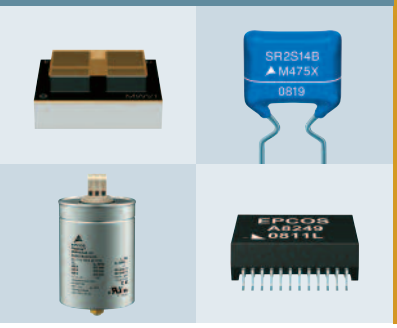
EPCOS

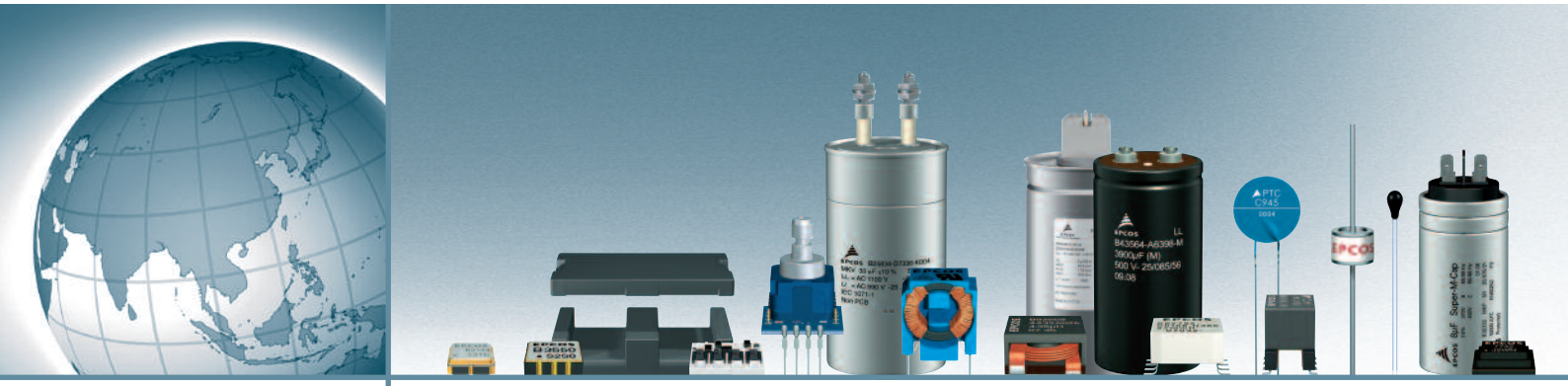
Product Survey 2009



Electronic Components, Modules and Systems

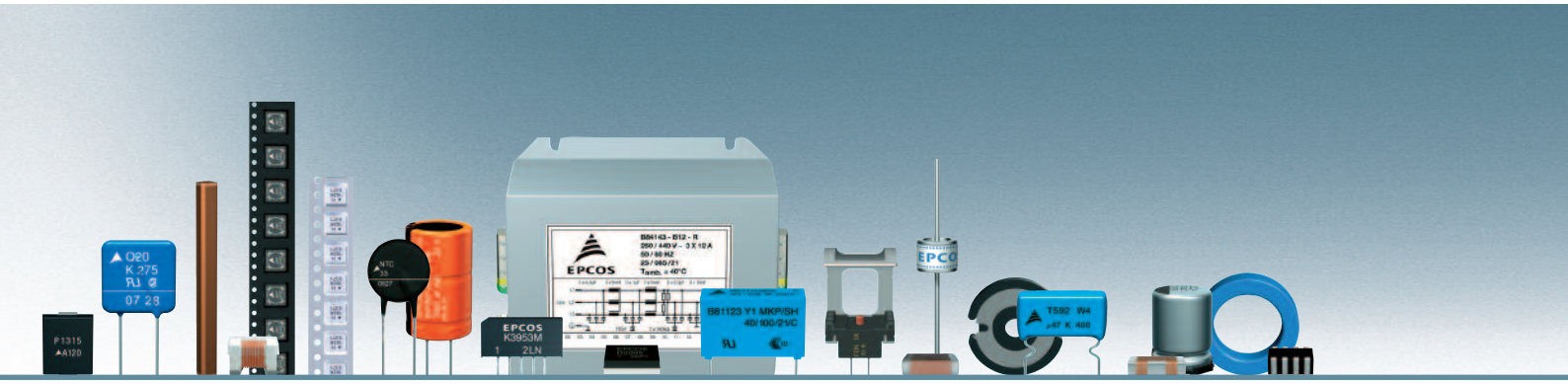
www.epcos.com

Welcome to the World of Electronic



EPCOS is a leading manufacturer of electronic components, modules and systems. Our broad portfolio includes capacitors, inductors and ferrites, EMC filters, sensors and sensor systems, nonlinear resistors, and arresters, as well as SAW and BAW components and RF modules. As an innovative technology-driven company, EPCOS focuses technologically demanding growth markets in the areas of information and communications technology, automotive, industrial, and consumer electronics. We offer our customers both standard components as well as application-specific solutions.

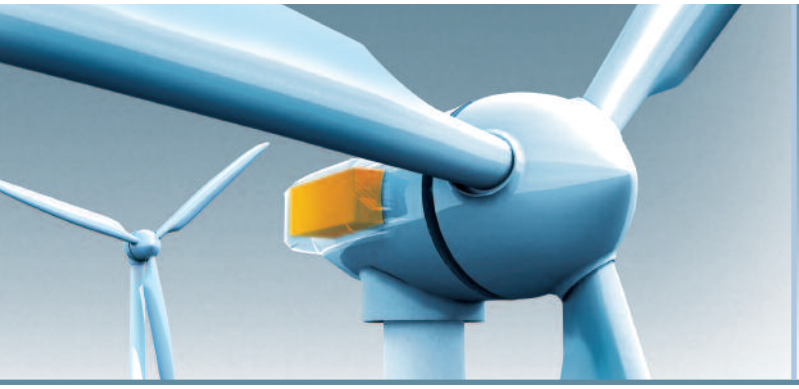
Components, Modules and Systems.



EPCOS has design, manufacturing and marketing facilities in Europe, Asia and the Americas. We are continuously strengthening our global research and development network by expanding R&D activities at our production locations, primarily in Eastern Europe, China and India. With our global presence we are able to provide our customers with local development and manufacturing know-how and support in the early phases of their projects.

EPCOS is continually improving its processes and thus the quality of its products and services. The Group is ISO/TS 16949 certified and remains committed to constantly reviewing and systematically improving its quality management system.

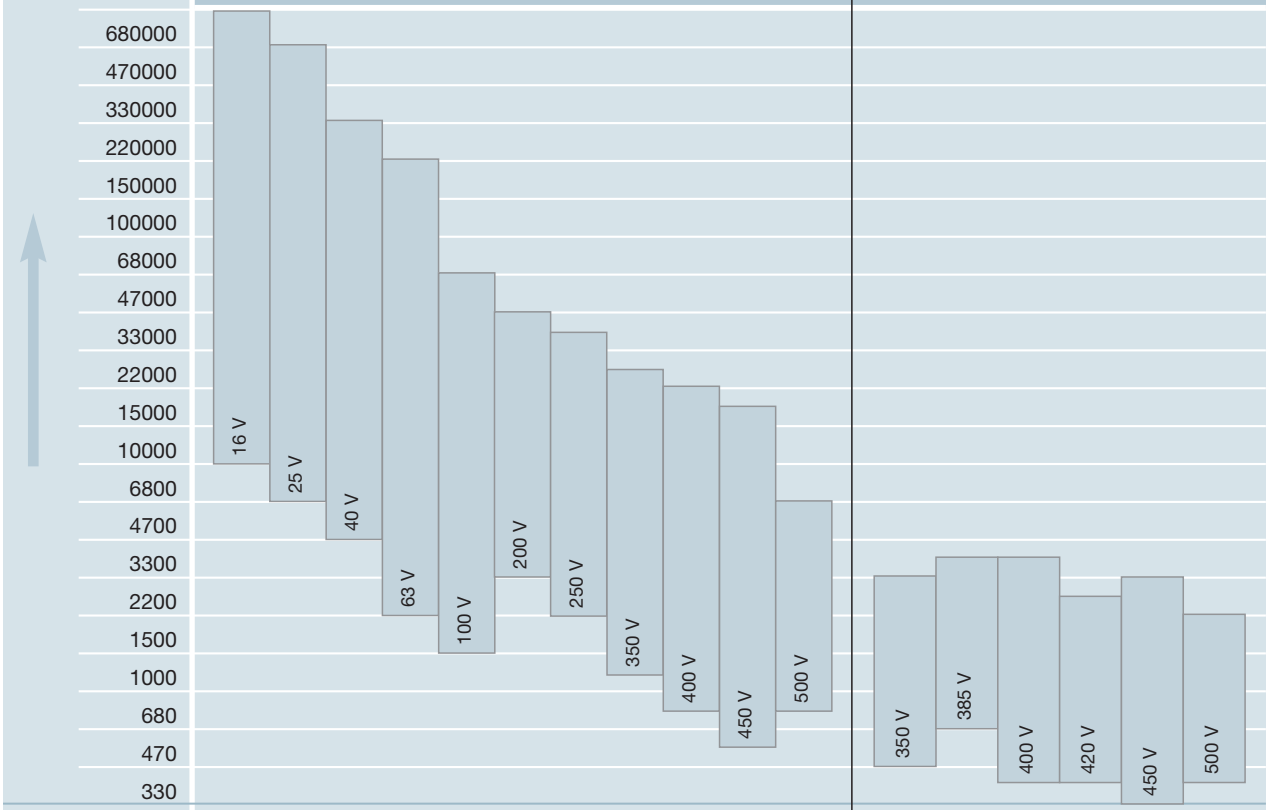
Components, Modules and Systems.



Contents

Solutions by EPCOS.

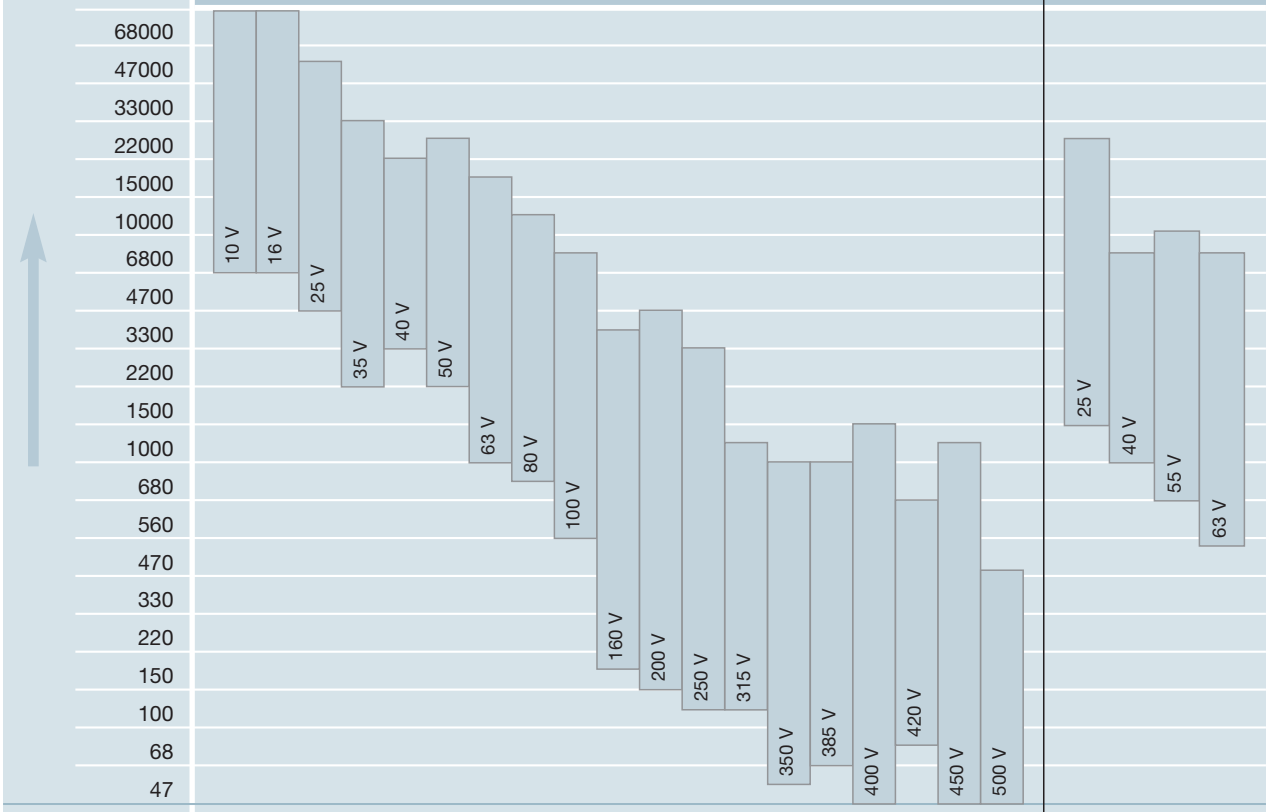
Aluminum Electrolytic Capacitors

	Screw terminals	Solder pins/4-pin snap-in
Rated capacitance C_R µF		
		
Temperature (°C)	+85; +105; +125	+85; +105
Features	Also available with low inductance design, forced can base cooling. Minimal overall length tolerance (±0.35 mm) for mounting between heat sink and busbar available.	High current stability with highest reliability
Applications	Frequency converters, traction, professional power supplies, industrial electronics, UPS	

Aluminum electrolytic capacitors are notable for their high capacitance per unit volume (CV product) and excellent current handling capability. Therefore they are essential components in frequency converters, as DC link in traction, in UPS and SMPS, in electronic lamp ballasts, automotive and studio flash applications.

Please read *Important notes* on page 78.

Aluminum Electrolytic Capacitors

	Snap-in	Large size Automotive
Rated capacitance C_R µF	   	
Temperature (°C)	+85; +105	+125/140; +125/150
Features	High current stability with highest reliability Also available with polarity reversal protection snap-in with 3 pins Including Alu-X product range	40 *g* vibration resistance, outstanding ripple current capability
Applications	Frequency converters, UPS, industrial applications, power supplies and SMPS, entertainment	Automotive applications

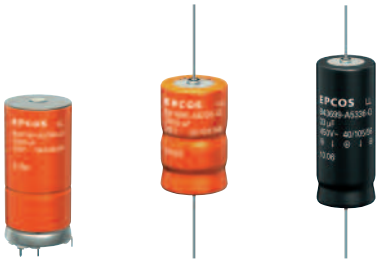
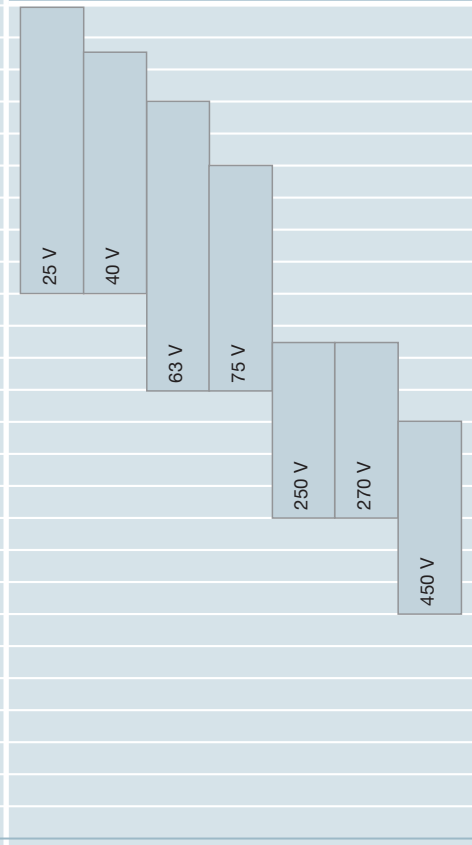
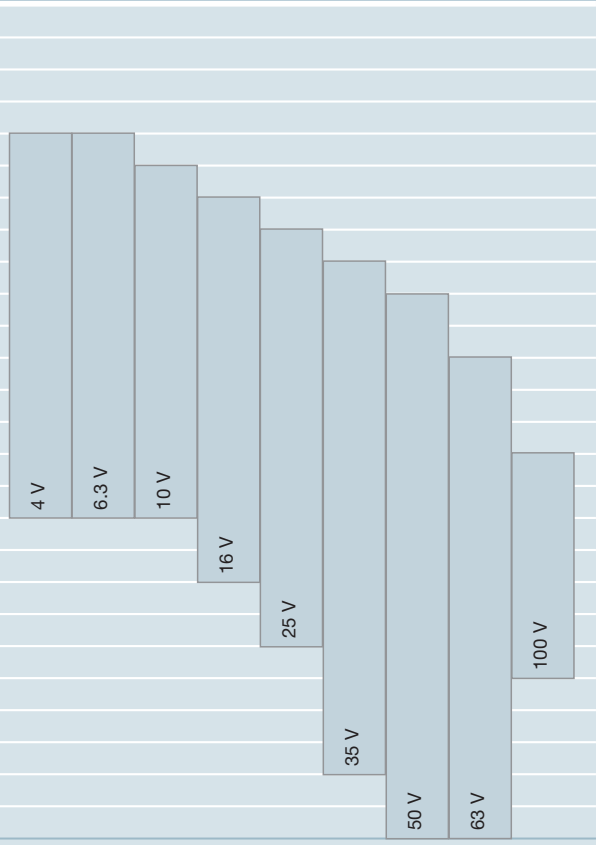
Please read *Important notes* on page 78.

Aluminum Electrolytic Capacitors

	Single-ended
Rated capacitance C_R µF	
Temperature (°C)	+85; +105; +125; +140; +150
Features	Various terminal configurations: Taped, cut, kinked, protection polarity reversal Including Alu-X product range
Applications	Industrial electronics, professional and high frequency electronics, telecom, data processing equipments, automotive, consumer electronics, lighting

Please read *Important notes* on page 78.

Aluminum Electrolytic Capacitors

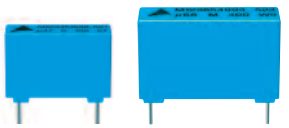
	Soldering star and axial-lead	SMD
		SMD 
Rated capacitance C_R µF		
Temperature (°C)	+105; +125/140; +125/150	+85; +105
Features	Automotive: High vibration resistance up to 20 *g*	Alu-X product range Surface mounting device, low impedance and long life series
Applications	Automotive applications, electronic ballasts	Consumer and industrial electronics, telecom and electronic data processing

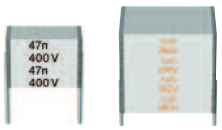
Please read *Important notes* on page 78.

Film Capacitors

MKT

Rated capacitance C_R





	B32520 … B32529	B32560 … B32564 B32572 … B32573	B32591 … B32594
220 µF	63 VDC	63 VDC	100 VDC
150 µF	100 VDC	100 VDC	250 VDC
100 µF	250 VDC	250 VDC	400 VDC
68 µF	400 VDC	400 VDC	630 VDC
47 µF	630 VDC	630 VDC	
33 µF		1000 VDC	
22 µF			
15 µF			
10 µF			
6.8 µF		420 VDC	
4.7 µF			
3.3 µF	NEW		
2.2 µF			
1.5 µF			
1.0 µF			
0.68 µF			
0.47 µF			
0.33 µF			
0.22 µF			
0.15 µF			
0.10 µF			
68 nF			
47 nF			
33 nF			
22 nF			
15 nF			
10 nF			
6.8 nF			
4.7 nF			
3.3 nF			
2.2 nF			
1.5 nF			
1.0 nF			
Technology Design	Stacked/wound Boxed (UL 94 V-0)	Stacked SilverCap	Stacked/wound Coated(UL 94 V-0)
Features and applications	General purpose	Smallest size; for electronic ballasts, CFL For ignition devices	General purpose

Metallized film capacitors have almost unlimited self-healing capability. Short circuits are thus largely nonexistent. They exhibit high pulse handling and ripple current capability together with long life time. Typical applications are ADSL, televisions, automobiles, PCs, lamp ballasts and power applications like UPS, power drives, inverters, etc.

Please read *Important notes* on page 78.

