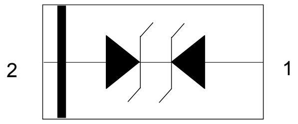
Prisemi®

PTVSHC2EN5VB

Transient Voltage Suppressor

Description

The PTVSHC2EN5VB ESD protector is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and PDA's. 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, lower operating voltage, lower clamping voltage and no device degradation when compared to MLVs. The PTVSHC2EN5VB protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. The PTVSHC2EN5VB is available in a DFN1610-2L package with working voltages of 4.5 volt. It is used to meet the ESD immunity requirements of IEC 61000-4-2, (±30kV air, ±30kV contact discharge)



Feature

- 1500W Peak pulse power per line (t_P = 8/20μs)
- DFN1610-2L package
- Response time is typically < 1 ns
- Protect one I/O or power line
- Low clamping Voltage
- RoHS compliant
- Transient protection for data lines to IEC 61000-4-2(ESD) ±30KV(air), ±30KV(contact); IEC 61000-4-4 (EFT) 40A (5/50ns)

Applications

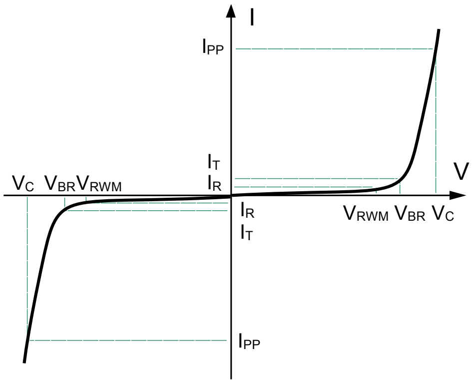
- Cell phone handsets and accessories
- Personal digital assistants (PDA's)
- Notebooks, desktops, and servers
- Portable instrumentation
- Cordless phones
- Digital cameras
- Peripherals
- MP3 players

Mechanical Characteristics

- Lead finish:100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature:260℃
- Pure tin plating: 7 ~ 17 um
- Pin flatness:≤3mil
- Device meets MSL3 requirement

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



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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Peak Reverse Working Voltage(PIN2~PIN1)	V_{RWM}				5	V
Breakdown Voltage(PIN2~PIN1)	V_{BR}	I_t = 1mA	5.4		6.5	V
Reverse Leakage Current(PIN2~PIN1)	I_R	V_{RWM} = 5V T=25℃			1.0	μA
Breakdown Voltage(PIN1~PIN2)	V_{BR}	I_t = 1mA	4.6		5.5	V
Reverse Leakage Current (PIN1~PIN2)	I_R	V_{RWM} = 4.5V T=25℃			2.0	μA
Clamping Voltage(PIN2~PIN1)	V_C	I_{PP}=20A t_P = 8/20μs		7	9	V
Clamping Voltage(PIN2~PIN1)	V_C	I_{PP}=50A t_P = 8/20μs		8	10	V
Clamping Voltage(PIN2~PIN1)	V_C	I_{PP}=100A t_P = 8/20μs		9.6	12	V
Clamping Voltage(PIN2~PIN1)	V_C	I_{PP}=140A t_P = 8/20μs		11	14	V
Junction Capacitance	C_j	V_R=0V f = 1MHz		260	300	pF

Note 1: V_{RWM} is the maximum reverse working voltage, or reverse stand-off voltage. ESD can protect signal line properly within its rated voltage. If the signal line's voltage is over V_{RWM}, ESD will change to other state.

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Peak Pulse Power (t_P = 8/20μS)	P_{pp}	1500	W
Total Device Dissipation FR-5 Board	P_D	500	mW
Lead Soldering Temperature	T_L	260 (10 sec)	℃
Operating Temperature	T_J	-55 to +125	℃
Storage Temperature	T_{STG}	-55 to +150	℃

