PROTEK DEVICES
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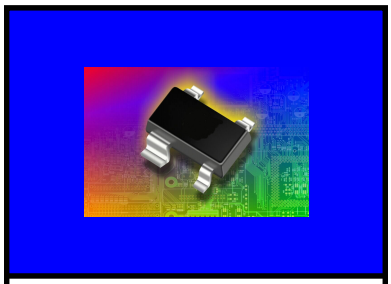
PSR05

LOW CAPACITANCE STEERING DIODE ARRAY/TVS COMBO

APPLICATIONS

✔ Ethernet - 10/100 Base T
✔ FireWire
✔ Wireless Communications
✔ USB Interfaces



SOT-143

IEC COMPATIBILITY (EN61000-4)

✔ 61000-4-2 (ESD): Air - 15kV, Contact - 8kV
✔ 61000-4-4 (EFT): 40A - 5/50ns
✔ 61000-4-5 (Surge): 24A, 8/20µs - Level 2(Line-Gnd) & Level 3(Line-Line)

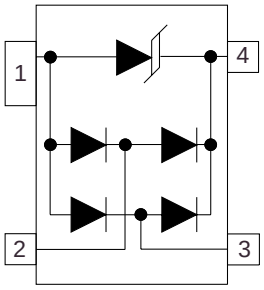
FEATURES

✔ 500 Watts Peak Pulse Power per Line(td=8/20µs)
✔ ESD Protection > 25 kilovolts
✔ Low Clampin Voltage
✔ Unidirectional Configuation
✔ ***PROTECTS 2 I/O PORTS & POWER SUPPLY***
✔ ***LOW CAPACITANCE - 10 pF***

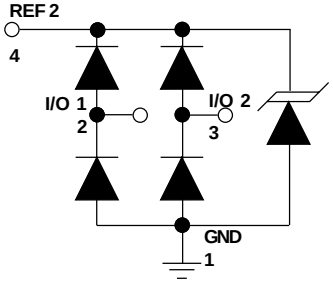
MECHANICAL CHARACTERISTICS

✔ Molded JEDEC SOT-143
✔ Weight 0.6 grams (Approximate)
✔ Flammability Rating UL 94V-0
✔ 8mm Tape and Reel Per EIA Standard 481-1-A
✔ Marking: Device Marking Code & Logo
✔ Pin One Defined By DOT on Top of Package

PIN CONFIGURATION



CIRCUIT DIAGRAM



DEVICE CHARACTERISTICS

MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	SYMBOL	VALUE	UNITS
Peak Pulse Power (t_p = 8/20µs) - See Figure 1	P_{PP}	500	Watts
Operating Temperature	T_J	-55°C to 150°C	°C
Storage Temperature	T_{STG}	-55°C to 150°C	°C
Peak Forward Voltage - I_F@ 1A, 8/20µs	V_F	1.5	Volts

ELECTRICAL CHARACTERISTICS PER LINE @ 25°C Unless Otherwise Specified - per TVS Diode							
PART NUMBER (See Note 1)	DEVICE MARKING	RATED STAND-OFF VOLTAGE V_{WM} VOLTS	MINIMUM BREAKDOWN VOLTAGE @ 1mA $V_{(BR)}$ VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ I_P = 1A V_C VOLTS	MAXIMUM CLAMPING VOLTAGE (See Fig. 2) @ 8/20µs V_C @ I_{PP}	MAXIMUM LEAKAGE CURRENT @V_{WM} I_D µA	MAXIMUM CAPACITANCE (See Note 2) (See Fig. 5) (Per Data Line) 0V @ 1 MHz C pF
PSR05	5A	5.0	6.0	9.8	20.0V @ 28.0A	5.0	10

Note 1: Spice model and parameters availabe for this device on the ProTek Devices website: www.protekdevices.com.
Note 2: As shown in Figure 5, REF1 is connected to ground, REF2 is connected to +V_{CC}, and input applies to V_{CC} = 5V, V_{sign} = 30mV, F = 1 MHz.

