

μESD3.3ST5G SERIES

ESD Protection Diodes In Ultra Small SOD-723 Package

The μESD 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:

- Small Body Outline Dimensions:
0.055" x 0.024" (1.40 mm x 0.60 mm)
- Low Body Height: 0.020" (0.5 mm)
- Stand-off Voltage: 3.3 V - 12 V
- 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
- These are Pb-Free Devices

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 | 150 | 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>



PIN 1. CATHODE
2. ANODE



**SOD-723
CASE 509AA**

MARKING DIAGRAM



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

ORDERING INFORMATION

| Device | Package | Shipping† |
|------------|----------------------|------------------|
| μESDxxST5G | SOD-723 (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.

DEVICE MARKING INFORMATION

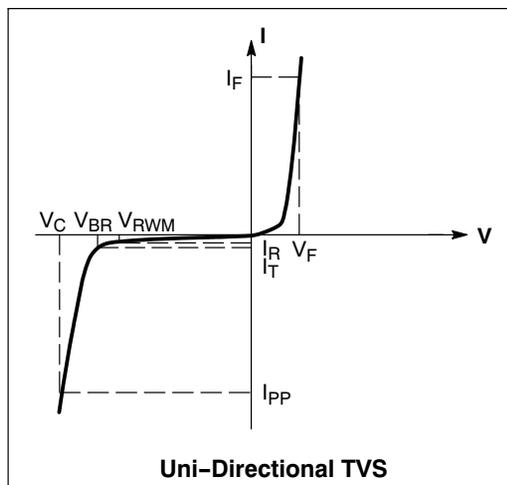
See specific marking information in the device marking column of the table on page 2 of this data sheet.

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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 |
| 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 |



ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted, V_F = 1.1 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) @ Max I _{PP} † | I _{PP} (A)† | P _{pk} (W)† | C (pF) |
|-------------|----------------|----------------------|--|---|----------------|--|----------------------|----------------------|--------|
| | | Max | Max | Min | mA | Max | Max | Max | Typ |
| μESD3.3ST5G | E0 | 3.3 | 2.5 | 5.0 | 1.0 | 10.9 | 10.4 | 113 | 80 |
| μESD5.0ST5G | E2 | 5.0 | 1.0 | 6.2 | 1.0 | 13.3 | 8.8 | 117 | 65 |
| μESD12ST5G | E3 | 12 | 1.0 | 13.5 | 1.0 | 23.7 | 5.4 | 128 | 30 |

*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.

