

## Electrostatic Discharged Protection Devices (ESD) Data Sheet

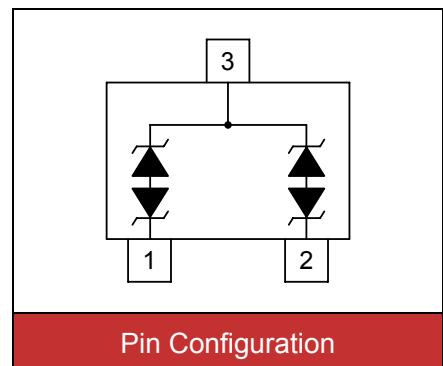
### Description

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).



### Features

- IEC61000-4-2 ESD 15KV Air, 8KV contact compliance
- SOT-523 surface mount package
- Protects two high speed data lines
- Working voltage: 5V
- 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
- Marking: 5E



### Applications

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

### Maximum Ratings

Rating	Symbol	Value	Unit
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 ( $T_J=25^\circ\text{C}$ )

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	$V_{RWM}$				5	V
Reverse breakdown voltage	$V_{BR}$	$I_{BR}=1\text{mA}$	6			V
Reverse leakage current	$I_R$	$V_R=5\text{V}$ Each I/O pin			1	$\mu\text{A}$
Clamping voltage ( $t_p=8/20\mu\text{s}$ )	$V_C$	$I_{PP}=1\text{A}$			16	V
Off state junction capacitance	$C_J$	0Vdc, $f=1\text{MHz}$ Between I/O pins and GND		10		pF

