

Description

The PESDLC23T27VBI is a TVS designed to protect I/O or data lines from the damaging effects of ESD. It is low capacitance transient voltage suppressors 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.

The SOT-23 is a very small package which allows space saving on high density printed circuit board and also gives the designer the flexibility to provide two I/O lines protection. All pins are rated to withstand 30kV ESD pulses using the IEC61000-4-2 air discharge method, which can meet the requirement of level 4.

Feature

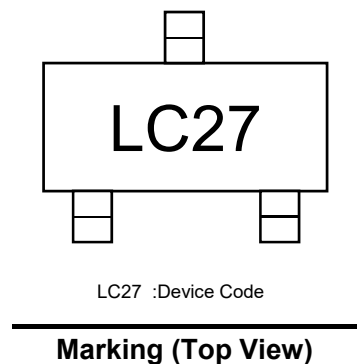
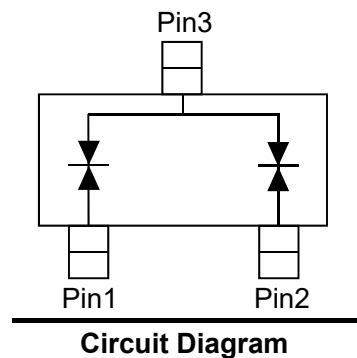
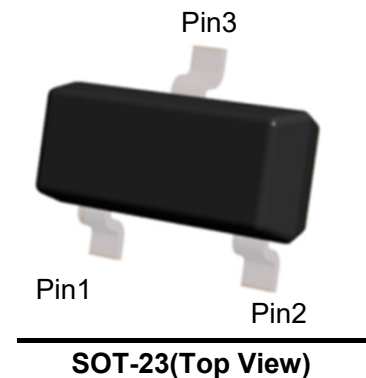
- 450W peak pulse power ($t_p=8/20\mu s$) :
- SOT-23 Package
- Protects two Uni-directional lines
- Working voltage: 27V
- Low leakage current
- Low clamping voltage
- RoHS Compliant
- Transient Protection for High Speed Data Lines to IEC61000-4-2(ESD) $\pm 30kV$ (air), $\pm 30kV$ (Contact)

Applications

- High-definition multimedia interface(HDMI)
- Mobile display digital interface(MDDI)
- RF/Antenna circuits
- USB 2.0&firewire ports
- HBT power amp protection
- Transceiver protection

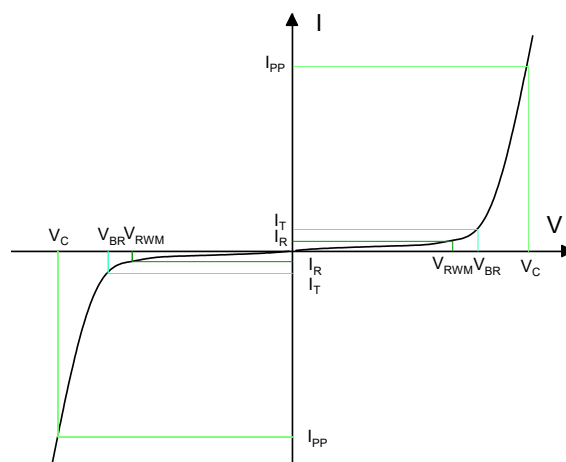
Mechanical Characteristics

- Lead finish:100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature:260°C
- Pure tin plating: 7 ~ 17 μm
- Pin flatness: $\leq 3mil$
- Device meets MSL 3 requirements



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°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage	V_{RWM}	-	-	-	27	V
Breakdown Voltage	V_{BR}	$I_t = 1\text{mA}$	28	-	37	V
Reverse Leakage Current	I_R	$V_{RWM} = 27\text{V}$	-	-	1.0	μA
Clamping Voltage ¹⁾	V_C	$\text{TLP} = 16\text{A}, t_p = 100\text{ns}$	-	50	-	V
Dynamic resistance ¹⁾	R_{DYN}	-	-	0.42	-	Ω
Clamping Voltage ²⁾	V_C	$I_{PP} = 9\text{A}, t_p = 8/20\mu\text{s}$	-	50	54	V
Junction Capacitance	C_J	$V_R = 0\text{V}, f = 1\text{MHz}$	-	0.8	1.5	pF

Notes:

1. TLP parameter: $Z_0=50\Omega$, $t_b=100\text{ns}$, $t_r=2\text{ns}$, averaging window from 70ns to 90ns. R_{DYN} is calculated from 4A to 16A.