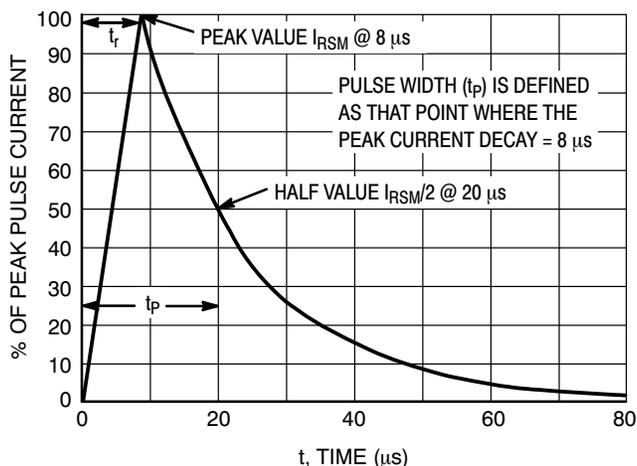


Figure 1. 8 x 20 μs Pulse Waveform

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TYPICAL CHARACTERISTICS

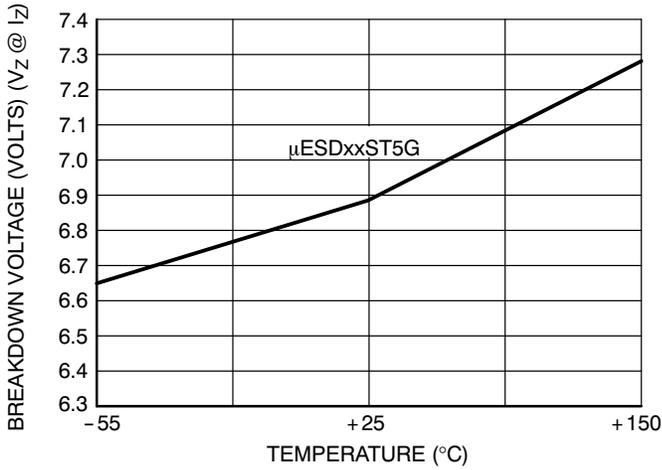


Figure 2. Typical Breakdown Voltage versus Temperature

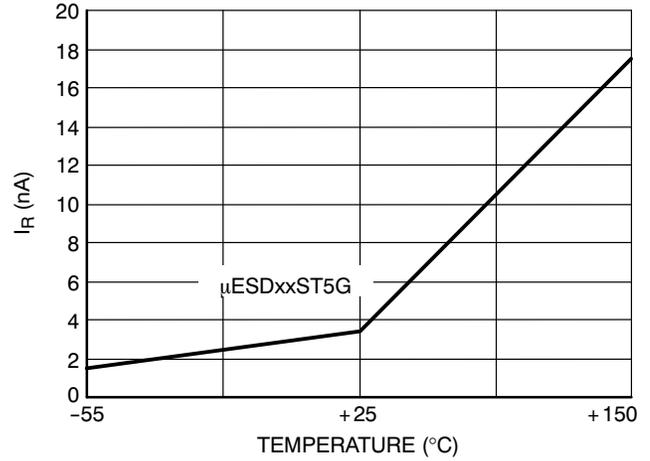


Figure 3. Typical Leakage Current versus Temperature

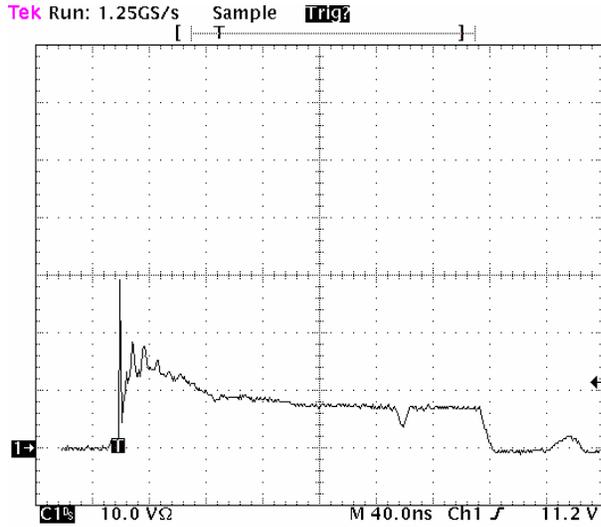


Figure 4. Positive 8 kV contact per IEC 6100-4-2 - μESD5.0ST5G

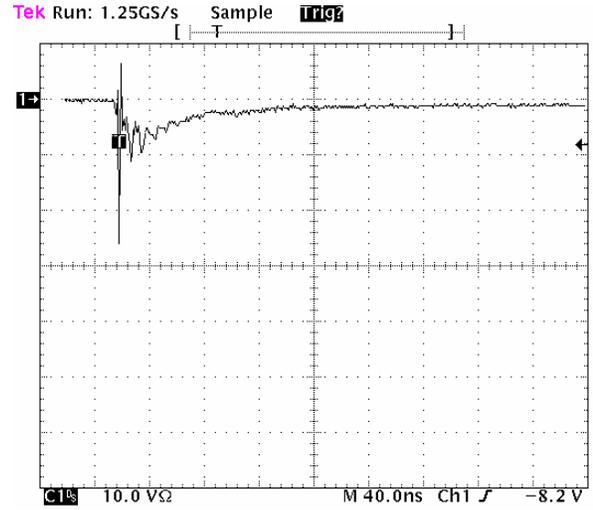
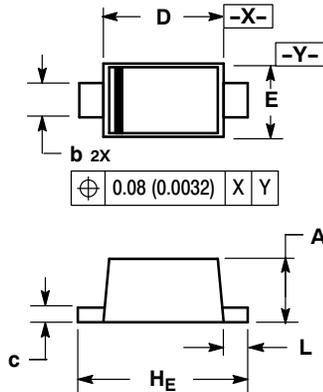


Figure 5. Negative 8 kV contact per IEC 6100-4-2 - μESD5.0ST5G

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PACKAGE DIMENSIONS

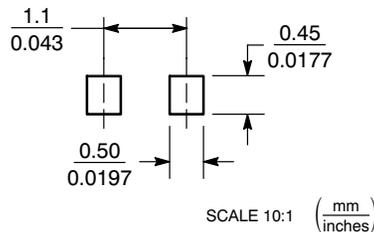
SOD-723
CASE 509AA-01
ISSUE O



- 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 | 0.49 | 0.52 | 0.55 | 0.019 | 0.020 | 0.022 |
| b | 0.25 | 0.28 | 0.32 | 0.0098 | 0.011 | 0.013 |
| c | 0.08 | 0.12 | 0.15 | 0.0032 | 0.0047 | 0.0059 |
| D | 0.95 | 1.00 | 1.05 | 0.037 | 0.039 | 0.041 |
| E | 0.55 | 0.60 | 0.65 | 0.022 | 0.024 | 0.026 |
| HE | 1.35 | 1.40 | 1.45 | 0.053 | 0.055 | 0.057 |
| L | 0.15 | 0.20 | 0.25 | 0.006 | 0.0079 | 0.010 |

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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