

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 cathode 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 μ 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 μ 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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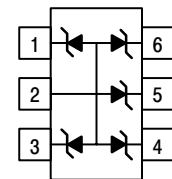
<http://onsemi.com>

SC-74 FIVE TRANSIENT VOLTAGE SUPPRESSOR 350 W PEAK POWER

PIN ASSIGNMENT

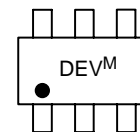


SC-74
CASE 318F
STYLE 6



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 |

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SMS05C 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 | | | 5.0 | μA |
| Clamping Voltage | V _C | I _{PP} = 5 A (8x20 μs Waveform) | | | 9.8 | V |
| Clamping Voltage | V _C | I _{PP} = 24 A (8x20 μs Waveform) | | | 14.5 | V |
| Maximum Peak Pulse Current | I _{PP} | 8x20 μs Waveform | | | 24 | A |
| Capacitance | C _J | V _R = 0 V, f=1 MHz (Line to GND) | | 260 | 400 | pF |

SMS12C 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 | | 0.001 | 1.0 | μA |
| Clamping Voltage | V _C | I _{PP} = 5 A (8x20 μs Waveform) | | | 19 | V |
| Clamping Voltage | V _C | I _{PP} = 15 A (8x20 μs Waveform) | | | 23 | V |
| Maximum Peak Pulse Current | I _{PP} | 8x20 μs Waveform | | | 15 | A |
| Capacitance | C _J | V _R = 0 V, f=1 MHz (Line to GND) | | 120 | 150 | pF |

SMS15C 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 | | 0.05 | 1.0 | μA |
| Clamping Voltage | V _C | I _{PP} = 5 A (8x20 μs Waveform) | | | 24 | V |
| Clamping Voltage | V _C | I _{PP} = 12 A (8x20 μs Waveform) | | | 29 | V |
| Maximum Peak Pulse Current | I _{PP} | 8x20 μs Waveform | | | 12 | A |
| Capacitance | C _J | V _R = 0 V, f=1 MHz (Line to GND) | | 95 | 125 | pF |

SMS24C 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 | | 0.001 | 1.0 | μA |
| Clamping Voltage | V _C | I _{PP} = 5 A (8x20 μs Waveform) | | | 40 | V |
| Clamping Voltage | V _C | I _{PP} = 8 A (8x20 μs Waveform) | | | 44 | V |
| Maximum Peak Pulse Current | I _{PP} | 8x20 μs Waveform | | | 8.0 | A |
| Capacitance | C _J | V _R = 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_{RWM}), which should be equal or greater than the DC or continuous peak operating voltage level.

