

ORDERING INFORMATION (OBSOLETE*)

CSR **XX** **B** **565** **K** **M**

TYPE
Capacitors, Fixed, Solid Electrolyte, Tantalum
Established Reliability

STYLE
Tubular Case — Always Sleeved

09 — Miniature — T222
13 — Standard — T212
21 — Standard, low ESR — T262
23 — Extended Range — T242
33 — Extended Range, Low Leakage — T252
91 — Non-Polar — T213

VOLTAGE

**FAILURE RATE LEVEL
IN % PER 1000 HOURS
GRADED**

A — Not Applicable
B — 0.1%/k hrs.
C — 0.01%/k hrs.
D — 0.001%/k hrs.

EXPONENTIAL

M — 1%/k hrs.
P — 0.1%/k hrs.
R — 0.01%/k hrs.
S — 0.001%/k hrs.

**CAPACITANCE
TOLERANCE**

J — ± 5%
K — ± 10%
M — ± 20%

CAPACITANCE

Expressed in picofarads (1 microfarad = 1,000,000 picofarads). First two digits represent significant figures. Last digit specifies the number of zeros to follow.

Examples

565 — 5,600,000 = 5.60 μF 563 — 56,000 = .056 μF
564 — 560,000 = .56 μF

Symbol	VDC Working		VDC Surge	
	85°C	125°C	85°C	125°C
B	6	4	8	5
C	10	7	13	9
D	15	10	20	12
E	20	13	26	16
F	35	23	46	28
G	50	33	65	40
H	75	50	98	64
J	100	67	130	86

* This Military Part Numbering System is obsolete in accordance with the current specifications. The correct current designation for a CSR part number is the MIL Specification Number, followed by the Specification (slash) Sheet Number and Dash Number (i.e. — MIL-PRF-39003/01-2270). However, the part number breakdown shown above is still widely used and is shown for reference.

MILITARY CAPACITOR APPROVED FAILURE RATE LEVELS AND MARKINGS PER MIL-PRF-39003 FOR CSR09 (T222 A & B CASE SIZES ONLY), CSR13 (T212), CSR21 (T262), CSR23 (T242) & CSR33 (T252) CAPACITORS

KEMET APPROVED FAILURE RATE LEVELS — MIL-PRF-39003/H (EXPONENTIAL)

STYLE	DESCRIPTION	KEMET SERIES	APPROVED FAILURE RATE LEVEL
CSR09	Polar-Subminiature	T222	S (0.001%/k hrs.)
CSR13	Polar-Standard MIL Range	T212	S (0.001%/k hrs.)
CSR21	Polar-Standard Low ESR MIL Range	T262	S (0.001%/k hrs.)
CSR23	Polar-Extended Range	T242	S (0.001%/k hrs.)

STYLE	DESCRIPTION	KEMET SERIES	APPROVED FAILURE RATE LEVEL
CSR33	Polar-Extended Range Low Leakage	T252	S (0.001%/k hrs.)
CSR91	Non-Polar	T213	S (0.001%/k hrs.)

MILITARY MARKING

A CASE

39003 — Military specification number
01 - K — Specification sheet number and trademark
9002J — Military dash number and "J" for JAN
+333 — Polarity, date code (1st digit indicates year and the next two digits indicate the week)
XY — Lot symbol

C & D CASES

M39003 — Military specification number
01 - 8222J — Specification sheet number, Military dash number, and "J" for JAN
+8.2 μF — Positive terminal identifier and capacitance value
10% 50V — Capacitance tolerance and voltage
31433 — Source code
0333 XY K — Date code, lot code, and trademark

B CASE

M39003 — Military specification number
01 - — Specification sheet number
8006J — Military dash number and "J" for JAN
31433 — Source code
+333 XY — Polarity, date code (1st digit indicates year and the next two digits indicate the week), lot symbol

CSR91 (T213) CAPACITORS

A, B, C & D CASES

M39003 — Military specification number
04 - 0980J — Specification sheet number, Military dash number, and "J" for JAN
1 μF — Capacitance value
10% 20VNP — Capacitance tolerance and voltage rating
0333 XY 31433 — Date code, lot code, and source code

(See page 38 for CSS Marking)

KEMET APPROVED FAILURE RATE LEVELS — MIL-PRF-39003/H (GRADED)

STYLE	DESCRIPTION	KEMET SERIES	APPROVED FAILURE RATE LEVEL*
CSR09	Polar-Subminiature	T222	D (0.001%/k hrs.)
CSR13*	Polar-Standard MIL Case	T212	D (0.001%/k hrs.)
CSS13**	Polar-Standard MIL Case	T216	C (0.01%/k hrs.)
CSR21	Polar-Standard Low ESR MIL Case	T262	D (0.001%/k hrs.)
CSR23*	Polar-Extended Range	T242	D (0.001%/k hrs.)

*Not approved to 'D' Failure Rate Level on all voltages and capacitance values.

**MIL-PRF-39003/10 for space applications.

STYLE	DESCRIPTION	KEMET SERIES	APPROVED FAILURE RATE LEVEL*
CSR33*	Polar-Extended Range Low Leakage	T252	D (0.001%/k hrs.)
CSS33**	Polar-Extended Range Low Leakage	T256	C (0.01%/k hrs.)
CSR91*	Non-Polar	T213	D (0.001%/k hrs.)

*Not approved to 'D' Failure Rate Level on all voltages and capacitance values.

**MIL-PRF-39003/10 for space applications.

Tantalum Hermetically Sealed

PERFORMANCE CHARACTERISTICS

- **CAPACITANCE/VOLTAGE RANGE:** .0023-1200µF, 6-125 Volts.
- **CAPACITANCE TOLERANCE:** Available in standard EIA values with ±20%, ±10% and ±5% tolerances.
- **DISSIPATION FACTOR:** Maximum DF limits are shown in corresponding series part number listings on pages 7-41. See Application Notes Section, page 76 for additional description.
- **DC LEAKAGE CURRENT:** Each corresponding part number table lists maximum leakage current for each capacitor on pages 7-41. See Application Notes Section, page 76 for additional description.
- **RATED VOLTAGE; WORKING VOLTAGE; SURGE VOLTAGE; REVERSE VOLTAGE:** See Application Notes Section, Pages 76 & 77 for description.
- **IMPEDANCE and ESR:** See Application Notes Section, pages 77 & 78 for description. Reference ESR values are shown for commercial hermetically sealed capacitors on page 19.

