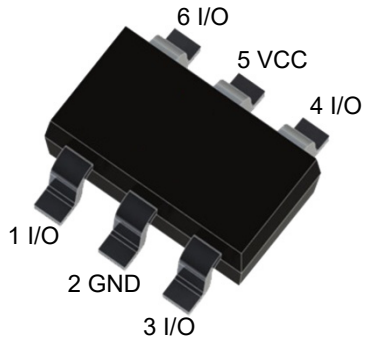
PESDARCH236T3V3UI

Low Capacitance TVS Array

Description

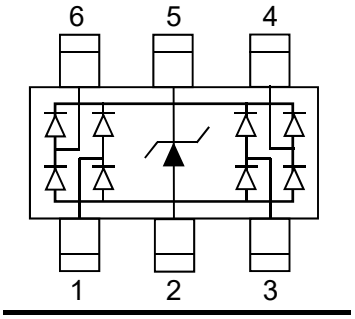
The PESDARCH236T3V3UI is low capacitance transient voltage suppressor array for high speed data interface that designed to protect sensitive electronics from damage or latch-up due to ESD lightning, and other voltage induced transient events. All pins are rated to withstand 30kV ESD pulses using the IEC 61000-4-2 air discharge method, which can meet the requirement of level 4.



SOT-23-6L(Top View)

Feature

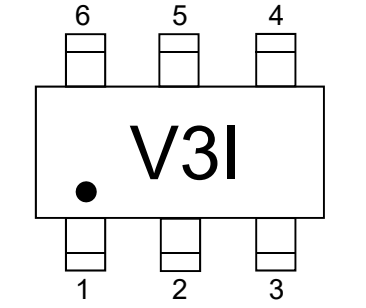
- 168W peak pulse power (t_P = 8/20μs)
- SOT-23-6L package
- Working voltage: 3.3V
- Capacitance: 0.4pF Typ.
- Low clamping voltage
- Low capacitance
- RoHS Compliant
- Transient Protection for High Speed Data Lines to IEC61000-4-2(ESD)±30kV(air),±30kV(contact)



Circuit Diagram

Applications

- USB 2.0 Power & Data Line Protection
- DVI & HDMI Port Protection
- Serial ATA Port Protection
- Mobile Handsets
- Digital Cameras and camcorders
- PDA & MP3 Players
- Digital TV and Set-top Boxes
- Other Portable Electronic Components



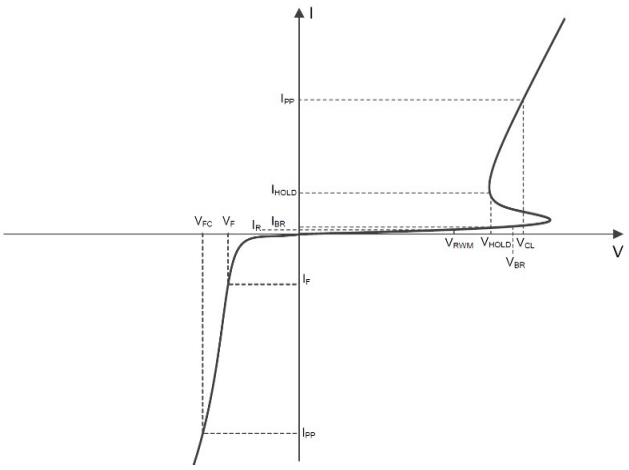
Marking (Top View)

Mechanical Characteristics

- Lead finish:100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature:260℃
- Device meets MSL 3 requirements
- Pure tin plating: 7 ~ 17 um
- Pin flatness:≤3mil

Electronics Parameter

Symbol	Parameter
V_{RWM}	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
P_{PP}	Peak Pulse Power
C_J	Junction Capacitance
I_F	Forward Current
V_F	Forward Voltage @ I_F



Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}	-		-	-	3.3	V
Breakdown Voltage	V_{BR}	I_t = 1mA		6.5	-	11	V
Reverse Leakage Current	I_R	V_{RWM} = 3.3V		-	-	1.0	μA
Clamping Voltage[1)]	V_C	TLP=16A, t_p = 100ns	I/O - GND	-	12	-	V
			V_{CC} - GND	-	10.5	-	
Dynamic resistance[1)]	R_{DYN}	I/O - GND		-	0.33	-	Ω
		V_{CC} - GND		-	0.15	-	
Clamping Voltage[2)]	V_C	I_{PP} = 12A,t_P = 8/20μs I/O - GND		-	12	15	V
		I_{PP} = 35A,t_P = 8/20μs V_{CC} - GND		-	12	15	V
Capacitance Between I/O and GND	C_J	V_R = 0V,f = 1MHz		-	0.4	0.6	pF
Capacitance Between I/O and I/O	C_J	V_R = 0V,f = 1MHz		-	0.2	0.4	pF

Notes:
1. TLP parameter: Z_0=50Ω, t_p=100ns, t_r=2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.
2. Non-repetitive current pulse, according to IEC61000-4-5.

