Vishay Intertechnology, Inc.

TVS, ESD Protection, and Zener Diodes

Industry-First, 1500 W PAR Transient Voltage Suppressor (TVS) Diodes in SMC Package

ESD Protection Diodes in Small CLP0603 Package

500 mW Zener Diodes With Extremely Tight Tolerance of ± 2.5%

600 W TransZorb® TVS in SlimSMA Package for Industrial Applications

www.vishay.com
TVS, ESD PROTECTION, AND ZENER DIODES

Focus Products

Esd Protection Diodes In The Small CLP0603 Package
CLP stands for Chip Level Package and 0603 for the tiny dimensions of just 0.6 mm x 0.3 mm. Both diodes are made to protect ESD-sensitive applications with a working range up to 5.5 V.

In case of any positive or negative ESD spikes, these diodes perform their bidirectional and symmetrical (BiSy) clamping performance and short the discharge current to ground.

VBUS05B1-SD0
With low capacitance of 0.29 pF, the VBUS05B1-SD0 is the right protection diode for fast data lines such as USB, HDMI, DVI, and others.

VCUT05E1-SD0
The stronger protection diode with a higher capacitance is made for higher surge pulses in slower applications.

Zener Diodes In MicroSMF (DO-219AC) Package
PLZ Series
This Zener diodes series in the ultra-compact class MicroSMF (DO-219AC) package has extremely tight Vz tolerances of only ± 2.5 %.

PLZ Series

<table>
<thead>
<tr>
<th>Vz</th>
<th>Polarity</th>
<th>Ppp</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0 V to 39 V</td>
<td>Single unidirectional</td>
<td>500 mW</td>
<td>AEC-Q101</td>
</tr>
</tbody>
</table>

Esd Protection Diode Array In LLP2510 Package
VBUS54GD-FBL
This four-line ESD protection diode array with low capacitance protects the D+ and D- I/O-ports of a double USB 2.0 port.

VBUS54GD-FBL

<table>
<thead>
<tr>
<th>Vz</th>
<th>Polarity</th>
<th>Ipp (tp = 8/20 µs)</th>
<th>PPP (tp = 8/20 µs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.9 V</td>
<td>Four-line bidirectional</td>
<td>3.0 A</td>
<td>45 W</td>
</tr>
</tbody>
</table>

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Focus Products

**TVS AND ZENER DIODES IN SMF (DO-219AB) PACKAGE**

**BZD27xx Series**
Zener diodes with 2% / 5% tolerance and TVS specification in the flat lead SMF package.

**SMFx Series**
TVS diodes with medium surge power.

**VTxSxx Series**
The strongest TVS diodes with the highest surge power. Also available in 2% tolerance.

<table>
<thead>
<tr>
<th>V&lt;sub&gt;BR&lt;/sub&gt;</th>
<th>V&lt;sub&gt;WM&lt;/sub&gt;</th>
<th>P&lt;sub&gt;(10 x 1000 µs)&lt;/sub&gt;</th>
<th>T&lt;sub&gt;j max.&lt;/sub&gt;</th>
<th>Polarization</th>
<th>Qualification</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4 V to 70 V</td>
<td>6.4 V to 24.5 V</td>
<td>400 W</td>
<td>175 °C</td>
<td>One-line unidirectional</td>
<td>AEC-0101</td>
</tr>
<tr>
<td>6.4 V to 24.5 V</td>
<td>5.0 V to 63 V</td>
<td>200 W</td>
<td>175 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5 V to 200.0 V</td>
<td>5.1 V to 58.0 V</td>
<td>150 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.0 V to 180.0 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TVS DIODES IN SMC (DO-214AB) PACKAGE**

**3KASMC and 5KASMC**
Designed for Transient Voltage Suppression in automotive applications (AEC-Q101 qualified). “3K” and “5K” stand for the peak pulse power of P<sub>PK</sub> = 3 kW and 5 kW respectively, tested with a 10/1000 µs test pulse. These unidirectional TVS diodes are built on our robust PAR® technology for a working range from V<sub>WM</sub> = 10 V to 43 V. The maximum junction temperature is T<sub>j max.</sub> = 185 °C.

<table>
<thead>
<tr>
<th>V&lt;sub&gt;BR&lt;/sub&gt;</th>
<th>V&lt;sub&gt;WM&lt;/sub&gt;</th>
<th>P&lt;sub&gt;(10 x 1000 µs)&lt;/sub&gt;</th>
<th>T&lt;sub&gt;j max.&lt;/sub&gt;</th>
<th>Polarization</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.1 V to 52.8 V</td>
<td>11.1 V to 52.8 V</td>
<td>3 kW</td>
<td>185 °C</td>
<td>One-line unidirectional</td>
</tr>
<tr>
<td>10 V to 43 V</td>
<td>10 V to 43 V</td>
<td>5 kW</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SMA6F SERIES**
600 W TRANSZORB® TVS in the SlimSMA (DO-221AC) package with a low profile of 0.95 mm height and maximum T<sub>j</sub> of 175 °C is 50% thinner than the SMA package with a footprint comparable to the SMA package. The surge capability is up to 600 W at 10/1000 µs waveform and is ideal for industrial and space-limited applications.

<table>
<thead>
<tr>
<th>V&lt;sub&gt;BR&lt;/sub&gt;</th>
<th>V&lt;sub&gt;WM&lt;/sub&gt;</th>
<th>P&lt;sub&gt;(10 x 1000 µs)&lt;/sub&gt;</th>
<th>T&lt;sub&gt;j max.&lt;/sub&gt;</th>
<th>Polarization</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.4 V to 24.5 V</td>
<td>5.0 V to 20 V</td>
<td>600 W</td>
<td>175 °C</td>
<td>Unidirectional</td>
</tr>
</tbody>
</table>

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Complete Portfolio of Diodes and TVS

**Advantages** of Vishay TVS, ESD Protection, and Zener Diodes
- High power surge capability up to 6.6 kW at 10/1000 µs
- Symmetrical leads, low profile packages
- Low capacitance
- Narrow tolerance, full Zener voltage range series

For the Following **Applications**
- Industrial
- Power supplies
- Electronic lighting
- Computer
- Automotive

Low profile SMA6F and SMF series for hard disk input
12 V / 5 V protection

**5KASMC**
1. Protecting ECUs in centralized load dump suppression power-net
2. Secondary protection in ECUs
3. Protection with MOSFET for Class B (ISO16750-1) grade electronics in vehicles

**Useful Links**