

## MULTI-LINE TVS ARRAY



**SC70-5L PACKAGE**

### DESCRIPTION

The PSMF05 is a subminiature TVS suppressor array designed for the protection of sensitive IC components from the damaging effects of Electrostatic Discharge (ESD) and Electrical Fast Transients (EFT). This device is ideally suited for use in portable electronics such as SMART phones, laptops, and other wireless devices.

The PSMF05 provides protection in accordance with IEC 61000-4-2 and IEC 61000-4-4 requirements. This device is available in a SC70-5L package configuration and is rated at 100 Watts peak pulse power (8/20 $\mu$ s) 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(tp = 8/20 $\mu$ s)
- Provides 4 Lines of Protection
- ESD Protection > 25 kilovolts
- Low Clamping Voltage
- RoHS Compliant
- REACH Compliant

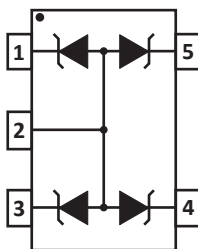
### APPLICATIONS

- SMART Phones
- Portable Electronics

### MECHANICAL CHARACTERISTICS

- Molded JEDEC SC70-5L 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

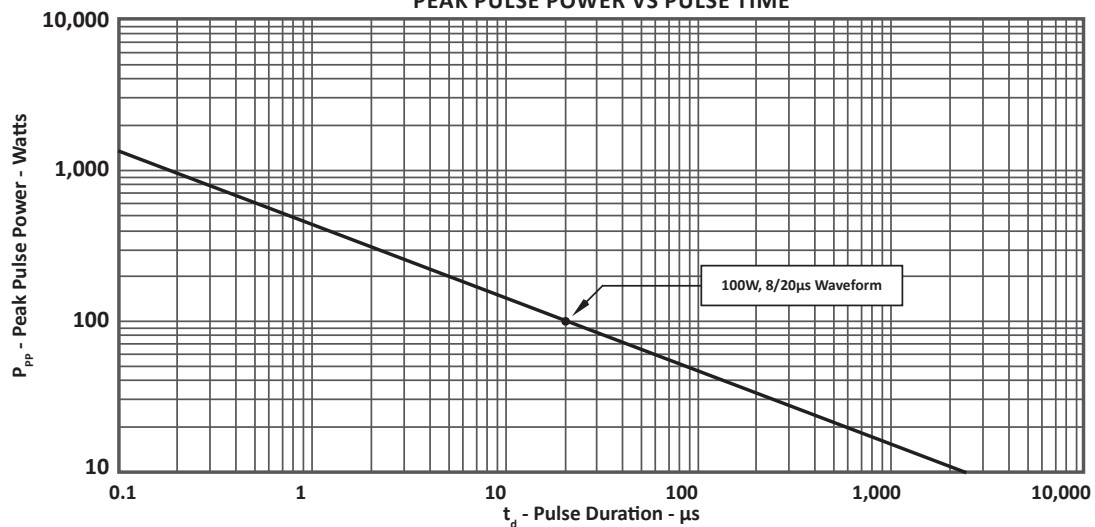
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power ( $t_p = 8/20\mu s$ ) - See Figure 1	$P_{PP}$	100	Watts
Operating Temperature	$T_L$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C
Forward Voltage @ 1A, 8/20 $\mu s$	$V_F$	1.5	Volts

