

# SMF05CT1G, SMF12CT1G, SMF15CT1G, SMF24CT1G, SZSMF12CT1G



ON Semiconductor®

<http://onsemi.com>

## 5-Line Transient Voltage Suppressor Array

This 5-line voltage transient suppressor array is designed for application requiring transient voltage protection capability. It is intended for use in over-transient voltage and ESD sensitive equipment such as computers, printers, automotive electronics, networking communication and other applications. This device features a monolithic common anode design which protects five independent lines in a single SC-88 package.

### Features

- Protects up to 5-Line in a Single SC-88 Package
- Peak Power Dissipation – 100 W (8 x 20  $\mu$ s Waveform)
- ESD Rating of Class 3B (Exceeding 8 kV) per Human Body Model and Class C (Exceeding 400 V) per Machine Model.
- Compliance with IEC 61000-4-2 (ESD) 15 kV (Air), 8 kV (Contact)
- Flammability Rating of UL 94 V-0
- SZ Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- Pb-Free Packages are Available\*

### Applications

- Hand-Held Portable Applications
- Networking and Telecom
- Automotive Electronics
- Serial and Parallel Ports
- Notebooks, Desktops, Servers

### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Rating	Value	Unit
$P_{PK1}$	Peak Power Dissipation 8 x 20 $\mu$ s Double Exponential Waveform (Note 1)	100	W
$T_J$	Operating Junction Temperature Range	-40 to 125	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_L$	Lead Solder Temperature (10 s)	260	$^\circ\text{C}$
ESD	Human Body Model (HBM) Machine Model (MM) IEC 61000-4-2 Air (ESD) IEC 61000-4-2 Contact (ESD)	16000 400 15000 15000	V

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. Nonrepetitive current pulse per Figure 3.

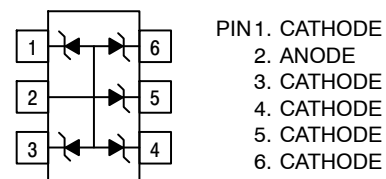
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## SC-88 FIVE TRANSIENT VOLTAGE SUPPRESSOR 100 W PEAK POWER

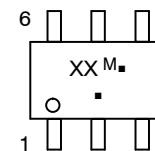


SC-88  
CASE 419B  
STYLE 24

### PIN ASSIGNMENT



### MARKING DIAGRAM



- XX = Specific Device Code  
6J = SMF05C  
6K = SZSMF12C/SMF12C  
6L = SMF15C  
6M = SMF24C
- M = Date Code
- = Pb-Free Package

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

# SMF05CT1G, SMF12CT1G, SMF15CT1G, SMF24CT1G, SZSMF12CT1G

## SMF05CT1G ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V <sub>RWM</sub>	(Note 2)			5.0	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1 mA, (Note 3)	6.2		7.2	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 5 V		0.07	5.0	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 5 A (8 x 20 μs Waveform)			9.8	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 8 A (8 x 20 μs Waveform)			12.5	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8 x 20 μs Waveform			8.0	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f = 1 MHz (Line to GND)		80	130	pF

## SMF12CT1G ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V <sub>RWM</sub>	(Note 2)			12	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1 mA, (Note 3)	13.3		15	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 12 V		0.01	0.1	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 3 A (8 x 20 μs Waveform)			21	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 6 A (8 x 20 μs Waveform)			23	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8 x 20 μs Waveform			6.0	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f = 1 MHz (Line to GND)		40	60	pF

## SMF15CT1G ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V <sub>RWM</sub>	(Note 2)			15	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1 mA, (Note 3)	17		19	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 15 V		0.01	1.0	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1 A (8 x 20 μs Waveform)			23	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 5 A (8 x 20 μs Waveform)			29	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8 x 20 μs Waveform			5.0	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f = 1 MHz (Line to GND)		33	45	pF

## SMF24CT1G ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V <sub>RWM</sub>	(Note 2)			24	V
Breakdown Voltage	V <sub>BR</sub>	I <sub>T</sub> = 1 mA, (Note 3)	26.7		32	V
Reverse Leakage Current	I <sub>R</sub>	V <sub>RWM</sub> = 24 V		0.01	1.0	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 1 A (8 x 20 μs Waveform)			40	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 2.5 A (8 x 20 μs Waveform)			44	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8 x 20 μs Waveform			2.5	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f = 1 MHz (Line to GND)		21	25	pF

2. TVS devices are normally selected according to the working peak reverse voltage (V<sub>RWM</sub>), which should be equal or greater than the DC or continuous peak operating voltage level.
3. V<sub>BR</sub> is measured at pulse test current I<sub>T</sub>.
4. Include SZ-prefix devices where applicable.

