ESD11B5.0SMT5G

Transient Voltage Suppressors

Micro−Packaged Diodes for ESD Protection

The ESD11B 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 Clamping Voltage
- Small Body Outline Dimensions: 0.60 mm x 0.30 mm
- Low Body Height: 0.3 mm
- Stand−off Voltage: 5.0 V
- Low Leakage
- Response Time is < 1 ns
- IEC61000−4−2 Level 4 ESD Protection
- IEC61000−4−4 Level 4 EFT Protection
- This is a Pb−Free Device

Mechanical Characteristics
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		±8.0 ±15	kV
Total Power Dissipation on FR−5 Board (Note 1) @ T_A = 25°C	P_D	250	mW
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	400	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−40 to +125	°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.

See Application Note AND8308/D for further description of survivability specs.

ON Semiconductor®

http://onsemi.com

2−PIN FLIP−CHIP
CASE 499BA

ORDERING INFORMATION

Device	Package	Shipping†
ESD11B5.0SMT5G	Flip−Chip (Pb−Free)	5000/Tape & Reel

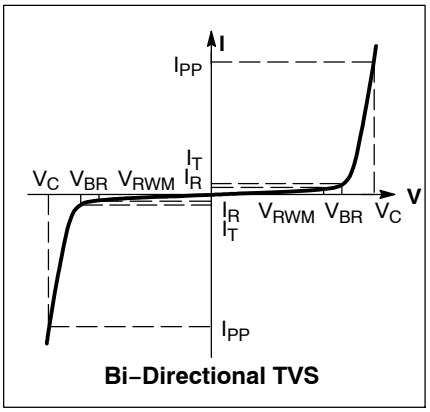
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

*See Application Note AND8308/D for detailed explanations of datasheet parameters.



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

Device	Device Marking	V_{RWM} (V) Max	I_R (μA) @ V_{RWM} Max	V_{BR} (V) @ I_T (Note 2) Min	I_T mA	C (pF) Typ	V_C Per IEC61000−4−2 (Note 4)
ESD11B5.0SMT5G	B5V0	5.0	1.0	5.8	1.0	13.5	Figures 1 and 2 See Below

