SMS05T1 Series

SC-74 Quad Transient Voltage Suppressor

for ESD Protection

This quad monolithic silicon voltage suppressor is designed for applications requiring transient overvoltage protection capability. It is intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems and other applications. This quad device provides superior surge protection over current quad Zener MMQA series by providing up to 350 watts peak power.

Features

- SC-74 Package Allows Four Separate Unidirectional Configurations
- Peak Power − 350 W, 8 x 20 μS
- ESD Rating of Class N (Exceeding 25 kV) per the Human Body Model
- ESD Rating:
  IEC 61000−4−2 (ESD) 15 kV (air) 8 kV (contact)
  IEC 61000−4−4 (EFT) 40 A (5/50 ns)
  IEC 61000−4−5 (lightning) 23 A (8/20 μs)
- UL Flammability Rating of 94 V−0
- Pb−Free Packages are Available

Typical Applications

- Hand Held Portable Applications such as Cell Phones, Pagers, Notebooks and Notebook Computers

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation 8 x 20 μS @ T_A = 25°C (Note 1)	P_{pk}	350	W
Total Power Dissipation on FR−5 Board @ T_A = 25°C (Note 2) Derate Above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	556	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C
Lead Solder Temperature Maximum 10 Seconds Duration	T_L	260	°C

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. Non−repetitive current pulse 8 x 20 μS exponential decay waveform
2. FR−5 = 1.0 x 0.75 x 0.62 in.

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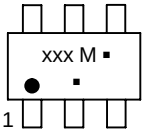
SC−74 QUAD TRANSIENT VOLTAGE SUPPRESSOR 350 WATTS PEAK POWER 5 VOLTS



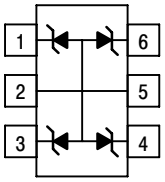
SC−74
CASE 318F
STYLE 1

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.

PIN ASSIGNMENT



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

DEVICE MARKING INFORMATION

See specific marking information in the device marking column of the Electrical Characteristics table on page 2 of this data sheet.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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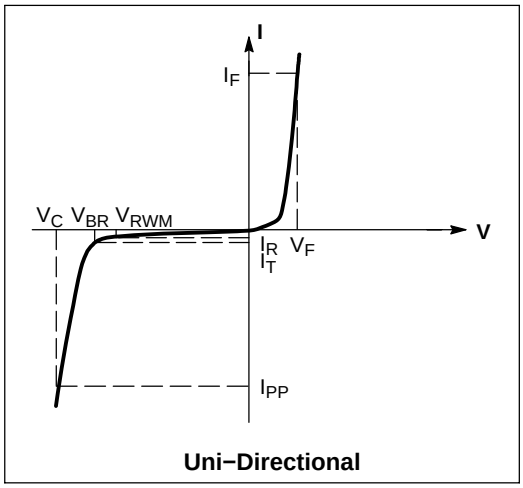
ELECTRICAL CHARACTERISTICS

(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
ΘV_{BR}	Maximum Temperature Coefficient of V_{BR}
I_F	Forward Current
V_F	Forward Voltage @ I_F
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}



Uni−Directional

ELECTRICAL CHARACTERISTICS − UNIDIRECTIONAL

Device	Device Marking	Breakdown Voltage V_{BR}(V)			I_T	Max Reverse Leakage Current		Max Reverse Voltage (Clamping Voltage) At Specified Reverse Surge Current (I_{RSM})		Max Reverse Voltage (Clamping Voltage) At Specified Reverse Surge Current (I_{RSM})		Capacitance @ 0 Volt Bias, 1 MHz (pF)	
		Min	Nom	Max	(mA)	I_R (μA)	V_R (V)	I_{RSM} (8x20 μs) (A)	V_{RSM} (8x20 μs) (V)	I_{RSM} (8x20 μs) (A)	V_{RSM} (8x20 μs) (V)	Min	Max
SMS05T1	5V0	6.0	−	7.2	1.0	20	5.0	5.0	9.8	23	15.5	250	400
SMS12T1	12V	13.3	−	15	1.0	1.0	12	5.0	19.0	15	23.0	80	150
SMS15T1	15V	16.7	−	18.5	1.0	1.0	15	5.0	24.0	12	29.0	60	125
SMS24T1	24V	26.7	−	32	1.0	1.0	24	5.0	40.0	8	44.0	40	75

ORDERING INFORMATION

Device	Package	Shipping†
SMS05T1	SC−74	3000 / Tape & Reel
SMS05T1G	SC−74 (Pb−Free)	
SMS12T1	SC−74	3000 / Tape & Reel
SMS12T1G	SC−74 (Pb−Free)	
SMS15T1	SC−74	3000 / Tape & Reel
SMS15T1G	SC−74 (Pb−Free)	
SMS24T1	SC−74	3000 / Tape & Reel
SMS24T1G	SC−74 (Pb−Free)	

†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.

