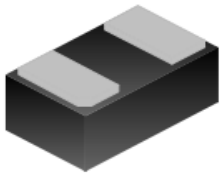
Bi-directional 5V Normal Capacitance ESD Protector

Description

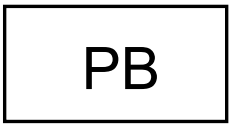
The PESDNC2FD5VB protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board 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)

Feature

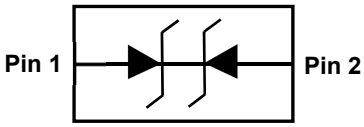
- 45W peak pulse power per line (t_P = 8/20μs)
- DFN1006-2L package
- Replacement for MLV (0402)
- Bidirectional configurations
- Response time is typically < 1ns
- Low clamping voltage
- Transient protection for data lines to
  IEC61000-4-2(ESD) ±30KV(air), ±30KV(contact);
  IEC61000-4-4 (EFT) 40A (5/50ns)



Marking (Top View)

Applications

- Cellular phones
- Portable devices
- Digital cameras
- Power supplies



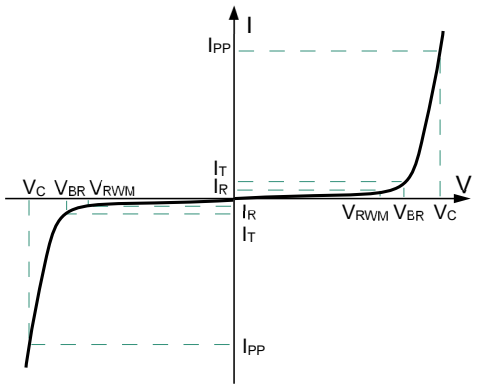
Circuit Diagram

Mechanical Characteristics

- Qualified max reflow temperature:260℃
- Device meets MSL 1 requirements
- RoHS compliant

Electronics Parameter Definiations

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



Electrical characteristics at @25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Reverse Working Voltage	V_{RWM}				5	V
Breakdown Voltage	V_{BR}	I_T= 1mA	5.6	7.0	7.8	V
Reverse Leakage Current	I_R	V_{RWM} = 5V			1.0	μA
Clamping Voltage[1)]	V_{CL}	I_{PP}=16A, t_p=100ns		9.3		V
Clamping Voltage	V_C	I_{PP}=1A,		7.5	8.0	V
Clamping Voltage[2)]	V_C	I_{PP}=3A, tp=8/20US		8.0	9.0	V
Clamping Voltage[2)]	V_C	I_{PP}=5.5A, tp=8/20US		8.5	9.5	V
Junction Capacitance	C_J	V_R=0V, f = 1MHz		15	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	Unit
Peak Pulse Power (t_p=8/20μs)	P_{pp}	45	W
Peak Pulse Current (t_p=8/20μs)	I_{pp}	5.5	A
Operating Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
ESD Protection-Contact Discharge	V_{ESD}	±30	kV
ESD Protection-Air Discharge	V_{ESD}	±30	kV

