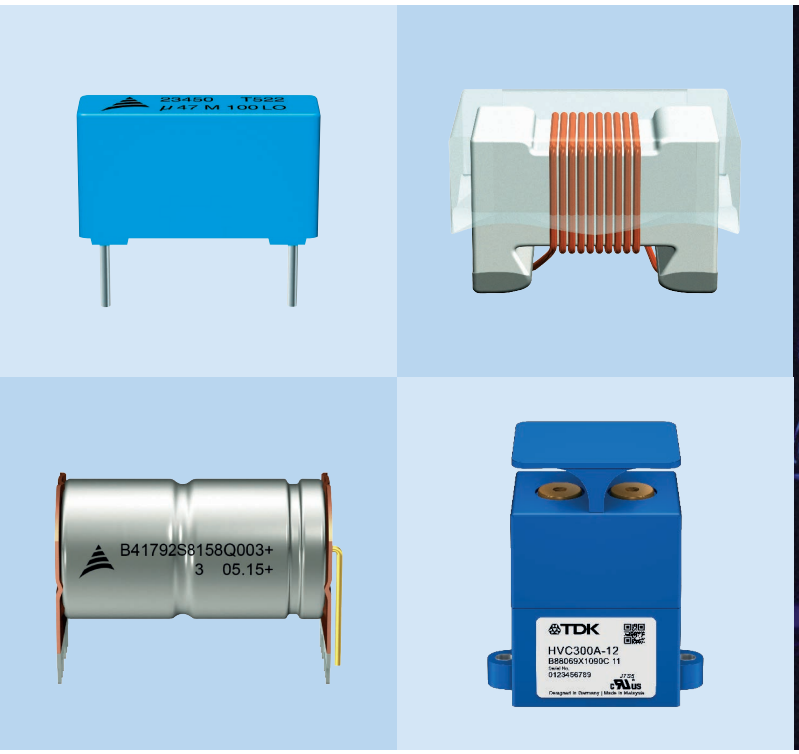
EPCOS Application Guide 2018

Automotive

Electronic Components for Safety Applications



www.epcos.com

EPCOS Components for Safety Applications

We offer one of the broadest product portfolios of electronic components for the demanding safety applications in vehicles, such as ABS, ESP, SRS, TPMS and many more. Our products range from capacitors and inductors to a wide variety of components for overvoltage protection and EMC, and include complete sensor systems. Just one example of components designed to meet the automotive industry's stiff requirements for quality and long-term stability are EPCOS aluminium electrolytic capacitors that can achieve a useful life of more than 10000 hours at an operating temperature of 125 °C.

On the following pages you will find further special features that distinguish our products and solutions for use in safety applications.

EPCOS Components for Safety Applications

Contents

EPCOS Components for Safety Applications

Special Features

Aluminum Electrolytic Capacitors

- High CV product in compact design
- High ripple current capability
- Long useful life
- Capacitors with AEC-Q200 qualification available

Ceramic Transient Voltage Suppressors (CTVS)

- Reliable ESD protection up to 30 kV
- Highly rugged on extreme thermal cycles and repetitive pulses
- Automotive grade ratings (load-dump, jump-start)
- Nickel barrier series acc. to AEC-Q200

Ferrites

- Recommended materials for automotive applications: N49, N87, N92, N95, N97
- CAN bus choke materials: K1, K10
- Suitability of other materials depends on transformer design
- Wide range of ferrite accessories

Film Capacitors (Medium Power)

- Long-term stability
- High reliability
- Self-healing capability
- High contact reliability
- Various lead configurations
- Capacitors qualified acc. to AEC-Q200D and IEC 60384-14:2013/AMD1:2016 available

High-Voltage Contactors (HVC)

- Hermetically sealed and high-speed arc extinguishing
- Maximum operating voltage up to 900 V DC
- High continuous operating current of up to 500 A
- Bipolar design
- 1 million nominal switching cycles
- Optional detection of switching status

Inductors

- Wide temperature range from –55 °C to +150 °C
- Miniaturized versions
- High mechanical strength
- Suitable for lead-free soldering profiles acc. to JEDEC J-STD 020D
- Qualified acc. to AEC-Q200

EPCOS Components for Safety Applications

Special Features

Switching Spark Gaps

- Very low switching losses
- Stable performance over lifetime
- Very short breakdown time
- Very long operating life
- High reliability due to robust design

