

# 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 Watts, 8 x 20  $\mu$ S
- 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 Amps (5/50 ns)  
IEC 61000-4-5 (lightning) 23 Amps (8/20  $\mu$ s)
- UL Flammability Rating of 94V-0

#### 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 $\mu$ S @ $T_A = 25^\circ\text{C}$ (Note 1)	$P_{pk}$	350	W
Total Power Dissipation on FR-5 Board @ $T_A = 25^\circ\text{C}$ (Note 2) Derate Above $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$
Lead Solder Temperature – Maximum 10 Seconds Duration	$T_L$	260	$^\circ\text{C}$

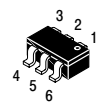
1. Non-repetitive current pulse 8 x 20  $\mu$ S exponential decay waveform
2. FR-5 = 1.0 x 0.75 x 0.62 in.



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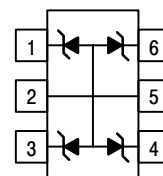
<http://onsemi.com>

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



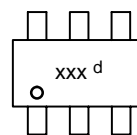
SC-74  
CASE 318F  
STYLE 1

#### PIN ASSIGNMENT



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

#### MARKING DIAGRAM



xxx = Device Code  
d = Date Code

#### ORDERING INFORMATION

Device	Package	Shipping
SMS05T1	SC-74	3000/Tape & Reel
SMS05T3	SC-74	10,000/Tape & Reel
SMS12T1	SC-74	3000/Tape & Reel
SMS12T3	SC-74	10,000/Tape & Reel
SMS15T1	SC-74	3000/Tape & Reel
SMS15T3	SC-74	10,000/Tape & Reel
SMS24T1	SC-74	3000/Tape & Reel
SMS24T3	SC-74	10,000/Tape & Reel

#### DEVICE MARKING INFORMATION

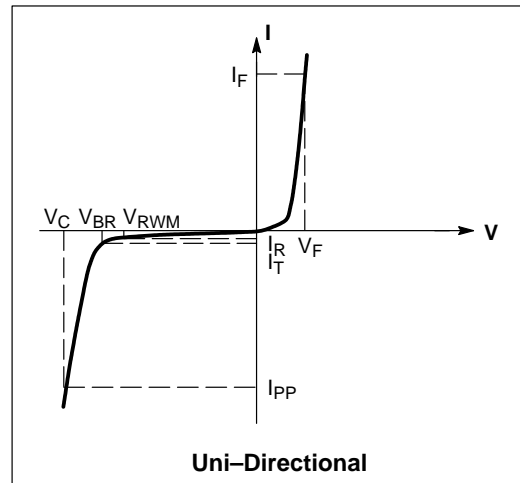
See specific marking information in the device marking column of the Electrical Characteristics table on page 2 of this data sheet.

# SMS05T1 Series

## ELECTRICAL CHARACTERISTICS

(T<sub>A</sub> = 25°C unless otherwise noted)

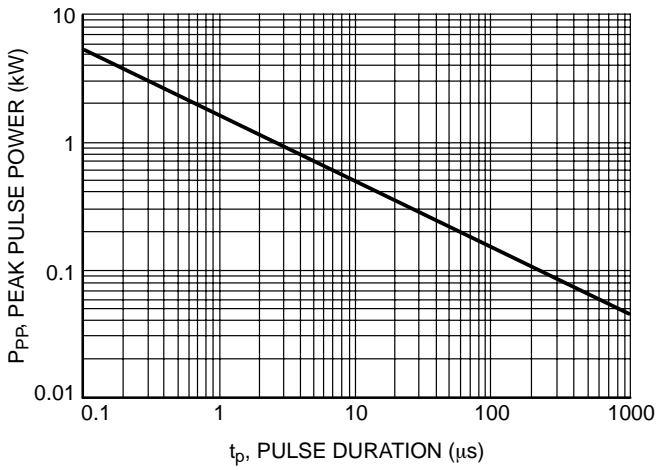
Symbol	Parameter
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ I <sub>PP</sub>
V <sub>RWM</sub>	Working Peak Reverse Voltage
I <sub>R</sub>	Maximum Reverse Leakage Current @ V <sub>RWM</sub>
V <sub>BR</sub>	Breakdown Voltage @ I <sub>T</sub>
I <sub>T</sub>	Test Current
ΘV <sub>BR</sub>	Maximum Temperature Coefficient of V <sub>BR</sub>
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>
Z <sub>ZT</sub>	Maximum Zener Impedance @ I <sub>ZT</sub>
I <sub>ZK</sub>	Reverse Current
Z <sub>ZK</sub>	Maximum Zener Impedance @ I <sub>ZK</sub>