Typical Characteristics

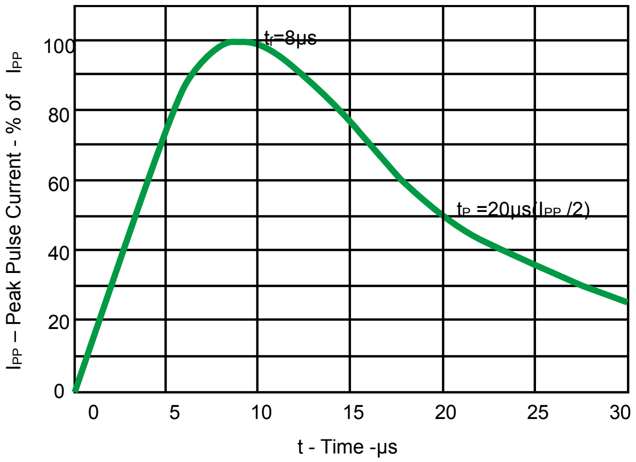


Fig 1.Pulse Waveform

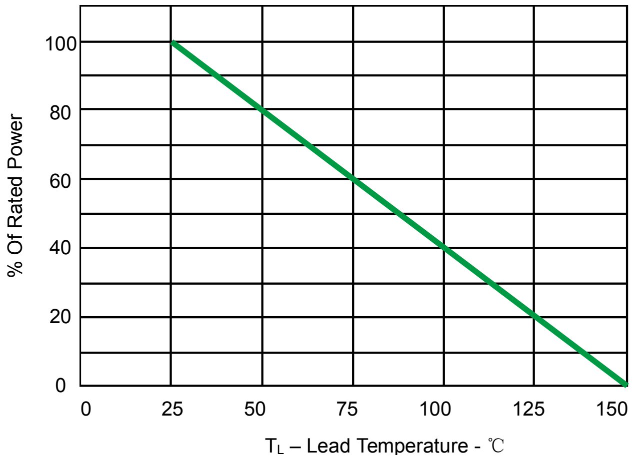


Fig 2.Power Derating Curve

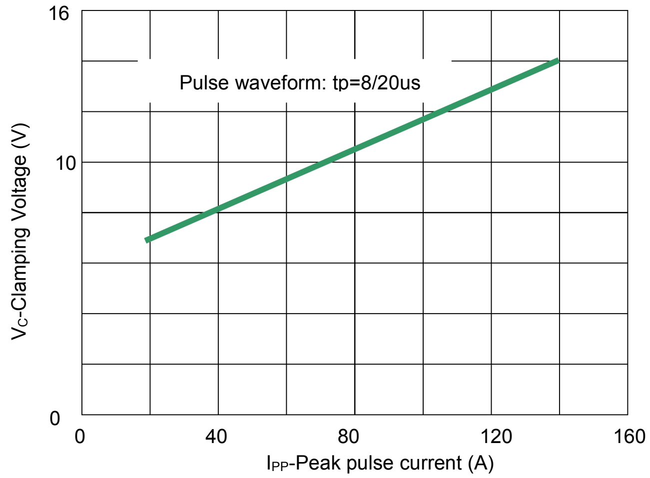


Fig 3. Clamping voltage vs. Peak pulse current

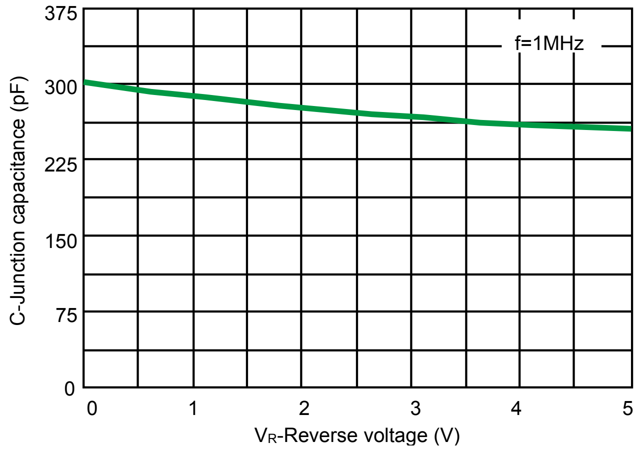


Fig 4. Capacitance vs. Reveres voltage

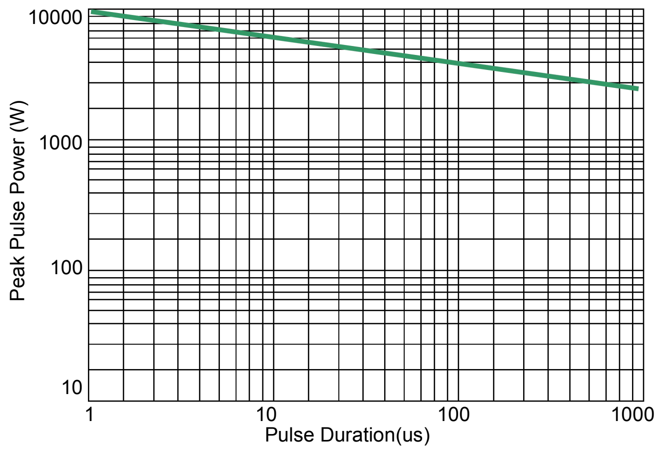
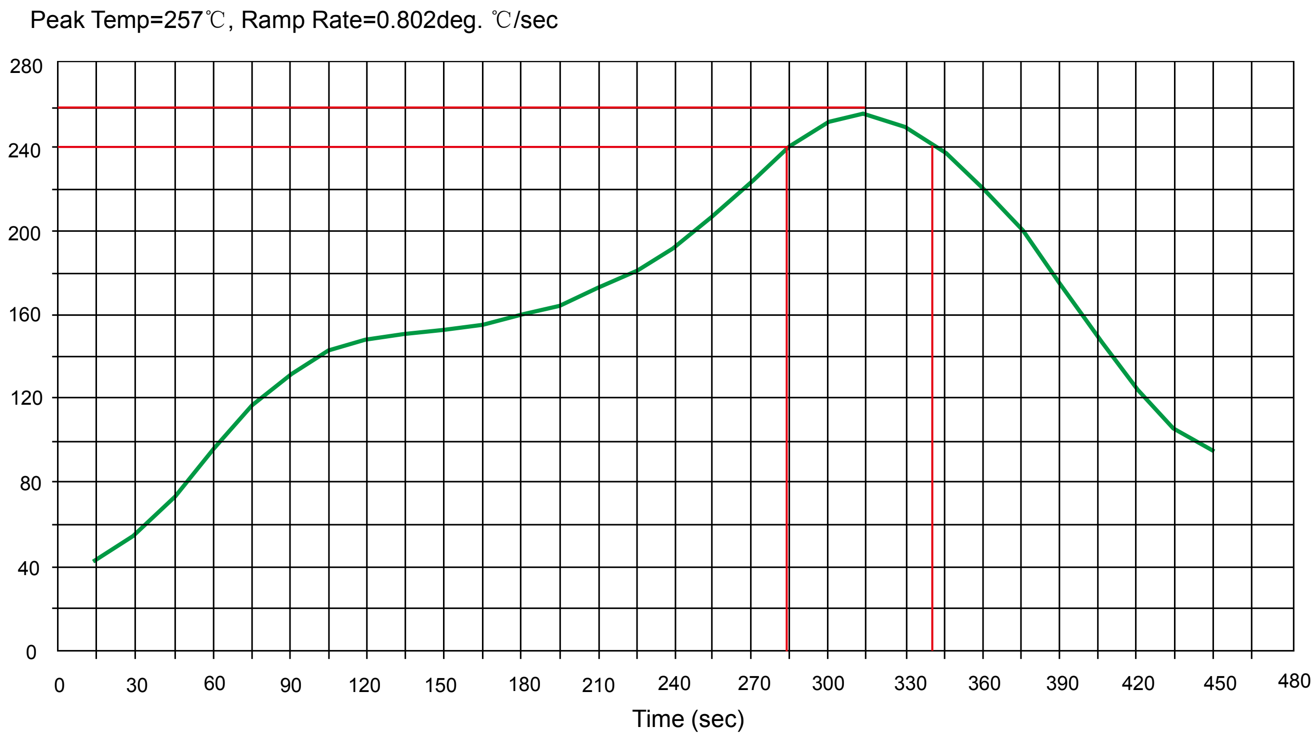


