

## HIGH POWERED TVS ARRAY



### DESCRIPTION

The PSD05HP is a single line, 1000 Watt transient voltage suppression device designed for use in battery chargers and battery packs to protect sensitive electronics from switching transients across the AC line. Available in a SOD-323 package configuration, the PSD05HP provides ESD and EOS protection while saving space on the printed circuit board. Other applications for the PSD05HP include wireless telecommunication devices and portable electronics like SMART phones.

The PSD05HP is ideally suited to protect 5V DC lines and data I/O ports against ESD, EOS and EFT. This device exceeds the requirements of IEC 61000-4-2 (ESD) and IEC 61000-4-4 (EFT). The PSD05HP, in conjunction with passive components integrated into a TVS/Filter network can be used for EMI/RFI protection.

### FEATURES

- Compatible with IEC 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
- Compatible with IEC 61000-4-4 (EFT): 40A - 5/50ns
- Compatible with IEC 61000-4-5 (Surge): 45A, 8/20 $\mu$ s
- 1000 Watts Peak Pulse Power per Line (tp = 8/20 $\mu$ s)
- Replacement for MLV (0805)
- Unidirectional Configuration
- Protects One Power Line
- Low Clamping Voltage
- RoHS Compliant
- REACH Compliant

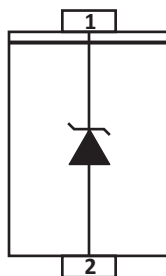
### APPLICATIONS

- Battery Chargers/Packs
- SMART Phones
- Portable Electronics

### MECHANICAL CHARACTERISTICS

- Molded JEDEC SOD-323 Package
- Approximate Weight: 5 milligrams
- Lead-Free Pure-Tin Plating (Annealed)
- Solder Reflow Temperature:  
Pure-Tin - Sn, 100: 260-270°C
- 8mm Tape and Reel Per EIA Standard 481
- Flammability Rating UL 94V-0

### PIN CONFIGURATION



**TYPICAL DEVICE CHARACTERISTICS**
**MAXIMUM RATINGS @ 25°C Unless Otherwise Specified**

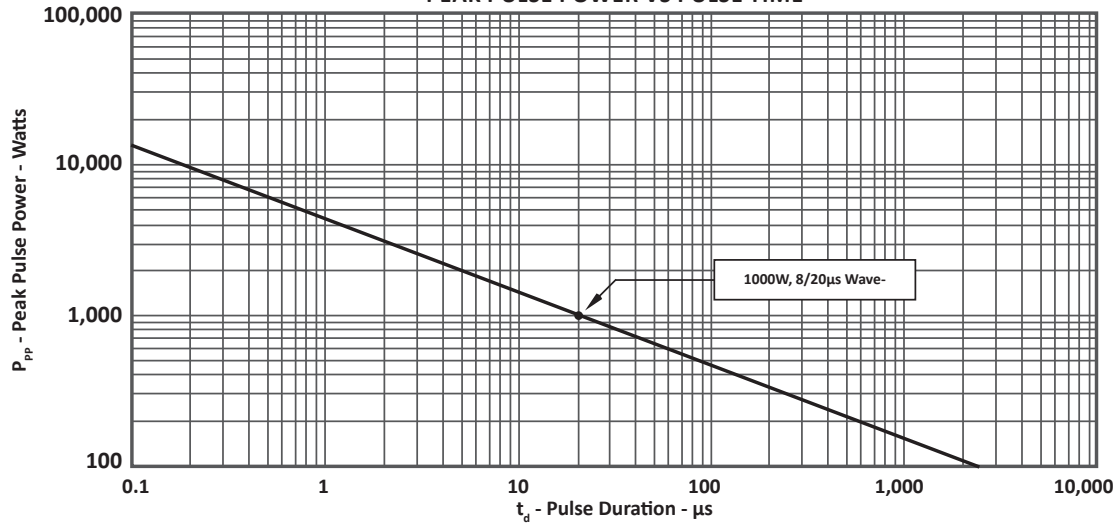
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (tp = 8/20μs) - See Figure 1	$P_{PP}$	1000	Watts
Operating Temperature	$T_A$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C

