Prisemi®

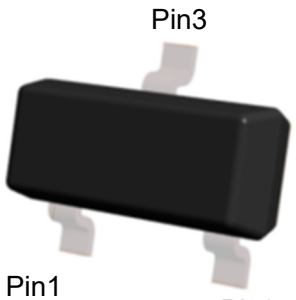
PESDNC23T1235

Bi-directional Normal Capacitance ESD Protector

Description

The PESDNC23T1235 is a Transient Voltage Suppressor Arrays that designed to protect components which are connected to data and transmission lines against electrostatic discharge(ESD), electrical fast transients(EFT), and lightning.

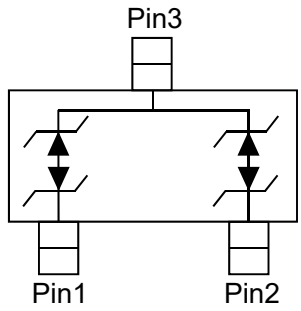
All pins are rated to withstand 30kV ESD pulses using the IEC61000-4-2 air discharge method.



SOT-23(Top View)

Feature

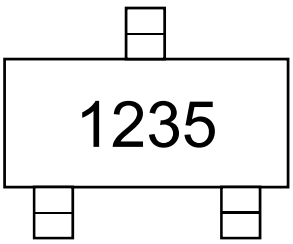
- Peak pulse power (tp=8/20μs) :
  pin1 or pin2 to pin3 : 300W
  pin3 to pin1 or pin2 : 130W
- SOT-23 Package
- Protects two bidirectional lines
- Working voltage:
  pin1 or pin2 to pin3 : 35V
  pin3 to pin1 or pin2 : 12V
- Low leakage current
- Low clamping voltage
- RoHS Compliant Transient Protection for High Speed Data Lines to IEC61000-4-2(ESD)±30kV(air),±30kV(Contact)



Circuit Diagram

Applications

- Cellular handsets and accessories
- Portable electronics
- Control & monitoring systems
- Servers, notebooks, and desktop PCs
- Set-top box
- Communication systems



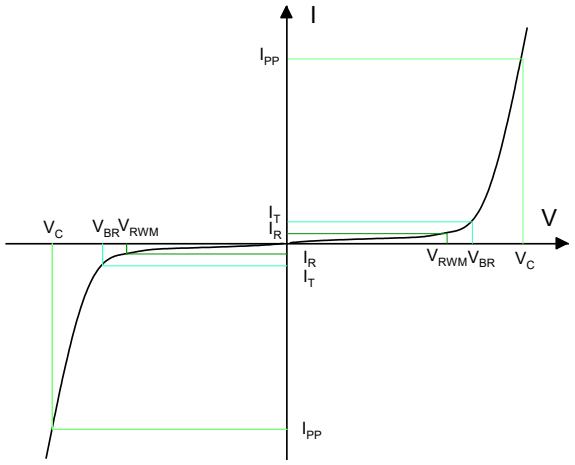
Marking (Top View)

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}	pin1 or pin2 to pin3	-	-	35	V
		pin3 to pin1 or pin2	-	-	12	
Breakdown Voltage	V_{BR}	I_R = 1mA, pin1 or pin2 to pin3	36	39	41	V
		I_R = 1mA, pin3 to pin1 or pin2	13	15	17	
Reverse Leakage Current	I_R	V_{RWM} = 35V, pin1 or pin2 to pin3	-	-	1	μA
		V_{RWM} = 12V, pin3 to pin1 or pin2	-	-	1	
ESD Clamping Voltage(1)	V_C	TLP, 16A, t_p = 100ns, pin1 or pin2 to pin3	-	49	-	V
		TLP, 16A, t_p = 100ns, pin3 to pin1 or pin2	-	24	-	
Dynamic Resistance(1)	R_{DYN}	TLP, 16A, t_p = 100ns, pin1 or pin2 to pin3	-	0.45	-	Ω
		TLP, 16A, t_p = 100ns, pin3 to pin1 or pin2	-	0.45	-	
Reverse Clamping Voltage(2)	V_C	I_{PP} = 5.5A, 8/20μs, pin1 or pin2 to pin3	-	55	60	V
		I_{PP} = 5.5A, 8/20μs, pin3 to pin1 or pin2	-	24.5	28	
Junction Capacitance	C_J	V_R = 0V, f = 1MHz	-	10	20	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}, pin1 or pin 2 to pin3	300	W
	P_{PP}, pin3 to pin 1 or pin2	130	
Peak Pulse Current (t_P = 8/20μs)	I_{PP}	5.5	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