- **AC RIPPLE VOLTAGE:** Permissible AC ripple voltage is related to the ESR of the capacitor and the power dissipation capabilities of a particular case size. Thermal capacities for the various case sizes have been determined empirically and are listed below. For additional description see page 78.

Standard Case Size	Watts	T222
A	.09	.070
B	.100	.090
C	.125	—
D	.180	—

Maximum Power Dissipation: 25°C Ambient

- **ENVIRONMENTAL CONSIDERATIONS:**
 - A. Shock Test: MIL-STD-202, Method 213
 - B. Thermal Shock, MIL-STD-202, Method 107, Condition B.
 - C. Moisture Resistance: MIL-STD-202, Method 106.
 - D. Solderability: MIL-STD-202, Method 208

For additional Environmental Test Information see pages 80, 81 and 82.

- **LEAD MATERIAL:** Standard leads are solder-coated nickel per MIL-STD-1276.
- **INSULATING SLEEVES:** The standard insulating material used in transparent high temperature plastic, having 2000 volt dielectric strength, excellent dimensional stability and chemical and cold flow resistance.
- **LEAD TAPE and REEL:** Reeling per specification RS-296. See pages 71 and 73 for additional information.

KEMET standard hermetic sealed T110 Series are desirable for use in high humidity environments. They are ruggedly built, designed for miniaturized circuitry, and are especially suited for coupling, bypass, filtering and R-C timing circuits. They exhibit excellent stability, extremely low DC leakage current, dissipation factor, and ESR/impedance over a wide temperature and frequency range.

Available in standard EIA capacitance values from .0047-330 μF in $\pm 20\%$, $\pm 10\%$, and $\pm 5\%$ tolerances and working voltages from 6-125 VDC.

Higher CV values in comparable case sizes are available in KEMET T140 Series. Refer to page 27.

Included in the following Series table is a complete listing of CSR13 qualified MIL-PRF-39003 capacitors. KEMET is approved to manufacture the S (0.001%/k hrs.) Exponential & D (0.001%/k hrs.) Graded failure rate levels.

KEMET is now offering low ESR limits in the T110 Series. See ESR chart on page 19. You may order the lower ESR by using Customer Specification 2864 as the last four digits of the part number.

Effective September 30, 2005, the KEMET T110 Series is RoHS Compliant.

CAPACITOR OUTLINE DRAWINGS



DIMENSIONS — INCHES & (MILLIMETERS)

CASE SIZE	UNINSULATED		INSULATED		B ± 0.002 $\pm (.05)$	C MAX.
	D ± 0.005 $\pm (.13)$	L ± 0.031 $\pm (.79)$	D ± 0.010 $\pm (.25)$	L ± 0.031 $\pm (.79)$		
A	0.125 (3.18)	0.250 (6.35)	0.135 (3.43)	0.286 (7.26)	0.020 (.51)	0.422 (10.72)
B	0.175 (4.45)	0.438 (11.13)	0.185 (4.70)	0.474 (12.04)	0.020 (.51)	0.610 (15.49)
C	0.279 (7.09)	0.650 (16.51)	0.289 (7.34)	0.686 (17.42)	0.025 (.64)	0.822 (20.88)
D	0.341 (8.66)	0.750 (19.05)	0.351 (8.92)	0.786 (19.96)	0.025 (.64)	0.922 (23.42)

ORDERING INFORMATION*



MARKING INFORMATION

Marking: Unless otherwise specified by special order, standard marking of T110 Series capacitor consists of the following:

A, B, C & D CASES

+K 10%	— Polarity, Manufacturer's Identification and Capacitance Tol.
R56 μF	— Nominal Capacitance — (μF) ("R" indicates decimal)
100V	— Voltage
0312	— Date Code (e.g.: 0312)

* For Military Marking, see page 4.



TANTALUM HERMETICALLY SEALED / AXIAL — MIL-PRF-39003
T110 SERIES — POLAR TYPE & T212 (CSR13)

