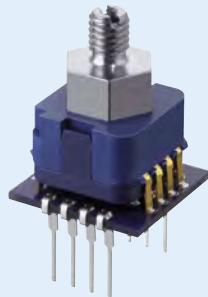




Application Guide 2011

Industrial Electronics

Electronic Components for Industrial Applications



Welcome to the World of Electronic Components, Modules and Systems



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.

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.

EPCOS Components for Industrial Applications

Special Features



Aluminum Electrolytic Capacitors

- High ripple current capability
- Operating temperature up to +140 °C
- Very low ESR and ESL
- Long useful life (> 20 years)
- Optimized thermal concept
- Special design for base cooling
- Self-extinguishing electrolyte upon request
- Compact can size

EMC Filters

- Wide current range of standard filters up to 2500 A
- Rated voltage up to 760 V AC and 2000 V DC
- Various terminal styles
- UL/CSA/ENEC approval
- Customer-specific solutions upon request
- EPCOS also runs its own accredited EMC laboratory in Regensburg/Germany which can perform all necessary tests and issue the documentation to obtain CE-conformity

Converter chokes and output filters

- Active front end chokes and dv/dt filters upon request
- Sine-wave filters
- SineFormer sine-wave EMC output filters for frequency converters supersede shielded motor cables

Ferrites

- Wide range of core shapes, sizes, materials and accessories
- Large-volume cores can be manufactured in customized shapes on special production equipment, such as a 400 t press

Film Capacitors (Medium Power)

- Long-term stability and reliability
- High peak and RMS current capability
- Very low ESR/ESL
- Overvoltage capability (self-healing)
- DC and AC voltage operation
- UL94V-0 epoxy and plastic resin sealing for boxed-types

Inductors

SIMID, power inductors

- High current handling capability
- Wide temperature range -55 °C to +150 °C
- Suppression of electromagnetic interference
- Energy storage in DC/DC converters
- Suitable for lead-free soldering profiles acc. to JEDEC J-STD 020C

Data and signal line chokes

- High rated currents
- Reduced components height
- Suitable for reflow soldering
- Qualified acc. to AEC-Q200

High current chokes

- High current handling capability
- High temperature stability
- Suppression of electromagnetic interference
- Energy storage in DC/DC converters

Powerline chokes

Common-mode chokes

- High current handling capability
- Housing design up to 16 A
- High temperature stability up to +125 °C
- Open design up to 62 A
- Voltages up to 690 V AC and 1000 V DC (DC link)
- Suppression of asymmetrical interference coupled onto lines
- Design complies with EN 60938-2

Differential-mode chokes

- High current handling capability
- High temperature stability
- Suppression of symmetrical interference coupled onto lines
- Double chokes: approx. 50% of rated inductance for common-mode interference suppression

EPCOS Components for Industrial Applications



Leaded RF/VHF chokes

- High current handling capability
- Wide temperature range
–55 °C to +125 °C
- Suppression of electromagnetic interference
- Energy storage in DC/DC converters

NTC Thermistors

- High measuring accuracy and long-term stability
- Fast response time
- Temperature measurement up to +300 °C
- Heat resistant and highly stable
- Rugged design
- Compact dimensions

PFC Capacitors & PFC Key Components

- Tuned and detuned PFC systems
- Harmonic filtering for 690/880 V grids
- Automatic PFC equipment and systems for reducing labor costs
- Additional key components for conventional PFC systems and harmonic filters

Power Capacitors

- Long life expectancy
- High capacitance stability
- Low ESR, ESL and R_{th} values
- High peak and RMS current capability
- For miniaturizing and system integration
- Solutions for traction up to automotive

Pressure Sensors

- Pressure sensing of gases (non-aggressive fluids upon request)
- Calibration and temperature compensation

PTC Thermistors

- Various PTC thermistors for limit temperature sensing, overcurrent protection and switching applications as well as inrush current limiting for DC-link capacitors

SAW Components

- Balanced and unbalanced operation possible
- High selectivity
- Extended operating temperature range –40 °C to +125 °C
- Qualified acc. to AEC-Q200

Surge Arresters

- Applicable as L-N and N-PE protection
- EN 61643-11 class I, II and III
- Very high discharge current
- High protection level
- Stable performance over useful life
- Very high insulation resistance

Transformers

- Current sense transformers
- High power density
- Operating temperature up to +155 °C
- High operating frequencies

Magnetics LAN modules, RJ45 Jacks

- Excellent electrical characteristics
- Extended temperature range –40 °C to +85 °C
- Compliant with IEEE 802.3

Varistors

- SMD varistors suitable for ESD protection and high energy absorption
- Leaded, strap, block and ThermoFuse varistors

EPCOS Components for Industrial Applications

Portfolio overview																
	Power supply & conversion				Power quality solutions				Ballast systems				Automation			
	Battery chargers	Frequency converters	Power supplies/switch mode power supplies (SMPS)	Uninterruptible power supplies (UPS)	Automated meter reading	Ground fault circuit interruptors	Power factor correction facilities	Surge protection modules	Electronic ballasts	Energy saving lamps	Magnetic ballasts	LED	Communication systems	Overcurrent and overvoltage protection	Pneumatic and hydraulic systems	Temperature measurement
Aluminum electrolytic capacitors																
Screw terminals		●	●	●												
4-pin snap-in terminals / solder pins		●	●	●												
Snap-in		●	●	●	●											
Single-ended	●	●	●	●	●				●	●		●				
Axial-lead								●								
EMC filters																
1-line filters			●													
2-line filters	●	●	●	●												
3-line filters	●	●	●	●												
4-line filters	●	●	●	●												
Converter chokes and output filters		●														
Ferrites																
E, ETD, EFD cores	●	●	●	●			●		●	●		●		●		
ELP, ER, EQ cores	●	●	●	●					●			●				
PQ cores	●	●	●	●												
U, PM cores	●	●	●	●												
RM cores	●	●	●	●												
Ring cores		●	●	●	●	●	●		●	●						
Film capacitors (medium power)																
MKP, MKT DC link		●										●				
MKP snubber (strap terminals)		●		●												
MKP PFC	●		●				●		●			●				
MKP, MFP for general purpose	●	●	●	●	●				●	●	●	●				
MKT AC heavy duty					●											
MKP AC filtering	●	●	●	●												
MKT	●		●						●	●		●				
X2, X1	●	●	●	●					●		●	●				
Y2, Y1	●	●	●	●					●			●				
Inductors																
SIMID 0603 ... 2220	●		●	●	●				●			●	●			
Power inductors	●		●	●	●											
Data and signal line chokes		●	●	●	●								●			
High current chokes	●		●	●	●											
Powerline chokes, common-mode (ring core)		●	●	●	●				●			●				
Powerline chokes, common-mode (D, U, FC, E core)			●		●				●			●				
Powerline chokes, differential-mode (I, ring core)			●		●		●									
Leaded RF chokes	●		●	●					●	●						
Leaded VHF chokes			●	●												






