

# SMS05C, SMS12C, SMS15C, SMS24C

## 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-74 package.

### Features

- Protects up to 5 Line in a Single SC-74 Package
- Peak Power Dissipation – 350 W (8 X20  $\mu$ 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)
- UL Flammability Rating of 94V-0

### 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
$P_{PK} 1$	Peak Power Dissipation 8x20 $\mu$ s Double Exponential Waveform (Note 1)	350	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)	>8000 >400 >15000 >8000	V

1. Non-repetitive current pulse per Figure 3.



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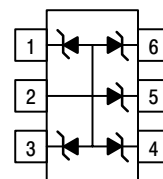
<http://onsemi.com>

## SC-74 FIVE TRANSIENT VOLTAGE SUPPRESSOR 350 W PEAK POWER

### PIN ASSIGNMENT

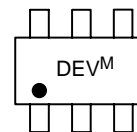


SC-74  
CASE 318F  
STYLE 6



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

### MARKING DIAGRAM



DEV = Specific Device Code  
M = Date Code

### ORDERING INFORMATION

Device	Package	Shipping†
SMS05CT1	SC-74	3000/Tape & Reel
SMS12CT1	SC-74	3000/Tape & Reel
SMS15CT1	SC-74	3000/Tape & Reel
SMS24CT1	SC-74	3000/Tape & Reel

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

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## SMS05C 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			5.0	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 5 A (8x20 μs Waveform)			9.8	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 24 A (8x20 μs Waveform)			14.5	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8x20 μs Waveform			24	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f=1 MHz (Line to GND)		260	400	pF

## SMS12C 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		0.001	1.0	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 5 A (8x20 μs Waveform)			19	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 15 A (8x20 μs Waveform)			23	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8x20 μs Waveform			15	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f=1 MHz (Line to GND)		120	150	pF

## SMS15C 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		0.05	1.0	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 5 A (8x20 μs Waveform)			24	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 12 A (8x20 μs Waveform)			29	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8x20 μs Waveform			12	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f=1 MHz (Line to GND)		95	125	pF

## SMS24C 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		0.001	1.0	μA
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 5 A (8x20 μs Waveform)			40	V
Clamping Voltage	V <sub>C</sub>	I <sub>PP</sub> = 8 A (8x20 μs Waveform)			44	V
Maximum Peak Pulse Current	I <sub>PP</sub>	8x20 μs Waveform			8.0	A
Capacitance	C <sub>J</sub>	V <sub>R</sub> = 0 V, f=1 MHz (Line to GND)		60	75	pF

2. Note 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. Note 3. V<sub>BR</sub> is measured at pulse test current I<sub>T</sub>.