## Typical Characteristics Curves

Figure 1. Power Derating Curve

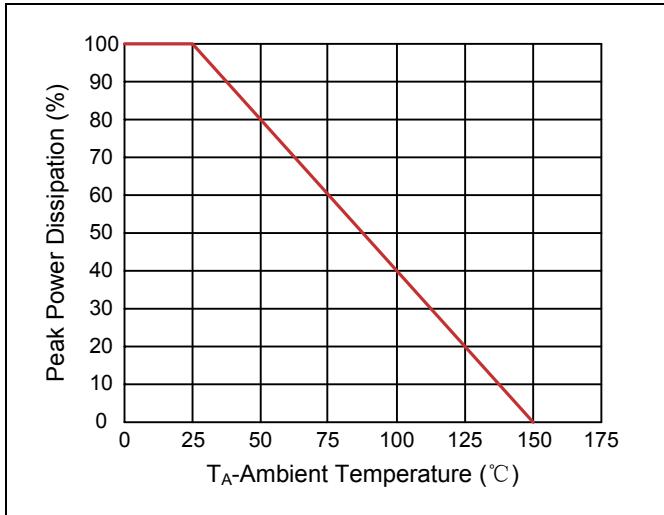


Figure 2. Pulse Waveforms

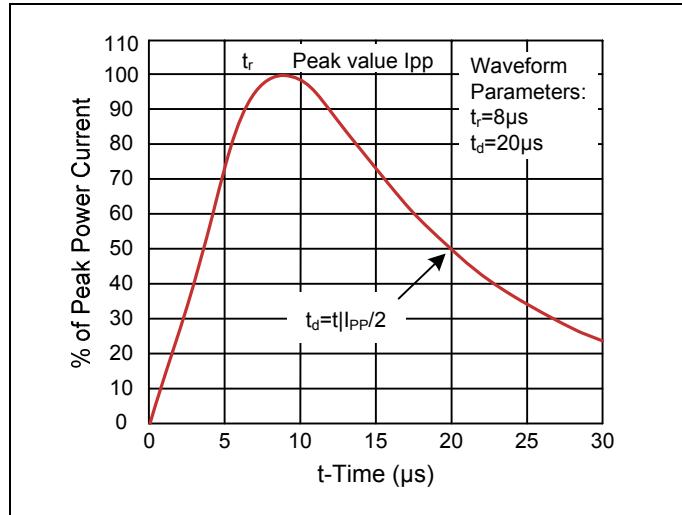


Figure 3. Capacitance vs. Reverse Voltage

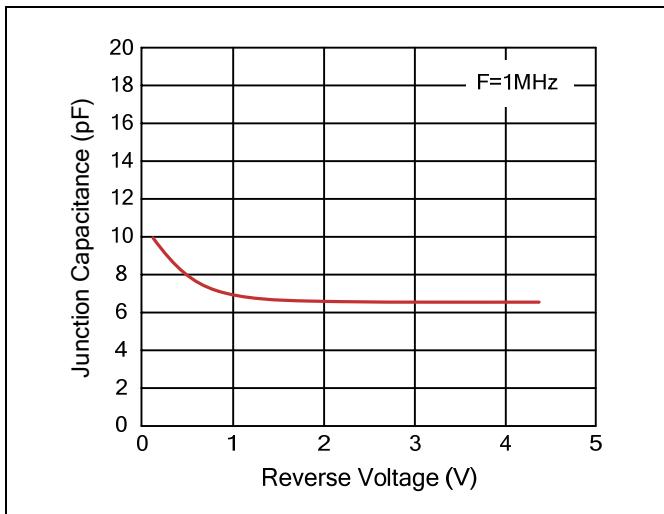
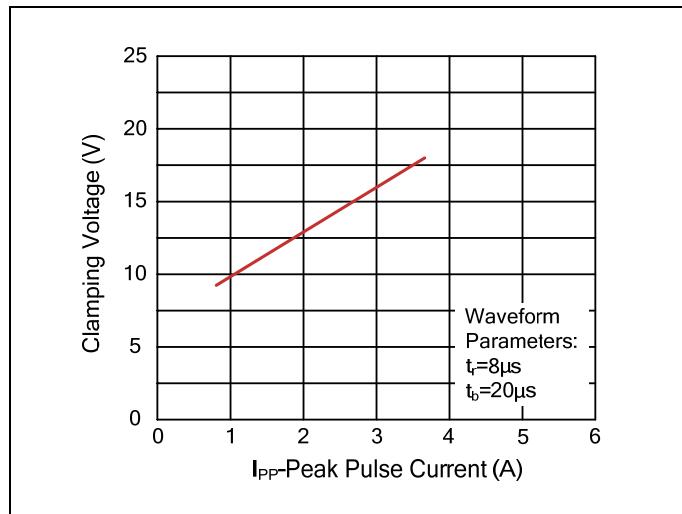
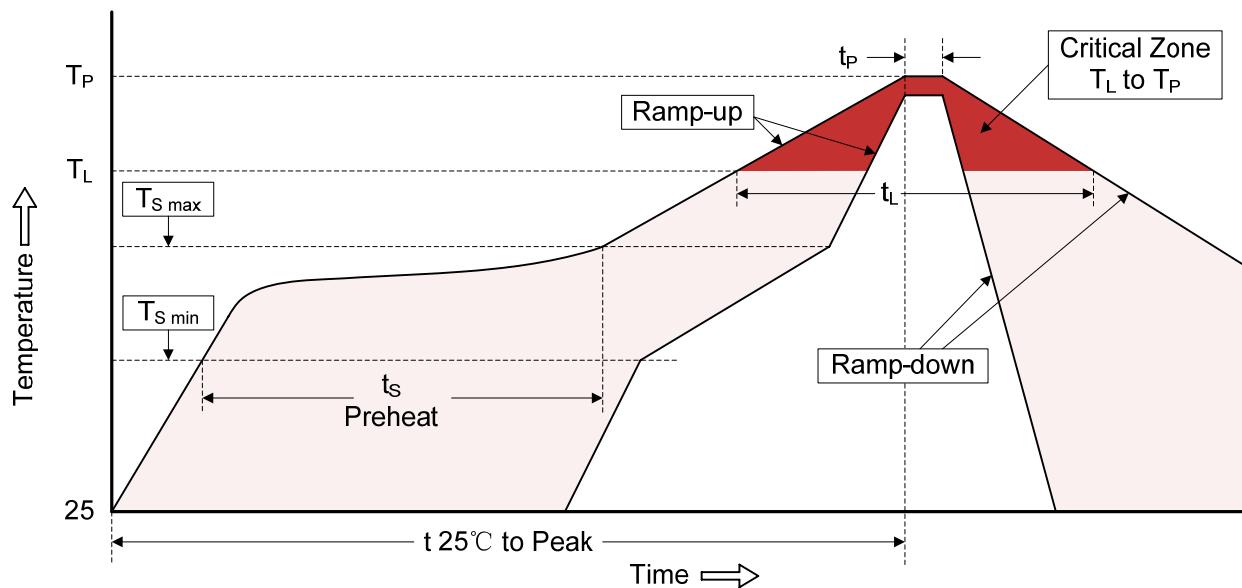