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

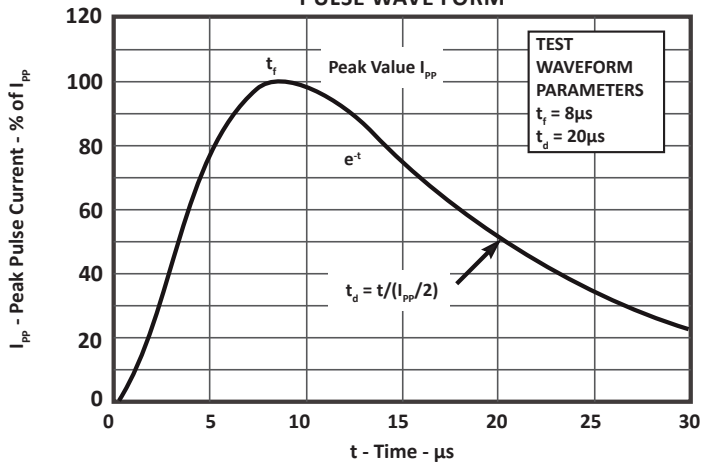
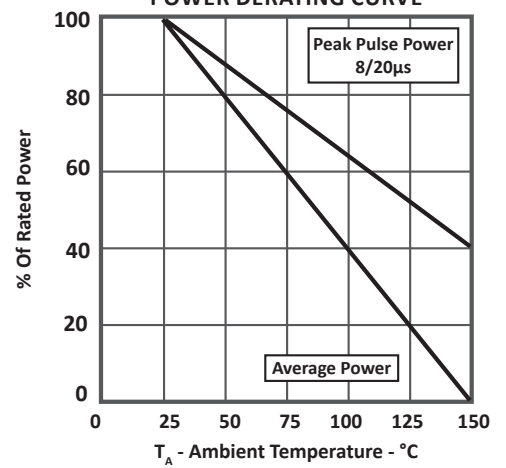
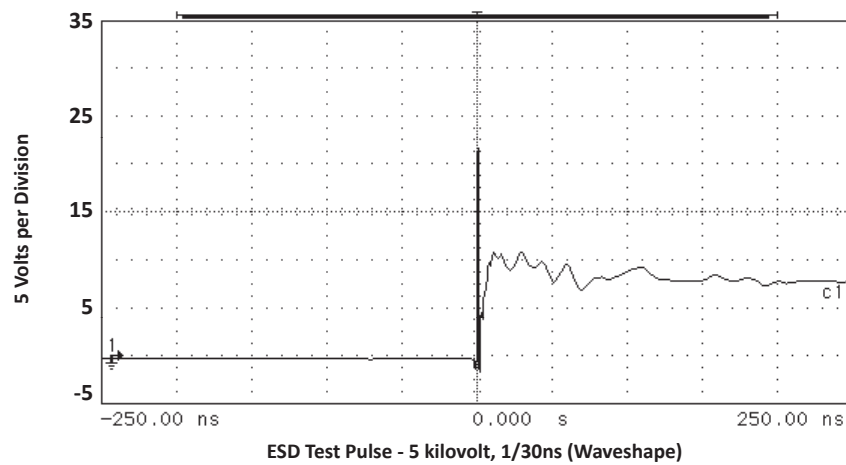
PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE  $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE (Note 1) @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ $I_p = 1A$ $V_c$ VOLTS	MAXIMUM LEAKAGE CURRENT @ $V_{WM}$ $I_D$ $\mu A$	MAXIMUM LEAKAGE CURRENT @ 3V $I_D$ $\mu A$	MAXIMUM CAPACITANCE @ 0V, 1MHz $C_j$ pF
PSMF05	05	5.0	6.0	9.5	10	1	60

## NOTES

1. Test between pins 1 to 2, 3 to 2, 4 to 2 and 5 to 2.
2. Contact factory for other voltages.

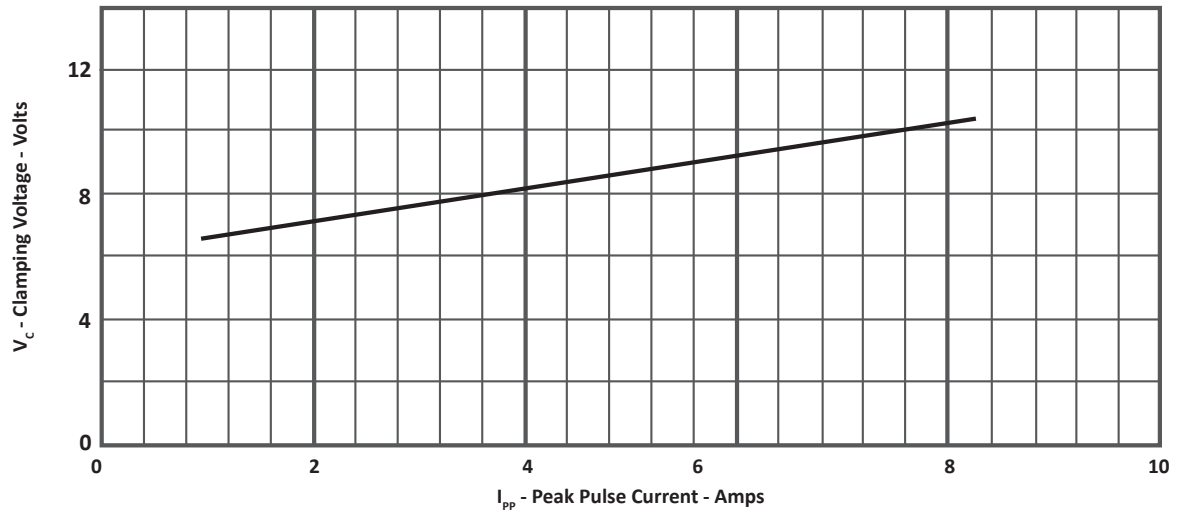
 FIGURE 1  
 PEAK PULSE POWER VS PULSE TIME


## TYPICAL DEVICE CHARACTERISTICS

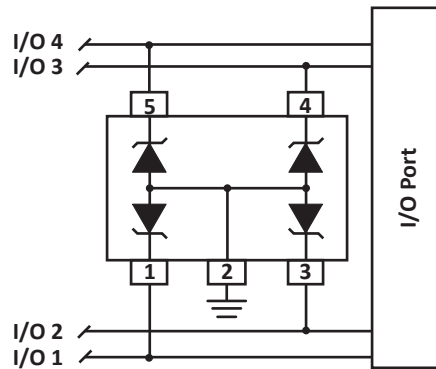
**FIGURE 2**  
**PULSE WAVE FORM**

**FIGURE 3**  
**POWER DERATING CURVE**

**FIGURE 4**  
**OVERSHOOT & CLAMPING VOLTAGE**


## TYPICAL DEVICE CHARACTERISTICS

FIGURE 5  
TYPICAL CLAMPING VOLTAGE VS PEAK PULSE CURRENT



## APPLICATION INFORMATION



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

Circuit connectivity is as follows:

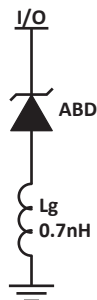
- I/O 1 is connected to pin 1.
- I/O 2 is connected to pin 3.
- I/O 3 is connected to pin 4.
- I/O 4 is connected to pin 5.
- Pin 2 is connected to ground.

