

APPLICATIONS

- ✓ Notebook Computers
- ✓ Cellular Phone Base Stations
- ✓ Personal Digital Assistant (PDA)
- ✓ Digital Cameras

IEC COMPATIBILITY (EN61000-4)

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

FEATURES

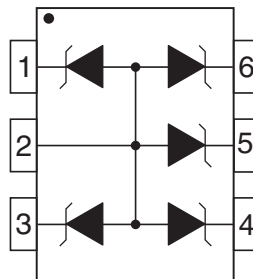
- ✓ 100 Watts Peak Pulse Power per Line (tp=8/20μs)
- ✓ Monolithic Design
- ✓ Available in Multiple Voltage Types Ranging From 5V to 24V
- ✓ Protect 4 Lines Bidirectional and 5 Lines Unidirectional
- ✓ ESD Protection > 25 kilovolts
- ✓ Low Clamping Voltage
- ✓ RoHS Compliant

MECHANICAL CHARACTERISTICS

- ✓ Molded JEDEC SC-70-6L Package
- ✓ Weight 7 milligrams (Approximate)
- ✓ Available in Lead-Free Pure-Tin Plating (Annealed)
- ✓ Solder Reflow Temperature:
Pure-Tin - Sn, 100: 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 Package



PIN CONFIGURATION



SMF05C thru SMF24C

DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

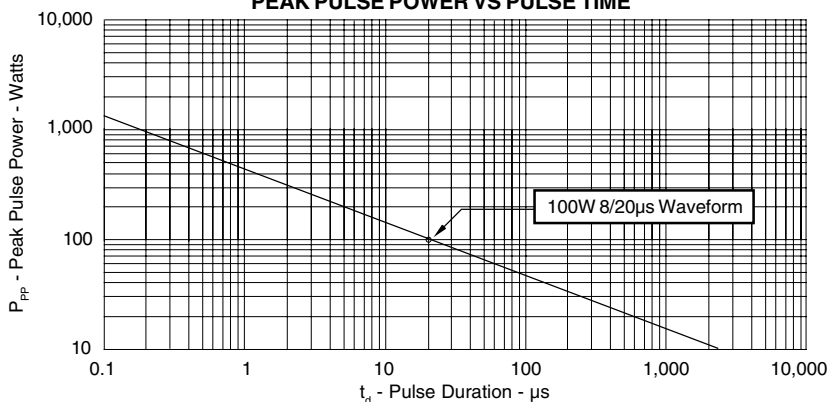
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power ($t_p = 8/20\mu s$) - See Figure 1	P_{PP}	100	Watts
Operating Temperature	T_L	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

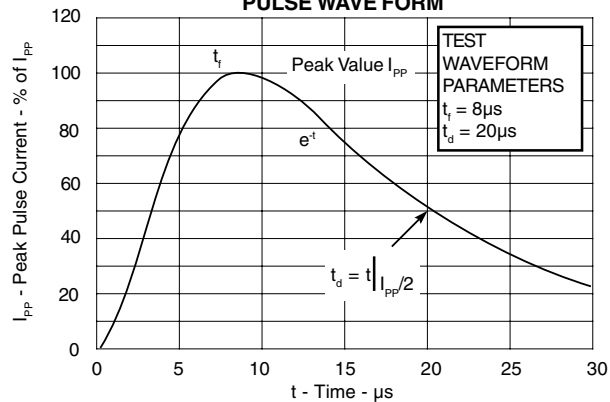
PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ $I_P = 5A$ V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ 8/20 μs V_C @ I_{PP}	MAXIMUM LEAKAGE CURRENT @ V_{WM} I_D μA	TYPICAL CAPACITANCE (See Note 1) @ 0V, 1 MHz C_J pF
SMF05C	05C	5.0	6.0	9.8	12.0V @ 9.0A	5	60
SMF12C	12C	12.0	13.3	-	23.8V @ 4.2A	1	30
SMF15C	15C	15.0	16.7	-	33.3V @ 3.0A	1	25
SMF24C	24C	24.0	26.7	-	55.5V @ 1.8A	1	20

Note 1: Pins 1, 3, 4, 5 or 6 to pin 2.