RATINGS & PART NUMBER REFERENCE

CAPACITANCE µF	CASE SIZE	CAPACITANCE TOLERANCE ±%	KEMET T110			MIL-PRF-39003 (CSR13) CAPACITORS								KEMET EQUIVALENT MILITARY PART NUMBER
			KEMET PART NUMBER	D.C. LEAKAGE µA@25°C MAX.	MAX. DISSIPATION FACTOR %@25°C, 120Hz	DASH NUMBER REFERENCE FAILURE RATE LEVEL (%/1000 HRS.)								
						MIL-PRF-39003/1H EXPONENTIAL				MIL-PRF-39003/1H GRADED				
						M (1.0)	P (0.1)	R (0.001)	S (0.001)	B (0.1)	C (0.01)	D (0.001)		
50 VOLT RATING AT 85°C — 33 VOLT RATING AT 125°C (Cont'd)														
18.0	C	10	T110C186K050AS	4.5	4	2379	2619	2859	3099	6232	7232	8232	T212C186K050(2)S	
18.0	C	20	T110C186M050AS	4.5	4									
22.0	D	5	T110D226J050AS	5.5	4	5094	5294	5494	5694	6233	7233	8233	T212D226J050(2)S	
22.0	D	10	T110D226K050AS	5.5	4	2380	2620	2860	3100	6234	7234	8234	T212D226K050(2)S	
22.0	D	20	T110D226M050AS	5.5	4	2381	2621	2861	3101	6235	7235	8235	T212D226M050(2)S	
60 VOLT RATING AT 85°C — 40 VOLT RATING AT 125°C														
0.0047	A	5,10,20	T110A472(1)060AS	0.3	3									
0.0056	A	5,10,20	T110A562(1)060AS	0.3	3									
0.0068	A	5,10,20	T110A682(1)060AS	0.3	3									
0.0082	A	5,10,20	T110A822(1)060AS	0.3	3									
0.01	A	5,10,20	T110A103(1)060AS	0.3	3									
0.012	A	5,10,20	T110A123(1)060AS	0.3	3									
0.015	A	5,10,20	T110A153(1)060AS	0.3	3									
0.018	A	5,10,20	T110A183(1)060AS	0.3	3									
0.022	A	5,10,20	T110A223(1)060AS	0.3	3									
0.027	A	5,10,20	T110A273(1)060AS	0.3	3									
0.033	A	5,10,20	T110A333(1)060AS	0.3	3									
0.039	A	5,10,20	T110A393(1)060AS	0.3	3									
0.047	A	5,10,20	T110A473(1)060AS	0.3	3									
0.056	A	5,10,20	T110A563(1)060AS	0.3	3									
0.068	A	5,10,20	T110A683(1)060AS	0.3	3									
0.082	A	5,10,20	T110A823(1)060AS	0.3	3									
0.1	A	5,10,20	T110A104(1)060AS	0.5	3									
0.12	A	5,10,20	T110A124(1)060AS	0.5	3									
0.15	A	5,10,20	T110A154(1)060AS	0.5	3									
0.18	A	5,10,20	T110A184(1)060AS	0.5	3									
0.22	A	5,10,20	T110A224(1)060AS	0.5	3									
0.27	A	5,10,20	T110A274(1)060AS	0.5	3									
0.33	A	5,10,20	T110A334(1)060AS	0.5	3									
0.39	A	5,10,20	T110A394(1)060AS	0.5	3									
0.47	A	5,10,20	T110A474(1)060AS	0.5	3									
0.56	A	5,10,20	T110A564(1)060AS	0.5	3									
0.68	A	5,10,20	T110A684(1)060AS	0.5	3									
0.82	B	5,10,20	T110B824(1)060AS	0.5	3									
1.0	B	5,10,20	T110B105(1)060AS	0.5	3									
1.2	B	5,10,20	T110B125(1)060AS	0.5	4									
1.5	B	5,10,20	T110B155(1)060AS	0.5	4									
1.8	B	5,10,20	T110B185(1)060AS	0.5	4									
2.2	B	5,10,20	T110B225(1)060AS	1.0	4									
2.7	B	5,10,20	T110B275(1)060AS	1.0	4									
3.3	B	5,10,20	T110B335(1)060AS	1.5	4									
3.9	B	5,10,20	T110B395(1)060AS	1.5	4									
4.7	C	5,10,20	T110C475(1)060AS	2.0	4									
5.6	C	5,10,20	T110C565(1)060AS	2.0	4									
6.8	C	5,10,20	T110C685(1)060AS	3.0	4									
8.2	C	5,10,20	T110C825(1)060AS	4.0	4									
10.0	C	5,10,20	T110C106(1)060AS	5.0	4									
12.0	C	5,10,20	T110C126(1)060AS	5.0	4									
15.0	D	5,10,20	T110D156(1)060AS	4.0	4									
18.0	D	5,10,20	T110D186(1)060AS	5.0	4									
22.0	D	5,10,20	T110D226(1)060AS	6.0	4									
75 VOLT RATING AT 85°C — 50 VOLT RATING AT 125°C														
0.0047	A	5,10,20	T110A472(1)075AS	0.3	2									
0.0056	A	5,10,20	T110A562(1)075AS	0.3	2									
0.0068	A	5,10,20	T110A682(1)075AS	0.3	2									
0.0082	A	5,10,20	T110A822(1)075AS	0.3	2									
0.01	A	5,10,20	T110A103(1)075AS	0.3	2									

(1) To complete T110 Series part number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T212 Series Part Number, insert Failure Rate Symbol in the 13th Character.

Bold Face lines indicate popular part types and values.

KEMET ultra-miniature T222 Series solid tantalum capacitors are designed especially for miniaturization.

The T222 Series capacitors employ a unique glass-to-metal compression end seal which has no protruding eyelet. This flush end seal construction makes T222 Series capacitors ideally suited for all miniature high density packaging applications. The capacitors con-

sist of a dry porous tantalum pellet hermetically sealed in a solder coated metal case with solder coated alloy 52 and solder coated nickel leads.

The T222 series is approved to MIL-PRF-39003/2, all ratings and failure rates.

CAPACITOR OUTLINE DRAWINGS



DIMENSIONS — INCHES & (MILLIMETERS)

CASE SIZE	UNINSULATED		INSULATED		B WIRE DIAMETER
	D ±0.005 (±.13)	L	D	L	
A	.085 (2.16)	.245 + .015 (6.22 + .38) - .010 (-.25)	.090 ± .009 (2.29 ± .23)	.250 + .031 (6.35 + .79) - .015 (-.38)	.016 + .005 (.41 + .13) - .001 (-.03)
B	.127 (3.23)	.375 ± .015 (.53 ± .38)	.138 ± .010 (3.51 ± .25)	.390 ± .015 (9.91 ± .38)	.016 + .005 (.41 + .13) - .001 (-.03)

ORDERING INFORMATION



CSR09 CAPACITOR MARKINGS PER MIL-PRF-39003

39003	— Military specification number
02 - K	— Specification sheet number and trademark
2961J	— Nonsignificant dash number and "J" for JAN
+333	— Polarity, date code (1st digit indicates year and the next two digits indicate the week)
XX	— and lot symbol

