ESD5Z2.5T1 SERIES

Transient Voltage Suppressors

Micro−Packaged Diodes for ESD Protection

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.

Specification Features:

- Small Body Outline Dimensions:
  0.047″ x 0.032″ (1.20 mm x 0.80 mm)
- Low Body Height: 0.028″ (0.7 mm)
- Stand−off Voltage: 2.5 V − 12 V
- Peak Power up to 240 Watts @ 8 x 20 μs Pulse
- Low Leakage
- Response Time is Typically < 1 ns
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- IEC61000−4−2 Level 4 ESD Protection
- IEC61000−4−4 Level 4 EFT Protection
- Pb−Free Packages are Available

Mechanical Characteristics:
CASE: Void-free, transfer-molded, thermosetting plastic
Epoxy Meets UL 94 V−0
LEAD FINISH: 100% Matte Sn (Tin)
MOUNTING POSITION: Any
QUALIFIED MAX REFLOW TEMPERATURE: 260°C
Device Meets MSL 1 Requirements

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
IEC 61000−4−2 (ESD)	Air Contact		±30 ±30	kV
IEC 61000−4−4 (EFT)			40	A
ESD Voltage	Per Human Body Model Per Machine Model		16 400	kV V
Total Power Dissipation on FR−5 Board (Note 1) @ T_A = 25°C		P_D	200	mW
Junction and Storage Temperature Range		T_J, T_{stg}	−55 to +150	°C
Lead Solder Temperature − Maximum (10 Second Duration)		T_L	260	°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.

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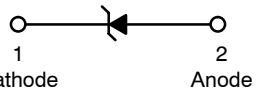
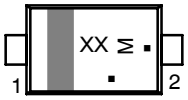
http://onsemi.com



SOD−523
CASE 502
PLASTIC

MARKING DIAGRAM



XX = Specific Device Code
M = Date Code
▪ = Pb−Free Package
(Note: Microdot may be in either location)

*Date Code orientation may vary depending upon manufacturing location.

ORDERING INFORMATION

Device	Package	Shipping†
ESD5ZxxxT1	SOD−523	3000/Tape & Reel
ESD5ZxxxT1G	SOD−523 Pb−Free	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

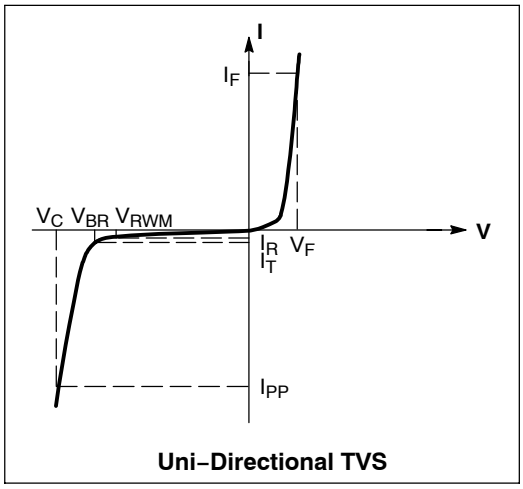
DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics tables starting on page 2 of this data sheet.

ELECTRICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted)

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_F	Forward Current
V_F	Forward Voltage @ I_F
P_{pk}	Peak Power Dissipation
C	Max. Capacitance @V_R = 0 and f = 1 MHz



Uni−Directional TVS

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted, V_F = 0.9 V Max. @ I_F = 10 mA for all types)

Device**	Device Marking	V_{RWM} (V)	I_R (μA) @ V_{RWM}	V_{BR} (V) @ I_T (Note 2)	I_T	V_C (V) @ I_{PP} = 5.0 A†	V_C (V) @ Max I_{PP}†	I_{PP} (A)†	P_{pk} (W)†	C (pF)
		Max	Max	Min	mA	Typ	Max	Max	Max	Typ
ESD5Z2.5T1, G*	ZD	2.5	6.0	4.0	1.0	6.5	10.9	11.0	120	145
ESD5Z3.3T1, G*	ZE	3.3	0.05	5.0	1.0	8.4	14.1	11.2	158	105
ESD5Z5.0T1, G*	ZF	5.0	0.05	6.2	1.0	11.6	18.6	9.4	174	80
ESD5Z6.0T1, G*	ZG	6.0	0.01	6.8	1.0	12.4	20.5	8.8	181	70
ESD5Z7.0T1, G*	ZH	7.0	0.01	7.5	1.0	13.5	22.7	8.8	200	65
ESD5Z12T1, G*	ZM	12	0.01	14.1	1.0	17	25	9.6	240	55

* The “G” suffix indicates Pb−Free package available.
**Other voltages available upon request.

†Surge current waveform per Figure 1.