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Peak Pulse Power (t_P = 8/20μs)	P_{PP}	150	W
Peak Pulse Current (t_P = 8/20μs)	I_{PP}	12	A
Lead Soldering Temperature	T_L	260 (10 sec)	℃
Junction and Storage Temperature Range	T_J,T_{STG}	-55~+150	℃
ESD Protection-Contact Discharge	V_{ESD}	±30	kV
ESD Protection-Air Discharge	V_{ESD}	±30	kV

Typical Characteristics

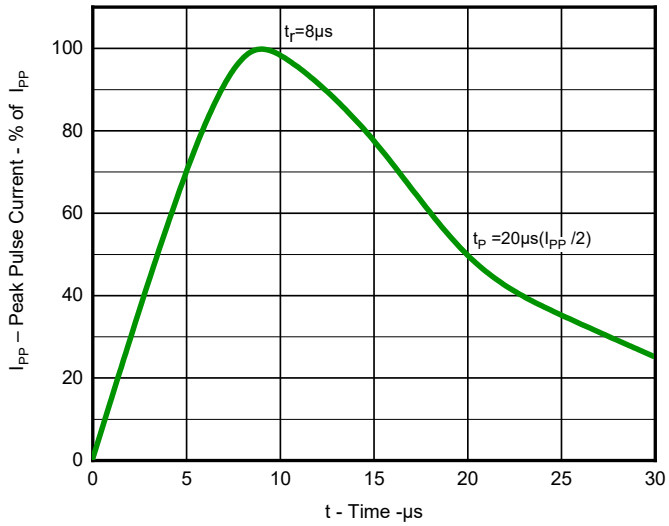


Fig 1.Pulse Waveform(8/20μs)

