

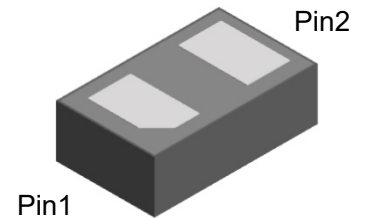
Uni-directional 5V High Capacitance TVS

Description

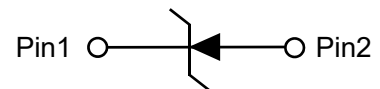
The PTVSHC2EN5VUHM Transient Voltage Suppressor is designed to replace multilayer varistors (MLVs) in portable applications such as cell phones, notebook computers, and PDA's. They feature large cross-sectional area junctions for conducting high transient currents, offer desirable electrical characteristics for board level protection, such as fast response time, lower operating voltage, lower clamping voltage and no device degradation when compared to MLVs.

The PTVSHC2EN5VUHM protects sensitive semiconductor components from damage or upset due to electrostatic discharge (ESD) and other voltage induced transient events.

The PTVSHC2EN5VUHM is available in a DFN1610-2L package with working voltages of 5 volt.



DFN1610-2L(Bottom View)



Circuit Diagram

Feature

- 1700W peak pulse power per line ($t_p = 8/20\mu s$)
- DFN1610-2L package
- Protect one I/O or power line
- Low clamping voltage
- RoHS compliant
- Transient protection for data lines to
IEC 61000-4-2(ESD) $\pm 30kV$ (air), $\pm 30kV$ (contact);
IEC 61000-4-5 (Lightning) 140A (8/20us)



Marking (Top View)

Applications

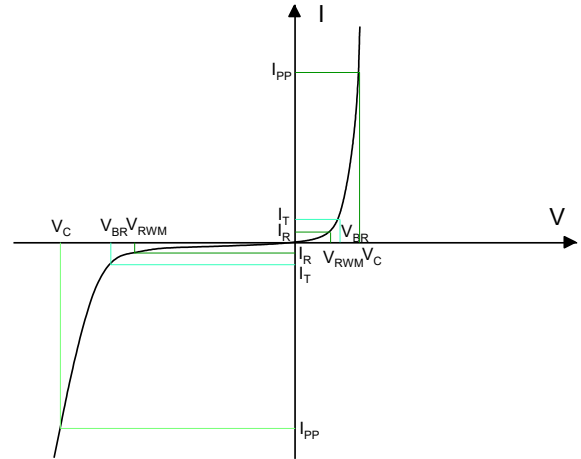
- Cell phone handsets and accessories
- Personal digital assistants (PDA's)
- Notebooks, desktops, and servers
- Portable instrumentation
- Cordless phones
- Digital cameras
- Peripherals
- MP4 players

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_{TRIG}	Reverse trigger Current
V_{HOLD}	Reverse holding voltage
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}	-	-	-	5.0	V
Breakdown Voltage	V_{BR}	$I_t = 1\text{mA}$	5.5	-	9.0	V
Reverse Leakage Current	I_R	$V_{RWM} = 5\text{V}$	-	-	1.0	μA
Clamping Voltage ¹⁾	V_C	TLP = 16A, $t_p = 100\text{ns}$	-	8.5	-	V
Dynamic resistance ¹⁾	R_{DYN}	-	-	0.05	-	Ω
Clamping Voltage ²⁾	V_C	$I_{PP} = 140\text{A}$, $t_p = 8/20\mu\text{s}$	-	12	14	V
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$	-	1100	1600	pF

Notes:

1. TLP parameter: $Z_0 = 50\Omega$, $t_p = 100\text{ns}$, $t_r = 2\text{ns}$, 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}	1700	W
Peak Pulse Current ($t_p = 8/20\mu\text{s}$)	I_{PP}	140	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