EPCOS Components for Industrial Applications

Portfolio overview															
	Power supply & conversion				Power quality solutions				Ballast systems				Automation		
	Battery chargers	Frequency converters	Power supplies/switch mode power supplies (SMPS)	Uninterruptible power supplies (UPS)	Automated meter reading	Ground fault circuit interruptors	Power factor correction facilities	Surge protection modules	Electronic ballasts	Energy saving lamps	Magnetic ballasts	LED	Communication systems	Overcurrent and overvoltage protection	Pneumatic and hydraulic systems
NTC thermistors															
V*	●	●	●	●	●				●	●	●				●
S8*, S9*, K1*, K2*, M8*	●	●	●	●	●			●	●	●	●	●			●
G15*	●	●	●	●											●
M703, M1703	●	●	●	●										●	●
K45	●	●	●	●											●
S1*, S2*, S3*, S4*	●	●	●	●				●	●	●					●
PFC capacitors & PFC key components															
MKV		●		●				●							
PhaseCap Premium		●		●				●							
PhaseCap Compact		●		●				●							
PhaseCap HD								●							
PhiCap				●				●							
PoleCap								●							
PFC key components								●							
Power capacitors															
MKK		●						●							
MKP		●	●	●											
MKV		●	●	●											
PCC		●													
Pressure sensors															
Pressure sensors														●	
PTC thermistors															
A641	●		●	●				●			●				●
D901			●	●							●				●
ICL PTC, leaded and housed		●	●	●									●		
Overcurrent protection, chip	●		●										●		
Overcurrent protection, leaded	●	●	●	●		●		●					●		
Lamp start switching PTC								●	●						
SAW components															
IF filters					●							●			
RF Front-end filters					●							●			





EPCOS Components for Industrial Applications

Portfolio overview																
	Power supply & conversion				Power quality solutions				Ballast systems			Automation				
	Battery chargers	Frequency converters	Power supplies/switch mode power supplies (SMPS)	Uninterruptible power supplies (UPS)	Automated meter reading	Ground fault circuit interruptors	Power factor correction facilities	Surge protection modules	Electronic ballasts	Energy saving lamps	Magnetic ballasts	LED	Communication systems	Overcurrent and overvoltage protection	Pneumatic and hydraulic systems	Temperature measurement
Surge arresters																
H3, L1							●							●		
V1	●			●			●							●		
A8 ... XP, A81			●	●			●						●	●		
M5 ... XP							●	●						●		
EF	●		●	●	●									●		
EM			●	●				●								
T8, T8 with failsafe					●								●			
Transformers																
EE4.2, EE5.0, EE12.6			●	●										●		
EP5		●	●	●												
EV15 ... EV25			●	●	●			●			●					
EFD15 ... EFD30			●	●	●			●			●					
EF13 ... EF32	●	●	●	●	●			●	●		●					
ER11 ... ER14.5			●	●	●											
EF6.3 ... EF16			●	●	●											
EHP16, EHP19			●	●	●											
Magnetic LAN modules		●	●	●	●											
RJ45 Jacks		●	●	●	●											
Varistors																
MLV, CeraDiodes 0201 ... 2220	●				●			●	●		●	●				
CU varistors			●		●	●		●						●		
S05 ... S20	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
S25		●	●	●	●		●	●								
Q14, Q20		●	●	●	●		●	●						●		
LS40 ... LS42							●									
B32 ... B80		●	●	●			●									
ETFV14 ... ETFV25		●	●	●	●	●	●	●						●		

EPCOS Components for Industrial Applications

Characteristics			
Series	Technical data	Features	Ordering code / Type
Aluminum electrolytic capacitors			
Screw terminals	 <p>Low voltage V_R: 16 ... 100 V DC C_R: 1 500 ... 680 000 μF Useful life up to +125 °C, 2 500 h +105 °C, 10 000 h +85 °C, 12 000 h</p> <p>High voltage V_R: 200 ... 550 V DC C_R: 560 ... 33 000 μF Useful life up to +105 °C, 8 000 h +85 °C, 15 000 h</p>	High ripple current capability Long useful life (> 20 years) Compact can size Special design for base cooling Self-extinguishing electrolyte upon request	B41550/B41570 B41554 B41456/B41458 B41560/B41580 B43464/B43484 B43455/B43457 B43456/B43458 B43740/B43760 B43564/B43584 B43750/B43770
4-pin snap-in terminals / solder pins	 <p>High voltage V_R: 350 ... 500 V DC C_R: 390 ... 2 700 μF Useful life up to +105 °C, 3 000 h +85 °C, 12 000 h</p>	High ripple current capability Long useful life (> 20 years) Compact can size	B43510/B43520 B43511/B43521 B43515/B43525
Snap-in	 <p>Low voltage V_R: 10 ... 100 V DC C_R: 820 ... 68 000 μF Useful life up to +105 °C, 5 000 h +85 °C, 2 000 h</p> <p>High voltage V_R: 160 ... 500 V DC C_R: 47 ... 3 300 μF Useful life up to +105 °C, 5 000 h +85 °C, 10 000 h</p>	High ripple current capability Long useful life (> 20 years) Compact can size Special design for base cooling	B41231 B41252 B41505/B43505 B43305 B43501 B43504 B43508 B43540 B43543 B43601
Single-ended	 <p>Low voltage V_R: 10 ... 100 V DC C_R: 22 ... 10 000 μF Useful life up to +105 °C, 2 000 h / 15 000 h</p> <p>High voltage V_R: 160 ... 450 V DC C_R: 1.0 ... 150 μF Useful life up to +140 °C, 1 000 h +125 °C, 2 000 h / 5 000 h +105 °C, 2 000 h / 15 000 h</p>	Low impedance at high frequency Different terminal configurations Compact design	B41858 B41859 B41888 B41890 B43082 B43086 B43088 B43866 B43867 B43890
Axial-lead	 <p>High voltage V_R: 450 V DC C_R: 6.8 ... 47 μF Useful life up to +105 °C, 15 000 h</p> <p>High voltage capability up to 500 V DC / +105 °C / 10 000 h 550 V DC / +85 °C / 5 000 h</p>	High ripple current capability Long useful life Low ESR at high temperatures	B43697 B43698 B43699









EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
EMC filters				
1-line filters Feedthrough capacitors Feedthrough filters		V_R : 75 ... 600 V AC / V DC I_R : 16 ... 500 A Feedthrough capacitors C_R : 0.00125 ... 4.7 μ F Feedthrough filters C_R : 0.0025 ... 2 x 4.7 μ F	MKP technology (dry, self-healing) Solderless production technology Terminals as axial leads, screw connectors, soldering tags or tab connectors Metal case, polyurethane potting (UL 94 V-0)	B85121 B85321
2-line filters		V_R : 250 ... 520 V AC V_R : 250 ... 2 000 V DC I_R : 0.5 ... 1 000 A	Suppression of differential and common-mode disturbances Modular SIFI filter system with various cases and insertion loss performances Medical versions with very low leakage current 1 or 2 stage filters Ambient temperature up to +100 °C Filters for traction applications and frequency converters Filters for PCB mounting	B84110 B84111F ... B84112G ... B84113H ... B84142A****R ... B84142A****S ...
3-line filters		V_R : 440 ... 760 V AC I_R : 6 ... 2 500 A	Main filters for 3-phase applications with symmetrical load Optimized leakage current Book size or compact filters B84143A****R106 for short motor cable lengths B84143A****R105 for converter applications with medium motor cable lengths B84143D****R127 for long motor cable lengths up to 300 m *S80/*S81 for high currents and short motor cable lengths *S20/S21/S24 for high currents on long motor cable lengths B84143A****R410 for regenerative units (Active Front End Converters) with high saturation-proof chokes	B84143
4-line filters		V_R : 440 ... 530 V AC I_R : 6 ... 600 A	For 3-phase applications with unsymmetrical load, space saving design B84108: chassis filters B84131: for power supplies B84144A****R120 with terminal blocks B84144B****S120 with busbars, standard performance B84144B****S121 with busbars, extended performance	B84108 B84131 B84144









EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
EMC filters				
Converter chokes		V_R : 520 ... 760 V AC I_R : 6 ... 1 500 A	Line reactors dv/dt chokes DC chokes	B86301U****R000 B86301U****S000 B86304L****R000 B86304L****S000
Output filters Sine-wave EMC output filters (SineFormer)		V_R : 440 ... 760 V AC I_R : 6 ... 1 500 A Clock frequency 2.5 ... 16 kHz	dv/dt filters Sine-wave output filters Low-cost sine-wave output filters Sine-wave EMC output filters (SineFormer) 520 V AC (R127 series) 760 V AC (R290 series)	B84143U****R000 B84143U****S000 B84143V****R027 B84143V****R127 B84143V****R227 B84143V****R290
Ferrites				
E cores ETD cores EFD cores		Material: N30, N87, N97 A_L : 69 ... 9 700 nH	Wide range of core shapes, sizes and accessories available	E5 ... E80 ETD29 ... ETD59 EFD15 ... EFD30
ELP cores ER cores EQ cores		Material: N49, N87, N92, N97 A_L : 160 ... 5 000 nH	Flat mounting height Board integrated	ELP14 ... ELP64 ER9.5 ... ER32 EQ13 ... EQ30
PQ cores		Material: N49, N87, N92, N95, N97 A_L : 1 900 ... 7 600 nH	Compact design Ferrite cores for power transformers and chokes	PQ16 ... PQ35
U cores PM cores		Material: N27, N87 A_L : 250 ... 16 000 nH	Maximum transmissible power Maximum magnetic cross section Large volume cores Accessories for PM cores available	U93 ... U126 PM50 ... PM114
RM cores		Material: N49, N87, N97 A_L : 250 ... 6 000 nH	Without center hole Compact design Accessories available	RM6 ... RM14
Ring cores		Material: N30, N87, T35, T37, T38 A_L : 560 ... 13 900 nH	Epoxy-coated ring cores are standard	R9.53 ... R202















EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
Film capacitors (medium power)				
MKP DC link		V_R : 450 ... 1 300 V DC C_R : 1.5 ... 110 μ F	High-density series, compact Operating temperature up to +105 °C Useful life 100 000 h at 1.0 · V_R , +70 °C High vibration resistance due to 4-pin terminals 2- and 4-pin versions Lead spacing 27.5 ... 52.5 mm	B32774 ... B32778
		V_R : 450 ... 1 050 V DC C_R : 0.47 ... 60 μ F	High power: higher RMS current capability than B3277x Operating temperature up to +105 °C Useful life 100 000 h at 1.0 · V_R , +70 °C High vibration resistance due to 4-pin terminals 2- and 4-pin versions Lead spacing 27.5 ... 52.5 mm	B32674 ... B32678
MKT DC link		V_R : 63 ... 400 V DC C_R : 1 nF ... 200 μ F	Low voltage DC-link applications Operating temperature up to +125 °C Useful life 200 000 h at 1.0 · V_R , +70 °C	B32520 ... B32529
MKP snubber with strap terminals	 	V_R : 850 ... 2 000 V DC C_R : 0.047 ... 3.3 μ F V_R : 1 000 ... 2 000 V DC C_R : 0.022 ... 68 μ F	Operating temperature up to +110 °C Service life 200 000 h at 1.0 · V_R , +85 °C Seven different terminal versions High dv/dt and current/frequency capability	B32656S ... B32686S ...
MKP AC filtering		V_{RMS} : 250 ... 400 V AC C_R : 0.82 ... 75 μ F	Operating temperature up to +105 °C Output AC filtering Optimized AC voltage performance with small dimensions High ripple current/frequency capability	B32794 ... B32798
MKP PFC	 	V_R : 450 ... 630 V DC C_R : 0.010 ... 2.2 μ F	Operating temperature up to +125 °C Specially designed for PFC stage Lead spacing 10 ... 22.5 mm	B32671Z ... B32673Z ... B3261XP4 ...

EPCOS Components for Industrial Applications

Characteristics			
Series	Technical data	Features	Ordering code / Type
Film capacitors (medium power)			
MKP general purpose	 VR: 250 ... 2 000 V DC CR: 1 nF ... 8.2 μF	Operating temperature up to +105 °C For snubber, resonant and switching Possibility of AC and/or DC operation High dv/dt and RMS current capability Lead spacing 10 ... 37.5 mm	B32651 ... B32656 B32671L ... B32672L
MFP	 VR: 630 ... 3 000 V DC CR: 0.47 nF ... 0.47 μF	Operating temperature up to +110 °C High dv/dt Lead spacing 15 ... 37.5 mm	B32632 ... B32634 dipped B32686A ... boxed
MKT	 VR: 63 ... 630 V DC CR: 1 nF ... 33 μF	Operating temperature up to +125 °C High dv/dt Miniaturized versions Lead spacing 7.5 ... 27.5 mm	B3256 ... B3257 ...
MKT AC heavy duty	 VRMS: 305 V AC CR: 47 nF ... 10 μF	+85 °C/85% RH/1 000 h/240 V AC X2 safety class per UL/IEC (C ≤ 2.2 μF) High stability on capacitance	B32931 ... B32936
X2	 VRMS: 305 V AC CR: 10 nF ... 45 μF	X2 (2 500 V) class for interference suppression and EMC Approved acc. to international standards Lead spacing 10 ... 52.5 mm	B32921 ... B32928
X1	 VRMS: 330 V AC CR: 10 nF ... 6.8 μF	X1 (4 000 V) class for interference suppression and EMC Approved acc. to international standards Across the line connection Lead spacing 10 ... 37.5 mm	B32911 ... B32916
Y2	 VRMS: 300 V AC CR: 1 nF ... 1 μF	Y2 (8 000 V) class for interference suppression and EMC Approved acc. to international standards Line to ground connection Lead spacing 10 ... 37.5 mm	B32021 ... B32026
Y1	 VRMS: 250 V AC CR: 1 nF ... 22 nF	Y1 (8 000 V) class for interference suppression and EMC Approved acc. to international standards Line to ground connection Lead spacing 15 ... 22.5 mm	B81123