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

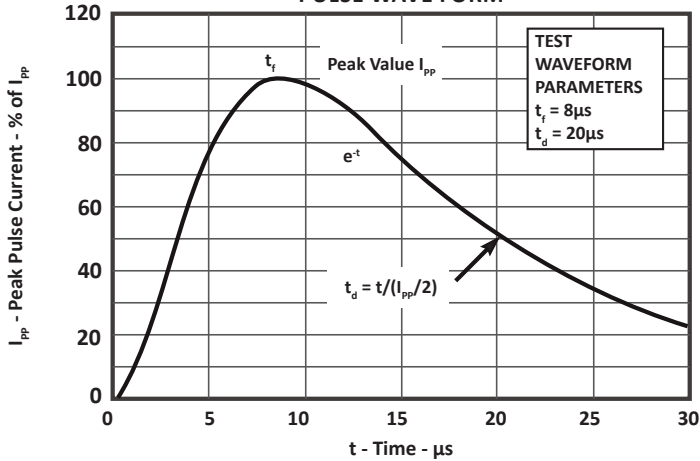
PART NUMBER	DEVICE MARKING	RATED STAND-OFF VOLTAGE $V_{WM}$ VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ IP = 1A $V_C$ VOLTS	MAXIMUM CLAMPING VOLTAGE (Fig. 2) @ 8/20μs $V_C @ I_{PP}$	MAXIMUM LEAKAGE CURRENT @ $V_{WM}$ $I_D$ μA	TYPICAL CAPACITANCE @ 0V, 1MHz C pF
PSD05HP	P	5.0	6.0	9.8	15.0V @ 72.0A	20	800

**TYPICAL DEVICE CHARACTERISTICS**

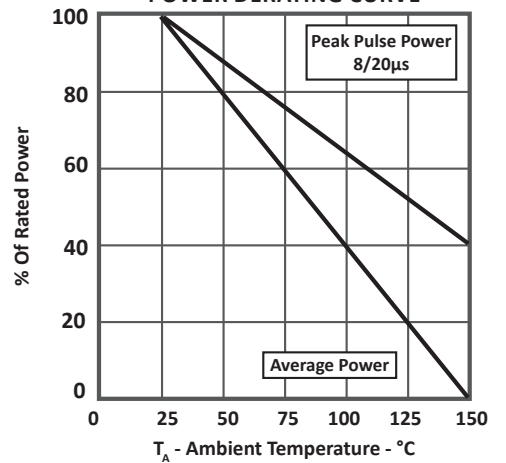
**FIGURE 1  
PEAK PULSE POWER VS PULSE TIME**



**FIGURE 2  
PULSE WAVE FORM**



**FIGURE 3  
POWER DERATING CURVE**



## SPICE MODEL

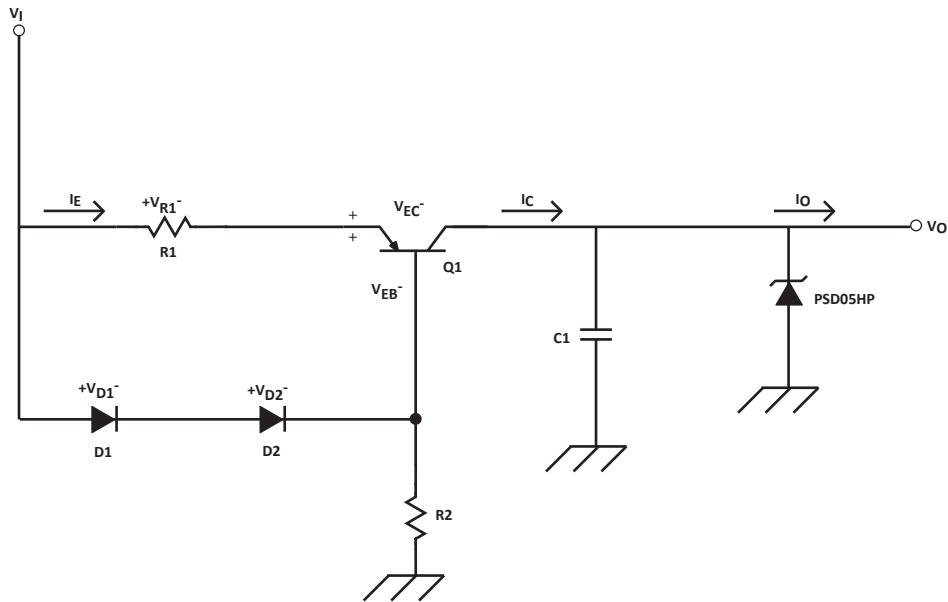
FIGURE 1  
SPICE MODEL FOR



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

TABLE 1 - SPICE PARAMETERS		
PARAMETER	UNIT	ABD(TVS)
BV	V	6.0
IBV	$\mu\text{A}$	1
$C_{j0}$	pF	880
$I_s$	A	1E-11
Vj	V	0.6
M	-	0.33
N	-	1
$R_s$	Ohms	0.09
TT	s	1E-8
EG	eV	1.11

## APPLICATION INFORMATION



**FIGURE 1 - USB BATTERY CHARGER APPLICATION**

- One PSD05HP is placed on the output of the power regulator to protect the VBAT line from switching transients as well as EFT that may occur across the line.