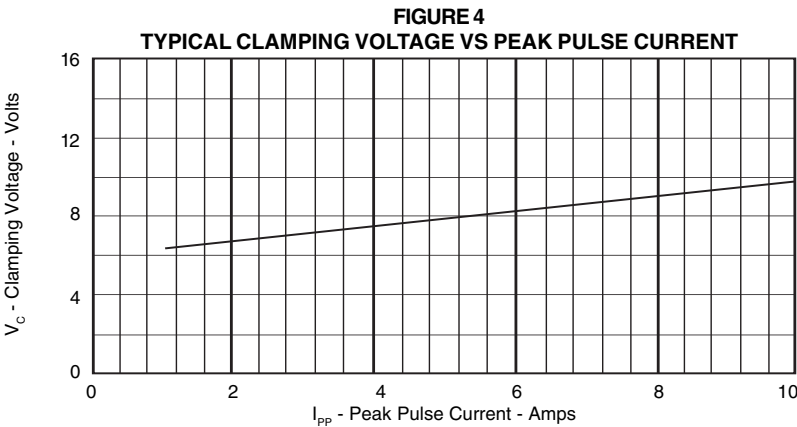
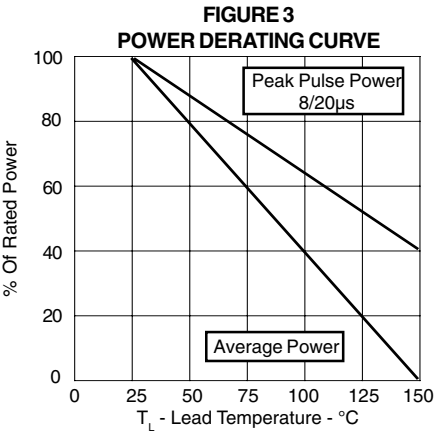
**FIGURE 1
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2
PULSE WAVE FORM**



GRAPHS



APPLICATION NOTE

The SMFC Series are TVS arrays designed to protect I/O or data lines from the damaging effects of ESD or EFT. This product provides both unidirectional and bidirectional protection, with a surge capability of 100 Watts P_{PP} per line for an 8/20 μ s waveshape and ESD protection > 25 kilovolts.

UNIDIRECTIONAL COMMON-MODE CONFIGURATION (Figure 1)

The SMFC Series provides up to four (4) lines of protection in a common-mode configuration as depicted in Figure 1.

Circuit connectivity is as follows:

- ✓ Line 1 is connected to Pin 1.
- ✓ Line 2 is connected to Pin 3.
- ✓ Line 3 is connected to Pin 4.
- ✓ Line 4 is connected to Pin 6.
- ✓ Pin 2 is connected to ground.

BIDIRECTIONAL DIFFERENTIAL-MODE CONFIGURATION (Figure 2)

The SMFC Series provides up to five (5) lines of protection in a differential-mode configuration as depicted in Figure 2.

Circuit connectivity is as follows:

- ✓ Line 1 is connected to Pin 1.
- ✓ Line 2 is connected to Pin 3.
- ✓ Line 3 is connected to Pin 4.
- ✓ Line 4 is connected to Pin 5.
- ✓ Line 5 is connected to Pin 6.
- ✓ Pin 2 is not connected.

