

**Transil array for data protection**

**Description:**

The ESDA6V8UF is 4-channel very low capacitance ESD transient voltage suppressor which provides a very high level of protection for sensitive electronic components that may be subjected to electrostatic discharge. It is particularly well-suited to protect systems with high speed communication lines from ESD, EFT, and lightning.

The ESDA6V8UF is consists of eight low capacitance steering diodes and a TVS diode in a SOT23-6L package. Each channel of ESDA6V8UF could safely dissipate ESD strikes of ±15kV air discharge as well as ±8kV contact discharge, meeting the requirement of the IEC 61000-4-2 international standard. Using the MIL-STD-883 (Method 3015) specification for Human Body Model (HBM) ESD, the device provides protection for contact discharges to greater than ±10kV.

The ESDA6V8UF can be used at 5V or lower than 5V revers working voltage applications.

**Specification Features:**

- Stand-off Voltage: 5V
- Peak Power up to 7.5 Watts @ 8 x 20 us Pulse
- Low Leakage current IEC61000-4-2
- Level 4 ESD Protection IEC61000-4-4
- Level 4 EFT Protection
- Low capacitance: 0.7 pF typical

**Mechanical Characteristics**

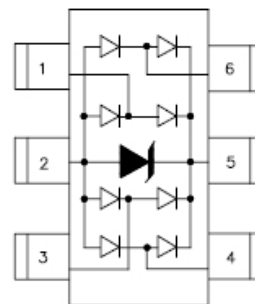
- SOT23-6L Package
- Pb-Free Packages are Available
- Molding compound flammability rating: UL 94V-0
- Packaging: Tape and Reel per EIA 481

**Order information**

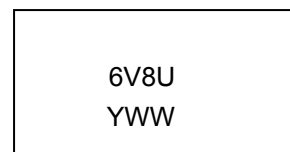
Part Number	Part Number	Shipping
ESDA6V8UF-6/TR	SOT23-6	3000Tape&Reel



(SOT23-6L)



SOT-23 6L (Top View)



6V8U=Specific Device Code  
YWW=Date Code (y=year,0,1,2;ww=week,A,B)

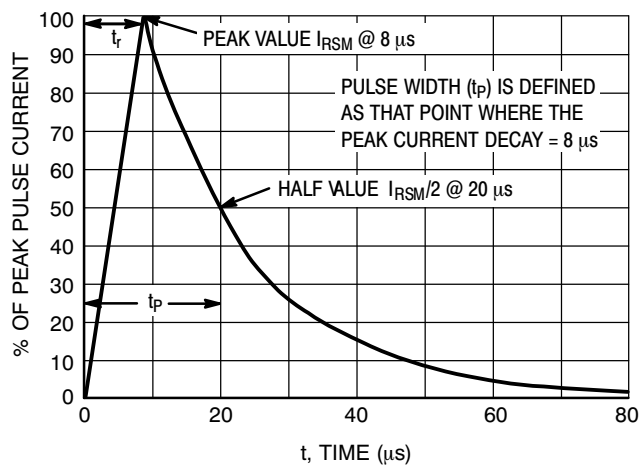
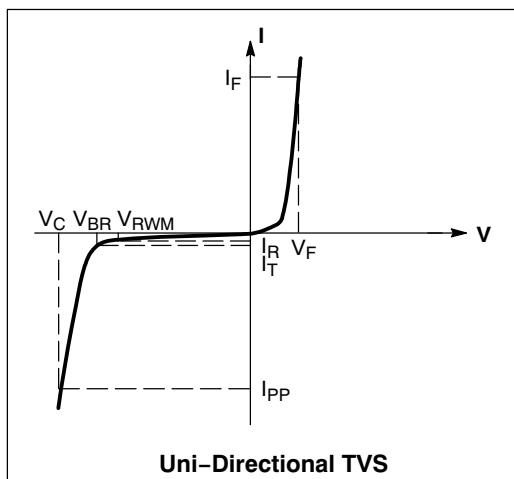
**Applications**