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## TYPICAL PERFORMANCE CURVES

( $T_J = 25^\circ\text{C}$  unless otherwise specified)

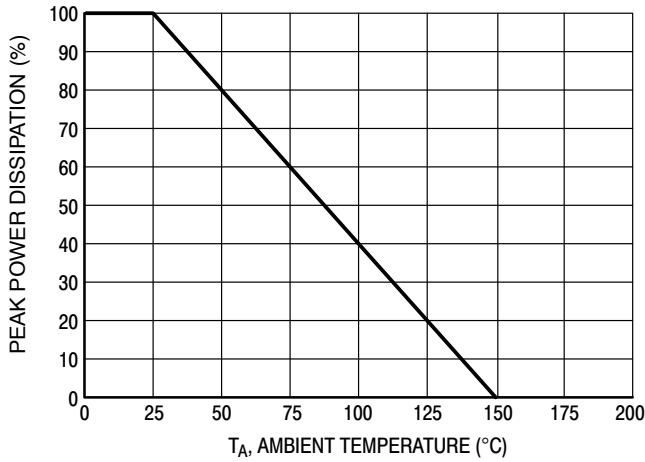


Figure 1. Pulse Derating Curve

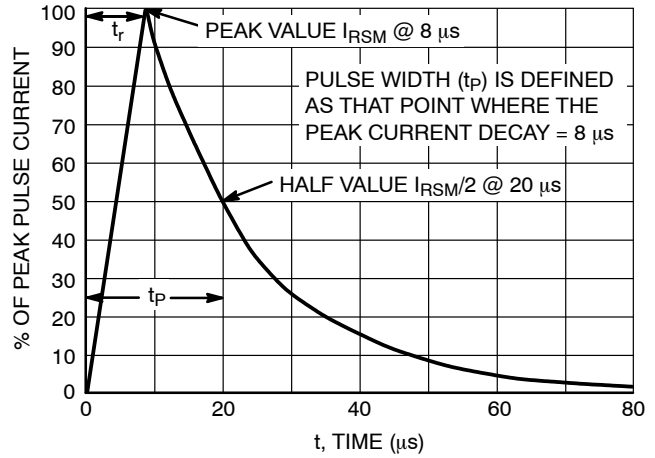


Figure 2.  $8 \times 20 \mu\text{s}$  Pulse Waveform

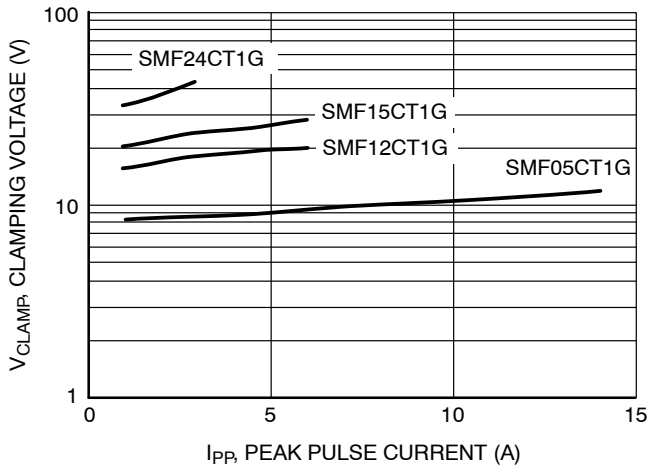


Figure 3. Clamping Voltage vs Peak Pulse Current

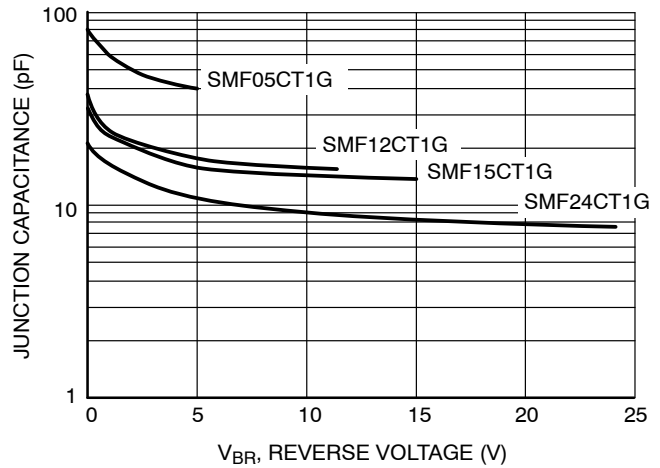


Figure 4. Junction Capacitance vs Reverse Voltage

### ORDERING INFORMATION

Device	Package	Shipping†
SMF05CT1G	SC-88 (Pb-Free)	3,000 / Tape & Reel
SMF05CT2G*	SC-88 (Pb-Free)	3,000 / Tape & Reel
SMF12CT1G	SC-88 (Pb-Free)	3,000 / Tape & Reel
SMF15CT1G	SC-88 (Pb-Free)	3,000 / Tape & Reel
SMF24CT1G	SC-88 (Pb-Free)	3,000 / Tape & Reel

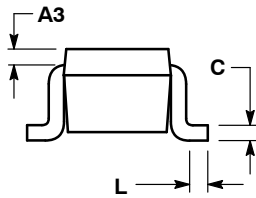
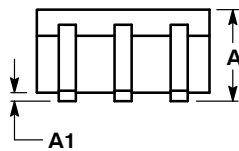
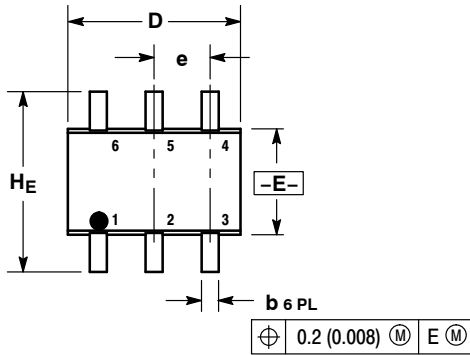
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*The "T2" suffix refers to an alternate tape & reel orientation.

