

APPLICATIONS

- ✓ Cellular Phones
- ✓ MP3 Players
- ✓ Personal Digital Assistant (PDA)
- ✓ Notebooks
- ✓ Digital Cameras

IEC COMPATIBILITY (EN61000-4)

- ✓ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- ✓ 61000-4-4 (EFT): 40A - 5/50ns

FEATURES

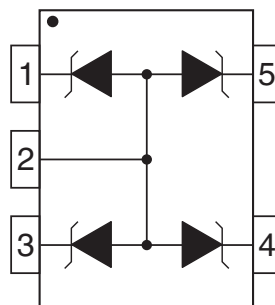
- ✓ 100 Watts Peak Pulse Power per Line (tp=8/20µs)
- ✓ Available in Multiple Voltages
- ✓ Up to Four (4) Lines of Protection
- ✓ ESD Protection > 25 kilovolts
- ✓ Low Clamping Voltage
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SC-70-5L
- ✓ Weight 7 milligrams (Approximate)
- ✓ Available in Lead-Free Plating
- ✓ Solder Reflow Temperature:
Lead-Free - Sn/Ag/Cu, 96/3.5/0.5: 260-270°C
- ✓ Consult Factory for Leaded Device Availability
- ✓ Flammability Rating UL 94V-0
- ✓ 8mm Tape and Reel Per EIA Standard 481
- ✓ Marking: Marking Code & Pin One Defined By Dot on Top of Package



PIN CONFIGURATION



PSMF05 thru PSMF24

DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

| PARAMETER | SYMBOL | VALUE | UNITS |
|---|-----------|------------|-------|
| Peak Pulse Power ($t_p = 8/20\mu s$) - See Figure 1 | P_{PP} | 100 | Watts |
| Operating Temperature | T_L | -55 to 150 | °C |
| Storage Temperature | T_{STG} | -55 to 150 | °C |
| Forward Voltage @ 1A, 8/20 μs | V_{FP} | 1.5 | Volts |

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

| PART NUMBER | DEVICE MARKING CODE | RATED STAND-OFF VOLTAGE V_{WM} VOLTS | MINIMUM BREAKDOWN VOLTAGE (See Note 1) @ 1mA $V_{(BR)}$ VOLTS | MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ $I_p = 1A$ V_C VOLTS | MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ 8/20 μs $V_C @ I_{PP}$ | MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D μA | MAXIMUM CAPACITANCE @ 0V, 1 MHz C_J pF |
|-------------|---------------------|--|--|---|---|---|---|
| PSMF05 | 05 | 5.0 | 6.0 | 9.5 | 12.0V @ 9.0A | 10 | 60 |
| PSMF12 | 12 | 12.0 | 13.3 | 15.0 | 22.0V @ 5.0A | 1 | 30 |
| PSMF15 | 15 | 15.0 | 16.7 | - | 33.0V @ 3.0A | 1 | 25 |
| PSMF24 | 24 | 24.0 | 26.7 | - | 55.5V @ 1.8A | 1 | 20 |

Note 1: Test between pins 1 to 2, 3 to 2, 4 to 2 and 5 to 2.

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

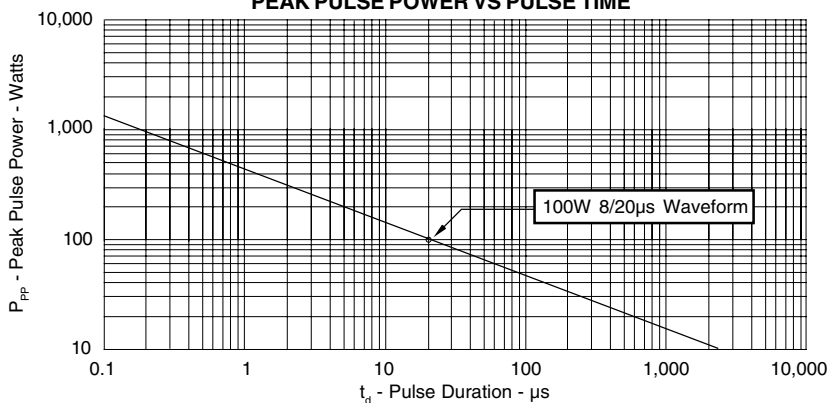
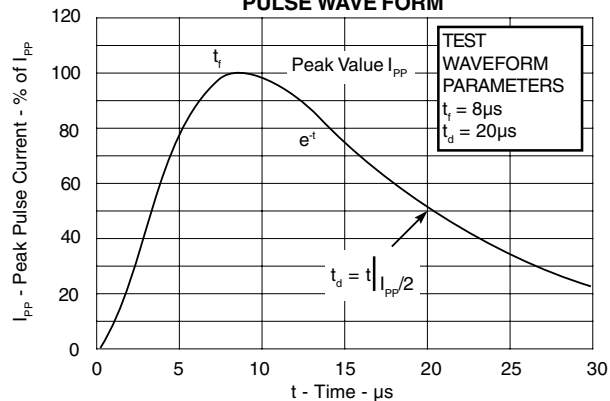
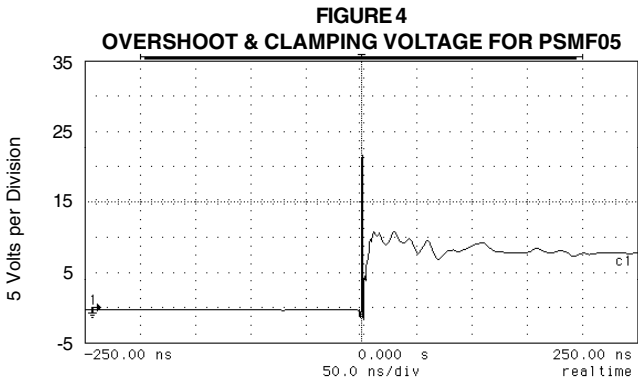
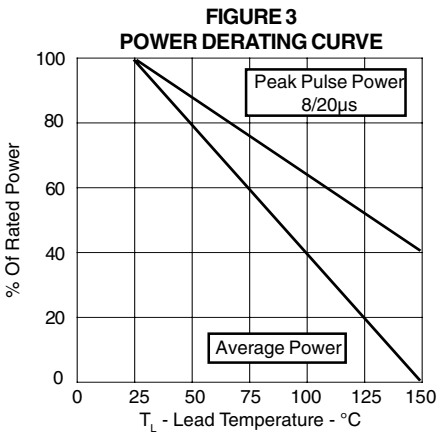


