

SOD-523 Plastic-Encapsulate ESD Protection Diodes

DESCRIPTION

ESD5Z3.3L is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.4pF, ESD5Z3.3L is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

ESD5Z3.3L uses ultra-small SOD-523 package. Each ESD5Z3.3L device can protect one high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make ESD5Z3.3L ideal for high-speed data port and high-frequency line (e.g., USB 2.0 & antenna line) applications, such as cellular phones and HD visual devices.

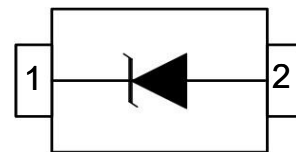
Features

- ◆ Peak power dissipation: 60W (8/20 μs)
- ◆ Transient protection for high-speed data lines
- ◆ IEC61000-4-2 (ESD) $\pm 15\text{kV}$ (air), $\pm 8\text{kV}$ (contact)
- ◆ IEC61000-4-4 (EFT) 40A (5/50ns)
Cable Discharge Event (CDE)
- ◆ Package optimized for high-speed lines
- ◆ Protects one data, control line
- ◆ Low capacitance: 0.4pF (Typical)
- ◆ Low clamping voltage
- ◆ Low leakage current

Pin Configuration



Circuit Diagram



Applications

- ◆ Serial ATA
- ◆ Desktops, Servers and Notebooks
- ◆ Cellular Phones
- ◆ MDDI Ports
- ◆ USB2.0 Power and Data Line Protection
- ◆ Display Ports
- ◆ Digital Visual Interfaces (DVI)

Mechanical Characteristics

- ◆ Package: SOD-523
- ◆ Flammability Rating: UL 94V-0
- ◆ High temperature soldering guaranteed:
260 $^{\circ}\text{C}$ / 10s
- ◆ Packaging: Tape and Reel
- ◆ Marking: 3L

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
ESD per IEC 61000-4-2 (Air)	V _{ESD}	± 20	KV
ESD per IEC 61000-4-2 (Contact)		± 20	
Peak Pulse Power(8/20us)	P _{PP}	60	W
Operating Temperature	T _{OPT}	-55 to +125	$^{\circ}\text{C}$
Storage Temperature	T _{STG}	-55 to +150	$^{\circ}\text{C}$
Lead Solder Temperature – Maximum (10 Second Duration)	T _L	260(10 sec.)	$^{\circ}\text{C}$

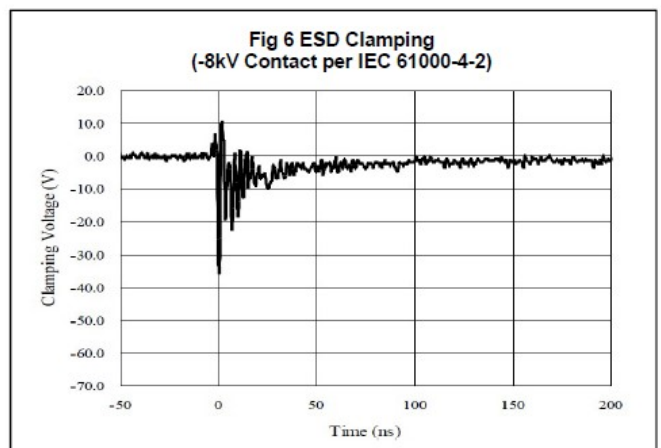
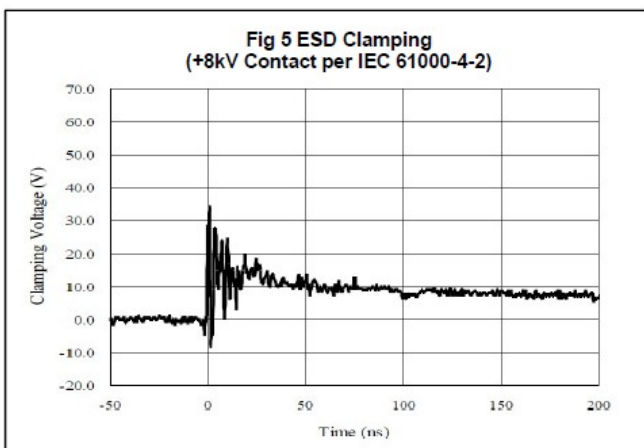
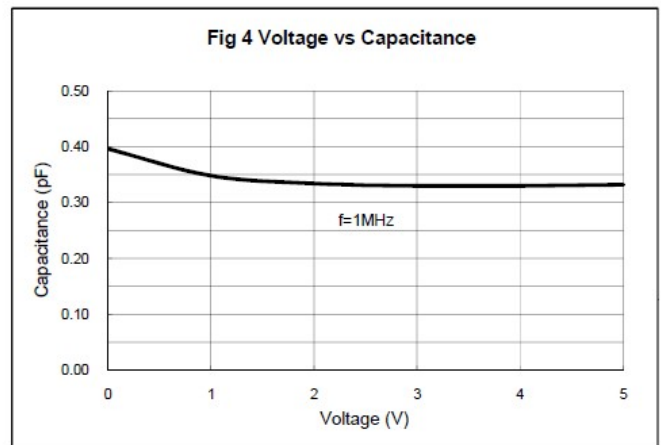
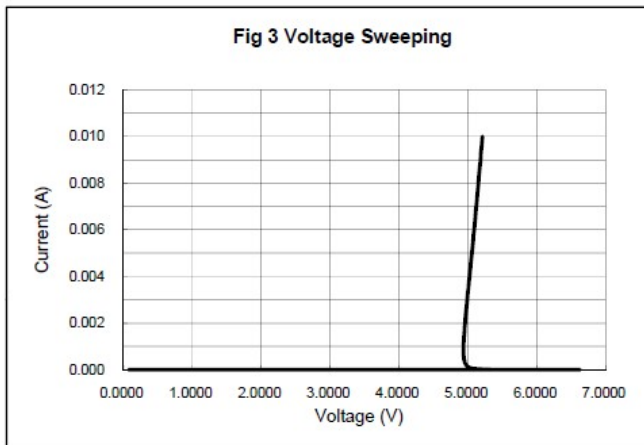
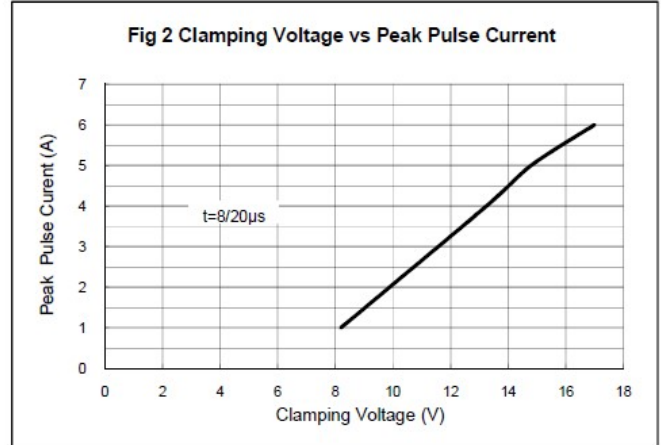
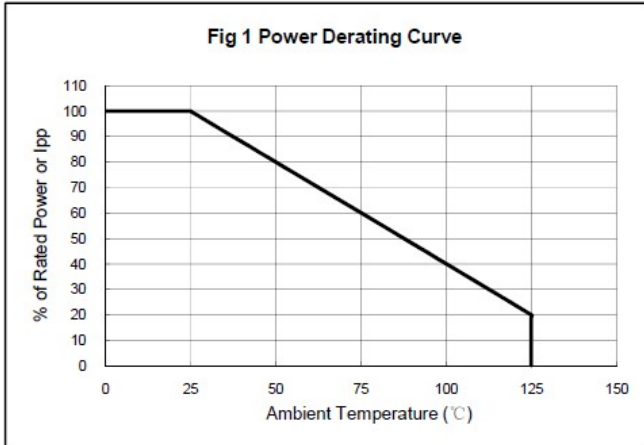
The above data are for reference only.