Typical Characteristics

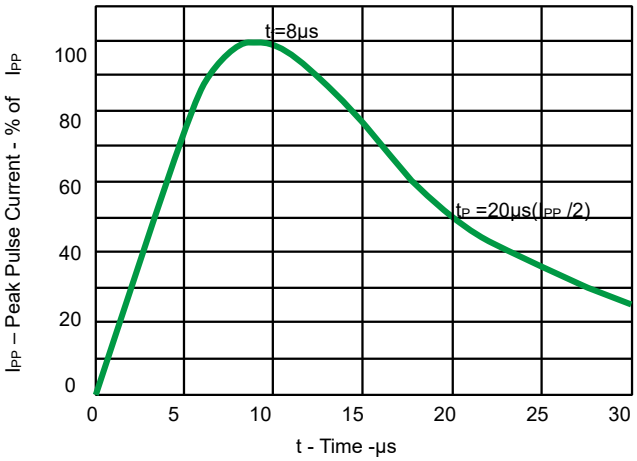


Fig 1.Pulse Waveform

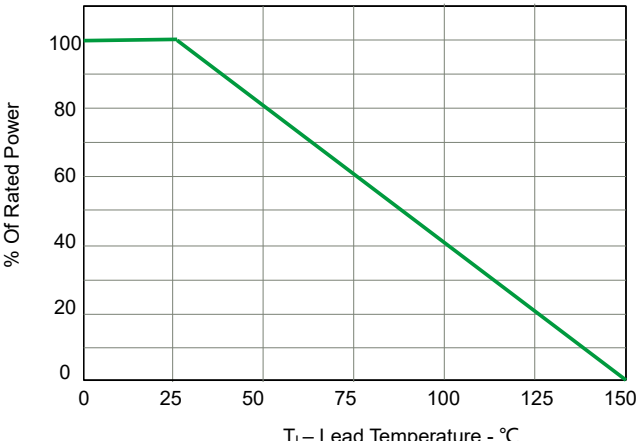


Fig 2.Power Derating Curve

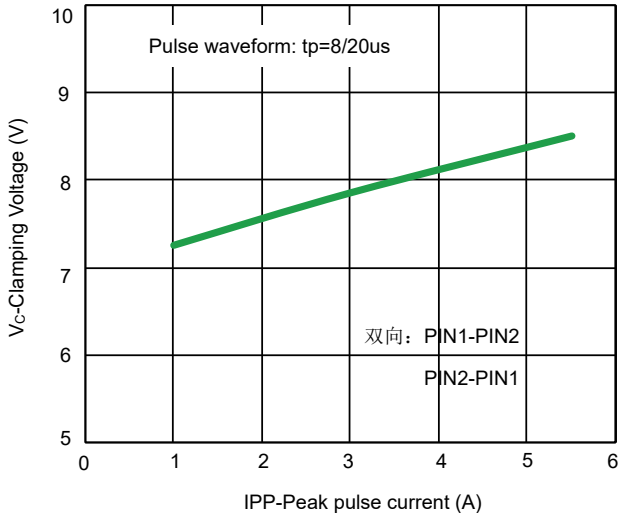


Fig 3. Clamping voltage vs. Peak pulse current

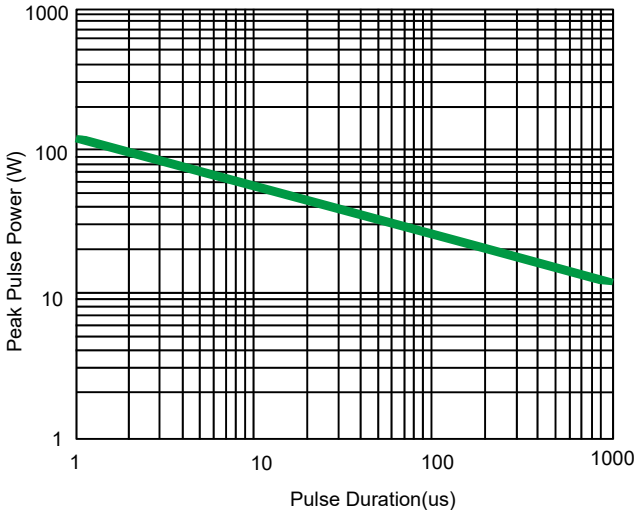