Film Capacitors

	MKT MiniBlue	MKT Axial		MKT CombiSuppressor
Rated capacitance C_R				
	B32559	B32231 B32232	B32227 B32237	B32537	B32521V B32529V
100 µF	NEW				NEW
68 µF					
47 µF					
33 µF					
22 µF					
15 µF					
10 µF					
6.8 µF					
4.7 µF					
3.3 µF					
2.2 µF					
1.5 µF					
1.0 µF	63 VDC				22 … 45 VDC
0.68 µF					
0.47 µF					
0.33 µF					
0.22 µF					
0.15 µF	100 VDC				
0.10 µF					
68 nF	250 VDC	33 nF … 10 µF 100 … 630 VDC		33 nF … 100 µF / 50 … 630 VDC MKT-S	
47 nF					
33 nF					
22 nF	400 VDC		0.68 nF … 0.25 µF / 1.0 … 12.5 kVDC High-voltage types		
15 nF					
10 nF					
6.8 nF					
4.7 nF					
3.3 nF					
2.2 nF					
1.5 nF					
1.0 nF					
0.68 nF	630 VDC				
Technology Design	Stacked MiniBlue	Flat winding	Tubular winding	Tubular winding	Capacitor with integrated ceramic varistor
Features and applications	For lighting, ADSL			High-reliability types	RFI suppression and overvoltage protection for small motors in automotive applications

The MKT CombiSuppressor comprises a film capacitor and a multilayer ceramic varistor connected in parallel in a plastic case. This is a space-saving solution for EMI suppression and overvoltage protection in DC motors in motor vehicles.

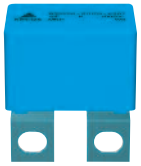
Please read *Important notes* on page 78.

Film Capacitors

	MKP				
Rated capacitance C_R					
	B32620, B32621 B32651… B32656	B32671Z... B32673Z	B32671L B32672L	B32612 … B32614	B32601L B32602L
10 µF	160 VDC, 250 VDC, 400 VDC, 630 VDC, 850 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC	NEW 450 VDC, 520 VDC, 630 VDC	NEW 250 … 630 VDC, 1000 VDC, 1300 VDC, 1600 VDC, 2000 VDC	250 VDC, 400 VDC, 630 VDC, 1000 VDC, 1250 VDC, 1600 VDC, 2000 VDC	NEW 250 … 630 VDC, 1000 VDC, 1300 VDC, 1600 VDC, 2000 VDC
6.8 µF					
4.7 µF					
3.3 µF					
2.2 µF					
1.5 µF					
1.0 µF					
0.68 µF					
0.47 µF					
0.33 µF					
0.22 µF					
0.15 µF					
0.10 µF					
68 nF					
47 nF					
33 nF					
22 nF					
15 nF					
10 nF					
6.8 nF					
4.7 nF					
3.3 nF					
2.2 nF					
1.5 nF					
1.0 nF					
0.68 nF					
0.47 nF					
0.33 nF					
Technology Design	Stacked/wound Boxed (UL 94 V-0)	Wound Boxed (UL 94 V-0)		Wound Coated (UL 94 V-0)	
Features and applications	For electronic ballasts, TV (S-correction, flyback) B3262* = Stacked B3265* = Wound	Power factor correction, SMPS, filtering	Electronic ballasts, resonant circuits, SMPS	Pulse applications	Electronic ballasts, resonant circuits, SMPS

Please read *Important notes* on page 78.

Film Capacitors

	MKP		MKP for DC link		MKP Axial
Rated capacitance C_R					
	B32656C	B32656S	B32674/676/678 High power (HP)	B32774/776/778 High density (HD)	B32669
110 µF					
100 µF					
75 µF					
60 µF					
50 µF					
40 µF					
35 µF					
30 µF					
27 µF					
25 µF					
22 µF					
20 µF					
16 µF					
15 µF					
14 µF					
12 µF					
10 µF					
6.8 µF					
4.7 µF					
3.3 µF					
2.2 µF					
1.5 µF					
1.0 µF					
0.68 µF	V_R=VDC				
0.47 µF					
0.33 µF					
0.22 µF					
0.15 µF					
0.10 µF					
68 nF					
47 nF					
Technology Design	Wound Boxed (UL 94 V-0)				Wound Axial-lead
Features and applications	4 pins Snubbering, filtering	Strap terminals IGBT, snubbering	2 and 4 pins High power DC link	2 and 4 pins High density, compact DC link	AC appli-cations

850 | 1000 | 1250 | 1600 | 2000

850 VDC | 1000 VDC | 1250 VDC | 1600 VDC | 2000 VDC

300 VDC | 450 VDC | 630 VDC | 750 VDC | 875 VDC

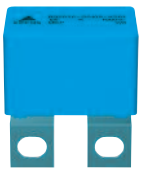
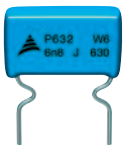
NEW

450 VDC | 800 VDC | 1100 VDC | 1300 VDC

250 VAC | 400 VAC

Please read *Important notes* on page 78.

Film Capacitors

	MFP			
Rated capacitance C_R				
	B32686A	B32686C	B32686S	B32632B … B32634B
1.0 µF				NEW
0.68 µF				
0.47 µF	1000 VDC	1000 VDC	1000 VDC	
0.33 µF	1250 VDC	1250 VDC	1250 VDC	
0.22 µF	1600 VDC	1600 VDC	1600 VDC	
0.15 µF	2000 VDC	2000 VDC	2000 VDC	
0.10 µF				
68 nF				630 VDC
47 nF				1250 VDC
33 nF				1600 VDC
22 nF				2000 VDC
15 nF				2500 VDC
10 nF				3000 VDC
6.8 nF				
4.7 nF				
3.3 nF				
2.2 nF				
1.5 nF				
1.0 nF				
0.68 nF				
0.47 nF				
Technology Design	Wound Boxed (UL 94 V-0)			Wound Coated (UL 94 V-0)
Features and applications	Snubbering	4 pins Snubbering, filtering	Strap terminals IGBT, snubbering	Pulse application

Please read *Important notes* on page 78.

Film Capacitors

	EMI suppression capacitors				
Rated capacitance C_R					
	X 2 305 VAC / 110, 125 °C	X 1 330 VAC / 110 °C	X 1 440 VAC / 110 °C	Y 2 300 VAC / 110 °C	Y 1 250 VAC / 100 °C
45 µF		NEW	NEW	NEW	
30 µF					
20 µF					
15 µF					
10 µF					
8.2 µF					
6.8 µF					
4.7 µF					
3.3 µF					
2.2 µF					
1.5 µF					
1.0 µF					
0.68 µF					
0.47 µF					
0.33 µF					
0.22 µF					
0.15 µF					
0.10 µF					
68 nF					
47 nF					
33 nF					
22 nF					
15 nF					
10 nF					
6.8 nF					
5.6 nF					
4.7 nF					
3.3 nF					
2.2 nF					
1.5 nF					
1.0 nF					
Series	B32921 ... B32928	B32911A/B ... B32916A/B	B32911E/F ... B32916E/F	B32021 ... B32026	B81123
Approvals					
Applications	Across the line applications	Across the line applications	Three phase Line to line applications	Line to ground applications	Line to ground applications with reinforced insulation
Features	EMI suppression capacitors for extreme safety requirements				

Please read *Important notes* on page 78.

Film Capacitors

Motor run capacitors




Rated capacitance C_R µF	B3232* MotorCap P0	B32330/32 MotorCap P2	B32335 Dual MotorCap	B3235* MotorCap P2
		NEW		NEW
100				
50	60	60	60	
10				20
5				
1	1	1	1	1
Safety (IEC/EN 60252)	P0	P2	P2	P2
Rated voltage V_R	250 … 480 VAC	250 ... 450 VAC	250 … 450 VAC	250 … 450 VAC
Approvals				
Design	Plastic can	Aluminum can	Aluminum can	Plastic can, compact
Applications	General applications	General applications, air conditioners	Air conditioners, washing machines	General applications, refrigerators

Motor run capacitors are used on single-phase asynchronous motors and compressors. They are connected continuously to them and are required for their operation. Motor run capacitors increase the effectiveness and efficiency of the motor or compressor.

Please read *Important notes* on page 78.

Power Capacitors

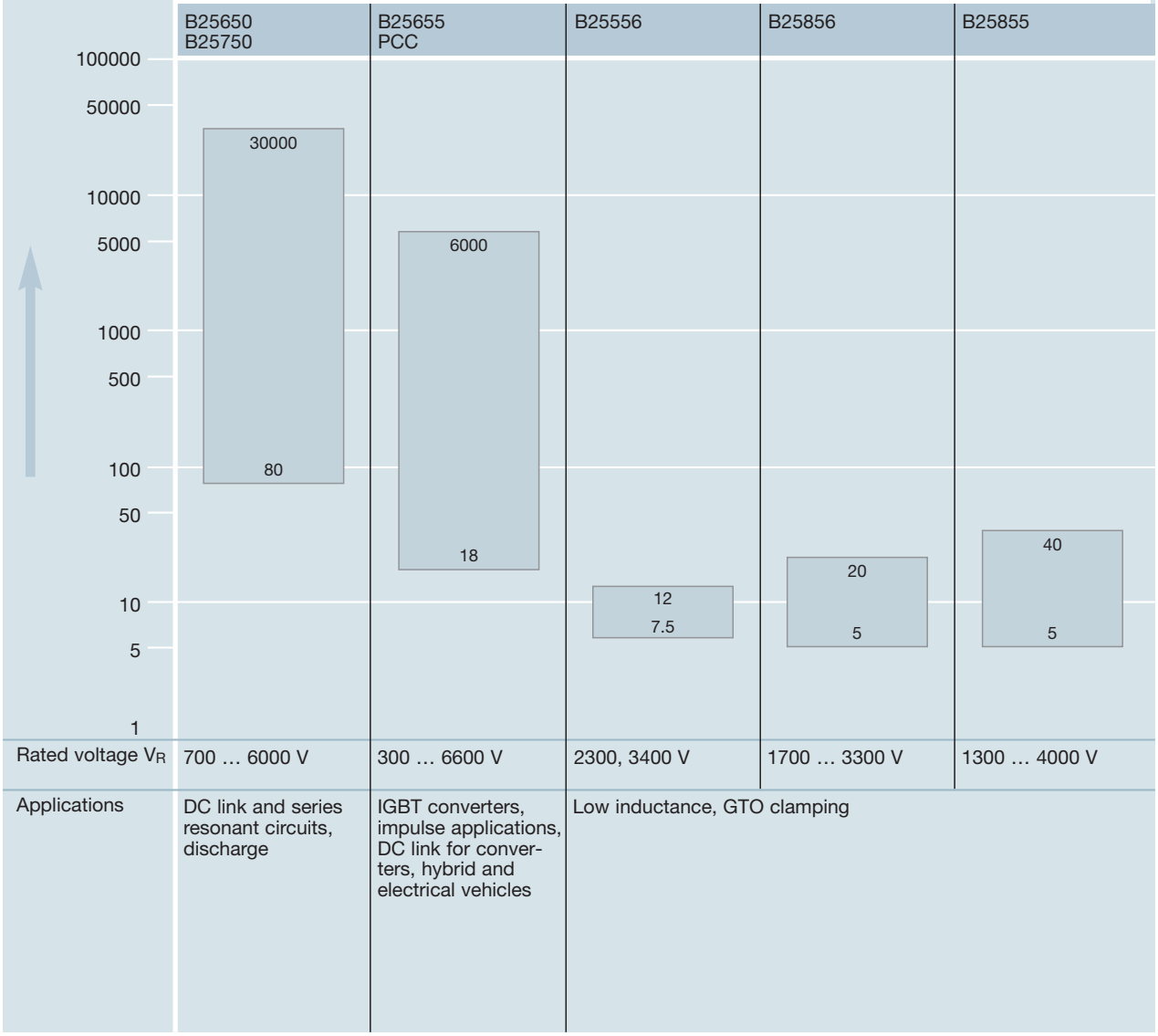
	Capacitors for power factor correction				
					
	B25667/B25668 PhaseCap	B25669 PhaseCap HD	B25673 PhaseCap Compact	B32340[1]/343[1]/344[2] PhiCap	B25836B*A305 MKV
Output Q (50 Hz) kvar	60 50 40 30 20 10 1 33 5	56 40	NEW 36 5	30 0.5	25 5
Rated voltage V_R	230 … 800 VAC	400 … 525 VAC	230 … 525 VAC	230 … 525 VAC	400 … 800 VAC
Terminals	SIGUT	SIGUT	SIGUT	[1] Fast-on [2] SIGUT	SIGUT
Applications	Automatic PFC and detuned systems, individual and groupfixed PFC Wind turbine generators, industrial applications, harmonic filtering	Power factor correction, detuned capacitor banks	All kinds of PFC applications	PFC, automatic capacitor banks, fixed applications, detuned systems	Tuned harmonic filters (resonant circuits), applications with high ambient temperatures

PFC capacitors compensate reactive power and reduce harmonics. In addition to PFC capacitors, EPCOS offers PFC key components, such as power factor controllers, multi measuring interfaces, switching devices and reactors.

Please read *Important notes* on page 78.

Power Capacitors

Capacitors for DC applications



	B25650 B25750	B25655 PCC	B25556	B25856	B25855
Rated voltage V_R	700 … 6000 V	300 … 6600 V	2300, 3400 V	1700 … 3300 V	1300 … 4000 V
Applications	DC link and series resonant circuits, discharge	IGBT converters, impulse applications, DC link for converters, hybrid and electrical vehicles	Low inductance, GTO clamping		

Power capacitors are used to store, convert and control energy.

All capacitors are self-healing, i.e. voltage breakdowns heal in a matter of microseconds and so produce no short circuit.

Please read *Important notes* on page 78.

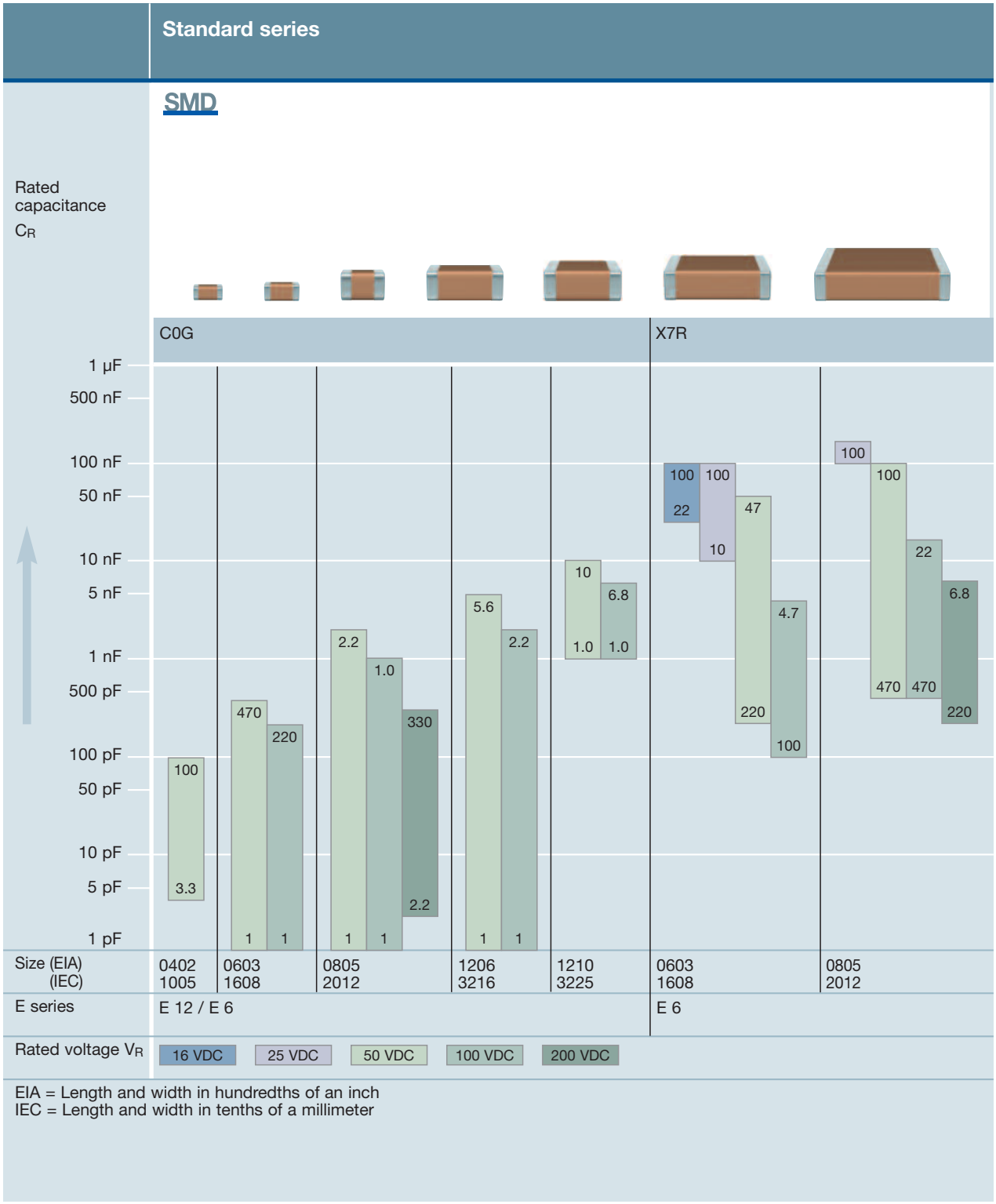
Power Capacitors

Capacitors for AC applications

	B3236*	B25832	B25834	B25835	B25838	B25855	B25856
Rated capacitance C_R µF	600 … 3	50 … 1	220 … 1	4.7 … 0.1	47 … 1	10 … 0.5	10 … 0.1
Rated voltage V_R	350 … 800 V	640, 930 V	500 … 2100 V	900 … 3400 V	600 … 1100 V	1100 … 3400 V	1400 … 3400 V
Applications	UPS and general AC applications	General AC applications	Damping, commutation	Damping	Damping, commutation	Low inductance, GTO snubbering	

Please read *Important notes* on page 78.

Multilayer Ceramic Capacitors



EIA = Length and width in hundredths of an inch
IEC = Length and width in tenths of a millimeter

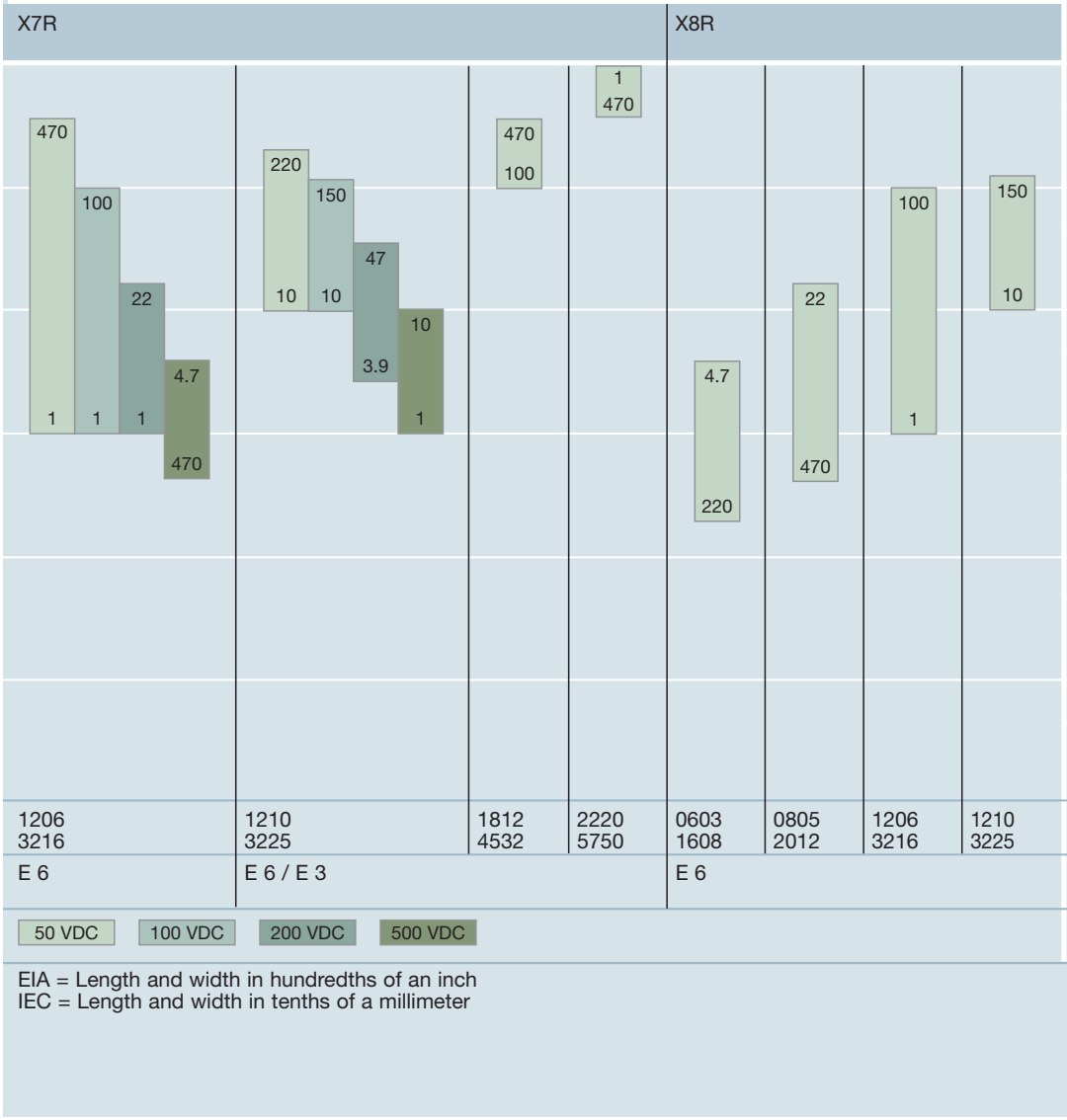
Multilayer ceramic capacitors (MLCC) offer maximum capacitance within the smallest space. They are needed in many areas of advanced microelectronics, for instance information, entertainment, automotive and industrial electronics.

