

## MULTI-LINE TVS ARRAY



### DESCRIPTION

The SMFxxC series are subminiature TVS suppressor arrays designed for the protection of sensitive IC components from the damaging effects of Electrostatic Discharge (ESD) and Electrical Fast Transients (EFT). This series is ideally suited for use in portable electronics such as SMART phones, laptops, as well as cellular phone base stations.

The SMFxxC series provides protection in accordance with IEC 61000-4-2 and IEC 61000-4-4 requirements. This series is available in a SC70-6L package configuration and is rated at 100 Watts peak pulse power (8/20µs) per line.

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air 15kV, Contact 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A, 5/50ns
- 100 Watts Peak Pulse Power per Line( $t_p = 8/20\mu s$ )
- Monolithic Design
- Protects 4 Bidirectional Lines or 5 Unidirectional Lines
- ESD Protection > 25 kilovolts
- Available in Multiple Voltages
- Low Clamping Voltage
- RoHS Compliant
- REACH Compliant

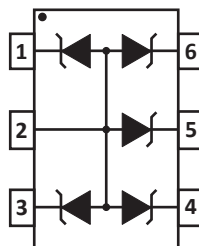
### APPLICATIONS

- Notebook Computers
- Cellular Phone Base Stations
- SMART Phones
- Digital Cameras

### MECHANICAL CHARACTERISTICS

- Molded JEDEC SC70-6L Package
- Approximate Weight: 7milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- Flammability Rating UL 94V-0
- 8mm Tape and Reel per EIA Standard 481

### PIN CONFIGURATION



## TYPICAL DEVICE CHARACTERISTICS

## MAXIMUM RATINGS @ 25°C Unless Otherwise Specified

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

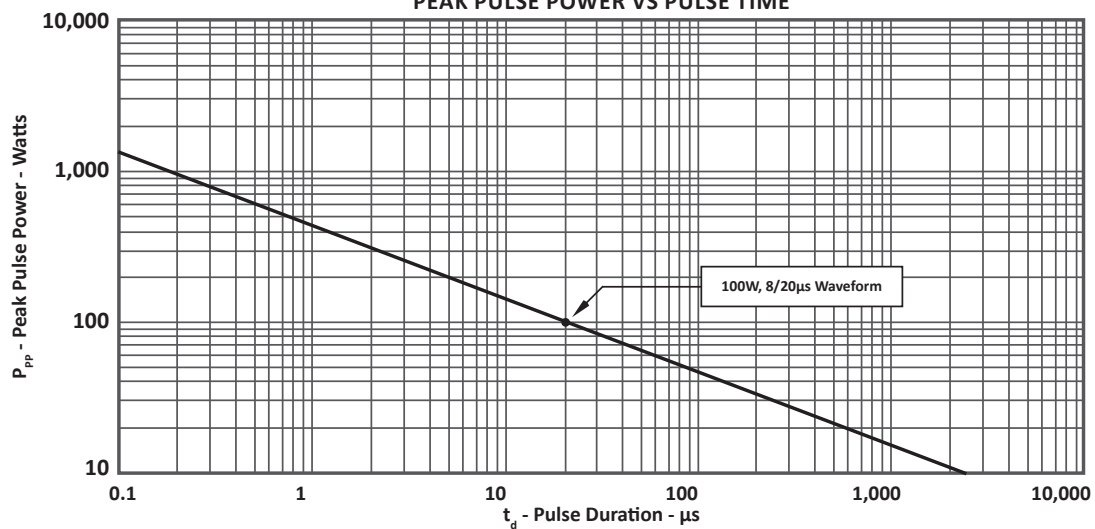
## ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified

PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE  @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2)  @ $I_p = 5A$ $V_C$ VOLTS	MAXIMUM LEAKAGE CURRENT  @ $V_{WM}$ $I_D$ μA	MAXIMUM CAPACITANCE (Note 1)  @ 0V, 1MHz $C_j$ pF
SMF05C	05C	5.0	6.0	9.8	5	60
SMF12C	12C	12.0	13.3	18.0	1	30
SMF15C	15C	15.0	16.7	22.0	1	25
SMF24C	24C	24.0	26.7	50.0	1	20

## NOTES

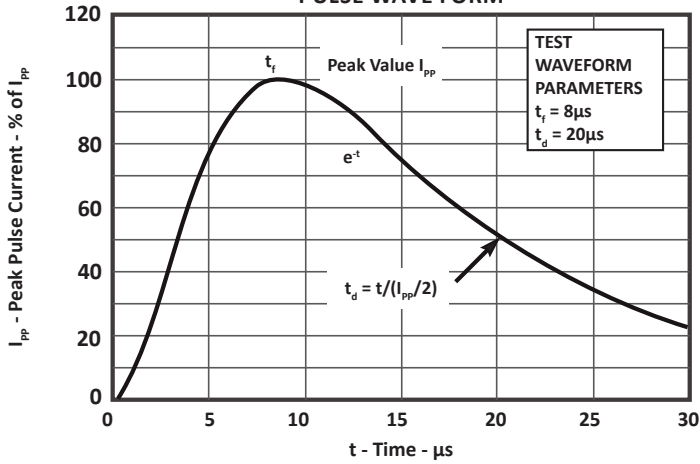
1. Pins 1, 3, 4, 5 or 6 to pin 2.

