



TVS, ESD Protection, and Zener Diodes

Industry-First, 1500 W PAR[®]
Transient Voltage Suppressor (TVS)
Diodes in **SMPC** Package

TPC11CA to TPC36CA



**ESD Protection Diodes in
Small CLP0603 Package**

VCUT05E1-SD0, VBUS05B1-SD0



**500 mW Zener Diodes With
Extremely Tight Tolerance
of $\pm 2.5\%$**

PLZ Series



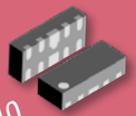
**600 W TRANSZORB[®] TVS in
SlimSMA Package for Industrial
Applications**

SMA6F Series



**ESD Protection Diodes With
Low Capacitance in LLP2510
Package**

VBUS54GD-FBL



**PAR[®] Transient Voltage
Suppressor (TVS) Diodes With
 $V_{WM} = 10\text{ V to }43\text{ V}$**

3KASMC and 5KASMC Series



**Transient Voltage Suppressor
(TVS) Diodes in SMF Package,
AEC-Q101 Qualified**

SMFxxA Series, VTVSxxASMF Series



**Zener Diodes With 2% / 5%
Tolerance in SMF Package**

BZD27CxxP Series





TVS, ESD PROTECTION, AND ZENER DIODES

Focus Products

LLP1713-7L



LLP1010-6L



LLP1010-5L



CLP0603



LLP1006-2L
LLP1006-2M



SOD-523



MicroSMF
(DO-219AC)



LLP1713-9L



LLP75-4L



LLP75-6L



LLP75-7L



LLP2513-13L

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.

	VBUS05B1-SD0	VCUT05E1-SD0
V_{BR}	6.0 V	6.5 V
V_{WM}	5.5 V	5.5 V
C_D	0.29 pF (typ.)	13 pF
Polarity	One-line bidirectional	
V_{ESD}	± 16 kV	± 30 kV
$I_{PP}(t_D = 8/20 \mu s)$	2.5 A	6.0 A
$P_{PP}(t_D = 8/20 \mu s)$	45 W	78 W

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 V_Z tolerances of only $\pm 2.5\%$.

	PLZ Series
V_{BR}	2.0 V to 39 V
Polarity	Single unidirectional
P_{PP}	500 mW
Qualification	AEC-Q101

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
V_{BR}	6.9 V
V_{WM}	5.5 V
C_D	0.6 pF
Polarity	Four-line bidirectional
V_{ESD}	± 15 kV
$I_{PP}(t_D = 8/20 \mu s)$	3.0 A
$P_{PP}(t_D = 8/20 \mu s)$	45 W



LLP2510-10M



LLP3313-17L



SOT-23



MicroMELF



QuadroMELF
(SOD-80)



MiniMELF
(SOD-80)



MELF
(DO-213AB)



DO-35
(DO-204A)



DO-41
(DO-204AL)



TVS, ESD PROTECTION, AND ZENER DIODES

Focus Products

SOD-323



MicroSMP
(DO-219AD)



SOD-123



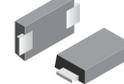
SMF
(DO-219AB)



SMP
(DO-220AA)



SlimSMA
(DO-221AC)



SMA
(DO-214AC)



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.

SMFxx Series

TVS diodes with medium surge power.

VTVSxx Series

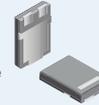
The strongest TVS diodes with the highest surge power. Also available in 2 % tolerance.



	VTVSxx	SMFxx	BZD27xx
V_{BR}	6.4 V to 70 V	6.4 V to 24.5 V	7.5 V to 200.0 V
V_{WM}	5.0 V to 63 V	5.1 V to 58.0 V	6.0 V to 180.0 V
P_{PPM} (10 x 1000 μ s)	400 W	200 W	150 W
T_j max.	175 °C	175 °C	175 °C
Polarity	One-line unidirectional		
Qualification	AEC-Q101		

TVS DIODES IN SMPC (TO-277A) PACKAGE

Industry-First 1500 W Bidirectional PAR[®] TVS in Low Profile SMPC (TO-277A) Package



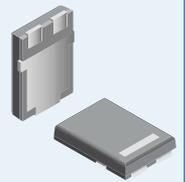
TPCxxCA Series

Vishay's innovative wafer technology enables placement of the TPCxxCA series bidirectional TVS, with 1500 W surge capability, into the slim SMPC package (1 mm height); a 52 % reduction in height from the traditional SMC package (2.3 mm height). The footprint has also been reduced 38 %. These high power density advantages save board space and reduce system costs.

