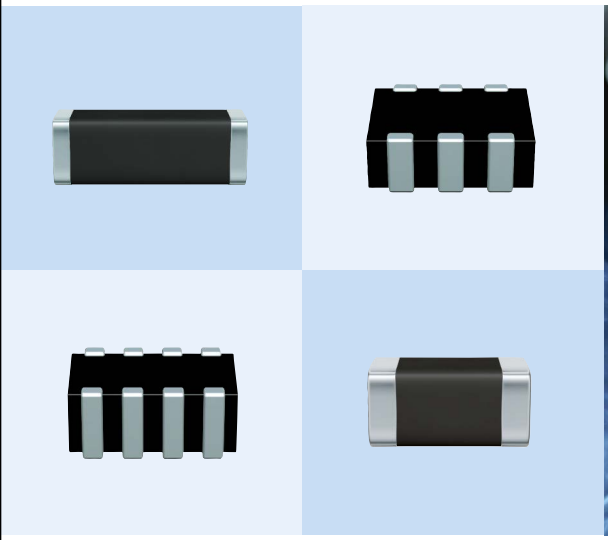
EPCOS Sample Kit 2015

# Ceramic Transient Voltage Suppressors

## CTVS Multilayer Varistors and CeraDiodes for General Use





www.epcos.com

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

TDK Corporation offers an innovative product portfolio of EPCOS CTVS® (=**C**eramic **T**ransient **V**oltage **S**uppressors) 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**

**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) 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 |
|---|---|---|---|---|---|---|---|---|

| B72714 D0160H060 | B72724 D0160H062 | B72510 T0140K062 | B72510 T0350K062 | B72520 T0350K062 | B72520 T0600K062 | B72530 T0350K062 | B72530 T0600K062 | B72580 T0350K062 |
|---|---|---|---|---|---|---|---|---|

| B72580 T0600K062 | B72580 T0950S172 | B72580 T0131K072 | B72540 T0300K062 | B72540 T6300K062 | B72540 T0400K062 | B72540 T0500K062 | B72540 T6500K062 | B72540 T0600K062 |
|---|---|---|---|---|---|---|---|---|

# Product range

## 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 µs [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 [2] | 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 [2] | 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 ≥ 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 µs [V] | $I_{surge,max}$ 8/20 µs [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 |
|---|---|---|---|---|---|---|---|
| **ESD protection (acc. to IEC 61000-4-2, level 4), CeraDiodes, single chips and arrays** | | | | | | | |
| 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 | $V_{DC, max}$ [V] | $I_{surge, max}$ 8/20 µs [A] | Security systems | Power over Ethernet (PoE) | Metering | Automation | Data capturing | Measurement and control |
|---|---|---|---|---|---|---|---|---|---|
| **High-energy transients protection, MLV types, single chips** | | | | | | | | | |
| 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 |

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