- High Speed Communication Line Protection
- USB 2.0 Power and Data Line Protection
- Monitors and Flat Panel Displays Notebook Computers
- Video Line Protection & Base Stations
- HDSL, IDSL Secondary IC Side Protection
- Microcontroller Input Protection
- LCD and camera modules
- 10/100/1000 Ethernet

**Absolute Max Ratings (Tamb=25 C )**

Rating	Symbol	Value	Units
Peak Pulse Power(tp = 8/20μs)	P <sub>PP</sub>	7.5	W
ESD per IEC 61000-4-2 (Air)	V <sub>pp</sub>	+/-15	KV
ESD per IEC 61000-4-2 (Contact)		+/-8	
Maximum lead temperature for soldering during 10s	T <sub>L</sub>	260	° C
Storage Temperature Range	T <sub>stg</sub>	-55 to +125	° C
Operating Temperature Range	T <sub>op</sub>	-55 to +125	° C

**Electrical Parameter**



Symbol	Parameter
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current
V <sub>C</sub>	Clamping Voltage @ IPP
V <sub>RWM</sub>	Working Peak Reverse Voltage
I <sub>R</sub>	Maximum Reverse Leakage Current @ VRWM
I <sub>T</sub>	Test Current
V <sub>BR</sub>	Breakdown Voltage @ IT
I <sub>F</sub>	Forward Current
V <sub>F</sub>	Forward Voltage @ IF

### Electrical Characteristics

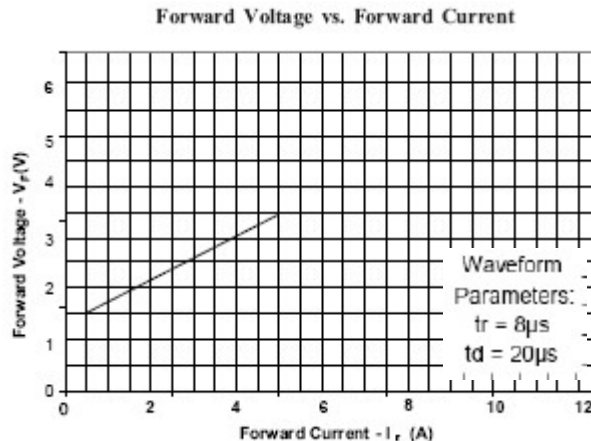
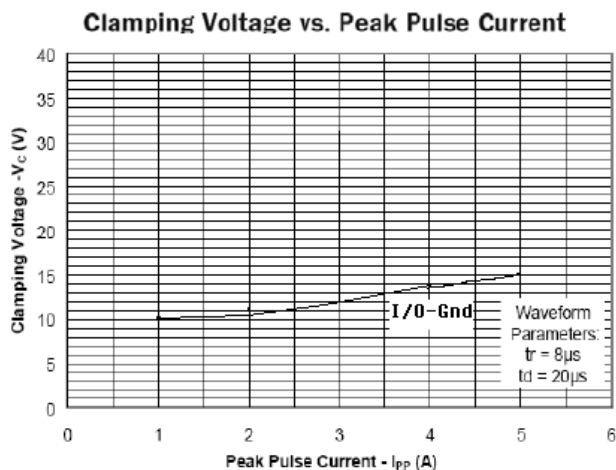
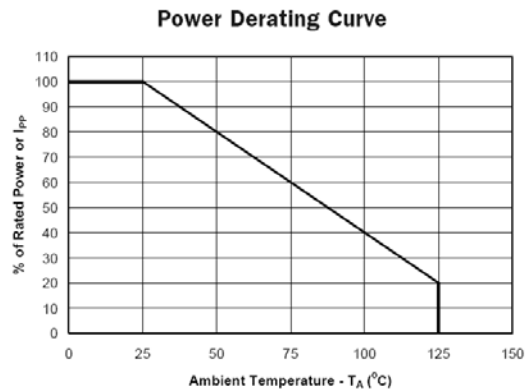
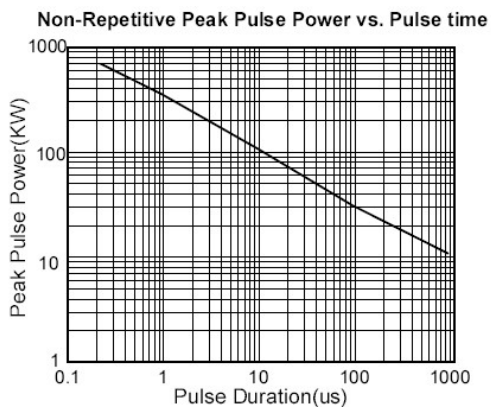
(T=25°C, Device for 5.0V Reverse Stand-off Voltage)

