

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

### Description

This is ultra low capacitance TVS arrays designed to protect high speed data interfaces. It has been specifically designed to protect sensitive components which is connected to high-speed data and transmission lines from overvoltage caused by electrostatic (ESD), cable discharge events (CDE) and electrical fast transients (EFT). It has a typical capacitance of only 0.8pF(typ.). This means it can be used on circuits operating in excess of 3GHz without signal attenuation.

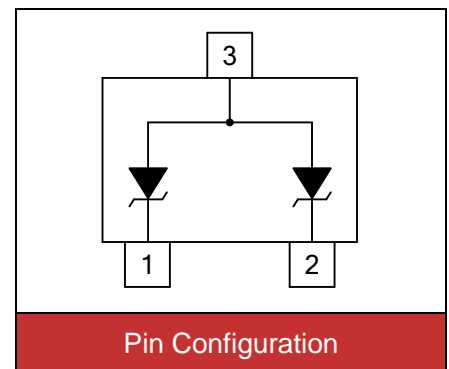


Contact : ±8kV  
Air : ±15kV



### Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- SOT-323 surface mount package
- Protects two high speed data lines
- Working voltage: 5V
- Ultra low capacitance and clamping voltages
- Low leakage current
- Solid-state silicon avalanche technology
- Lead Free/RoHS compliant
- Solder reflow temperature: Pure Tin-Sn, 260~270°C
- Flammability rating UL 94V-0
- Meets MSL level 1, per J-STD-020
- AEC-Q101 qualified
- Marking: B BU



### Applications

- HDMI interface protection
- GaAs photodetector protection
- Mobile display digital interface
- HBT power Amp protection
- RF/Antenna circuits
- Infiniband transceiver protection
- USB 2.0 & Firewire ports

### Maximum Ratings

Rating	Symbol	Value	Unit
Peak pulse current (tp=8/20µs)	$I_{PP}$	3	A
ESD voltage (Contact discharge)	$V_{ESD}$	±8	kV
ESD voltage (Air discharge)		±15	
Storage & operating temperature range	$T_{STG}, T_J$	-55~+150	°C

**Electrical Characteristics (T<sub>J</sub>=25°C)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				5	V
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> =1mA	6			V
Reverse leakage current	I <sub>R</sub>	V <sub>R</sub> =5V Each I/O pin			1	μA
Clamping voltage (t <sub>p</sub> =8/20μs)	V <sub>C</sub>	I <sub>PP</sub> =3A			15	V
Off state junction capacitance	C <sub>J</sub>	0Vdc, f=1MHz Between I/O pins and GND		0.8		pF