3. Note 3. V_{BR} is measured at pulse test current I_T.

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

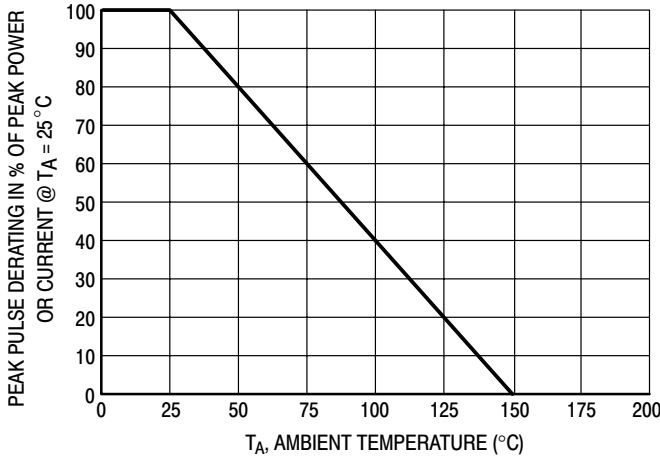


Figure 1. Pulse Derating Curve

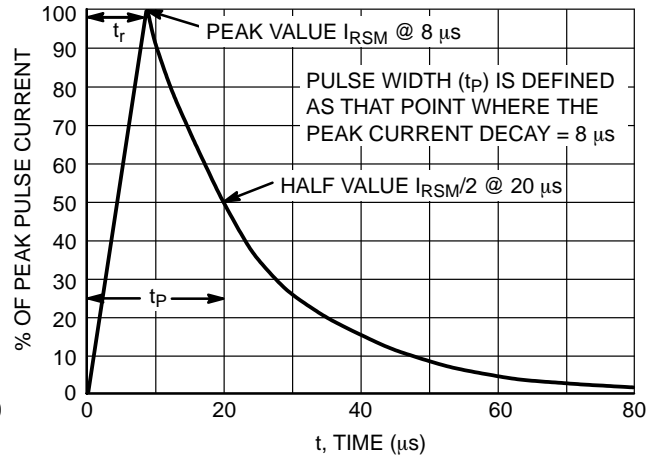


Figure 2. $8 \times 20 \mu\text{s}$ Pulse Waveform

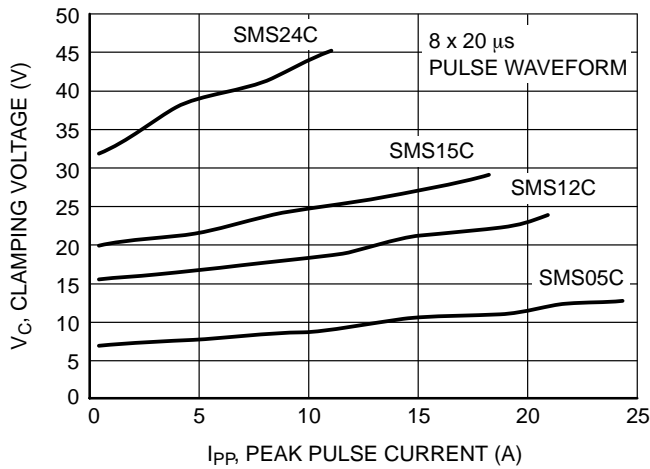


Figure 3. Clamping Voltage vs Peak Pulse Current

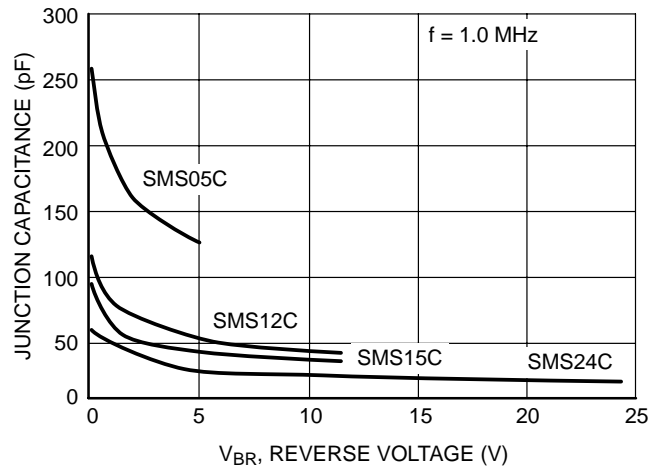


Figure 4. Junction Capacitance vs Reverse Voltage

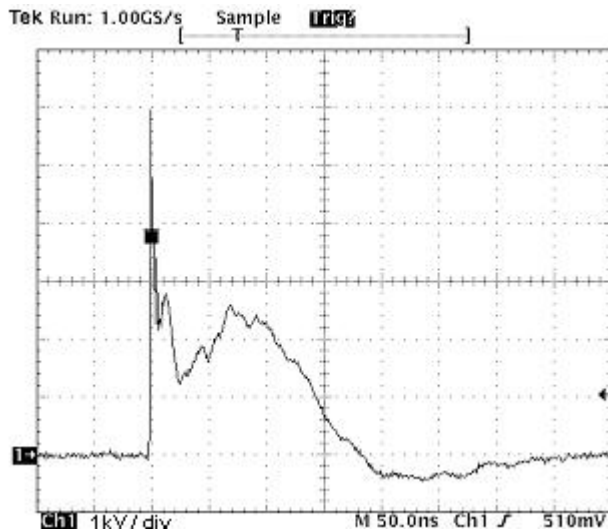


Figure 5. ESD Pulse IEC 61000-4-2 (8 kV Contact)

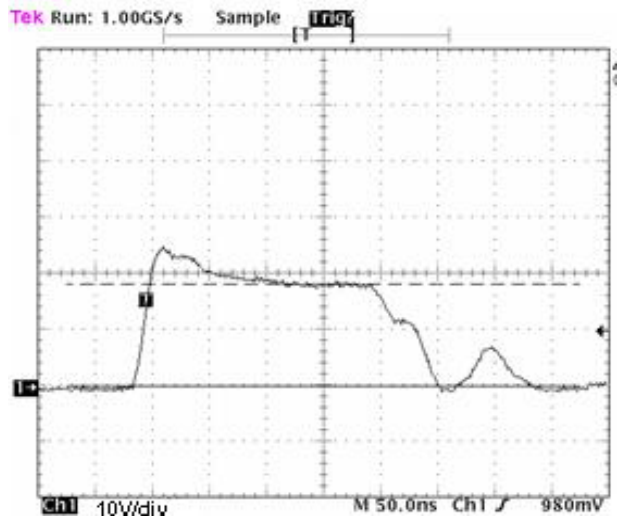


Figure 6. SMS15CT1 ESD Response for IEC 61000-4-2 (+8 kV Contact)

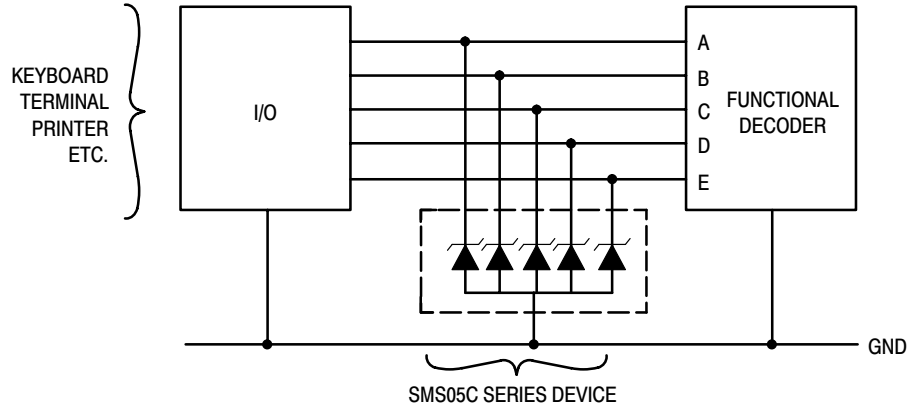
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TYPICAL COMMON ANODE APPLICATIONS