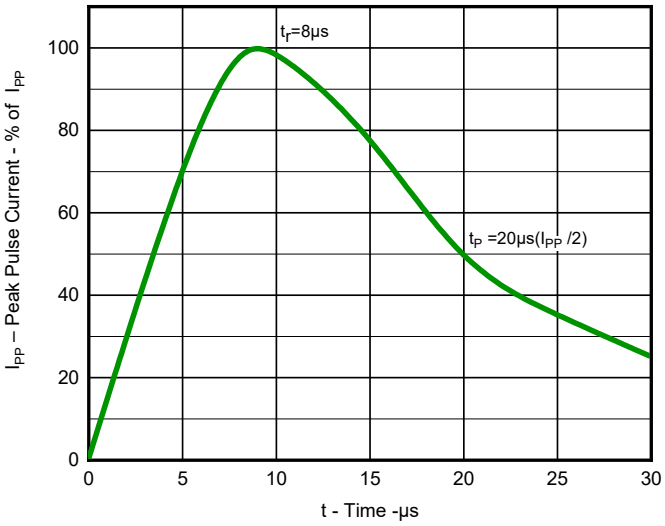


Fig 1.Pulse Waveform(8/20μs)

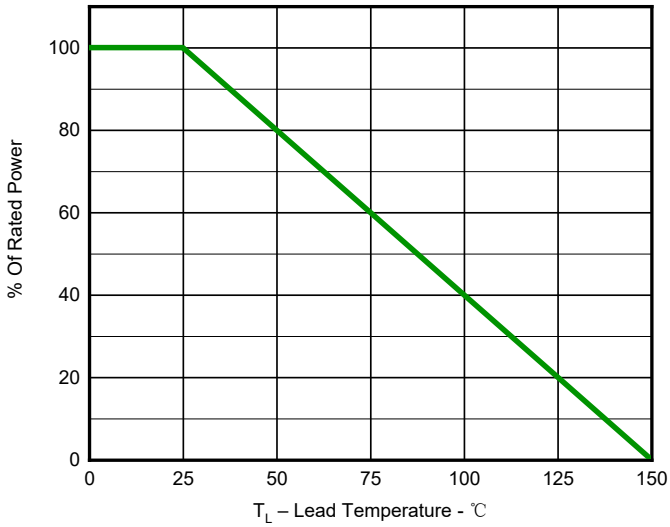


Fig 2.Power Derating Curve

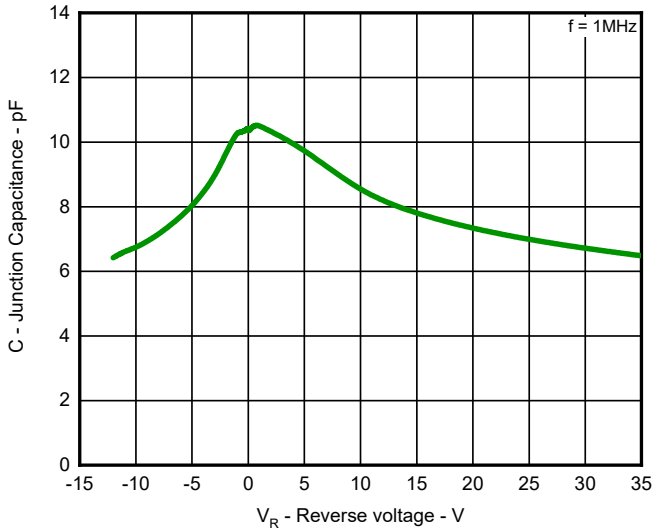


Fig 3. Capacitance vs. Reveres voltage