	Conditions	Minimum	Typical	Maximum	Unit
$I_R$	$V_{RWM}=5V$ , Pin5 to 2			5	uA
$V_F$	$I_F=10mA$	0.4	0.8	1.5	V
$V_{BR}$	$I_T=1mA$ , Pin5 to 2	6.0	7.0		V
$V_C$	$I_{PP}=1A$ , $t_p = 8/20\mu s$ , note 1&2 Any I/O pin to Ground			12.0	V
$C_j$	$V_R = 0V$ , $f = 1MHz$ Any I/O pin to Ground		1.2	1.5	pF
	$V_R = 0V$ , $f = 1MHz$ Between I/O pins		0.7		pF

Note 1: These parameters guaranteed by design and characterization.

Note 2: These measurements performed with no external capacitor on Pin5.

### Typical Characteristics



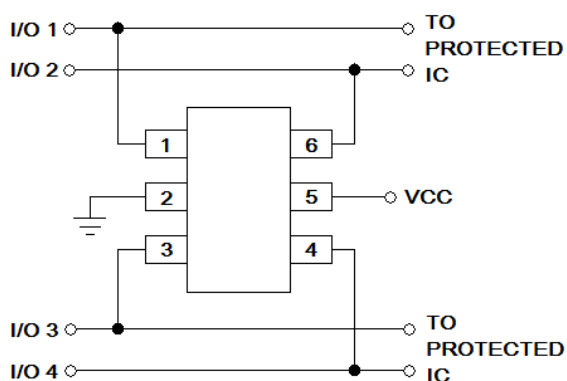
## Applications Information

### Device Connection Options for Protection of Four High-Speed Data Lines

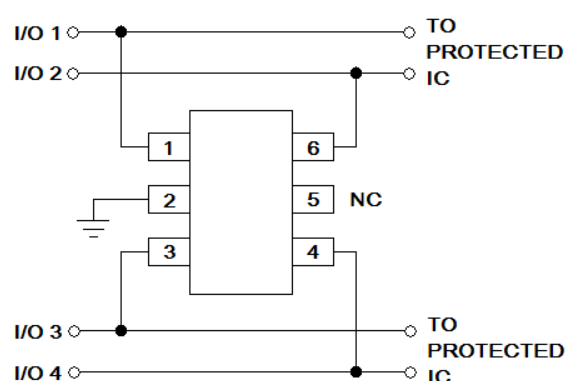
This device is designed to protect data lines by clamping them to a fixed reference. When the voltage on the protected line exceeds the reference voltage the steering diodes are forward biased, conducting the transient current away from the sensitive circuitry. Data lines are connected at pins 1, 3, 4 and 6. Pin 2 should be connected directly to a ground plane. The path length is kept as short as possible to minimize parasitic inductance. The positive reference is connected at pin 5. The options for connecting the positive reference are as follows:

1. To protect data lines and the power line, connect pin 5 directly to the positive supply rail (VCC). In this configuration the data lines are referenced to the supply voltage. The internal TVS diode prevents over-voltage on the supply rail.
2. In applications where the supply rail does not exit the system, the internal TVS may be used as the reference. In this case, pin 5 is not connected. The steering diodes will begin to conduct when the voltage on the protected line exceeds the working voltage of the TVS (plus one diode drop).
3. In applications where complete supply isolation is desired, the internal TVS is again used as the reference and VCC is connected to one of the I/O inputs. An example of this configuration is the protection of a SIM port. The Clock, Reset, I/O, and VCC lines are connected at pins 1, 3, 4, and 6. Pin 2 is connected to ground and pin 5 is not connected.

