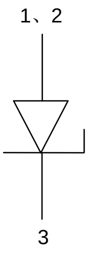
Prisemi®

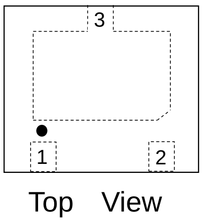
PTVSHC3N15VUL1

Transient Voltage Suppressor

Description

The PTVSHC3N15VUL1 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 PTVSHC3N15VUL1 protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events. The PTVSHC3N15VUL1 is available in a DFN2×2-3L package with working voltages of 15 volt. It is used to meet the ESD immunity requirements of IEC 61000-4-2 (±30kV air, ±30kV contact discharge)





Feature

- 3400W Peak pulse power per line (t_P = 8/20μs)
- DFN2×2-3L 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) 80A (5/50ns), IEC 61000-4-5 (Lightning) 110A (8/20us)

Applications

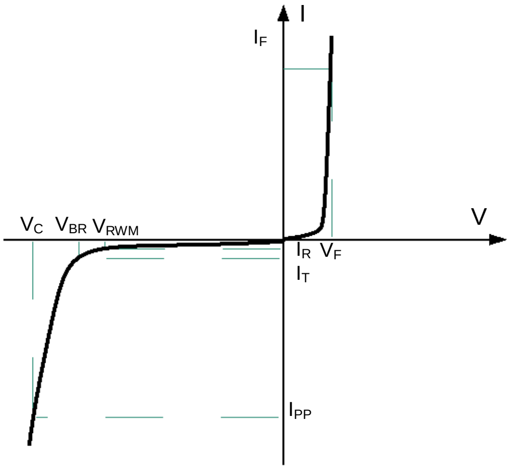
- Cell phone handsets and accessories
- Personal digital assistants (PDA's)
- Notebooks, desktops, and servers
- Portable instrumentation
- Cordless phones
- Digital cameras
- Peripherals
- MP3 players

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

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}				15	V
Breakdown Voltage	V_{BR}	I_t =1mA	16	18	20	V
Reverse Leakage Current	I_R	V_{RWM} =15V			1	μA
Clamping Voltage	V_C	I_{PP}=30A t_P = 8/20μs		22	24	V
Clamping Voltage	V_C	I_{PP}=100A t_P = 8/20μs		30	34	V
Peak Pulse Power (t_P = 8/20μS)	P_{pp}		3400			W
Junction Capacitance	C_j	V_R=0V f = 1MHz		500	650	pF

Notes ： Measured from pin 3 to pin 1 and pin 2.

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Lead Soldering Temperature	T_L	260 (10 sec)	℃
Operating Temperature	T_J	-55 to +150	℃
Storage Temperature	T_{STG}	-55 to +150	℃