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

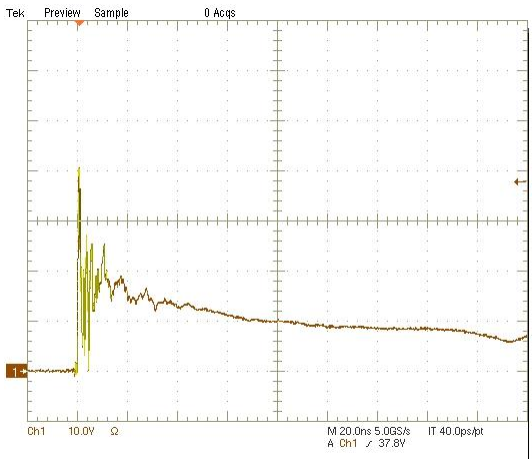


Figure 1. ESD Clamping Voltage Screenshot Positive 8 kV Contact per IEC61000−4−2

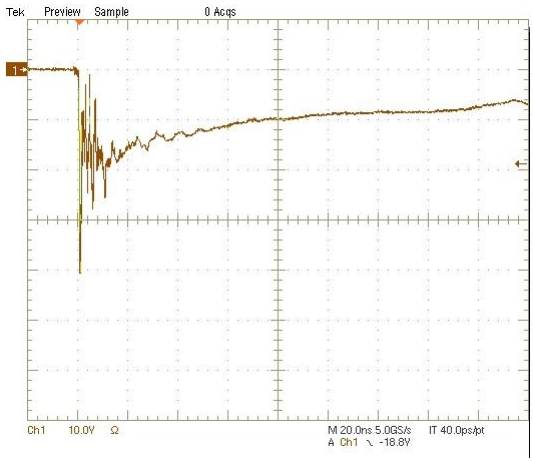


Figure 2. ESD Clamping Voltage Screenshot Negative 8 kV Contact per IEC61000−4−2

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

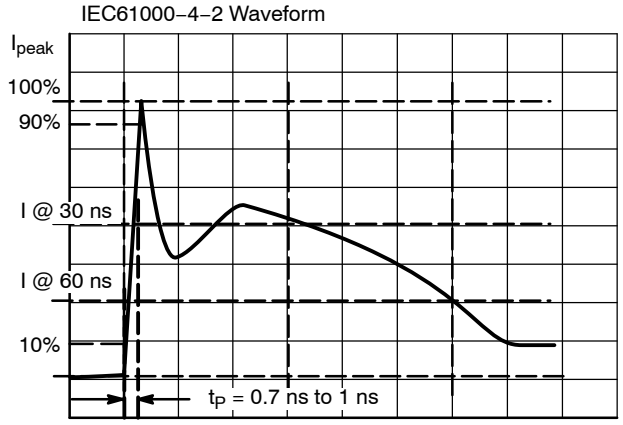


Figure 3. IEC61000−4−2 Spec

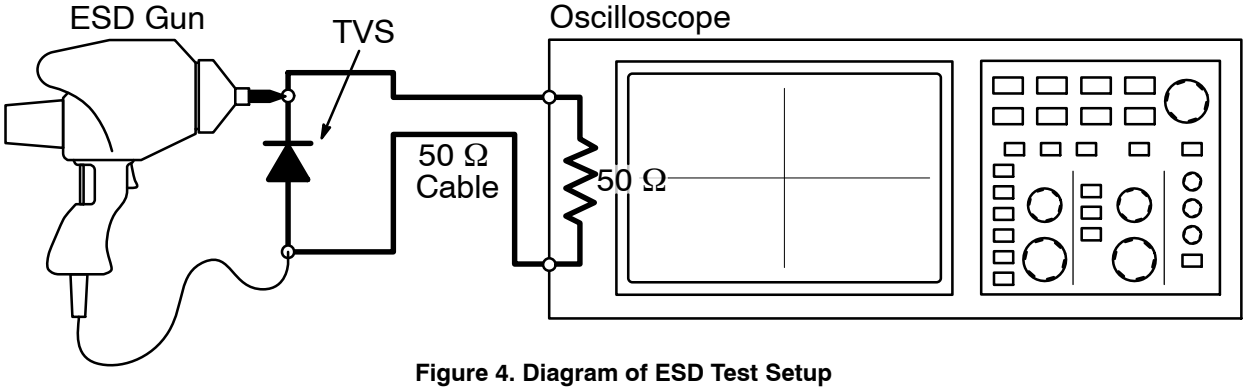


Figure 4. Diagram of ESD Test Setup

The following is taken from Application Note AND8308/D − Interpretation of Datasheet Parameters for ESD Devices.

ESD Voltage Clamping

For sensitive circuit elements it is important to limit the voltage that an IC will be exposed to during an ESD event to as low a voltage as possible. The ESD clamping voltage is the voltage drop across the ESD protection diode during an ESD event per the IEC61000−4−2 waveform. Since the IEC61000−4−2 was written as a pass/fail spec for larger systems such as cell phones or laptop computers it is not clearly defined in the spec how to specify a clamping voltage at the device level. ON Semiconductor has developed a way to examine the entire voltage waveform across the ESD protection diode over the time domain of an ESD pulse in the form of an oscilloscope screenshot, which can be found on the datasheets for all ESD protection diodes. For more information on how ON Semiconductor creates these screenshots and how to interpret them please refer to AND8307/D.

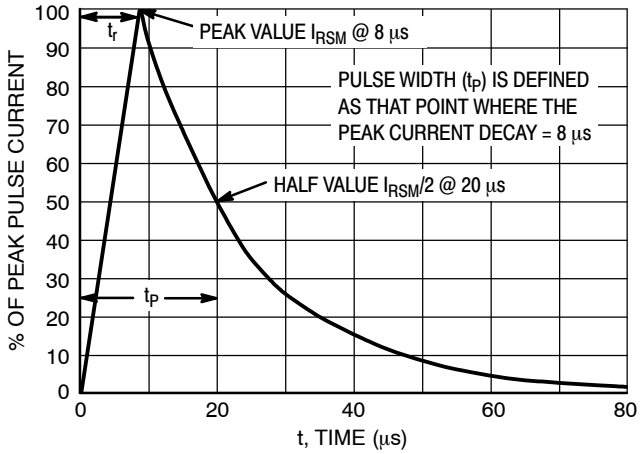
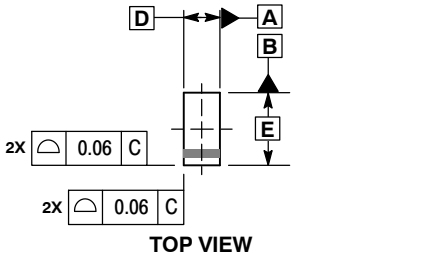


Figure 5. 8 X 20 μs Pulse Waveform

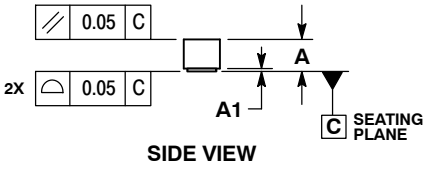
ESD11B5.0SMT5G

PACKAGE DIMENSIONS

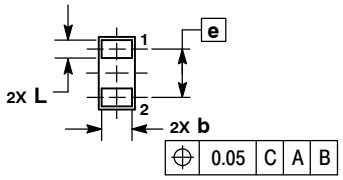
2 Pin Flip−Chip, 0.6x0.3
CASE 499BA−01
ISSUE O



TOP VIEW



SIDE VIEW

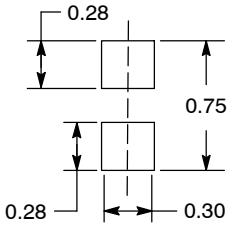


BOTTOM VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.24	0.30
A1	0.00	0.05
b	0.22	0.28
D	0.30 BSC	
E	0.60 BSC	
e	0.40 BSC	
L	0.12	0.18

MOUNTING FOOTPRINT*



DIMENSIONS: MILLIMETERS

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

Notice:
Product contains TiNiAg metal leads which may result in tarnishing. Tarnishing results in product with discolored leads. Issue is cosmetic only − performance is not compromised from tarnishing. The composition of the Tarnish is Silver Sulfide, which is electrically conductive.

Packaging Disclosures:
In order to meet Motorola timing deadlines ON Semiconductor has employed a tape and reel machine from an outside source for all sample builds to date and the same source will be used for early production builds through March 31, 2009. The outside vendor's tape and reel environment may not be controlled to ON Semiconductor's clean room standards. ON Semiconductor's tape and reel processes guarantee part placement in pocket with no more than 30 ppm rotated parts and no more than three consecutive components rotated.

ON Semiconductor will continue to optimize the tape and reel operation to achieve our usual high quality standards.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

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For additional information, please contact your local Sales Representative