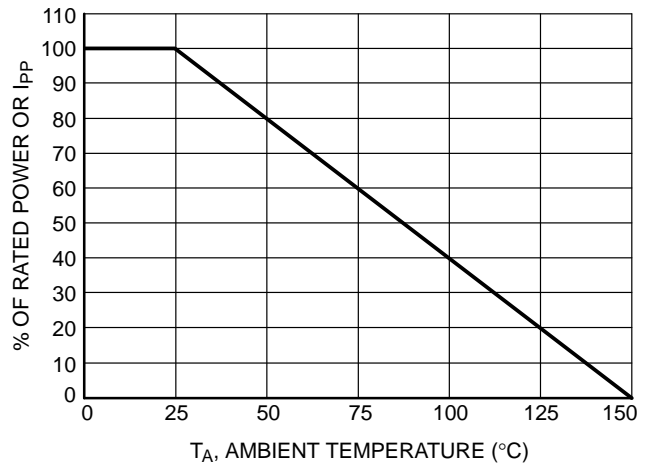
## ELECTRICAL CHARACTERISTICS – UNIDIRECTIONAL

Device	Device Marking	Breakdown Voltage			Max Reverse Leakage Current			Max Reverse Voltage (Clamping Voltage) At Specified Reverse Surge Current (I <sub>RSM</sub> )		Max Reverse Voltage (Clamping Voltage) At Specified Reverse Surge Current (I <sub>RSM</sub> )		Capacitance @ 0 Volt Bias, 1 MHz	
		V <sub>BR</sub> (V)			I <sub>T</sub>	I <sub>R</sub>	V <sub>R</sub>	I <sub>RSM</sub> (8x20 μs)	V <sub>RSM</sub> (8x20 μs)	I <sub>RSM</sub> (8x20 μs)	V <sub>RSM</sub> (8x20 μs)	(pF)	
		Min	Nom	Max	(mA)	(μA)	(V)	(A)	(V)	(A)	(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

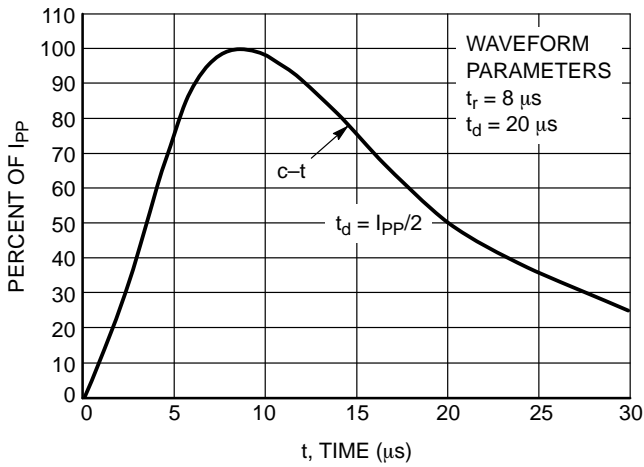
# SMS05T1 Series



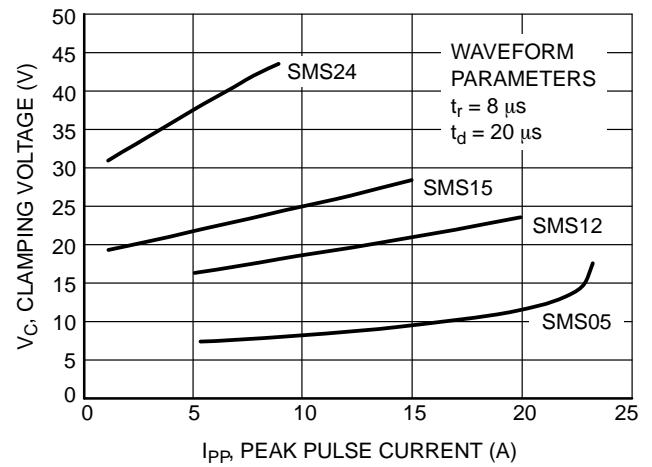
**Figure 1. Non-Repetitive Peak Pulse Power versus Pulse Time**