Please read *Important notes* on page 78.

Multilayer Ceramic Capacitors

Standard series

SMD

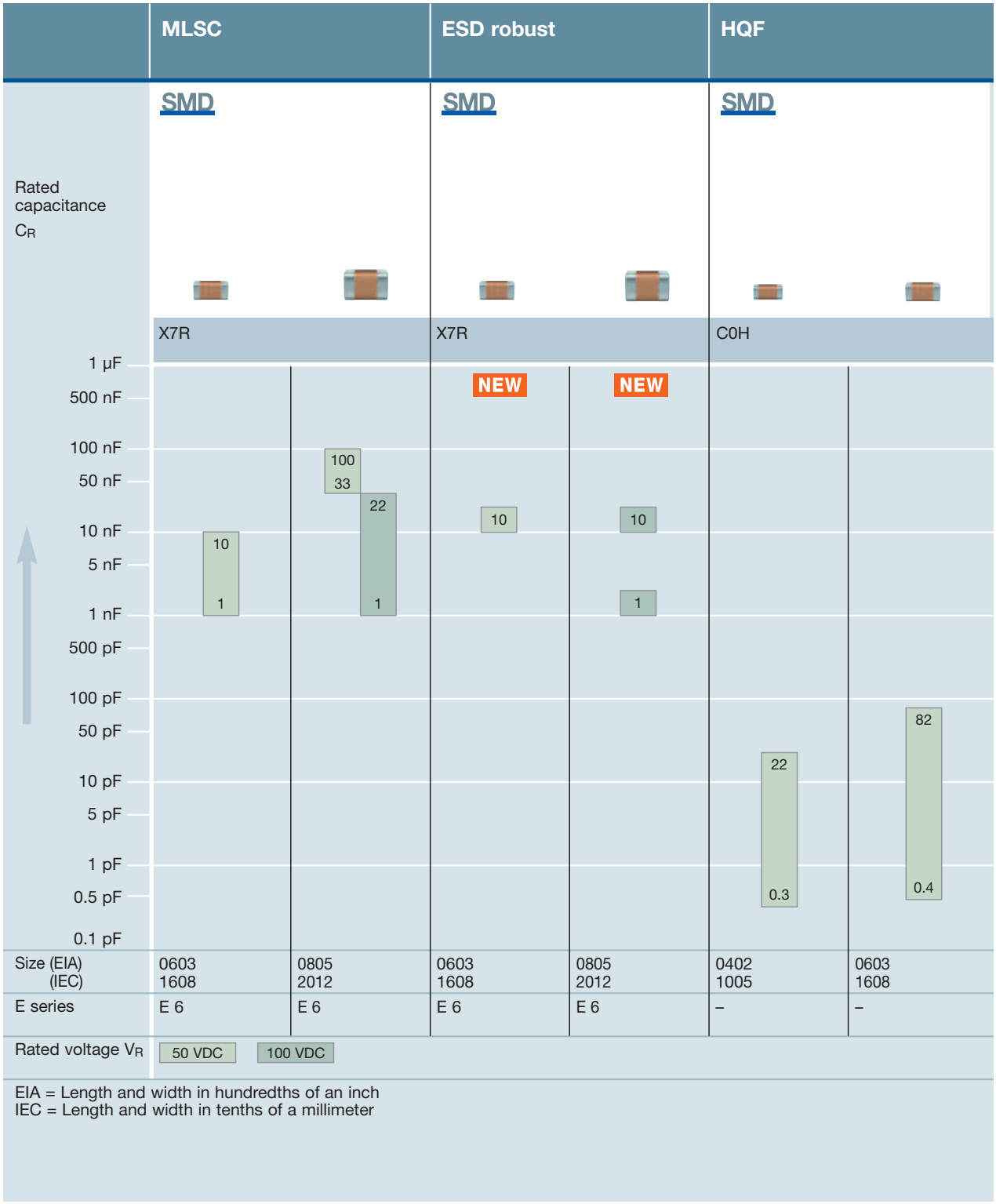


EIA = Length and width in hundredths of an inch
IEC = Length and width in tenths of a millimeter

The complete product range of surface-mount MLCC by EPCOS is qualified to AEC-Q200 and thus is meeting the strict reliability criteria of automotive electronics as well as demanding environmental and operating conditions in applications of industrial and information electronics.

Please read *Important notes* on page 78.

Multilayer Ceramic Capacitors



EIA = Length and width in hundredths of an inch
IEC = Length and width in tenths of a millimeter

The MLSC series provides highest functional reliability while saving space on the board thanks to the integration of two series capacitors in a single component.
The MLCCs of the ESD-robust series withstand voltages of 9 kV (1 nF) through > 25 kV (10 nF, size 0805), making them a cost-attractive solution in an ESD-fraught environment.

The HQF series was designed for wireless communications and high-frequency applications. Their advantages are excellent attenuation, low power dissipation and less energy absorption.

Please read *Important notes* on page 78.

Multilayer Ceramic Capacitors

	Arrays (2- and 4-fold)						Feedthrough single			twin	array
	SMD						SMD			SMD	SMD
Rated capacitance C_R											
	C0G	X7R	C0G	X7R	C0G	X7R	X7R			X7R	X7R
1 µF											
500 nF							NEW		220	NEW 220	NEW
100 nF											
50 nF		33				22					10
10 nF		1		10 1		1					
5 nF							2.2	2.2			
1 nF					1						
500 pF											
100 pF	100		220								
50 pF	10		10		10						
10 pF											
5 pF											
1 pF											
0.5 pF											
0.1 pF											
Size (EIA) (IEC)	0405 1012		0508 1220		0612 1632		0805 2012	1206 1632	1806 4616	1206 1632	0612 1632
E series	E 6	E 3	E 6	E 3	E 6	E 6	–	–	–	–	–
Design	2-fold		4-fold		4-fold		–			2-fold	4-fold
Rated voltage V_R	16 VDC		25 VDC		50 VDC						

EIA = Length and width in hundredths of an inch
IEC = Length and width in tenths of a millimeter

Arrays allow especially high placement and integration density on the PCB board. Thus they help cutting the cost and time for placement.

Feedthrough capacitors offer outstanding performance for signal filtering and EMI suppression up to the GHz frequency range.

Please read *Important notes* on page 78.

Multilayer Ceramic Capacitors

	Leaded			
Rated capacitance C_R				
	C0G		X7R	
10 µF				
5 µF				
1 µF				
500 nF				
100 nF			220 – 3.3	470 – 3.3
50 nF			150 – 470	150 – 470
10 nF	10 – 100	10 – 100		
5 nF				
1 nF	2.2 – 10	2.2 – 10		
500 pF				
100 pF				
50 pF				
10 pF				
Lead spacing (mm)	2.5	5	2.5	5
E series	E 6		E 6	
Rated voltage V_R	50 VDC	100 VDC		

Please read *Important notes* on page 78.

Ferrite Materials

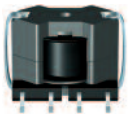
Field of application	Material	Initial permeability	Application examples
Inductors for resonant circuits and filters	K1	80 ± 25%	VHF filters, Balun, CATV, RF transformers
	M33	750 ± 25%	RF transformers
	K10	800 ± 25%	Line attenuation, current-compensated chokes
	K8	860 ± 25%	
	M13	2300 ± 25%	
	N48	2300 ± 25%	RF transformers, filters for telecommunications
Broadband transformers and EMC applications	N45	3800 ± 25%	Filters for telecommunications
	T57	4000 ± 25%	LAN, DSL
	N30	4300 ± 25%	Current-compensated chokes
	T65	5200 ± 30%	RF chokes
	T35	6000 ± 25%	
	T37	6500 ± 25%	Power line filters
	T36	7000 ± 25%	Current-compensated chokes, current transformers for energy meters
	T38	10000 ± 30%	DSL, impedance and matching transformers
	T66	13000 ± 30%	
	T46	15000 ± 30%	ISDN transformers
Power transformers and chokes	N49	1500 ± 25%	High-frequency power transformers and chokes
	N92	1500 ± 25%	Diode splitting transformers, high-voltage transformers, chokes
	N27	2000 ± 25%	Power transformers and chokes for medium- to high-frequency SMPS
	N87	2200 ± 25%	
	N97	2300 ± 25%	
	N72	2500 ± 25%	Ballasts for energy-saving lamps
	N41	2800 ± 20%	Pulse transformers, inverters for CCFL
	N51	3000 ± 25%	Power transformers for standby
	N95	3000 ± 25%	Power transformers
Inductive proximity switches	N22	2300 ± 25%	Sensors, ID systems

EPCOS develops and manufactures soft-magnetic oxide ceramic ferrite materials (basic materials MnZn and NiZn) under the designation SIFERRIT.

The outstanding properties of these materials permit diverse applications. The above table is an orientation aid for their selection and use.

Please read *Important notes* on page 78.

Ferrites and Accessories

	RM, RM LP												
	SMD												
													
Material	K1	M33	N48	N45	N30	T35	T38	T66	N49	N87	N97	N41	N92
RM cores	A_L values approx. (nH)												
RM 4 ❶❷❸❹	16 25	40 63	63 ... 160	1700	1900	2800	3700		750	1100	1100		
RM 5 ❶❷❸❹❺	25 40	63 100	160 ... 1800	2600	3500		6700	9600	1300	2000	2000	2600	
RM 6 ❶❷❸❹❺	40	63 100	160 ... 2200	3500	4300	6200	8600	12300	1700	2400	2400	250 3100	
RM 7 ❶❷❸❹			250 ... 315		5000		10000		1900	2700	2700	160 250	
RM 8 ❶❷❸❹			250 ... 2900		5700		12500		2200	250 ... 3300	3300	160 ... 4100	
RM 10 ❶❷❸❹			400 630		7600		16000		2900	4200	4200	250 ... 5500	
RM 12 ❶❷					8700				3700	5300	5300	160 ... 6000	
RM 14 ❶❷❸									3900	6000	6000	160 ... 6800	
Low profile													
RM 4 LP ❷❸❺							5000		950	1300			1000
RM 5 LP							7700		1700	2400			1900
RM 6 LP							10500		2200	3000			2300
RM 7 LP							11500		2400	3300			2600
RM 8 LP ❷❸									2900	4100			3100
RM 10 LP									3700	5200			4000
RM 12 LP									4500	6300			4800
RM 14 LP									5100	7100			5400

Accessories:
❶ = Pin coil formers
❷ = Clamps, mounting assemblies
❸ = Insulating washers
❹ = Adjusting devices
❺ = SMD coil formers

RM cores allow high effective packing density. The core dimensions are matched to standard PCB grids. When height is a problem, there are low-profile designs (RM LP). RM cores are available with or without an air gap.

Please read *Important notes* on page 78.

Ferrites and Accessories

	EP, EPX, EPO, PM							
	SMD							
								
Material	N45	N30	T57	T38	T65	T66	N27	N87
EP cores	A_L values approx. (nH)							
EP 5	550		560	16 ... 2000		2200		430
EP 6	530		900	16 ... 1900		1700		410
EP 7 ❶❷❸	63 ... 1500	2000	63 ... 1500	63 ... 5200	3000	5800		63 ... 1100
EPX 7/9 ❸	63 ... 2500		63 ... 2600	63 ... 9000		63 ... 10500		
EPX 9/9 ❸	63 ... 2400		63 ... 2400	63 ... 8000		63 ... 8100		
EP 10 ❶❷	63 ... 1600	2000	63 ... 1600	63 ... 4800	2900	6000		63 ... 1100
EPX 10			63 ... 2000	63 ... 6100				
EP 13 ❶❷	63 ... 2400	2800	63 ... 2500	63 ... 7000	4000	63 ... 8500		63 ... 1600
EPO 13 ❶			63 ... 2400	63 ... 6600				
EP 17 ❶❷		4300		10800	6200	13000		2400
EP 20 ❶❷		6700		18700	10200			200 ... 4000
PM cores								
PM 50/39 ❶❷							250 ... 7400	7400
PM 62/49 ❶❷							315 ... 9200	9200
PM 74/59 ❶❷							315 ... 10000	10000
PM 87/70 ❶							400 ... 12000	12000
PM 114/93 ❶							630 ... 16000	16000

Accessories:
❶ = Pin coil formers
❷ = Yokes, mounting assemblies
❸ = SMD coil formers

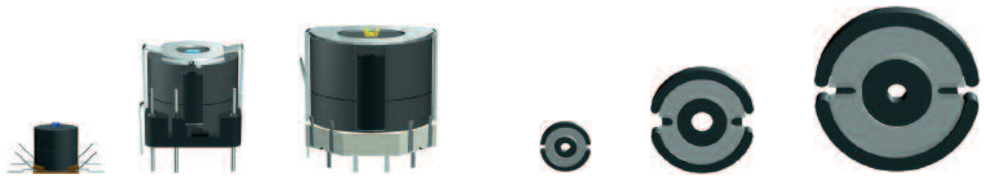
EP cores are ideal for compact transformer designs with high inductance.

EPX and EPO cores are optimized ferrite cores for xDSL applications. They increase loop reach at a given data rate for xDSL applications.

PM cores are particularly suitable for use in transformers handling high powers up to 300 kHz.

Please read *Important notes* on page 78.

Ferrites and Accessories

	P, PS, PCH								
									
Material	K1	M33	N48	N30	T38	N87	N41	N27	N22
P cores	A_L values approx. (nH)								
P 3.3 x 2.6	25			500					
P 4.6 x 4.1		200		800					
P 5.8 x 3.3		350	800						
P 7 x 4 ❶❷	25	63	100 1000	2000					
P 9 x 5 ❶❷❸❺	25 40	63	100 ... 1300	2500	5500				
P 11 x 7 ❶❷❹	25 40	40, 63 780	100 ... 1800	3500	7000	2000			
P 14 x 8 ❶❷❸❹	140	100 970	160 ... 2100	4600	9800	2800	3300		
P 18 x 11 ❶❷❸❹	40	100	160 ... 2800	5900	12600	3600			
P 22 x 13 ❶❸❹	220		160 ... 3800	8300	16000	4400			
P 26 x 16 ❶❷❸❹	100	100 160	160 ... 4900	9700	22000	5500			
P 30 x 19 ❶❷❸❹			250 ... 6200	11500	28000	6400			
P 36 x 22 ❶❷❸❹			250 ... 7600	15200					
P 41 x 25 ❷			250 ... 8400						
Pot core halves[1)]									
PS 7.35 x 3.6 ❶									
PS 9 x 3.5 ❶									
PCH 14.4 x 7.5 ❶									
PS 25 x 8.9 ❶									
PS 30.5 x 10.2 ❶									
PS 35 x 10.8									
PS 47 x 14.9									
PS 68 x 14.5									
PCH 70 x 14.5 ❶									
PCH 150 x 30									

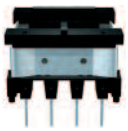
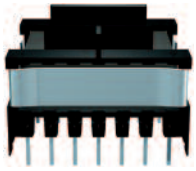
Accessories:
❶ = Coil formers
❷ = Yokes, mounting assemblies
❸ = Insulating washers
❹ = Adjusting devices
❺ = SMD coil formers

[1)] PS cores to IEC 62323

P core sets (gapped and ungapped): Since the wound coil is completely enclosed by the ferrite core, P cores feature very low magnetic leakage.

Pot core halves are used in inductive proximity switches. Their dimensions are matched to standardized switches.

Please read *Important notes* on page 78.

	E							
	SMD							
								
Material	N30	T38	T46	N45	N27	N72	N87	N41
E cores	A_L values approx. (nH)[1]							
E 5		1400					270	
E 6.3 ❷❸	700	1700					380	
E 8.8 ❷❸	1000	2100					550	
E 10/5.5/5					750		800	
E 13/7/4 ❶❷❸	1000		3600	950	800		850	
E 14/8/4	1250				860			1050
E 16/6/5					1100		1200	
E 16/8/5 ❶❷	1400		5100	1400	950		1000	
E 19/8/5	1700		5800		1050		1150	
E 20/10/6 ❶❷	2150				1300		1470	
E 21/9/5	1500				900			
E 25/13/7 ❶❷	2900				1750		1850	
E 25.4/10/7	2700		8500		1500		1670	
E 30/15/7 ❶❷	3100				1700		1900	
E 32/16/9 ❶❷	3800				2100		2300	
E 32/16/11							2900	
E 34/14/9					2300		2450	
E 36/18/11 ❶					2900		3100	
E 40/16/12					3800	4600	4150	
E 42/21/15					3500		3950	
E 42/21/20 ❶					4750		5200	
E 47/20/16					5100		5600	
E 55/28/21					5800		6400	
E 55/28/25					6800		7300	
E 56/24/19					6300		6900	
E 65/32/27					7200		7900	
E 70/33/32					8850		9700	
E 80/38/20					4150		4500	

Accessories:
❶ = Pin coil formers
❷ = Yokes, mounting assemblies
❸ = SMD coil formers

[1] A_L values for ungapped core sets

E cores are suitable for power converters as well as for small-signal applications and EMI suppression purposes.

Please read *Important notes* on page 78.

Ferrites and Accessories

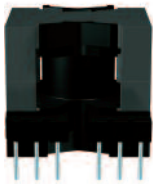
	EELP, EILP, ER planar, EQ/I				
					
Material	T38	N49	N92	N87	N97
EELP cores	A_L values approx. (nH)[1)]				
ELP 14/ELP 14		800	850	1100	1150
ELP 18/ELP 18 ②		1900	2050	2600	2670
ELP 22/ELP 22		3100	3400	4500	4600
ELP 32/ELP 32 ②		3900	4300	5700	5700
ELP 38/ELP 38		4850	5400	7200	7400
ELP 43/ELP 43		5000	5500	7300	7500
ELP 58/ELP 58				7400	
ELP 64/ELP 64		8000		12500	
EILP cores					
ELP 14/I 14		850	900	1250	1300
ELP 18/I 18 ②		2100	2300	2900	3000
ELP 22/I 22 ②		3700	4000	5200	5250
ELP 32/I 32 ②		4400	4800	6300	6300
ELP 38/I 38		5700	6200	8300	8400
ELP 43/I 43		5900	6400	8500	8700
ELP 58/I 58				8400	
ELP 64/I 64		8900		14000	
ER planar/I cores					
ER 9.5/5 ②③	4500			800	
ER 11/5 ②③	6400	800		1200	
ER 14.5/6		1100	1100	1500	1500
ER 18/3/ER 18/3		1800	1800	2300	2300
ER 23/5/ER 23/5		2200	2200	3000	3000
ER 23/5/I 23/2		2600	2600	3400	3400
ER 25/6/I 25/3		3400	3400	4600	4600
ER 25/6/ER 25/6		3000	3000	4100	4100
ER 32/5/ER 32/5		3800	3800	4900	5000
EQ/I cores					
EQ 13/3/I 13/1		1600	1550	1700	1800
EQ 13/3/EQ 13/3		1360	1320	1640	1700
EQ 20/6/I 20/2		3000	2950	3680	3770
EQ 20/6/EQ 20/6		2400	2450	3100	3200
EQ 25/6/I 25/2		4200	4150	5100	5300
EQ 25/6/EQ 25/6		3600	3650	4700	4800
EQ 30/8/I 30/3		4350	4450	5600	5750
EQ 30/8/EQ 30/8		3330	3270	4300	4500

Accessories: ② = Clamps mounting assemblies ③ = SMD coil formers

[1)] A_L values for ungapped core sets

Low-profile E cores (ELP) feature high power density and low insertion height. Suitable for DC/DC and AC/DC converters with frequencies up to 1 MHz.

Planar cores has become common in the power supply market for low-profile design. Planar cores can be directly integrated into the PCB.