Thermistors NTC

- Wide range of case sizes, resistances and tolerances
- Very good long-term stability in high-temperature environments
- Temperature measurement up to +260 °C
- Short response time
- Compact dimensions
- High measuring accuracy
- SMD NTCs are qualified acc. to AEC-Q200
- High accuracy (ΔR = ±1%)

Thermistors PTC

- Overcurrent protection
- Limit temperature sensors
- Qualified acc. to AEC-Q200

Transformers

- Material class –40 °C to +155 °C
- High power density
- Advanced thermal behavior
- Platform designs qualified acc. to AEC-Q200

Varistors

Leaded disk and CU varistors

- Automotive grade ratings (load-dump, jump-start)
- Stable protection level
- Minimum leakage current
- Operating temperature up to +125 °C
- High resistance to cyclic temperature stress
- Qualified acc. to AEC-Q200

EPCOS Components for Safety Applications

Overview

	Airbag control units	Battery disconnect unit (BDU)	Blind spot radars	Braking control units (ABS/ESP)	Cruise control systems	Lane departure warning	Light systems: HID lamp control units	Light systems: Light modules incl. front, travelling and LED light control, adaptive headlight control	Power steering	Suspension control units	Tire pressure monitoring systems (TPMS)
Aluminum electrolytic capacitors											
Axial-lead, soldering star				●					●		
Single-ended	●			●					●		
Ceramic transient voltage suppressors (CTVS)											
Automotive series	●			●	●		●	●	●	●	●
Ferrites											
Double-aperture cores					●						
E, EFD, ELP, EQ, ER cores				●			●		●	●	
Ring cores	●			●	●						
RM, RM LP cores				●			●				
Film capacitors (medium power)											
MMKP, MKP	●			●	●		●		●		●
X1 MKP	●			●	●		●		●		
X2 MKP	●			●	●		●		●		
Y2 MKP	●	●		●	●		●		●		
High-voltage contactors (HVC)											
HVC200, HVC300, HVC500		●									
Inductors											
CAN-/ FlexRay bus chokes	●		●	●	●	●	●	●	●	●	●
Cylindrical core chokes									●		
E core chokes				●				●			
Power inductors	●		●	●	●	●	●	●	●	●	
SIMID 0603 … 2220	●		●	●	●	●	●	●	●	●	●
Transponder coils											●
Switching spark gaps											
FS series							●				
Thermistors NTC											
Glass-encapsulated NTCs									●		
SMD NTCs	●		●	●	●	●	●	●	●	●	●
Thermistors PTC											
Limit temperature sensors								●			●
Overcurrent protectors	●										
Transformers											
EHR series							●	●			
EP series			●			●					
Varistors											
S07 … S20 AUTO (D1)	●			●	●						
CU varistors	●			●	●						

Please read *Important notes* on page 14.

EPCOS Components for Safety Applications

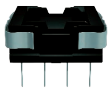
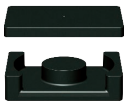
Characteristics

Series		Technical data	Features	Ordering code/ type
Aluminum electrolytic capacitors				
Axial-lead, soldering star	  	V_R: 25 … 75 V DC C_R: 220 … 10000 µF	High ripple current capability Useful life: up to 10000 h at +125 °C up to 2000 h at +150 °C Different mechanical construction designs available Soldering star for horizontal and vertical mounting High vibration resistance design up to 60 *g* avilable upon request Shelf life up to 15 years	B41689/B41789 B41690/B41790 B41691/B41791 B41692/B41792
Single-ended	   	V_R: 10 … 100 V DC C_R: 47 … 10000 µF	High CV product Different lead configurations available, e.g. J-leads, crimped leads, bent 90° leads Useful life up to 10000 h at +125 °C	B41866 B41888 B41895 B41896 B41898
Ceramic transient voltage suppressors (CTVS)				SMD
Automotive series	   	Temperature range up to +150 °C V_R: 15 … 34 V DC C_R: 10 pF … 10 µF V_{RMS}: 14 … 30 V AC W_{LD}: 1 … 25 J Case sizes: 0402 … 2220	ESD protection up to 30 kV Low leakage current Controlled capacitance for additional EMI filtering Qualified acc. to AEC-Q200 Protection against transients acc. ISO 7637-2 Jump-start and load-dump capability	B725**E… B725**G…

Please read *Important notes* on page 14.

