

**SESRXX**  
**Low Capacitance TVS Diode Array**

Revision:B

**General Description**

The SESRXX is a transient voltage suppressor designed to protect components which are connected to data and transmission lines against ESD. It clamps the voltage just above the logic level supply for positive transients and to a diode drop below ground for negative transients

**Applications**

- Ethernet – 10/100 Base
- Wireless Communications
- FireWire
- USB power & data line protection
- T1/E1 secondary IC side protection
- Portable electronics

**Features**

- 150 W Peak Pulse Power per Line (tp=8/20s)
- Low Clamping Voltage
- ESD Protection > 25 kilovolts
- Unidirectional Configuration
- Low Leakage Current
- Protects two I/O lines
- Low capacitance :0.6pF

**Complies with the following standards**

**IEC61000-4-2**

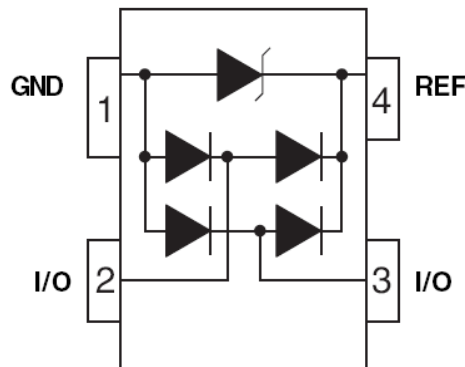
**Level 4 15 kV (air discharge)**

**8 kV(contact discharge)**

**MIL STD 883E - Method 3015-7 Class 3**

**25 kV HBM (Human Body Model)**

**Functional diagram**



**Absolute Maximum Ratings @ 25°C Unless Otherwise Specified**

Symbol	Parameter	Value	Units
P <sub>PP</sub>	Peak Pulse Power (tp = 8/20μs) - See Fig1.	150	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 125	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 125	°C
V <sub>F</sub>	Peak Forward Voltage – I <sub>F</sub> =1A, 2/20μs	1.5	Volts

## Electrical Characteristics Per Line @ 25°C Unless Otherwise Specified

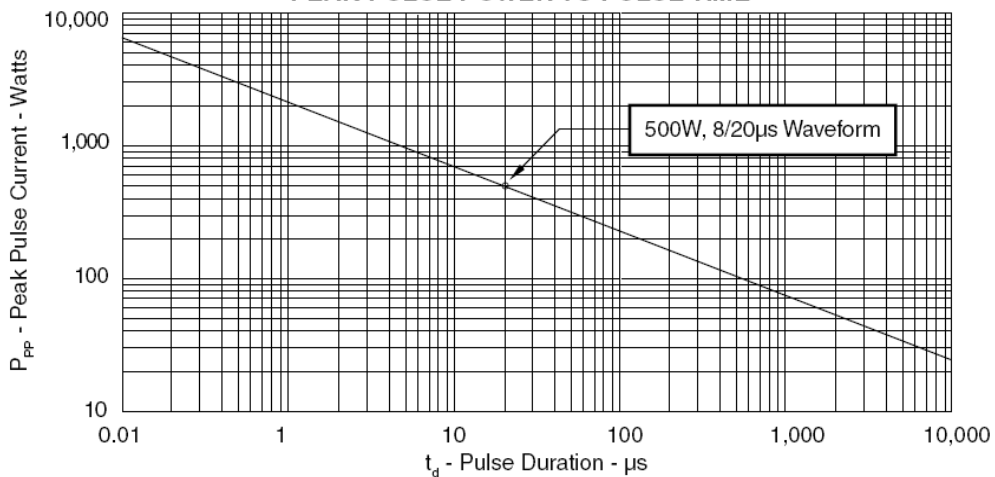
Electrical Characteristics( $T_J=25^\circ\text{C}$  unless otherwise noted)

Part Numbers	$V_{BR}$			$I_T$	$V_{RM}$	$I_{RM}$	$V_F$	$I_F$	$C$
	Min.	Typ.	Max.				Max.		Typ.
	V	V	V				mA		V
SESR05	6.0	6.6	9.8	1	5.0	1	1.25	200	0.6
SESR12	13.3	14.0	16.5	1	12.0	1	1.25	200	0.6