Figure 4. Clamping Voltage vs. Peak Pulse Current



## Recommended Soldering Conditions

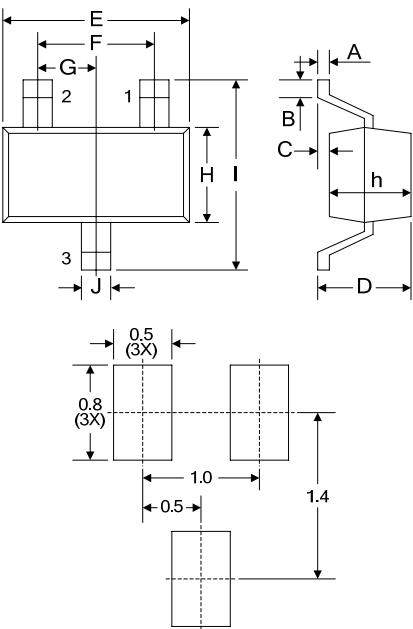
### Reflow Soldering



### Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
- Temperature Min ( $T_{S\ min}$ )	150°C
- Temperature Max ( $T_{S\ max}$ )	200°C
- Time (min to max) ( $t_S$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
- Ramp-up Rate	3°C/second max.
Time maintained above:	
- Temperature ( $T_L$ )	217°C
- Time ( $t_L$ )	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.

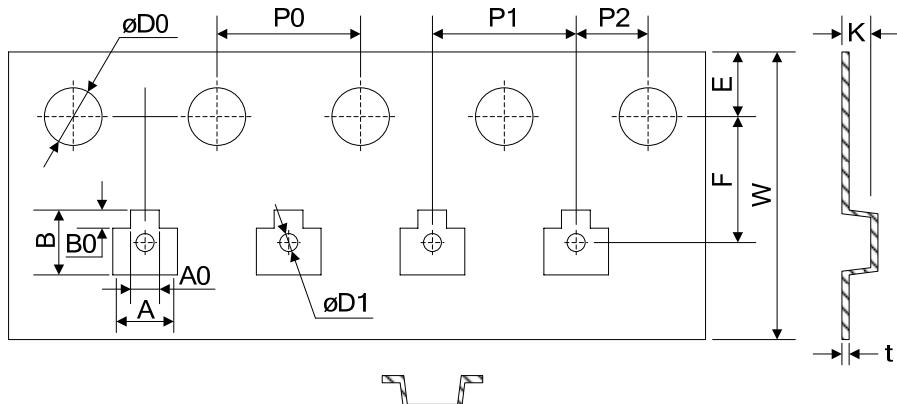
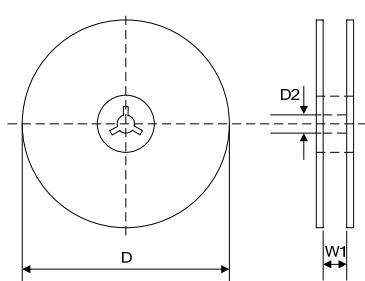
Dimensions (SOT-523)



Symbol	Dimension			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.10	0.20	0.004	0.008
B	0.28	0.44	0.011	0.017
C	-	0.10	-	0.004
D	0.70	0.90	0.028	0.035
E	1.50	1.70	0.059	0.067
F	0.90	1.10	0.035	0.043
G	0.50TYP		0.020TYP	
H	0.75	0.85	0.030	0.033
I	1.45	1.75	0.057	0.069
J	0.15	0.35	0.006	0.014
h	0.70	0.80	0.028	0.031

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	Φ0.50±0.05
	E	1.75±0.10
	F	3.50±0.10
	A	1.80±0.10
	A0	0.80±0.10
	B	1.80±0.10
	B0	0.45±0.10
	K	0.85±0.10
	t	0.20±0.05
Reel	D	Φ178.0±2.0
	D2	Φ13.0
	W1	9.5
	Quantity: 3000PCS	