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

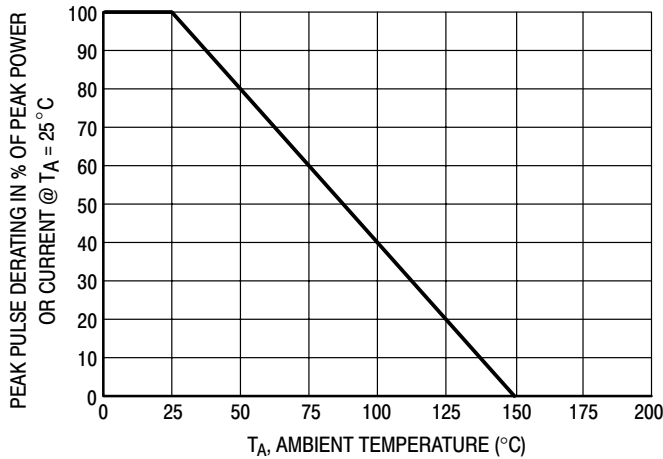


Figure 1. Pulse Derating Curve

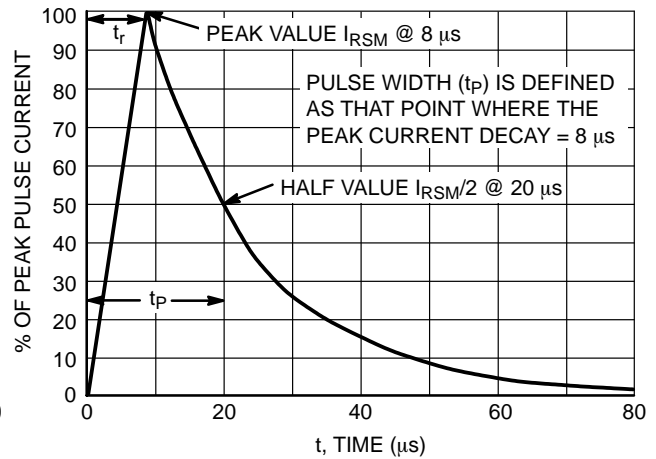


Figure 2.  $8 \times 20\ \mu\text{s}$  Pulse Waveform

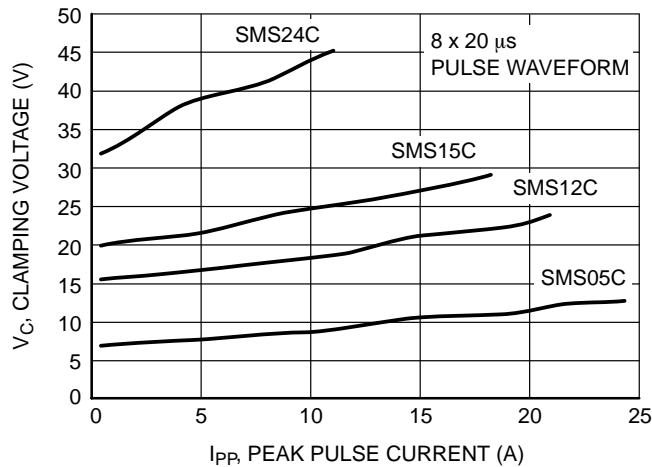


Figure 3. Clamping Voltage vs Peak Pulse Current

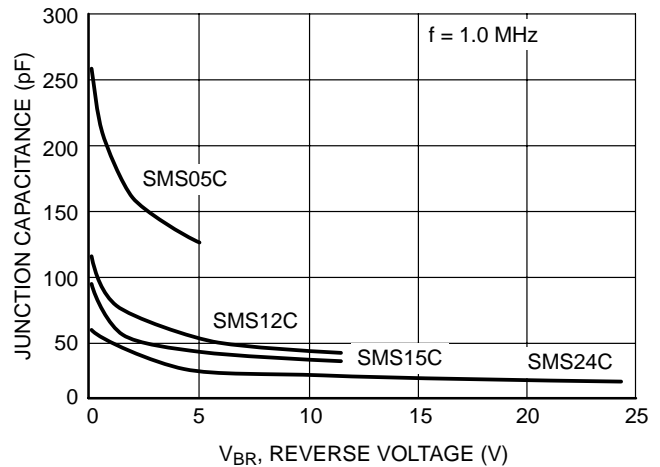


Figure 4. Junction Capacitance vs Reverse Voltage

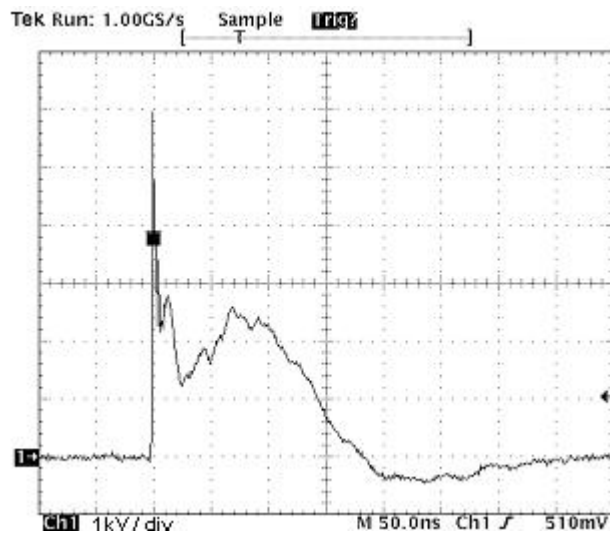


Figure 5. ESD Pulse IEC 61000-4-2 (8 kV Contact)

