ESD Protection Diode

SOD-323 Diodes for ESD Protection

SD05T1 Series, SZSD05T1 Series



These surge protection 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 Routing 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.



SOD-323
CASE 477
STYLE 1

MARKING DIAGRAM



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
SD12T1G		

DISCONTINUED (Note 1)

SZSD05T1G	SOD-323 (Pb-Free)	3000 / Tape & Reel
SZSD12T1G		

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

1. **DISCONTINUED:** These devices are not available. Please contact your **onsemi** representative for information. The most current information on these devices may be available on www.onsemi.com.

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation @ 20 μs (Note 1) @ $T_L \le 25$ °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 °C Derate above 25 °C Thermal Resistance, Junction-to-Ambient	P_D $R_{\theta JA}$	300 2.4 416	mW mW/°C °C/W
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 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.

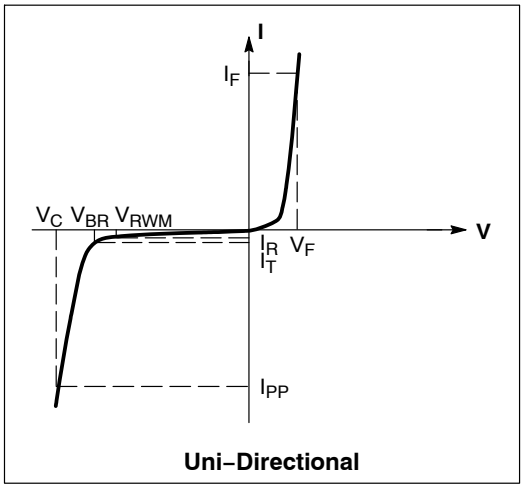
* Other voltages may be available upon request.

1. Non-repetitive current pulse, per Figure 6.
2. FR-4 printed circuit board, single-sided copper, mounting pad 1 cm^2.

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



Uni−Directional

ELECTRICAL CHARACTERISTICS

Device	V_{RWM} (V)	I_R @ V_{RWM} (μA)	V_{BR}, Breakdown Voltage (V)		I_T mA	V_C @ I_{PP} = 5 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 V f = 1.0 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 × 20 μs pulse waveform.

* Include SZ-prefix devices where applicable.