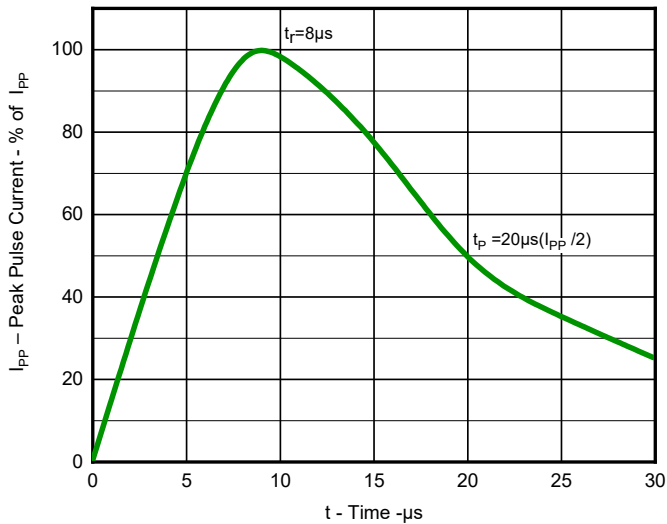


Fig 1. Pulse Waveform(8/20 μs)

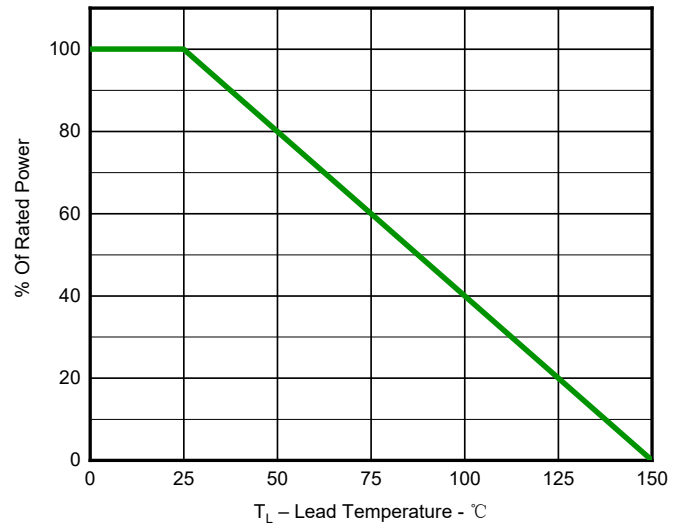


Fig 2. Power Derating Curve

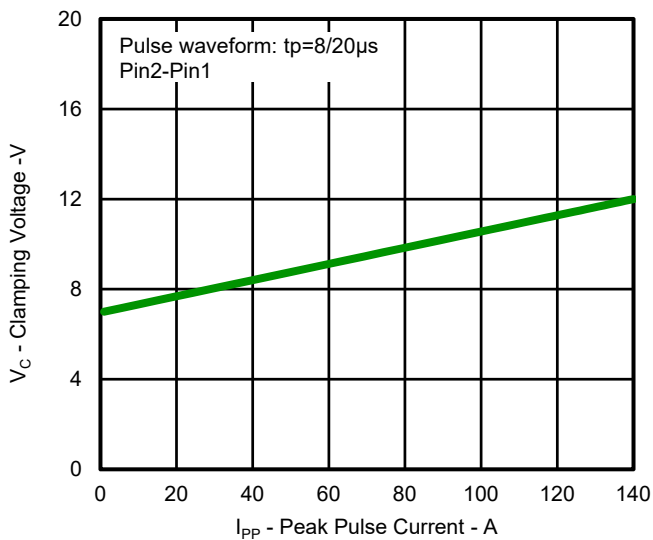


