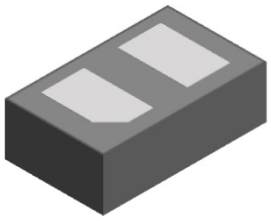
Prisemi®

PESDRCH2FD3V3BIN

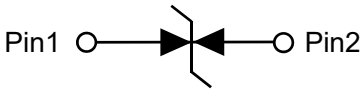
Bi-directional Low Capacitance ESD Protector

Description

The PESDRCH2FD3V3BIN protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, low operating voltage. It gives designer the flexibility to protect one bi-directional line in applications where arrays are not practical.



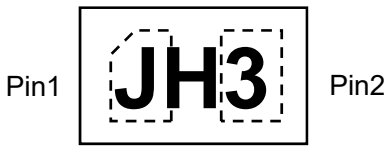
DFN1006-2L(Bottom View)



Circuit Diagram

Feature

- 60W peak pulse power per line (t_P = 8/20μs)
- Ultra-low capacitance: Cj = 0.3pF typ.
- Low clamping voltage
- DFN1006-2L package
- Response time is typically < 1 ns
- Bidirectional configurations
- RoHS compliant
- Transient protection for data lines to
  IEC 61000-4-2(ESD) ±30kV(air), ± 30kV(contact);
  IEC 61000-4-5 (Lightning) 4.5A (8/20us)



Marking (Top View)

Applications

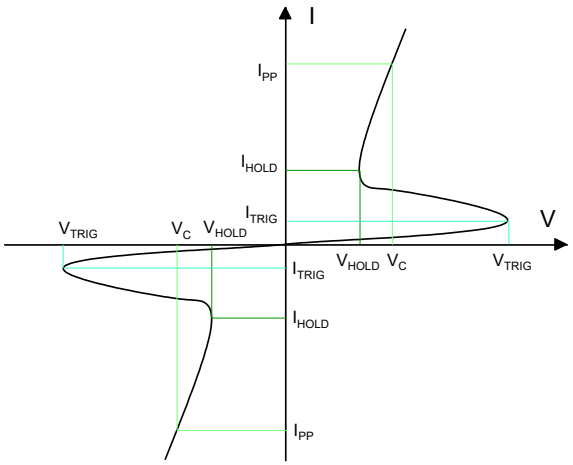
- Cellular phones
- Portable devices
- Digital cameras
- Power supplies
- USB 2.0 and USB 3.0
- HDMI 1.3 and HDMI 1.4

Mechanical Characteristics

- Mounting position: Any
- Qualified max reflow temperature:260℃
- Device meets MSL 1 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}
I_{TRIG}	Reverse Trigger Current
V_{TRIG}	Reverse Trigger Voltage
I_{HOLD}	Reverse Holding Current
V_{HOLD}	Reverse Holding Voltage



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	5.0	-	9.0	V
Reverse Leakage Current	I_R	V_{RWM} = 3.3V	-	-	1.0	μA
Clamping Voltage	V_C	I_{PP} = 4.5A,t_P = 8/20μs	-	12	14	V
Junction Capacitance	C_J	V_R = 0V,f = 1MHz	-	0.3	0.5	pF

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Peak Pulse Power (t_P = 8/20μs)	P_{PP}	60	W
Peak Pulse Current (t_P = 8/20μs)	I_{PP}	4.5	A
Operating Supply Voltage	V_{DC}	±3.3V	V
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