	TPCxxCA
V_{BR}	11 V to 36 V
V_{WM}	10.5 V to 37.8 V
P_{PPM} (10 x 1000 μ s)	1500 W
T_j max.	185 °C
Polarity	Bidirectional
Qualification	AEC-Q101
Technology	PAR [®]



SMB
(DO-214AA)



SMPC
(TO-277A)

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 $P_{PP} = 3$ kW and 5 kW respectively, tested with a 10/1000 μ s test pulse. These unidirectional TVS diodes are built on our robust PAR[®] technology for a working range from $V_{WM} = 10$ V to 43 V. The maximum junction temperature is T_j max. = 185 °C.



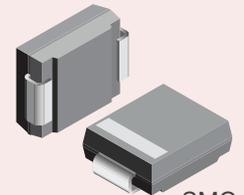
	3KASMC	5KASMC
V_{BR}	11.1 V to 52.8 V	11.1 V to 52.8 V
V_{WM}	10 V to 43 V	10 V to 43 V
P_{PPM} (10 x 1000 μ s)	3 kW	5 kW
T_j max.	185 °C	185 °C
Polarity	One-line unidirectional	

SMA6F SERIES

600 W TRANSZORB[®] TVS in the SlimSMA (DO-221AC) package with a low profile of 0.95 mm height and maximum T_j 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 μ s waveform and is ideal for industrial and space-limited applications.



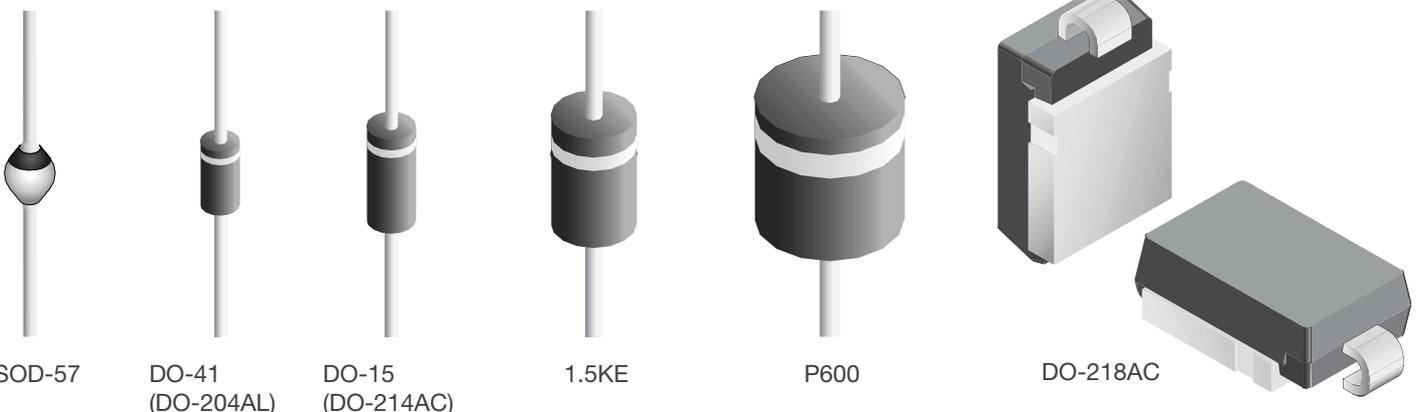
	SMA6FxxA
V_{BR}	6.4 V to 24.5 V
V_{WM}	5.0 V to 20 V
P_{PPM} (10 x 1000 μ s)	600 W
T_j max.	175 °C
Polarity	Unidirectional



SMC
(DO-214AB)



SlimSMA
(DO-221AC)



SOD-57

DO-41
(DO-204AL)

DO-15
(DO-214AC)

1.5KE

P600

DO-218AC

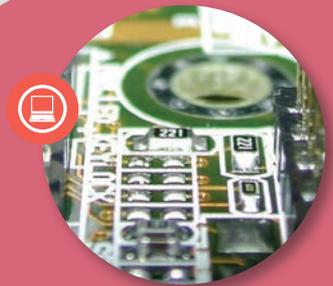
Complete Portfolio of Diodes and TVS

Advantages of Vishay TVS, ESD Protection, and Zener Diodes

- High power surge capability up to 6.6 kW at 10/1000 μ s
- 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

- TVS Diodes Selector Guide www.vishay.com/doc?49477
- ESD Protection Diodes Selector Guide www.vishay.com/doc?49673
- Zener Diodes Selector Guide www.vishay.com/doc?49494

AEC-Q101
QUALIFIED

RoHS
COMPLIANT

HALOGEN
FREE

GREEN
(5-2008)