	ER, PQ						
							
Material	N49	N92	N27	N87	N97	N72	N95
ER cores	A_L values approx. (nH)[1]						
ER 28/17/11						2700	
ER 35/20/11			2500	2700			
ER 42/22/15 ❶			3200	3700			
ER 46/17/18			5700				
ER 49/27/17			3500				
ER 54/18/18			5600	5800			
PQ cores	NEW						
PQ 16/11.6	1900	1900		2350	2450		2750
PQ 20/16 ❶	2400	2400		3100	3200		3750
PQ 20/20 ❶	2000			2650	2750		3300
PQ 26/20 ❶	3850			5000	5150		6300
PQ 26/25 ❶	3300			4500	4650		5700
PQ 32/20 ❶	4600			6300	6500		7600
PQ 32/30 ❶	3450			4800	5000		6100
PQ 35/35 ❶	3300	3300		4500	4700		5700
Accessories: ❶ = Pin coil formers							

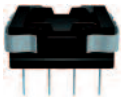
[1] A_L values for ungapped core sets

ER cores with round center leg offer ideal features for the design of SMPS transformers and chokes.

PQ cores are a preferred shape for power conversion. Compared to the conventional round/rectangular E type cores they have optimized round leg and wider outer surface. Thus reduces winding length and hence copper cost in the manufacturing and lowers the thermal resistance by offering a larger area for heat dissipation.

Please read *Important notes* on page 78.

Ferrites and Accessories

	ETD, EFD, EV, U/I			
	    			
Material	N49	N27	N87	N97
ETD cores	A_L values approx. (nH)[1]			
ETD 29/16/10 ❶❷		2000	2200	2250
ETD 34/17/11 ❶❷		2400	2600	2650
ETD 39/20/13 ❶❷		2550	2700	2800
ETD 44/22/15 ❶❷		3300	3500	3600
ETD 49/25/16 ❶❷		3700	3800	3900
ETD 54/28/19 ❶❷		4200	4450	4600
ETD 59/31/22 ❶❷		5000	5300	5500
EFD cores				
EFD 10/5/3	370		450	470
EFD 15/8/5 ❶❷❸	600		780	820
EFD 20/10/7 ❶❷	910		1200	1250
EFD 25/13/9 ❶❷			2000	2100
EFD 30/15/9 ❶❷			2050	2150
EV cores				
EV 15/9/7		1150	1250	1300
EV 25/13/13		2400	2500	2600
EV 30/16/13		2600	2800	2900
U/UI cores				
U 93/76/16		2900	3100	
U 93/76/20		3600	3900	
U 93/76/30		5400	5700	
U 101/76/30		4600	5700	
U 126/91/20			3000	
U 141/78/30		7500	8900	
UI 93/104/16		3800	4100	
UI 93/104/20		4900	5300	
UI 93/104/30		7400	7900	
UI 126/119/20			3900	

Accessories:
❶ = Pin coil formers
❷ = Yokes, mounting assemblies
❸ = SMD coil formers

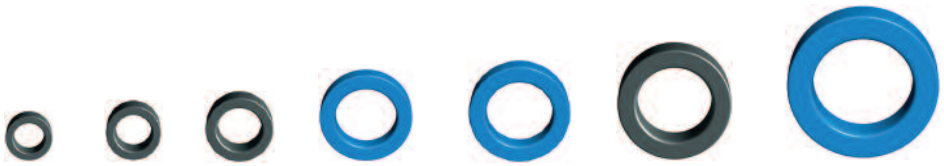
[1] A_L values for ungapped core sets

ETD, EFD and EV cores with flattened and recessed center leg permit a particularly flat transformer design. They are used for DC/DC converters, EV cores are also for storage chokes and EMI suppression chokes.

U cores are used for power, pulse and high-voltage transformers.

Please read *Important notes* on page 78.

Toroids



Material			K10	N30	T57	T65	T35	T37	T38	T46	N87
Toroids	Outer dia. x inner dia. x height		A_L values approx. (nH)								
	mm	inch									
R 2.5	2.50 x 1.50 x 1.00	0.098 x 0.059 x 0.039	70		410	470			1020	1530	
R 2.54	2.54 x 1.27 x 1.27	0.100 x 0.050 x 0.050	120		690	800			1760	2640	
R 3.05	3.05 x 1.27 x 1.27	0.120 x 0.050 x 0.050	160		830	1000			2200	3340	
	3.05 x 1.27 x 2.54	0.120 x 0.050 x 0.100	330		1700	2000			4200	6500	
	3.05 x 1.78 x 2.03	0.120 x 0.070 x 0.080	160		870	1000			2150	3250	
R 3.43	3.43 x 1.78 x 1.78	0.135 x 0.070 x 0.070	160		930	1050			2300	3400	
	3.43 x 1.78 x 2.03	0.135 x 0.070 x 0.080	190		1060	1200			2650	4000	
	3.43 x 1.78 x 2.11	0.135 x 0.070 x 0.083	200		1100	1300			2770	4000	
R 3.94	3.94 x 1.78 x 1.78	0.155 x 0.070 x 0.070	200		1100	1350			2830	4200	
	3.94 x 2.24 x 1.30	0.155 x 0.088 x 0.051	100		550	700			1470	2200	
R 4	4.00 x 2.40 x 1.60	0.157 x 0.094 x 0.063		700		750			1630	2450	
R 5.84	5.84 x 3.05 x 3.00	0.230 x 0.120 x 0.118		1680		1800			3900	5850	
R 6.3	6.30 x 3.80 x 2.50	0.248 x 0.150 x 0.098		1090		1160			2530	3600	560
R 8	8.00 x 4.00 x 4.00	0.315 x 0.158 x 0.158		2400		2550			5500	8000	1200
R 9.53	9.53 x 4.75 x 3.17	0.375 x 0.187 x 0.125		1900		2050	2650		4410	6400	970
R 10	10.0 x 6.00 x 4.00	0.394 x 0.236 x 0.157		1760		1900	2460	2660	4090	6000	900
R 12.5	12.5 x 7.50 x 5.00	0.492 x 0.295 x 0.197		2200		2400	3060	3320	5110		1120
R 12.7	12.7 x 7.90 x 6.35	0.500 x 0.311 x 0.250		2600		2850	3620	3920	6030		1330
R 13.3	13.3 x 8.30 x 5.00	0.524 x 0.327 x 0.197		2030		2300	2830	3060	4700		1040
R 14	14.0 x 9.00 x 5.00	0.551 x 0.354 x 0.197		1900		2300	2650	2880	4420		970
R 15	15.0 x 10.4 x 5.30	0.591 x 0.409 x 0.209		1670		2020	2330	2520	3880		850
R 15.8	15.8 x 8.90 x 4.70	0.622 x 0.350 x 0.185		2320		2800	3240	3500	5400		1190
R 16	16.0 x 9.60 x 6.30	0.630 x 0.378 x 0.248		2770		3350	3870	4190	6440		1420
R 17	17.0 x 10.7 x 6.80	0.669 x 0.421 x 0.268		2710		3250	3770	4080	6280		1390
R 18.4	18.4 x 5.90 x 5.90	0.724 x 0.232 x 0.232		5770		6680	8020	8690	13400		2950
R 20	20.0 x 10.0 x 7.00	0.787 x 0.394 x 0.276		4160		5050	5000	6280	9740		2130
R 22.1	22.1 x 13.7 x 6.35	0.870 x 0.539 x 0.250		2610		3160	3200	3950	6070		1340
	22.1 x 13.7 x 7.90	0.870 x 0.539 x 0.311		3250		3930	4000	4900	7570		1660
	22.1 x 13.7 x 12.5	0.870 x 0.539 x 0.492		5140		6200	6000	7770	12000		2630
R 22.6	22.6 x 14.7 x 9.20	0.890 x 0.579 x 0.362		3420		4100	4200	5170	7900		1740
R 25.3	25.3 x 14.8 x 10.0	0.996 x 0.583 x 0.394		4620		5350	5400	6970	10700		2360
	25.3 x 14.8 x 15.0	0.996 x 0.583 x 0.590		6930		8000		10460	16100		3500
	25.3 x 14.8 x 20.0	0.996 x 0.583 x 0.787		9160		10600	10700	13800	21300		4680

Toroids are used principally as EMC chokes to suppress RF interference in the MHz region and in signal transformers.

LAN chokes are typical applications for the K10 material.

Please read *Important notes* on page 78.

Ferrites and Accessories

Toroids, Double-aperture cores

Material			K1	M13	N30	T65	T37	T38	N87
Toroids	Outer dia. x inner dia. x height		A_L values approx. (nH)						
	mm	inch							
R 29.5	29.5 x 19.0 x 14.9	1.142 x 0.748 x 0.587			5630	6800	8500	13100	2880
R 30.5	30.5 x 20.0 x 12.5	1.201 x 0.787 x 0.492			4540	5400	6400	10600	2320
R 34	34.0 x 20.5 x 10.0	1.339 x 0.807 x 0.394			4360	5100	6100	10100	2230
	34.0 x 20.5 x 12.5	1.339 x 0.807 x 0.492			5460	6400	7600	12700	2790
R 36	36.0 x 23.0 x 15.0	1.417 x 0.906 x 0.591			5750	6700	8000	13500	2940
R 38.1	38.1 x 19.05 x 12.7	1.500 x 0.750 x 0.500			7570	8800	10500	17600	3870
R 40	40.0 x 24.0 x 16.0	1.575 x 0.945 x 0.630			7000	8200	9800		3590
R 41.8	41.8 x 26.2 x 12.5	1.646 x 1.031 x 0.492			5000	5800	7000		2560
R 50	50.0 x 30.0 x 20.0	1.969 x 1.181 x 0.787			8700	10000	12000		4460
R 58.3	58.3 x 32.0 x 18.0	2.295 x 1.260 x 0.709			9300		13000		4800
	58.3 x 40.8 x 17.6	2.283 x 1.606 x 0.693			5400	6250	7160		2760
	58.3 x 40.8 x 20.2	2.295 x 1.606 x 0.795			6200	7200	8000		3200
R 63	63.0 x 38.0 x 25.0	2.480 x 1.496 x 0.984			10800	12600	13900		5000
R 68	68.0 x 48.0 x 13.0	2.677 x 1.890 x 0.512			3890	4500	5000		1990
R 87	87.0 x 54.3 x 13.5	3.425 x 2.138 x 0.531			5400	6280	7000		2790
R 102	102 x 65.8 x 15.0	4.016 x 2.591 x 0.591			5500	6500			2880
R 140	140 x 103 x 25.0	5.512 x 4.055 x 0.984			6200				
R 202	202 x 153 x 25.0	7.953 x 6.024 x 0.984			5200				
Double-aperture cores									
	Core height (mm)								
	2.0		42	1100	2400				
	2.5		60	1440	3100				
	6.2		140		7300				
	8.3		190		10000				
	14.5		330						

Double-aperture cores are particularly suitable for low-leakage storage chokes, pulse and broadband transformers.

Please read *Important notes* on page 78.

SMT Inductors

	SIMID series							
	SMD							NEW
Rated inductance/ Rated current								
	SIMID 0402 B82499	SIMID 0603 B82496	SIMID 0805 B82498	SIMID 1008 B82494	SIMID 1210 B82412	SIMID 1210 B82422	SIMID 1812 B82432	SIMID 2220 B82442
L_R µH / I_R A	0.1 / 0.09 … 0.001 / 0.4	0.22 / 0.11 … 0.001 / 1.8	6.8 / 0.08 … 0.0027 / 1	100 / 0.06 … 0.01 / 0.28	10 / 0.09 … 0.01 / 0.7	680 / 0.06 … 0.0082 / 2.05	1000 / 0.055 … 1 / 1.3	10000 / 0.025 … 1 / 3.51
Size (EIA) (IEC)	0402 1005	0603 1608	0805 2012	1008 2520	1210 3225	1210 3225	1812 4532	2220 5650
Applications	Protection against electromagnetic interferences (EMC) RF filtering, resonant circuits Coupling, decoupling Energy storage for DC/DC converters Impedance matching							

SMT inductors (SIMID) from EPCOS have excellent RF properties and very high reliability. They are characterized by high temperature stability and can be used at ambient temperatures of up to 150 °C.

Please read *Important notes* on page 78.

SMT Power Inductors

	Low profile				
	SMD				
Rated inductance/ Rated current					
	B82466	B82467	B82468	B82469	B82470
	NEW	NEW	NEW	NEW	NEW
L_R µH / I_R A	22 / 0.25 0.56 / 1.3	22 / 0.38 0.5 / 2.25	22 / 0.48 1 / 1.95	22 / 0.53 0.5 / 2.8	47 / 0.32 1 / 1.8
Size (mm) (length x width)	2 x 2	2.8 x 2.6	3 x 3	3.8 x 3.6	4.8 x 4.8
Height (mm)	1.0	1.0	1.4	1.2	1.04/1.2
Version[1)]	G	G	A	G	A
Applications	Filtering of supply voltages Coupling, decoupling DC/DC converters				

[1)] A = unshielded, G = shielded

SMT power inductors extend the power range of the SIMID series towards even higher currents. The major characteristics of power inductors are high rated current and low DC resistance. These compact and powerful components are available in shielded and unshielded versions.

Please read *Important notes* on page 78.

SMT Power Inductors

	Standard and extended series								
SMD									
Rated inductance/ Rated current	B82462	B82464	B82471 ... B82475	B82472	B82476	B82477	B82479	B82559 A013	B82559 A025
L_R µH / I_R A	1000 0.11 0.82 3.45	1000 0.33 0.82 7.6	680 0.28 10 2.6	1000 0.18 1 3.6	1000 0.3 1 6.8	1000 0.4 0.82 11	1000 0.53 1 8.6	3.9 12 I_{sat} 0.5 30	NEW 10 24 I_{sat} 0.44 71
Size (l x w) (mm)	6 x 6 6.3 x 6.3	10.4 x 10.4	6.1 x 5.5/5.6 8.3 x 7.5 10.4 x 9.4	7.3 x 7.3	12.95 x 9.4	12.3 x 12.3 12.5 x 12.5 12.8 x 12.8	18.5 x 15.24 18.54 x 15.24	13.2 x 11	25.3 x 23.5
Height (mm)	2.5/3	3/4.8	4.9/5.5/5.8	3.5/4.5	5.08	4.8/6/6.5/ 8/8.5	7.11/7.25	4.95/5.95	8.95 … 12.85
Version[1]	A/G	A/G/Z/P	A	G/P	B	G/P/D	A/G	G	G
Applications	Energy storage for DC/DC converters Protection against electromagnetic interferences (EMC) Filtering of supply voltages Coupling, decoupling							Energy storage for DC/DC converters VRM modules, POL converters	

[1] A = unshielded, G = shielded, D = double power inductors, P = shielded, with bottom plate
B = rugged wire connection, Z = cost-efficient

Please read *Important notes* on page 78.

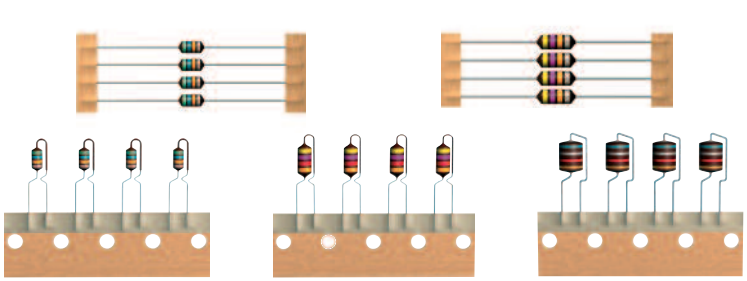
Transponder Coils

	For automotive applications		
Rated inductance L_R mH	SMD		
			
	B82450A*E XY coil, molded	B82450A*A XY coil, molded	B82451N Z coil
	NEW 	NEW 	NEW 
Sensitivity (mV / µT)	10 … 28	16 … 51	16
f_{res} (MHz)	1.1 … 3.0	1.1 … 3.5	> 0.0012
Dimensions (mm) (l x w x h)	7.8 x 2.7 x 2.7	11.4 x 3.5 x 2.4	7.7 x 7.5 x 2.65
Applications	Automotive: Immobilizer, passive keyless entry/go, TPMS Logistics Security Systems Agriculture Medical engineering		

SMT transponder coils are components forming part of a radio-frequency identification (RFID) system. These systems allow contactless identification without direct line of sight. RFID systems are used in very different applications calling for wireless and contactless data transmission within a range of a few meters.

Please read *Important notes* on page 78.

Chokes

	RF chokes, leaded						VHF chokes
Rated inductance/ Rated current							
	MCC B781*8-T	SBC B82141	BC B781*8-S	HBC B82143	LBC B82144	HLBC B82145	B82111/B8213* B82500
L_R mH / I_R A	0.1 / 0.085 … 0.0001 / 1.12	1 / 0.055 … 0.001 / 0.725	4.7 / 0.055 … 0.001 / 1.2	0.027 / 0.85 … 0.001 / 2 High current	100 / 0.02 … 0.001 / 2.5	10 / 0.11 … 0.1 / 0.86 High current	3.9 / 0.1 … 0.001 / 10
Version	axial radial	axial radial	axial radial	axial radial	axial radial	axial	axial
Applications	For LF and HF decoupling of signal and control circuits Application: All fields of electronics						Interference suppression in the VHF range, blocking/filtering of RF decoupling

The proven RF and VHF chokes from EPCOS have outstanding RF and temperature properties as well as excellent saturation behavior.

VHF chokes offer broadband noise suppression and are predestined for power voltage applications thanks to their insulated encapsulation.

Please read *Important notes* on page 78.

Chokes

Data and signal line chokes

	SMD							SMD		
Rated inductance/ Rated current										
	B82788[1] SIMDAD	B82789[1] SIMDAD	B82799[1] C0/S0	B82793 C0/S0	B82790 C0/S0	B82792 C0	B82794 C0	B82793 C2	B82792 C2	B82794 C2
	NEW									
L_R mH / I_R A	0.1 / 0.15 / 0.011 / 0.3	0.1 / 0.15 / 0.011 / 0.3	0.47 / 0.2 / 0.011 / 0.3	47 / 0.1 / 20 / 0.1 — Telecom applications — 4.7 / 0.4 / 0.005 / 2	4.7 / 0.2 / 0.005 / 1	50 / 0.1 / 4.7 / 0.6	68 / 0.2 / 4.7 / 0.7	2.2 / 0.1 / 0.011 / 0.2	4.7 / 0.3 / 0.47 / 0.6	10 / 0.2 / 4.7 / 0.3
	For CAN and FlexRay bus applications									
Size (EIA) (IEC)	1210 3225	1812 4532	1812 4532							
Version	Double chokes for surface mounting							Quad chokes for surface mounting		
Applications	Chokes and filters for reducing the asymmetrical interference level on data lines and other interfaces. Thus, in certain applications shielding of the lines becomes unnecessary. Main applications: telecommunications, automotive electronics (bus systems) as well as buildings and automation technology.									

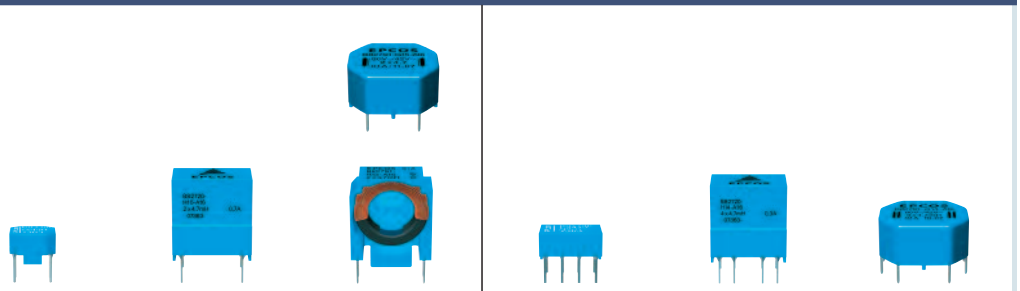
EIA = Length and width in hundredths of an inch
IEC = Length and width in tenths of a millimeter

[1] For operating temperatures up to 150 °C

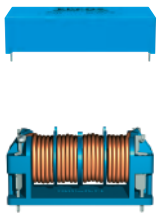
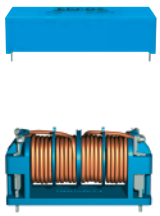
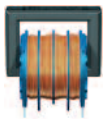
Data line chokes ensure electromagnetic compatibility (EMC) in the sector of data and signal transmission. They already suppress asymmetrical interference coupled onto the lines from 1 kHz while letting data line signals up to several MHz bandwidth pass through unaffected.

Please read *Important notes* on page 78.

Chokes

	Data and signal line chokes					
Rated inductance/ Rated current						
	B82796 C0/S0	B82720 H15	B82791 G15/H15	B82796 C2	B82720 H14	B82791 G14
L_R mH / I_R A	4.7 / 0.4 0.005 / 1.2	68 / 0.2 4.7 / 0.7	47 / 0.1 2.2 / 0.1	2.2 / 0.1 0.011 / 0.2	10 / 0.2 4.7 / 0.3	6 / 0.1 0.2 / 0.1
Version	Double chokes, radial-lead			Quad chokes, radial-lead		
Applications	Chokes and filters for reducing the asymmetrical interference level on data lines and other interfaces. Thus, in certain applications shielding of the lines becomes unnecessary. Main applications: telecommunications, buildings and automation technology.					