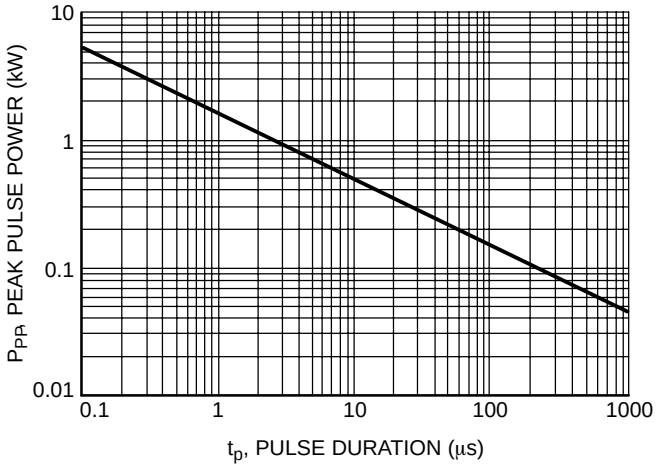


Figure 1. Non−Repetitive Peak Pulse Power versus Pulse Time

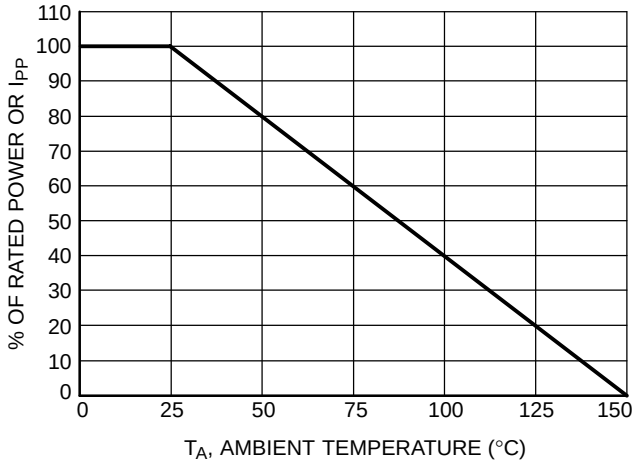


Figure 2. Power Derating Curve

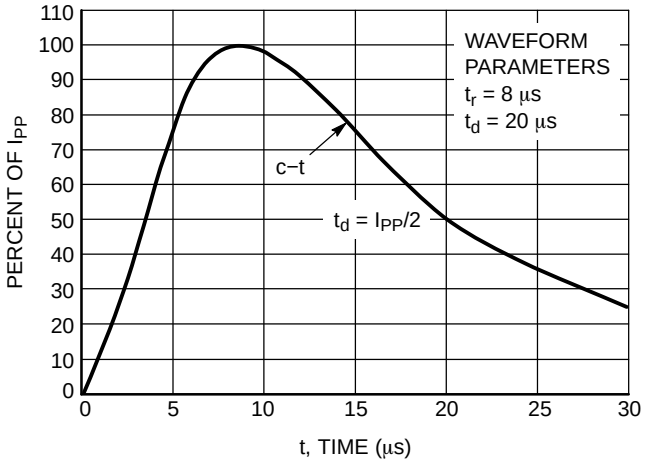


Figure 3. Pulse Waveform

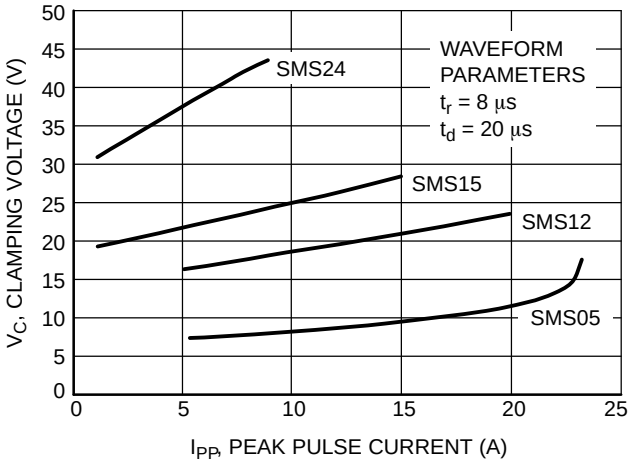


Figure 4. Clamping Voltage versus Peak Pulse Current

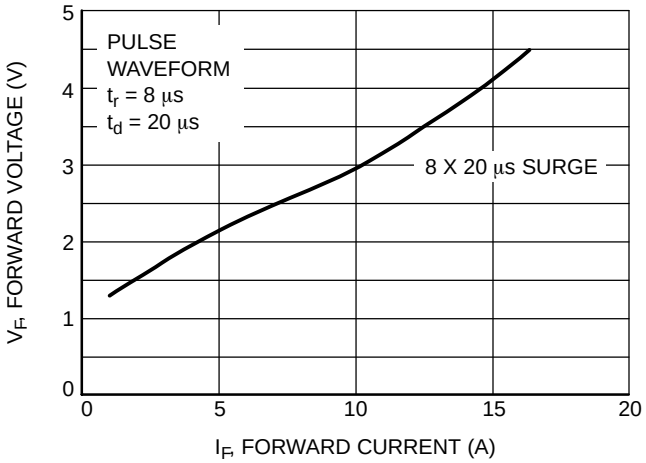


Figure 5. 8 x 20 μs V_F

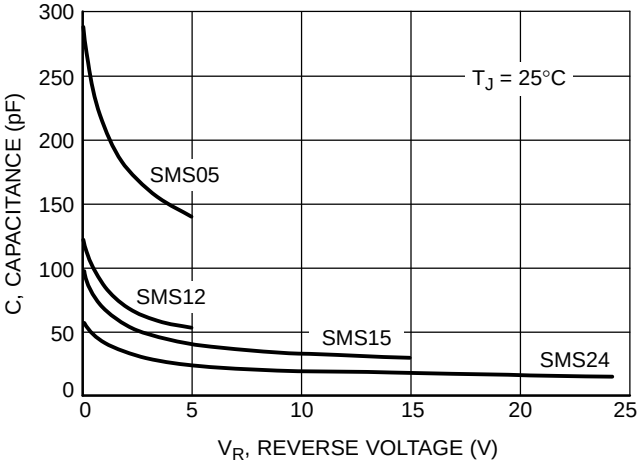
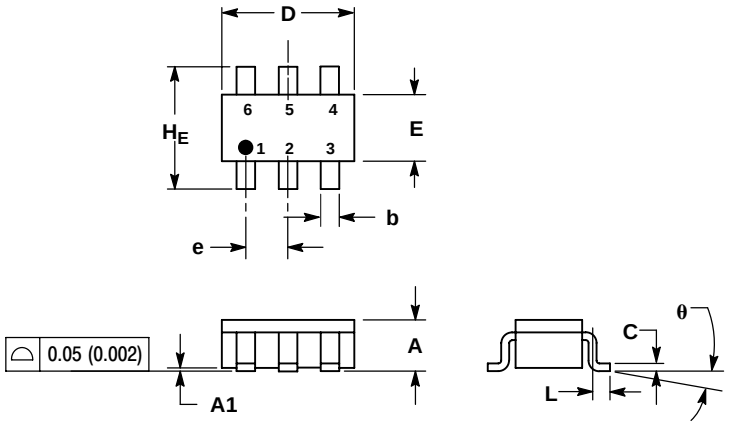


Figure 6. Typical Capacitance (SMS05 Series)

PACKAGE DIMENSIONS

SC−74 (SC−59ML)
CASE 318F−05
ISSUE M

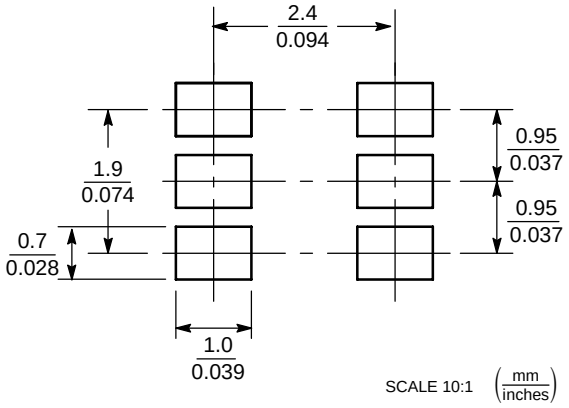


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318F−01, −02, −03, −04 OBSOLETE. NEW STANDARD 318F−05.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.90	1.00	1.10	0.035	0.039	0.043
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.25	0.37	0.50	0.010	0.015	0.020
c	0.10	0.18	0.26	0.004	0.007	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
E	1.30	1.50	1.70	0.051	0.059	0.067
e	0.85	0.95	1.05	0.034	0.037	0.041
L	0.20	0.40	0.60	0.008	0.016	0.024
H_E	2.50	2.75	3.00	0.099	0.108	0.118
θ	0°	–	10°	0°	–	10°

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

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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