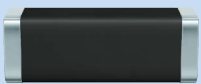


EPCOS Sample Kit 2015

# Ceramic Transient Voltage Suppressors

CTVS Multilayer Varistors and CeraDiodes for General Use



# Protection against ESD and high-energy transients for general use

TDK Corporation offers an innovative product portfolio of EPCOS CTVS® (=Ceramic Transient Voltage Suppressors) for general use. The portfolio includes both multilayer varistors (MLV) and CeraDiodes®. In this sample kit you will find the most frequently used high runner types for general protection purposes. Based on a new coating technology this product portfolio ensures a high level of protection both against ESD as well as against high-energy transients.

## Benefits for customer applications

- Bidirectional ESD protection up to 25 kV (ISO 10605)
- Bidirectional ESD protection min. 8 kV contact, 15 kV air (IEC 61000-4-2)
- High energy handling capability, high current handling
- High reliability, stable protection level, excellent long-term stability
- Multi-strike capability
- Low leakage current, low parasitic inductance
- No derating up to +85 °C/ +125 °C (depending on type)
- EMI/ RFI attenuation
- Short response time of < 0.5 ns

## Applications

- Smartphone/ Wireless
- NFC antenna protection
- LCD TV
- Set top box
- Computer/ DSP-products/ disk drive
- PoE (Power over Ethernet)
- Data capturing, e.g. bar code reader
- Comfort, control and security systems, e.g. heat and/ or smoke detectors
- Monitoring systems
- Medical equipment
- Wearable devices
- White goods
- Power supply

More details and applications under [www.epcos.com/ctvs\\_gu](http://www.epcos.com/ctvs_gu)

**Important information:** 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. We expressly point out that these statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. It is incumbent on the customer to check and decide whether a product is suitable for use in a particular application. This publication is only a brief product survey which may be changed from time to time. Our products are described in detail in our data sheets. The *Important notes* ([www.epcos.com/ImportantNotes](http://www.epcos.com/ImportantNotes)) and the product-specific *Cautions and warnings* must be observed. All relevant information is available through our sales offices.

# Components

B72440 C0050A160	B72440 C0050H160	B72590 D0050H260	B72590 D0150H060	B72590 T7151V060	B72500 D0050H160	B72500 D0160H060	B72500 D0300H060	B72500 T7151V060
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B72714 D0160H060	B72724 D0160H062	B72510 T0140K062	B72510 T0350K062	B72520 T0350K062	B72520 T0600K062	B72530 T0350K062	B72530 T0600K062	B72580 T0350K062
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B72580 T0600K062	B72580 T0950S172	B72580 T0131K072	B72540 T0300K062	B72540 T6300K062	B72540 T0400K062	B72540 T0500K062	B72540 T6500K062	B72540 T0600K062
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## Electrical specifications and ordering codes

### ESD protection (acc. to IEC 61000-4-2, level 4), CeraDiodes, single chips and arrays

EIA case size	Ordering code	$V_{DC, max}$ [V]	$V_v$ @ 1 mA [V]	$V_{clamp, max}$ 8/20 $\mu$ s [V]	$C_{typ}^{1)}$ 1 MHz, 1 V [pF]	$C_{max}^{1)}$ 1 MHz, 1 V [pF]
0201, single chip	B72440C0050A160	5.5	11	22	15	-
0201, single chip	B72440C0050H160	5.5	17	33	7	-
0402, single chip	B72590D0050H260	5.6	90	-	0.6	0.9
0402, single chip	B72590D0150H060	15	23	66	10	15
0402, single chip	B72590T7151V060 <sup>2)</sup>	16	175	290	2	-
0603, single chip	B72500D0050H160	5.6	150	-	0.6	0.9
0603, single chip	B72500D0160H060	16	65	290	3	5
0603, single chip	B72500D0300H060	30	50	120	10	15
0603, single chip	B72500T7151V060 <sup>2)</sup>	16	175	290	3	-
0508, 4-fold array	B72714D0160H060	16	22	66	10	15
0612, 4-fold array	B72724D0160H062	16	80	350	3	5