Fig.3 Clamping Voltage vs. Peak Pulse Current

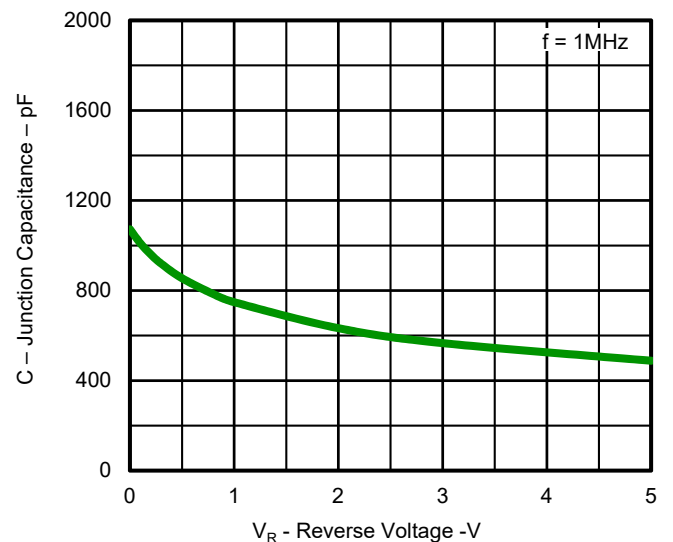


Fig.4 Capacitance vs. Reverse Voltage

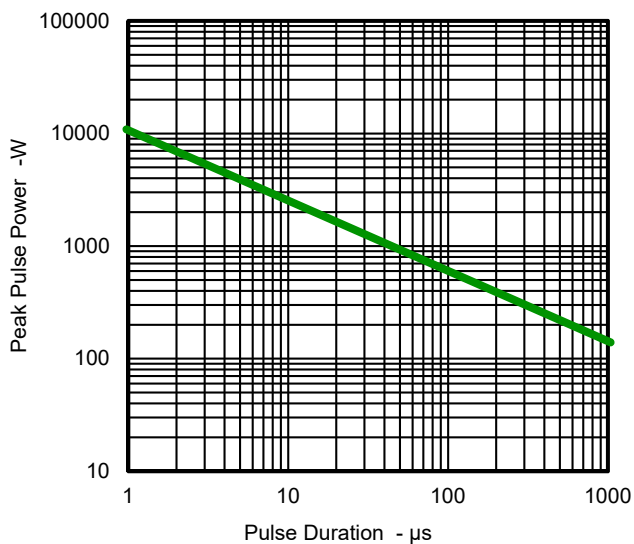