EPCOS Components for Safety Applications

Characteristics

Series		Technical data	Features	Ordering code/ type
Ferrites				
Double aperture		Material: K1, K10, N30 A_L: 30 … 10000 nH	For BALUN transformers and frequency diplexers	B62152
E cores SMD		Material: N27, N30, N87, N95, N97 A_L: 30 … 13000 nH	E, EFD, ELP, EQ and ER cores are available in a wide variety of sizes E, EFD, ELP, EQ and ER cores are supplied in single units	E 5 … E 100
EFD cores		Material: N27, N49, N87, N95, N97 A_L: 16 … 2150 nH		EFD 10 … EFD 30
ELP cores ELP + I cores		Material: N49, N87, N92, N95, N97 A_L: 100 … 15500 nH		ELP 14 … ELP 102 I 14 … I 102
EQ cores EQ + I cores		Material: N49, N87, N92, N95, N97 A_L: 1320 … 5750 nH		EQ 13 … EQ 30 I 13 … I 30
ER cores ER planar + I cores		Material: N27, N49, N87, N92, N95, N97, T38 A_L: 40 … 6600 nH		ER 9.5 … ER 54 I 23, I 25
Ring cores		Material: K1, K10, N27, N30, N87, T35, T37, T38, T65 A_L: 70 … 21300 nH	Ring cores are primarily used as EMC chokes for suppressing RF interference	R 2.5 … R 202
RM cores		Material: K1, M33, N30, N41, N48, N49, N87, N92, N95, N97, T35, T38 A_L: 16 … 16000 nH	RM cores are ideal for low-loss/ highly stable filter coils Sizes are specified acc. to IEC 60431 RM cores are supplied in sets	RM 4 … RM 14
RM LP cores		Material: N49, N87, N95 A_L: 40 … 11500 nH	Low-profile RM cores are specified acc. to IEC 61860 Low-profile RM cores are supplied in sets	RM 4 LP … RM 14 LP

EPCOS Components for Safety Applications

Characteristics

Series		Technical data		Features	Ordering code/ type
Film capacitors (medium power)					
MMKP		V_R: V_{RMS}: C_R:	400 … 2000 V DC 250 … 500 V AC 2.2 … 560 µF	Electronic ballasts (resonant circuits) LLC typology in resonant circuits High frequency applications with high current stress Switched-mode power supply	B32641B … B32643B
MKP	 	V_R: C_R:	160 … 700 V AC 250 … 2000 V DC 1 nF … 40 µF	High pulse strength High contact reliability Very low inductance	B32651 … B32658
		V_R: C_R:	200 … 900 V AC 400 … 2000 V DC 1 nF … 1 µF	Max. operating temp. +125 °C Very small dimensions High peak current Very high AC voltages for all frequency ranges High peak voltage for short time periods High pulse withstand capability	B32671L … B32672L
X1 MKP		V_R: C_R:	530 V AC 4.7 nF … 1 µF	Across-the-line applications Severe ambient conditions	B32912 … B32916
X2 MKP		V_R: C_R:	305 V AC 47 nF … 2.2 µF	For connection in series with the mains High stability of capacitance value Severe ambient conditions	B32932A/B … B32936A/B
		V_R: C_R:	305 V AC 100 nF … 15 µF	Across-the-line applications High stability of capacitance value Severe ambient conditions	B32922H/J … B32926H/J
		V_R: C_R:	350 V AC 470 nF … 10 µF	Internal series construction “E-meters”, “In-series” with mains Across-the-line applications +85 °C/85%RH at 330 V AC, 1000 h	B32924A/B4 … B32926A/B4
Y2 MKP		V_R: C_R:	350 V AC 4.7 nF … 1.2 µF	Line-to-ground applications Severe ambient conditions Small dimensions +85 °C/85%RH at 350 V AC, 1000 h	B32032 … B32036

Please read *Important notes* on page 14.