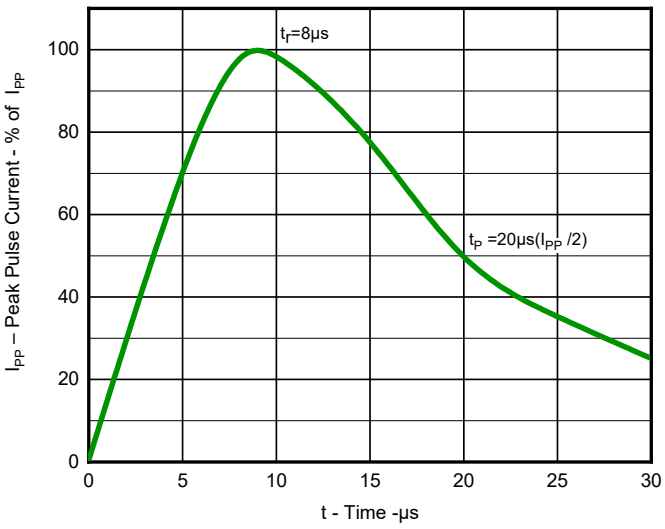


Fig 1.Pulse Waveform(8/20μs)

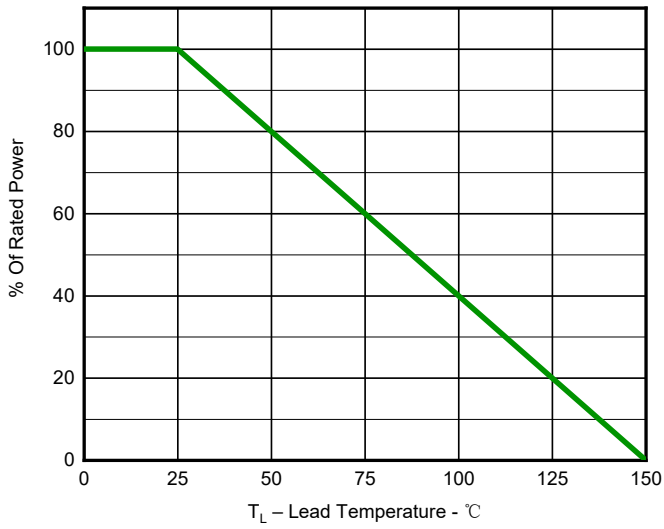


Fig 2.Power Derating Curve

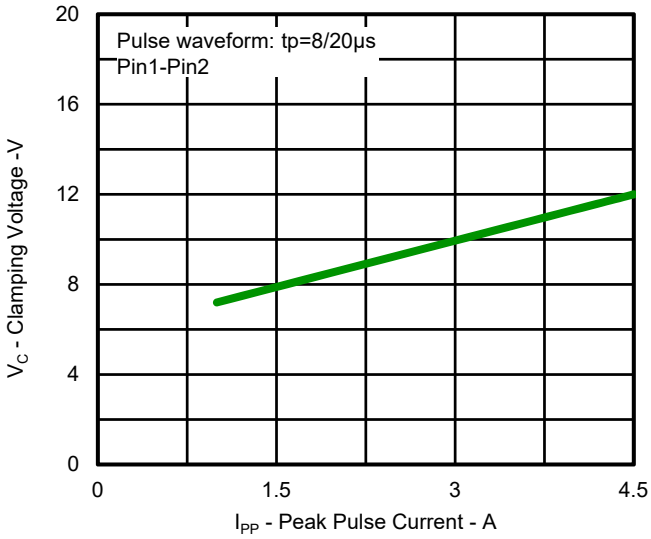


Fig.3 Clamping Voltage vs. Peak Pulse Current