RATINGS & PART NUMBER REFERENCE

CAPACITANCE µF	CASE SIZE	CAPACITANCE TOLERANCE ±%	KEMET T140			MIL-PRF-39003 (CSR23) CAPACITORS								KEMET EQUIVALENT MILITARY PART NUMBER
			KEMET PART NUMBER	D.C. LEAKAGE µA@25°C MAX.	MAX. DISSIPATION FACTOR %@25°C, 120Hz	DASH NUMBER REFERENCE FAILURE RATE LEVEL (%/1000 HRS.)								
						MIL-PRF-39003/3F EXPONENTIAL				MIL-PRF-39003/3F GRADED				
						M (1.0)	P (0.1)	R (0.01)	S (0.001)	B (0.1)	C (0.01)	D (0.001)		
20 VOLT RATING AT 85°C — 13 VOLT RATING AT 125°C														
2.7	A	10	T140A275K020AS	0.8	4	0146	0246	0346	0446	2046	3046	4046	T242A275K020(2)S	
2.7	A	20	T140A275M020AS	0.8	4									
3.3	A	10	T140A335K020AS	1.0	4	0147	0247	0347	0447	2047	3047	4047	T242A335K020(2)S	
3.3	A	20	T140A335M020AS	1.0	4	0148	0248	0348	0448	2048	3048	4048	T242A335M020(2)S	
3.9	A	10	T140A395K020AS	1.2	4	0149	0249	0349	0449	2049	3049	4049	T242A395K020(2)S	
3.9	A	20	T140A395M020AS	1.2	4									
18.0	B	10	T140B186K020AS	3.0	6	0150	0250	0350	0450	2050	3050	4050	T242B186K020(2)S	
18.0	B	20	T140B186M020AS	3.0	6									
22.0	B	10	T140B226K020AS	3.0	6	0151	0251	0351	0451	2051	3051	4051	T242B226K020(2)S	
22.0	B	20	T140B226M020AS	3.0	6	0152	0252	0352	0452	2052	3052	4052	T242B226M020(2)S	
27.0	B	10	T140B276K020AS	4.0	6	0153	0253	0353	0453	2053	3053	4053	T242B276K020(2)S	
27.0	B	20	T140B276M020AS	4.0	6									
56.0	C	10	T140C566K020AS	7.0	6	0154	0254	0354	0454	2054	3054	4054	T242C566K020(2)S	
56.0	C	20	T140C566M020AS	7.0	6									
68.0	C	10	T140C686K020AS	8.0	6	0155	0255	0355	0455	2055	3055	4055	T242C686K020(2)S	
68.0	C	20	T140C686M020AS	8.0	6	0156	0256	0356	0456	2056	3056	4056	T242C686M020(2)S	
82.0	C	10	T140C826K020AS	10.0	6	0157	0257	0357	0457	2057	3057	4057	T242C826K020(2)S	
82.0	C	20	T140C826M020AS	10.0	6									
100.0	C	10	T140C107K020AS	12.0	6	0158	0258	0358	0458	2058	3058	4058	T242C107K020(2)S	
100.0	C	20	T140C107M020AS	12.0	6	0159	0259	0359	0459	2059	3059	4059	T242C107M020(2)S	
120.0	C	10	T140C127K020AS	12.0	6	0160	0260	0360	0460	2060	3060	4060	T242C127K020(2)S	
120.0	C	20	T140C127M020AS	12.0	6									
150.0	D	10	T140D157K020AS	15.0	8	0161	0261	0361	0461	2061	3061	4061	T242D157K020(2)S	
150.0	D	20	T140D157M020AS	15.0	8	0162	0262	0362	0462	2062	3062	4062	T242D157M020(2)S	
180.0	D	10	T140D187K020AS	15.0	8	0163	0263	0363	0463	2063	3063	4063	T242D187K020(2)S	
180.0	D	20	T140D187M020AS	15.0	8									
30 VOLT RATING AT 85°C — 20 VOLT RATING AT 125°C														
1.2	A	10, 20	T140A125(1)030AS	1.0	4									
1.5	A	10, 20	T140A155(1)030AS	1.0	4									
1.8	A	10, 20	T140A185(1)030AS	1.0	4									
2.2	A	10, 20	T140A225(1)030AS	1.0	4									
2.7	A	10, 20	T140A275(1)030AS	1.0	4									
12.0	B	10, 20	T140B126(1)030AS	3.0	4									
15.0	B	10, 20	T140B156(1)030AS	3.0	4									
18.0	B	10, 20	T140B186(1)030AS	3.0	4									
33.0	C	10, 20	T140C336(1)030AS	6.0	6									
39.0	C	10, 20	T140C396(1)030AS	6.0	6									
47.0	C	10, 20	T140C476(1)030AS	7.0	6									
56.0	C	10, 20	T140C566(1)030AS	7.0	6									
68.0	C	10, 20	T140C686(1)030AS	7.0	6									
82.0	D	10, 20	T140D826(1)030AS	10.0	6									
100.0	D	10, 20	T140D107(1)030AS	10.0	8									

(1) To complete T140 Series Part Number, insert Capacitance Tolerance Symbol in the 9th Character as shown on Page 6.

(2) To complete the T242 Series Part Number, insert Failure Rate Symbol in the 13th Character.

Bold Face lines indicate popular part types and values.

T140/T242 Series Tantalum
Hermetically Sealed

Available from 1.2 μF to 1000 μF , 6VDC to 50 VDC, these high capacitance-to-volume ratio, hermetically sealed solid tantalum capacitors are offered in standard MIL style A, B, C, and D cases. They meet or exceed the environmental and mechanical requirements of MIL-C-39003. Designed to operate from -55°C to $+125^{\circ}\text{C}$, they exhibit

exceptionally low DC leakage, dissipation factor and impedance characteristics. They are ideal for coupling, bypass, filtering and timing circuits, and are excellent substitutes for wet tantalums in low voltage applications. They are available in style CSR33 (T252 Series) per MIL-PRF-39003/06.

