OM SENI

ESD9B3.3ST5G,ESD9B5.0ST5G

Transient Voltage Suppressors

Micro−Packaged Diodes for ESD Protection

The ESD9B Series is designed to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space comes at a premium.

Specification Features

- Low Capacitance 15 pF
- Low Clamping Voltage
- Small Body Outline Dimensions: 0.039″ x 0.024″ (1.0mm x 0.60mm)
- Low Body Height: 0.016″ (0.4 mm)
- Stand−off Voltage: 3.3 V, 5 V
- Low Leakage
- Response Time is < 1 ns
- IEC61000−4−2 Level 4 ESD Protection
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- This is a Pb−Free Device

Mechanical Characteristics

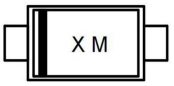
LEAD FINISH: 100% Matte Sn (Tin)
MOUNTING POSITION: Any
QUALIFIED MAX REFLOW TEMPERATURE: 260°C
Device Meets MSL 1 Requirements

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
IEC 61000−4−2 (ESD) Contact Air		±18 ±18	kV
IEC 61000−4−4 (EFT)		40	A
Total Power Dissipation on FR−5 Board (Note 1) @ T_A = 25°C Thermal Resistance, Junction−to−Ambient	P_D $R_{\theta JA}$	300 400	mW °C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C
Lead Solder Temperature − Maximum (10 Second Duration)	T_L	260	°C

SOD−923
CASE 514AB

MARKING DIAGRAM



X = Specific Device Code
M Date Code

ORDERING INFORMATION

Device	Package	Shipping†
ESD9B3.3ST5G	SOD−923 (Pb−Free)	8000/Tape & Reel
ESD9B5.0ST5G	SOD−923 (Pb−Free)	8000/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.

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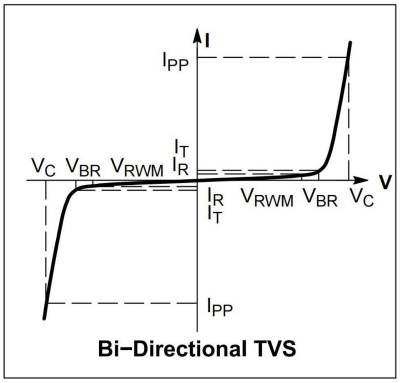
ELECTRICAL CHARACTERISTICS

(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
C	Capacitance @ V_R = 0 V and f = 1.0 MHz



Bi−Directional TVS

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Device	Device Marking	V_{RWM} (V)	I_R (nA) @ V_{RWM}	V_{BR} (V) @ I_T (Note 2)		I_T	C (pF)	V_C	V_C (V) Max Per 8 x 20 μs (Note 4)	
		Max	Max	Min	Max	mA	Typ	Per IEC61000−4−2 (Note 3)	I_{PP} = 1 A	I_{PP} = 2 A
ESD9B3.3ST5G	2*	3.3	100	5.0	7.0	1.0	15	Figures 1 and 2 See Below	10.5	11.5
ESD9B5.0ST5G, SZESD9B5.0ST5G	E	5.0	100	5.8	7.8	1.0	15	Figures 1 and 2 See Below	12.5	15.0

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

* Rotated 270°.

2. V_{BR} is measured with a pulse test current I_T at an ambient temperature of 25°C.
3. For test procedure see Figures 3 and 4 and Application Note AND8307/D.
4. Surge current waveforms per Figure 5.

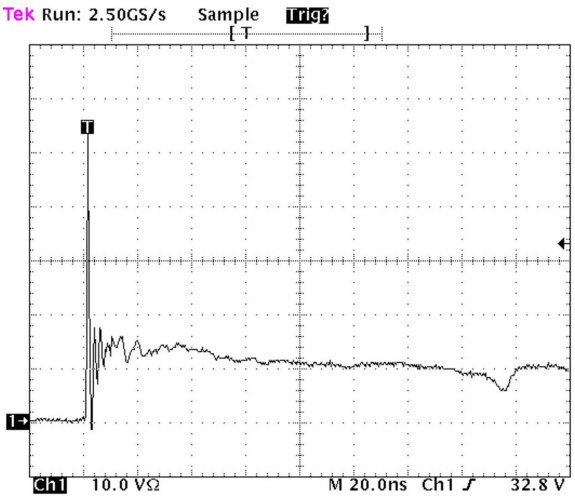


Figure 1. ESD Clamping Voltage Screenshot Positive 8 kV Contact per IEC61000−4−2

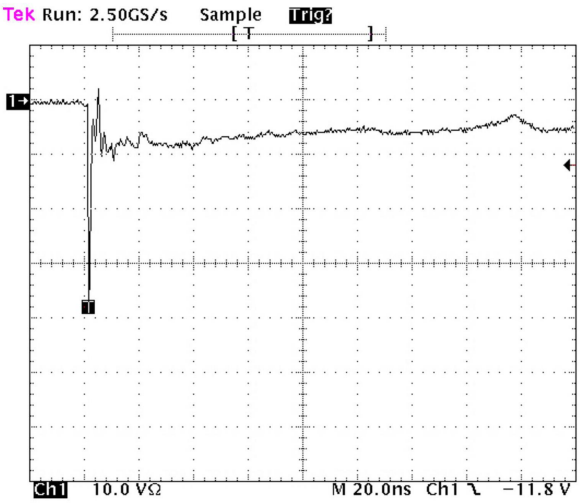


Figure 2. ESD Clamping Voltage Screenshot Negative 8 kV Contact per IEC61000−4−2

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IEC 61000−4−2 Spec.