2. Non-repetitive current pulse, according to IEC61000-4-5.

Absolute maximum rating@25°C

Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 8/20\mu\text{s}$)	P_{PP}	450	W
Peak Pulse Current ($t_p = 8/20\mu\text{s}$)	I_{PP}	9.0	A
Lead Soldering Temperature	T_L	260 (10 sec)	°C
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	°C
ESD Protection-Contact Discharge	V_{ESD}	± 30	kV
ESD Protection-Air Discharge	V_{ESD}	± 30	kV

Typical Characteristics

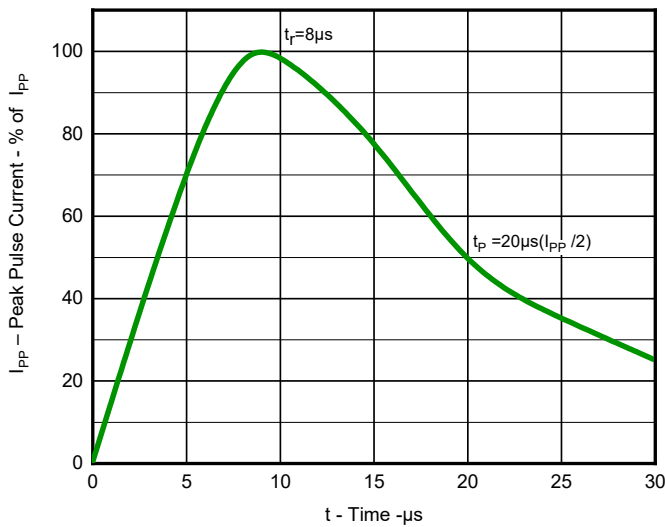
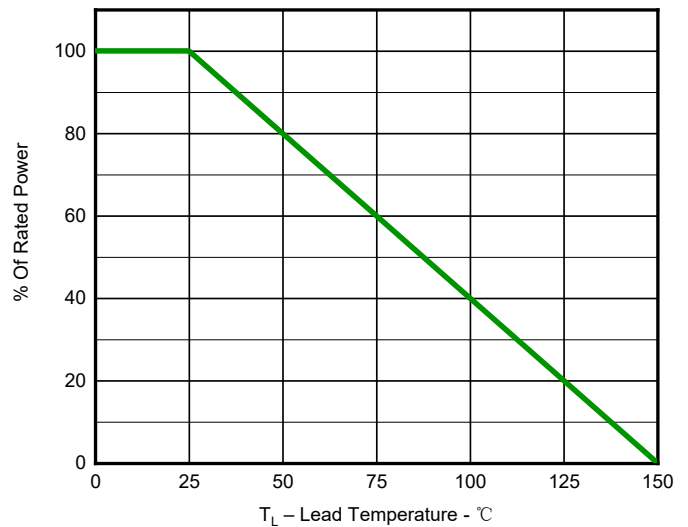
Fig 1. Pulse Waveform(8/20 μs)

