

# ESD5B5.0ST1G

## Transient Voltage Suppressor

### Bi-directional Micro-Packaged Diode for ESD Protection

The ESD5B 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 and bi-directional design, it is ideal for use in cellular phones, MP3 players, and portable applications that require audio line protection.

#### Specification Features

- Small Body Outline Dimensions: nom 0.063" x 0.032" (1.6x0.8 mm)
- Low Body Height: nom 0.024" (0.6 mm)
- Reverse Working (Stand-off) Voltage: 5.0 V
- Peak Power up to 50 W @ 8 x 20  $\mu$ s 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
- This is a Pb-Free Device

#### 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) Contact		$\pm 30$	kV
ESD Voltage Per Human Body Model Per Machine Model		16 400	kV V
Peak Power (Figure 1) Per 8 x 20 $\mu$ s Waveform Peak Power (Figure 2) Per 10 x 1000 $\mu$ s Waveform	$P_{PK}$	50 10	W
Total Power Dissipation on FR-5 Board (Note 1) @ $T_A = 25^\circ\text{C}$	$P_D$	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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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



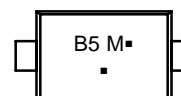
ON Semiconductor®

<http://onsemi.com>



SOD-523  
CASE 502  
PLASTIC

#### MARKING DIAGRAM



B5 = Specific Device Code  
M = Date Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
ESD5B5.0ST1G	SOD-523 (Pb-Free)	3000/Tape & Reel

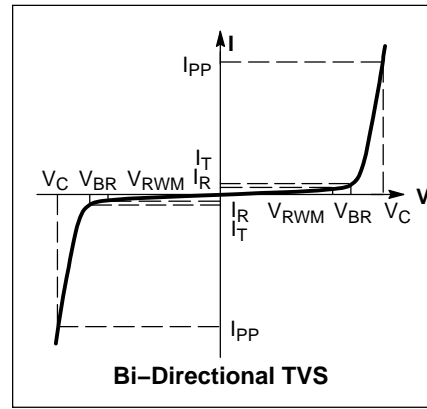
<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# ESD5B5.0ST1G

## ELECTRICAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter
$I_{PP}$	Reverse Peak Pulse Current
$V_C$	Clamping Voltage @ $I_{PP}$
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current



## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted, $V_F = 0.9\text{ V Max.}$ @ $I_F = 10\text{ mA}$ for all types)

Device*	$V_{RWM}$ (V)	$I_R$ ( $\mu\text{A}$ ) @ $V_{RWM}$	$V_{BR}$ (V) @ $I_T$ (Note 2)		$I_T$	$C$ (pF) @ $V_R = 0\text{ V}$ , $f = 1\text{ MHz}$
	Max	Max	Min	Max	mA	Typ
ESD5B5.0ST1G	5.0	1.0	5.8	7.8	1.0	32

\*Other voltages available upon request.

2.  $V_{BR}$  is measured with a pulse test current  $I_T$  at an ambient temperature of  $25^\circ\text{C}$ .

