum
- CONTACTS: Beryllium copper, gold plated
- CONTACT RESISTANCE: 7 milliohms, maximum
- IMMERSION: per MIL-C-55074
- MOISTURE RESISTANCE: per MIL-C-55074
- AIR LEAKAGE: per MIL-C-55074
- VIBRATION: per MIL-C-55074
- TEMPERATURE: –65°F to 150°F
- OVERALL DIMENSIONS (approx.): U-185B/G 2.437" x 2.750" x 13.125" U-186C/G 3.500" x 4.000" x 6.375" U-187A/G 2.375" x 3.125" x 6.375"
- MILITARY SPECIFICATION: MIL-C-55074, MIL-STD-454

Plug (Cable Connector)

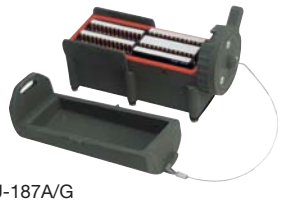
U-185B/G

Receptacle

U-186C/G Bottom Mount



Side Mount



U-187A/G

Contact Assembly

MX-3227/G

Binding Post

SC-C-136011

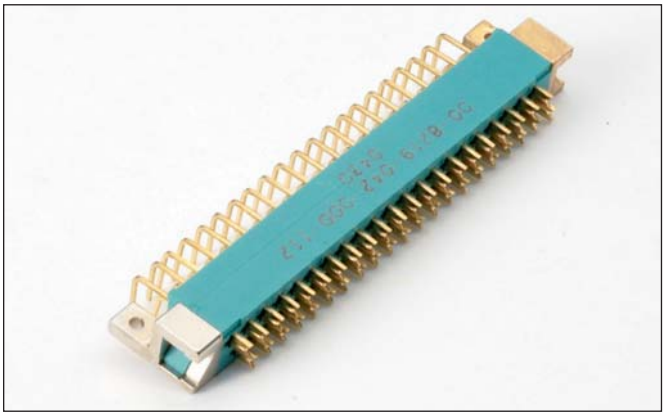
ELCO P/N 08 2264 0130 00 000
MATERIAL: Brass, machined (terminal)
Nylon (housing)

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/conns.pdf

PART	ELCO PART NUMBER	MILITARY PART NUMBER	DESCRIPTION
ELCO HERMAPHROCON™ CONNECTORS	08 2260 0110 00 000	U-185B/G M-55074/1-01	HERMAPHROCON™ PLUG, cable type
	08 2276 0110 00 000	U-186C/G M-55074/2-01	HERMAPHROCON™ RECEPTACLE, panel type
	08 2263 0110 00 000	U-187A/G M-55074/3-01	HERMAPHROCON™ RECEPTACLE, panel type
	08 2260 9010 00 000	MX-3227/G M-55074/4-01	HERMAPHROCON™ CONTACT ASSEMBLY
BINDING POSTS	08 2264 0110 00 000	SIG. CORPS. DWG. # SC-C-136011	SHORT SPRING BINDING POST ASSEMBLY with O-ring, flat washer, split washer and nut - White
	08 2264 0120 00 000	SIG. CORPS. DWG. # SC-C-136001	SHORT SPRING BINDING POST ASSEMBLY without hardware - White
	08 2264 0130 00 000	SIG. CORPS. DWG. # SC-C-136001	LONG SPRING BINDING POST with O-ring, flat washer, split washer and nut - White
	08 2264 0121 00 000	SIG. CORPS. DWG. # SC-C-136001	LONG SPRING BINDING POST without hardware - White

Varicon®

Series 8219 – 0.050" Staggered Dual Row



FEATURES

- For p.c. card-to-card applications
- High contact density
- Low withdrawal force contacts
- Rugged, color coded end guides
- Parallel or perpendicular p.c. board mounting
- Mates with Series 8218

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/conns.pdf

TECHNICAL SPECIFICATIONS

Current Rating:
5 amperes, maximum

Contact Resistance:
6 milliohms, maximum

Contact Material and Plating:
Phosphor Bronze

Gold, 10 microinches minimum, over nickel, 50 to 100 microinches

Insulator Material:
Diallyl phthalate, glass-filled, flame resistant per MIL-M-14F, Type SDGF.

