

SD05T1 Series

Preferred Device

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 200 mW
- Peak Power – 350 W ($8 \times 20 \mu\text{s}$)
- 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
- Pb-Free Packages are Available

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†
SD05T1	SOD-323	3000/Tape & Reel
SD05T1G	SOD-323 (Pb-Free)	3000/Tape & Reel
SD12T1	SOD-323	3000/Tape & Reel
SD12T1G	SOD-323 (Pb-Free)	3000/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.

Preferred devices are recommended choices for future use and best overall value.

SD05T1 Series

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-5 Board (Note 2) @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	200 1.6	mW mW/ $^\circ\text{C}$
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	635	$^\circ\text{C}/\text{W}$
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	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

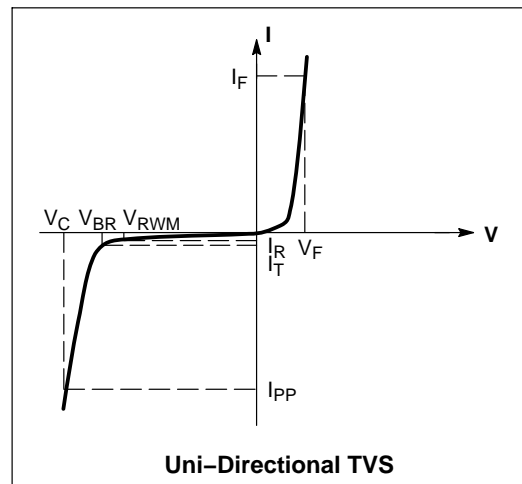
*Other voltages may be available upon request.

1. Nonrepetitive current pulse, per Figure 6.
2. FR-5 = 1.0 x 0.75 x 0.62 in.

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					$V_R = 0\text{ V}$ $f = 1.0\text{ MHz}$
SD05T1, G	5.0	10	6.2	7.3	1.0	9.8	24	14.5	350
SD12T1, G	12	1.0	13.3	15.75	1.0	19	15	25	150