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				3.3	V
V_{BR}	Reverse Breakdown Voltage	$I_T = 1\text{mA}$	4.2			V
I_R	Reverse Leakage Current	$V_{RWM} = 3.3\text{V}$			100	nA
V_C	Clamping Voltage	$I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$			10	V
V_C	Clamping Voltage	$I_{PP} = 4\text{A}, t_p = 8/20\mu\text{s}$			15	V
C_J	Junction Capacitance	$V_R = 0\text{V}, f = 1\text{MHz}$		0.40	0.70	pF

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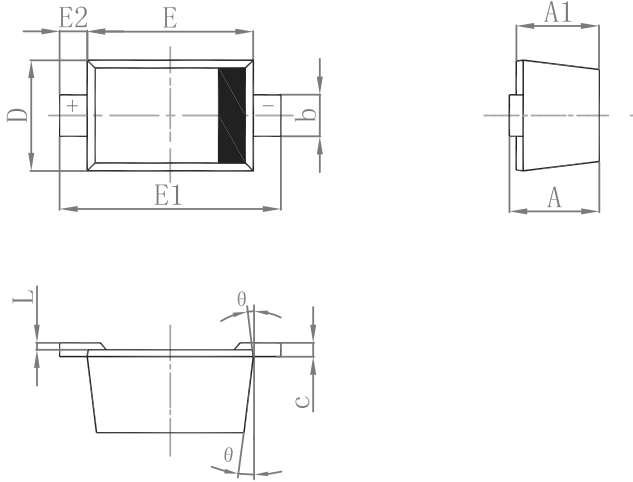
ELECTRICAL CHARACTERISTICS CURVE



The curve above is for reference only.

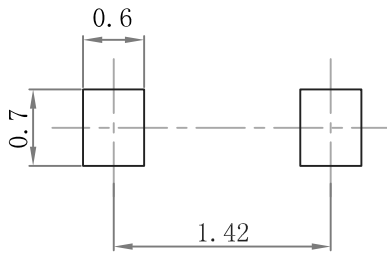
Outline Drawing

SOD-523 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.510	0.770	0.020	0.031
A1	0.500	0.770	0.020	0.031
b	0.250	0.400	0.010	0.016
c	0.080	0.150	0.003	0.006
D	0.750	1.000	0.030	0.040
E	1.100	1.300	0.043	0.051
E1	1.500	1.700	0.059	0.067
E2	0.150	0.250	0.006	0.010
L	0.000	0.070	0.000	0.003
K	0°	8°	0°	8°

Suggested Pad Layout



Note:

1. Controlling dimension: in/millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

PACKAGE SPECIFICATIONS

Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)	Box Size (mm)	QTY/Box (pcs)	Carton Size (mm)	Q'TY/Carton (pcs)
SOD-523	7'	178	3000	183×188×80	45,000	386×265×215	180,000