Fig 4. Non-Repetitive Peak Pulse Power vs. Pulse time

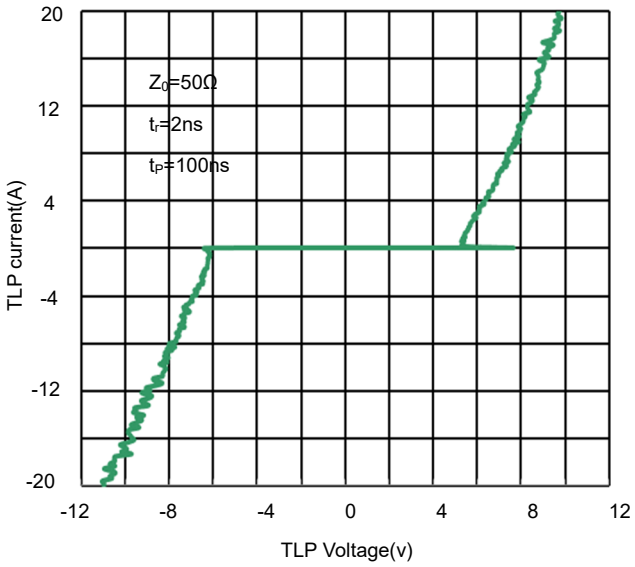


Fig 5. TLP Measurement

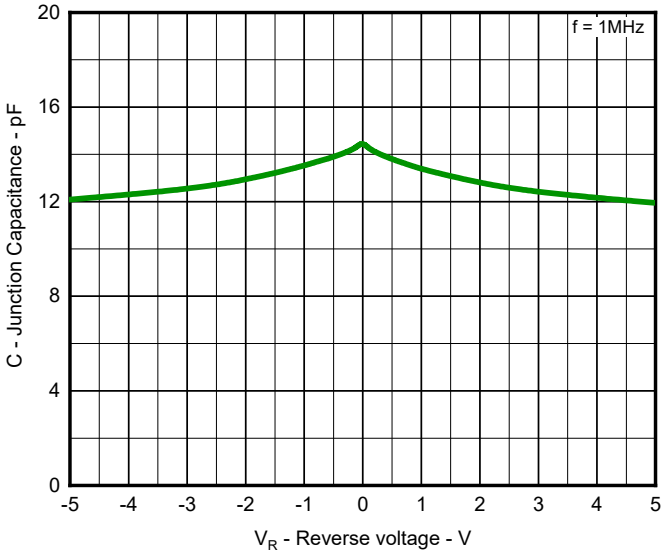


Fig 6. Capacitance vs. Reveres voltage

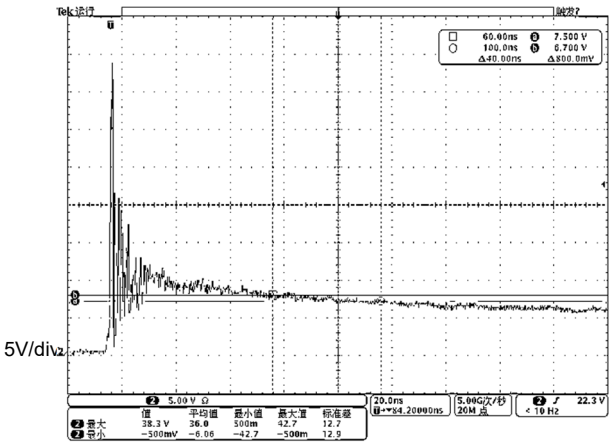


Fig 7. ESD clamping voltage
(IEC61000-4-2 +8KV contact)