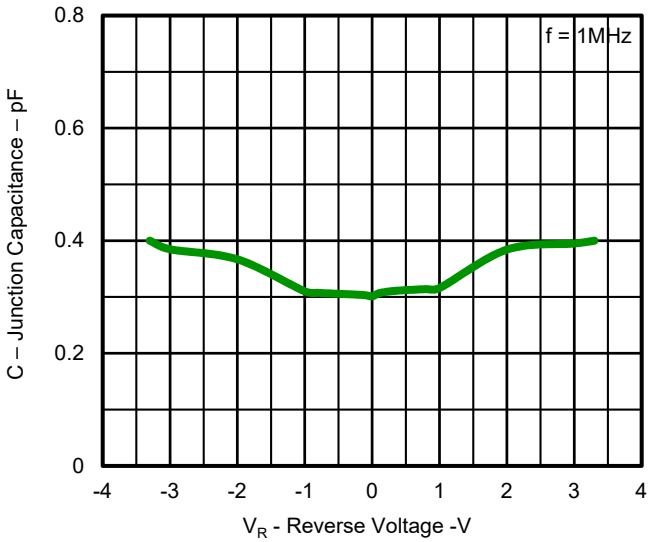


Fig.4 Capacitance vs. Reveres Voltage

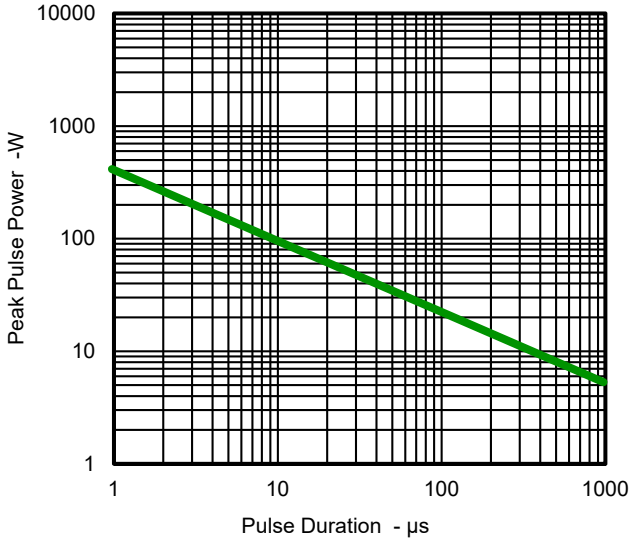


Fig.5 Non-Repetitive Peak Pulse Power vs. Pulse Time

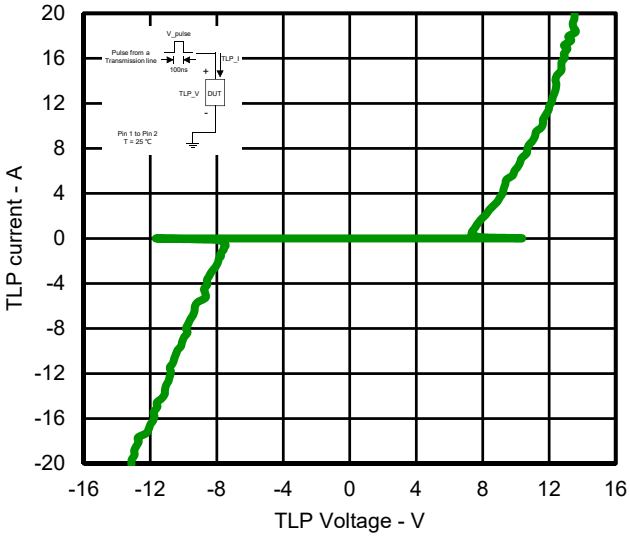
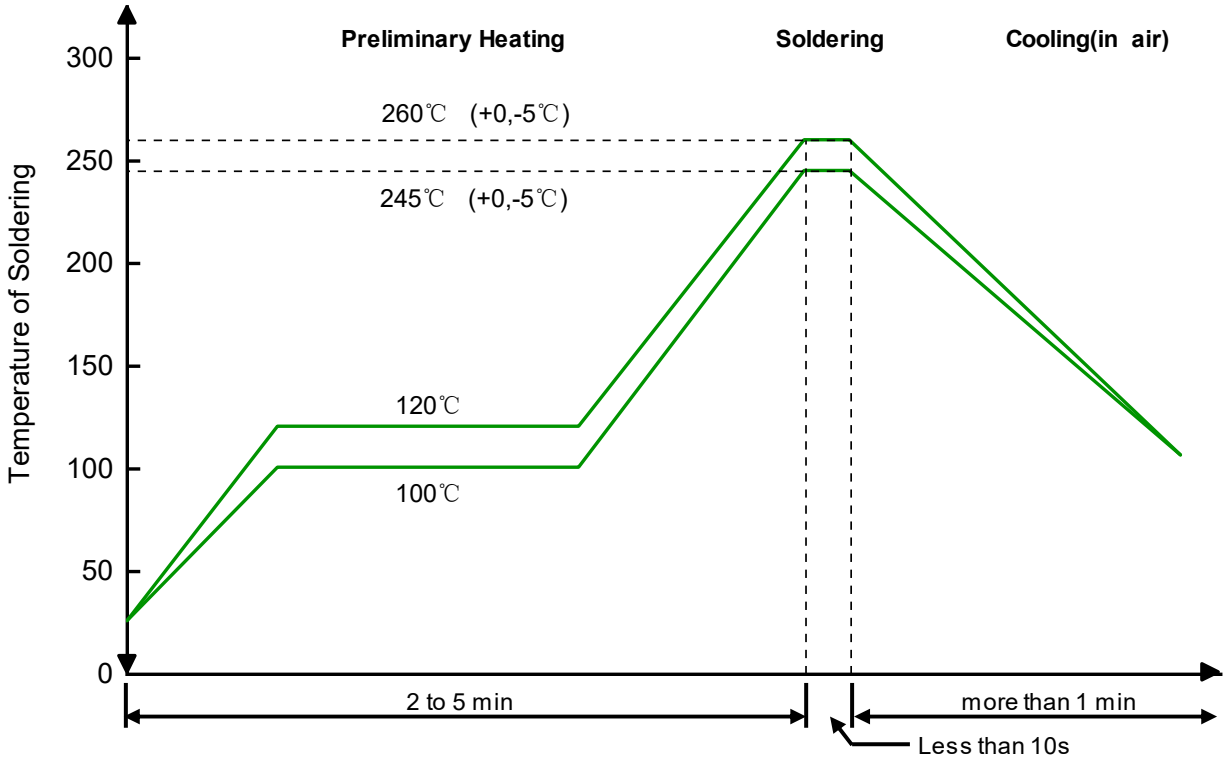