EPCOS Components for Safety Applications

Characteristics

Series		Technical data	Features	Ordering code/ type
High-voltage contactors (HVC)				
HVC200 HVC300 HVC500		Maximum operating voltage up to 900 V DC Continuous operating current up to 500 A 1 million nominal switching Contact stuck detection available	Bipolar design Gas-filled and hermetically sealed No EMI, no inrush current phase at start-up UL 60947-4-1	B88269X…
Inductors				
CAN-/ FlexRay bus chokes SMD	  	L_R: 5 µH … 4.7 mH I_R: up to 1.2 A	Miniaturized types ACT45B, B82789 in size 1812 Bifilar and sector winding Temperatures up to +150 °C For reflow soldering and gluing	B82787 (ACT45B) B82789C0… B82789S0… B82793C0… B82793S0…
Cylindrical core chokes		L_R : 3 … 4 µH I_{peak} : > 80 A	High saturation currents Differential-mode choke	B82116
E core chokes SMD		L_R : 0.5 … 35 µH I_{peak} : > 50 A	High saturation currents High ripple currents Low losses	B82559
Power inductors SMD	 	L_R: 0.82 … 1000 µH I_R: up to 12.5 A Case sizes: 6 × 6 … 12 × 12 mm	Shielded and unshielded versions Low DC resistance Temperatures up to +150 °C Qualified acc. to AEC-Q200	B82462A… B82462G… B82464A… B82464G… B82464P… B82472P… B82473M… B82475M… B82477P…
Dual inductors SMD		L_R: 2 … 100 µH (inductance per winding) I_R: 15 A Case size: 7 × 7, 12 × 12 mm	Two windings Shielded construction High coupling factor Special winding technology for low stray inductance Temperatures up to +150 °C Qualified acc. to AEC-Q200	B82477D… B82472D…
SIMID 0603-C SMD		L_R: 1 … 220 nH I_R: 110 … 1800 mA Case size: 0603	Copper plated ceramic core Laser cut winding Epoxy coated	B82496C…

EPCOS Components for Safety Applications

Characteristics

Series		Technical data	Features	Ordering code/ type
Inductors				SMD
SIMID 0805-F3		L_R: 2.7 … 820 nH I_R: 180 … 1000 mA Case size: 0805	Cubic coil with ceramic core Epoxy molded flat top for vacuum pickup Winding ends welded to the terminals	B82498F3…
SIMID 1210-H		L_R: 1 … 680 µH I_R: 61 … 1150 mA Case size: 1210	Ferrite drum core Laser welded winding Flame retardant molding	B82422H…
SIMID 1812-T/C		L_R: 1 … 1000 µH I_R: 55 … 1300 mA Case size: 1812	Ferrite drum core Laser welded winding Flame retardant molding	B82432C… B82432T…
SIMID 2220		L_R: 1 µH … 10 mH I_R: 25 … 3510 mA Case size: 2220	Ferrite drum core Laser welded winding Flame retardant molding	B82442
Transponder coils 8, 11 mm		L_R: 1 … 18.52 mH Sensitivity: 10 … 52 mV/µT	Ferrite core Enamel copper wire welded to terminals Flame retardant molding	B82450A…A… B82450A…E…
Transponder coils TC1210, TC1812		TC1210 L_R: up to 1.34 mH Sensitivity: up to 3.7 mV/µT TC1812 L_R: up to 2.38 mH Sensitivity: up to 7.6 mV/µT	Ferrite drum core Laser-welded winding with non-solderable wire Flame retardant molding	B82450A…C… B82451A…D…
Switching spark gaps				
FS08X-1JG FS08X-1JGS		Nominal breakdown voltage: 800, 850 V Breakdown voltage during lifetime (ionized mode): 680 … 920 V 720 … 980 V	Switching operations: up to 200000 ignitions Operating temperature: –40 … +150 °C	B88069X3560T502 B88069X5980T502
FS08XJMSMD SMD		Nominal breakdown voltage: 800 V Breakdown voltage during lifetime (ionized mode): 680 … 920 V	Switching operations: up to 380000 ignitions Operating temperature: –40 … +175 °C	B88069X4151T602
Thermistors NTC				
Glass-encapsulated NTCs G1541 G1551 G1561		Temperature range: –55 … +260 °C (G1541: +250 °C) Rated resistance at 25 °C: 2 … 100 kΩ Resistance tolerance: ±1 … ±3% Insulation resistance: > 100 MΩ 500 V DC (1 s)	High-temperature resistant Insulated wires with high insulation voltage Non-standard wire configurations	B57541G1… B57551G1… B57561G1…

Please read *Important notes* on page 14.

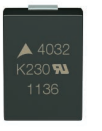
EPCOS Components for Safety Applications