FIGURE 1  
PEAK PULSE POWER VS PULSE TIME

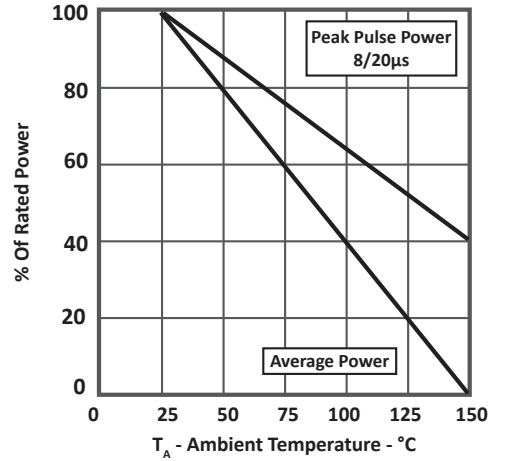


**TYPICAL DEVICE CHARACTERISTICS**

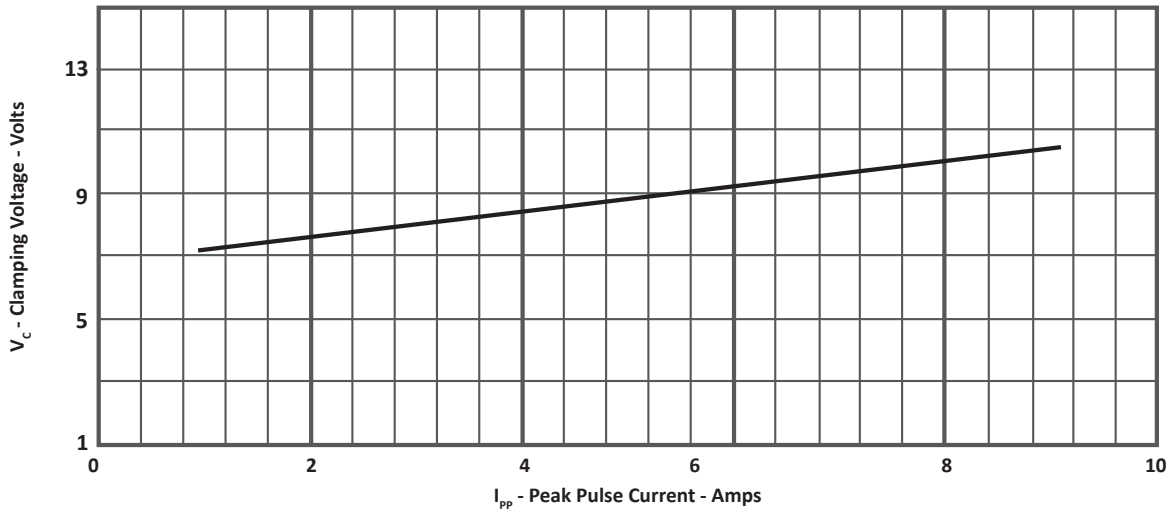
**FIGURE 2  
PULSE WAVE FORM**



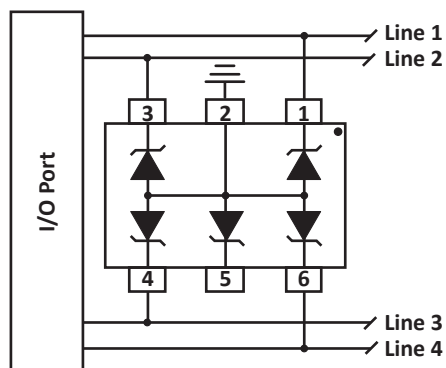
**FIGURE 3  
POWER DERATING CURVE**



**FIGURE 4  
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT SMF05C**



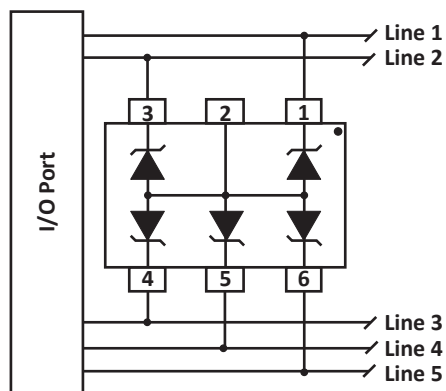
## APPLICATION INFORMATION



**FIGURE 1 - COMMON-MODE I/O PORT PROTECTION (UNIDIRECTIONAL)**

Circuit connectivity is as follows:

- Line 1 connected to pin 1.
- Line 2 connected to pin 3.
- Line 3 connected to pin 4.
- Line 4 connected to pin 6.
- Pin 2 connected to ground.
- Pin 5 not connected.



**FIGURE 2 - COMMON-MODE I/O PORT PROTECTION (BIDIRECTIONAL)**

Circuit connectivity is as follows:

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

## CIRCUIT BOARD RECOMMENDATIONS

Circuit board layout is critical for electromagnetic compatibility 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.