## CIRCUIT BOARD RECOMMENDATIONS

Circuit board layout is critical for electromagnetic compatibility protection. The following guidelines are recommended:

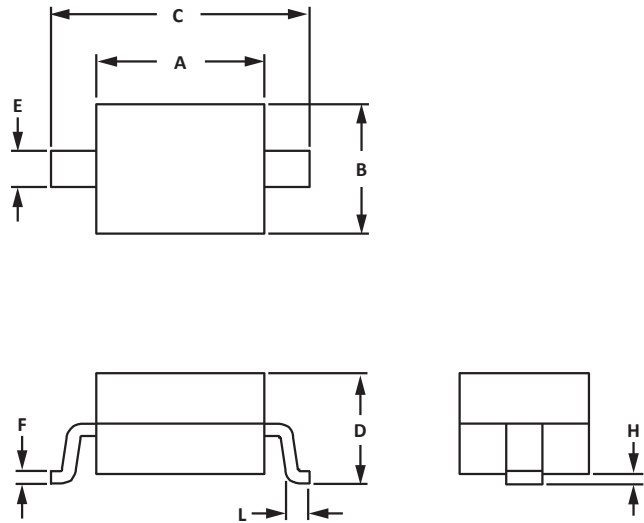
- The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- The path length between the TVS device and the protected line should be minimized.
- All conductive loops including 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.

**SOD-323 PACKAGE INFORMATION**
**OUTLINE DIMENSIONS**

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.60	1.90	0.063	0.075
B	1.15	1.45	0.045	0.057
C	2.39	2.70	0.094	0.106
D	0.80	1.10	0.031	0.043
E	0.25	0.40	0.010	0.016
F	0.10	0.20	0.004	0.008
H	-	0.10	-	0.004
L	0.20	-	0.008	-

**NOTES**

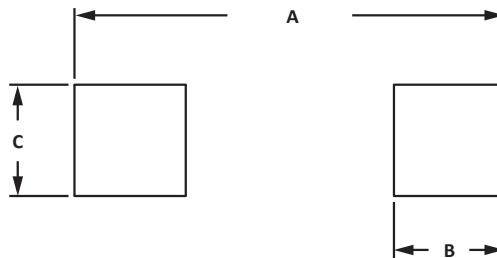
- Controlling dimension: millimeters.
- Dimensioning and tolerances per ANSI Y14.5M, 1985.
- Dimensions are exclusive of mold flash and metal burrs.


**PAD LAYOUT DIMENSIONS**

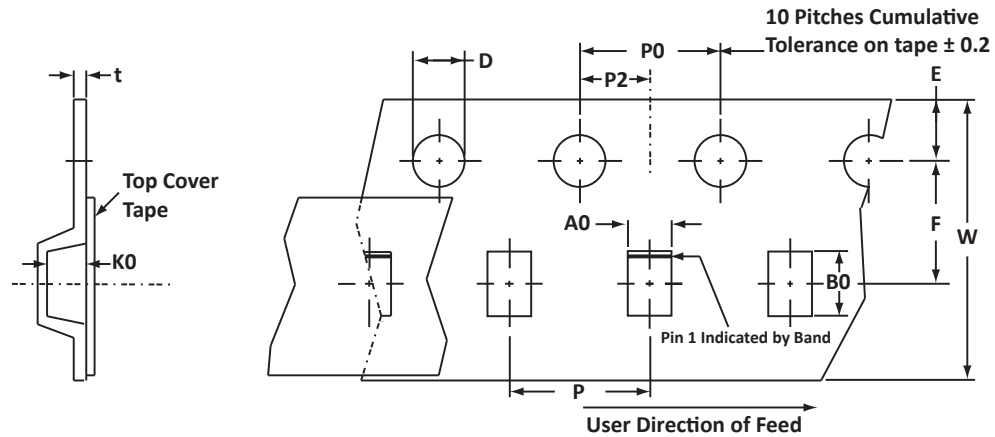
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.87	3.12	0.113	0.123
B	0.66	0.91	0.026	0.036
C	0.66	0.91	0.026	0.036

**NOTES**

- Controlling dimension: millimeters.



## TAPE AND REEL



## SPECIFICATIONS

REEL DIA.	TAPE WIDTH	A0	B0	K0	D	E	F	W	P0	P2	P	tmax
178mm (7")	8mm	1.55 ± 0.10	2.90 ± 0.10	1.35 ± 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

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

Package outline, pad layout and tape specifications per document number 06010.R4 9/10.

## ORDERING INFORMATION

BASE PART NUMBER	LEADFREE SUFFIX	TAPE SUFFIX	QTY/REEL	REEL SIZE	TUBE QTY
PSD05HP	n/a	-T7	3,000	7"	n/a

## COMPANY INFORMATION

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### COMPANY PROFILE

ProTek Devices, based in Tempe, Arizona USA, is a manufacturer of Transient Voltage Suppression (TVS) products designed specifically for the protection of electronic systems from the effects of lightning, Electrostatic Discharge (ESD), Nuclear Electromagnetic Pulse (NEMP), inductive switching and EMI/RFI. With over 25 years of engineering and manufacturing experience, ProTek designs TVS devices that provide application specific protection solutions for all electronic equipment/systems.

ProTek Devices Analog Products Division, also manufactures analog interface, control, RF and power management products.

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