T252 Series Tantalum
Hermetically Sealed

CAPACITOR OUTLINE DRAWINGS



DIMENSIONS — INCHES & (MILLIMETERS)

CASE SIZE	UNINSULATED		INSULATED		B ± 0.002 ($\pm .05$)	C MAX.
	D ± 0.005 ($\pm .13$)	L ± 0.031 ($\pm .79$)	D ± 0.010 ($\pm .25$)	L ± 0.031 ($\pm .79$)		
A	0.125 (3.18)	0.250 (6.35)	0.135 (3.43)	0.286 (7.26)	0.020 (.51)	0.422 (10.72)
B	0.175 (4.45)	0.438 (11.13)	0.185 (4.70)	0.474 (12.04)	0.020 (.51)	0.610 (15.49)
C	0.279 (7.09)	0.650 (16.51)	0.289 (7.34)	0.686 (17.42)	0.025 (.64)	0.822 (20.88)
D	0.341 (8.66)	0.750 (19.05)	0.351 (8.92)	0.786 (19.96)	0.025 (.64)	0.922 (23.42)

ORDERING INFORMATION



For Military Marking Information, see page 4.

RATINGS & PART NUMBER REFERENCE

CAPACITANCE µF	CASE SIZE	CAPACITANCE TOLERANCE ±%	KEMET T252 SERIES				MIL-PRF-39003 (CSR33) CAPACITORS					
			D.C. LEAKAGE µA@25°C MAX.	MAX. DISSI- PATION FACTOR %@25°C, 120Hz	DASH NUMBER REFERENCE FAILURE RATE LEVEL (%/1000 HRS.)				KEMET EQUIVALENT MILITARY PART NUMBER			
					MIL-PRF-39003/6C EXPONENTIAL		MIL-PRF-39003/6C GRADED					
					M (1.0)	P (0.1)	R (0.01)	S (0.001)	B (0.1)	C (0.01)	D (0.001)	
6 VOLT RATING AT 85°C												
10.0	A	10	0.5	6	0001	0101	0201	0301	2001	3001	4001	T252A106K006(1)S
10.0	A	20	0.5	6	0002	0102	0202	0302	2002	3002	4002	T252A106M006(1)S
12.0	A	10	0.5	6	0003	0103	0203	0303	2003	3003	4003	T252A126K006(1)S
100.0	B	10	1.0	8	0004	0104	0204	0304	2004	3004	4004	T252B107K006(1)S
100.0	B	20	1.0	8	0005	0105	0205	0305	2005	3005	4005	T252B107M006(1)S
330.0	C	10	2.0	8	0006	0106	0206	0306	2006	3006	4006	T252C337K006(1)S
330.0	C	20	2.0	8	0007	0107	0207	0307	2007	3007	4007	T252C337M006(1)S
390.0	C	10	2.0	10	0008	0108	0208	0308	2008	3008	4008	T252C397K006(1)S
470.0	C	10	2.0	10	0009	0109	0209	0309	2009	3009	4009	T252C477K006(1)S
470.0	C	20	2.0	10	0010	0110	0210	0310	2010	3010	4010	T252C477M006(1)S
680.0	D	10	5.0	10	0011	0111	0211	0311	2011	3011	4011	T252D687K006(1)S
680.0	D	20	5.0	10	0012	0112	0212	0312	2012	3012	4012	T252D687M006(1)S
820.0	D	10	5.0	10	0013	0113	0213	0313	2013	3013	4013	T252D827K006(1)S
1000.0	D	10	5.0	10	0014	0114	0214	0314	2014	3014	4014	T252D108K006(1)S
1000.0	D	20	5.0	10	0015	0115	0215	0315	2015	3015	4015	T252D108M006(1)S
10 VOLT RATING AT 85°C												
6.8	A	10	.5	6	0016	0116	0216	0316	2016	3016	4016	T252A685K010(1)S
6.8	A	20	.5	6	0017	0117	0217	0317	2017	3017	4017	T252A685M010(1)S
8.2	A	10	.5	6	0018	0118	0218	0318	2018	3018	4018	T252A825K010(1)S
47.0	B	10	1.0	6	0019	0119	0219	0319	2019	3019	4019	T252B476K010(1)S
47.0	B	20	1.0	6	0020	0120	0220	0320	2020	3020	4020	T252B476M010(1)S
56.0	B	10	1.0	6	0021	0121	0221	0321	2021	3021	4021	T252B566K010(1)S
68.0	B	10	1.0	6	0022	0122	0222	0322	2022	3022	4022	T252B686K010(1)S
68.0	B	20	1.0	6	0023	0123	0223	0323	2023	3023	4023	T252B686M010(1)S
82.0	B	10	1.0	6	0024	0124	0224	0324	2024	3024	4024	T252B826K010(1)S
220.0	C	10	1.0	8	0025	0125	0225	0325	2025	3025	4025	T252C227K010(1)S
220.0	C	20	1.0	8	0026	0126	0226	0326	2026	3026	4026	T252C227M010(1)S
270.0	C	10	2.0	8	0027	0127	0227	0327	2027	3027	4027	T252C277K010(1)S
390.0	D	10	2.0	10	0028	0128	0228	0328	2028	3028	4028	T252D397K010(1)S
470.0	D	10	4.0	10	0029	0129	0229	0329	2029	3029	4029	T252D477K010(1)S
470.0	D	20	4.0	10	0030	0130	0230	0330	2030	3030	4030	T252D477M010(1)S
560.0	D	10	4.0	10	0031	0131	0231	0331	2031	3031	4031	T252D567K010(1)S
15 VOLT RATING AT 85°C												
4.7	A	10	.5	4	0032	0132	0232	0332	2032	3032	4032	T252A475K015(1)S
4.7	A	20	.5	4	0033	0133	0233	0333	2033	3033	4033	T252A475M015(1)S
5.6	A	10	.5	4	0034	0134	0234	0334	2034	3034	4034	T252A565K015(1)S
33.0	B	10	1.0	6	0035	0135	0235	0335	2035	3035	4035	T252B336K015(1)S
33.0	B	20	1.0	6	0036	0136	0236	0336	2036	3036	4036	T252B336M015(1)S
39.0	B	10	1.0	6	0037	0137	0237	0337	2037	3037	4037	T252B396K015(1)S
150.0	C	10	1.0	8	0038	0138	0238	0338	2038	3038	4038	T252C157K015(1)S
150.0	C	20	1.0	8	0039	0139	0239	0339	2039	3039	4039	T252C157M015(1)S
180.0	C	10	2.0	8	0040	0140	0240	0340	2040	3040	4040	T252C187K015(1)S
220.0	D	10	2.0	8	0041	0141	0241	0341	2041	3041	4041	T252D227K015(1)S
220.0	D	20	2.0	8	0042	0142	0242	0342	2042	3042	4042	T252D227M015(1)S
270.0	D	10	2.0	8	0043	0143	0243	0343	2043	3043	4043	T252D277K015(1)S
330.0	D	10	2.0	8	0044	0144	0244	0344	2044	3044	4044	T252D337K015(1)S
330.0	D	20	2.0	8	0045	0145	0245	0345	2045	3045	4045	T252D337M015(1)S