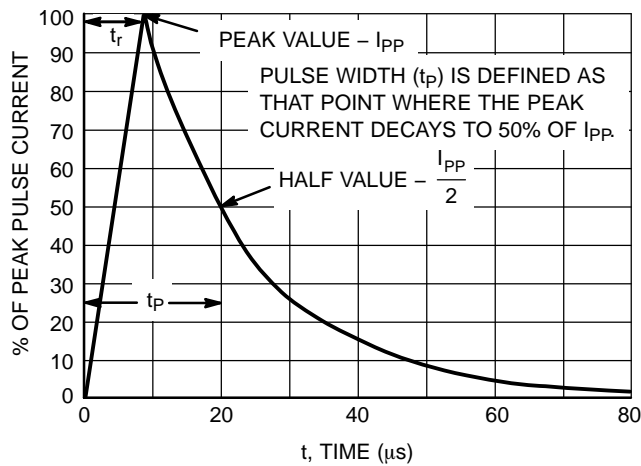


Figure 1. 8 x 20  $\mu\text{s}$  Pulse Waveform

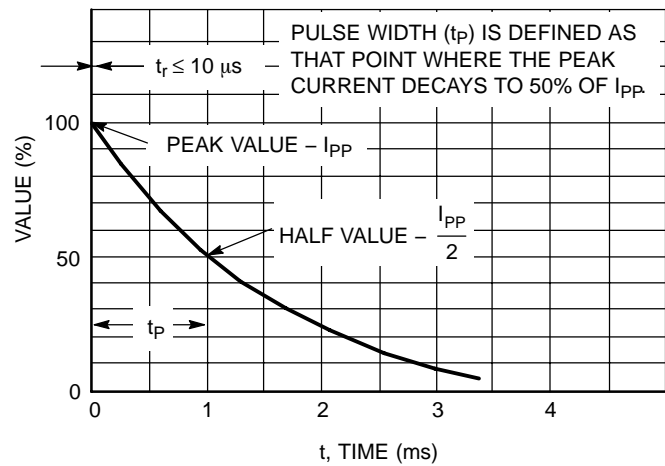


Figure 2. 10 x 1000  $\mu\text{s}$  Pulse Waveform

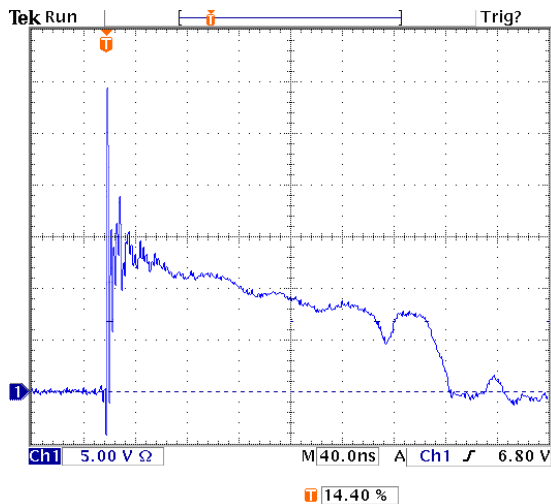


Figure 3. Positive 8 kV Contact per IEC 6100-4-2  
ESD5B5.0ST1G

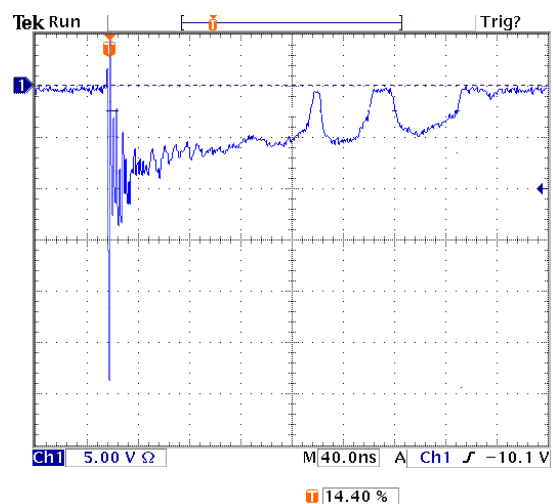
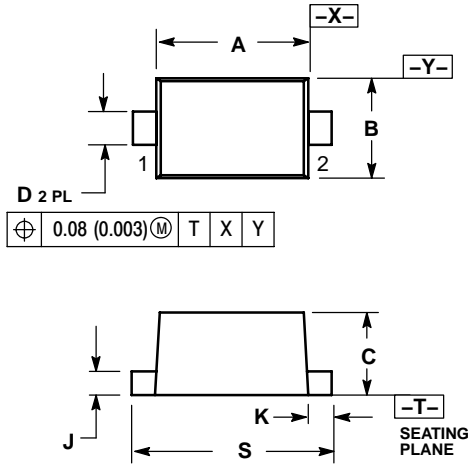


Figure 4. Negative 8 kV Contact per IEC 6100-4-2  
ESD5B5.0ST1G

# ESD5B5.0ST1G

## PACKAGE DIMENSIONS

**SOD-523**  
CASE 502-01  
ISSUE B

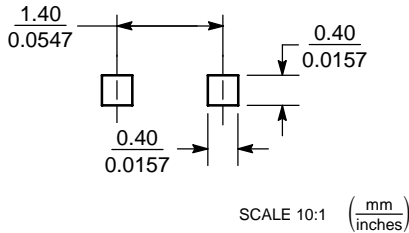


### NOTES:

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.

DIM	MILLIMETERS			INCHES		
	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.

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