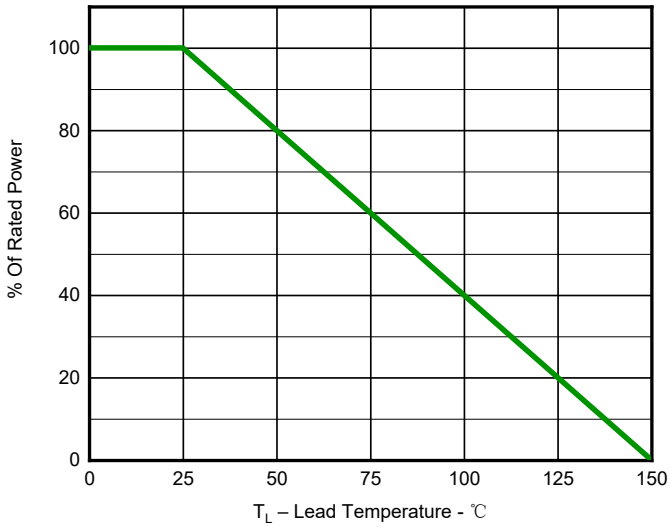


Fig 2.Power Derating Curve

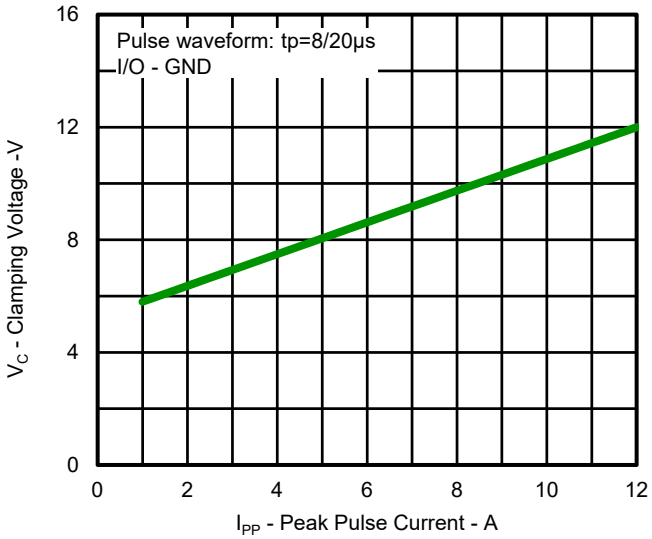


Fig.3 Clamping Voltage vs. Peak Pulse Current

Fig.4 Clamping Voltage vs. Peak Pulse Current

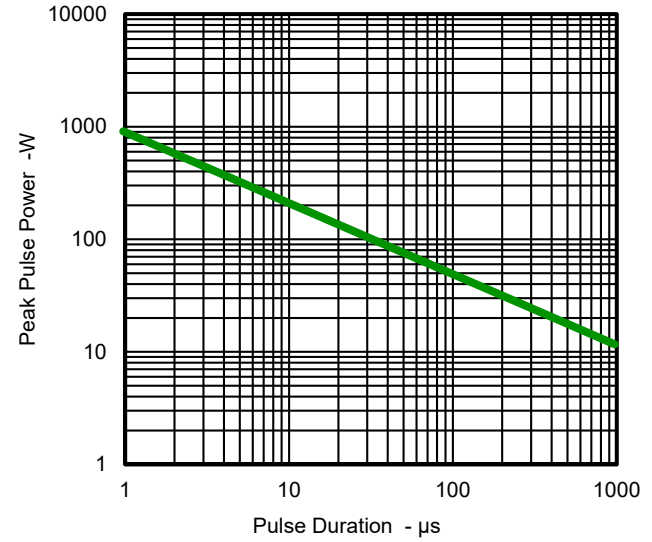


Fig.5 Non-Repetitive Peak Pulse Power vs. Pulse Time

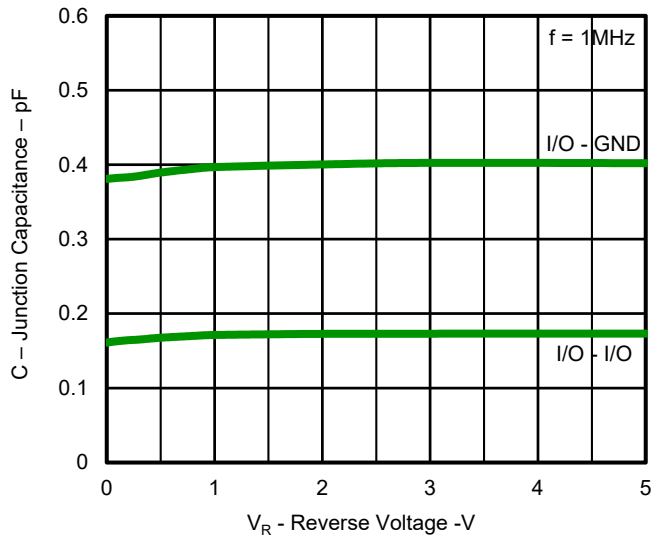


Fig.6 Capacitance vs. Reveres Voltage

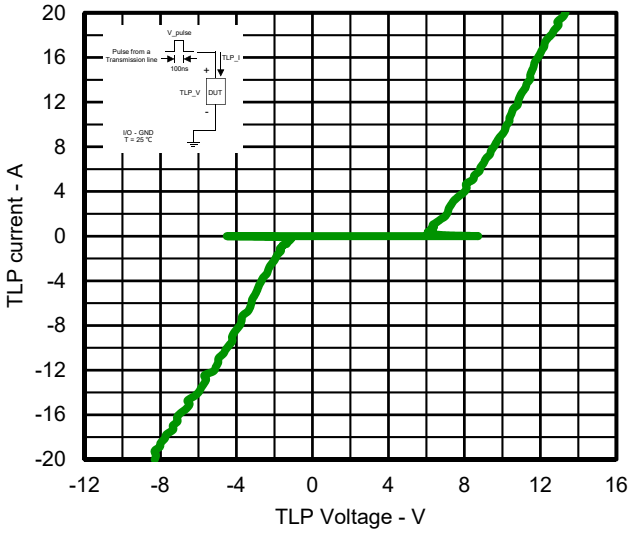


Fig.7 TLP Measurement (I/O – GND)