Chokes

	Power line chokes				
Rated inductance/ Rated current					
	B82502 B82503	B82522 B82523	B82504 ... B82506	B82615, B82623, B82625	B82614
L_R mH / I_R A	82 / 0.2 0.025 / 15	68 / 0.1 0.033 / 10	27 / 1 0.015 / 95	20 / 0.3 0.033 / 6	3 / 0.8 0.5 / 2.7
Type	I core chokes			Powder core chokes	Sine-wave chokes
Applications	Suppression of symmetrical and asymmetrical interference voltages at high currents, high-performance power supplies, industrial applications (B82522 and B82523 are double chokes)			Suppression of differential-mode interferences, switch-mode applications, PFC, reduction of harmonics	Reduction of harmonics and PFC, SMPS, output filter in switch-mode applications

EPCOS offers a wide range of power line chokes to ensure electromagnetic compatibility (EMC).
I core, powder core and sine-wave chokes are used to attenuate symmetrical interference, and current-compensated chokes to reduce asymmetrical interference (toroids, E core and D core chokes).

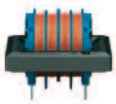
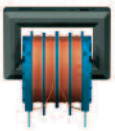
Please read *Important notes* on page 78.

Chokes

	Power line chokes (current-compensated)								
Rated inductance/ Rated current	SMD						NEW		
	      								
	B82720S	B82720	B82791	B82721 … B82725	B82725S B82726S	B82745	B82747	B82748	B82765
L_R mH I_R A	22 0.3 1.1 2	22 0.3 1.1 2	47 0.25 4.7 0.9	100 0.3 0.2 16	NEW 7.8 6 0.19 54	1.3 12 0.12 200	6 6 0.95 42	NEW 1.5 18 1.1 62	1.8 16 0.9 75
Type	Ring core double chokes					Ring core triple chokes			Ring core quad chokes
Applications	Current-compensated chokes are used to reduce asymmetrical interference voltages. Major applications: All kinds of switch-mode power supplies								

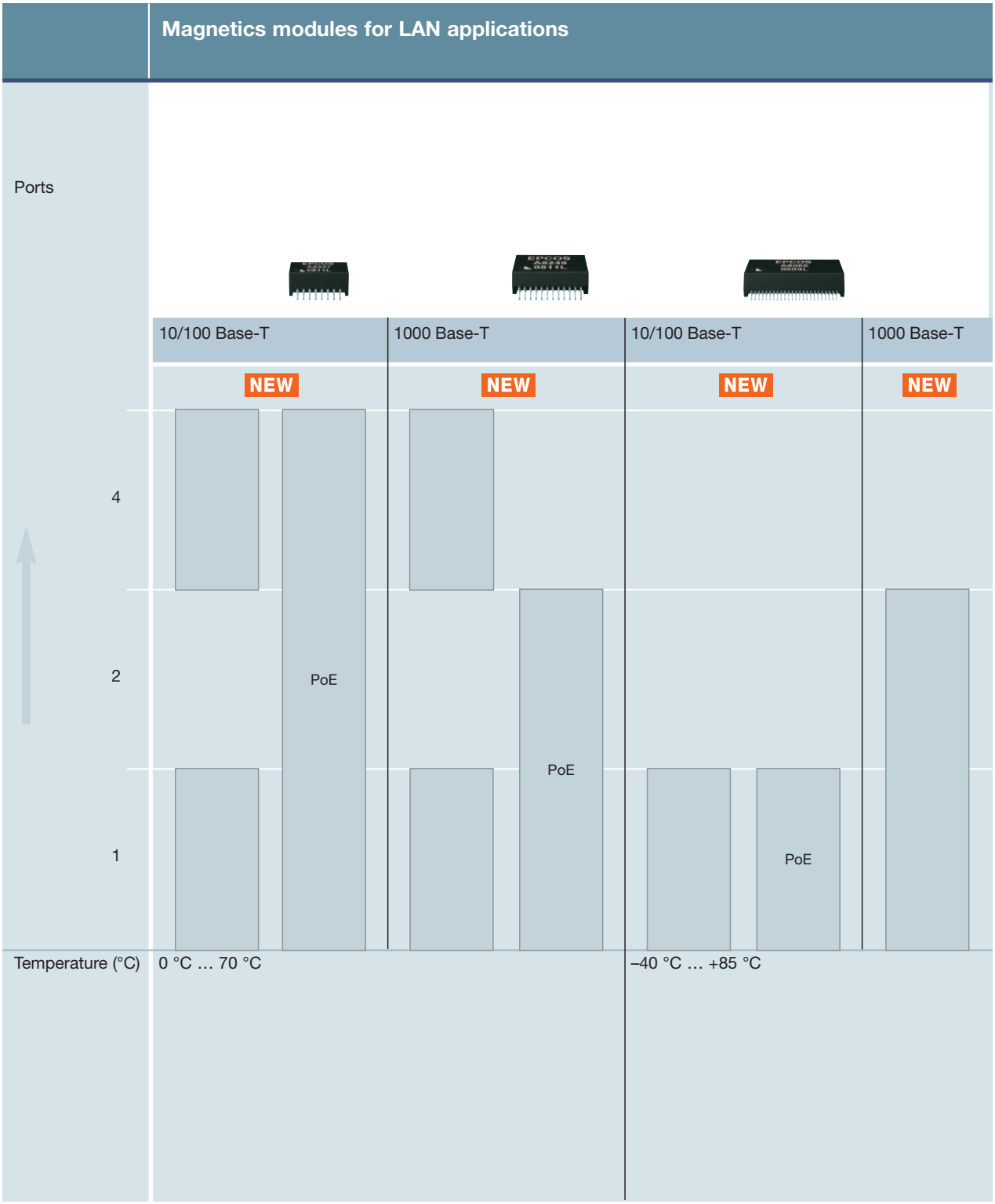
Please read *Important notes* on page 78.

Chokes

	Power line chokes (current-compensated)						
Rated inductance/ Rated current							
	B82730U	B82731T	B82731M B82731H	B82732R B82732W	B82734R B82734W	B82732F	B82733F
L_R mH / I_R A	NEW 15 / 0.4 0.33 / 2.6	100 / 0.3 3.3 / 1.8	100 / 0.35 l = 20.5 mm 3.3 / 1.8	100 / 0.4 l = 24 mm 3.3 / 2.2	68 / 0.7 l = 32.5 mm 3.3 / 4.6	100 / 0.45 10 / 1.6	100 / 0.7 10 / 2.3
Type	U core double chokes	E core double chokes	D core double chokes			Frame core double chokes	
Applications	EMI suppression chokes for applications requiring high pulse strength, e.g. SMPS in consumer electronics, electronic lamp ballasts and industrial equipment.						

Please read *Important notes* on page 78.

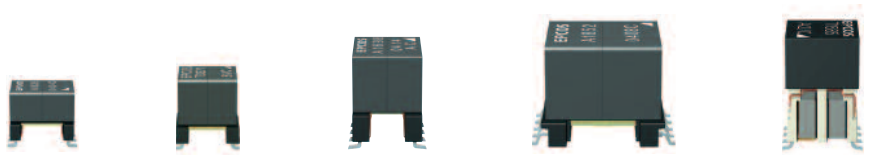
Transformers for Information Technology



EPCOS introduces a new range of magnetics modules for Local Area Networks (LAN). They are optimized for use in hubs, switches, and routers but also for use in PCs and modems.
Ethernet Protocol is the common basis for data communication in LANs. Depending on the technology, different transmission speeds can be distinguished: 10 Base-T with 10 Mbit/s, 100 Base-T with 100 Mbit/s and 1000 Base-T with 1 Gbit/s transmission speed.
Power over Ethernet (PoE) is necessary to implement applications like Voice over IP (VoIP) where the phone is powered via the Ethernet connection.

Please read *Important notes* on page 78.

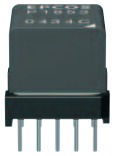
Transformers for Information Technology

	xDSL				
	SMD 				
IC manufacturer	IC name	IC number	Core	Version	L (mH)
	Interface transformers ADSL / ADSL+				
Broadcom	Bladerunner	BCM6410/6420 BCM6411/6421, 6511	EP 5 XL, EP 7	SMD	0.10, 0.42, 0.43
Conexant	Viking/Atlas	G7000 DTM	EP 13	SMD	0.44
	Octane G24		EP 7, EPX 5, EPX 7/9	SMD	1.0, 1.075
Infineon	Amazon	PSB 50501/505/510	EP 13	SMD	0.2, 1.4
	Danube		EP 13	SMD	0.2, 1.4
	GEMINAX	PEF 55008, 55208, 55016, 55218, 55602	EP 13, EP 7, EPX 5 TP-Module	SMD	0.082, 0.34, 0.44, 1.4 1.44, 2.8, 6.8, 20
Texas Instruments	AC6	AC6	EP 7	SMD	0.40
	Interface transformers SHDSL				
Infineon	SDFE-x and Socrates family	PEF 21624, 22624, 24624, 21627, 22627, 24627, 21628, 22628, 24628, 24625	EPX 9, EP 13	SMD, PTH	3.0
	Socrates	PEF 22622, 22623, 24622	EP 13	SMD	3.0
	Interface transformers VDSL				
Broadcom	Bladerunner	BCM6505, 6506, 6510, 6526, 6511, 6512, 6516, 6526	EP 7, EPX 5	SMD	0.10, 0.42, 0.43
Conexant	Accelity		EP 7	SMD	0.8
Ikanos	CO2	CO2	EP 7	SMD	0.22
Infineon	VINAX	PEF 88102, 88208, 88204	EP 5 XL, EP 7, EPX 5 TC-Module, EP 13	SMD	0.082, 0.27, 0.47
		PEB 83000 PSB 80170	EP 7	SMD	0.27, 0.47

Leading manufacturers of telecom ICs have released the EPCOS transformers listed here for the respective xDSL applications.

Please read *Important notes* on page 78.

Transformers for Information Technology

	ISDN			
	SMD			
	    			
IC manufacturer	IC number	Core	Version	L (mH)
	U_{K0}/2B1Q			
AMD	AM2091	RM 6, RM 8	PTH	13.3, 14.5
Infineon	Q-Smint PEF 80912, 80913, 81912, 81913, 82912, 82913	RM 6 EP 13	PTH SMD, PTH	14.44 14.47
	PSB 24902, 24911, 8091, 8191	RM 6, RM 8	PTH	13.3, 14.5
	U_{K0}/4B3T			
AMD	AM20902	RM 6	PTH	5.5, 7.7
Infineon	T-Smint PEF 80902, 80903, 81902, 81903, 82902, 82903	RM 6 EP 13	PTH SMD, PTH	7.61 7.57
	PSB 20902, 24901, 24902, 8090	RM 6	PTH	5.5, 7.7
Mietec	MTC2071	RM 6	PTH	5.5
	MTC2072	RM 6	PTH	7.7
	S_0			
AMD	AM79C30A, 79C32A	R 10, R 10 amorph	PTH	22, 30
Infineon	PEB/PSB 2080, 2081, 2084, 2085, 2086, 2115, 2186, 8090, 8091, 8191	R 10, R 10 amorph	PTH	22, 30
	PEB/PSB 21381 ... 21384	R 10	SMD	22
Mietec	MTC2072, 20276	R 10, R 10 amorph	PTH	22, 30

Leading manufacturers of telecom ICs have released the EPCOS transformers listed here for the respective ISDN applications.

Please read *Important notes* on page 78.

Specific Transformers and Chokes

	RF transformers	Lighting	Industrial	Automotive	Current sense transformers
	SMD 		SMD 	SMD 	NEW 
Applications	■ Antenna plugs for SAT + CATV ■ Satellite receivers ■ Cable-TV, video modulators ■ Mixers and up/down converters ■ Mobile communications	■ Chokes for resonant circuits ■ Transformers for power factor correction ■ EMI suppression chokes	■ Input chokes ■ Output chokes ■ Energy storage chokes ■ Point of load converter (POL) ■ Power transformers ■ Drive transformers	■ Transformers and chokes for – HID lamps – fuel injection – park systems – electrical steering – displays – dashboards – anntenna diversities – start stop	■ Switching power supplies ■ Feedback control ■ Overload sensing ■ Load drop/ shut down detection
Features	Transformers based on double-aperture cores. Application range from 100 kHz to 2.5 GHz.	Ferrite materials with low power loss. Multi-section coil formers help to isolate the high resonance and winding voltage up to 3 kV. Flat types with height ≤14 mm available.	Chokes and standard transformers for very different power ranges plus custom models.	Customized products	Very low DC resistance, different turns ratios, small package

In transformers, EPCOS devises complete solutions that perfectly match customer specifications. That allows tailored inductive components from application-specific development through to volume production.

Please read *Important notes* on page 78.

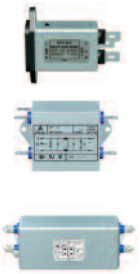
EMC Feedthrough Components

	Feedthrough capacitors			Feedthrough filters	
Rated current/ Rated capacitance					
	B85121 Ø 16 mm, 20 mm	B85121 Ø 30 mm, 55 mm	B85111 Special	B85321 Ø 16 mm, 20 mm	B85321 Ø 30 mm, 55 mm
I A / C µF	25 / 16 — 0.00125 / 1	200 / 25 — 0.1 / 4.7	800 / 50 — 0.035 / 4.7	25 / 16 — 2x0.0025	500 / 25 — 2 x 0.1 / 2 x 4.7
Terminals	Axial wire leads, screw terminals, soldering tag	Screw terminals	Screw terminals	Axial wire leads, screw terminals, soldering tag	Screw terminals
Features	Solderless MKP technology (dry, self-healing)				
Applications	Broadband interference suppression beyond the VHF range in AC/DC supplies and control lines of electronic equipment and systems.				

Feedthrough components are used to suppress interference in electrical installations and equipment. They are also ideal for telephone switching systems and base stations, where they prevent interference pulses in the external power supply network from entering the equipment and vice versa.

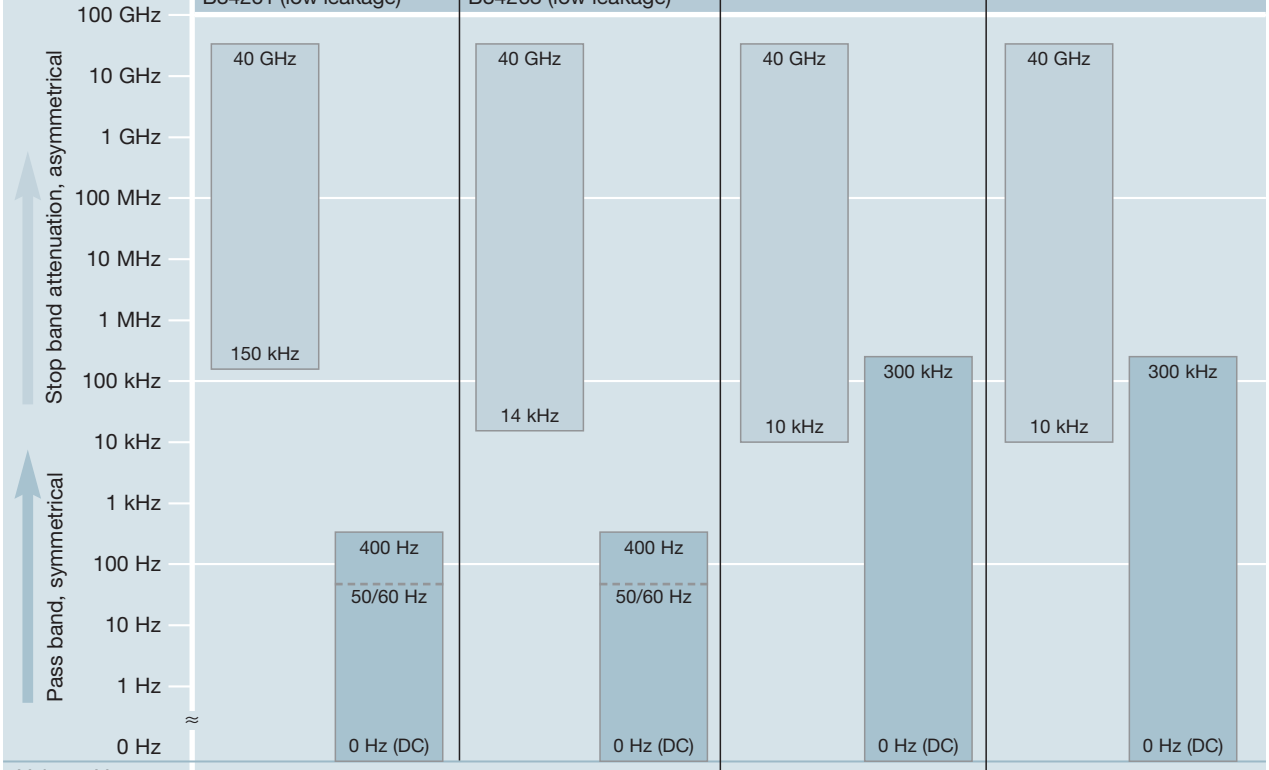
Please read *Important notes* on page 78.

EMC Filters

	2-line filters			3-line filters			4-line filters		Custo-mized	Output filters	
											
Rated current I_R A	SIFI IEC	PCB	Con-verter	Com-pact	AFE	Book-format	Con-verter	Install./ Systems	2-, 3-, 4-line filters	dv/dt chokes	Sine Former
10000											
5000									8000	NEW	NEW
1000			1600	2500							
500					230	220	600			600	600
100								125			
50											
10	36	6	8	8	8	8	8	6		6	6
5											
1	1	0.5							0.2		
0.5											
Voltage V_R	AC 250 ... 520 V DC 250 ... 2000 V			AC 440, 480, 500, 520, 690, 760 V 690 V (IT)			AC 520 V		DC ... 3000 V AC ... 4200 V	AC 520, 760 V	
Series	B84111 ... B84115 B8477*	B84110	B84142	B84143	B84143 A*R410	B84143	B84144	B84131	On request	On request	B84143 V*R127
Features	High-efficiency compact EMC filters, line reactors and output filters for frequency converters, power supplies and all kinds of electric equipment and systems. The numerous marks of conformity permit worldwide use of equipment incorporating these filters. The SineFormer forms sine-wave phase to phase voltage, supersedes shielded motor cables and reduces bearing currents.										

Electromagnetic compatibility (EMC) has become a mandatory property of electronic equipment by assuring its functionality. By offering one-stop shopping for EMC components and services (including consulting), EPCOS supports its customers from the start of product development all the way to volume production.

EMC Filters for Shielded Rooms

	For power lines		For communica-tions lines	Customized filters Filter cabinets
				
	B84299*B**1; B84299*E**1 B84261 (low leakage)	B84299*B**3; B84299*E**3 B84263 (low leakage)	B84312	B84299G
Stop band attenuation, asymmetrical Pass band, symmetrical				
Voltage V_R	AC/DC 250 … 690 V		100 V	AC/DC 100 … 690 V
Current	16 … 1600 A		0.1 … 3 A	0.1 … 2500 A
Lines	2 … 4 for single or 3-phase systems or DC systems		2 … 20	2 … 1000
Features	Power line filters B84299 with single line chokes (separate lines without intercoupling) are an optimal solution for all kinds of testings and inspections. Power line filters B84261 and B84263 are designed for low leakage current. All filters are available with integrated EMP protection.			

Filters for shieded rooms allow power and communications lines to be connected to shielded cabinets.

Please read *Important notes* on page 78.

EMC laboratory

The EPCOS EMC Laboratory in Regensburg offers comprehensive, in-depth EMC services: from consulting and pre-compliance investigations on prototypes to conformity testing of series production equipment.

The excellently equipped laboratory, combined with many years' experience and EMC expertise, as well as active participation in national and international standardization bodies, provides a solid foundation for meeting customers' requirements. Investigations performed side by side with the development process determine the measures required to observe the EMC limits: these measures are documented in the measurement report in a manner that is transparent for the developers.

A test report provides proof of compliance with the relevant standards and is the basis for the customer's declaration of conformity.

Qualification

The EMC laboratory in Regensburg has been an accredited test laboratory since October 1994. Accreditation in accordance with the guidelines of the German Accreditation Council (DAR) now meets the current EN ISO/IEC 17025 quality standard for laboratories as the basis for the guaranteed independence, impartiality and integrity of its measurement and test results.

Installations

The EMC laboratory has a semi-anechoic chamber for field-strength measurements in accordance with the relevant standards at a measurement distance of 10 m between the antenna and the equipment under test. Special facilities such as large entrances, exhaust gas extraction, power supplies up to 100 A as well as resistive and inductive (motor) loads even permit the testing of bulky or high-powered equipment.

Please read *Important notes* on page 78.