Level	Test Voltage (kV)	First Peak Current (A)	Current at 30 ns (A)	Current at 60 ns (A)
1	2	7.5	4	2
2	4	15	8	4
3	6	22.5	12	6
4	8	30	16	8

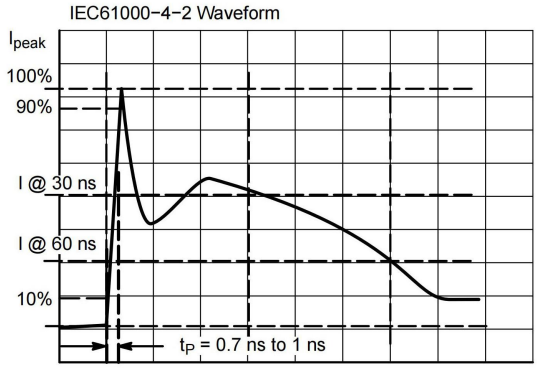

Figure 3. IEC61000−4−2 Spec

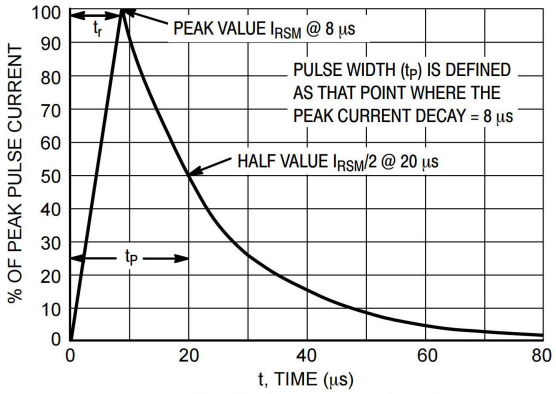

Figure 5. 8 X 20 μs Pulse Waveform

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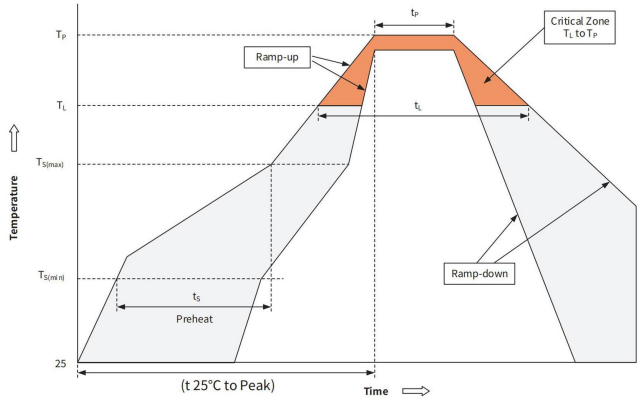
Ordering Information

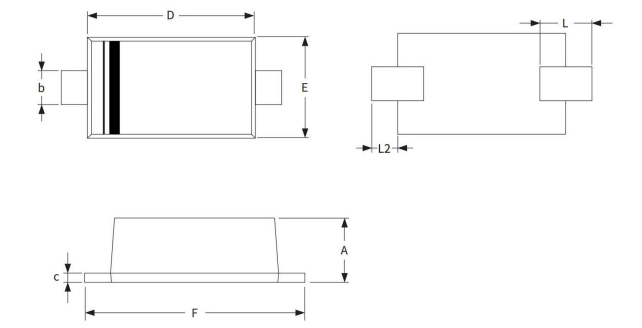
PREFERED P/N	PACKAGE	SIZE(mm)	DELIVERY MODE	MPQ(PCS)
	SOD-923	1.00×0.60×0.37	7"	8000

Recommended Soldering Conditions



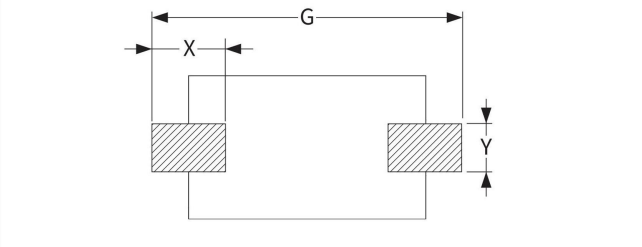
Profile Feature		Pb-Free Assembly
Pre-heat	Temperature Min ($T_{S(min)}$)	+150°C
	Temperature Max($T_{S(max)}$)	+200°C
	Time (Min to Max) (t_S)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C /sec. Max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C /sec. Max
Reflow	Temperature(T_L)(Liquid us)	+217°C
	Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		20-40secs
Ramp-down Rate		6°C /sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

Package Outline Dimensions (SOD-923)



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.34	0.40	0.013	0.016
b	0.15	0.25	0.006	0.010
c	0.07	0.17	0.003	0.007
D	0.75	0.85	0.030	0.033
E	0.55	0.65	0.022	0.026
F	0.95	1.05	0.037	0.041
L	0.19REF		0.007REF	
L2	0.05	0.15	0.002	0.006

Suggested Pad Layout



Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
G	-	1.20		0.047
X	0.36	-	0.014	-
Y	0.25	-	0.010	-