(1) To complete Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 31.

RATINGS & PART NUMBER REFERENCE

CAPACITANCE µF	CASE SIZE	CAPACITANCE TOLERANCE ±%	KEMET T252 SERIES				MIL-PRF-39003 (CSR33) CAPACITORS					
			D.C. LEAKAGE µA@25°C MAX.	MAX. DISSI- PATION FACTOR %@25°C, 120Hz	DASH NUMBER REFERENCE FAILURE RATE LEVEL (%/1000 HRS.)				MIL-PRF-39003/6C GRADED			KEMET EQUIVALENT MILITARY PART NUMBER
					MIL-PRF-39003/6C EXPONENTIAL							
					M (1.0)	P (0.1)	R (0.01)	S (0.001)	B (0.1)	C (0.01)	D (0.001)	
20 VOLT RATING AT 85°C												
2.7	A	10	.5	4	0046	0146	0246	0346	2046	3046	4046	T252A275K020(1)S
3.3	A	10	.5	4	0047	0147	0247	0347	2047	3047	4047	T252A335K020(1)S
3.3	A	20	.5	4	0048	0148	0248	0348	2048	3048	4048	T252A335M020(1)S
3.9	A	10	.5	4	0049	0149	0249	0349	2049	3049	4049	T252A395K020(1)S
18.0	B	10	1.0	6	0050	0150	0250	0350	2050	3050	4050	T252B186K020(1)S
22.0	B	10	1.0	6	0051	0151	0251	0351	2051	3051	4051	T252B226K020(1)S
22.0	B	20	1.0	6	0052	0152	0252	0352	2052	3052	4052	T252B226M020(1)S
27.0	B	10	1.0	6	0053	0153	0253	0353	2053	3053	4053	T252B276K020(1)S
56.0	C	10	1.0	6	0054	0154	0254	0354	2054	3054	4054	T252C566K020(1)S
68.0	C	10	1.0	6	0055	0155	0255	0355	2055	3055	4055	T252C686K020(1)S
68.0	C	20	1.0	6	0056	0156	0256	0356	2056	3056	4056	T252C686M020(1)S
82.0	C	10	1.0	6	0057	0157	0257	0357	2057	3057	4057	T252C826K020(1)S
100.0	C	10	1.0	6	0058	0158	0258	0358	2058	3058	4058	T252C107K020(1)S
100.0	C	20	1.0	6	0059	0159	0259	0359	2059	3059	4059	T252C107M020(1)S
120.0	C	10	1.0	6	0060	0160	0260	0360	2060	3060	4060	T252C127K020(1)S
150.0	D	10	2.0	8	0061	0161	0261	0361	2061	3061	4061	T252D157K020(1)S
150.0	D	20	2.0	8	0062	0162	0262	0362	2062	3062	4062	T252D157M020(1)S
180.0	D	10	2.0	8	0063	0163	0263	0363	2063	3063	4063	T252D187K020(1)S
35 VOLT RATING AT 85°C												
1.8	A	10	.5	4	0064	0164	0264	0364	2064	3064	4064	T252A185K035(1)S
8.2	B	10	1.0	6	0065	0165	0265	0365	2065	3065	4065	T252B825K035(1)S
10.0	B	10	1.0	6	0066	0166	0266	0366	2066	3066	4066	T252B106K035(1)S
10.0	B	20	1.0	6	0067	0167	0267	0367	2067	3067	4067	T252B106M035(1)S
33.0	C	10	1.0	6	0068	0168	0268	0368	2068	3068	4068	T252C336K035(1)S
33.0	C	20	1.0	6	0069	0169	0269	0369	2069	3069	4069	T252C336M035(1)S
39.0	C	10	1.0	6	0070	0170	0270	0370	2070	3070	4070	T252C396K035(1)S
47.0	C	10	1.0	6	0071	0171	0271	0371	2071	3071	4071	T252C476K035(1)S
47.0	C	20	1.0	6	0072	0172	0272	0372	2072	3072	4072	T252C476M035(1)S
56.0	D	10	2.0	6	0073	0173	0273	0373	2073	3073	4073	T252D566K035(1)S
68.0	D	10	2.0	6	0074	0174	0274	0374	2074	3074	4074	T252D686K035(1)S
68.0	D	20	2.0	6	0075	0175	0275	0375	2075	3075	4075	T252D686M035(1)S
50 VOLT RATING AT 85°C												
1.2	A	10	.5	4	0076	0176	0276	0376	2076	3076	4076	T252A125K050(1)S
1.5	A	10	.5	4	0077	0177	0277	0377	2077	3077	4077	T252A155K050(1)S
1.5	A	20	.5	4	0078	0178	0278	0378	2078	3078	4078	T252A155M050(1)S
5.6	B	10	1.0	4	0079	0179	0279	0379	2079	3079	4079	T252B565K050(1)S
6.8	B	10	1.0	6	0080	0180	0280	0380	2080	3080	4080	T252B685K050(1)S
6.8	B	20	1.0	6	0081	0181	0281	0381	2081	3081	4081	T252B685M050(1)S
22.0	C	10	1.0	6	0082	0182	0282	0382	2082	3082	4082	T252C226K050(1)S
22.0	C	20	1.0	6	0083	0183	0283	0383	2083	3083	4083	T252C226M050(1)S
27.0	C	10	1.0	6	0084	0184	0284	0384	2084	3084	4084	T252C276K050(1)S
33.0	D	10	1.0	6	0085	0185	0285	0385	2085	*	*	T252D336K050(1)S
33.0	D	20	1.0	6	0086	0186	0286	0386	2086	*	*	T252D336M050(1)S
39.0	D	10	1.0	6	0087	0187	0287	0387	2087	*	*	T252D396K050(1)S

(1) To complete Part Number, insert Failure Rate Symbol in the 13th Character as shown on Page 31.
*NOTE: C Failure rate not QPL for -3085 thru 3087.
D Failure rate not QPL for -4085 thru 4087.