**Typical Characteristics Curves**

Figure 1. Power Derating Curve

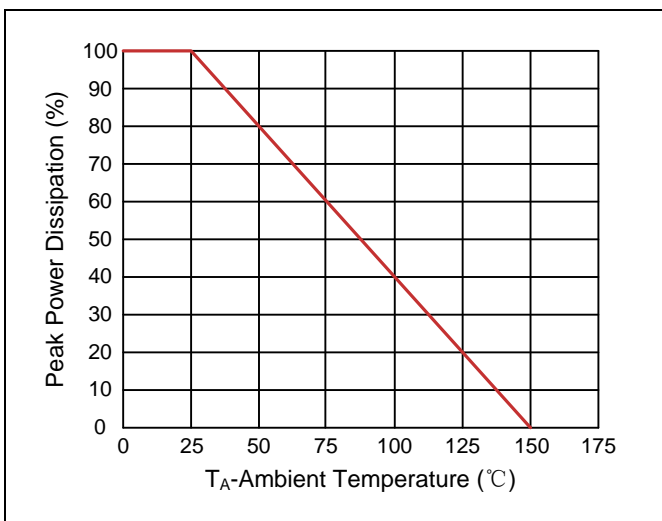


Figure 2. Pulse Waveforms

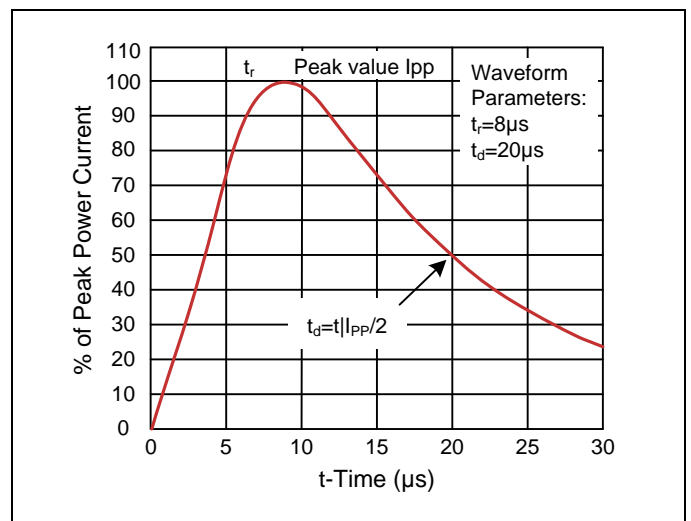


Figure 3. Non-Repetitive Peak Pulse vs. Pulse Time

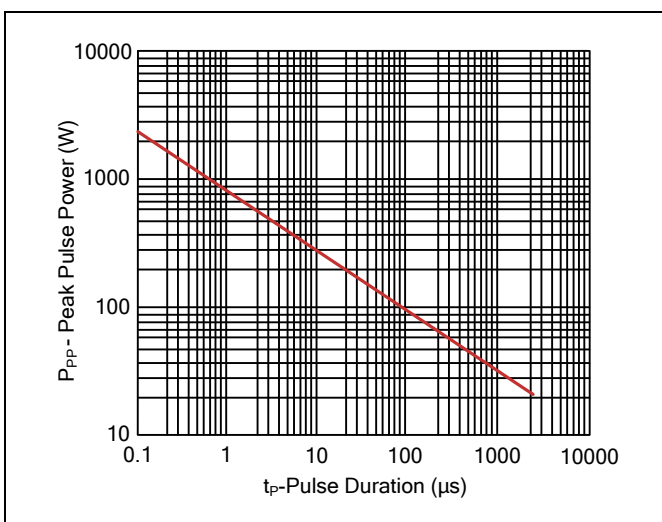
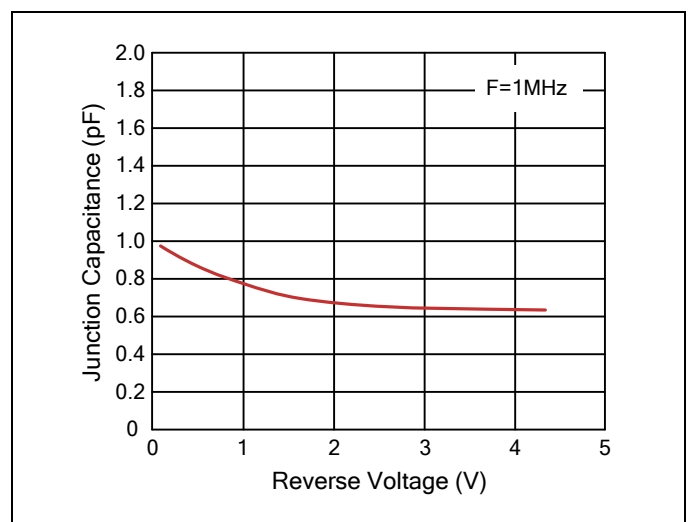
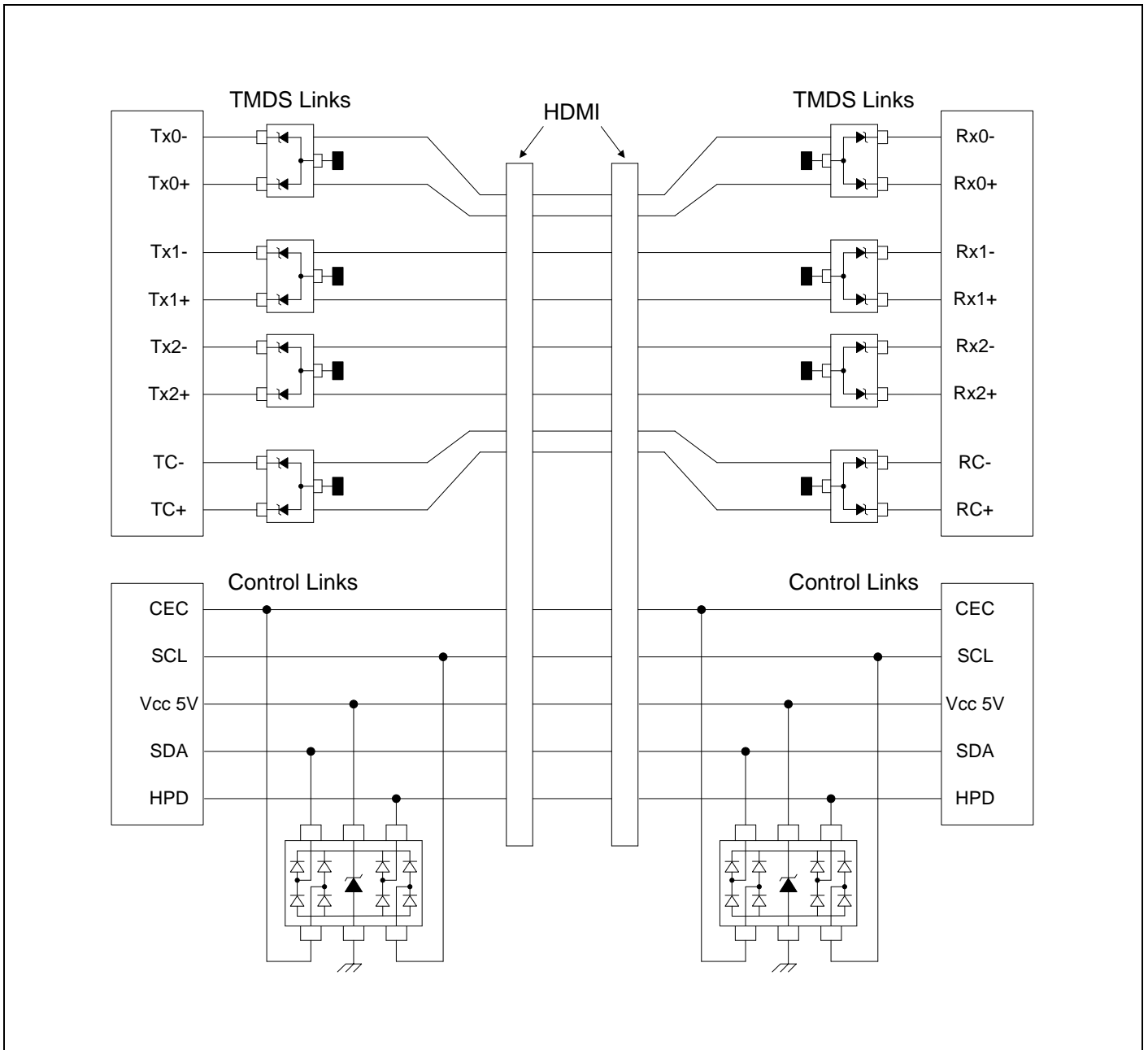


