

SD05T1 Series, SZSD05T1 Series

Transient Voltage Suppressor Diode

SOD-323 Diodes for ESD Protection

These TVS diodes are designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. These devices are ideal for situations where board space is at a premium.

Specification Features:

- Steady State Power Rating of 300 mW
- Peak Power – 350 W (8 × 20 μs)
- Low Leakage
- Cathode Indicated by Polarity Band
- Package Weight: 4.507 mg/wmt
- Meets IEC61000-4-2 Level 4, 15 kV (Air), 8 kV (Contact)
- Meets IEC6100-4-4 Level 4, 40 A
- Meets IEC6100-4-5 (Lightning), 24 A
- Meets 16 kV Human Body Model ESD Requirements
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant

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

Use the Device Number to order the 7 inch/3,000 unit reel.
Replace the “T1” with “T3” in the Device Number to order the 13 inch/10,000 unit reel.



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MARKING DIAGRAM



**SOD-323
CASE 477
STYLE 1**

xx = Specific Device Code
ZA = SD05T1
ZC = SD12T1
M = Month Code
▪ = Pb-Free Package
(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|-----------|----------------------|-----------------------|
| SD05T1G | SOD-323 (Pb-Free) | 3000/Tape & Reel |
| SZSD05T1G | | |
| SD12T1G | | |
| SZSD12T1G | | |

[†]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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MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|-----------------|-----------------------|----------------------------|
| Peak Power Dissipation @ 20 μ s (Note 1) @ $T_L \leq 25^\circ\text{C}$ | P_{pk} | 350 | Watts |
| IEC 61000-4-2 (ESD) Air Contact | | ± 15 ± 8.0 | kV |
| IEC 61000-4-4 (EFT) | | 40 | A |
| ESD Voltage (Human Body Model (HBM) Waveform per IEC 61000-4-2) | V_{pp} | 30 | kV |
| Total Power Dissipation on FR-4 Board (Note 2) @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 300 2.4 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 416 | $^\circ\text{C/W}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |
| Lead Solder Temperature – Maximum (10 Second Duration) | T_L | 260 | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

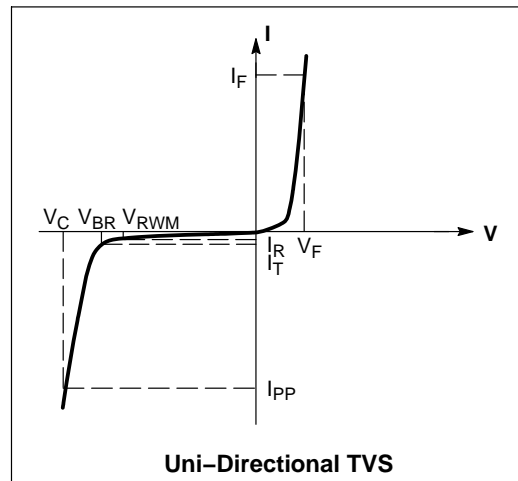
*Other voltages may be available upon request.

1. Nonrepetitive current pulse, per Figure 6.
2. FR-4 printed circuit board, single-sided copper, mounting pad 1 cm².

ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ 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 |



ELECTRICAL CHARACTERISTICS

| Device | V_{RWM} (V) | I_R @ V_{RWM} (μA) | V_{BR} , Breakdown Voltage (V) | | I_T mA | V_C @ $I_{PP} = 5\text{ A}$ (Note 3) (V) | Max I_{PP} (Note 3) (A) | V_C @ Max I_{PP} (Note 3) (V) | Max Capacitance (pF) |
|---------|---------------|-------------------------------------|----------------------------------|-------|----------|--|---------------------------|-----------------------------------|--|
| | | | Min | Max | | | | | $V_R = 0\text{ V}$ $f = 1.0\text{ MHz}$ |
| SD05T1G | 5.0 | 10 | 6.2 | 7.3 | 1.0 | 9.8 | 24 | 14.5 | 350 |
| SD12T1G | 12 | 1.0 | 13.3 | 15.75 | 1.0 | 19 | 15 | 25 | 150 |

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.

3. $8 \times 20\ \mu\text{s}$ pulse waveform.

*Include SZ-prefix devices where applicable.