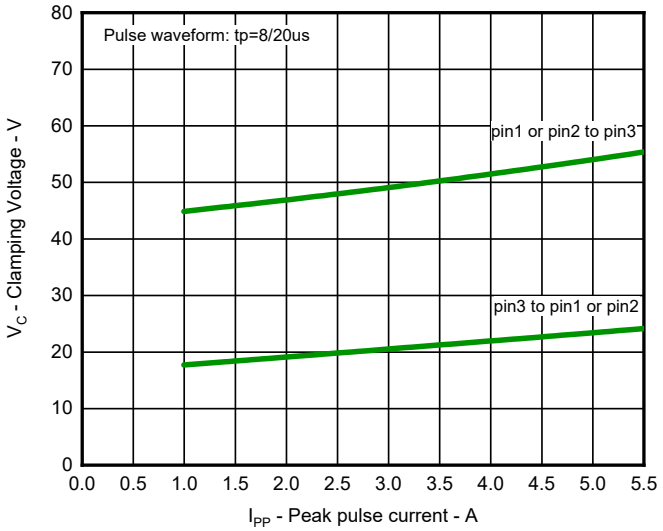


Fig 4. Clamping voltage vs. Peak pulse current

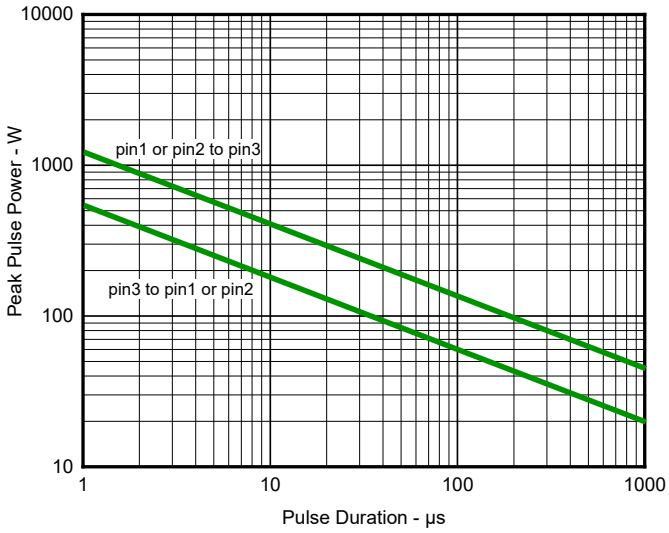


Fig 5. Non Repetitive Peak Pulse Power vs. Pulse time

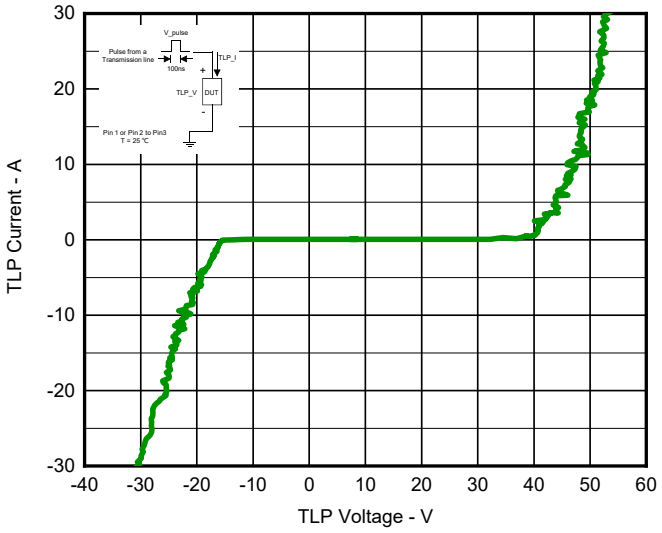