Guidance Hardware:
Left hand guides: Metal, gold color
Right hand guides: Metal, silver color

Insulation Resistance:
5,000 megohms, minimum

Dielectric Withstanding Voltage:
Sea Level: 1000 Volts rms
3.4" Hg: 500 Volts rms

Insertion/Withdrawal Force:
2 to 8 ounces per contact

ORDERING CODE

00	8219	042	722	001

Number of Contacts
018, 030, 036, 042, 054, 072

Contact Code
(see below)

Variation Code

For Variation = 001

Code No.	Contact Type	"X" Dim.
722	Wire hole tail	.187
721	P. C. solder tail	.250
736	P. C. solder tail	.281
737	P. C. solder tail	.562
753	P. C. solder tail	.125
771	P. C. solder tail	.484

For Variation = 002

Code No.	Contact Type
000	P. C. solder tails formed
722	Wire hole tail unformed

For Variation = 005

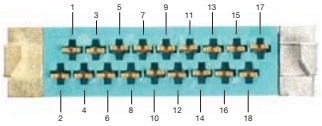
Code No.	Contact Type	"Y" Dim.
722	Wire hole tail	.157
721	P. C. solder tail	.219
736	P. C. solder tail	.250
737	P. C. solder tail	.531
753	P. C. solder tail	.093
771	P. C. solder tail	.453

Without Keying	001 = Receptacle
	002 = Plug, parallel board mounting
	005 = Plug, perpendicular board mounting

NOTE: Connector is supplied with mounting screws or eyelets, as applicable (see drawings).

Contact Factory for Special Variations.

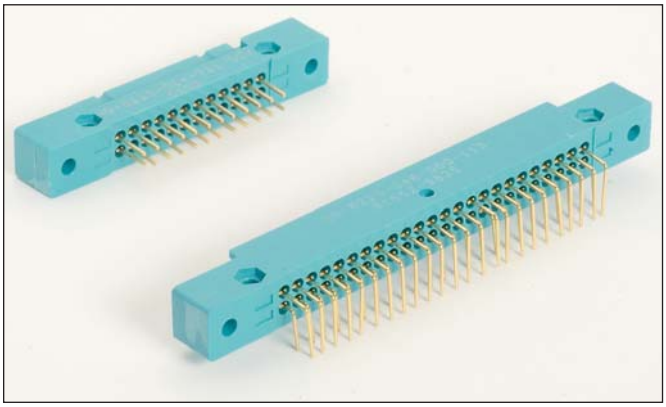
POLARIZING SYSTEM



When Keying is ordered with part number, the Key is installed at the factory.

Varicon®

Series 8223 – 0.100" Dual Row Square Grid



FEATURES

- Wide range of contact terminations including wire wrapping, P.C. solder tail, wire hole, wire crimp
- For 1/16", 3/32" P.C. card
- Polarity and keying are built into the connector body to prevent mismating
- Perpendicular or parallel connector mounting
- Proven Varicon® contact reliability
- Protected male; recessed female contacts

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/conns.pdf

TECHNICAL SPECIFICATIONS

CONTACTS

Current Rating:
5 amperes with 22 AWG wire

Contact Resistance:
6 milliohms, maximum

Contact Material and Plating:
Phosphor Bronze

Nickel plate, 50 to 100 microinches, followed by gold plate.

10 microinches minimum

INSULATORS

Material:
Diallyl Phthalate, glass-filled, flame resistant, per MIL-M-14-F, Type SDGF

Insulation Resistance:
5,000 megohms, minimum

Dielectric Withstanding Voltage:
Sea Level: 1,000 Volts rms

Insertion/Withdrawal Force:
2 to 8 ounces per contact

ORDERING CODE

00	8223	024	000	001
		Number of Contacts 024, 048, 072 & 096	**Contact Code**	**Variation Code**

Use three digit code number when contacts are to be factory installed. If contacts are to be supplied loose, or contact tails to be formed, use three zeros (000) in contact code section. Note that the wire crimp tail contacts can only be ordered as separate items by part numbers.