FIGURE 1
PEAK PULSE POWER VS PULSE TIME

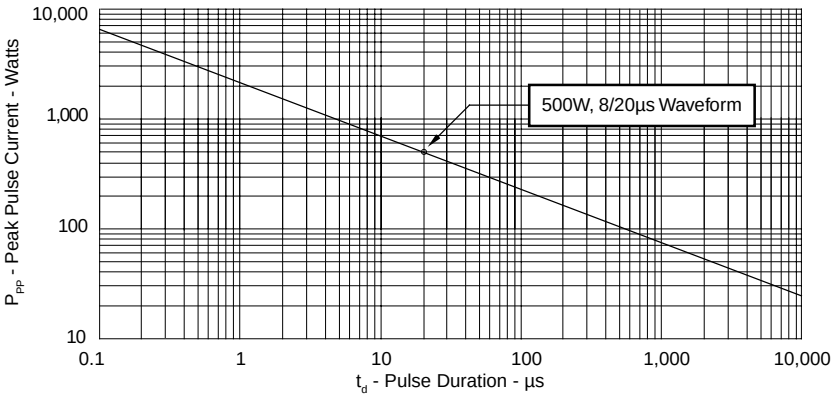
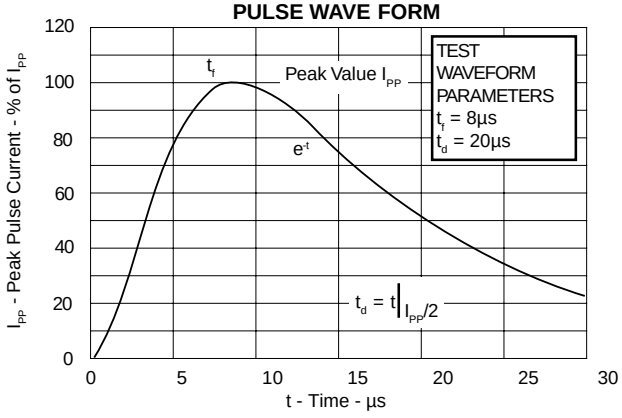


FIGURE 2
PULSE WAVE FORM



GRAPHS

FIGURE 3
POWER DERATING CURVE

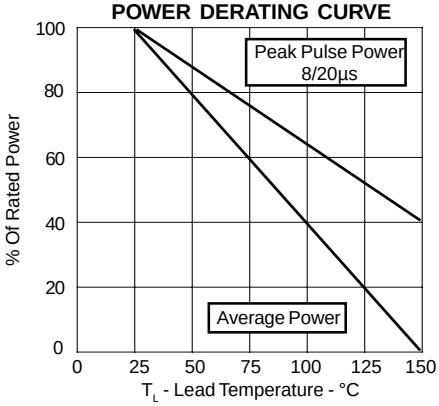
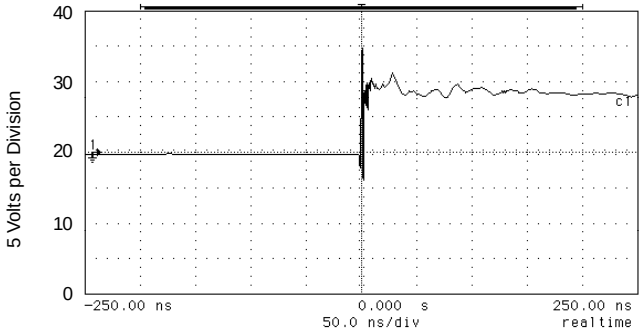


