



## ESD5Z Series

### Protection Diodes Transient Voltage Suppressors

#### Description

The ESD5Z Series is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium. Because of its small size, it is suited for use in cellular phones, portable devices, digital cameras, power supplies and many other portable applications.

#### Features

- IEC61000-4-2 Level 4 ESD protection
- IEC61000-4-4 Level 4 EFT Protection
- ESD Rating of Class 3(>16kV) per Human Body Model
- 240 Watts Peak Pulse Power per (tp=8/20us)
- Low clamping voltage
- Stand-off voltages: 2.5V to 12V
- Low leakage current
- Response Time is Typically <1ns

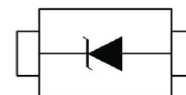
#### Mechanical Data

- SOD-523 Package
- Flammability Rating: UL 94V-0
- High temperature soldering guaranteed: 260°C/10s
- Device Meets MSL 1 Requirements

#### Package outline



#### Pin Configuration



#### ABSOLUTE MAXIMUM RATING

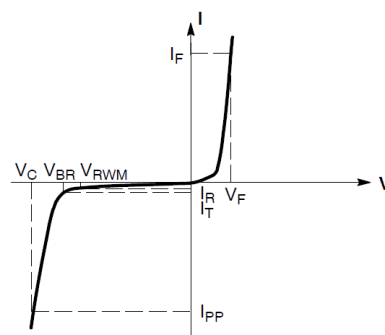
Parameters	Symbol	Value	Unit
ESD per IEC61000-4-2(Air)	V <sub>ESD</sub>	± 30	kV
ESD per IEC61000-4-2(Contact)			
IEC 61000-4-4(EFT)		40	A
ESD Voltage	Per Human Body Model	16	kV
	Per Machine Model	400	v
Total Power Dissipation on FR-5 Board (note 1)@Ta=25°C	P <sub>PP</sub>	200	W
Operating temperature	T <sub>OPT</sub>	-55-+150	°C
Storage temperature range	T <sub>STG</sub>	-55-+150	°C
Lead Soldering temperature-Maximum (10 second Duration)	T <sub>L</sub>	260(10 sec.)	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. FR-5=1.0 x 0.75 x 0.62 in.

#### Electrical Characteristics (Ratings at 25°C ambient temperature unless otherwise specified).

Symbol	Parameter
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ I <sub>pp</sub>
V <sub>RWM</sub>	Working Peak Reverse Voltage
I <sub>R</sub>	Maximum Reverse Leakage Current @ V <sub>RWM</sub>
V <sub>BR</sub>	Breakdown Voltage@ I <sub>T</sub>
I <sub>T</sub>	Test Current
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>
P <sub>PK</sub>	Peak Power Dissipation
C	Max. Capacitance @ V <sub>R</sub> =0 and f=1MHZ



Uni-Directional TVS

## Electrical Characteristics (Ta= 25°C unless otherwise noted, VF=0.9V Max.@ IF=10mA for all types).

DEVICE	DEVICE MARKING	VRWM (V) (max.)	IR(μA) @VRWM (max.)	VBR(V) @IT(note2) (min.)	IT (mA)	Vc@5A* (V) (Typ.)	Vc* (V) (Mx@IPP)	IPP* (A)	Ppk* (W) (max.)	C (pF) (Typ.)
ESD5Z2.5	ZD	2.5	6.0	4.0	1.0	6.5	10.9	11.0	120	145
ESD5Z3.3	ZE	3.3	0.05	5.0	1.0	8.4	14.1	11.2	158	105
ESD5Z5.0	ZF	5.0	0.05	6.2	1.0	11.6	18.6	9.4	174	80
ESD5Z6.0	ZG	6.0	0.01	6.8	1.0	12.4	20.5	8.8	181	70
ESD5Z7.0	ZH	7.0	0.01	7.5	1.0	13.5	22.7	8.8	200	65
ESD5Z12	ZM	12	0.01	14.1	1.0	17	25	9.6	240	55

\*urge current waveform per Figure 1.

2. VBR is measured with a pulse test current IT at an ambient temperature of 25°C

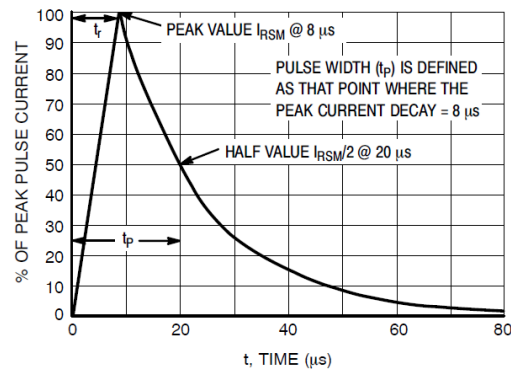


Figure 1. 8 x 20 μs Pulse Waveform

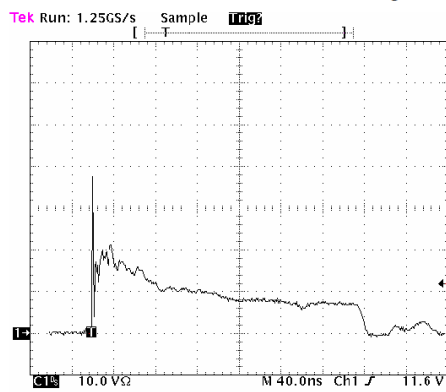


Figure 2. Positive 8 kV contact per IEC 6100-4-2  
- ESD5Z5.0T1G

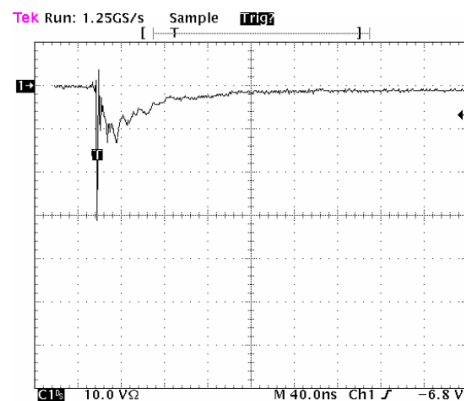
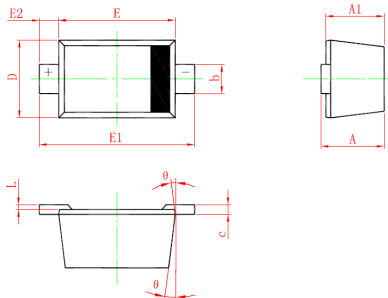


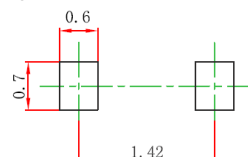
Figure 3. Negative 8 kV contact per IEC 6100-4-2  
- ESD5Z5.0T1G

## SOD-523 PACKAGE OUTLINE Plastic surface mounted package



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.510	0.770	0.020	0.031
A1	0.500	0.700	0.020	0.028
b	0.250	0.380	0.010	0.015
c	0.080	0.150	0.003	0.006
D	0.750	0.850	0.030	0.033
E	1.100	1.300	0.043	0.051
E1	1.500	1.700	0.059	0.067
E2	0.200 REF		0.008 REF	
L	0.010	0.070	0.001	0.003
θ	7° REF		7° REF	

## SOD-523 Suggested Pad Layout



Note:  
1. Controlling dimension: in millimeters.  
2. General tolerance: ±0.05mm.  
3. The pad layout is for reference purposes only.