Fig.5 Non-Repetitive Peak Pulse Power vs. Pulse Time

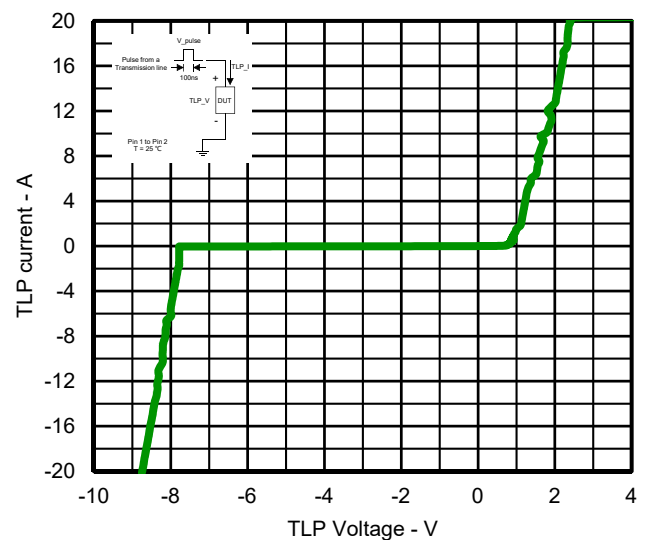
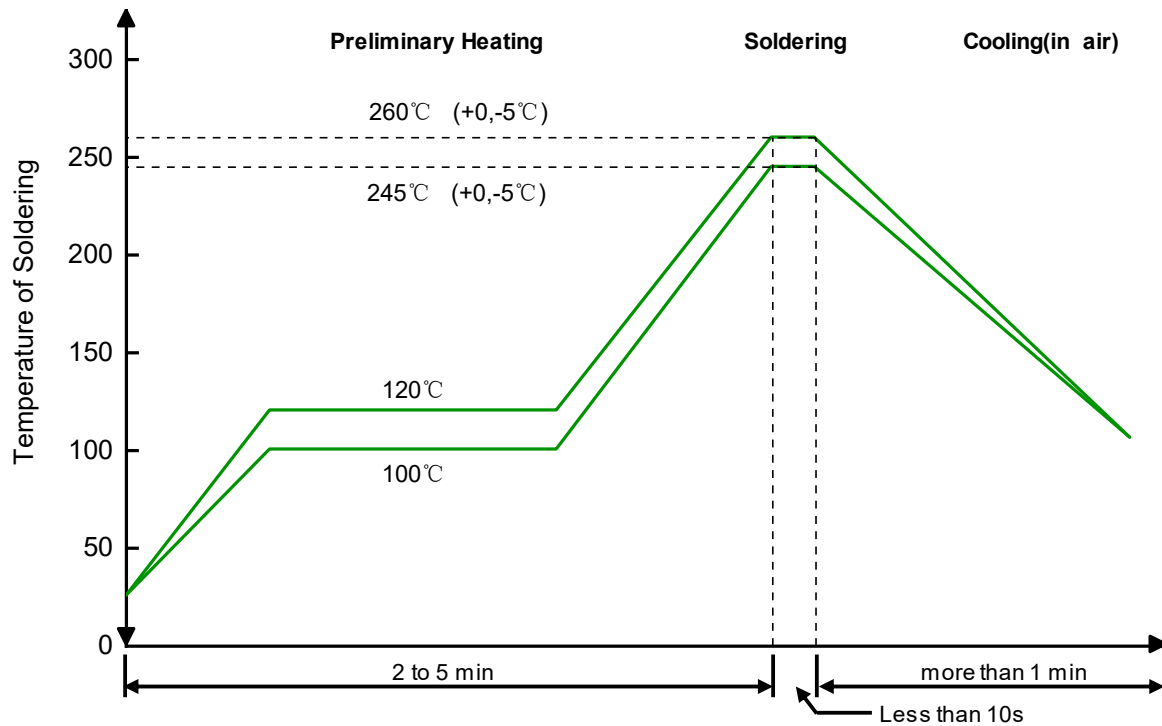


Fig.6 TLP Measurement

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.