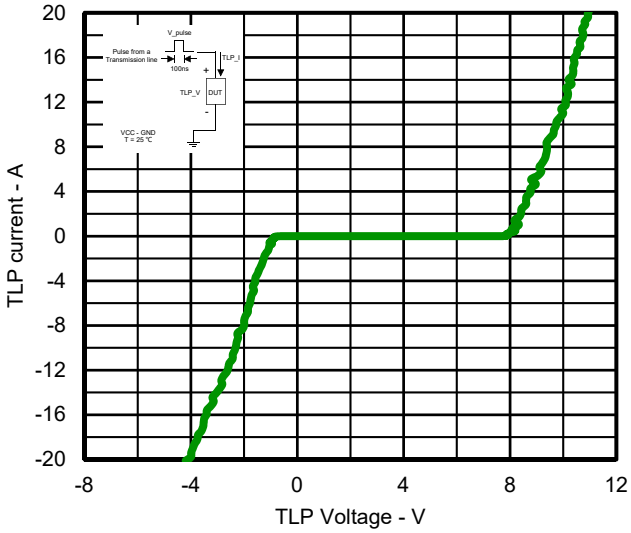
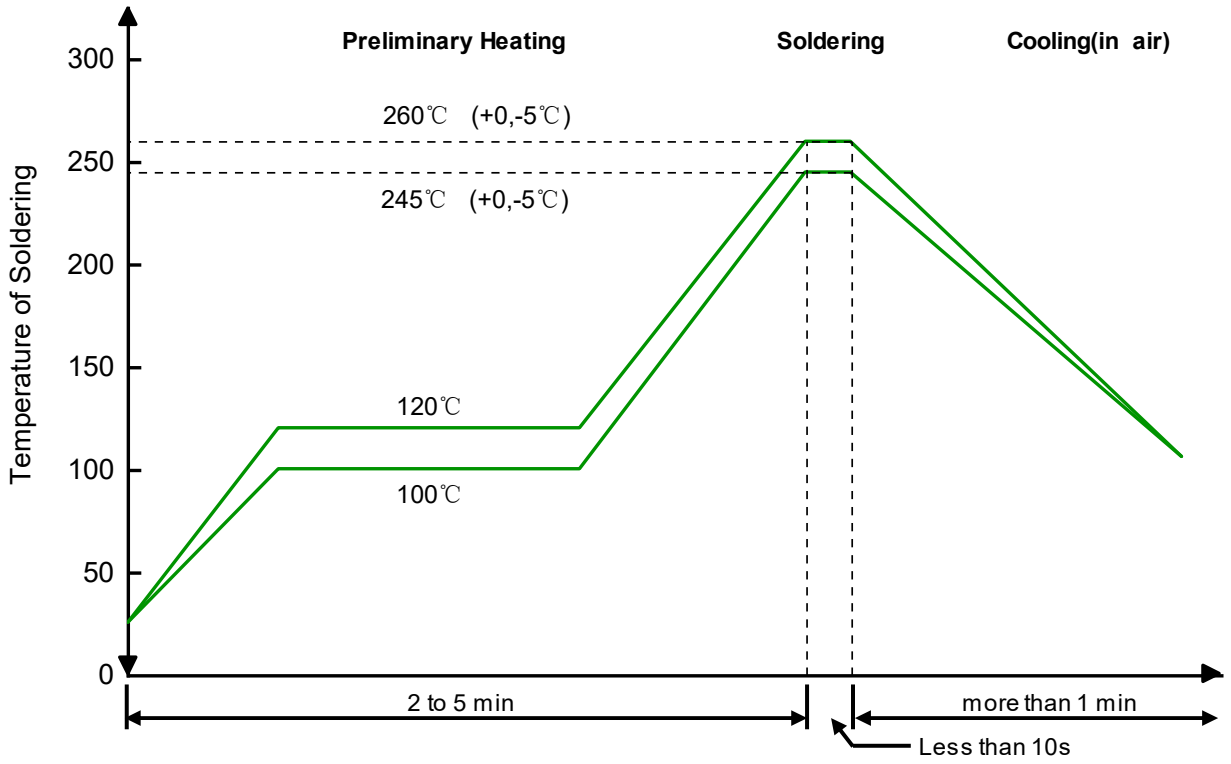


Fig.8 TLP Measurement (VCC– GND)

Solder Reflow Recommendation



Remark: Pb free for 260℃; Pb for 245℃.

PCB Design

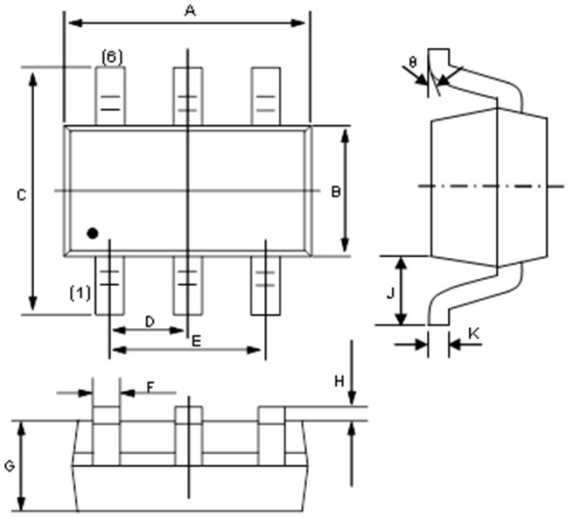
For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

- Do not use stubs, but place the cathode of the TVS diode directly on the signal trace.
- Do not make false economies and save copper for the ground connection.
- Place via holes to ground as close as possible to the anode of the TVS diode.
- Use as many via holes as possible for the ground connection.
- Keep the length of via holes in mind! The longer the more inductance they will have.