T252 Series Tantalum
Hermetically Sealed

KEMET's T262 (CSR21) per MIL-C-39003/09 hermetically sealed solid tantalum capacitors are similar to KEMET's popular T212 (CSR13 per MIL-PRF-39003/01) capacitors shown on page 6, but offer higher ripple current handling capability and exhibit exceptionally low Equivalent Series Resistance (ESR).

The T262 Series is ideal for filtering applications and in military power supplies where low ESR is essential. T262s are 100% surge current tested and their dissipation factor is screened at 1kHz. Available in C & D case sizes only, 5.6 to 330 μ F, 6 to 50 VDC.

CAPACITOR OUTLINE DRAWINGS



DIMENSIONS — INCHES & (MILLIMETERS)

CASE SIZE	UNINSULATED		INSULATED		B ± 0.002 ($\pm .05$)	C MAX.
	D ± 0.005 ($\pm .13$)	L ± 0.031 ($\pm .79$)	D ± 0.010 ($\pm .25$)	L ± 0.031 ($\pm .79$)		
C	0.279 (7.09)	0.650 (16.51)	0.289 (7.34)	0.686 (17.42)	0.025 (.64)	0.822 (20.88)
D	0.341 (8.66)	0.750 (19.05)	0.351 (8.92)	0.786 (19.96)	0.025 (.64)	0.922 (23.42)

ORDERING INFORMATION



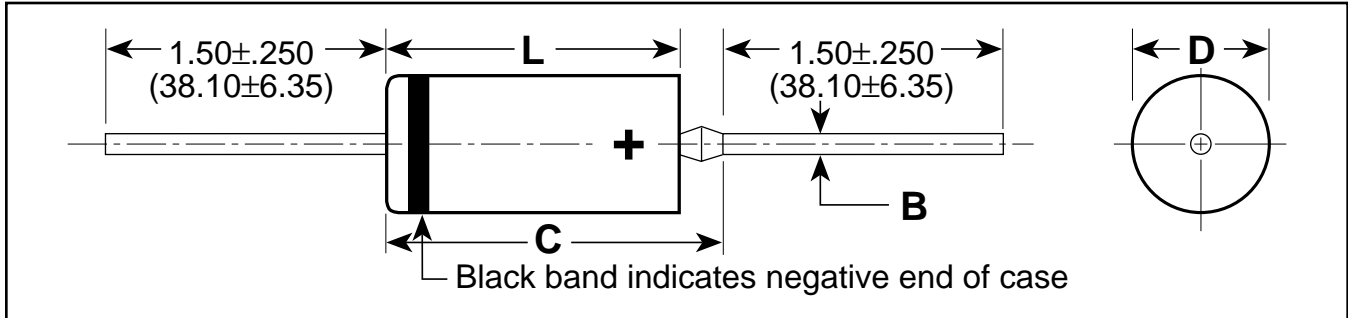
For Military Marking Information, see page 4.

T216 and T256 are KEMET's new designation for MIL-Style CSS13 and CSS33 capacitors. The T216/T256 Series is qualified to all failure rates per MIL-PRF-39003/10. Products meeting this specification have passed rigorous test requirements and are used in space applications or other equally demanding environments.

The T216 is available in capacitance ratings from .15 μ F to 330 μ F; voltage ratings from 6 VDC to 75 VDC. The T256 is available in capacitance ratings from 1.2 μ F to 1000 μ F with voltage ratings of 6 VDC to 50 VDC.

These capacitors provide circuit designers an excellent choice for blocking, bypass, decoupling, filtering and timing applications.

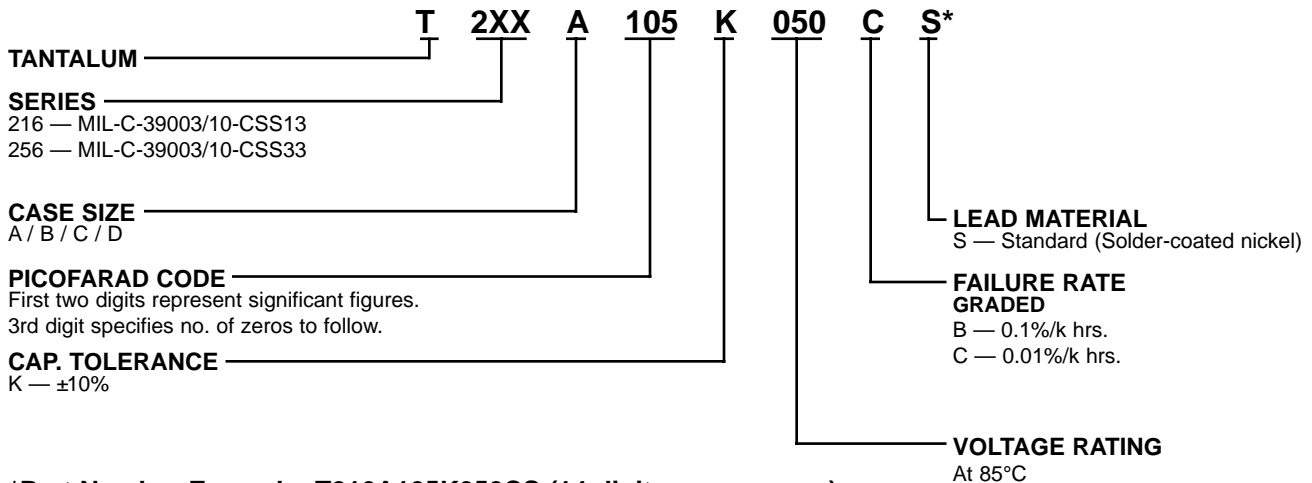
CAPACITOR OUTLINE DRAWINGS



DIMENSIONS — INCHES & (MILLIMETERS)