Characteristics

Series	Technical data	Features	Ordering code/ type
Thermistors NTC			
H650 	Temperature range: –40 … +600 °C Rated resistance at 200 °C: 5 kΩ Resistance tolerance at 200 °C ±2	High-temperature resistant and highly stable Rigid terminals aluminumoxid with termination pads Short response time	B57650H0824A001
SMD NTCs SMD 	Temperature range: –40 … +150 °C Rated resistance at 25 °C: 4.7 … 100 kΩ Case sizes: 0402, 0603, 0805 Resistance tolerance: ±1, ±3, ±5% B-tolerance: ±1, ±3%	Qualified acc. to AEC-Q200 Operating temperatures up to +150 °C	B57***V5…
Thermistors PTC			SMD
Limit temperature sensors 	Sensing temperature: +70 … +145 °C in steps of +10 °C Temperature tolerance: ±5 °C V_{max}: 32 V Rated resistance: 470 Ω (0402 and 0603) 680 Ω (0805) Case sizes: 0402, 0603, 0805	Qualified acc. to AEC-Q200 Lead-free tinned terminations	B59421A… B59641A… B59721A…
Overcurrent protectors 	Rated current: 90 mA 70 mA 50 mA 12 mA Rated resistance: 27 Ω 55 Ω 125 Ω 1500 Ω Case size: 1210	Qualified acc. to AEC-Q200 Lead-free tinned terminations UL approval Short response time	B59606A0110A062 B59607A0120A062 B59707A0120A062 B59907A0120B062

EPCOS Components for Safety Applications

Characteristics

Series		Technical data		Features	Ordering code/ type
Transformers					
EHR 16LP		Power:	20 … 50 W	Switching frequencies up to 700 kHz Saturation currents up to 30 A Leakage inductance 50 nH typ. Flyback or Buck Boost	B78362
EHR 16					B78363
EHR 18					B78364
EP 6		V_{out}:	80 … 140 V	Insensitive against external fields Low inductance drift overtemperature	B78416
Varistors					
S07… AUTO (D1)		V_{DC}: V_{RMS}: C_{typ}: I_{max} 8/20 µs:	16 V 14 V 2.3 nF 250 A	High energy absorption, particularly in case of load dump Jump-start strength Operating temperature up to +125 °C (D1)	B72207S1…
S10… AUTO (D1)		V_{DC}: V_{RMS}: C_{typ}: I_{max} 8/20 µs:	16 … 20 V 14 … 17 V up to 5.2 nF 500 A		B72210S1…
S14… AUTO (D1)		V_{DC}: V_{RMS}: C_{typ}: I_{max} 8/20 µs:	16 … 34 V 14 … 30 V up to 10 nF 1000 A		B72214S1…
S20… AUTO (D1)		V_{DC}: V_{RMS}: C_{typ}: I_{max} 8/20 µs:	16 … 34 V 14 … 30 V up to 19 nF 2000 A		B72220S1…
CU varistors SMD	 	V_R: C_R: V_{RMS}: W_{LD}: Case sizes:	16 … 34 V DC 600 … 2300 pF 14 … 30 V AC 6 … 12 J 3225, 4032	Jump-start and load-dump protection acc. to ISO 7637, pulse 5 Overvoltage protection in SMT version of standard disk varistors (5 and 7 mm diameter) Qualified acc. to AEC-Q200	B72650M… B72660M…

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.

   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.

5. 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)**.

6. The trade names EPCOS, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP, CTVS, DeltaCap, DigiSiMic, ExoCore, FilterCap, FormFit, LeaXield, MiniBlue, MiniCell, MKD, MKK, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, 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.

Get in Contact

Europe

Austria
TDK Austria GesmbH
T +43 1 25 63 630 56 39
F +43 1 25 63 630 56 44
sales.austria@eu.tdk.com

Bulgaria, Greece, Macedonia
TDK Austria GesmbH
T +43 1 25 63 630 56 30
F +43 1 25 63 630 56 44
sales.csee@eu.tdk.com

Czech Republic
TDK Czech s.r.o.
T +420 2 33 03 22 81
F +420 2 33 03 22 89
sales.czech@eu.tdk.com

Finland, Estonia
TDK Nordic OY
T +358 10 34 90 108
sales.nordic@eu.tdk.com

France, Belgium, Luxembourg, Malta
TDK Electronics France SAS
T +33 1 49 46 67 89
F +33 1 49 46 67 67
sales.france@eu.tdk.com

Germany, Liechtenstein, Netherlands, Switzerland
TDK Europe GmbH
T (D) 0180 500 33 48
(0.14 Euro/min.)
(NL) +31 70 33 10 611
(CH) +49 89 54020 2691
F +49 89 54020 2913
sales.germany@eu.tdk.com

Hungary
TDK Electronics Hungary Ltd.
T +36 1 436 07 20
F +36 1 436 07 21
sales.hungary@eu.tdk.com

Italy
TDK Italy S.r.l
T +39 02 50 99 54 25
F +39 02 50 99 54 55
sales.italy@eu.tdk.com