Surge Arresters

2-electrode surge arresters

SMD

DC spark-over voltage
V

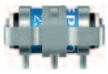
	Light duty						Medium duty		Heavy duty		
	S30	ES	EM	M5	EC	EF	A6/N8	A7	A8	A83	V1
5500	NEW										
4500											
4000											
3600											
3500											
3000											
2500											
2200											
2000											
1600											
1500											
1400											
1000											
800											
600											
500											
470											
400											
350											
300											
270											
260											
250											
230											
170											
150											
90											
75											
Dimensions (mm) (ø x h)	4.5 x 3.2 x 2.7	4.7 x 4.7	5.5 x 6	5 x 5	8 x 6	8 x 6	8 x 6	8 x 8	8 x 6	8 x 20	11.8 x 17.4
Discharge class (kA/A)[1]	2/2	2.5/2.5	2.5/2.5 2/2; 1.5	5/5	5/5	5/5	10/10	5; 2.5/2.5 10/10	20/20	20/20	20/20
Typical applications	Customer premises equipment such as DSL modems, WLAN routers, TV sets and cable modems						Crossover junctions for overhead cables, underground cables, subscriber protection		Overhead lines and installations particularly susceptible to lightning threats, subscriber protection in exposed locations		

[1] Surge current: 10 x 8/20 µs wave in total /AC current: 10 x 1 s/50 Hz in total

Surge arresters are components which protect communications and information installations as well as TT systems from failure or destruction.
Reliable voltage limitation, high current-discharge capability, low self-capacitance and high insulation resistance offer optimum protection against voltage surges due to lightning, electrostatic or electromagnetic discharges.
This applies to equipment and installations in the fixed network with its xDSL applications as well as in the mobile phone, cable TV and AC power line networks.

Please read *Important notes* on page 78.

Surge Arresters

	3-electrode surge arresters									
		SMD								
DC spark-over voltage V										
	Hybrid EK	Light duty EZ	Light duty T9	Medium duty ER	Medium duty EK	Medium duty T3	Medium duty T8	Heavy duty T2	Heavy duty T2/T5	Heavy duty T6
650										
600										
500										
420										
350										
300										
260										
250										
230										
150										
90										
75										
Dimensions (mm) (ø x h)	8.3 x 14	5 x 7.6	5 x 7.6	6.3 x 8.1	6.8 x 10	6 x 8	8 x 10	8 x 10	8 x 10	9.5 x 11.5
Discharge class (kA/A)[1)]	10/10	5/5	5/5	10/10	10/10	10/10	10/10	20/10	20/10 (US spec.)	20/20
Typical applications	Main distributor and subscriber protection in regions with high frequency of lightning strikes	Underground cables and private branch exchanges in densely populated regions as well as main distributors		Crossover junctions for overhead cables, underground cables, subscriber protection				Overhead lines and installations particularly susceptible to lightning threats, subscriber protection in exposed locations		

[1)] Surge current: 10 x 8/20 µs wave in total/AC current: 10 x 1 s/50 Hz in total

Please read *Important notes* on page 78.

	AC power line protection					
DC spark-over voltage V						
	Max. duty V1	D20	L1	H3	M5	A8
1800		NEW	NEW		NEW	NEW
1400						
1000						
800						
600						
500						
420						
350						
300						
250						
230						
200						
150						
90						
70						
Dimensions (mm) (ø x h)	12 x 17	20 x 4	30 x 12	30 x 30	5 x 5	8 x 6
Protection class	I & II	I & II	I & II	I & II	II & III	II & III
Typical applications	AC power line protection, class I & II				AC power line protection, class II & III	
Protection class to EN 61643-11						

Please read *Important notes* on page 78.

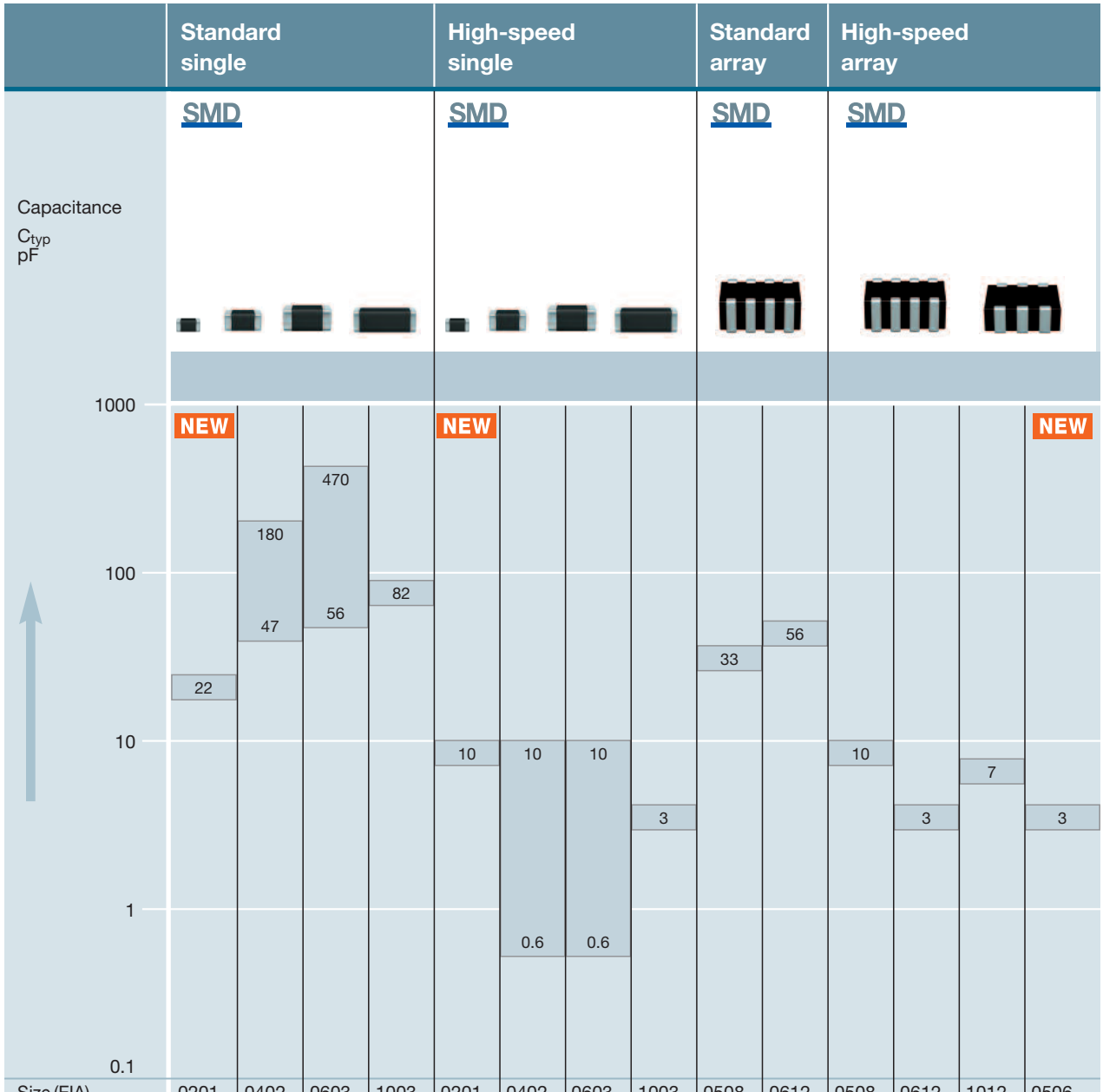
Switching Spark Gaps

	Commodity types				High performance types		
Nominal voltage V_N							SMD 
	CAS	CAM	SSG		FS		FS...SMD
5500							
5000							
3000							
1000							
850							
800							
600							
400							
230							
Dimensions (mm) (ø x h)	8 x 6	5 x 5	8 x 6	8 x 8	8 x 6	8 x 8	8 x 6
Typical applications	Electrical gas ignition devices		Ignition devices for high-pressure discharge lamps (video and data projectors, general lighting)		Ignition devices for high-pressure discharge lamps (automobile headlamps, xenon gas-discharge lamps)		

Switching spark gaps are powerful switches which can transmit capacitively stored energy with low losses. They have switch-through times in the region of nanoseconds and thus allow brief high-energy pulses to be generated by means of discharges from inductive loads.

Please read *Important notes* on page 78.

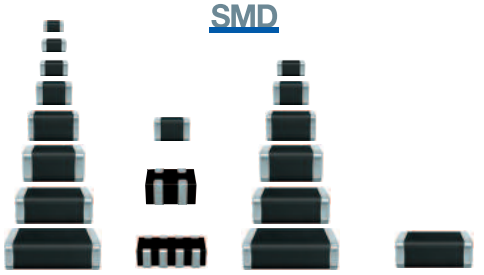
CeraDiodes



IT products and consumer electronics are becoming increasing complex and thus more susceptible to ESD. CeraDiodes can solve this problem simply and economically. Compared to TVS diodes, they offer cost savings of up to 50%, are up to 80% smaller while offering equal or better performance.

Please read *Important notes* on page 78.

Ceramic Transient Voltage Suppressors (CTVS)

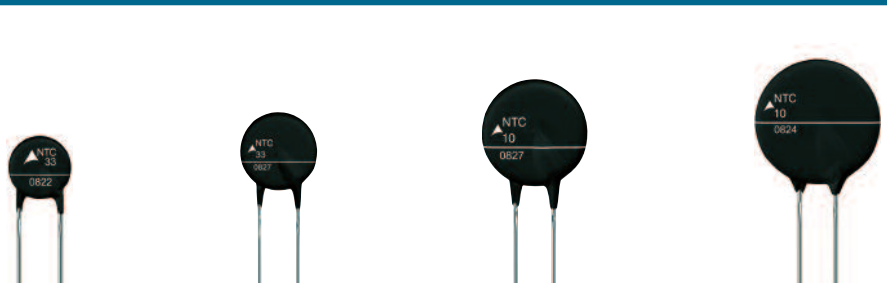
	Multilayer chip varistors				ESD/EMI filters		SMD disk varistors (CU)	SHCV
	SMD				SMD		SMD	
								
	Standard	Special tolerance	Automotive		Telecom	Audio	RC	Housed	Leaded
						NEW			
	2220 1812 1210 1206 0805 0603 0402 0201	1200 pF C 0.6 pF	2220 1812 1210 1206 0805 0603	25 J W_{LD} 1 J	$I_{surge,max}$ 45 A	$f_{cut-off,min}$ 10 MHz	290 MHz $f_{cut-off,min}$ 80 MHz	1200 A $I_{surge,max}$ 100 A	4.7 µF C 220 nF
Parameter	EIA size	Capacitance C	EIA size	Max. load dump energy W_{LD} (10 pulses)	Max. surge current i (10x) 10/700 µs	Minimum cut-off-frequency		Maximum surge current 8/20 µs	Capacitance C
Version		CC, LC, HS, RF	Standard AUTO CC, LC, HS, HT		EIA size 1812			Standard AUTO (load dump, jump starts), TELE	SR1 (EIA size 1812) SR2 (EIA size 2220) SR6 (EIA size 1206)

CC = Controlled capacitance, LC = Low capacitance, HS = High-speed, HT = High temperature, RF = Radio frequency

Ceramic transient voltage suppressors (CTVS) are voltage-dependent resistors with a symmetrical V/I characteristic whose resistance decreases with increasing voltage. Because of their application as overvoltage protection devices, they are also often referred to as transient voltage suppressors on silicon basis. EPCOS ceramic transient voltage suppressors (CTVS) have proven to be excellent protective devices because of their application flexibility and high reliability.

Please read *Important notes* on page 78.

Inrush Current Limiters (ICL)

	ICL – NTC disk thermistors						
Rated resistance R_{25}							
100 Ω							
50 Ω							
10 Ω	33 S153 4.7	10 S235 5	80 S236 2.5	33 S237 1	25 S238 2.5	10 S364 1	10 S464 1
5 Ω							
1 Ω							
Approval							–
Max. diameter (mm)	8.5	9.5	11.5	15	16	21	26
Applications	Inrush current reduction in circuits up to 265 V						

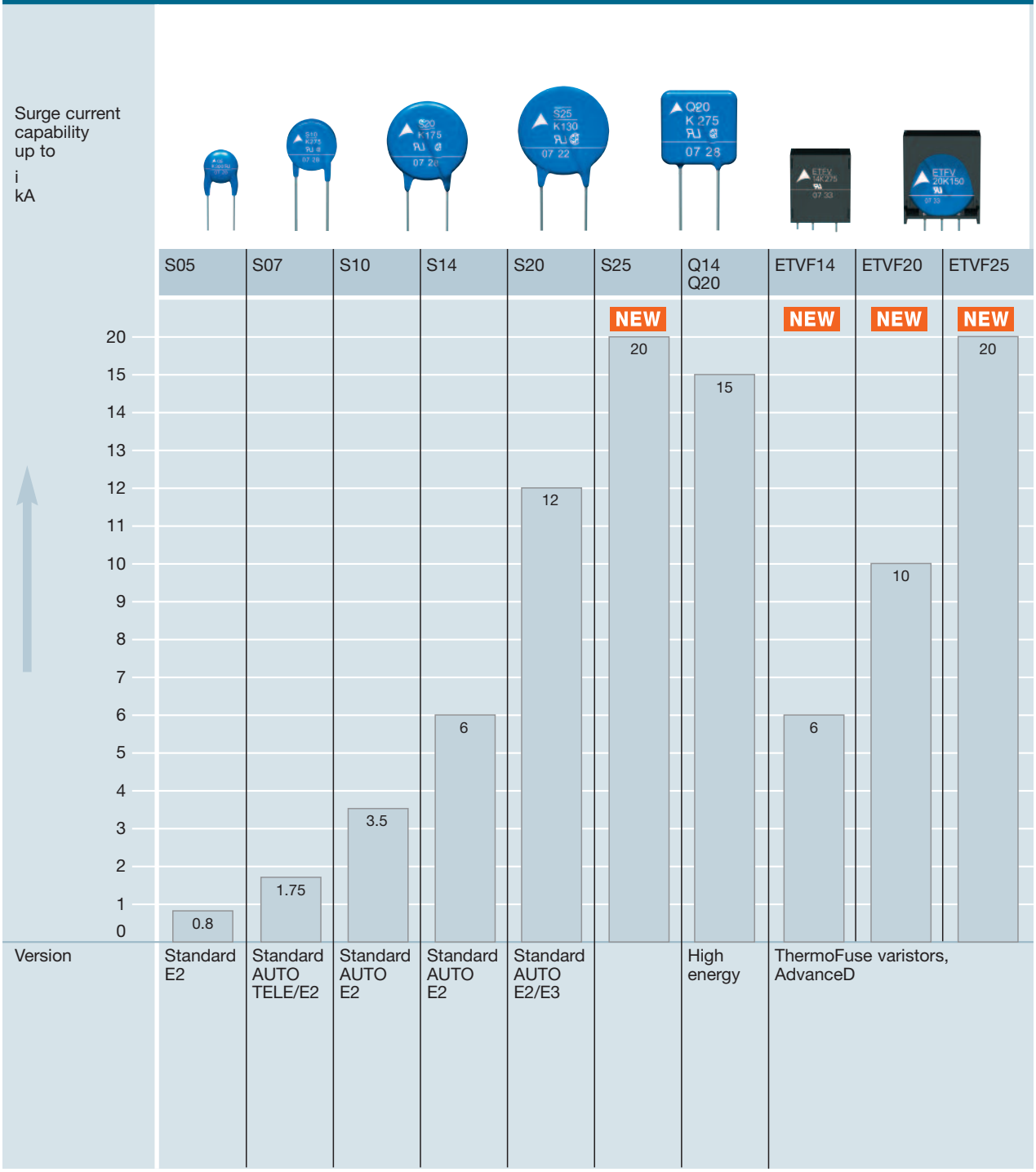
Many items of equipment like switch-mode power supplies, electric motors or transformers exhibit excessive inrush currents when they are turned on. The thermistor limits the current at turn-on by its relatively high cold resistance. As a result of the load current the thermistor heats up and reduces its resistance.

ICLs are able to effectively handle higher inrush currents than fixed resistors with the same power consumption. They thus provide protection from undesirably high inrush currents at switch-on and offers a fairly low resistance during continuous operation.

Please read *Important notes* on page 78.

Metal Oxide Varistors

Disk varistors



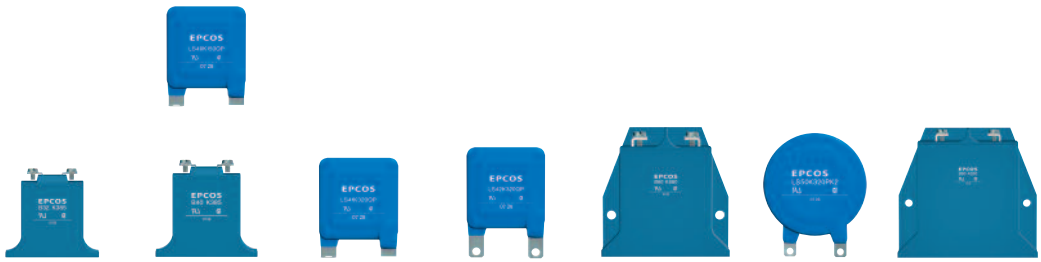
Metal oxide varistors SIOV are voltage-dependent resistors with symmetrical V/I characteristic.

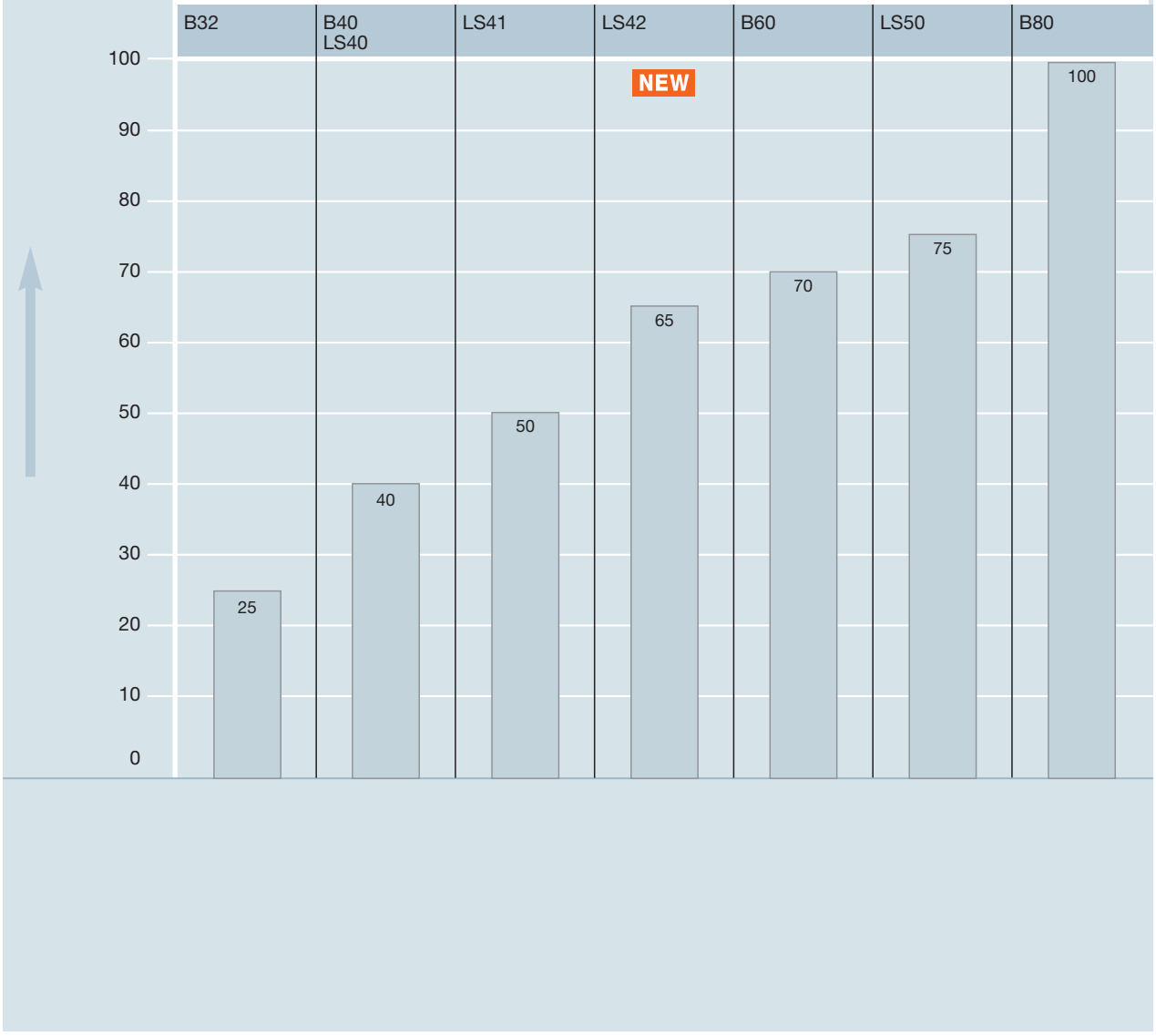
Consequently, varistors provide protection against all kinds of overvoltage and prevent electronic equipment from being damaged.