2. V_{BR} is measured with a pulse test current I_T at an ambient temperature of 25°C.

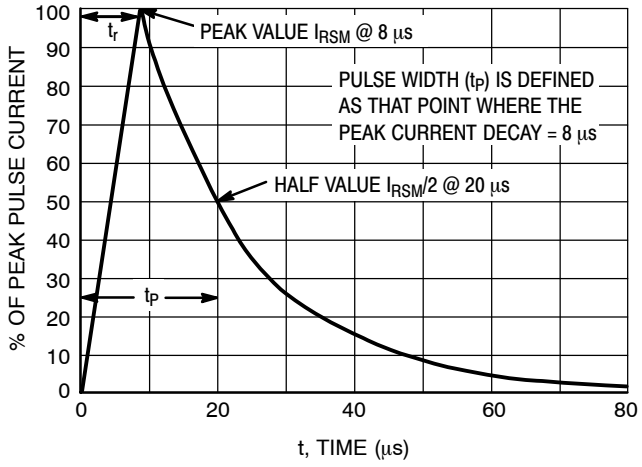


Figure 1. 8 x 20 μs Pulse Waveform

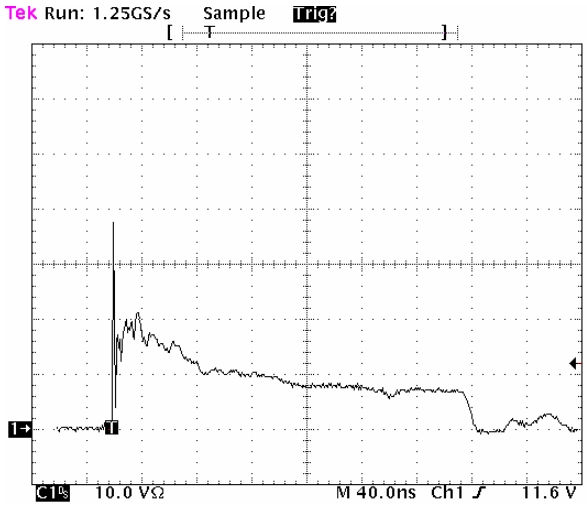


Figure 2. Positive 8 kV contact per IEC 6100−4−2 − ESD5Z5.0T1G

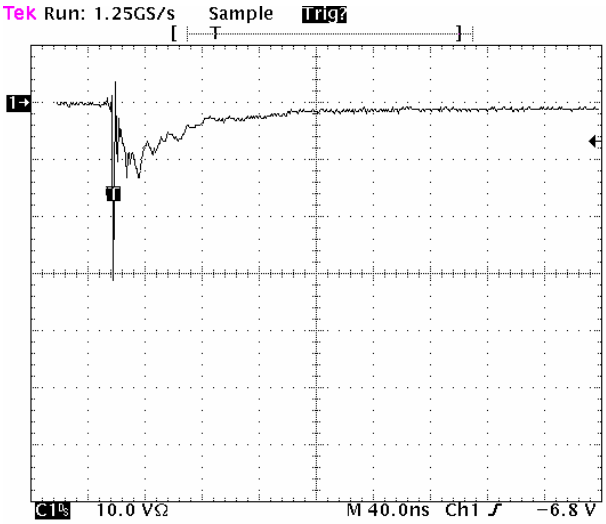
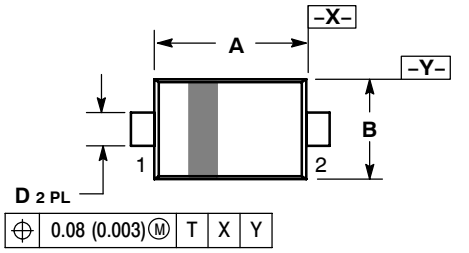
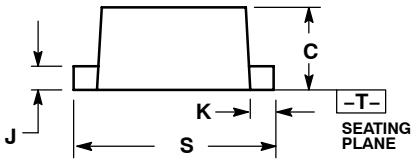


Figure 3. Negative 8 kV contact per IEC 6100−4−2 − ESD5Z5.0T1G

PACKAGE DIMENSIONS

SOD−523
CASE 502−01
ISSUE B

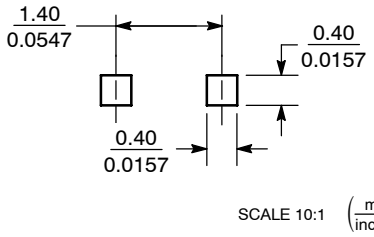




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	1.10	1.20	1.30	0.043	0.047	0.051
B	0.70	0.80	0.90	0.028	0.032	0.035
C	0.50	0.60	0.70	0.020	0.024	0.028
D	0.25	0.30	0.35	0.010	0.012	0.014
J	0.07	0.14	0.20	0.0028	0.0055	0.0079
K	0.15	0.20	0.25	0.006	0.008	0.010
S	1.50	1.60	1.70	0.059	0.063	0.067

SOLDERING FOOTPRINT*



*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
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