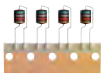


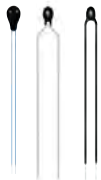

EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
Inductors				
SIMID 0603 ... 2220 SMD	 	L _R : 1 nH ... 10 mH I _R : up to 3.5 A	Laser-welded, molded High current handling capability	B82422 B82432 B82442 B82496C ... B82498F ...
Power inductors SMD	 	L _R : 0.82 ... 1 000 µH I _R : up to 11 A	Shielded and unshielded versions Low-profile versions down to 1 mm height High current handling capability Low DC resistance	B8246 ... B8247 ...
Data and signal line chokes SMD		L _R : 0.005 ... 4.7 mH I _R : 0.4 ... 1.2 A	Suppression of asymmetrical interference coupled in on lines, whereas data signals up to several MHz can pass unaffectedly	B82793C ...
High current chokes, helically wound SMD		L _R : 0.00044 ... 0.01 mH I _R : 12 ... 71 A	Highly rated current Very low DC resistance Very low profile and smallest possible footprint helically wound Suitable for pick and place processes	B82559
Ring core chokes, double SMD	    	L _R : 0.19 ... 100 mH I _R : 0.25 ... 62 A V _R : 250 ... 300 V AC 250 ... 1 000 V DC (DC link)	High resonance frequency owing to special winding technique Approx. 1% stray inductance for symmetrical interference suppression Plastic case with terminals Higher current chokes on baseplate, winding wire serves as solder terminal	B8272 ... B82791H2 ... B82791G2 ...
D core chokes	 	L _R : 3.3 ... 100 mH I _R : 0.35 ... 4.6 A	High resonance frequency due to 2-section winding Approx. 1% stray inductance for symmetrical interference suppression Low leakage due to closed core shape High pulse strength Low whirring noise Low-height horizontal versions	B82731H ... B82731M ... B83732R ... B83732W ... B82734R ... B82734W ...
U core chokes		L _R : 0.33 ... 15 mH I _R : 0.4 ... 2.6 A	High resonance frequency Approx. 1.3% stray inductance for symmetrical interference suppression Low whirring noise Low saturation effects 300 V AC rated voltage Low-height horizontal versions feasible on request Compact size	B82730U3 ...







EPCOS Components for Industrial Applications

Characteristics			
Series	Technical data	Features	Ordering code / Type
Inductors			
Framecore chokes (FC) 	L_R : 10 ... 100 mH I_R : 0.45 ... 2.3 A	Closed magnetic circuit with frame construction 4-section winding Approx. 2% stray inductance, excellent differential mode suppression High pulse-handling capability Low height allows usage in lamp ballasts Optional: magnetic bypass to increase stray inductance	B82732F ... B82733F ...
E core chokes 	L_R : 3.3 ... 100 mH I_R : 0.3 ... 1.8 A	High resonance frequency due to 2-section winding Approx. 2% stray inductance for symmetrical interference suppression High pulse strength Low whirring noise	B82731T ...
Ring core chokes, triple/quad    	L_R : 0.12 ... 6 mH I_R : 6 ... 200 A	High power handling Available in plastic or aluminum case (fully potted) or on baseplate	B8274 ... B8276 ...
I core chokes  	L_R : 0.015 ... 82 mH I_R : 0.2 ... 82 A	Low power dissipation Broadband interference suppression Core: laminated iron-silicon Compact design	B82502 ... B82523
Ring core chokes  	L_R : 0.025 ... 40 mH I_R : 0.3 ... 10 A	Iron powder core Single and double chokes High thermal stability due to complete potting High differential attenuation at low frequencies	B8261 ... B8262 ...






EPCOS Components for Industrial Applications

Characteristics			
Series	Technical data	Features	Ordering code / Type
Inductors			
Leaded RF chokes	 <p>L_R: 0.1 μH ... 100 mH I_R: up to 2.5 A</p>	High current handling capability Low DC resistance Very good saturation characteristics Axial and radial leaded versions	B781 ... B8214 ...
Leaded VHF chokes			 <p>L_R: 1 ... 39 000 μH I_R: up to 10 A</p>
NTC thermistors			
V2 V3 V4 SMD	 <p>Temperature range: -55 ... +125 °C (+150 °C upon request) Rated resistance at 25 °C: 47 Ω ... 470 kΩ Resistance tolerance: ± 3, ± 5%; ± 1% Case sizes: 0402/0603/0805</p>	Wide range of resistances and tolerances Multilayer SMD NTC with inner electrodes Very good aging stability in high-temperature environment Very good resistance stability during soldering (change < 1%)	B572**V ... B573**V ... B574**V ...
S86 S87 S88 S964 K1150 K220	 <p>Temperature range: -55 ... +155 °C Rated resistance at 25 °C: 2 ... 100 kΩ Resistance tolerance: ± 1 ... ± 5 %</p>	Nonstandard lead configurations Taped versions for automatic processing Lead spacing 2.5 and 5.0 mm (S87, S88) UL approval (S86) Leadless types (K1150, K220)	B5786*S ... B5787*S ... B5788*S ... B57962S ... B57150K1 ... B57220K ...
M891	 <p>Temperature range: -40 ... +125 °C Rated resistance at 25 °C: 1 ... 470 kΩ Resistance tolerance: ± 5, ± 10 %</p>	Wide resistance range Lead spacing 2.5 mm Taped versions for automatic processing Cost-effective	B57891M ...






EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
NTC thermistors				
G1540 G1550 G1560		Temperature range: -55 ... +300 °C (G1540: +250 °C) Rated resistance at 25 °C: 2 ... 1 400 kΩ Resistance tolerance: ±1 ... ±5% Head diameter (max.): 0.9 ... 2.5 mm	High-temperature resistant Short response time Small head diameters Nonstandard wire configurations	B57540G ... B57550G ... B57560G ...
G1541 G1551 G1561 G1565		Temperature range: -55 ... +260 °C (G1541: +250 °C) Rated resistance at 25 °C: 10 kΩ Resistance tolerance: ±1 ... ±5 % Insulation resistance: > 100 MΩ 500 V DC (1s)	High-temperature resistant Insulated wires with high insulation voltage Nonstandard wire configurations	B57541G ... B57551G ... B57561G ...
M703		Temperature range: -55 ... +125 °C Rated resistance at 25 °C: 5 ... 30 kΩ Resistance tolerance: ±2%	Easy mounting Good thermal coupling through metal-tag UL approval (E69802)	B57703M0103G040 B57703M0303G040 B57703M0502G040
M1703		Temperature range: -20 ... +300 °C Rated resistance at 25 °C: 10 ... 100 kΩ Resistance tolerance: ±2, ±3%	High-temperature resistant Easy mounting Good thermal coupling through metal-tag	B57703M1103A001 B57703M1104A001
K45		Temperature range: -55 ... +125 °C Rated resistance at 25 °C: 1 ... 150 kΩ Resistance tolerance: ±10%	Electrically isolated aluminum case Tinned copper leads Good thermal coupling through case Cost effective	B57045K0102K000 B57045K0222K000 B57045K0472K000 B57045K0682K000
Inrush current limiters S153 S235 S236 S237 S238 S364 S464		Rated resistance at 25 °C: 1 ... 80 Ω I _{max} : up to 20 A V _{RMS} : 265 V	Limiting of inrush current Taped versions for automatic processing UL approval (E69802) High accuracy and easy mounting Lead spacing 5 and 7.5 mm	B57***S***M ...








EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
PFC capacitors & PFC key components				
PhaseCap Premium		Q_R : 5 ... 33 kvar V_R : 230 ... 800 V AC f_R : 50/60 Hz MKK-technology Extruded aluminum can with stud Concentric winding Optimized capacitor safety terminal Ceramic discharge resistor premounted up to 690 V; external discharge module for 765 and 800 V	High pulse current withstand capability up to $300 \times I_R$ Triple safety system: self healing, overpressure disconnecter, dry technology Mean life expectancy up to 180 000 h @ temp. class -40/C Certificates: cUL file E238746 up to 690 V; GOST	B25667C ...
PhaseCap Compact		Q_R : 5 ... 33 kvar V_R : 230 ... 1 000 V AC f_R : 50/60 Hz MKK-technology Extruded aluminum can with stud Concentric winding Optimized capacitor safety terminal Ceramic discharge resistor premounted	High pulse current withstand capability up to $400 \times I_R$ Dual safety system: self healing, overpressure disconnecter Mean life expectancy up to 200 000 h @ temp. class -40/C	B25673A ... B25673S ...
PhaseCap HD		Q_R : 40 ... 60 kvar V_R : 400 ... 525 V AC f_R : 50/60 Hz MKK-technology Extruded aluminum can with stud Stacked winding SIGUT™ safety terminal Ceramic discharge resistor premounted	High pulse current withstand capability up to $300 \times I_R$ Triple safety system: self healing, overpressure disconnecter, dry technology Mean life expectancy up to 180 000 h @ temp. class -40/C Certificates: GOST	B25669
PhiCap		Q_R : 0.5 ... 30 kvar V_R : 230 ... 525 V AC f_R : 50/60 Hz MKP-technology Extruded aluminum can with stud Stacked winding Optimized capacitor safety terminal for B32344-series; fast-on terminals for B32340- and B32343-series Ceramic discharge resistor premounted for B32344 series; included in the delivery for other series	High pulse current withstand capability up to $200 \times I_R$ Dual safety system: self healing, overpressure disconnecter Mean life expectancy up to 135 000 h @ temp. class -40/C Certificates: cUL file E106388; CSA file C22.2 N° 190 MC 236094 (up to \varnothing 85 mm); GOST	B32340C ... B32343C ... B32344E ...
MKV		Q_R : 4.2 ... 30 kvar V_R : 400 ... 800 V AC f_R : 50/60 Hz MKV-technology Extruded aluminum can with stud Stacked winding SIGUT™-terminal Discharge-module pre-mounted	High pulse current withstand capability up to $500 \times I_R$ Dual safety system: self healing, overpressure disconnecter Mean life expectancy up to 300 000 h @ temp. class -40/D For ambient temperatures up to +70 °C Certificates: GOST	B25836








EPCOS Components for Industrial Applications

Characteristics				
Series	Technical data	Features	Ordering code / Type	
PFC capacitors & PFC key components				
PoleCap MKK/MKP	 <p>V_R: 400, 440, 525 V Q_R: 0.5 ... 30 kvar f_R: 50/60 Hz</p> <p>MKP- and MKK-technology Dielectric: polypropylene film Extruded aluminum can with stud Excellent heat dissipation due to single-housing concept</p>	<p>Pole mounting Outdoor application Suitable for applications with high dust or moisture concentration Provided with fault identification, visible from the ground Certificates: GOST</p>	B25671A ...	
PF controllers BR604 and BR6000 series	 <p>Supply voltage: BR604 – 230 V AC BR6000 – 110 ... 230 V AC</p> <p>Measuring voltage: BR604 – 230 V AC BR6000 – 30 ... 525 V AC (L-N or L-L)</p> <p>Output stages: BR604 – 4 steps BR6000 – 6 and 12 steps</p> <p>f_R: 50/60 Hz</p> <p>Interface for BR6000-R12/S485 20 control series preset and control editor for free programming</p>	<p>Intelligent control behaviour Plain language menu: BR604 – DE/E/ES/PT BR6000 – CZ/DE/E/ES/F/NL/PL/PT/RU/TR</p> <p>Version BR6000-T for dynamic compensation Version BR6000-R6T6 for mixed compensation Version BR6000-HD for temperature range –40 ... +80 °C Windows software BR7000-SOFT included</p>	B44066R6 ...	
PF controller BR7000	 <p>Supply voltage: 110 ... 230 V AC</p> <p>Measuring voltage: 3 x 40 ... 440 V AC (L-N) 50 ... 760 V AC (L-L)</p> <p>f_R: 50/60 Hz</p>	<p>Output stages: 15 switching outputs for switching of 1- or 3-phase capacitors 2 independent isolated RS485-interfaces Usage as controller and as grid measuring tool Plain language menu in DE/E/ES/RU/TR Windows software BR7000-SOFT included</p>	B44066R7415E230	
MMI6000	 <p>Supply and measuring voltage: 230 V AC</p> <p>f_R: 50/60 Hz</p> <p>Power consumption: < 4 VA</p> <p>Output capacity: MMI6000-R – 250 V AC, 1 000 W MMI6000-T – 60 V DC, 150 mA</p> <p>Interface RS485 included Plain language menu DE/E</p>	<p>Coupling with PF controller via interface Processing of measured data via PC Version MMI6000-R with standard relay Version MMI6000-T with optocoupler</p>	B44066M6000E230 Standard version B44066M6100E230 Dynamic version	
MMI7000	 <p>Operating voltage: 110 ... 230 V AC ±15%</p> <p>Measuring voltage (3-phase): 3 x 30 ... 440 V AC (L-N), 3 x 50 ... 760 V AC (L-L)</p> <p>f_R: 50/60 Hz</p> <p>Power consumption: < 5 VA</p> <p>Output capacity (relay): 250 V AC, 1 000 W (version MMI7000-E only)</p> <p>Interface RS485 (optional) Graphical menu (DE/E/ES/RU/TR)</p>	<p>Three-phase measuring and display of V, I, P, Q, S, cos-φ, f, W, T, THD-V, THD-I Display of harmonics (of voltage and current up to 51st) as bar chart Oscilloscope mode: for graphic display of a complete oscillation incl. harmonics Programmable display editor Scan mode for rotating display of selected values Display and recording of minimum and maximum values with time stamp Panel mounting instrument</p>	B44066M7100E230 MMI7000-B (basic version) B44066M7200E230 MMI7000-S (incl. 2 interfaces RS485) B44066M7300E230 MMI7000-E (extended version)	