Typical Characteristics

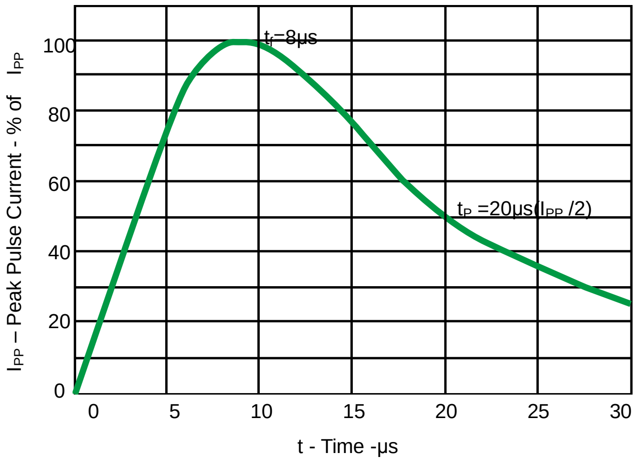


Fig 1.Pulse Waveform

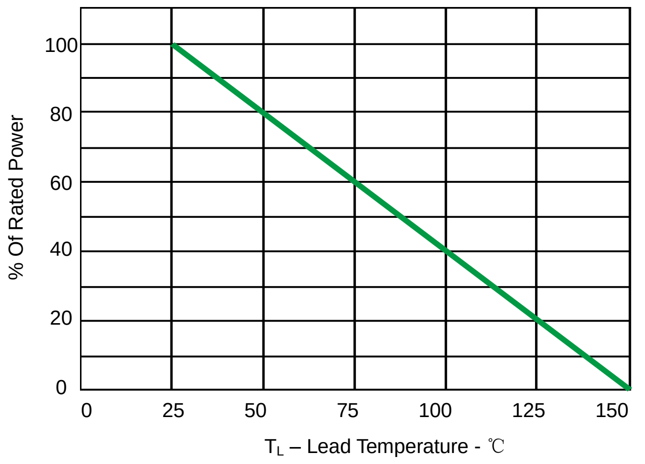


Fig 2.Power Derating Curve

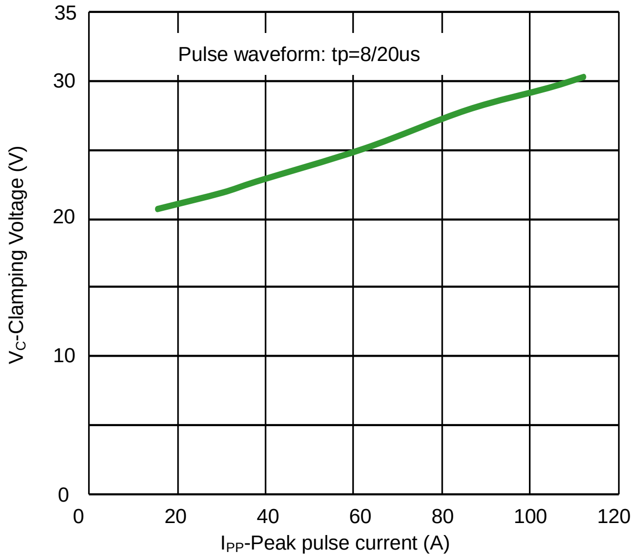


Fig 3. Clamping voltage vs. Peak pulse current

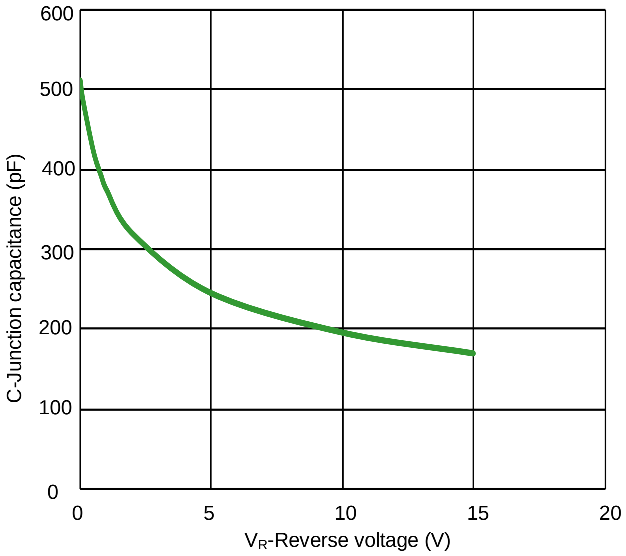


Fig 4. Capacitance vs. Reveres voltage

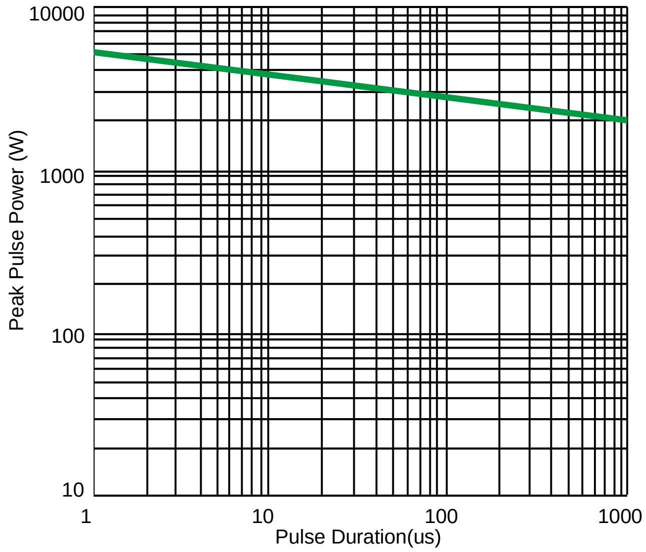
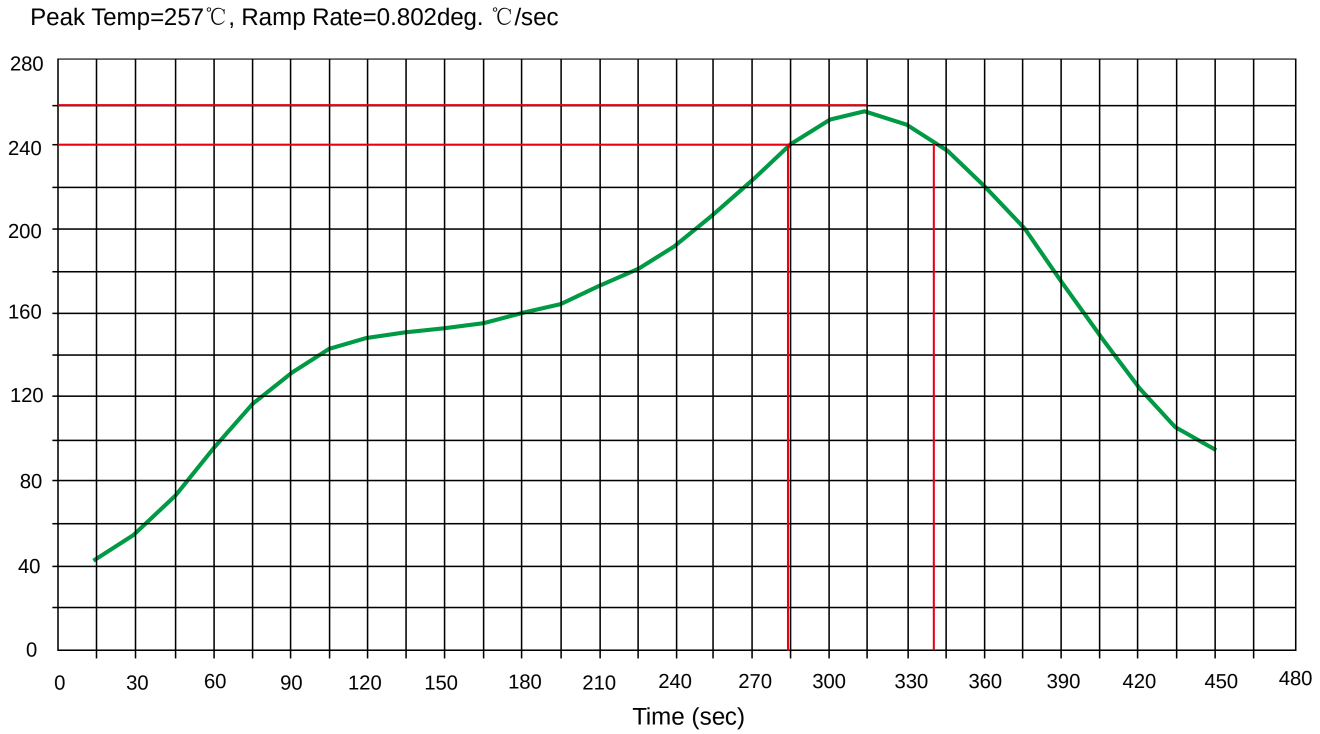


Fig 5. Non Repetitive Peak Pulse Power vs. Pulse time

Solder Reflow Recommendation

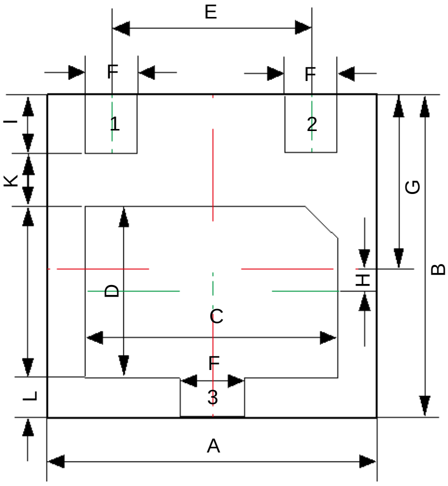


PCB Design

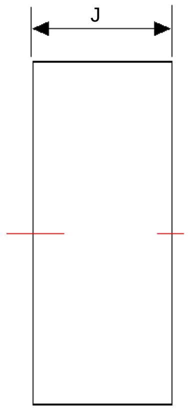
For TVS diodes a low-ohmic and low-inductive path to chassis earth is absolutely mandatory in order to achieve good ESD protection. Novices in the area of ESD protection should take following suggestions to heart:

- 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.

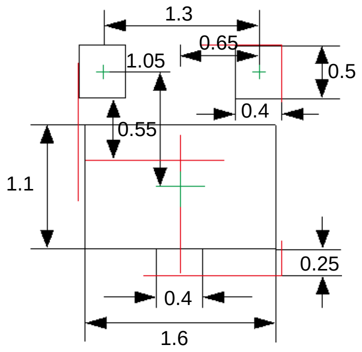
Product dimension (DFN2×2-3L)



Bottom View



Dim	Millimeters	
	MIN	MAX
A	1.90	2.10
B	1.90	2.10
C	1.40	1.60
D	0.90	1.10
E	1.30BSC	
F	0.25	0.35
G	0.95	1.05
H	0.20	0.30
I	0.35	0.45
J		0.65
K	0.30	0.35
L	0.15	0.20



Unit:mm

Recommended Soldering Pad

Ordering information

Device	Package	Shipping
PTVSHC3N15VUL1	DFN2×2-3L (Pb-Free)	3000 / Tape & Reel

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