SMF05CT1G, SMF12CT1G,SMF15CT1G, SMF24CT1G,

ESD Protection Diode Array,5-Line

This 5−line surge protection 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 μs 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°C unless otherwise specified)

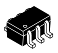
Symbol	Rating	Value	Unit
P_{PK} 1	Peak Power Dissipation 8 x 20 μs Double Exponential Waveform (Note 1)	100	W
T_J	Operating Junction Temperature Range	−40 to 125	°C
T_{STG}	Storage Temperature Range	−55 to 150	°C
T_L	Lead Solder Temperature (10 s)	260	°C
ESD	Human Body Model (HBM) Machine Model (MM)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

Stresses exceeding 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. Nonrepetitive current pulse per Figure 3.

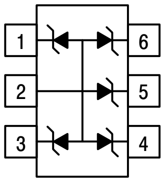
*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

SC−88 FIVE SURGE PROTECTION 100 W PEAK POWER



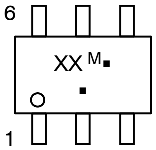
SC−88
CASE 419B
STYLE 24

PIN ASSIGNMENT



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

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 ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	(Note 2)			5.0	V
Breakdown Voltage	V_{BR}	I_T = 1 mA, (Note 3)	6.2		7.2	V
Reverse Leakage Current	I_R	V_{RWM} = 5 V		0.07	5.0	μA
Clamping Voltage	V_C	I_{PP} = 5 A (8 x 20 μs Waveform)			9.8	V
Clamping Voltage	V_C	I_{PP} = 8 A (8 x 20 μs Waveform)			12.5	V
Maximum Peak Pulse Current	I_{PP}	8 x 20 μs Waveform			8.0	A
Capacitance	C_J	V_R = 0 V, f = 1 MHz (Line to GND)		80	130	pF

SMF12CT1G ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	(Note 2)			12	V
Breakdown Voltage	V_{BR}	I_T = 1 mA, (Note 3)	13.3		15	V
Reverse Leakage Current	I_R	V_{RWM} = 12 V		0.01	0.1	μA
Clamping Voltage	V_C	I_{PP} = 3 A (8 x 20 μs Waveform)			21	V
Clamping Voltage	V_C	I_{PP} = 6 A (8 x 20 μs Waveform)			23	V
Maximum Peak Pulse Current	I_{PP}	8 x 20 μs Waveform			6.0	A
Capacitance	C_J	V_R = 0 V, f = 1 MHz (Line to GND)		40	60	pF

SMF15CT1G ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	(Note 2)			15	V
Breakdown Voltage	V_{BR}	I_T = 1 mA, (Note 3)	17		19	V
Reverse Leakage Current	I_R	V_{RWM} = 15 V		0.01	1.0	μA
Clamping Voltage	V_C	I_{PP} = 1 A (8 x 20 μs Waveform)			23	V
Clamping Voltage	V_C	I_{PP} = 5 A (8 x 20 μs Waveform)			29	V
Maximum Peak Pulse Current	I_{PP}	8 x 20 μs Waveform			5.0	A
Capacitance	C_J	V_R = 0 V, f = 1 MHz (Line to GND)		33	45	pF

SMF24CT1G ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}	(Note 2)			24	V
Breakdown Voltage	V_{BR}	I_T = 1 mA, (Note 3)	26.7		32	V
Reverse Leakage Current	I_R	V_{RWM} = 24 V		0.01	1.0	μA
Clamping Voltage	V_C	I_{PP} = 1 A (8 x 20 μs Waveform)			40	V
Clamping Voltage	V_C	I_{PP} = 2.5 A (8 x 20 μs Waveform)			44	V
Maximum Peak Pulse Current	I_{PP}	8 x 20 μs Waveform			2.5	A
Capacitance	C_J	V_R = 0 V, f = 1 MHz (Line to GND)		21	25	pF

2. Surge protection devices are normally selected according to the working peak reverse voltage (V_{RWM}), which should be equal or greater than the DC or continuous peak operating voltage level.
3. V_{BR} is measured at pulse test current I_T.
4. Include SZ-prefix devices where applicable.