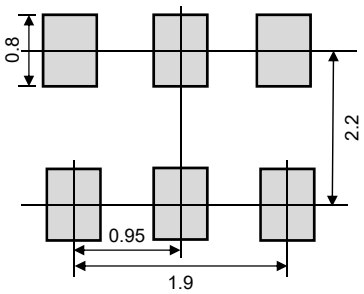
Ordering information

Package	Reel	Shipping
SOT-23-6L	7"	3000 / Tape & Reel

Product dimension (SOT-23-6L)



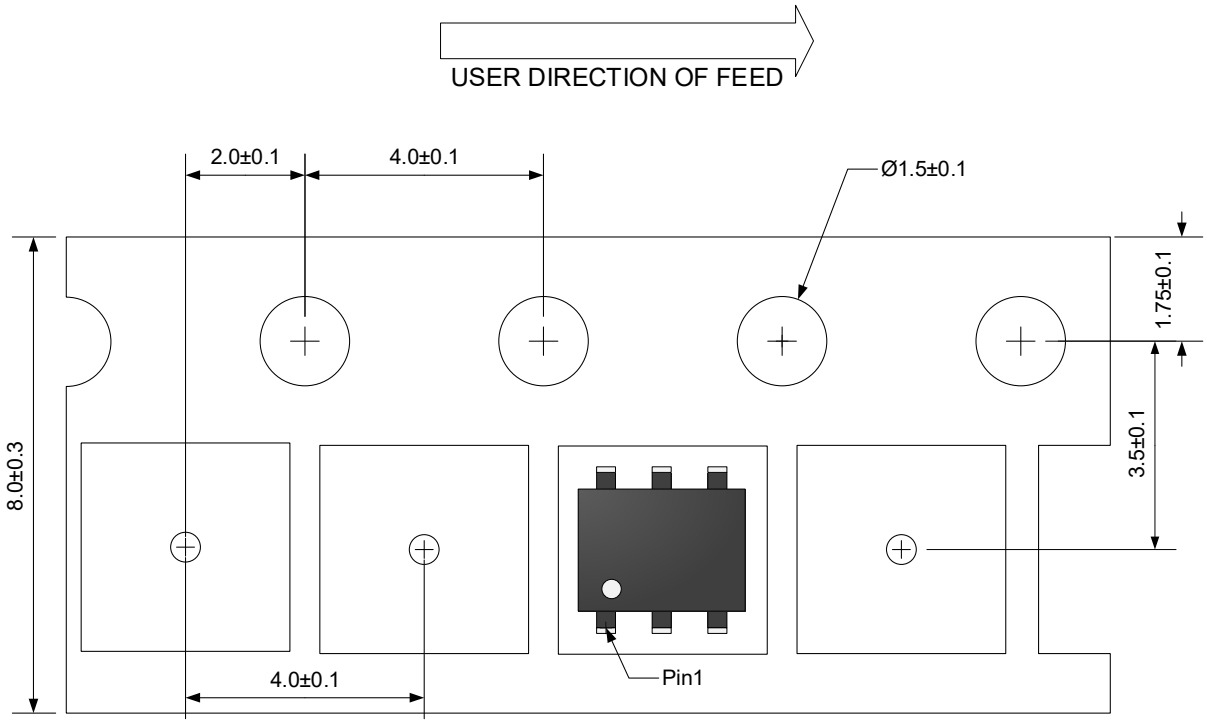
Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	2.720	3.120	0.107	0.123
B	1.400	1.800	0.055	0.071
C	2.600	3.000	0.102	0.118
D	0.950 (BSC)		0.037 (BSC)	
E	1.800	2.000	0.071	0.079
F	0.300	0.500	0.012	0.020
G	1.000	1.250	0.040	0.049
H	0.000	0.150	0.000	0.006
J	0.450	0.750	0.0180	0.029
K	0.100	0.200	0.004	0.008
θ	0°	8°	0°	8°



Suggested PCB Layout

Unit: mm

Load with information



Unit:mm

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