FIGURE 4
OVERSHOOT & CLAMPING VOLTAGE FOR PSR05



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

FIGURE 5
INPUT CAPACITANCE CIRCUIT

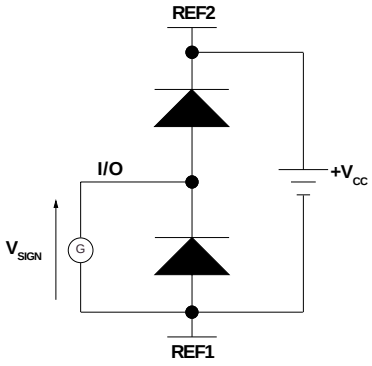
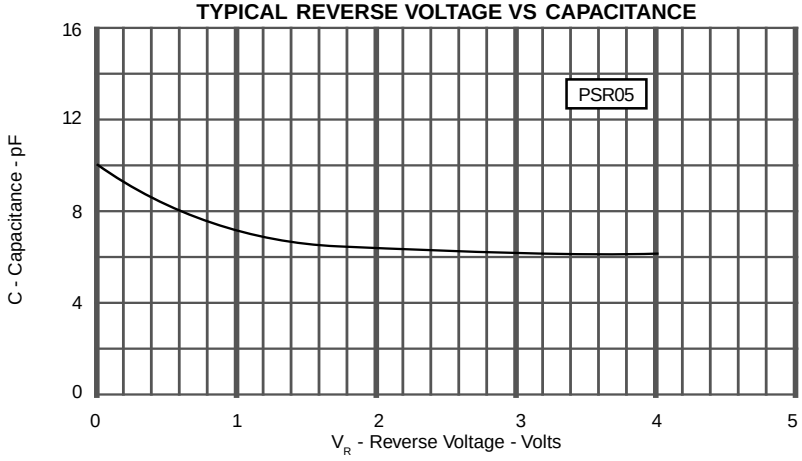


FIGURE 6
TYPICAL REVERSE VOLTAGE VS CAPACITANCE



APPLICATION NOTE

The PSR05 is a low capacitance, bidirectional TVS array that is designed to protect I/O or high speed data lines from the damaging effects of ESD or EFT. This product series has a surge capability of 500 Watts P_{PP} per line for an 8/20µs waveform and offers ESD protection > 25kv.

DIFFERENTIAL MODE CONFIGURATION (Figure 1)

Ideal for use in USB applications, two PSR05 devices provides up to two(2) lines of protection(per device) in a common-mode configuration as depicted in Figure 1.

Circuit connectivity is as follows:

- ✔ Pins 2 and 3 are connected to the datalines.
- ✔ Pin 1 is connected to ground.
- ✔ Pin 4 is connected to the databus.