Fig 5. Non Repetitive Peak Pulse Power vs. Pulse time

Solder Reflow Recommendation

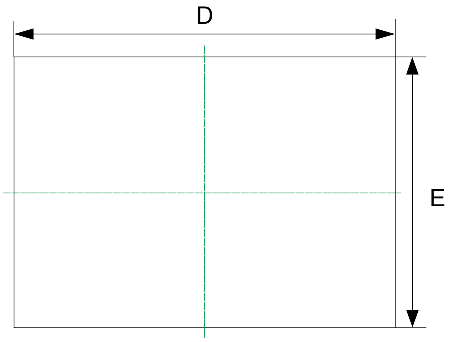


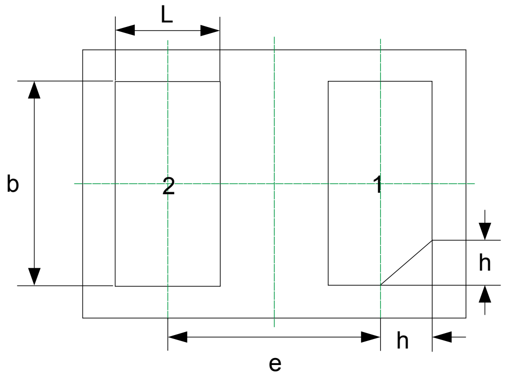
PCB Design

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:

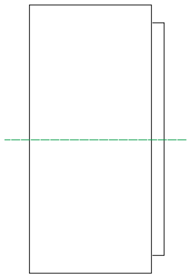
- Do not use stubs, but place the cathode of the TVS diode directly on the signal trace.
- Do not make false economies and save copper for the ground connection.
- Place via holes to ground as close as possible to the anode of the TVS diode.
- Use as many via holes as possible for the ground connection.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

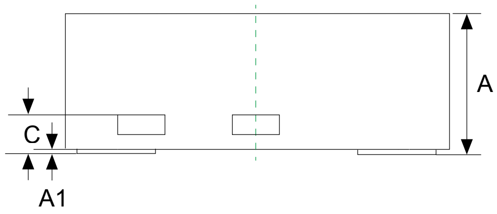
Product dimension (DFN1610-2L)



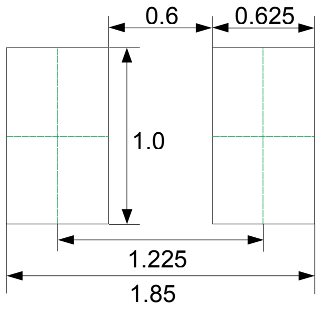


Bottom View





Dim	Millimeters	
	MIN	MAX
A	0.45	0.60
A1	--	0.05
b	0.75	0.85
c	0.10	0.20
D	1.55	1.65
e	1.10BSC	
E	0.95	1.05
L	0.35	0.45
h	0.15	0.25



Recommended Soldering Pad

Unit:mm

Ordering information

Device	Package	Shipping
PTVSHC2EN5VB	DFN1610-2L (Pb-Free)	3000 / Tape & Reel

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