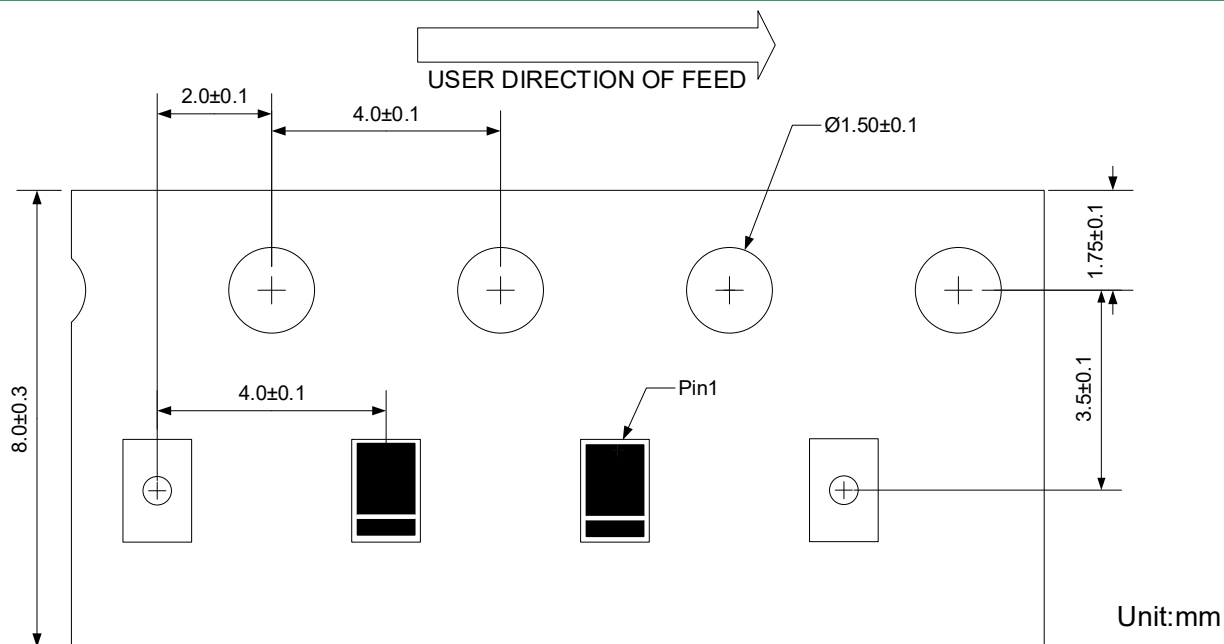
Ordering information

Package	Reel	Shipping
DFN1610-2L	7"	3000 / Tape & Reel

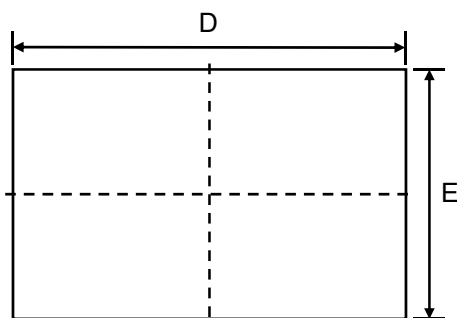
Transient Voltage Suppressor

PTVSHC2EN5VUHM

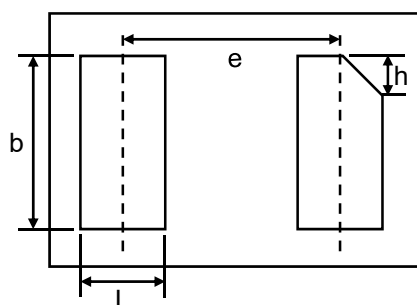
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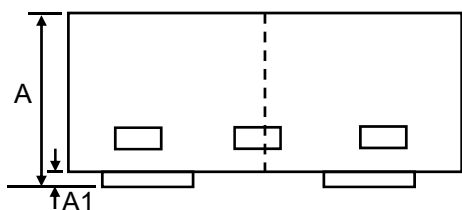
Product Dimension (DFN1610-2L)



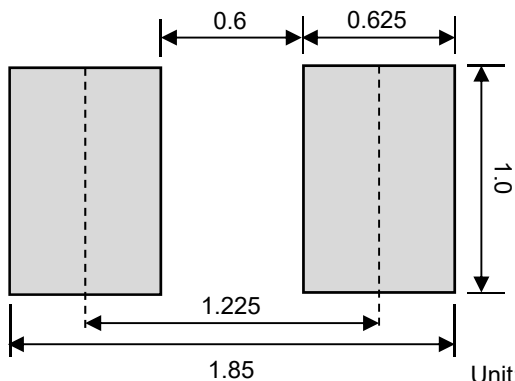
Top View



Bottom View



Side View



Suggested PCB Layout

Unit: mm

Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	0.40	0.60	0.016	0.024
A1	0.00	0.05	0.000	0.002
b	0.75	0.85	0.030	0.033
c	0.05	0.20	0.002	0.008
D	1.55	1.65	0.061	0.065
E	0.95	1.05	0.037	0.041
e	1.10 BSC		0.043 BSC	
L	0.35	0.45	0.014	0.018
h	0.15	0.25	0.006	0.010

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