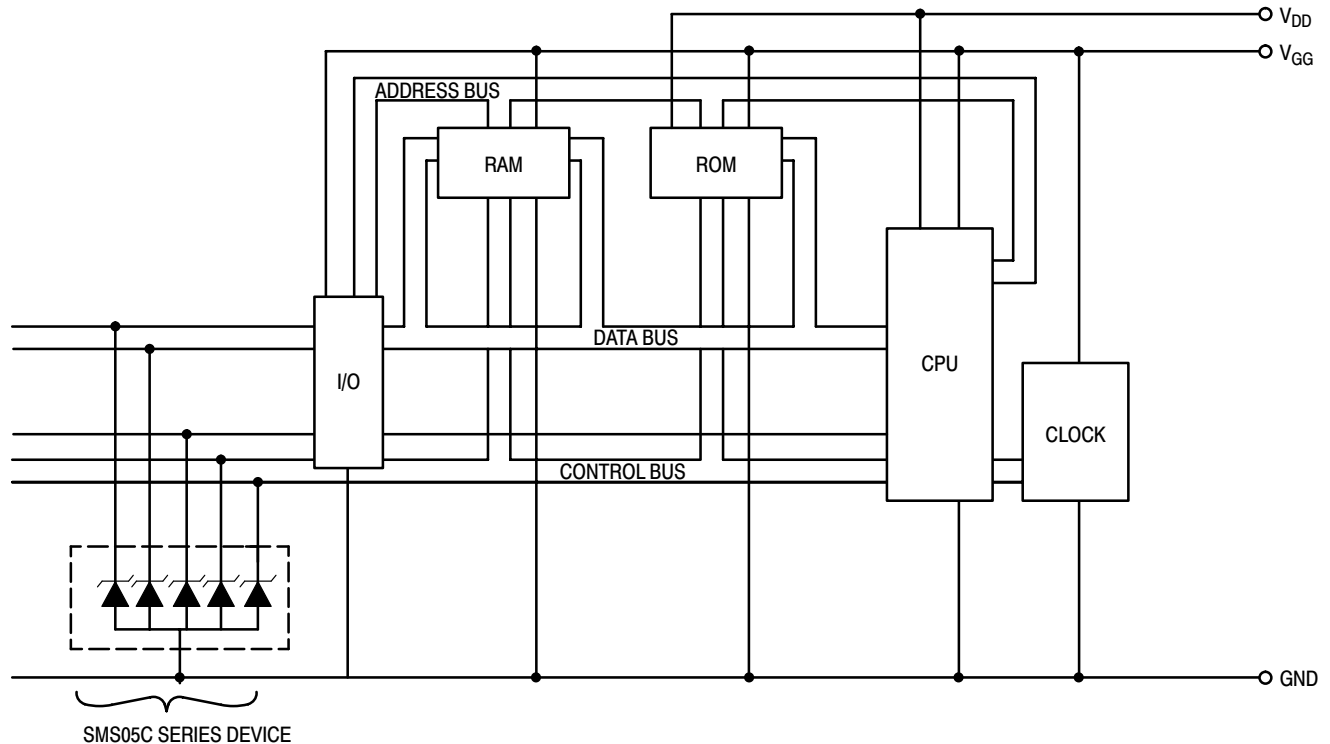
A 5 TVS junction common anode design in a SC-74 package protects four separate lines using only one package. This adds flexibility and creativity to PCB design especially

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

Computer Interface Protection



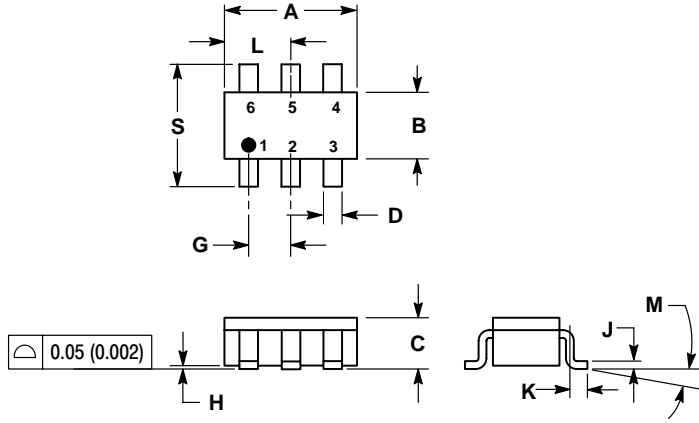
Microprocessor Protection



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

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