Fig 2. Power Derating Curve

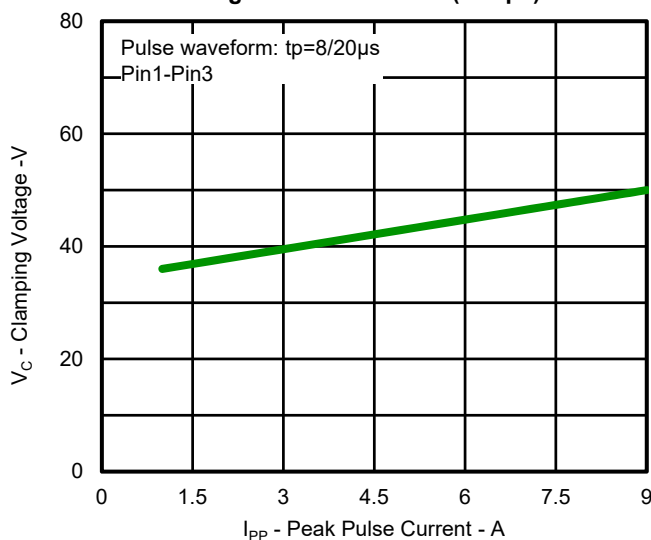


Fig.3 Clamping Voltage vs. Peak Pulse Current

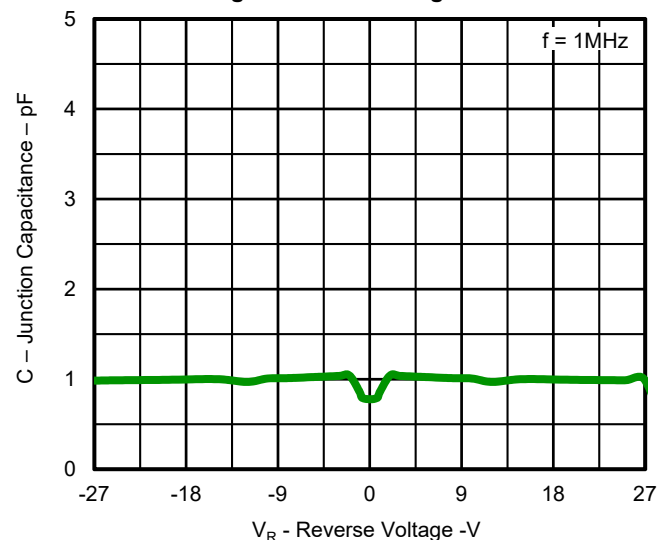


Fig.4 Capacitance vs. Reverse Voltage

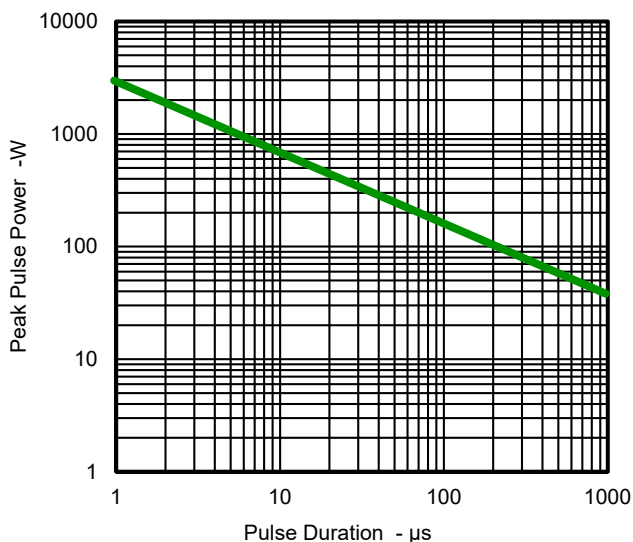