Please read *Important notes* on page 78.

Metal Oxide Varistors

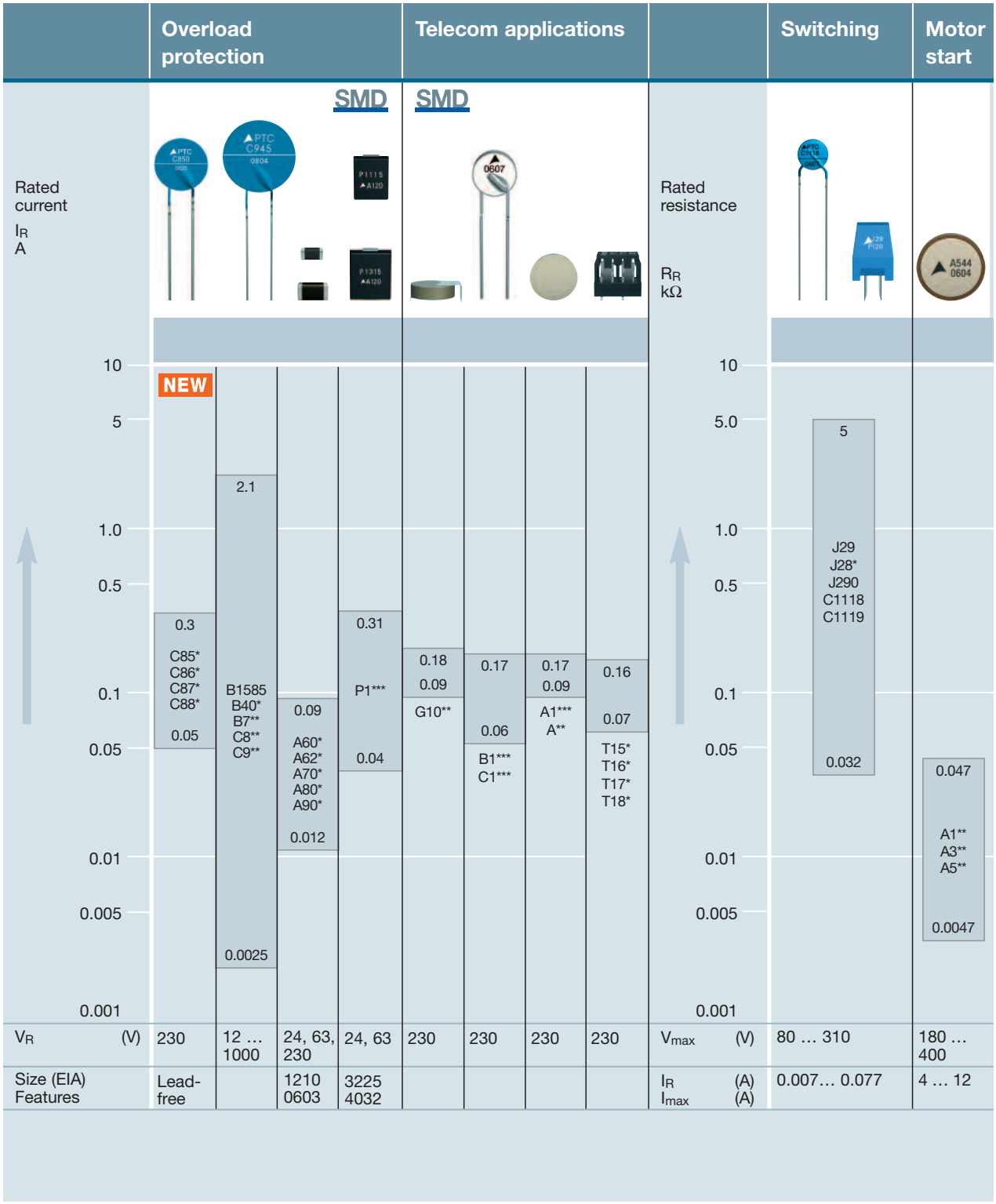
Block varistors, strap varistors





Please read *Important notes* on page 78.

PTC Thermistors

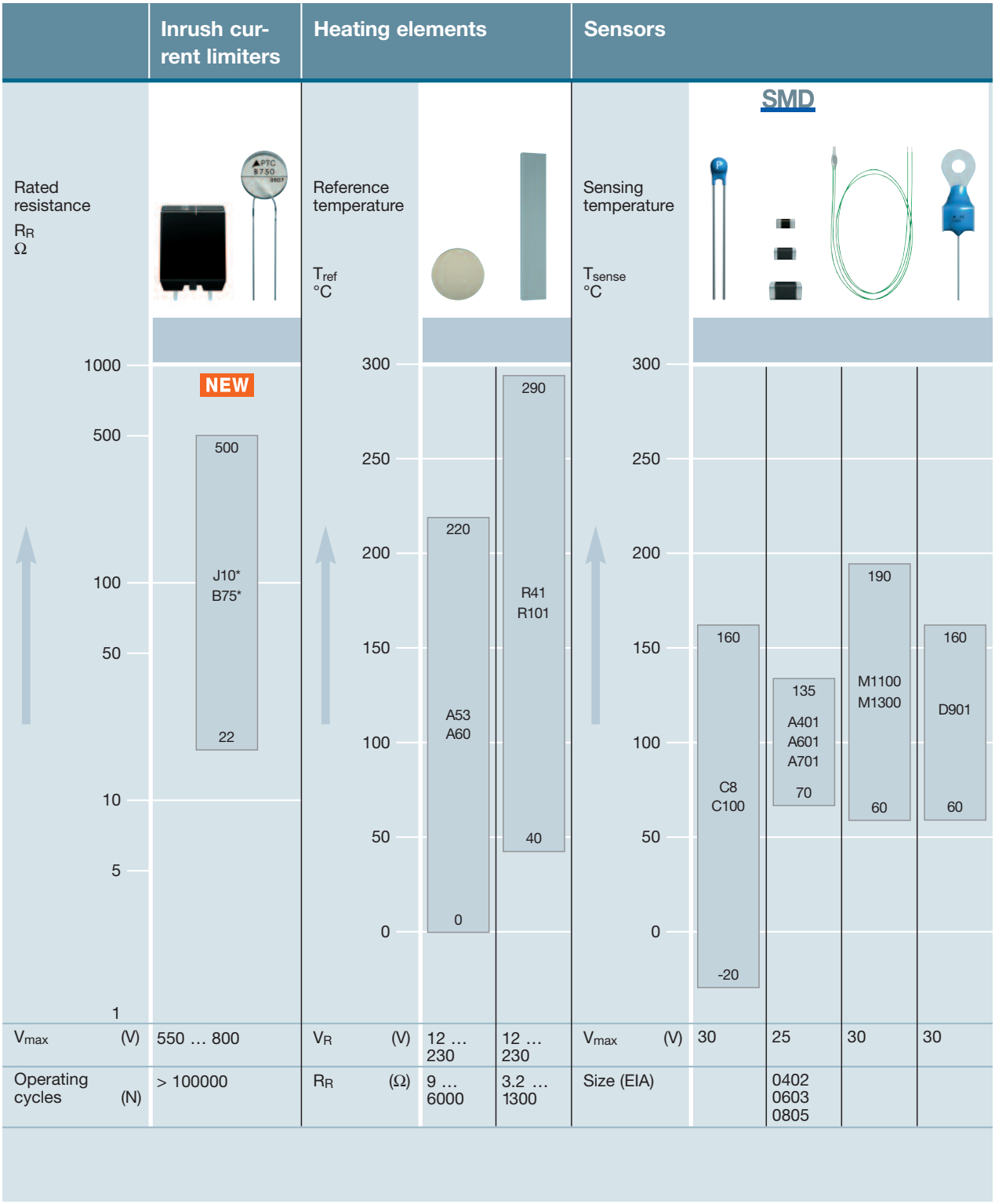


PTC thermistors are temperature-dependent resistors. They measure and control temperatures, protect against overload and serve as heating elements.

PTC switches are used in lighting systems, starter circuits for (compressor) motors and for degaussing color picture tubes.

Please read *Important notes* on page 78.

PTC Thermistors



Please read *Important notes* on page 78.

NTC Sensors

Temperature measurement and compensation

Rated resistance R_{25} kΩ

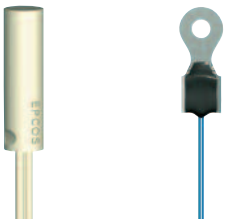
5
1000
5
100
5
10
5
1
5
0.1
5
0.01
5
0.001

	100 S861 S862[1] S863[2] S867 S869[2] 2	100 S962[1] S871 S881 S891 S971[2] S981[2] 2.1	1400 G540[1] G550 G560 2	100 G541[1] G551 G561 2	NEW 30 10 G1565	470 K164 0.015	470 M891 1	2.5 K220 K1150 0.144 0.092 0.04 M820
ΔR_R	±1%, ±3% ±5%	±1%, ±3% ±5%	±1%, ±2% ±3%, ±5%	±1%, ±2% ±3%, ±5%	±1%, ±2% ±3%, ±5%	±5% ±10%	±5% ±10%	±5%
Climatic category (IEC 60068-1)	55/155/56	55/155/56	55/300/56	55/260/56	55/260/56	55/125/21	40/125/56	–55/+155 °C
Features	Insulated leads [1]) Improved moisture resistance [2]) ±0.2 K (0 … 70 °C)	Lead spacing [1]) Improved moisture resistance [2]) Flexible coating of head and wires	[1]) Head diameter 0.9 mm max., T_{max} = 250 °C	Insulated [1]) Head diameter 0.9 mm max., T_{max} = 250 °C	Improved resistance against fluids, e.g. storage in motor oil (2000 h at 140 °C)	Lead spacing 5 mm	Lead spacing 2.5 mm	Unleaded disk

NTC sensors are temperature-dependent resistors which reduce their resistance as temperature increases. They are used particularly for precise temperature measurement in automotive, domestic, communication and industrial electronics.

Please read *Important notes* on page 78.

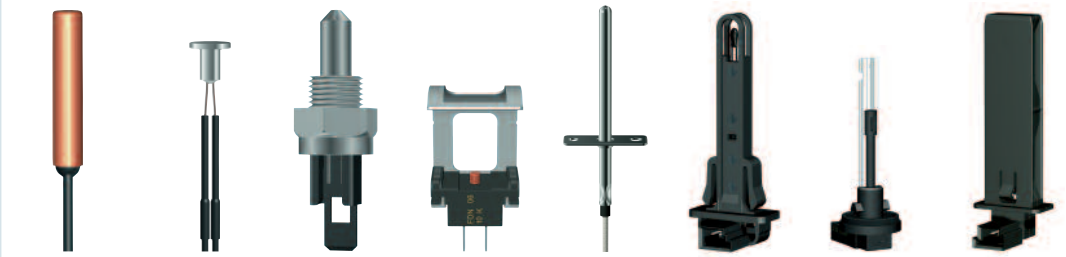
NTC Sensors

	Temperature measurement and compensation		Temperature measurement NTC probe assemblies			
	SMD					
Rated resistance R_{25} kΩ						
5						
1000						
5	470					
100						
5		100				
10	0402	0402				
5	0603	0603	10	30	12	10
1	0805	0805	2	10	4.8	K504
5			M1005	5	K276	
0.1	0.1	4.7	M2010	M703		
5			M2020			
0.01			M2030			
5			M2035			
0.001			M3020			
			M3035			
ΔR_R	±3% ±5%	±3%, ±5%	±2% ±5%	±2%	±2%	±2%
Operating temperature	–55/+125 °C	–40/+150 °C	–40/+80 °C	–55/+125 °C	–10/+100 °C	–20/+150 °C
Features	Multilayer Ni barrier	Automotive AEC-Q200	High moisture resistance M3020/M3035: PVC-free	Sensor for easy screw mounting in industrial applications	Suitable for corrosive environment, UL approved	Immersion probe, fast response time

Please read *Important notes* on page 78.

NTC Sensors

Temperature measurement
NTC probe assemblies



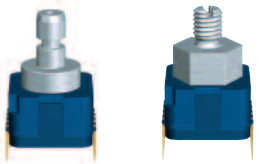
Rated resistance R_{25} kΩ

5
1000
5
100
5
10
5
1
5
0.1
5
0.01
5
0.001

		NEW			NEW			NEW
	10 K500 K800	100 50 K560	10 K301	10 ClipOn T120	R_0 = 1 K554	10 2 Z801	30 2 Z811	30 2 Z812
ΔR_R	±3%	±3% ±2.5%	±2%	±3.6%	EN60751 class B	±1%	±1%	±1%
Operating temperature	–30/+100 °C	–30/+250 °C	–30/+100 °C	–5/+100 °C	–40/+550 °C	–40/+90 °C	–40/+90 °C	–40/+90 °C
Features	Cable sensors for air conditioners and heat pumps	Sensor for hot plates and induction hobs	Immersion probe	Pipe sensor for easy clip mounting in heating applications	Sensor for stoves and ovens, PT-1000 element, fast and simple flange installation	Humidity resistant, 2000 h water immersion at 80 °C	Measuring the average airflow temperature	Duct sensor Measuring the average airflow temperature

Please read *Important notes* on page 78.

Pressure Sensors and Transmitters

	Pressure sensor chips NEW						Pressure transducers NEW
	SMD					SMD	
Rated pressure p_R bar							
	AE2 C41	AE2 C27		AE2 C28		C29 wet media	AK2
	0.06 / 0.025	1 / 0.25	1 / 0.1	25 / 2.5	25 / 2.5	10 / 1	1 / 0.025
Pressure measurement	Relative, back side	Absolute, front side	Relative, back side	Absolute/ relative, front side	Relative, back side	Absolute, back side	Relative
Measurement media	Non-aggressive fluids and gases	Dry technical gases	Non-aggressive fluids and gases	Dry technical gases	Non-aggressive fluids and gases	Non-aggressive fluids and gases	Non-aggressive fluids and gases
Geometry and features	5 x 5 (mm)	3 x 3 (mm)		2 x 2 (mm)		2.7 x 2.2 (mm)	14 x 15 (mm) M5, tube fitting
Output signal	Not calibrated, not temperature-compensated						
Applications	Automotive, medical, measurement and control technology, environmental and climate protection						Automotive, medical, measurement and control technology, environmental and climate protection, hydraulic and pneumatic systems, level measurement, compressors and pumps

Pressure sensor chips consist of a piezoresistive silicon element with anodically bonded glass base. Relative pressure sensor chips with pressure to front and back side as well as absolute pressure sensor chips with pressure to front and back side are available.

Pressure transducers with metal-plastic package are based on the pressure sensor chips. The bridge signal is available uncalibrated and without temperature compensation.

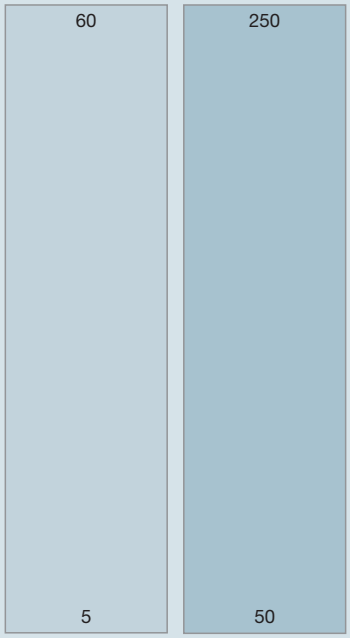
Please read *Important notes* on page 78.

Pressure Sensors and Transmitters

	Pressure transmitters NEW					
Rated pressure p_R bar	 			 		
	CAU			AC		
						
Pressure measurement	Absolute	Relative	Relative, symmetrical	Absolute	Relative	Relative, symmetrical
Measurement media	Dry technical gases	Non-aggressive fluids and gases		Dry technical gases	Non-aggressive fluids and gases	
Geometry and features	With casing: Diameter 22 mm / G 1/8" / connector M 12 Without casing: PCB diam. approx. 18 mm / M 5 / soldering pins			PCB area 19 x 18 mm Tube fitting / M5 thread / DIL pins		
Output signal	Calibrated and temperature-compensated					
Applications	Medical, measurement and control technology, environmental and climate protection, hydraulic and pneumatic systems, level measurement, compressors and pumps			Medical, measurement and control technology, environmental and climate protection, hydraulic and pneumatic systems, level measurement		

Pressure transmitters are extended by a signal evaluation module and supplied with and without stainless steel casing. They represent temperature compensated and calibrated precision pressure sensors.

Piezo Components

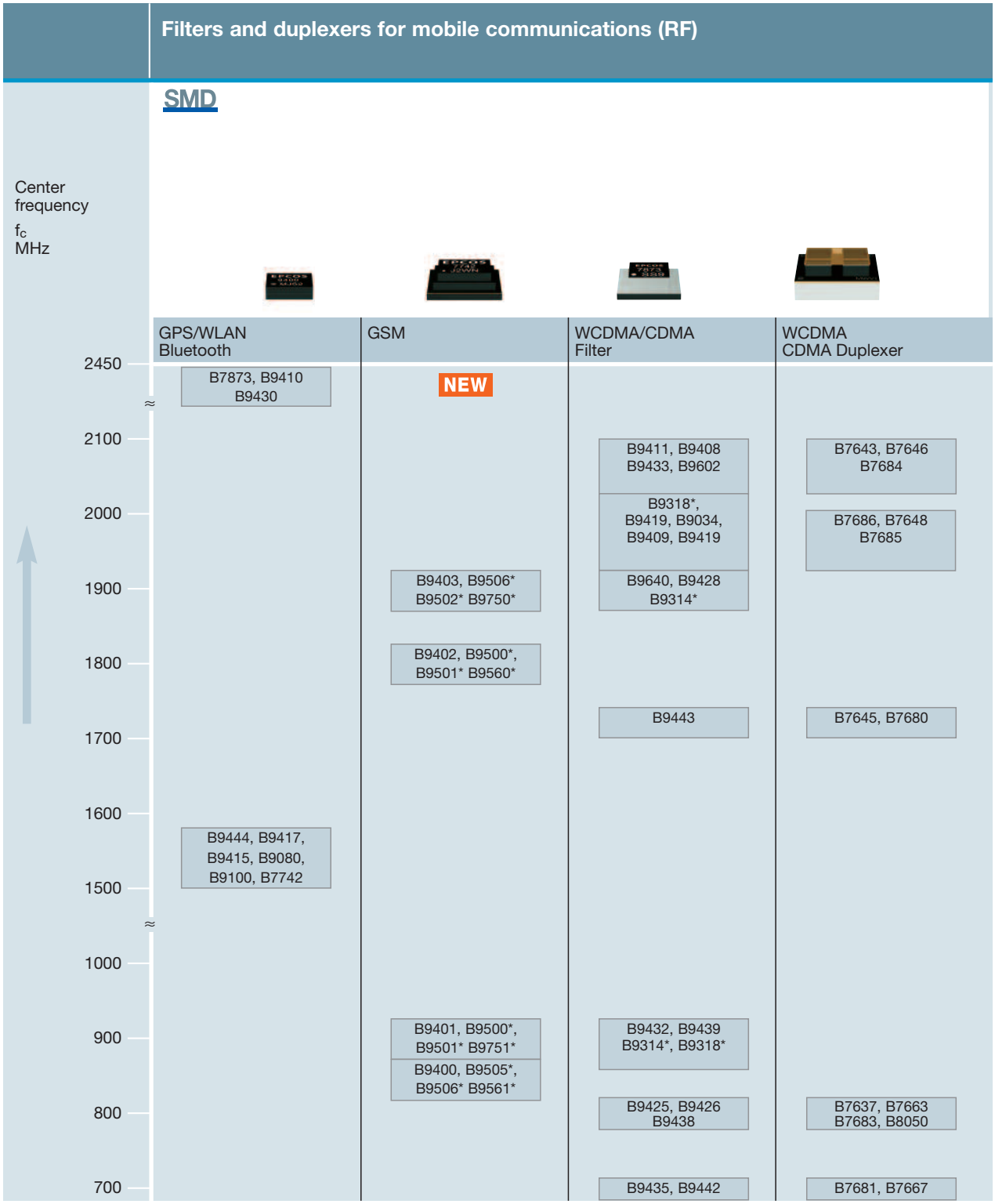
	Multilayer piezo actuators
Length l Rated voltage V_R	
l mm V_R VDC	
Cross section	2 x 2 … 10 x 10 mm^2
Elongation	5 … 90 µm
Blocking force	100 … 5000 N
Temperature	–40 … +150 °C
Life time	Up to 10^{10} cycles

Multilayer piezo actuators are applied in state-of-the-art Diesel and gasoline injection systems, enabling improved engine performance as well as a reduction of emissions and fuel savings. However, fast response and unrivalled precision are making piezo actuators likewise attractive for a number of further mechatronic tasks.