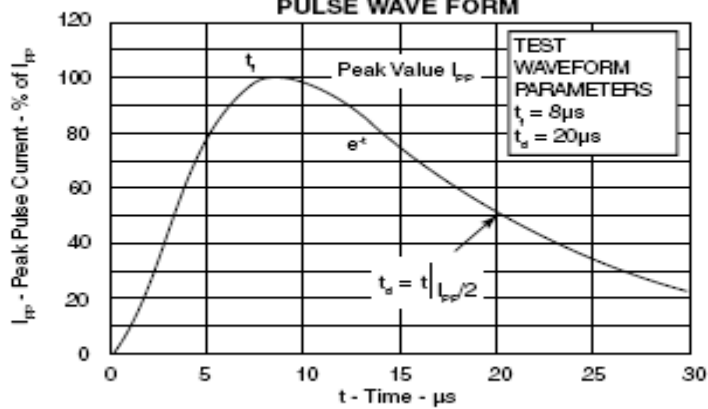
Note 1:As shown in Figure 5,REF 1is connected to ground, REF 2 is connected to  $+V_{cc}$  and input applies to  $V_{cc}=5V, V_{sign}=30mV, F=1MHz$

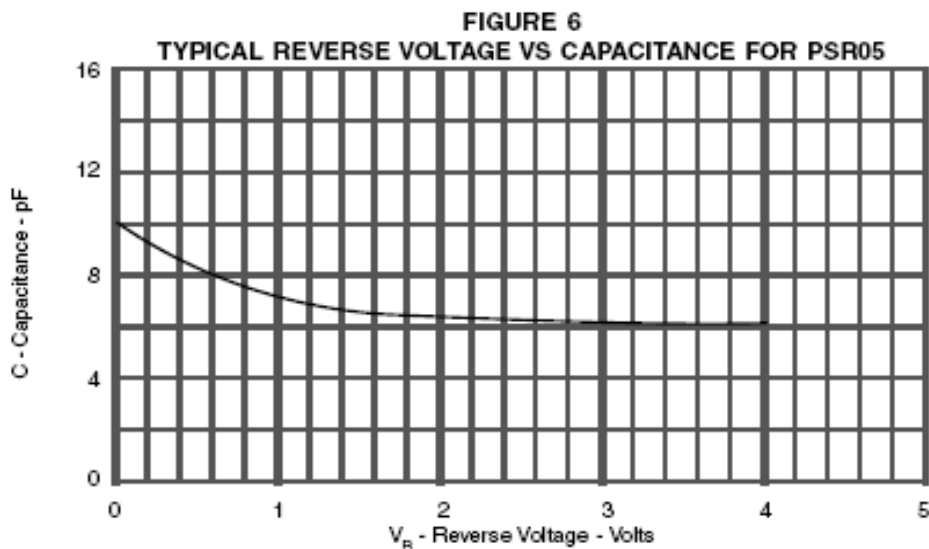
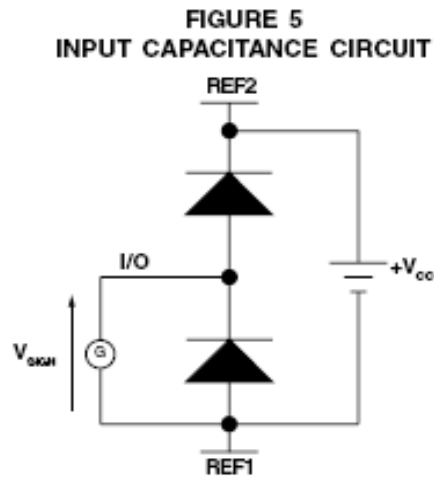
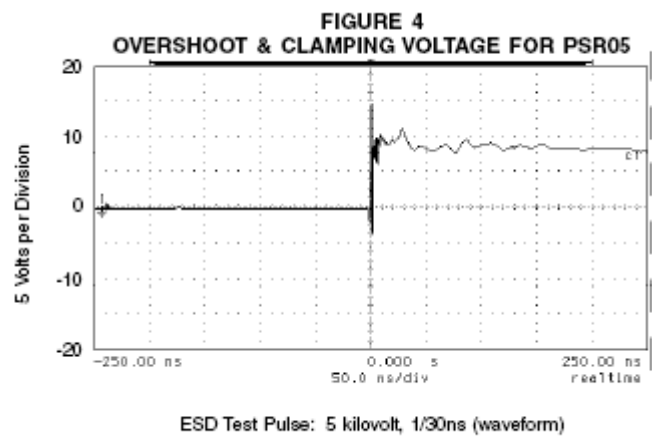
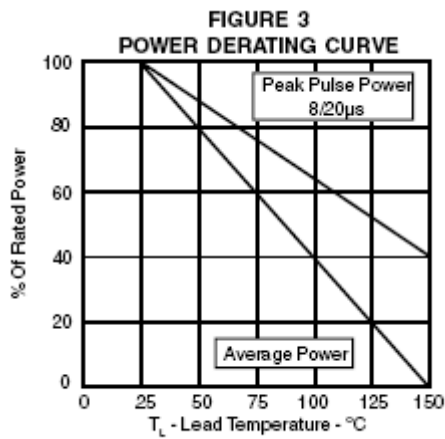
### Typical Characteristics

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



**FIGURE 2**  
PULSE WAVE FORM





## COMMON-MODE CONFIGURATION (Figure 1)

Ideal for use in USB applications, two SESR05 devices up to two (2) lines of protection(per device) in a common-mode configuration as depicted in Figure 1.