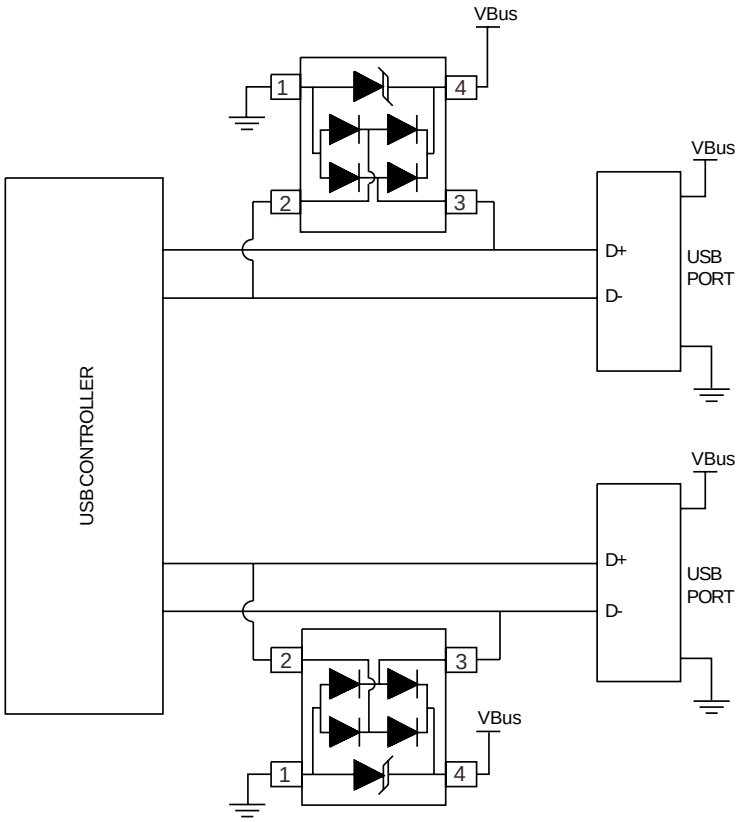


Figure 1. Typical Common-Mode USB Protection

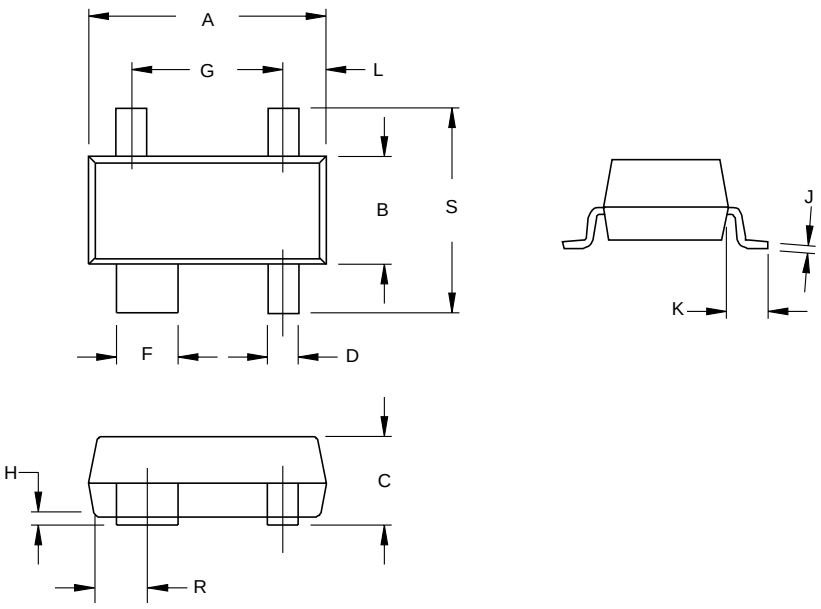
CIRCUIT BOARD LAYOUT RECOMMENDATIONS

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

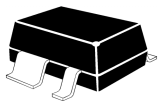
- ✔ The protection device should be placed near the input terminals or connectors, the device will divert the transient current immediately before it can be coupled into the nearby traces.
- ✔ The path length between the TVS device and the protected line should be minimized.
- ✔ All conductive loops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

PACKAGE OUTLINE & DIMENSIONS

PACKAGE OUTLINE



SOT-143

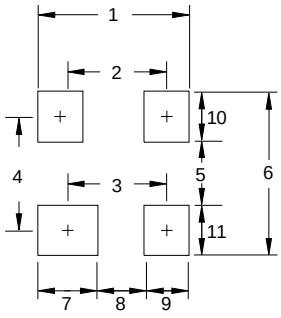


PACKAGE DIMENSIONS

DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	2.80	3.04	0.110	0.0120
B	1.20	1.39	0.047	0.055
C	0.84	1.14	0.033	0.045
D	0.39	0.50	0.015	0.020
F	0.79	0.93	0.031	0.037
G	1.78	2.03	0.070	0.080
H	0.013	0.10	0.0005	0.004
J	0.08	0.15	0.003	0.006
K	0.46	0.60	0.018	0.024
L	0.445	0.60	0.0175	0.024
R	0.72	0.83	0.028	0.033
S	2.11	2.48	0.083	0.098

MOUNTING PAD

TYPICAL		
DIM	Millimeters	Inches
1	2.85	0.112
2	2.00	0.079
3	1.80	0.071
4	1.90	0.075
5	1.05	0.041
6	2.75	0.108
7	1.20	0.047
8	0.80	0.031
9	0.85	0.033
10	0.85	0.033
11	0.85	0.033



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

06011 Rev 1 - 11/01

TAPE & REEL PACKAGING:
Surface mount product is taped and reeled in accordance with EIA-481, reel quantites and sizes are as follows:
7 Inch Reel - 3,000 pieces per reel; 13 Inch Reel - Not Available

ProTek Devices
2929 South Fair Lane, Tempe, AZ 85282
Tel: 602-431-8101 Fax: 602-431-2288
E-Mail: sales@protekdevices.com
Web Site: www.protekdevices.com