# SMF05CT1G, SMF12CT1G, SMF15CT1G, SMF24CT1G, SZSMF12CT1G

## PACKAGE DIMENSIONS

### SC-88/SC70-6/SOT-363 CASE 419B-02 ISSUE W



NOTES:

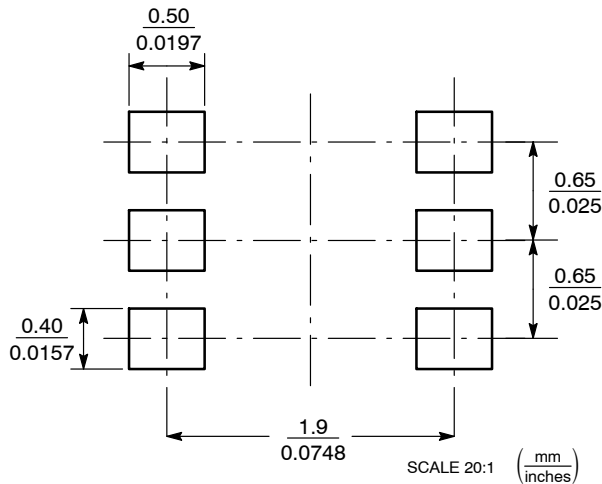
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419B-01 OBSOLETE, NEW STANDARD 419B-02.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.95	1.10	0.031	0.037	0.043
A1	0.00	0.05	0.10	0.000	0.002	0.004
A3	0.20 REF			0.008 REF		
b	0.10	0.21	0.30	0.004	0.008	0.012
C	0.10	0.14	0.25	0.004	0.005	0.010
D	1.80	2.00	2.20	0.070	0.078	0.086
E	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.10	0.20	0.30	0.004	0.008	0.012
HE	2.00	2.10	2.20	0.078	0.082	0.086

STYLE 24:

- PIN 1. CATHODE
- 2. ANODE
- 3. CATHODE
- 4. CATHODE
- 5. CATHODE
- 6. CATHODE

### SOLDERING FOOTPRINT\*



### SC-88/SC70-6/SOT-363

\*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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- Техническую поддержку проекта.
- Защиту от снятия компонента с производства.
- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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