Poland, Latvia, Lithuania
TDK Polska Sp. z o.o.
T +48 22 24 60 409
F +48 22 24 60 400
sales.poland@eu.tdk.com

Portugal
TDK Electronics Spain S.L.U.
T +34 93 480 42 92
+34 93 480 42 68
F +34 93 480 42 31
sales.iberia@eu.tdk.com

Romania
TDK Austria GesmbH
T +43 1 25 63 630 56 30
F +43 1 25 63 630 56 44
sales.romania@eu.tdk.com

Russia, Belarus, Kazakhstan, Moldavia, Ukraine
TDK CIS LLC
T +7 495 663 21 00
+7 495 663 21 22
sales.cis@eu.tdk.com

Slovakia
TDK Austria GesmbH
T +43 1 25 63 630 56 30
F +43 1 25 63 630 56 44
sales.slovakia@eu.tdk.com

Bosnia and Herzegovina, Croatia, Montenegro, Serbia, Slovenia
TDK Austria GesmbH
T +43 1 25 63 630 56 30
F +43 1 25 63 630 56 44
sales.slovenia@eu.tdk.com

Spain
TDK Electronics Spain S.L.U.
T +34 93 480 42 92
+34 93 480 43 33
F +34 91 514 70 14
sales.iberia@eu.tdk.com

Sweden, Iceland, Denmark, Norway
TDK Nordic AB
T +46 8 4 77 27 00
F +46 8 4 77 27 01
sales.nordic@eu.tdk.com

Turkey
TDK Europe GmbH
T +90 216 5 69 81 01
F +90 216 4 64 07 56
sales.turkey@eu.tdk.com

United Kingdom, Ireland
TDK UK Limited
T +44 13 44 38 15 10
F +44 13 44 38 15 12
sales.uk@eu.tdk.com

Asia

Afghanistan, Iran, Iraq, Jordan, Lebanon, Pakistan, Syria
TDK Europe GmbH
T +90 216 5 69 81 01
F +90 216 4 64 07 56
sales.turkey@eu.tdk.com

China
EPCOS (Shanghai) Ltd.
T +86 21 22 19 15 00
F +86 21 22 19 15 99
sales.cn@epcos.com

Hong Kong
EPCOS Limited
T +852 36 69 82 00
F +852 36 69 82 56
sales.cn@epcos.com

India, Bahrain, Bangladesh, Kuwait, Nepal, Oman, Qatar, Saudi Arabia, Sri Lanka, United Arab Emirates
EPCOS India Private Ltd.
T +91 120 45 05 801
F +91 120 45 05 818
sales.in@epcos.com

Israel
TDK Sales Representative
T +972 73 2676 317
sales.israel@eu.tdk.com

Japan
TDK Corporation
T +81 3 68 52 73 00
inquiry@jp.tdk.com

Malaysia
EPCOS RDC SDN. BHD.
T +60 6 79 98 168
F +60 6 79 98 162
sales.asean@epcos.com

Philippines
c/o TDK Electronics Philippines Corporation
T +63 49 541 31 41 66 30
+63 49 541 31 41 66 31
F +63 49 541 31 40
sales.asean@epcos.com

Singapore, Indonesia, Thailand, Vietnam
EPCOS COMPONENTS PTE. LTD.
T +65 65 97 06 28
F +65 65 97 06 07
sales.asean@epcos.com

Taiwan
EPCOS Taiwan Co. Ltd.
T +886 2 26 55 76 76
F +886 2 27 82 03 89
sales.tw@epcos.com

Americas

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

South America
EPCOS do Brasil Ltda.
T +55 11 32 89 95 99 Ext. 6851
F +55 11 32 89 99 40
sales.br@epcos.com

Australia

Australia, New Zealand
TDK Sales Representative
T +61 3 95 66 72 17
F +61 3 95 66 72 99
sales.au@epcos.com

Africa

Egypt
TDK Europe GmbH
T +90 216 5 69 81 01
F +90 216 4 64 07 56
sales.turkey@eu.tdk.com

Morocco, Tunisia
TDK Electronics France SAS
T +33 1 49 46 67 89
F +33 1 49 46 67 67
sales.france@eu.tdk.com

South Africa
TDK Sales Representative
T +27 11 458 90 00
+27 11 458 90 32
F +27 11 458 90 34
sales.southernafrica@epcos.com

01/18

The addresses of our worldwide distributors and regional sales offices are available at www.epcos.com/sales

Edition 2018 · Ordering No. EPC:65073-7600 · Printed in Germany · AG 01181.