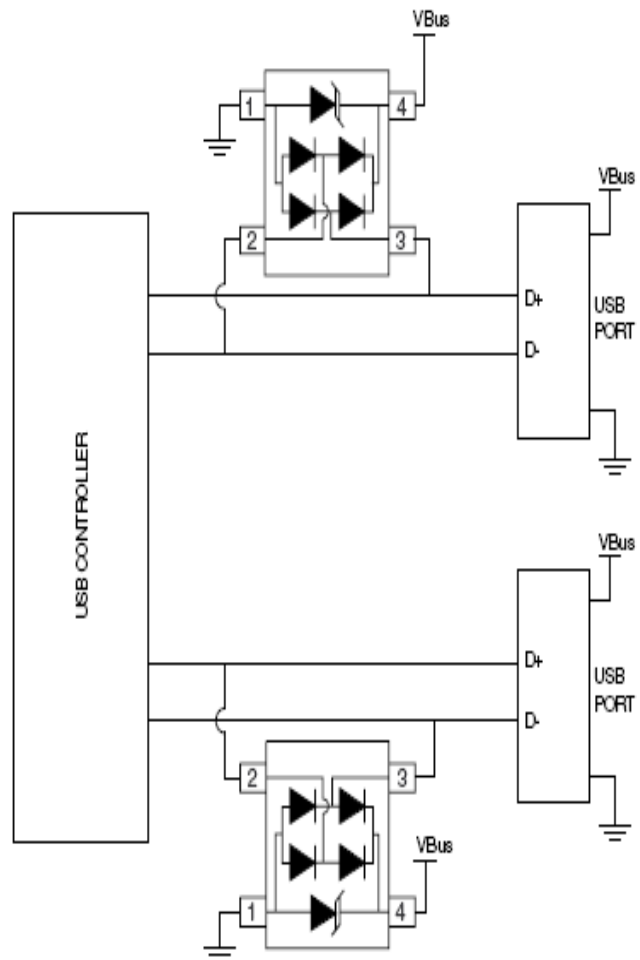
Circuit connectivity is as follows:

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

## CIRCUIT BOARD LAYOUT RECOMMENDATIONS

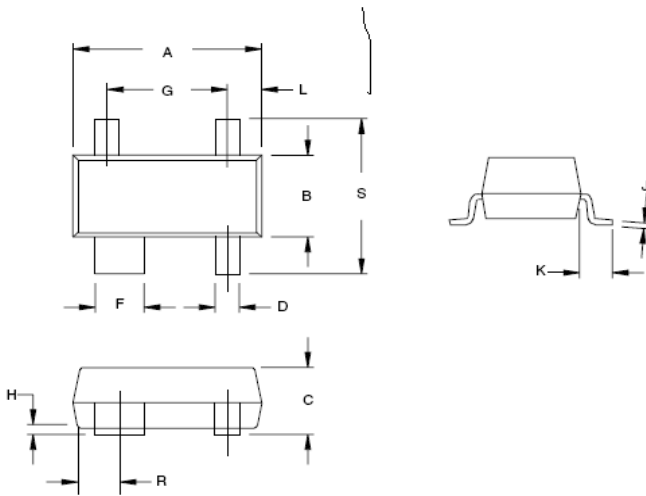
- Circuit board layout is critical for Electromagnetic Compatibility (EMC) protection. The following guidelines are recommended:
  - The protection device should be placed near the input terminals or connectors, th device will divert the transient current immediately before it can be coupled into the 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 grouor 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. Typical Common-Mode USB Protection



## PACKAGE Mechanical Data

PACKAGE OUTLINE



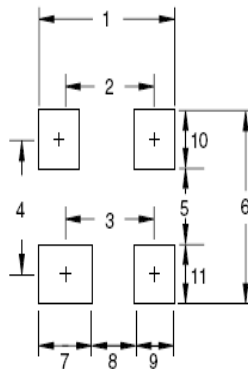
SOT-143



### PACKAGE DIMENSIONS

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

MOUNTING PAD



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.80	3.04	0.110	0.120
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

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