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TYPICAL CHARACTERISTICS

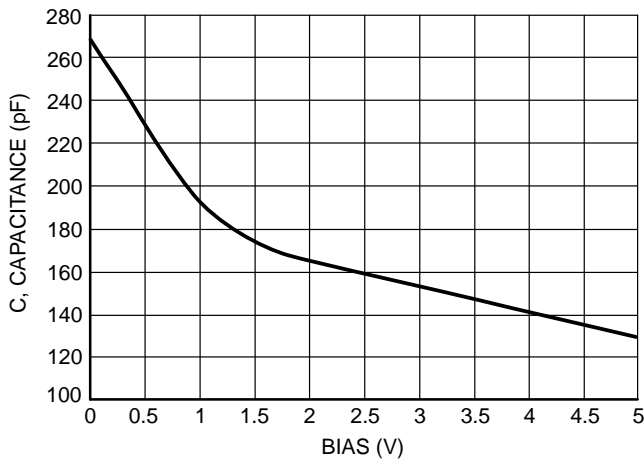


Figure 1. SD05 Typical Capacitance versus Bias Voltage

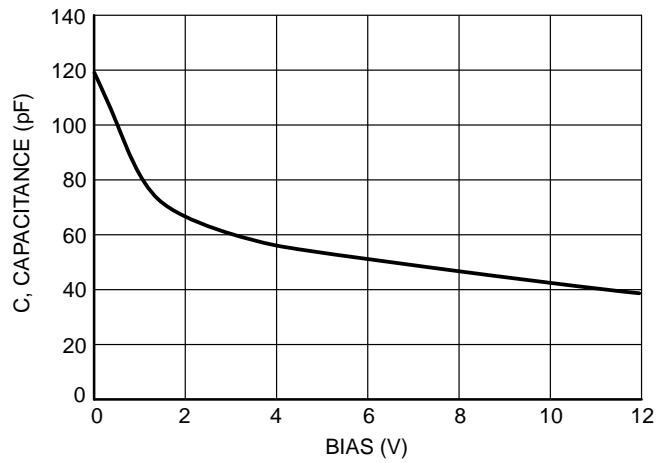


Figure 2. SD12 Typical Capacitance versus Bias Voltage

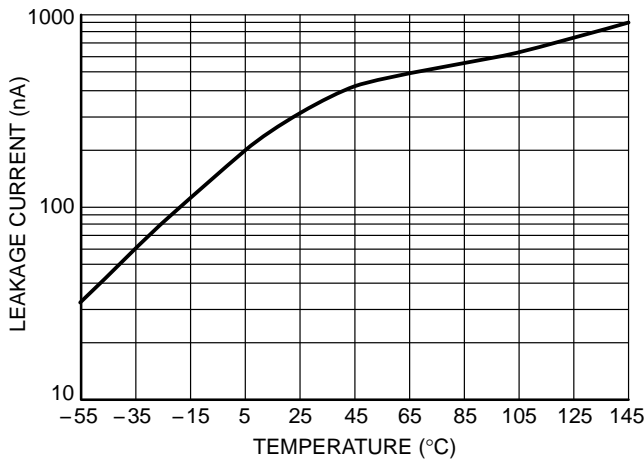


Figure 3. SD05 Typical Leakage Current versus Temperature

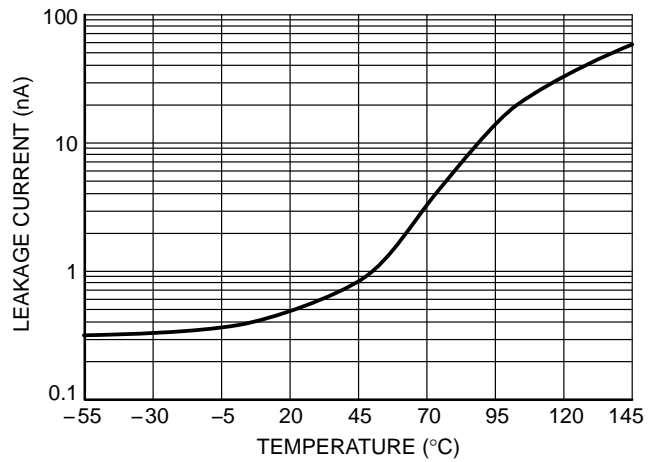


Figure 4. SD12 Typical Leakage Current versus Temperature

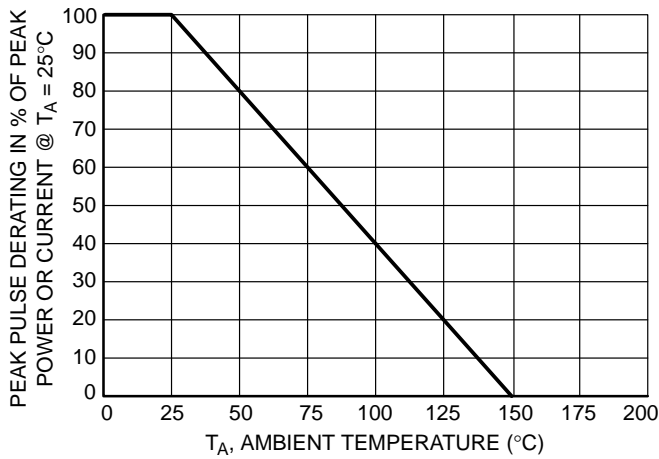


Figure 5. Pulse Derating Curve

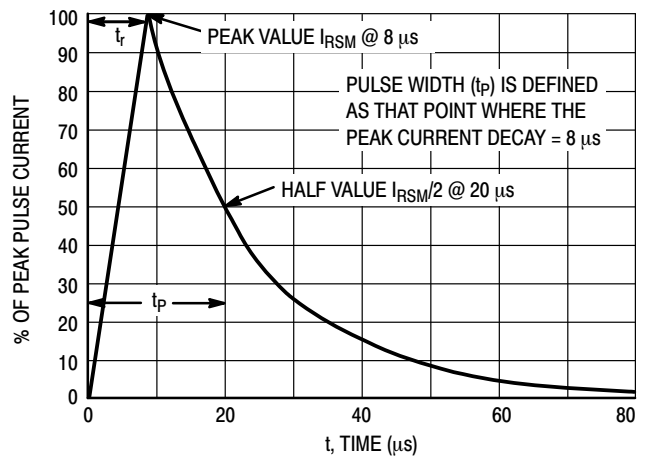
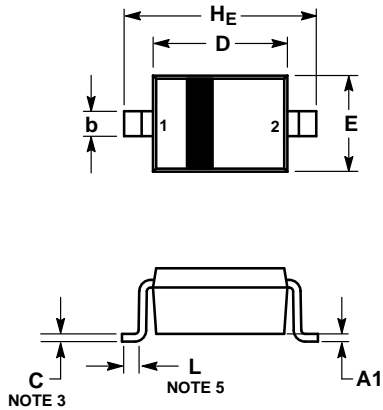


Figure 6. 8 x 20 μs Pulse Waveform

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PACKAGE DIMENSIONS

SOD-323
CASE 477-02
ISSUE H



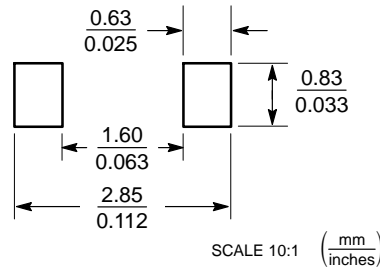
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DIMENSION L IS MEASURED FROM END OF RADIUS.


| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|-------|-----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.80 | 0.90 | 1.00 | 0.031 | 0.035 | 0.040 |
| A1 | 0.00 | 0.05 | 0.10 | 0.000 | 0.002 | 0.004 |
| A3 | 0.15 REF | | | 0.006 REF | | |
| b | 0.25 | 0.32 | 0.4 | 0.010 | 0.012 | 0.016 |
| C | 0.089 | 0.12 | 0.177 | 0.003 | 0.005 | 0.007 |
| D | 1.60 | 1.70 | 1.80 | 0.062 | 0.066 | 0.070 |
| E | 1.15 | 1.25 | 1.35 | 0.045 | 0.049 | 0.053 |
| L | 0.08 | | | 0.003 | | |
| HE | 2.30 | 2.50 | 2.70 | 0.090 | 0.098 | 0.105 |

STYLE 1:
PIN 1. CATHODE
2. ANODE

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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