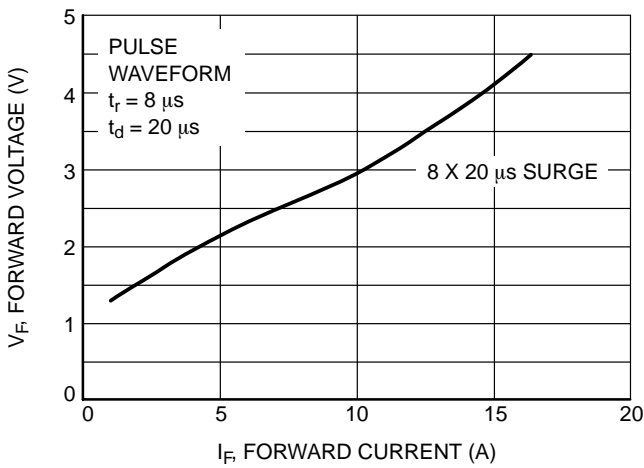
**Figure 2. Power Derating Curve**



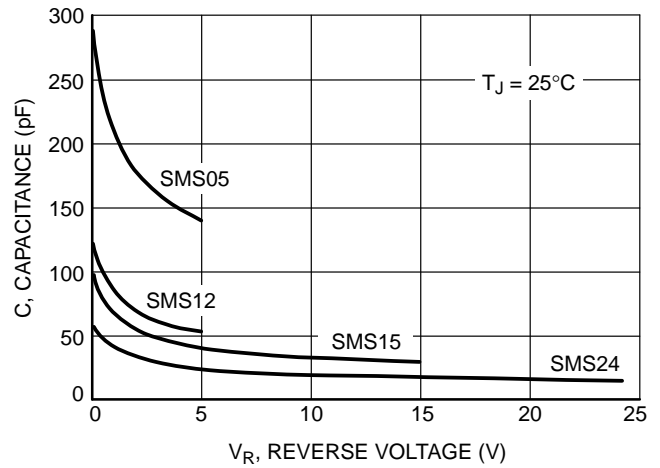
**Figure 3. Pulse Waveform**



**Figure 4. Clamping Voltage versus Peak Pulse Current**



**Figure 5. 8 x 20 μs V<sub>F</sub>**

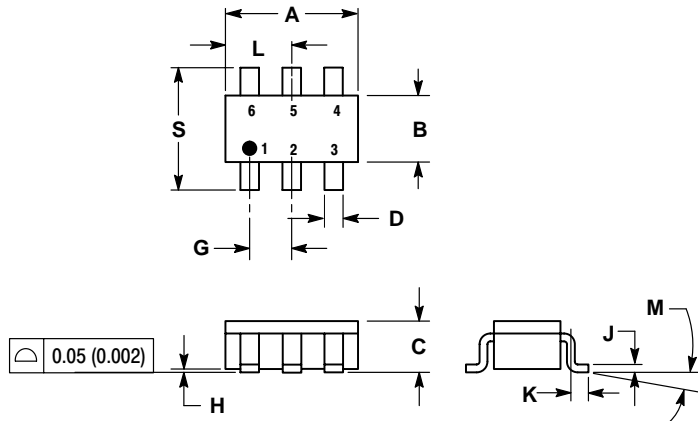


**Figure 6. Typical Capacitance (SMS05 Series)**

# Transient Voltage Suppressors – Surface Mount

## 350 Watts Peak Power

SC-74 (SC-59ML)  
CASE 318F-03  
ISSUE F




## NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
- MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
- 318F-01 AND -02 OBSOLETE. NEW STANDARD 318F-03.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1142	0.1220	2.90	3.10
B	0.0512	0.0669	1.30	1.70
C	0.0354	0.0433	0.90	1.10
D	0.0098	0.0197	0.25	0.50
G	0.0335	0.0413	0.85	1.05
H	0.0005	0.0040	0.013	0.100
J	0.0040	0.0102	0.10	0.26
K	0.0079	0.0236	0.20	0.60
L	0.0493	0.0649	1.25	1.65
M	0°	10°	0°	10°
S	0.0985	0.1181	2.50	3.00

## STYLE 1:

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

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