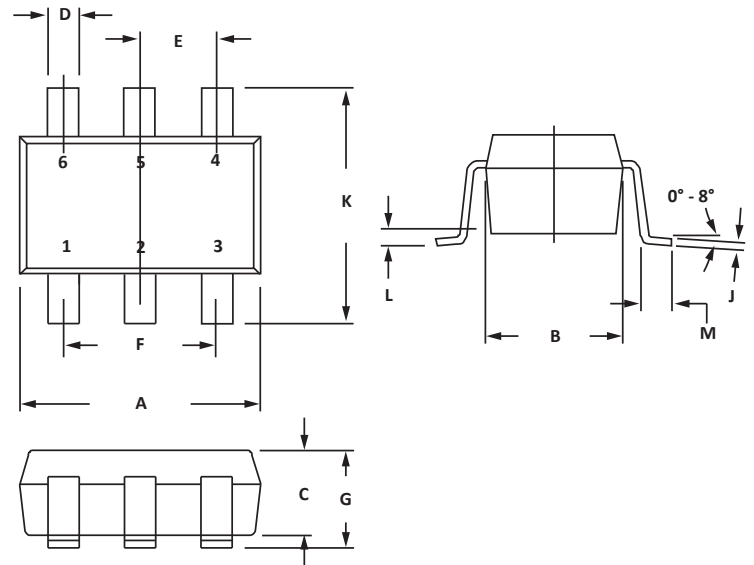
## SC70-6L PACKAGE INFORMATION

## OUTLINE DIMENSIONS

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	0.005	0.012
E	0.65 BSC		0.026 BSC	
F	1.30 BSC		0.051 BSC	
G	0.80	1.10	0.031	0.043
J	0.08	0.25	0.003	0.010
K	2.00	2.40	0.078	0.095
L	-	0.10	-	0.004
M	0.26	0.46	0.010	0.018

## NOTES

1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Dimensions are exclusive of mold flash and metal burrs.

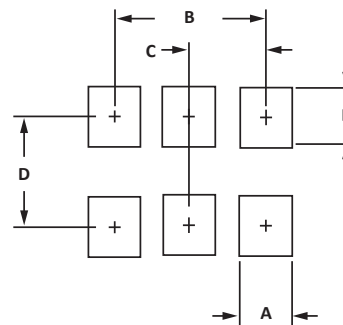


## PAD LAYOUT DIMENSIONS

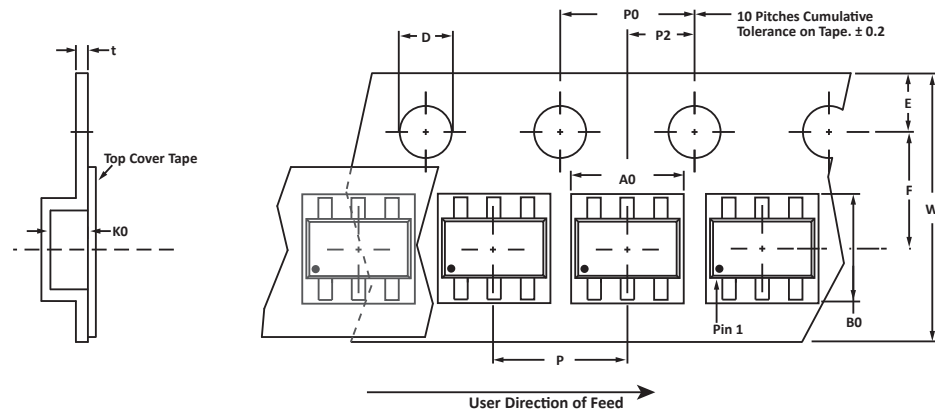
DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.50	0.020
B	1.30	0.051
C	0.65	0.026
D	1.72	0.068
E	0.60	0.024

## NOTES

1. Controlling dimension: inches.



## TAPE AND REEL



## SPECIFICATIONS

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

## NOTES

- Dimensions are in millimeters.
- Surface mount product is taped and reeled in accordance with EIA-481.
- Suffix - T7 = 7" Reel - 3,000 pieces per 8mm tape.
- Marking on Part - marking code (see page 2) and pin one defined by dot on package.

## ORDERING INFORMATION

BASE PART NUMBER (xx = Voltage)	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
SMFxxC	-LF	-T7	3,000	7"	n/a

This device is only available in a Lead-Free configuration.

## COMPANY INFORMATION

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### COMPANY PROFILE

In business more than 25 years, ProTek Devices™ is a privately held semiconductor company. The company offers a product line of overvoltage protection and overcurrent protection components. These include transient voltage suppressor array (TVS arrays) avalanche breakdown diode, steering diode TVS array and electronics SMD chip fuses. These components deliver circuit protection in electronic systems from numerous overvoltage and overcurrent events. They include lightning; electrostatic discharge (ESD); nuclear electromagnetic pulses (NEMP); inductive switching; and electromagnetic interference (EMI) / radio frequency interference (RFI). ProTek Devices also offers LED wafer die for ESD protection and related high frequency products. ProTek Devices is ISO 9001:2015 certified.

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