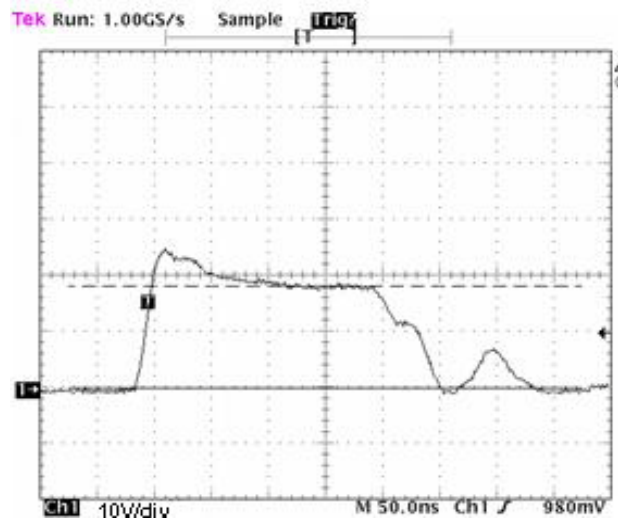


Figure 6. SMS15CT1 ESD Response for IEC 61000-4-2 (+8 kV Contact)

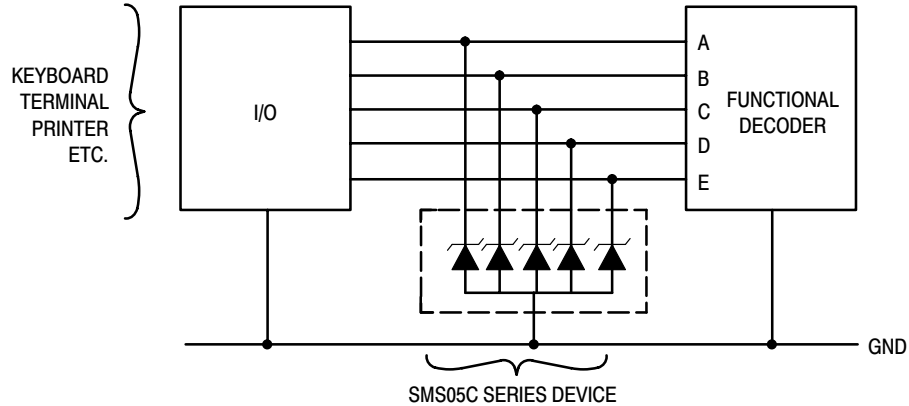
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### TYPICAL COMMON ANODE APPLICATIONS