1) Measurement frequency:  $f = 1$  MHz for  $C < 100$  pF,  $f = 1$  kHz for  $C \geq 100$  pF

2) MLV types

### High energy transients protection, MLV types, single chips

EIA case size	Ordering code	$V_{DC, max}$ [V]	$V_v$ @ 1 mA [V]	$V_{clamp, max}$ 8/20 $\mu$ s [V]	$I_{surge, max}$ 8/20 $\mu$ s [A]	$W_{max}$ 2 ms [mJ]
0805	B72510T0140K062	18	22	40	120	300
0805	B72510T0350K062	45	56	95	80	300
1206	B72520T0350K062	45	56	90	100	400
1206	B72520T0600K062	85	100	165	100	700
1210	B72530T0350K062	45	56	90	250	2.000
1210	B72530T0600K062	85	100	165	200	2.000
1812	B72580T0350K062	45	56	90	500	4.000
1812	B72580T0600K062	85	100	165	400	5.800
1812	B72580T0950S172	125	165	270	250	2.800
1812	B72580T0131K072	170	205	340	250	3.500
2220	B72540T0300K062	38	47	77	1.200	12.000
2220	B72540T6300K062	38	47	77	5.000	15.000
2220	B72540T0400K062	56	68	110	1.000	9.000
2220	B72540T0500K062	65	82	135	800	5.600
2220	B72540T6500K062	65	82	135	4.500	15.000
2220	B72540T0600K062	85	100	165	800	6.800

# Application matrix for ESD protection and for surge current protection



EIA case size	Ordering code	Analog video, digital audio, USB 2.0, Ethernet, memory card, SIM card	DVI, UDI, HDMI 1.3, display port, SATA, WiMax, 802.16	HDMI 1.3 / display port	Analog audio, ISDN, key buttons, push buttons, PS/2	CANopen, Bluetooth	Serial RS-232 / RS-485
<b>ESD protection (acc. to IEC 61000-4-2, level 4), CeraDiodes, single chips and arrays</b>							
0201, single chip	B72440C0050A160				x		x
0201, single chip	B72440C0050H160				x		x
0402, single chip	B72590D0050H260	x	x	x			
0402, single chip	B72590D0150H060	x				x	x
0402, single chip	B72590T7151V060, MLV type	x	x	x			
0603, single chip	B72500D0050H160	x	x	x			
0603, single chip	B72500D0160H060	x				x	x
0603, single chip	B72500D0300H060	x				x	x
0603, single chip	B72500T7151V060, MLV type	x	x	x			
0508, 4-fold array	B72714D0160H060	x				x	x
0612, 4-fold array	B72724D0160H062	x				x	x

EIA case size	Ordering code	V <sub>bc, max</sub> [M]	I <sub>surge, max</sub> 8/20 μs [A]	Security systems	Power over Ethernet (PoE)	Metering	Automation	Data capturing	Measurement and control
<b>High-energy transients protection, MLV types, single chips</b>									
0805	B72510T0140K062	18	22	x		x			x
0805	B72510T0350K062	45	80	x		x			x
1206	B72520T0350K062	45	100	x		x	x	x	x
1206	B72520T0600K062	85	100		x		x		
1210	B72530T0350K062	45	250	x		x	x	x	x
1210	B72530T0600K062	85	200		x		x		
1812	B72580T0350K062	45	500	x			x	x	x
1812	B72580T0600K062	85	400		x		x		
1812	B72580T0950S172	125	250	x	x			x	x
1812	B72580T0131K072	170	250	x	x			x	x
2220	B72540T0300K062	38	1.200			x	x	x	x
2220	B72540T6300K062	38	5.000				x		
2220	B72540T0400K062	56	1.000	x	x				
2220	B72540T0500K062	65	800		x				
2220	B72540T6500K062	65	4.500		x				
2220	B72540T0600K062	85	800	x	x				x