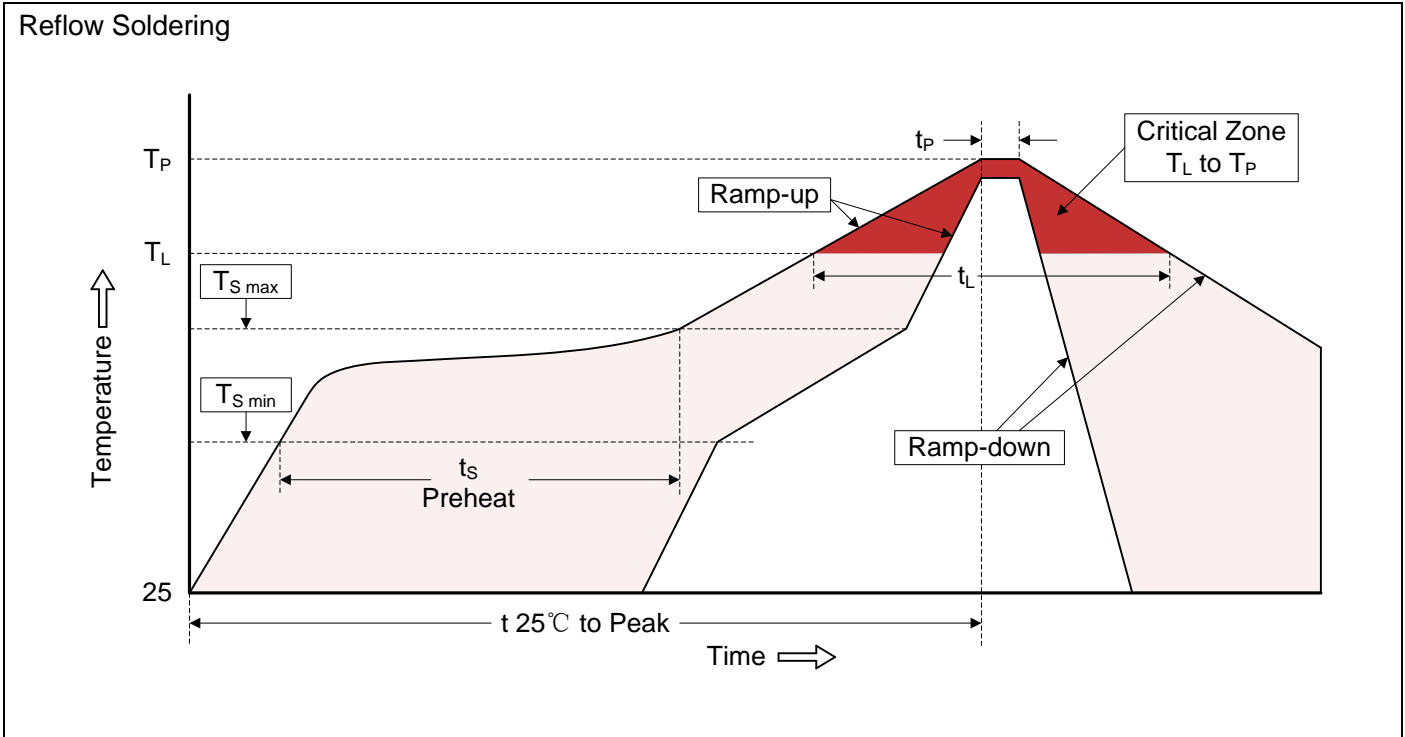
Figure 4. Capacitance vs. Reverse Voltage