Fig.6 TLP Measurement

Solder Reflow Recommendation



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

PCB Design

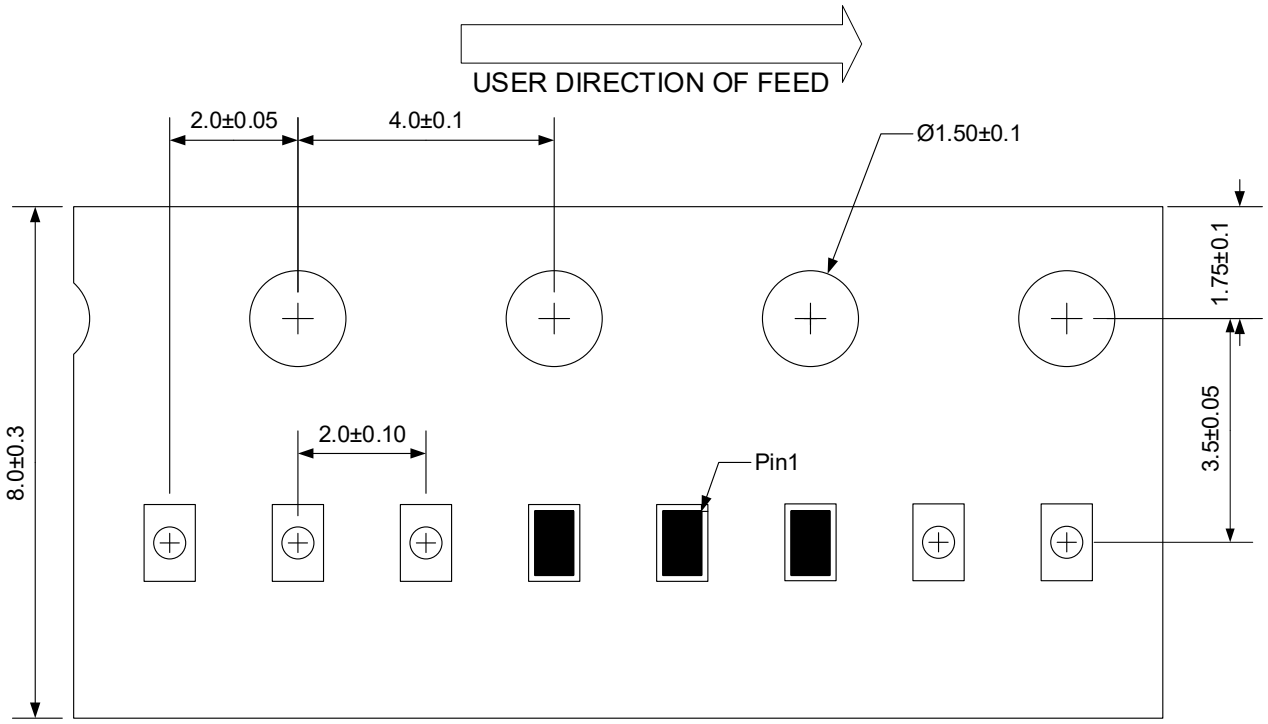
For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