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

SD05T1 Series

TYPICAL CHARACTERISTICS

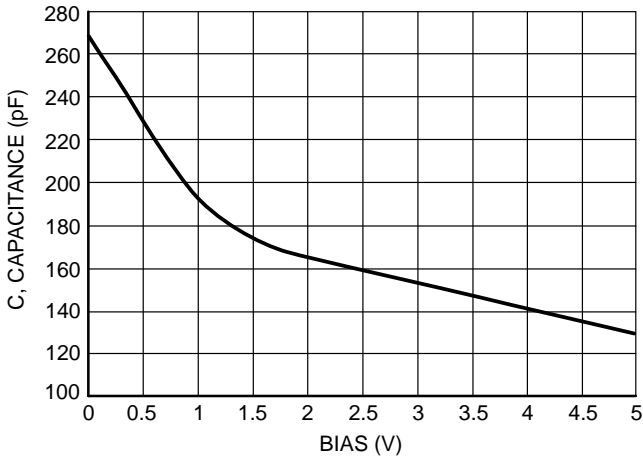


Figure 1. SD05 Typical Capacitance versus Bias Voltage

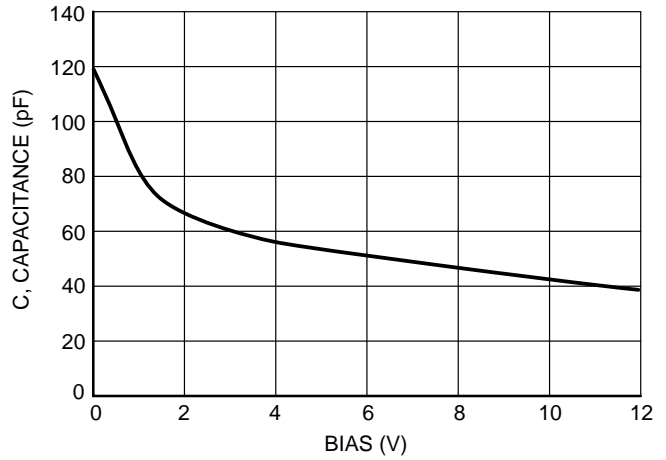


Figure 2. SD12 Typical Capacitance versus Bias Voltage

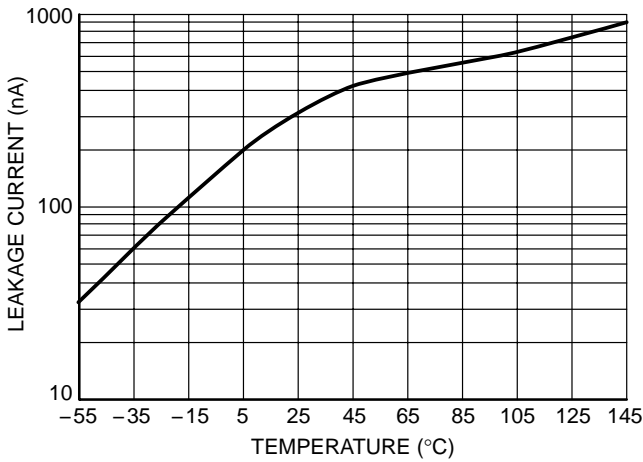


Figure 3. SD05 Typical Leakage Current versus Temperature

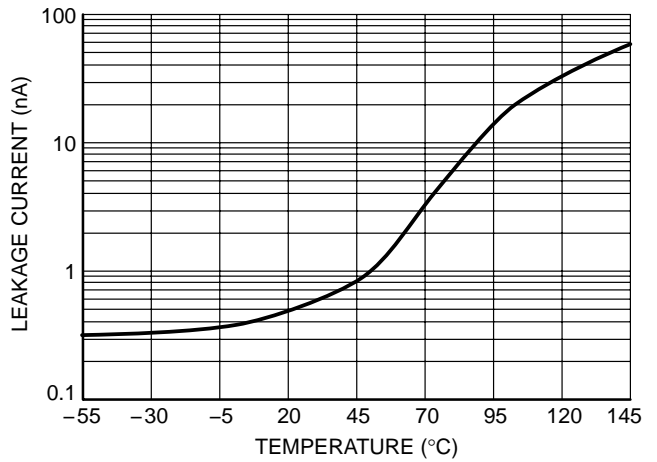


Figure 4. SD12 Typical Leakage Current versus Temperature

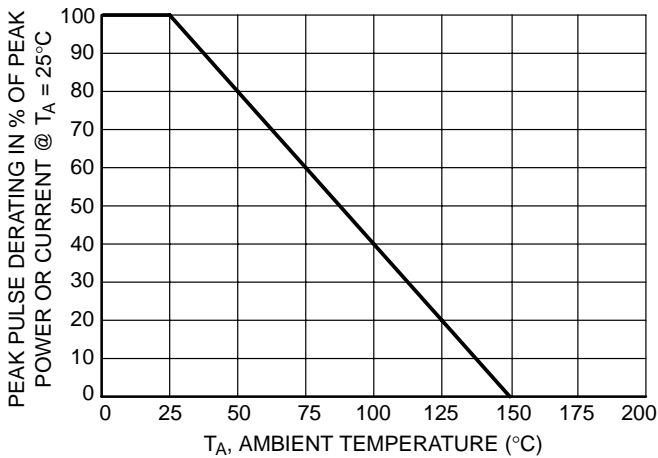


Figure 5. Pulse Derating Curve

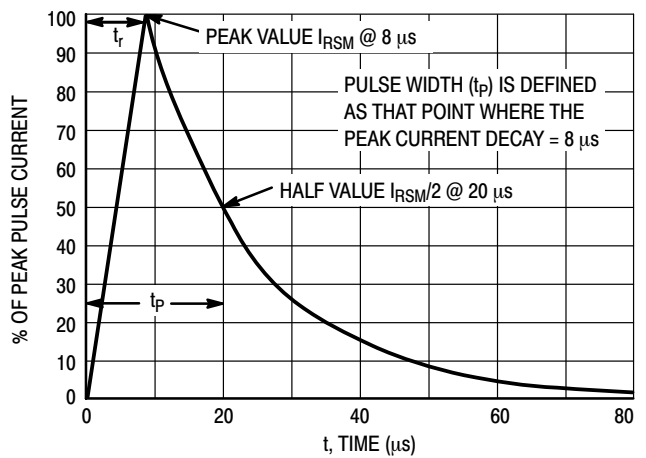
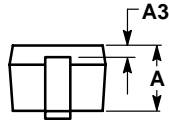
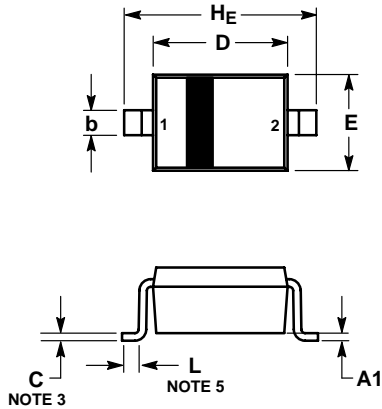


Figure 6. 8 x 20 μs Pulse Waveform

SD05T1 Series

PACKAGE DIMENSIONS

SOD-323
CASE 477-02
ISSUE G



NOTES:

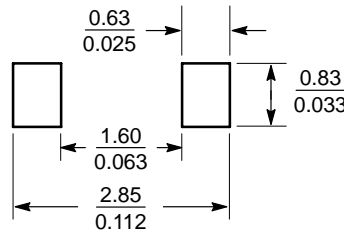
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DIMENSION L IS MEASURED FROM END OF RADIUS.

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:

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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