Fig 6. TLP Measurement

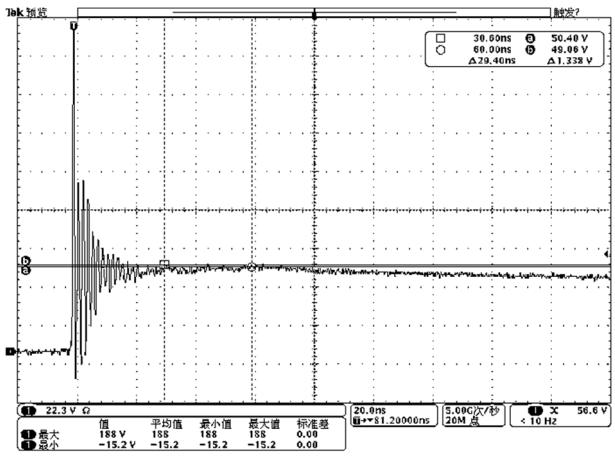


Fig 7. Clamping Voltage at IEC61000-4-2 +8kV Pulse Waveform

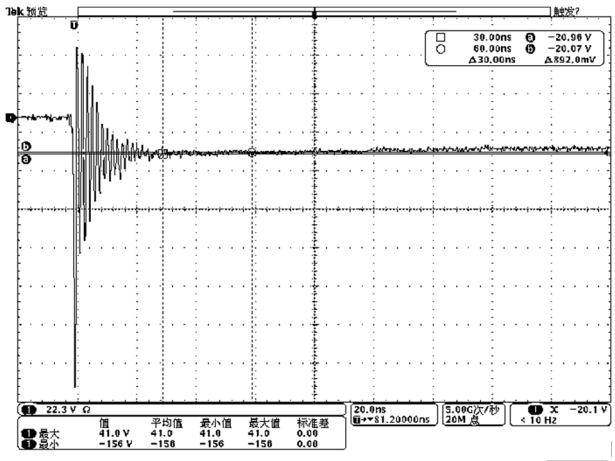
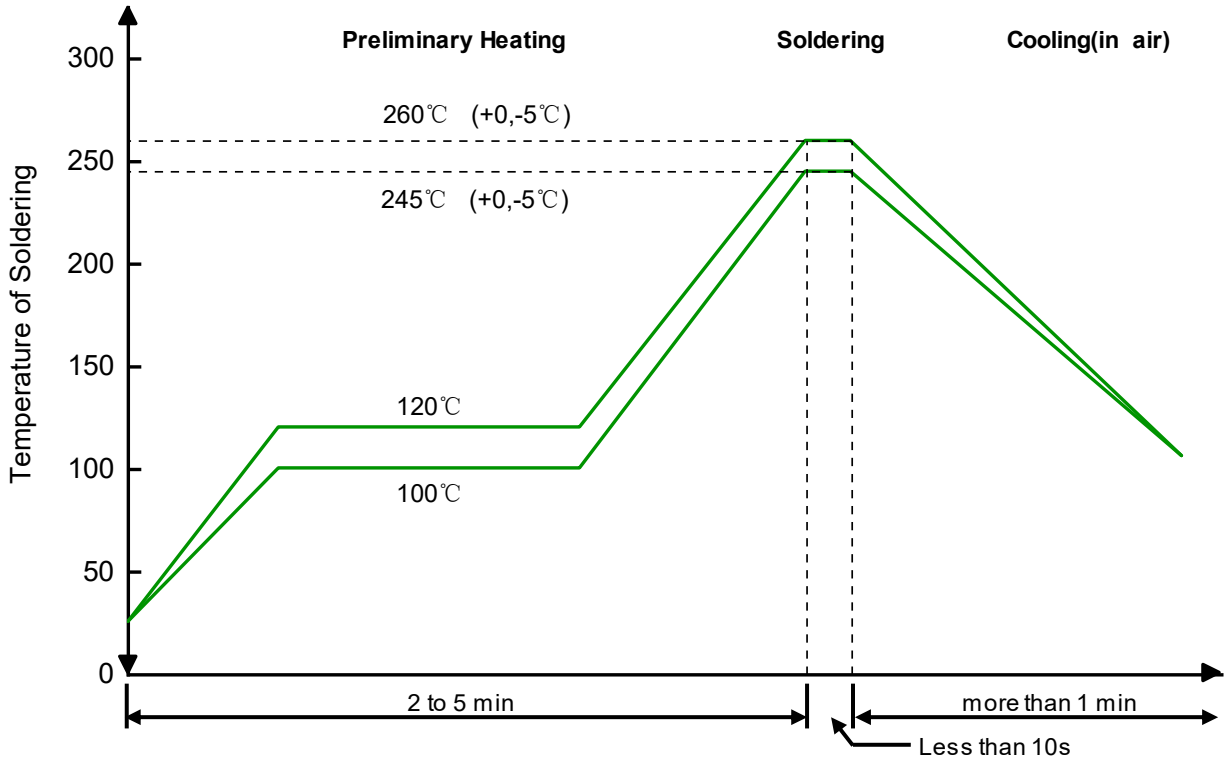