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TYPICAL CHARACTERISTICS

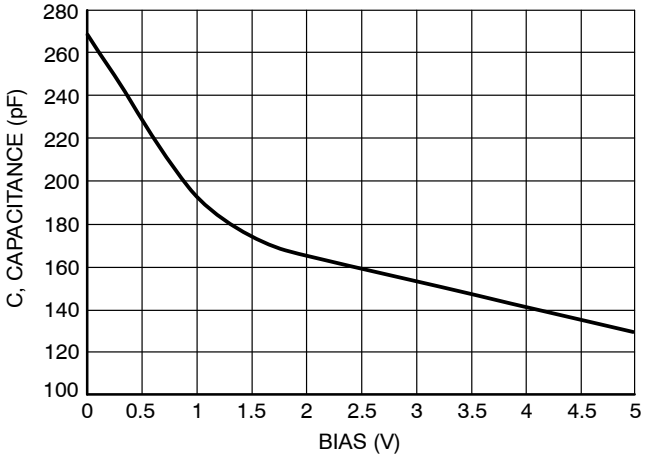

Figure 1. SD05 Typical Capacitance versus Bias Voltage

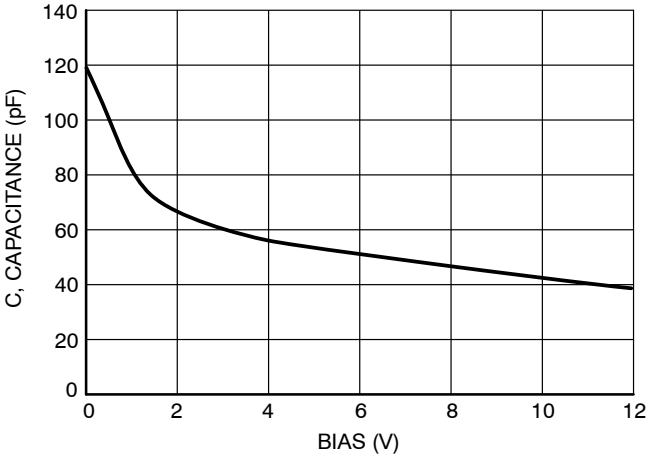

Figure 2. SD12 Typical Capacitance versus Bias Voltage

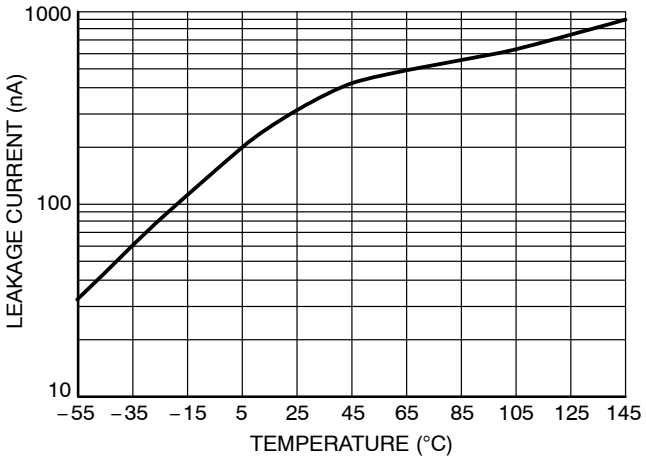

Figure 3. SD05 Typical Leakage Current versus Temperature

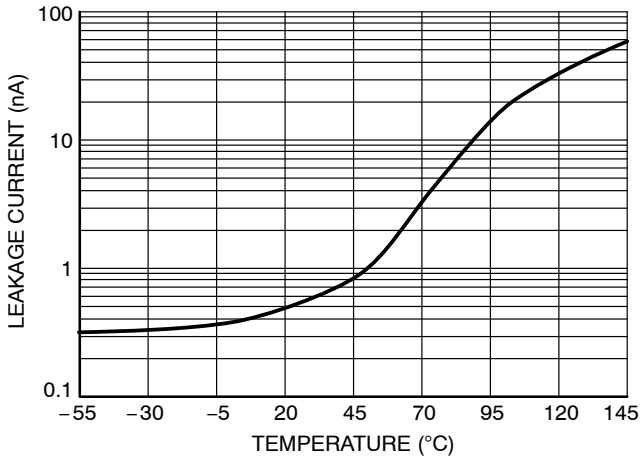

Figure 4. SD12 Typical Leakage Current versus Temperature

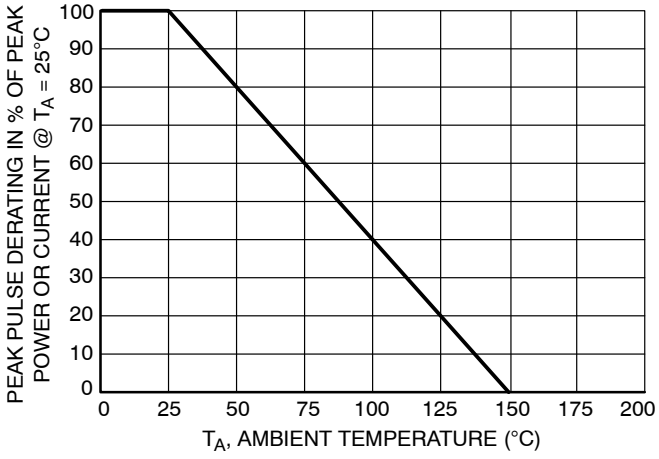

Figure 5. Pulse Derating Curve

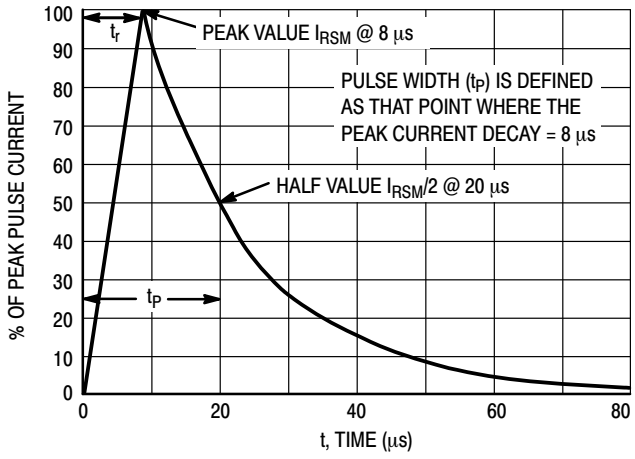

Figure 6. 8 × 20 μs Pulse Waveform

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REVISION HISTORY

Revision	Description of Changes	Date
6	Rebranded the Data Sheet to **onsemi** format. SZSD05T1G, SZSD12T1G OPNs Marked as Discontinued.	09/11/2025

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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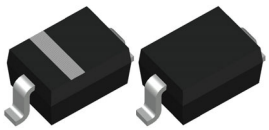
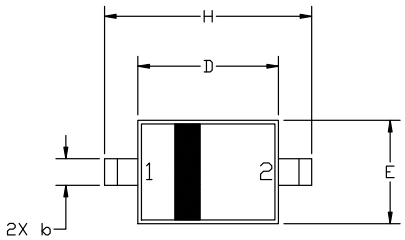
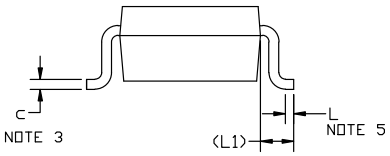


SOD−323 1.70x1.25x0.85
CASE 477
ISSUE K

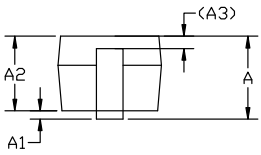
DATE 11 MAR 2024



TOP VIEW



SIDE VIEW

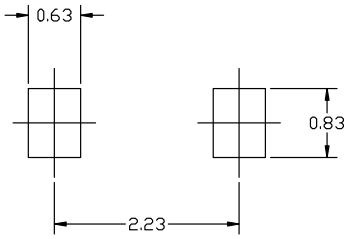


END VIEW

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
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 MEASURE FROM END OF RADIUS.

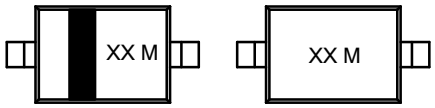
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.80	0.90	1.00
A1	0.00	0.05	0.10
A2	0.75	0.85	0.95
A3	0.15 (REF)		
b	0.25	0.32	0.4
c	0.09	0.12	0.18
D	1.60	1.70	1.80
E	1.15	1.25	1.35
H	2.30	2.50	2.70
L	0.08	---	---
L1	0.40 (REF)		



RECOMMENDED MOUNTING 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.

GENERIC MARKING DIAGRAM*



STYLE 1 STYLE 2

XX = Specific Device Code
M = Date Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

STYLE 1:
PIN 1. CATHODE (POLARITY BAND)
2. ANODE

STYLE 2:
NO POLARITY

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DESCRIPTION:	**SOD−323 1.70x1.25x0.85**		**PAGE 1 OF 1**

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