ESD Protection Diode Array

Quad, Low Clamping Voltage

SMF05

This quad monolithic silicon overvoltage suppressor is designed for applications requiring transient voltage protection capability. It is intended for use in ESD sensitive equipment such as computers, printers, cell phones, medical equipment, and other applications. Its quad junction common anode design protects four separate lines using only one package. These devices are ideal for situations where board space is at a premium.

Specification Features

- SC−88A Package Allows Four Separate Unidirectional Configurations
- Low Leakage < 5 μA @ 5 V
- Breakdown Voltage: 6.1 V − 7.2 V @ 1 mA
- Low Capacitance (90 pF TYP)
- Provides Protection for IEC61000−4−2
- Pb−Free Packages are Available*

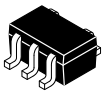
Mechanical Characteristics

- Void Free, Transfer−Molded, Thermosetting Plastic Case
- Corrosion Resistant Finish, Easily Solderable
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications

Applications

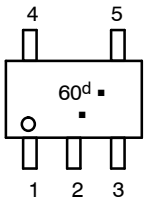
- Computers
- Printers
- Cell Phones
- Medical Equipment

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

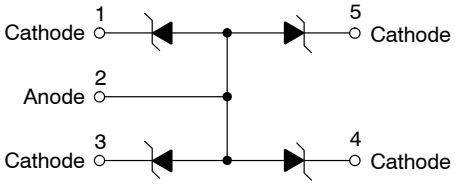


SC−88A/SOT−353
CASE 419A−02
STYLE 5
SCALE 2:1

MARKING DIAGRAM



60 = Specific Device Code
d = Date Code
▪ = Pb−Free Package
(Note: Microdot may be in either location)



ORDERING INFORMATION

See detailed ordering, marking, and shipping information on page 2 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 2.

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Table 1. ORDERING INFORMATION

Device	Package	Shipping†
SMF05T1G	SC-88A (Pb-Free)	3000 / Tape & Reel
SMF05CT1G		
SMF05CT2G		

DISCONTINUED (Note 1)

SMF05T1	SC-88A	3000 / Tape & Reel
SMF05T2G	SC-88A (Pb-Free)	
SMF05CT1	SC-88A	
SMF05CT2		

† 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.

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 (T_A = 25 °C unless otherwise noted)

Characteristic	Symbol	Value	Unit
Peak Power Dissipation @ 8 X 20 μs @$T_A \le$ 25 °C (Note 1)	P_{pk}	200	W
Maximum Junction Temperature	T_{Jmax}	150	°C
Operating Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C
ESD Discharge IEC61000−4−2, Air Discharge IEC61000−4−2, Contact Discharge	V_{PP}	16 9	kV
Lead Solder Temperature (10 seconds 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.

1. Non−repetitive current per Figure 2. Derate per Figure 3.

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

Device	Breakdown Voltage V_{BR} @ 1 mA (Volts)		Leakage Current I_R @ V_{RWM} = 5 V (μA)	Capacitance @ 0 V Bias (pF)	Max V_F @ I_F = 200 mA (V)	Max Clamping Voltage (V_C) @ I_{PP}		Max Clamping Voltage (V_C) @ I_{PP}	
	Min	Max				I_{PP} (A)	V_C (V)	I_{PP} (A)	V_C (V)
SMF05	6.0	7.2	5.0	90	1.25	1.0	9.5	12	12.5

TYPICAL PERFORMANCE CURVES

(T_A = 25 °C unless otherwise noted)