Fig 8. Clamping Voltage at IEC61000-4-2 -8kV Pulse Waveform

Solder Reflow Recommendation



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

PCB Design

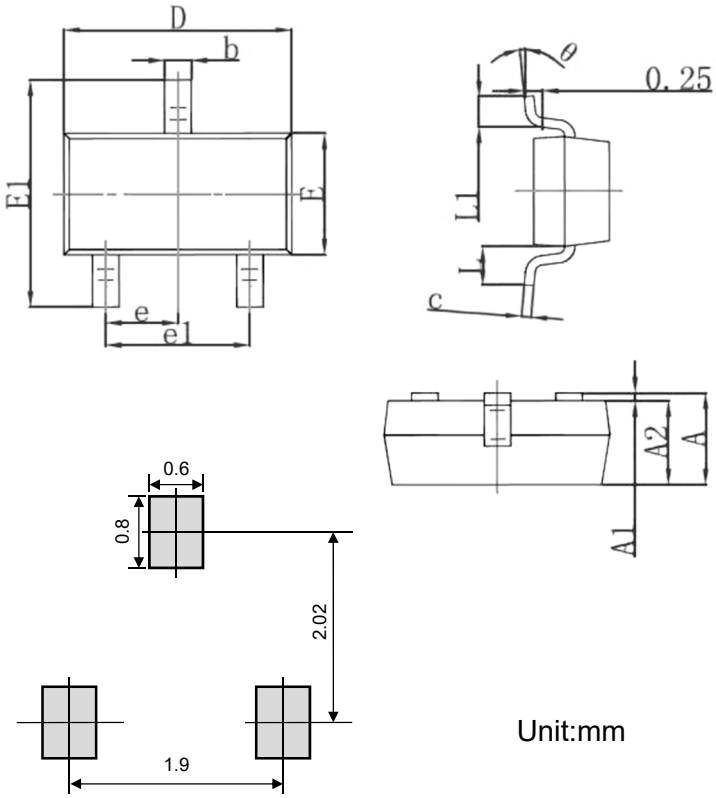
For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

- 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

Device	Package	Reel	Shipping
PESDNC23T1235	SOT-23 (Pb-Free)	7"	3000 / Tape & Reel

Product dimension (SOT-23)

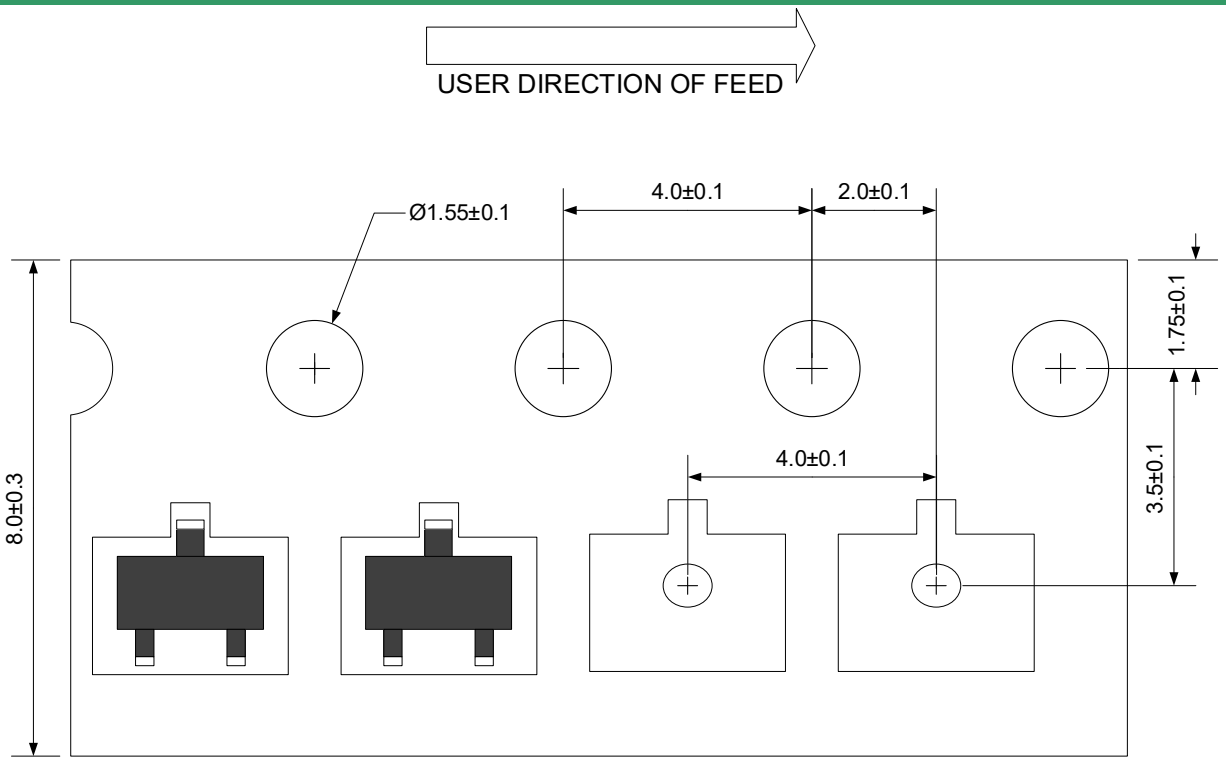


Suggested PCB Layout

Unit:mm

Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 Typ.		0.037 Typ.	
e1	1.800	2.000	0.071	0.079
L	0.550 Ref.		0.022 Ref.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Load with information



Unit:mm

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