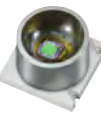





EPCOS Components for Industrial Applications

Characteristics			
Series	Technical data	Features	Ordering code / Type
PFC capacitors & PFC key components			
Capacitor contactors	 <p>Q_R: 12.5 ... 100 kvar V_R: 400 ... 690 V f_R: 50/60 Hz</p> <p>AC6b utilization category for J110/J230-series</p>	<p>Series J110/J230 for PFC systems without reactors; coil voltage 230 resp. 110 V</p> <p>Series N110/N230 for PFC systems with reactors only; coil voltage 230 resp. 110 V</p> <p>Certificates: CCC up to 75 kvar; cUL file 224924</p>	<p>B44066S****J110/N110 B44066S****J230/N230</p>
Thyristor modules TSM-series	 <p>Q_R: 12.5 ... 100 kvar V_R: 3 x 400 V TSM-LC-series 3 x 690 V TSM-HV series f_R: 50/60 Hz</p> <p>Fast electronically controlled self-observing thyristor-switches for dynamic PFC</p> <p>Switching of capacitors within 5 milliseconds</p>	<p>Easy installation</p> <p>Display of various system parameters</p> <p>For usage with dynamic PF-controller BR6000-T series</p>	<p>B44066T****E402 B44066T****E690</p>
Harmonic filter reactors	 <p>Q_R: 10 ... 100 kvar V_R: 400 and 440 V (other voltages on request) f_R: 50 or 60 Hz</p> <p>Detuning factor: 5.67%, 7% and 14%</p> <p>High harmonic loading capability</p> <p>Temperature protection by microswitch (NC)</p> <p>Low noise emission</p>	<p>Easy installation</p> <p>Ambient temperature +40 °C</p> <p>High linearity to avoid choke tilt</p>	<p>B44066D ...</p>
Grid Analysis Tool MC7000-3	 <p>Measuring voltage (3-phase): 3 x 30 ... 440 V AC (L-N) 3 x 50 ... 760 V AC (L-L)</p> <p>Measuring current (3-phase): 30, 300, 3 000 A</p>	<p>3-phase measuring device for measuring, display and storage</p> <p>Easy to use in the field</p> <p>Light weight compact suitcase</p> <p>Power consumption < 5 A</p> <p>Plain language menu DE/E/ES/RU/TR</p> <p>Numerous accessories included</p>	<p>B44066M7777E230</p>
Power capacitors			
MKK DC MKK DCI MKK DCR PCC HP	 <p>V_R: 700 ... 6 000 V C_R: 100 ... 30 000 µF</p>	<p>DC link and series resonant circuits</p> <p>Discharge</p> <p>IGBT converters</p> <p>Impulse applications</p>	<p>B25640 B25650 B25655 B25750</p>
MKK PCC LP	 <p>V_R: 300 ... 1 400 V C_R: 50 ... 2 000 µF</p>	<p>DC link for converters</p> <p>Hybrid and electrical vehicles</p>	<p>B25655</p>
MKK HP	 <p>V_R: 250 ... 1 000 V AC C_R: 100 ... 3 x 1 000 µF</p>	<p>Single- or three-phase AC filtering</p> <p>Output filters for drives or auxiliary converters</p>	<p>B25610</p>



EPCOS Components for Industrial Applications

Characteristics			
Series	Technical data	Features	Ordering code / Type
Power capacitors			
MKP AC	 VR: 350 ... 680 V AC CR: 3 ... 600 µF	UPS and general AC applications	B3236 ...
MKP DC	 VR: 880 ... 1 980 V DC CR: 30 ... 1 500 µF	DC link for converters	B2562 ...
MKV	   VR: 500 ... 2 100 V CR: 1 ... 220 µF	General AC applications Damping Commutation	B25834 B25835 B25856
Pressure sensors			
CAU pressure transmitters (voltage output)	 Pressure: 0 ... 25.0 bar gauge Other pressure ranges on request Supply voltage: 7.5 ... 30.0 V Output voltage: 0.5 ... 4.5 V Pressure interface: thread G 1/8", 6.5 mm long Electrical connector: M12 Total length without cable: approx. 66 mm Cable length: 2 m Case diameter: 22 mm	Pressure sensing of gases (non-aggressive fluids on request) Silicon diaphragm Stainless steel case Calibration and temperature compensation with special signal conditioning	B58621H5810A023 B58621H5810A024 B58621H5810A025 B58621H5810A026 B58621H5810A027 B58621H5810A028 B58621H5810A029 B58621H5810A030
CAU pressure transmitters (current output)	 Pressure: 0 ... 25.0 bar gauge Other pressure ranges on request Supply voltage: 10.0 ... 30.0 V Output current: 4 ... 20 mA Pressure interface: thread G 1/8", 6.5 mm long Electrical connector: M12 Total length without cable: approx. 66 mm Cable length: 2 m Case diameter: 22 mm	Pressure sensing of gases (non-aggressive fluids on request) Silicon diaphragm Stainless steel case Calibration and temperature compensation with special signal conditioning	B58621H5820A040 B58621H5820A041 B58621H5820A042 B58621H5820A043 B58621H5820A044 B58621H5820A045 B58621H5820A046 B58621H5820A047








EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
Pressure sensors				
AC pressure transmitters (voltage output)		Pressure: 0 ... 25.0 bar gauge Other pressure ranges on request Supply voltage: 4.75 ... 5.5 V Output voltage: 0.5 ... 4.5 V Pressure interface: thread M5 (tube fitting on request) Dual-in-line package for PCB mounting 18 x 18 x 22 mm	Pressure sensing of gases (non-aggressive fluids on request) Silicon diaphragm Plastic housing Calibration and temperature compensation with special signal conditioning	B58621K1510A062 B58621K1510A063 B58621K1510A064 B58621K1510A065 B58621K1510A066 B58621K1510A067 B58621K1510A068 B58621K1510A069
ASB miniaturized barometric pressure transmitters (voltage output) SMD		Pressure: 0 ... 1.2 bar absolute Supply voltage: 2.7 ... 5.5 V Output voltage: 0 ... 1 V or ratiometric (10% ... 90% of supply voltage) SMT-mountable 4 x 4 x 3 mm	Pressure sensing of gases (non-aggressive fluids on request) Silicon diaphragm Gel protected Calibration and temperature compensation with special signal conditioning	B58620A010A001 B58620A010A002
MiniCell pressure transmitters (voltage output)		Pressure: -0,5 ... 2.5 bar differential (other pressure ranges on request) Supply voltage: 4.75 ... 5.5 V Output voltage: 0.5 ... 4.5 V Pressure interface: adaptable pressure ports Electrical connector: soldering pads Dimensions: 20 x 16 x 11 mm	Differential pressure sensing of aggressive fluids and gases High alloyed steel diaphragms at each pressure port Miniaturized integrated ceramic package Calibration and temperature compensation with special signal conditioning	Upon request
PTC thermistors				
Limit temperature sensor, chip A641 SMD		Sensing temperature: 75 ... 145 °C in steps of 10 °C R_R : 470 Ω Tolerances: ± 5 °C	EIA 0603 Lead-free tinned terminations	B59641A ...
Temperature sensor probe D901		Sensing temperature: 60 ... 130 °C in steps of 10 °C R_R : ≤ 100 Ω	Sensor with epoxy resin coating Metal tag for easy mounting Good thermal contact Short response time	B59901D ...
Inrush current limiter		R_R : 20 Ω , V_{max} : 550 V R_R : 56 Ω , V_{max} : 650 V	Self-protecting in case of malfunction of short-circuit relay or internal short circuit of capacitor For high pulse currents and a high number of operating cycles Inrush current limiters are not damaged when directly connected to V_{max} even without additional current limitation	B59201J0140B010
ICL PTC, leaded and housed		R_R : 100 Ω , V_{max} : 800 V R_R : 22 Ω , V_{max} : 360 V R_R : 56 Ω , V_{max} : 620 V R_R : 100 Ω , V_{max} : 800 V R_R : 25 Ω , V_{max} : 360 V R_R : 50 Ω , V_{max} : 360 V R_R : 80 Ω , V_{max} : 360 V R_R : 120 Ω , V_{max} : 620 V R_R : 150 Ω , V_{max} : 620 V R_R : 500 Ω , V_{max} : 800 V R_R : 120 Ω , V_{max} : 620 V R_R : 56 Ω , V_{max} : 620 V		B59202J0135B010 B59204J0130B010 B59105J0130A020 B59107J0130A020 B59109J0130A020 B59750B0120A070 B59751B0120A070 B59752B0120A070 B59753B0120A070 B59754B0120A070 B59755B0115A070 B59412C1130B070 B59451C1130B070