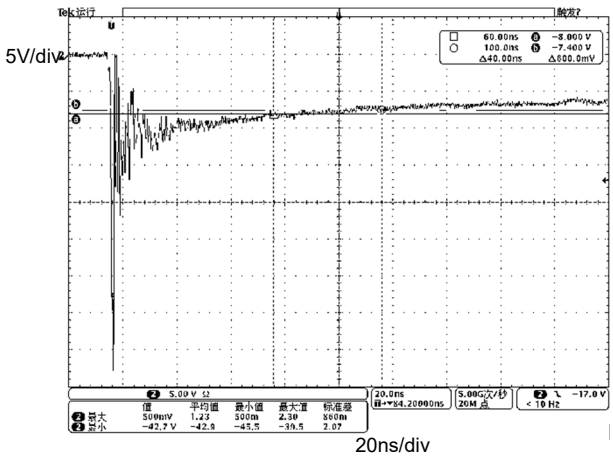
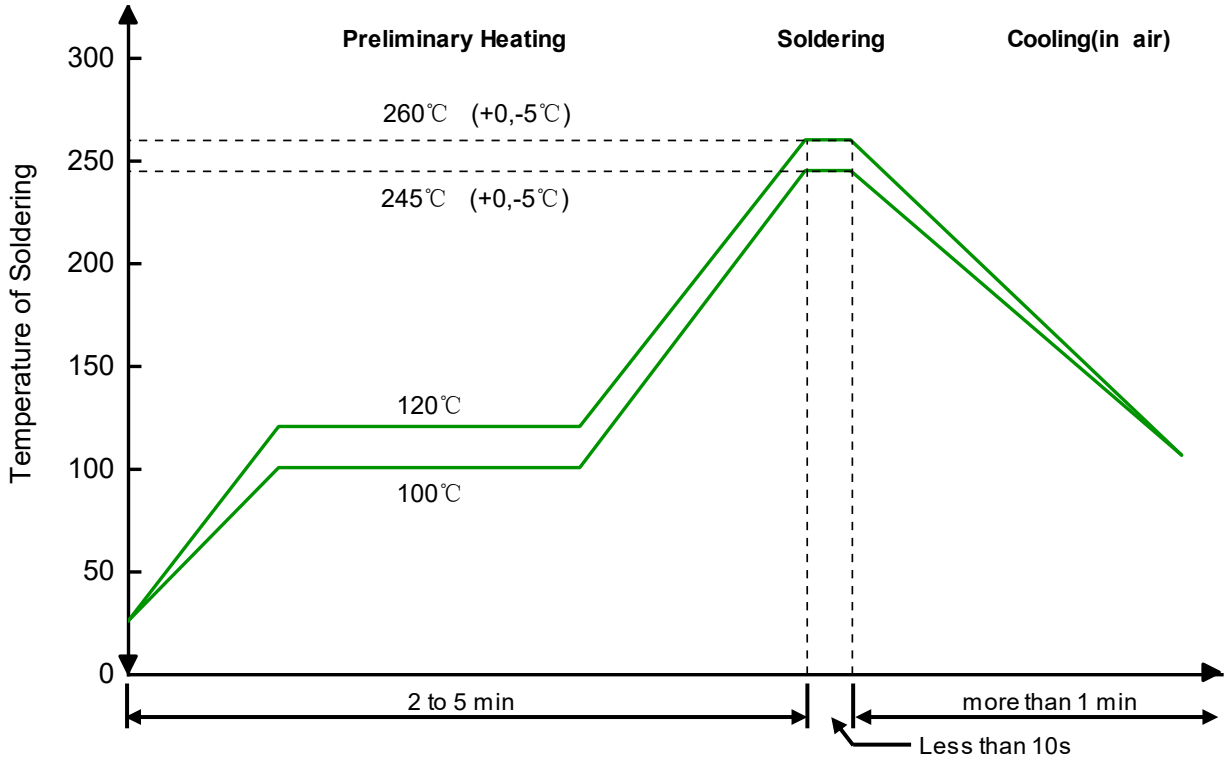


Fig 8. ESD clamping voltage
(IEC61000-4-2-8KV contact)

Solder Reflow Recommendation



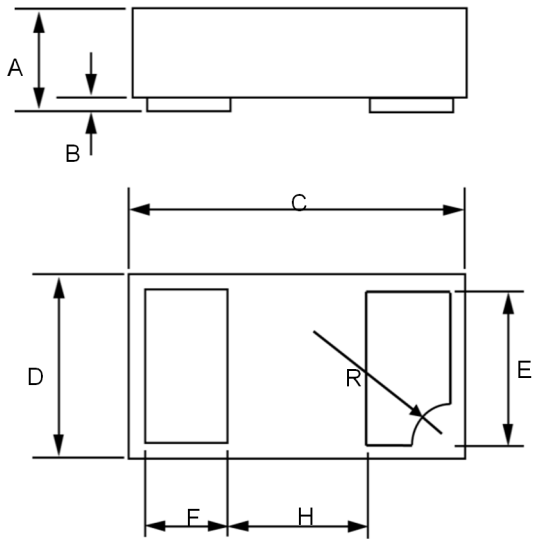
Remark: Pb free for 260℃; Pb for 245℃.

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:

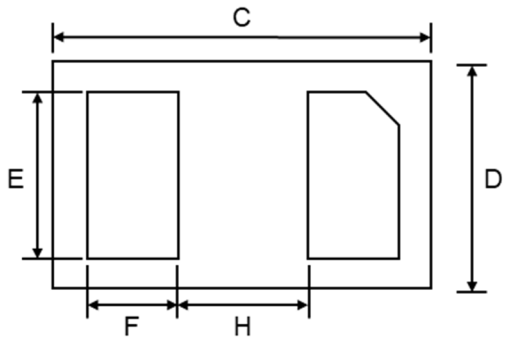
- Do not use stubs, but place the cathode of the TVS diode directly on the signal trace.
- Do not make false economies and save copper for the ground connection.
- Place via holes to ground as close as possible to the anode of the TVS diode.
- Use as many via holes as possible for the ground connection.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

Product dimension (DFN1006-2L)