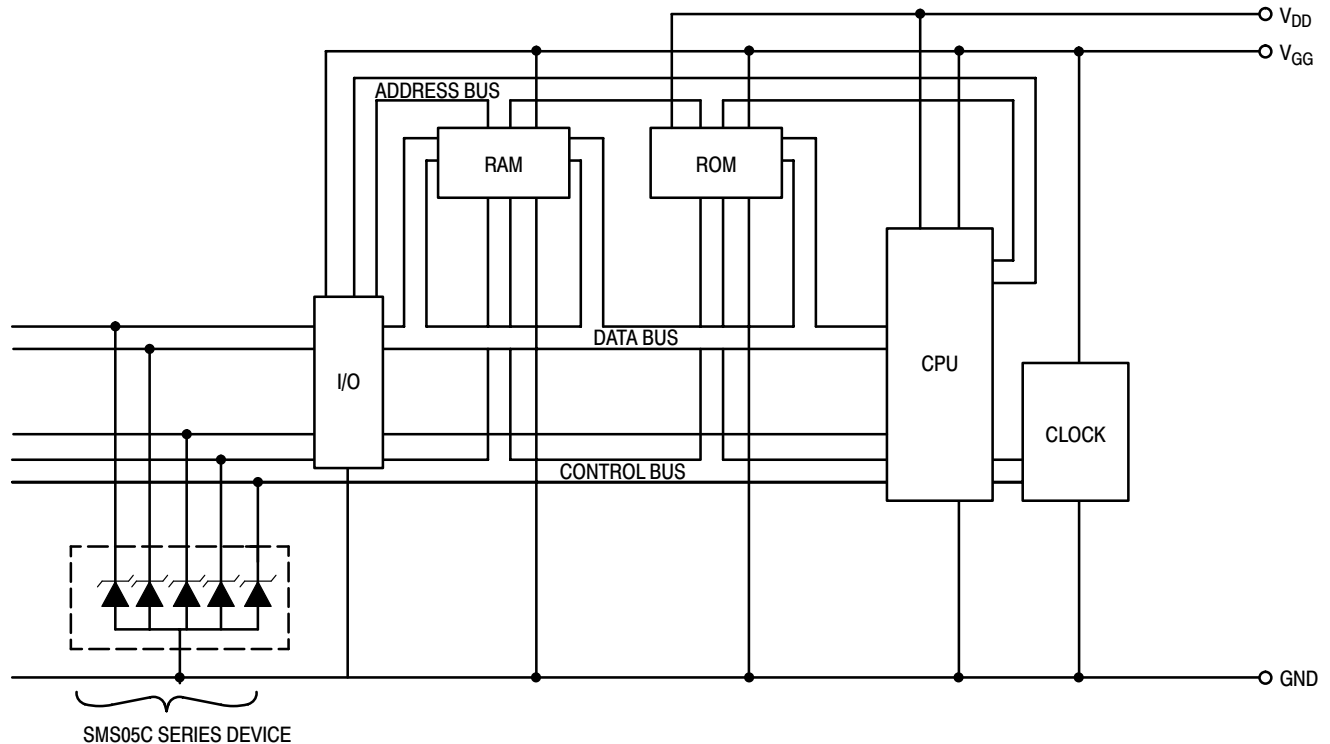
A 5 TVS junction common anode design in a SC-74 package protects four separate lines using only one package. This adds flexibility and creativity to PCB design especially

when board space is at a premium. A simplified example of SMS05C Series Device applications is illustrated below.

#### Computer Interface Protection



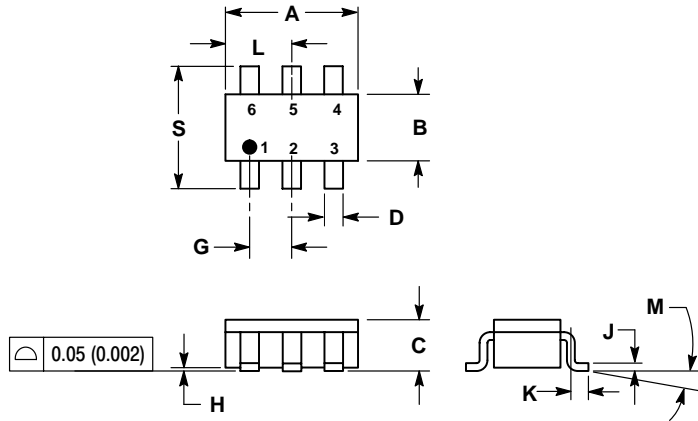
#### Microprocessor Protection



# SMS05C, SMS12C, SMS15C, SMS24C

## PACKAGE DIMENSIONS

SC-74  
CASE 318F-04  
ISSUE K



### 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 OBSOLETE. NEW STANDARD 318F-04.

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 6:

- PIN 1. CATHODE  
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4. CATHODE  
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6. CATHODE

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