CASE SIZE	UNINSULATED		INSULATED		B ± 0.002 ($\pm .05$)	C MAX.
	D ± 0.005 ($\pm .13$)	L ± 0.031 ($\pm .79$)	D ± 0.010 ($\pm .25$)	L ± 0.031 ($\pm .79$)		
A	0.125 (3.18)	0.250 (6.35)	0.135 (3.43)	0.286 (7.26)	0.020 (.51)	0.422 (10.72)
B	0.175 (4.45)	0.438 (11.13)	0.185 (4.70)	0.474 (12.04)	0.020 (.51)	0.610 (15.49)
C	0.279 (7.09)	0.650 (16.51)	0.289 (7.34)	0.686 (17.42)	0.025 (.64)	0.822 (20.88)
D	0.341 (8.66)	0.750 (19.05)	0.351 (8.92)	0.786 (19.96)	0.025 (.64)	0.922 (23.42)

ORDERING INFORMATION



*Part Number Example: T216A105K050CS (14 digits – no spaces)

T216/T256 Series Tantalum Hermetically Sealed

MIL-PRF-39003/10 ORDERING INFORMATION

M39003/10 — 3078S



MARKING INFORMATION

A CASE

39003	Military specification number
10 - K	Specification sheet number and trademark
3078S	Military dash number and "S" for sleeved
+J310	Polarity, "J" for JAN date code (1st digit indicates year and the next two digits indicate the week)
XYA	Lot, unique lot code

C & D CASE

M39003	Military specification number
10-2049SJ	Specification sheet number, military dash number and "J" for Jan.
+6.8 μF	Positive terminal identifier and capacitance value
10% 35V	Capacitance tolerance and voltage rating
31433	Source code
0310 NAB K	Date code, lot code, unique lot code, and trademark

B CASE

M39003	Military specification number
10 -	Specification sheet number
3082SJ	Military dash number and "J" for JAN
31433	Source code
+310	Polarity, date code (1st digit indicates year and the next two digits indicate the week)
NABK	Lot code, unique lot code and trademark.

NOTE: Marking will include S or U after the MIL dash number, a third letter following lot symbol or lot code designates a unique lot identifier, and a black band on negative end of case.

■ Black band on negative end.

T216/(CSS13)
RATINGS & PART NUMBER REFERENCE

CAPACITANCE μF	KEMET T216 SERIES								MIL-PRF-39003 (CSS13) CAPACITORS	
	CASE SIZE	KEMET EQUIVALENT PART NUMBER FOR CSS13 CAPACITORS	DC LEAKAGE			MAX. DISSIPATION FACTOR		MAX. ESR Ω @ 25°C, 100 kHz	DASH NUMBER REFERENCE FAILURE RATE LEVEL (%/1000 HRS) MIL-PRF-39003/10 GRADED	
			μA @ +25° MAX.	μA @ +85° MAX.	μA @ +125° MAX.	% @ -55°C +25°C MAX.	% @ -85°C +125°C MAX.		B (0.1)	C (0.01)
6 VOLT RATING AT 85° C										
5.6	A	T216A565K006CS	0.3	6.0	7.5	4	4	0.90	2001(1)	3001(1)
6.8	A	T216A685K006CS	0.3	6.0	7.5	6	6	0.80	2002(1)	3002(1)
47.0	B	T216B476K006CS	1.5	24.0	30.0	6	6	0.24	2003(1)	3003(1)
56.0	B	T216B566K006CS	1.5	24.0	30.0	6	6	0.24	3004(1)	3004(1)
150.0	C	T216C157K006CS	4.5	90.0	113.0	8	8	0.09	2005(1)	3005(1)
180.0	C	T216C187K006CS	5.5	110.0	138.0	8	8	0.08	3206(1)	3006(1)
270.0	D	T216D277K006CS	6.5	130.0	163.0	8	8	0.07	2007(1)	3007(1)
330.0	D	T216D337K006CS	7.5	150.0	188.0	8	8	0.06	2008(1)	3008(1)
10 VOLT RATING AT 85° C										
3.9	A	T216A395K010CS	0.3	6.0	7.5	4	4	1.00	2009(1)	3009(1)
4.7	A	T216A475K010CS	0.4	7.0	8.8	4	4	0.90	2010(1)	3010(1)
27.0	B	T216B276K010CS	2.0	40.0	50.0	6	6	0.25	2011(1)	3011(1)
33.0	B	T216B336K010CS	2.5	50.0	63.0	6	6	0.24	2012(1)	3012(1)
39.0	B	T216B396K010CS	2.5	50.0	63.0	6	6	0.24	2013(1)	3013(1)
82.0	C	T216C826K010CS	4.0	80.0	100.0	6	6	0.12	2014(1)	3014(1)
100.0	C	T216C107K010CS	5.0	100.0	125.0	8	8	0.11	2015(1)	3015(1)
120.0	C	T216C127K010CS	6.0	120.0	150.0	8	8	0.10	2016(1)	3016(1)
180.0	D	T216D187K010CS	9.0	180.0	226.0	8	8	0.08	2017(1)	3017(1)
220.0	D	T216D227K010CS	10.0	200.0	250.0	8	8	0.07	2018(1)	3018(1)

(1) To complete, insert S for sleeved or U for unsleeved, if "U" ordered also use C-0100.