Applications Information



**Recommended Soldering Conditions**

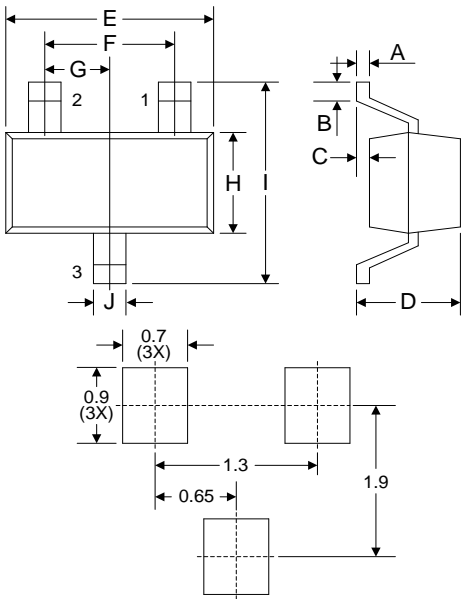


**Recommended Conditions**

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -Temperature Min ( $T_{S\ min}$ ) -Temperature Max ( $T_{S\ max}$ ) -Time (min to max) ( $t_s$ )	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature ( $T_L$ ) -Time ( $t_L$ )	217°C 60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_P$ )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

**Dimensions (SOT-323)**

Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.05	0.20	0.002	0.008
B	0.10	-	0.004	-
C	-	0.10	-	0.004
D	0.80	1.10	0.031	0.043
E	1.80	2.20	0.071	0.087
F	1.30		0.051	
G	0.65		0.026	
H	1.15	1.35	0.045	0.053
I	2.00	2.20	0.079	0.087
J	0.20	0.40	0.008	0.016



Recommended Soldering Pad Layout

**Packaging**

Tape	Symbol	Dimension (mm)
	W	8.00±0.30
	P0	4.00±0.10
	P1	4.00±0.10
	P2	2.00±0.10
	D0	Φ1.55±0.10
	D1	Φ1.05±0.05
	E	1.75±0.10
	F	3.50±0.10
	A	2.30±0.10
	A0	1.40±0.10
	B	2.60±0.10
	B0	0.70±0.10
	K	1.10±0.10
	t	0.20±0.05
Reel	D	Φ178.0±2.0
	D2	Φ13.0
	W1	9.5
		Quantity: 3000PCS