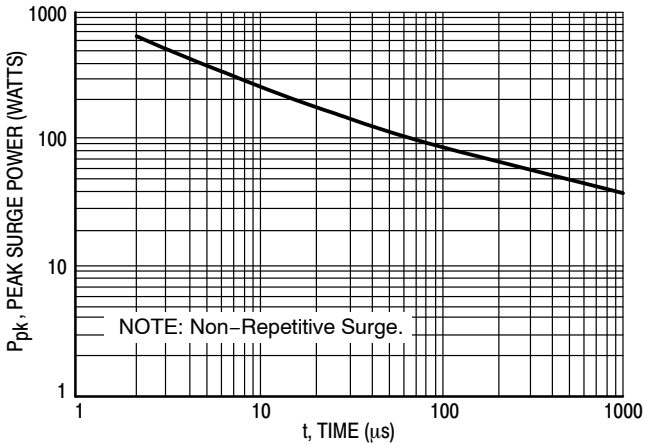


Figure 1. Peak Power Dissipation versus Pulse Width

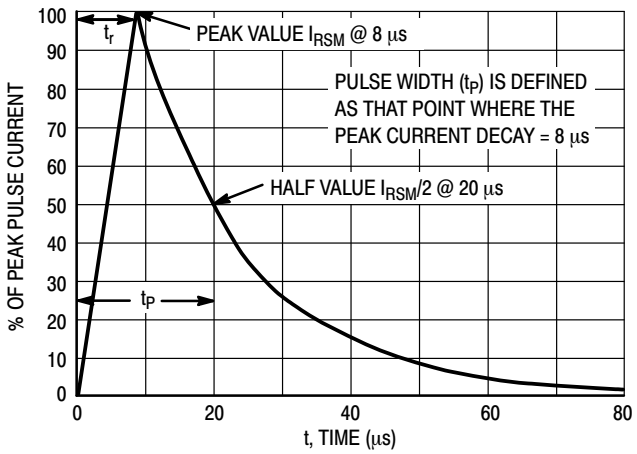


Figure 2. Pulse Waveform 8 x 20 μs

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TYPICAL PERFORMANCE CURVES

(T_A = 25 °C unless otherwise noted)

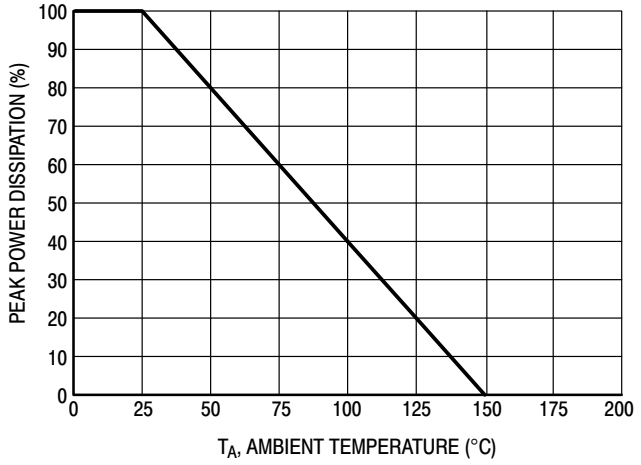


Figure 3. Power Derating Curve

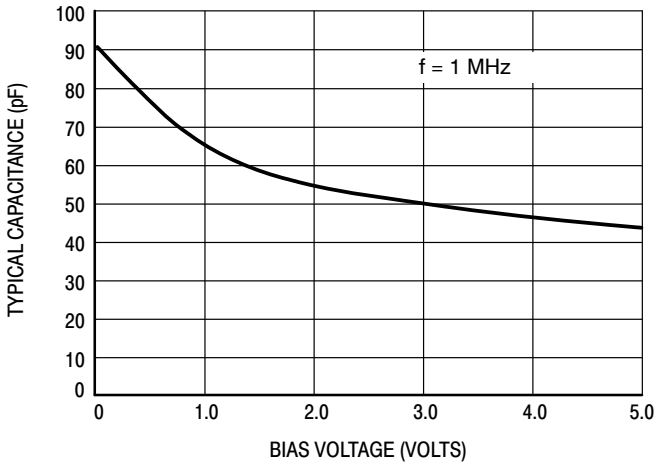


Figure 4. Junction Capacitance versus Reverse Voltage

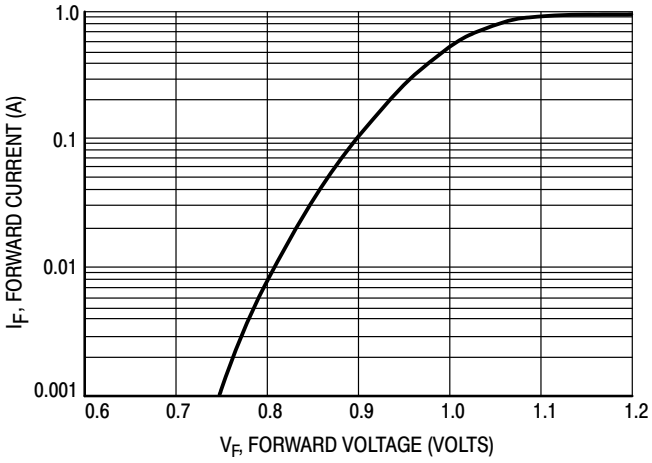


Figure 5. Forward Voltage Curve

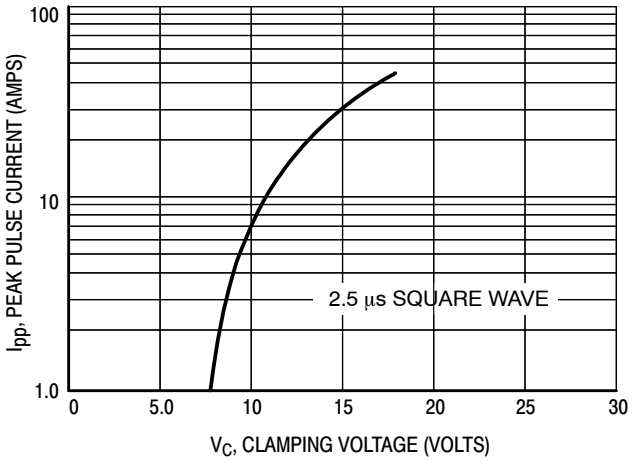


Figure 6. Clamping Voltage versus Peak Pulse Current (Reverse Direction)