#### Data Line and Power Supply Protection Using Vcc as reference



#### Data Line Protection Using Internal TVS Diode as reference

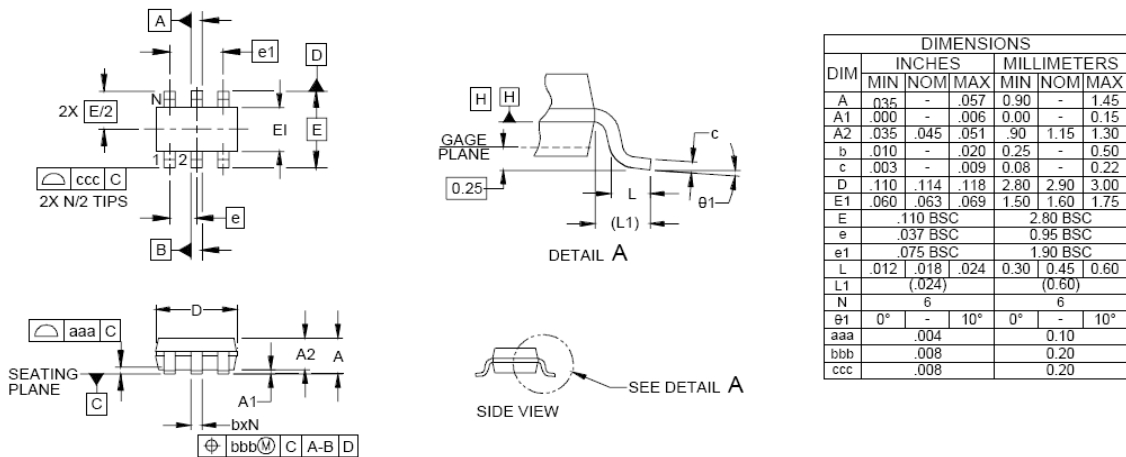


### Matte Tin Lead Finish

Matte tin has become the industry standard lead-free replacement for SnPb lead finishes. A matte tin finish is composed of 100% tin solder with large grains. Since the solder volume on the leads is small compared to the solder paste volume that is placed on the land pattern of the PCB, the reflow profile will be determined by the requirements of the solder paste. Therefore, these devices are compatible with both lead-free and SnPb assembly techniques. In addition, unlike other lead-free compositions, matte tin does not have any added alloys that can cause degradation of the solder joint.

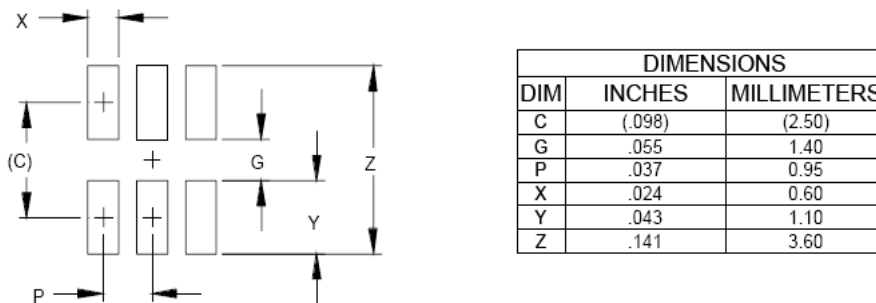
Package mechanical data

Outline drawing:



- NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
  2. DATUMS **-A-** AND **-B-** TO BE DETERMINED AT DATUM PLANE **-H-**
  3. DIMENSIONS "E1" AND "D" DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

Land Pattern:



- NOTES:
1. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.