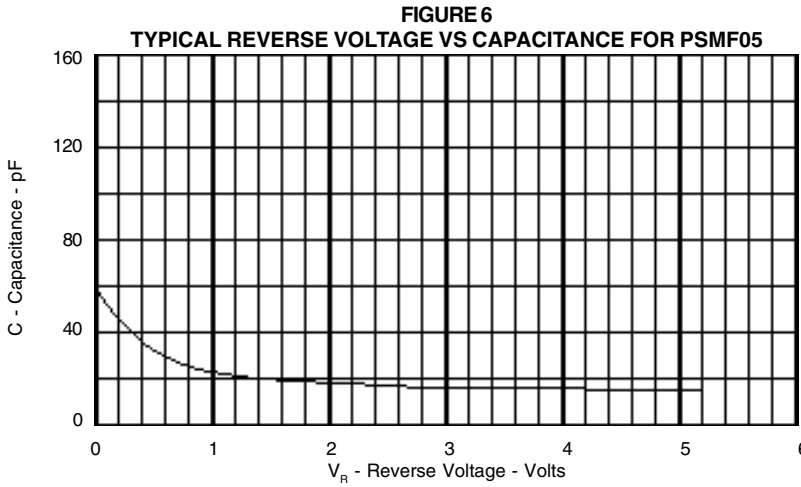
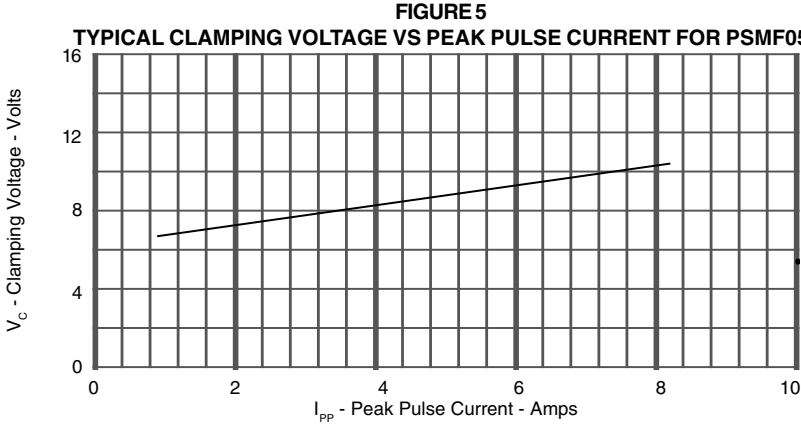
FIGURE 2
PULSE WAVEFORM



GRAPHS



ESD Test Pulse: 5 kilovolt, 1/30ns (waveform)



APPLICATION NOTE

The PSMF Series are TVS arrays designed to protect I/O or data lines from the damaging effects of ESD or EFT. This product provides unidirectional protection, with a surge capability of 200 Watts P_{PP} per line for an 8/20 μ s waveform and ESD protection > 25 kilovolts.