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

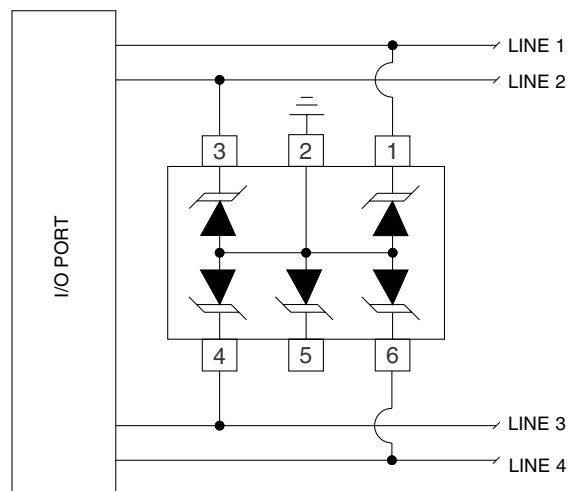
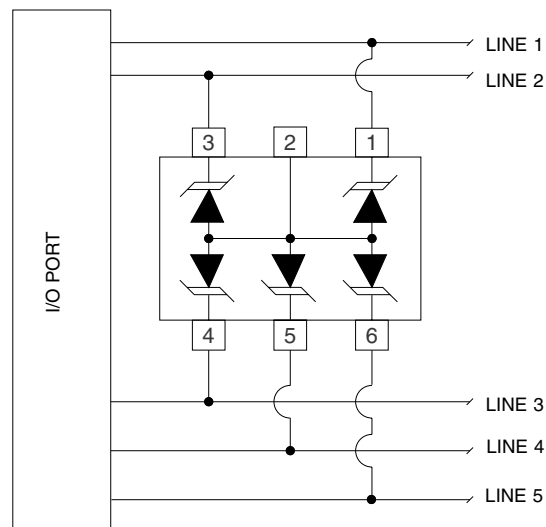
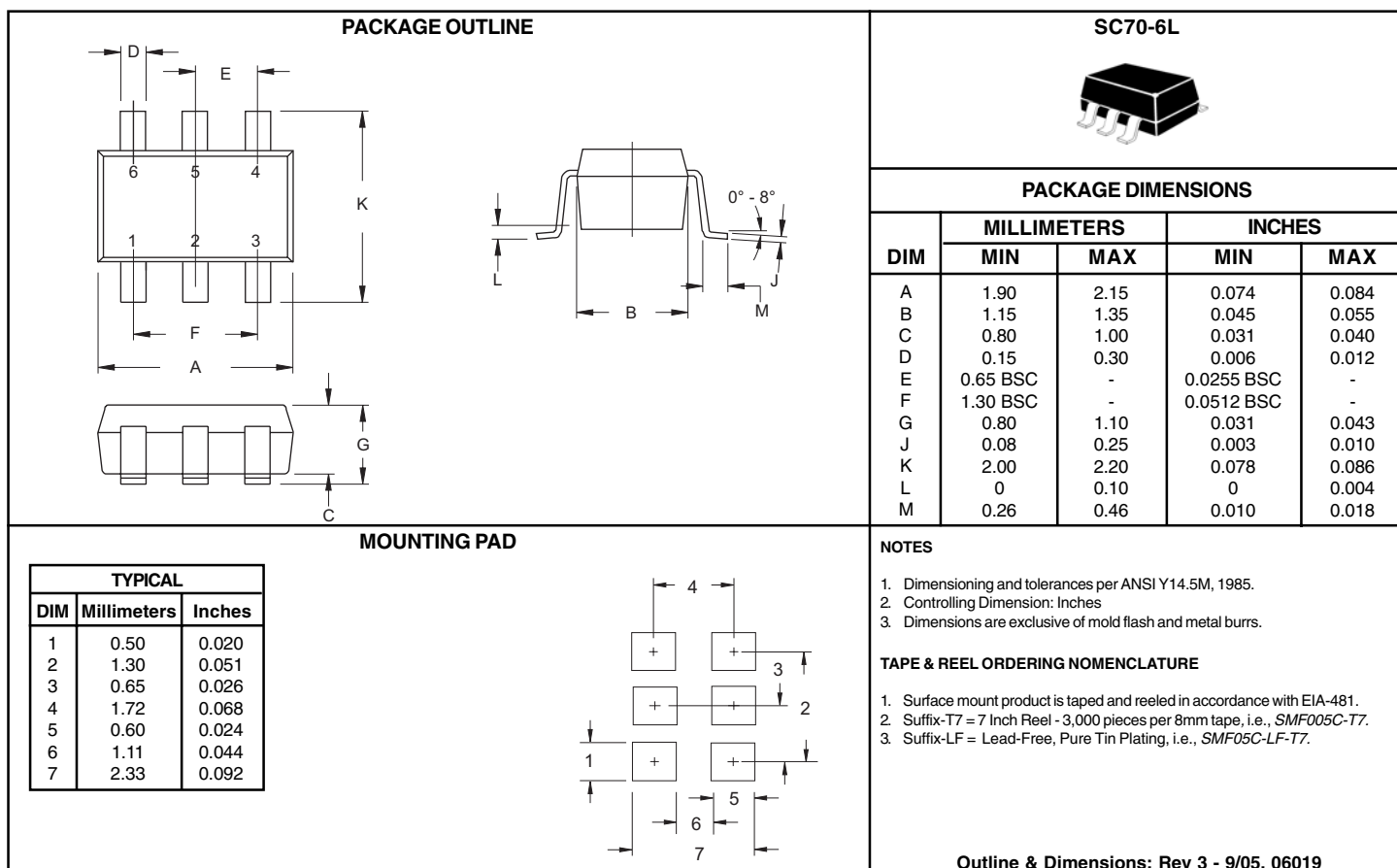


Figure 2 - Bidirectional Configuration
Differential-Mode I/O Port Protection



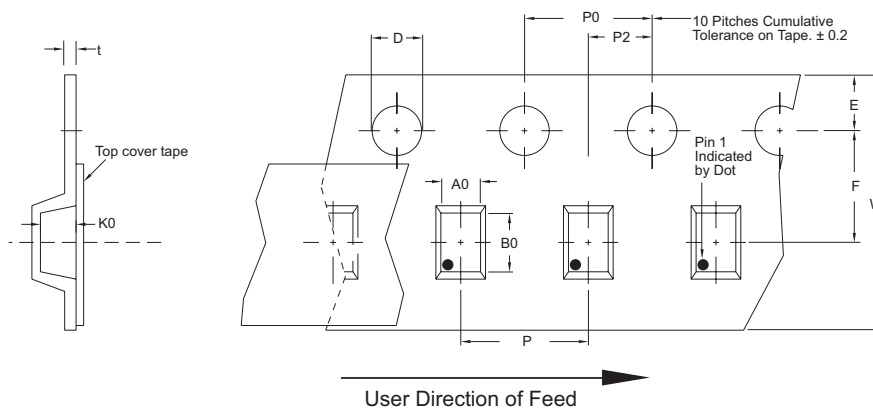
SMF05C thru SMF24C

SC-70-6L PACKAGE OUTLINE & DIMENSIONS



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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