EPCOS Components for Industrial Applications

Characteristics				
Series	Technical data	Features	Ordering code / Type	
PTC thermistors				
Overcurrent protection, chip SMD		R _R : 27 Ω, V _{max} : 30 V, EIA 1210	Lead-free tinned termination Short response time	B59606A0110A062
		R _R : 55 Ω, V _{max} : 30 V, EIA 1210		B59607A0120A062
		R _R : 125 Ω, V _{max} : 80 V, EIA 1210		B59707A0120A062
		R _R : 400 Ω, V _{max} : 265 V, EIA 1210		B59807A0090A062
		R _R : 1 500 Ω, V _{max} : 400 V, EIA 1210		B59907A0120A062
		R _R : 220 Ω, V _{max} : 60 V, EIA 0603		B59622A0090A062
		R _R : 470 Ω, V _{max} : 80 V, EIA 0603		B59623A0090A062
Overcurrent protection, leaded		Various rated resistance versions available V _{max} : up to 1 000 V	Broad product range UL approval VDE approval	B404, B406 B750 ... B774 C810 ... C890 C884 ... C886
Lamp start switching PTC		Various rated resistance versions available V _{max} : up to 550 V	Broad product range Customized designs upon request	C1118 C1119 S1076 S1082 S1097
SAW components				SMD
IF filters		Center frequency: 315.00 MHz Usable bandwidth: 1.0 MHz	ELPAS passivation for particle protection and against aging Filter curve with steep skirts protects the IC and LNA from adjacent high power radio frequency activities (e.g. base stations) Qualified acc. to AEC-Q200	B39321B3722U410
RF Front-end filters		Center frequency: 400.00 MHz Usable bandwidth: 0.25 MHz		B39401B3742H110
		Center frequency: 433.92 MHz Usable bandwidth: 1.6 MHz		B39431B3721U410
		Center frequency: 433.92 MHz Usable bandwidth: 0.36 MHz		B39431B3740H110
		Center frequency: 460.00 MHz Usable bandwidth: 20.0 MHz		B39461B3590Z810
		Center frequency: 866.50 MHz Usable bandwidth: 7.0 MHz		B39871B3717U410
		Center frequency: 868.30 MHz Usable bandwidth: 0.60 MHz		B39871B3744H110
		Center frequency: 869.00 MHz Usable bandwidth: 2.0 MHz		B39871B3725U410
		Center frequency: 869.00 MHz Usable bandwidth: 2.0 MHz		B39871B3716U410
		Center frequency: 915.00 MHz Usable bandwidth: 10.0 MHz		B39921B3726U410
		Center frequency: 915.00 MHz Usable bandwidth: 26.0 MHz		B39921B3728U410
		Center frequency: 915.00 MHz Usable bandwidth: 26.0 MHz		B39921B4301F210
		Center frequency: 915.00 MHz Usable bandwidth: 26.0 MHz		B39921B3588U410
		Center frequency: 2450 MHz Usable bandwidth: 97.0 MHz		B39252B4041U410
		Center frequency: 2,448.50 MHz Usable bandwidth: 97.0 MHz		B39242B3912U410

EPCOS Components for Industrial Applications

Characteristics			
Series	Technical data	Features	Ordering code / Type
Surge arresters			
H3	 <p>Operating voltage V_{RMS} at 50/60 Hz: 255 V Protection level at 1.2/50 μs, 6 kV: < 1500 V Nominal discharge current 8/20 μs: 100 kA Impulse current 10/350 μs: 100 kA</p>	EN 61643-11 class I Neutral to PE High insulation resistance Temporary overvoltage	B88069X6821 ...
L1	 <p>Operating voltage V_{RMS} at 50/60 Hz: 255 V Protection level at 1.2/50 μs, 6 kV: < 1500 V Nominal discharge current 8/20 μs: 50 kA Impulse current 10/350 μs: 50 kA</p>	EN 61643-11 class I & II Neutral to PE High insulation resistance Temporary overvoltage	B88069X5451 ... B88069X5731 ... B88069X6551 ...
V1	 <p>Operating voltage V_{RMS} at 50/60 Hz: 255 V Protection level at 1.2/50 μs, 6 kV: < 1500 V Nominal discharge current 8/20 μs: 40 kA Impulse current 10/350 μs: 12 kA Max. discharge current 8/20 μs: 65 kA</p>	EN 61643-11 class I & II Neutral to PE High insulation resistance Temporary overvoltage	B88069X4380 ... B88069X6940 ...
	 <p>Operating voltage V_{RMS} at 50/60 Hz: 255 V Protection level at 1.2/50 μs, 6 kV: < 1500 V Nominal discharge current 8/20 μs: 20 kA Max. discharge current 8/20 μs: 40 kA</p>	EN 61643-11 class II Neutral to PE High insulation resistance Temporary overvoltage	B88069X4390 ... B88069X4400 ...
A8 ... XP	 <p>Operating voltage V_{RMS} at 50/60 Hz: 255 V Protection level at 1.2/50 μs, 6 kV: < 1500 V Nominal discharge current 8/20 μs: 10 kA Max. discharge current 8/20 μs: 20 kA</p>	EN 61643-11 class II & III High insulation resistance Stable performance over lifetime Application in series with MOV Small size	B88069X5691 ... B88069X5701 ...
A81	 <p>DC breakdown voltage: 90, 150, 230, 350 V Max. discharge current 8/20 μs: 20 kA</p>	Very high discharge current High isolation resistance Compact size	B88069X1380 ... B88069X2840 ... B88069X2250 ... B88069X2380 ...
M5 ... XP	 <p>Operating voltage V_{RMS} at 50/60 Hz: 255 V Protection level at 1.2/50 μs, 6 kV: < 1500 V Nominal discharge current 8/20 μs: 3 kA Max. discharge current 8/20 μs: 3 kA</p>	EN 61643-11 class II & III High insulation resistance Stable performance over lifetime Very small size	B88069X4781 ...

















EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
Surge arresters				
EF		DC breakdown voltage: 270, 470, 600, 800, 1 500, 2 500 V Max. discharge current 8/20 μ s: 10 kA	High discharge current and isolation resistance High follow current High voltage types available Application in series with MOV Small size	B88069X2641 ... B88069X4131 ... B88069X4301 ... B88069X5080 ... B88069X5690 ... B88069X6461 ...
EM		DC breakdown voltage: 2 500, 2 700, 3 600 V Nominal discharge current 8/20 μ s: 2 kA	Very fast response time High isolation resistance Application in series with MOV IEC 60950 Compact size	B88069X2500 ... B88069X4241 ... B88069X7051 ...
T8		DC breakdown voltage: 90 V, 230 V, 350 V Maximum discharge current 8/20 μ s: 10 kA	Fast response time High isolation resistance High discharge current	B88069X3651* B88069X8300* B88069X8690* B88069X8910*
T8, failsafe		DC breakdown voltage: 90 V, 230 V, 350 V Maximum discharge current 8/20 μ s: 10 kA	Fast response time High isolation resistance High discharge current	B88069X8080* B88069X8680* B88069X8720* B88069X8750*
Transformers				
EE4.2 EE5.0 EE12.6 SMD		Sensed current: 7... 40 A Turns ratio: 1:20 ... 1:200	Very low DC resistance Wide range of turns ratio Very small package	B82801
EP5 SMD		Inductance: 264 ... 690 μ H E x dt: 22.4 ... 40.8 μ Vs V _{test} : 1 500 V DC Footprint: 8.1 x 6.7 mm Height: 5.4 mm	High isolation	B82804

EPCOS Components for Industrial Applications

Characteristics				
Series		Technical data	Features	Ordering code / Type
Transformers				
EV15 ... EV25		Power: up to 70 W	Low profile High creepage distance High dielectric strength Low cost	B784 ... Upon request
EFD15 ... EFD30		Power: up to 90 W	Low profile High creepage distance High dielectric strength Low cost	B7832 ... Upon request B82802
EF13 ... EF32		Power: up to 200 W	Types with > 8 mm creepage and clearance distance available High dielectric strength Low cost	B783 ... Upon request
ER11 ... ER14.5 SMD		Power: up to 15 W	Low stray inductance	B7833 ... Upon request
EF6.3 ... EF16 SMD		Power: up to 20 W	Up to 3 MHz operating frequency	B783 ... Upon request
EHP16 EHP19 SMD		Power: up to 50 W	Low stray inductance	B783 ... Upon request
Magnetics LAN modules SMD		Single, dual and quad port Insulation voltage V_{RMS} : 1 500 V	Fast and Gigabit industrial Ethernet Power over Ethernet, IEEE 802.3 af Low insertion loss	B78476
RJ45 Jacks			Integrated magnetics 100Base-T industrial Ethernet With shielding tabs for high EMI suppression With and without LED Low insertion loss High mechanical durability Excellent return loss, crosstalk and differential to common-mode rejection	B78477

EPCOS Components for Industrial Applications

Characteristics				
Series	Technical data	Features	Ordering code / Type	
Varistors				
MLV, CeraDiodes 0402 ... 2220 SMD		Operating voltage V_{RMS} : 4 ... 60 V Surge current up to 1200 A Operating temperature up to +125 °C	Bidirectional clamping Stable protection level Minimum leakage current Low inductance For ESD protection ESD protection for data lines such as USB and Ethernet	B72500
				B72510
				B72520
				B72530
				B72542
				B72582
CU varistors SMD		Operating voltage V_{RMS} : 11 ... 460 V	Cylindrical varistor element Electrical equivalents to leaded SIOV S05 and S07 Encapsulated thermoplast Low inductance Stable protection level UL and CSA approved	B72650
				B72660
S05		I_{max} 8/20 μ s: up to 800 A	Operating voltage V_{RMS} : 11 ... 1 100 V High surge current ratings up to 12 kA High energy ratings (2 ms) up to 440 J For high energy absorption	B72205S ...
S07		I_{max} 8/20 μ s: up to 1750 A		B72207S ...
S10		I_{max} 8/20 μ s: up to 3.5 kA		B72210S ...
S14		I_{max} 8/20 μ s: up to 6 kA		B72214S ...
S20		I_{max} 8/20 μ s: up to 12 kA		B72220S ...
S25		I_{max} 8/20 μ s: 20 kA		B72225S ...
Q14		I_{max} 8/20 μ s: 8 kA	Operating voltage V_{RMS} : 11 ... 320 V Maximum load capacity at minimum component Height miniaturization High surge current rating up to 15 kA	B72214Q ...
Q20		I_{max} 8/20 μ s: 15 kA		B72220Q ...
LS40		I_{max} 8/20 μ s: 40 kA	Operating voltage V_{RMS} : 11 ... 750 V High surge current ratings up to 65 kA High energy ratings (2 ms) up to 1 650 J Bent or straight terminals possible	B72240L ...
LS41		I_{max} 8/20 μ s: 50 kA		B72241L ...
LS42		I_{max} 8/20 μ s: 65 kA		B72242L
B32		I_{max} 8/20 μ s: 25 kA	Operating voltage V_{RMS} : 11 ... 1 100 V Disk-shaped varistor element potted in plastic housing Housing and potting flame retardant to UL 94 V-0 Screw terminals	B72232B ...
B40		I_{max} 8/20 μ s: 40 kA		B72240B ...
B60		I_{max} 8/20 μ s: 70 kA		B72260B ...
B80		I_{max} 8/20 μ s: 100 kA		B72280B ...
ETFV14		I_{max} 8/20 μ s: 6 kA	Operating voltage V_{RMS} : 130 ... 420 V Disk varistor and fuse in one housing Space saving Monitoring option with 3rd lead UL approval (UL 1449)	B72214T ...
ETFV20		I_{max} 8/20 μ s: 10 kA		B72220T ...
ETFV25		I_{max} 8/20 μ s: 20 kA		B72225T ...

EPCOS Components for Industrial Applications

Accredited 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.

The EMC laboratory in Regensburg is accredited by Deutsche Akkreditierungsstelle (DAkkS), the German accreditation body, for a number of test procedures in the area of electromagnetic compatibility. Accreditation is based on EN ISO/IEC 17025, the generally accepted quality standard for test laboratories. The laboratory's organization and high quality ambitions provide 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.

Important Notes

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.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.

We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available.

The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.
6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the “General Terms of Delivery for Products and Services in the Electrical Industry” published by the German Electrical and Electronics Industry Association (ZVEI)**.
7. The trade names EPCOS, BAOKE, Alu-X, CeraDiode, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, FormFit, MiniBlue, MiniCell, MKD, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.epcos.com/trademarks.

Leading in Passives.



TDK-EPC Corporation (TDK-EPC), a TDK group company, is a leading manufacturer of electronic components, modules and systems headquartered in Tokyo, Japan. TDK-EPC has emerged from the combination of the electronic components business of TDK and the EPCOS Group and markets its products under the product brands, TDK and EPCOS. We offer a broad range of products and solutions of outstanding value from a single source and focus on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics. The company has design and manufacturing locations and sales offices in Asia, Europe, and in North and South America.

- Ceramic capacitors
- Aluminum electrolytic capacitors
- Film capacitors
- Power Quality Solutions
- Ferrites and inductive components
- RF filters and modules
- ESD/EMI modules
- Piezo components
- Protection devices
- Sensors

The contact data for our regional sales offices and worldwide distributors are available at www.tdk-epc.com