- 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

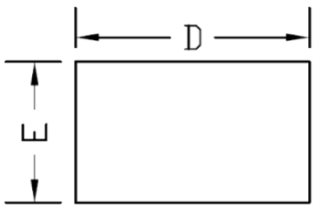
Package	Reel	Shipping
DFN1006-2L	7"	10000 / Tape & Reel

Load with information

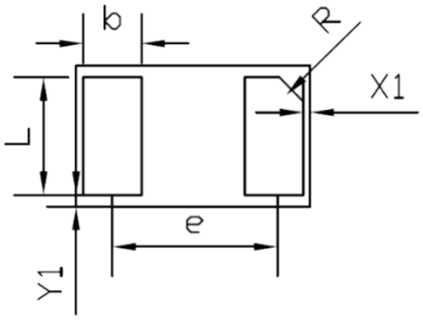


Unit:mm

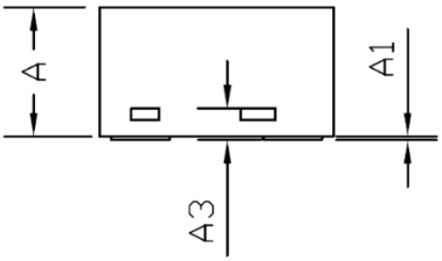
Product Dimension (DFN1006-2L)



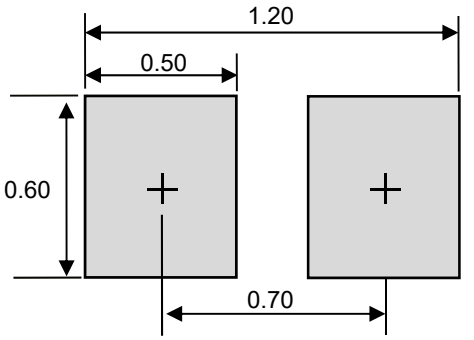
TOP VIEW



BOTTOM VIEW



SIDE VIEW



Unit:mm

Suggested PCB Layout

Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.45	0.55	0.018	0.022
D	0.95	1.05	0.037	0.041
E	0.55	0.65	0.022	0.026
b	0.20	0.30	0.008	0.012
L	0.45	0.55	0.018	0.022
e	0.65 Typ.		0.026 Typ.	
R	0.07	0.13	0.003	0.005
X1	0.025	0.065	0.001	0.003
Y1	0.025	0.065	0.001	0.003
A1	0.00	0.015	0.000	0.001
A3	0.119	0.15	0.005	0.006

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