UNIDIRECTIONAL COMMON-MODE CONFIGURATION (Figure 1)

The PSMF Series provides up to four (4) lines of protection in a common-mode configuration as depicted in Figure 1. Circuit connectivity is as follows:

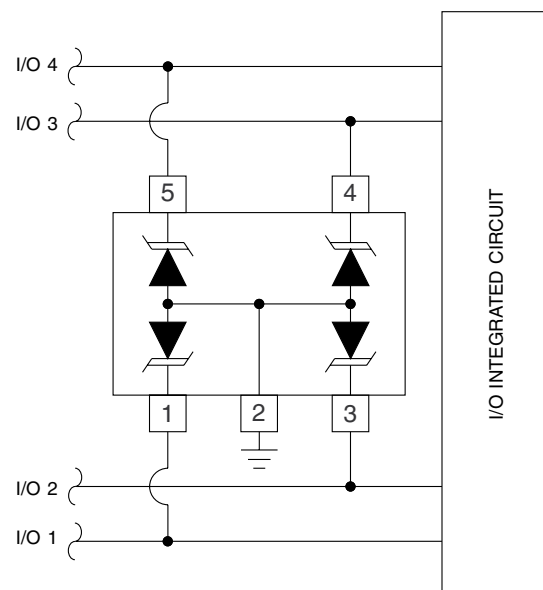
- ✓ I/O 1 is connected to Pin 1.
- ✓ I/O 2 is connected to Pin 3.
- ✓ I/O 3 is connected to Pin 4.
- ✓ I/O 4 is connected to Pin 5.
- ✓ Pin 2 is connected to ground.

CIRCUIT BOARD LAYOUT RECOMMENDATIONS

Circuit board layout is critical for Electromagnetic Compatibility (EMC) protection. The following guidelines are recommended:

- ✓ The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- ✓ The path length between the TVS device and the protected line should be minimized.
- ✓ All conductive loops including power and ground loops should be minimized.
- ✓ The transient current return path to ground should be kept as short as possible to reduce parasitic inductance.
- ✓ Ground planes should be used whenever possible. For multilayer PCBs, use ground vias.

Figure 1 - Unidirectional Configuration
Common-Mode I/O Port Protection



PSMF05 thru PSMF24

SC-70-5L PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE

SC70-5L

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|------|------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.90 | 2.15 | 0.074 | 0.084 |
| B | 1.15 | 1.35 | 0.045 | 0.055 |
| C | 0.80 | 1.00 | 0.031 | 0.040 |
| D | 0.15 | 0.30 | 0.006 | 0.012 |
| E | 0.65 BSC | - | 0.0255 BSC | - |
| F | 1.30 BSC | - | 0.0512 BSC | - |
| G | 0.80 | 1.10 | 0.031 | 0.043 |
| J | 0.08 | 0.25 | 0.003 | 0.010 |
| K | 1.90 | 2.15 | 0.074 | 0.084 |
| L | 0 | 0.10 | 0 | 0.004 |
| M | 0.26 | 0.46 | 0.010 | 0.018 |

MOUNTING PAD

| TYPICAL | | |
|---------|-------------|--------|
| DIM | Millimeters | Inches |
| 1 | 0.50 | 0.020 |
| 2 | 1.30 | 0.051 |
| 3 | 0.65 | 0.026 |
| 4 | 1.72 | 0.068 |
| 5 | 0.60 | 0.024 |
| 6 | 1.11 | 0.044 |
| 7 | 2.33 | 0.092 |

NOTES

- Dimensioning and tolerances per ANSI Y14.5M, 1985.
- Controlling Dimension: Inches
- Dimensions are exclusive of mold flash and metal burrs.

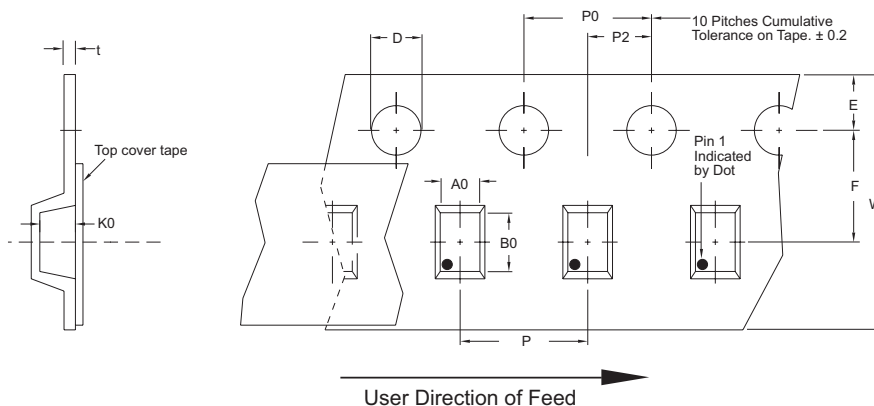
TAPE & REEL ORDERING NOMENCLATURE

- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix-T7 = 7 Inch Reel - 3,000 pieces per 8mm tape, i.e., PSMF05-T7.
- Suffix-LF = Lead-Free, Pure-Tin Plating, i.e., PSMF05-LF-T7.

Outline & Dimensions: Rev 2 - 10/05, 06005

Tape & Reel Specifications (Dimensions in millimeters)

| Reel Dia. | Tape Width | A0 | B0 | K0 | D | E | F | W | P0 | P2 | P | tmax |
|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|
| 178mm (7") | 8mm | 2.25 ± 0.10 | 2.34 ± 0.10 | 1.22 ± 0.10 | 1.50 ± 0.10 | 1.75 ± 0.10 | 3.50 ± 0.05 | 8.00 ± 0.30 | 4.00 ± 0.10 | 2.00 ± 0.05 | 4.00 ± 0.10 | 0.25 |



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