Fig.5 Non-Repetitive Peak Pulse Power vs. Pulse Time

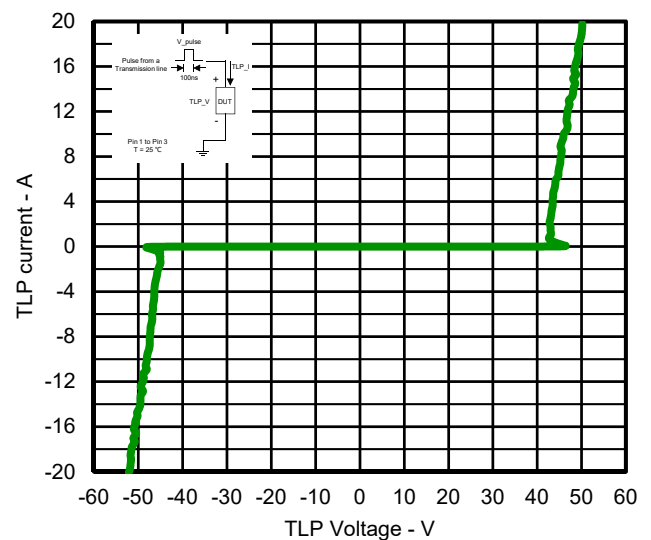
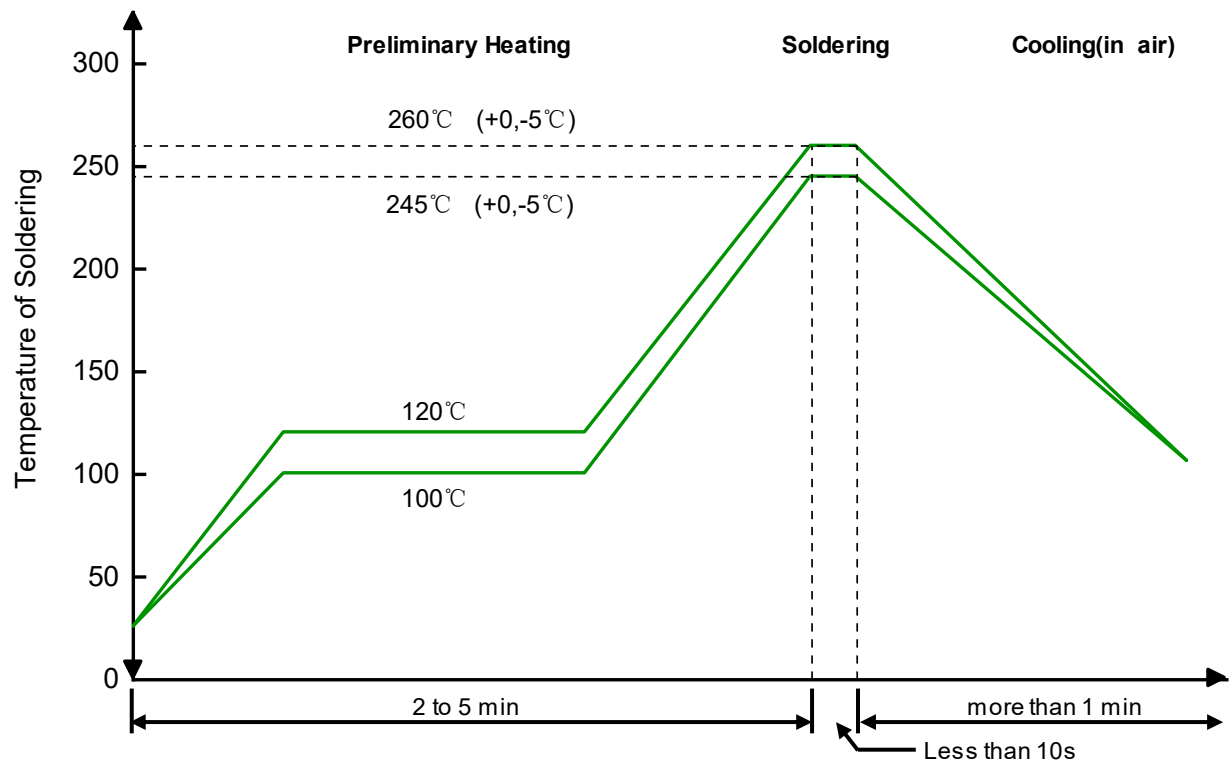


Fig.6 TLP Measurement

Solder Reflow Recommendation



Remark: Pb free for 260°C; Pb for 245°C.