Code	Profile	Description	Part No.	H Dim.	Board Thk.
000		Coined Tail Formed 90° after installing (Max. 0236 Diag.)	60 8223 0223 60 8223 0213		.080 .062
000		Coined Tail Formed 90° after installing (Max. 0236 Diag.)	60 8223 0243 60 8223 0253		.093
722		Wire Hole Tail (.032 x .050)	60 8200 1613	.162	
721		P.C. Tail .020 Sq.	60 8200 1623	.228	
736		P.C. Tail .020 Sq.	60 8200 1633	.259	
737		P.C. Tail .020 Sq.	60 8200 1643	.541	
753		P.C. Tail .020 Sq.	60 8200 1653	.103	
771		P.C. Tail .020 Sq.	60 8200 1663	.462	
000		Crimp Contact (Reel 3000) 22-30 AWG	60 8216 0323		
000		Crimp Contact (Loose) 22-30 AWG	60 8216 0313		
491		Wrappable/Removable Contact (.025 Sq.)	60 8216 0413	.560	

Insulator Type	Variation	Contact Style	Accessories: Guide Pins Sockets (R) Keying	Board Thickness
Male (Exposed Contacts)	001	Formed Contact Terminal	X	.080 2.03 .062 1.57
	002	PC Terminal	X	
		Wire Hole Terminal	X	
		PC Straight Terminal	X	
	003	Crimp Contact	X	
		Wrappable Removable	X	
	004	Formed Contact Terminal	X	.093 2.36
Female (Exposed Contacts)	901	Formed Contact Terminal	X	.080 2.03 .062 1.57
	902	PC Terminal	X	
		Wire Hole Terminal	X	
		PC Straight Terminal	X	
	903	Crimp Contact	X	
		Wrappable Removable	X	
	904	Formed Contact Terminal	X	.093 2.36

M55302 Two Piece Edge Board Connectors

- M55302 Qualified
- 64 & 96 Pin Male and Female
- Vertical and Right Angle
- Gold Plated Contacts
- Certified to M55302 (500 mating cycles)
- Marked with Military number
- Group A & B testing standard

Check for up-to-date CV Tables at
http://www.avx.com/docs/catalogs/conns.pdf

M55302 / XXX - XX

01-09 =
Contact Style
Contact Tail Length

131 = 96 Pin R/A Male
132 = 96 Pin Vert Female
133 = 64 Pin R/A Male
134 = 64 Pin Vert Female
157 = 64 Pin Vert Male
148 = 64 Pin R/A Female

PERFORMANCE CLASS AND LOADING VARIATIONS

Class	M55302 & DIN41612 Class I	DIN 41612 Class II	DIN 41612 Class III
Cycle Life	500+ Mating Cycles	400 Mating Cycles	50 Mating Cycles

QUALIFIED MILITARY PART NUMBERS

Military Designation	
M55302/131-01	M55302/134-02
M55302/131-02	M55302/134-04
M55302/132-01	M55302/134-05
M55302/132-02	M55302/134-07
M55302/132-04	M55302/134-08
M55302/132-05	M55302/157-01
M55302/132-06	M55302/157-02
M55302/133-01	M55302/157-03
M55302/133-02	M55302/157-04
M55302/133-03	M55302/158-01
M55302/134-01	M55302/158-02

AMERICAS

AVX Myrtle Beach, SC
Tel: 843-448-9411

AVX Northwest, WA
Tel: 360-699-8746

AVX Midwest, IN
Tel: 317-861-9184

AVX Mid/Pacific, CA
Tel: 408-988-4900

AVX Northeast, MA
Tel: 617-479-0345

AVX Southwest, CA
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AVX Czech Republic
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http://www.avx.com