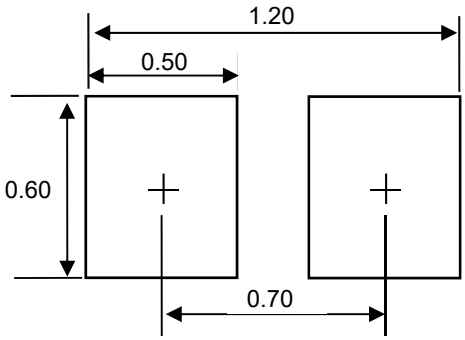


Bottom View

Dim	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.013	0.020	0.34	0.498
B	0.000	0.002	0.00	0.05
C	0.037	0.043	0.95	1.080
D	0.022	0.027	0.55	0.680
E	0.016	0.024	0.40	0.60
F	0.008	0.012	0.20	0.30
H	0.015Typ.		0.40Typ.	
R	0.001	0.005	0.05	0.15



Bottom View



Unit:mm

Suggested PCB Layout

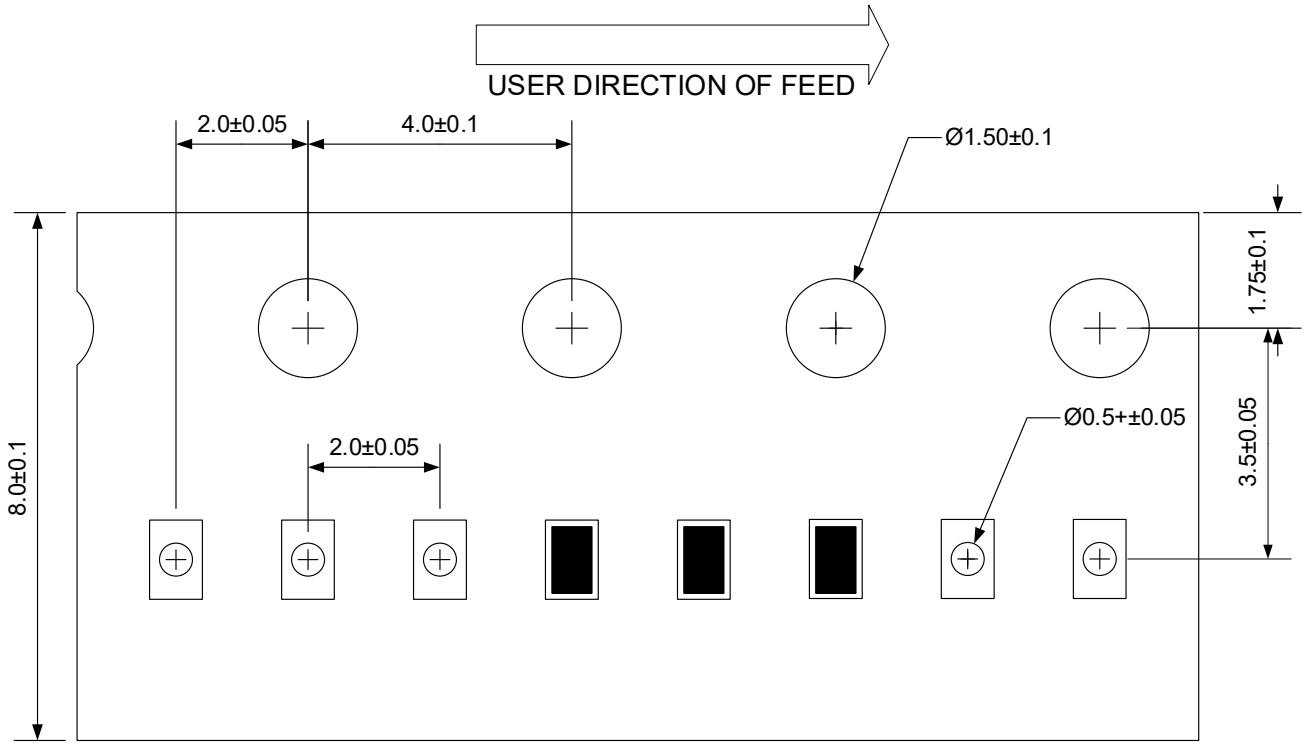
Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

Ordering information

Device	Package	Reel Size	MPQ
PESDNC2FD5VB	DFN1006-2L (Pb-Free)	7"	10000 / Tape & Reel

Load with information



Unit:mm

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