TYPICAL PERFORMANCE CURVES

(T_J = 25°C unless otherwise specified)

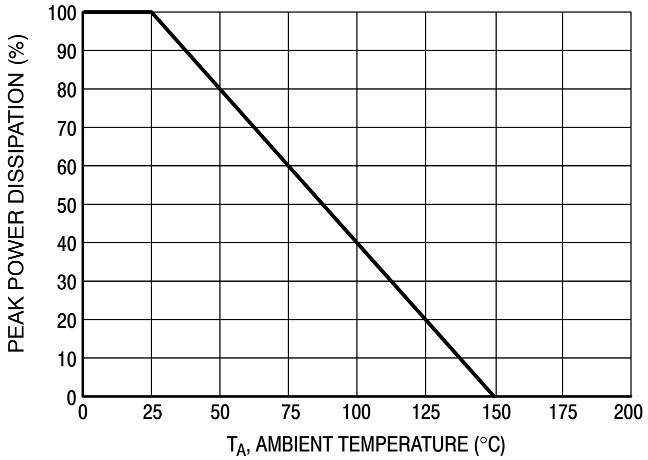


Figure 1. Pulse Derating Curve

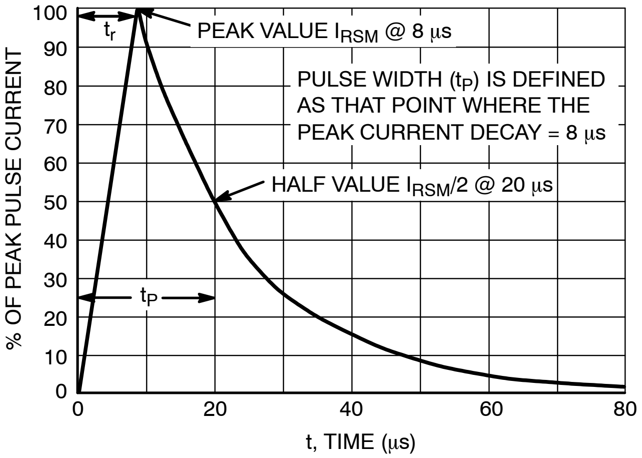


Figure 2. 8 × 20 μs Pulse Waveform

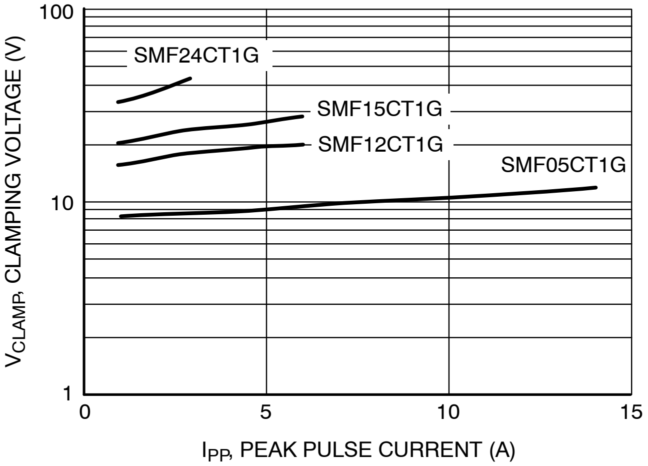


Figure 3. Clamping Voltage vs Peak Pulse Current

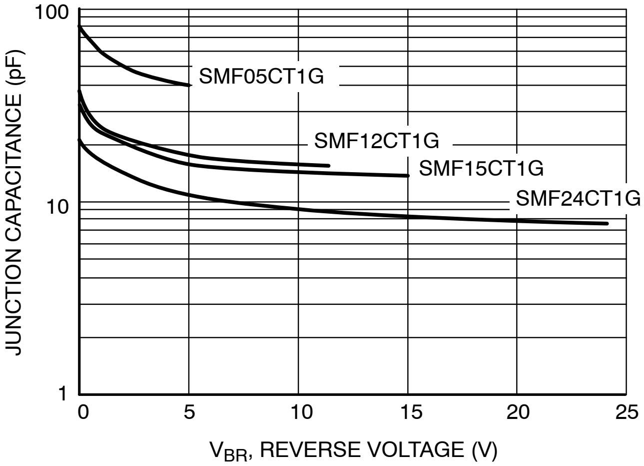


Figure 4. Junction Capacitance vs Reverse Voltage

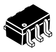
ORDERING INFORMATION

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.