PCB Design

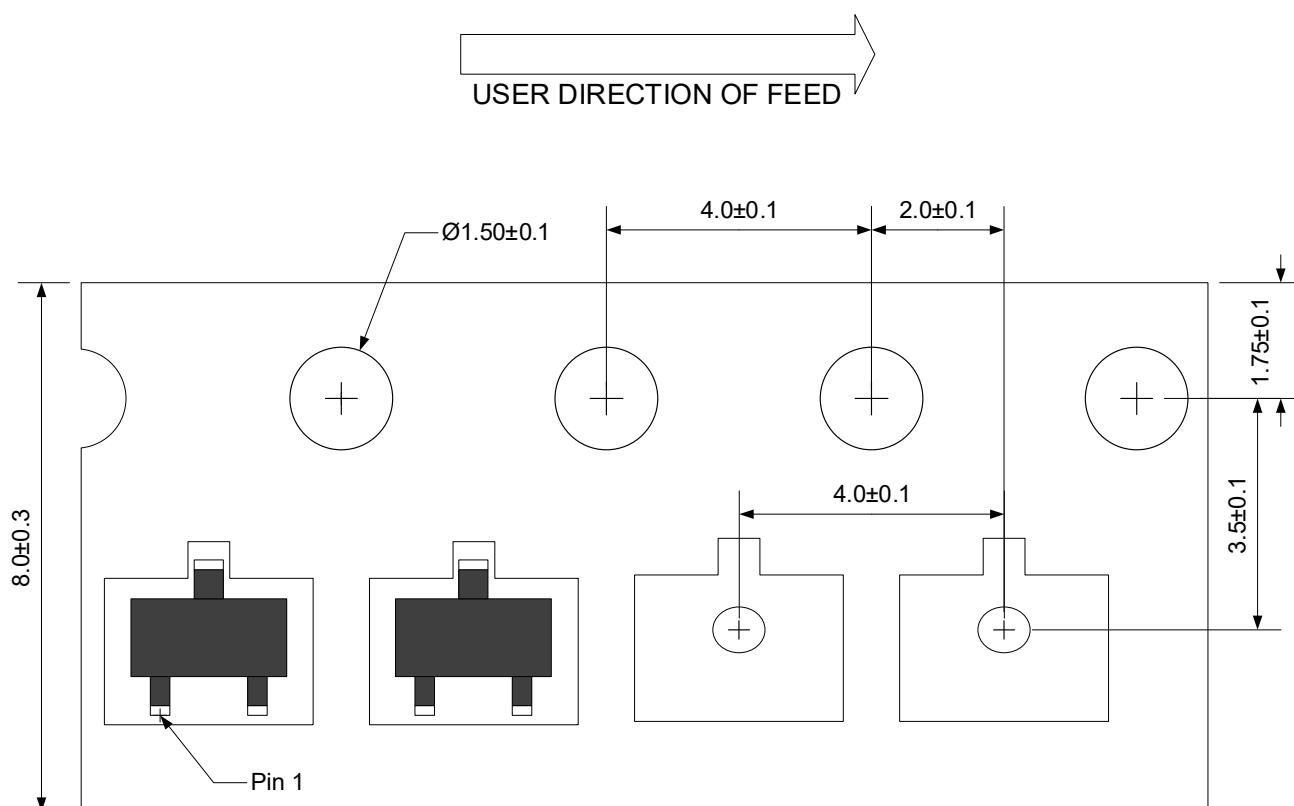
For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

- 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

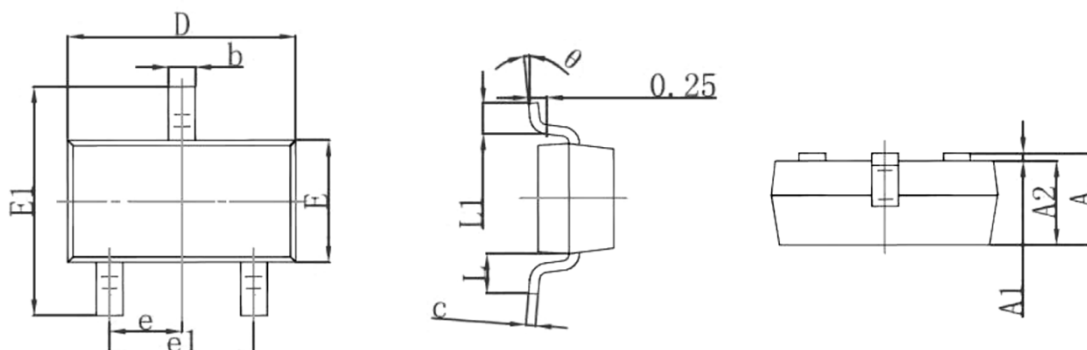
Package	Reel	Shipping
SOT-23	7"	3000 / Tape & Reel

Load with information

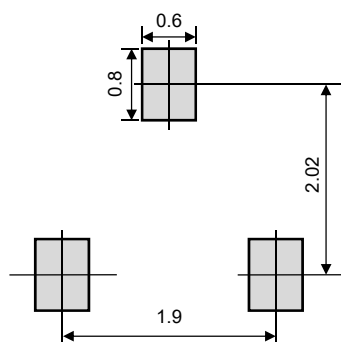


Unit:mm

Product Dimension (SOT-23)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
A2	0.90	1.05	0.035	0.041
b	0.30	0.50	0.012	0.020
c	0.08	0.25	0.003	0.010
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
E1	2.25	2.55	0.089	0.100
e	0.95 Typ.		0.037 Typ.	
e1	1.80	2.00	0.071	0.079
L	0.550 Ref.		0.022 Ref.	
L1	0.30	0.50	0.012	0.020
θ	0°	8°	0°	8°



Unit: mm

Suggested PCB Layout

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