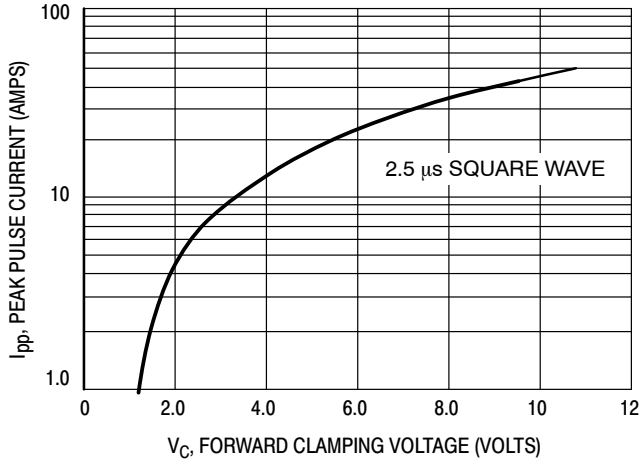


Figure 7. Clamping Voltage versus Peak Pulse Current (Forward Direction)

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REVISION HISTORY

Revision	Description of Changes	Date
3	Rebranded the Data Sheet to **onsemi** format. SMF05T1, SMF05T2G, SMF05CT1, SMF05CT2 OPNs Marked as Discontinued.	09/10/2025

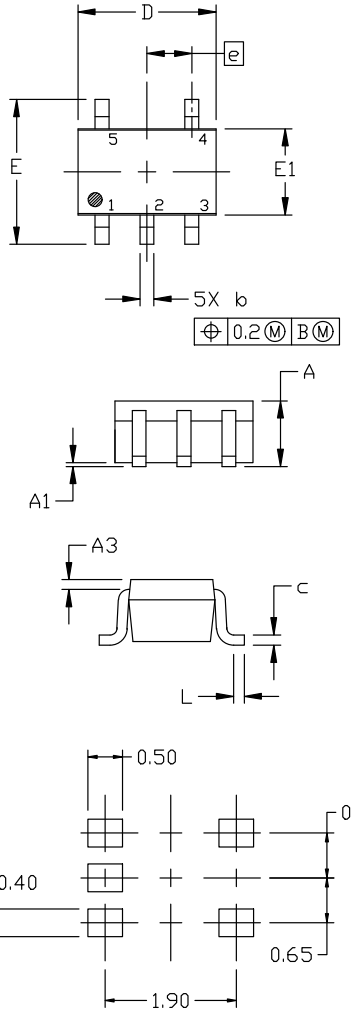
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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SC−88A (SC−70−5/SOT−353)
CASE 419A−02
ISSUE M

DATE 11 APR 2023

SCALE 2:1



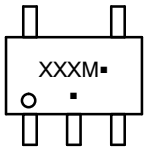
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. 419A−01 OBSOLETE. NEW STANDARD 419A−02
4. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.1016MM PER SIDE.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.80	0.95	1.10
A1	---	---	0.10
A3	0.20 REF		
b	0.10	0.20	0.30
c	0.10	---	0.25
D	1.80	2.00	2.20
E	2.00	2.10	2.20
E1	1.15	1.25	1.35
e	0.65 BSC		
L	0.10	0.15	0.30

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*



*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.

XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

STYLE 1:
PIN 1. BASE
2. EMITTER
3. BASE
4. COLLECTOR
5. COLLECTOR

STYLE 2:
PIN 1. ANODE
2. EMITTER
3. BASE
4. COLLECTOR
5. CATHODE

STYLE 3:
PIN 1. ANODE 1
2. N/C
3. ANODE 2
4. CATHODE 2
5. CATHODE 1

STYLE 4:
PIN 1. SOURCE 1
2. DRAIN 1/2
3. SOURCE 1
4. GATE 1
5. GATE 2

STYLE 5:
PIN 1. CATHODE
2. COMMON ANODE
3. CATHODE 2
4. CATHODE 3
5. CATHODE 4

STYLE 6:
PIN 1. EMITTER 2
2. BASE 2
3. EMITTER 1
4. COLLECTOR
5. COLLECTOR 2/BASE 1

STYLE 7:
PIN 1. BASE
2. EMITTER
3. BASE
4. COLLECTOR
5. COLLECTOR

STYLE 8:
PIN 1. CATHODE
2. COLLECTOR
3. N/C
4. BASE
5. EMITTER

STYLE 9:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. ANODE
5. ANODE

Note: Please refer to datasheet for style callout. If style type is not called out in the datasheet refer to the device datasheet pinout or pin assignment.

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DESCRIPTION:	**SC−88A (SC−70−5/SOT−353)**	**PAGE 1 OF 1**

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