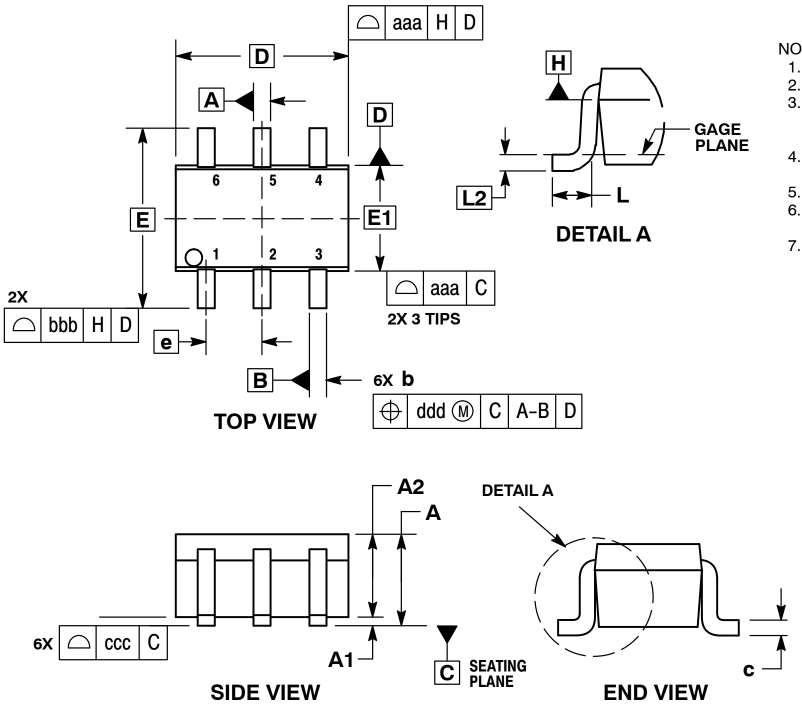
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS



SCALE 2:1

SC−88/SC70−6/SOT−363
CASE 419B−02
ISSUE Y

DATE 11 DEC 2012



DETAIL A

TOP VIEW

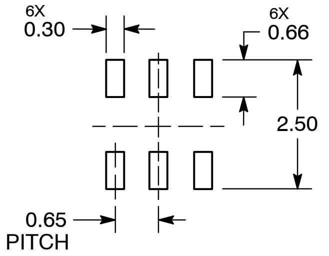
SIDE VIEW

END VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.20 PER END.
4. DIMENSIONS D AND E1 AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AND DATUM H.
5. DATUMS A AND B ARE DETERMINED AT DATUM H.
6. DIMENSIONS b AND c APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.08 AND 0.15 FROM THE TIP.
7. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 TOTAL IN EXCESS OF DIMENSION b AT MAXIMUM MATERIAL CONDITION. THE DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.

	MILLIMETERS			INCHES		
DIM	**MIN**	**NOM**	**MAX**	**MIN**	**NOM**	**MAX**
A	−−−	−−−	1.10	−−−	−−−	0.043
A1	0.00	−−−	0.10	0.000	−−−	0.004
A2	0.70	0.90	1.00	0.027	0.035	0.039
b	0.15	0.20	0.25	0.006	0.008	0.010
C	0.08	0.15	0.22	0.003	0.006	0.009
D	1.80	2.00	2.20	0.070	0.078	0.086
E	2.00	2.10	2.20	0.078	0.082	0.086
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65 BSC			0.026 BSC		
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	0.15 BSC			0.006 BSC		
aaa	0.15			0.006		
bbb	0.30			0.012		
ccc	0.10			0.004		
ddd	0.10			0.004		

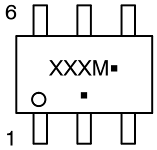
RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*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*



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

(Note: Microdot may be in either location)

*Date Code orientation and/or position may vary depending upon manufacturing location.

*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.

STYLES ON PAGE 2