EPCOS is a leading supplier of customer specific multilayer piezo actuator solutions. With many years of experience supplying the automotive industries at highest quality levels, EPCOS provides solutions in silver/palladium as well as copper technology.

Please read *Important notes* on page 78.

Surface Acoustic Wave Components



* 2in1

Surface acoustic wave components are electronic components in which piezoelectric effects are utilized to produce band-pass characteristics.

Their compact size qualifies SAW filters not only for use in mobile phones. In all other wireless communications systems too, they contribute to boosting the growing trend for miniaturisation and integration.

Please read *Important notes* on page 78.

Surface Acoustic Wave Components

Filters for infrastructure systems

SMD

Center frequency f_c MHz

2140 ≈ 1000 — 500 — 100

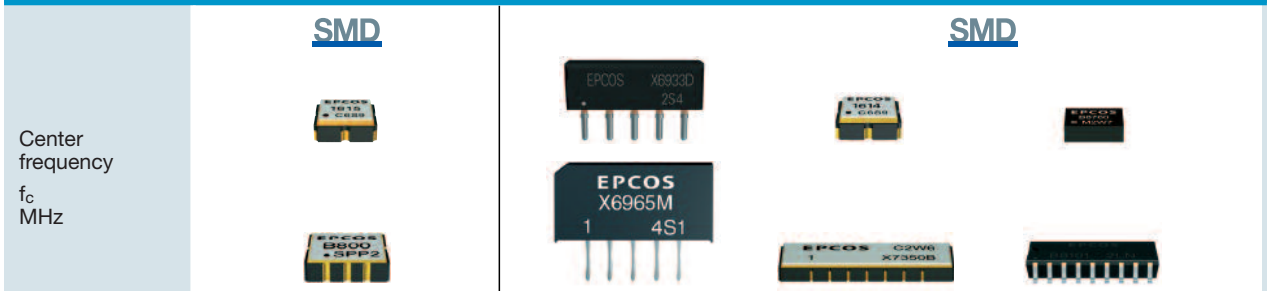
Applications	Basestation IF filters	Basestation RF filters	Broadband wireless access and WiMAX filters	Trunked radio filters (e.g. TETRA)	Filters for industrial applications (e.g. CATV)
	570	2140	810	1048	610
	B3826	B3669	B4070	B3852	B3690
	B3825, B5005	B4150	B5033	B4165	B3688
	B3849	B3668, B5064	B5040	B3835	B3860, B3884
	B3807	B4143	B5011, B5032, B5034	B4161, B5013	B3643
	B3873, B3865	B3832, B4166	B3677, B5025	B3836, B5046	B3678
	B3894	B5085	B5076, B5092, B5093	B5055, B5052	B5068
	B3646, B3848	B5057, B4124	B3606, B3607	B5048, B3681	B4908
	B3817, B5035	B5056, B4130	B3608	B3823	B3886
	B5006, B5026	B3851, B4125	B4542	B3822, B3830	
	B3841	B4180	B5015, B5018	B5047	
	B3881, B3898	B5008	B3605, B3897	B3683, B3815	
	B5051	B5027			
	B3853				
	B3647, B3850				
	B3685				B3856
	B5050				B3872
	B3874, B3625, B3891				
	71	464	70	382	39

Surface acoustic wave filters play a key role in the infrastructure systems of modern telecommunications. Because of their special features, these products are increasingly being used in various infrastructure systems such as mobile phone base stations, wireless local loop and trunked radio systems, or cable TV networks.

Please read *Important notes* on page 78.

Surface Acoustic Wave Components

Filters for multimedia applications



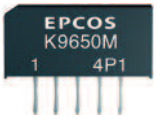
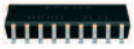
Center frequency f_c MHz

2000
1000
500
200

Applications	1-channel and 2-channel satellite receivers	Channel stacking	Digital terrestrial TV	Digital cable	Digital audio	Double conversion tuners	Mobile TV
	B801 B800 480	NEW 2000 B1630 B1629 B1628 B1626 B1625 B1633 B1632 B1620 B1616 B1617 B1631 B1615 914 2100 B1640 B1639 B1638 B1637 B1636 B1635 B1634 B1641 1400	57 X6771D, X6948D X6941D, X6764D X7550D, X7251D X6778D, X6966M X6857D, X7255D X7350B 36	57 X6771D, X6948D X6965M, X6759M X6864D X6751M 36	1472 B1608 B4030 B1726 B1729 B1730 B1727 B1728 X6922D X7001L 30	1220 B1610, B1605 B1614, B1618 1216	NEW 800 B8752 B8760 470

Please read *Important notes* on page 78.

Surface Acoustic Wave Components

	Filters for multimedia applications					
Inter-mediate frequency f_{IF} MHz	    SMD					
	Standard*)					
38.0	D/K	K2959M K2983M	K3964M	K9351M K9358M		
	Multi-standard	K7253M[1)] (B/G, D/K, I+M/N)	K7262D[1)] (B/G, D/K, I+M/N)	K9655D[1)] (B/G, D/K, I+M/N)	K3567D (B/G, D/K)	
38.9	B/G	G1865M G1975M G1985M	G3956M	G9353M		G4963D
	Multi-standard	K7252M[1)] (B/G, D/K + M/N) K2966M (B/G, D/K) K2982M (B/G, D/K)	K3953M (B/G, I, L/L') K7257M[1)] (B/G, D/K, I, L/L'+M/N)	K9653D[1)] (B/G, D/K, L, I+M/N) K9656M[1)] (B/G, D/K, L, I+L')	K3565M (B/G, D/K)	K4960D (D/K)
45.75	M/N	M1867D M1971M, M1871M	M3953M M3954D	M9370M	M3575D M3565M	M4952M
58.75	M	N1952D			N3561M N3564D	
Applications		Intercarrier filters	Video filters	Audio filters	Quasi/split sound filters	Vestigial sideband filters

[1)] 2-channel filter/

*) L: France
B: Australia
D/K: OIRT, eastern standard, China
B/G: CCIR, Germany, Europe (7/8 MHz)
I: Great Britain, Ireland, South Africa
M/N: FCC, America
M: Japan/FCC

Please read *Important notes* on page 78.

Surface Acoustic Wave Components

Remote-control and other automotive applications

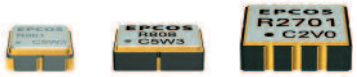
SMD

Filters

Center frequency f_c MHz

	2450	1600	1000	869	433.92	315
	B4041 B3526	B3515 B3529 B3521 B3520 B4050	B3514 B3588 B3716 B3717 B3563 B3721 B3722 B3712	915 B3746 B3734 B3744 B3737 B3735 B3733 B3732 B3743 B3741 B3738	915 B3773 B3793 B3791 B3782 B3780 B3760 B3790 B3792 B3783 B3781 B3761 B3766	915 B3574 B3575 B3576
	300	300	300	300	300	300
Package	QCC 10G DCC 6D/6C	DCC 6E	QCC 8B	QCC 8C		
Dimensions (mm)	3 x 2.5 3 x 3	3 x 3	3.8 x 3.8	5 x 5		
Applications	Wide band filt., typ. 50 Ω, Impedance, 1 ... 8 MHz bandwidth	Narrow band quartz filters (typ. 400 kHz)[1] Ultra-narrow band quartz filters (typ. 200 kHz)[1]				

SMD



Resonators

Center frequency f_c MHz

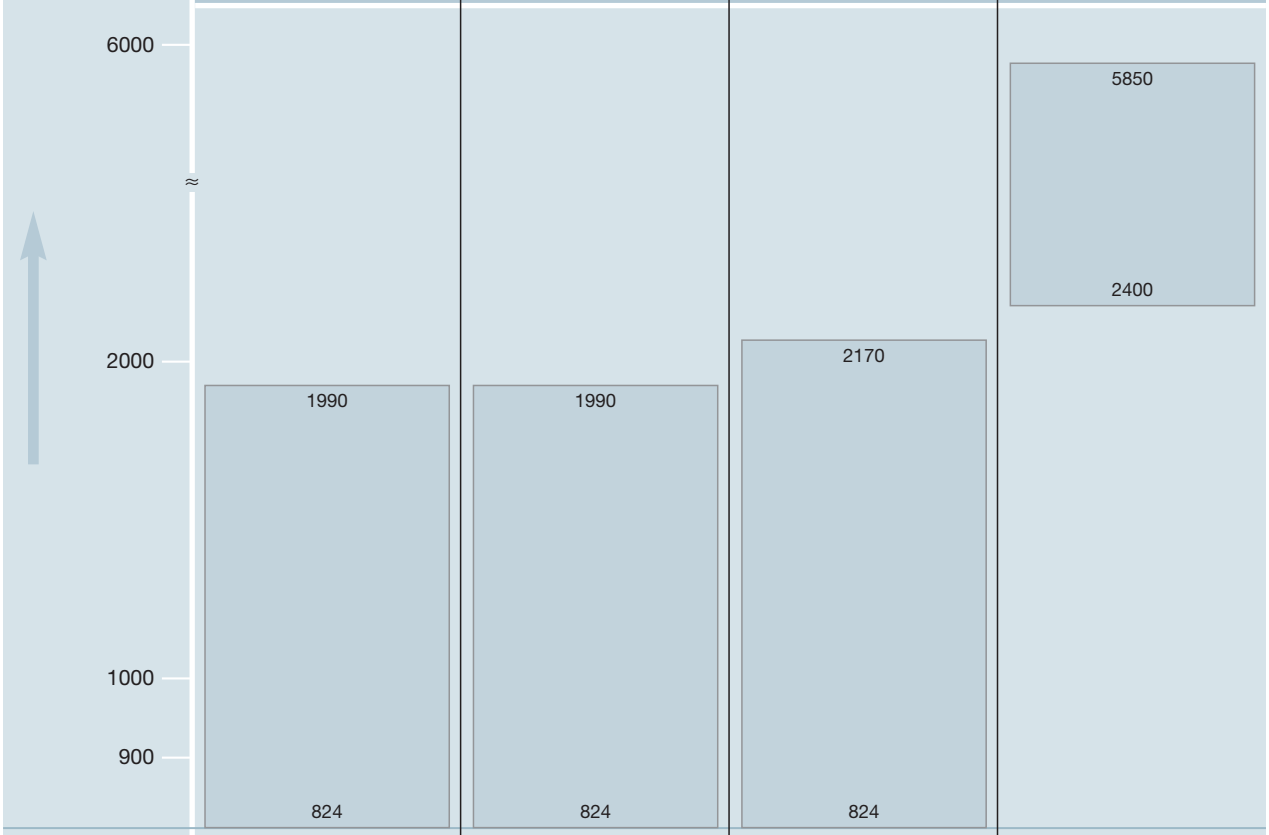
	2450	1600	1176 R959	1000	869	433.92	315
				915 R2906	868 R808 R958 R904 R920, R960 R962 R820, R860 R963, R901, R961 R801	915 R2706 R2711 R770 R2701 R771 R2704	
				300	300	300	
Package				DCC 6C DCC 6E	QCC 4A	QCC 8C	
Dimensions (mm)				3 x 3	3.5 x 5	5 x 5	
Applications				Resonators Tolerances: ±50 kHz, ±75 kHz			

[1] Usable bandwidth (including temperature shift and production tolerances)

Please read *Important notes* on page 78.

RF Modules

	Modules for mobile communications			
	SMD			
Center frequency f_c MHz				
	Filterbank QB GSM	Frontend module DB/TB/QB GSM	Frontend module GSM/WCDMA	Frontend module WLAN
Combination of bands	850 / 900 / 1800 / 1900	900 / 1800 850 / 1900 900 / 1800 / 1900 850 / 1800 / 1900 850 / 900 / 1800 / 1900	TB GSM + UMTS QB GSM + UMTS QB GSM + TB WCDMA	WLAN IEEE 802.11 a, b, g Single band b, g Dual band a, b, g
Products	Frontend module (FEM): Integration of diplexer, Tx low-pass filters, Tx/Rx switching and Rx SAW filters Filterbank: Integration of four Rx SAW filters together with complex impedance matching WLAN module: Integration of switching, filtering, diplexing, power amplifying, coupling			



LTCC (low-temperature co-fired ceramics)

Trends in mobile radio mean that the conventional cell-phone is gradually turning into a multimedia terminal. This in turn presents enormous challenges when it comes to the miniaturization and functional integration of electronic components. EPCOS' answer to this is RF modules based on LTCC technology.

Please read *Important notes* on page 78.

Subject Index

Subject Index

Please read *Important notes* on page 78.

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The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
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Get in Contact

Europe

Austria, Bulgaria, Greece, Montenegro, Romania, Serbia
EPCOS OHG
Vienna
T +43 51 70 72 56 30
F +43 51 70 75 56 45
sales.csee@epcos.com

Czech Republic
EPCOS s.r.o.
Prague
T +420 2 33 03 22 81
F +420 2 33 03 22 89
sales.czech@epcos.com

Finland
EPCOS Nordic OY
Espoo
T +358 10 5 11 32 00
F +358 10 5 11 22 85
sales.nordic@epcos.com

France, Belgium, Luxembourg, Malta, Netherlands
EPCOS SAS
Saint-Denis/France
T +33 1 49 46 67 89
F +33 1 49 46 67 67
sales.france@epcos.com

Germany, Liechtenstein, Switzerland
EPCOS AG
Customer Service
Munich
T (D) 0180 500 33 48
(0.14 Euro/min.)
(CH) 08 48 37 26 71
F +49 89 63 62 80 10
sales.germany@epcos.com

Hungary
EPCOS Elektronikai
Alkatrész Kft.
Budapest
T +36 1 436 07 20
F +36 1 436 07 21
sales.hungary@epcos.com

Italy
Siemens S. p. A.
Settore EPCOS
Milan
T +39 02 24 36 42 65
F +39 02 24 36 44 24
sales.italy@epcos.com

Poland, Latvia, Lithuania
Siemens Sp.z.o.o
EPCOS Division
Warsaw
T +48 22 8 70 91 51
F +48 22 8 70 91 59
sales.poland@epcos.com

Portugal
EPCOS 2 Portugal LDA
Évora
T +351 91 75 67 927
F +351 21 49 33 476
sales.portugal@epcos.com

Russia, Belarus, Kazakhstan, Moldavia, Ukraine
OOO Siemens
EPCOS Division
Moscow
T +7 495 7 37 24 17 / 18
F +7 495 7 37 23 46
sales.cis@epcos.com

Slovakia
EPCOS Sales Representative
Dolný Kubín
T +42 1 43 5 82 36 73
F +42 1 43 5 82 37 33
sales.slovakia@epcos.com

Slovenia, Croatia, Bosnia & Herzegovina
EPCOS Sales Representative
Škofljica/Slovenia
T +386 599 56 35 3
F +386 599 56 35 4
sales.slovenia@epcos.com

Spain
Siemens S.A.
EPCOS Division
Getafe
T +34 91 514 80 00
F +34 91 514 70 14
sales.iberia@epcos.com

Sweden, Estonia, Iceland, Denmark, Norway
EPCOS Nordic AB
Kista/Sweden
T +46 8 4 77 27 00
F +46 8 4 77 27 01
sales.nordic@epcos.com

Turkey
EPCOS AG
Liaison Office
Istanbul
T +90 216 5 69 81 01
F +90 216 4 64 07 56
sales.turkey@epcos.com

United Kingdom, Ireland
EPCOS UK Ltd.
Bracknell
T +44 13 44 38 15 10
F +44 13 44 38 15 12
sales.uk@epcos.com

Asia

Afghanistan, Iran, Iraq, Jordan, Lebanon, Syria
EPCOS AG
Liaison Office
Istanbul/Turkey
T +90 216 5 69 81 01
F +90 216 4 64 07 56
sales.turkey@epcos.com

China
EPCOS (Shanghai) Ltd.
Shanghai
T +86 21 33 02 46 20
F +86 21 63 91 68 89
sales.cn@epcos.com

Hong Kong
EPCOS Limited
Hong Kong
T +85 2 31 01 56 00
F +85 2 31 01 56 46
sales.cn@epcos.com

India, Bahrain, Bangladesh, Kuwait, Nepal, Oman, Pakistan, Qatar, Saudi Arabia, Sri Lanka, United Arab Emirates
EPCOS India Private Ltd.
Bangalore
T +91 80 40 39 06 15
F +91 80 40 39 06 03
sales.in@epcos.com

Israel
Nisko Projects Electronics & Communications (1999) Ltd.
Tel Aviv
T +972 37 65 73 00
F +972 37 65 73 33
sales.israel@epcos.com

Japan
EPCOS KK
Yokohama
T +81 45 4 78 72 00
F +81 45 4 78 72 25
sales.jp@epcos.com

Korea
EPCOS Korea LLC
Seoul
T +82 2 21 56 68 18
F +82 2 21 56 68 98
sales.kr@epcos.com

Malaysia
EPCOS SDN. BHD.
Kuala Lumpur
T +60 3 79 60 81 80
F +60 3 79 60 81 82
sales.asean@epcos.com

Philippines
Siemens Inc.
EPCOS Division
Manila
T +63 2 8 78 94 41
F +63 2 8 78 94 40
sales.asean@epcos.com

Singapore, Indonesia, Thailand, Vietnam
EPCOS PTE LTD
Singapore
T +65 68 41 20 11
F +65 67 44 69 92
sales.asean@epcos.com

Taiwan
EPCOS Taiwan Co. Ltd.
Taipei
T +886 2 26 55 76 76
F +886 2 55 59 02 88
sales.tw@epcos.com

Americas

USA, Canada, Mexico
EPCOS, Inc.
Iselin, NJ, USA
T +1 732 9 06 43 00
F +1 732 9 06 43 95
sales.usa@epcos.com

South America
EPCOS do Brasil Ltda.
São Paulo
T +55 1 138 17 34 46
F +55 1 138 17 34 43
sales.br@epcos.com

Australia

Australia, New Zealand
Electronic Component Solutions Pty Ltd
Melbourne
T +61 3 85 61 19 99
F +61 3 95 74 70 55
sales.au@epcos.com

Africa

Republic of South Africa
Electrocomp (PTY) Ltd.
Sandton
T +27 11 458 90 00 32
F +27 11 458 90 34
sales.southernafrica@epcos.com

Egypt
Siemens Ltd.
EPCOS Division
Cairo
T +202 3 333 36 69
F +202 3 333 36 07
sales.egypt@epcos.com

Morocco, Tunisia
EPCOS SAS
Saint-Denis/France
T +33 1 49 46 67 89
F +33 1 49 46 67 67
sales.france@epcos.com

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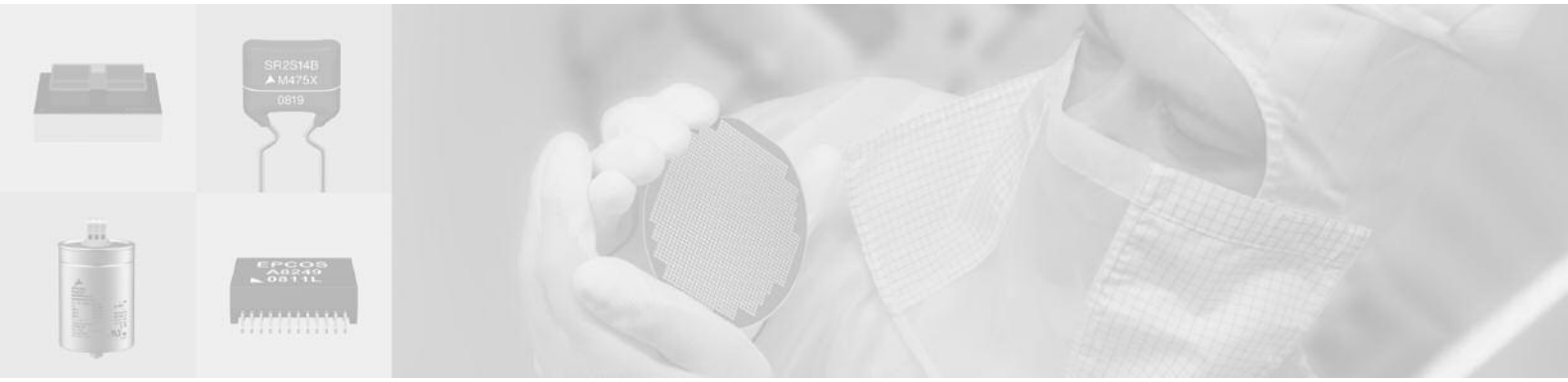

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