## CIRCUIT BOARD 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.

## SPICE MODEL

**FIGURE 1**  
**SPICE MODEL**


ABD - Avalanche Breakdown Diode (TVS)  
 Lg - Lead Inductance

**TABLE 1 - SPICE PARAMETERS**

PARAMETER	UNIT	ABD(TVS)
BV	V	See Table 2
IBV	$\mu\text{A}$	1
$C_{jo}$	pF	See Table 2
$I_s$	A	See Table 2
Vj	V	0.6
M	-	0.33
N	-	1
$R_s$	Ohms	See Table 2
TT	s	1E-8
EG	eV	1.11

**TABLE 2 - ABD SPECIFIC SPICE PARAMETERS**

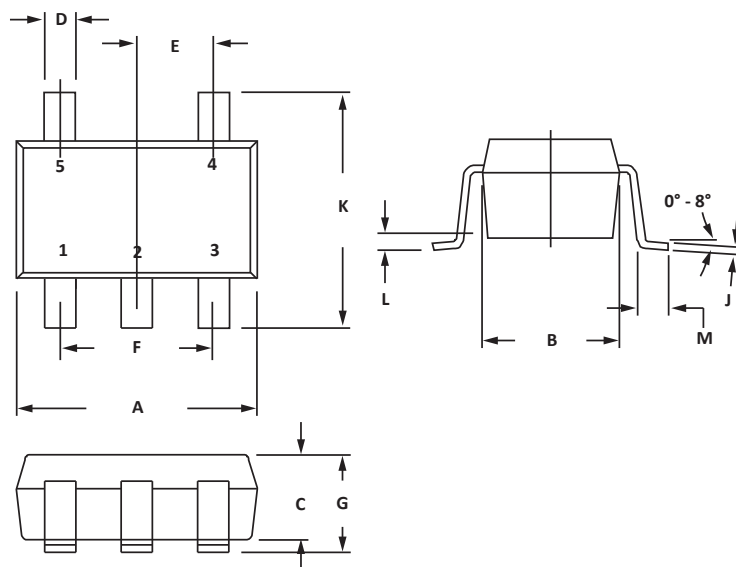
PART NUMBER	$B_V$ (VOLTS)	$C_{jo}$ (pF)	$I_s$ (AMPS)	$R_s$ (OHMS)
PSMF05	6.0	115	1E-11	0.325

## SC70-5L 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**

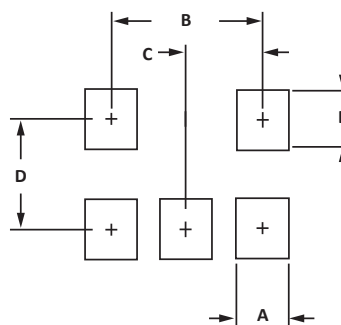
1. Controlling dimension: inches.
2. Dimensioning and tolerances per ANSI Y14.5M, 1985.
3. Dimensions are exclusive of mold flash and metal burrs.



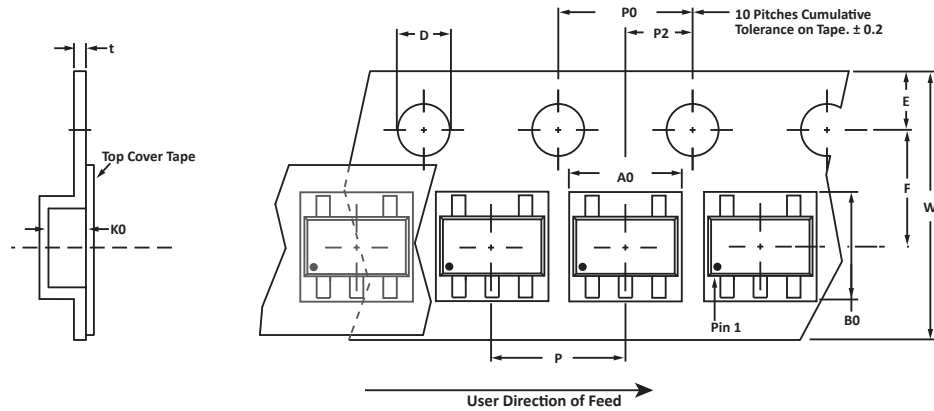
PAD LAYOUT DIMENSIONS		
DIM	MILLIMETERS	INCHES
	NOMINAL	NOMINAL
A	0.50	0.020
B	1.30	0.051
C	0.65	0.026
D	1.72	0.068
E	0.60	0.024

**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	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PSMF05	-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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