



Features

- Bidirectional TVS 5 V
- Low capacitance - 0.3 pF
- ESD protection >15 kV
- Replacement for MLV (0402)
- Low Clamping Voltage

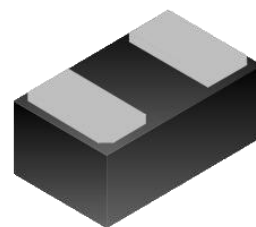
Applications

- High Speed Line :USB1.0/2.0/3.0, VGA, DVI, HDMI
- Serial and Parallel Ports
- Notebooks, Desktops, Servers
- Cellular handsets and accessories

VTSB50X3 ----- SURFACE MOUNT TVS Diodes

General Information

The VTSB50X3 is designed with Vicsemi Punch-Through process TVS technology to protect voltage sensitive components from ESD. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space comes at a premium. Also because of its low capacitance, it is suited for use in high frequency designs such as USB 2.0/3.0 high speed, VGA, DVI, HDMI and other high speed line applications.



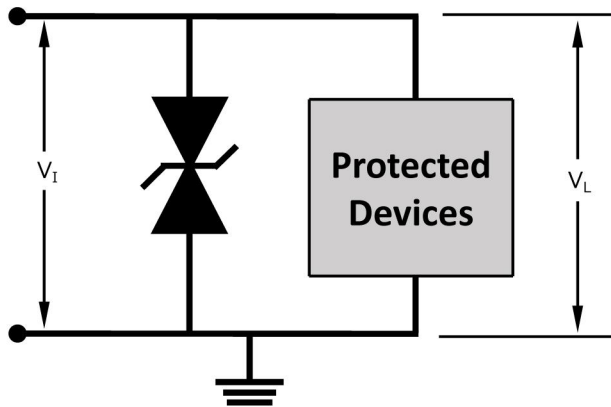
Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Maximum Contact discharge voltage Per IEC61000-4-2	---	8KV	V
Maximum Air discharge voltage Per IEC61000-4-2	---	15KV	V
Maximum Operating temperature	T _{OPER}	-40 to +90	°C
Maximum Storage temperature	T _{STG}	-55 to +125	°C
Maximum lead temperature for soldering during 10s	T _L	260	°C

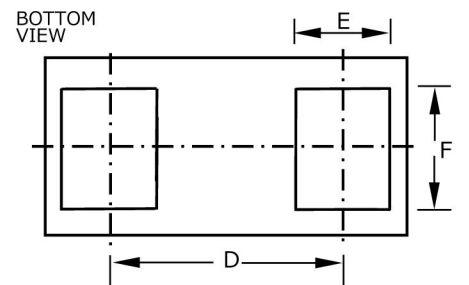
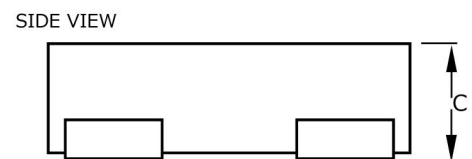
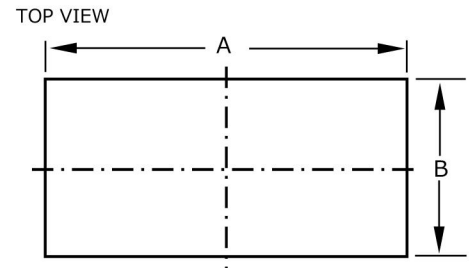
Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Reverse Working Voltage	V _{RWM}	Any I/O pin to GND	---	---	5.0	V
Reverse Breakdown Voltage	V _{BR}	Any I/O pin to GND I _T =1mA	6.0	---	---	V
Positive Clamping Voltage	V _C	I _{PP} =1A, t _p =8/20μ; Any I/O pin to GND	---	---	9.5	V
Reverse Leakage Current	I _L	V _{RWM} =5V ; Any I/O pin to GND	---	---	1.00	uA
Junction Capacitance	C _p	V _{RWM} =0V, f=1MHz ; Any I/O pin to GND	---	0.3	---	pF

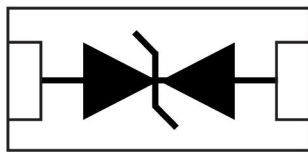
Typical Protection Circuit



Product Dimensions

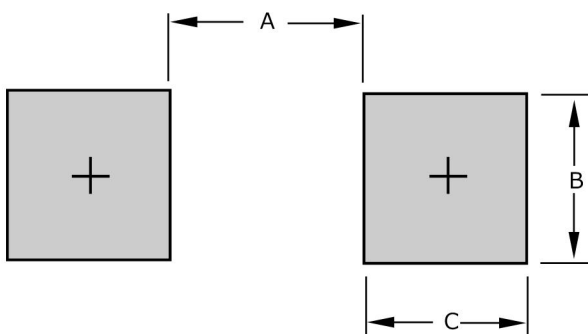


Block Diagram



Bi-directional

Recommended PCB Footprint



Dimension	DFN-2L
A	$\frac{0.30}{(0.012)}$
B	$\frac{0.80}{(0.031)}$
C	$\frac{0.55}{(0.022)}$

Dimension	DFN-2L
A	$\frac{0.95-1.05}{(0.037-0.041)}$
B	$\frac{0.55-0.65}{(0.022-0.026)}$
C	$\frac{0.40-0.50}{(0.016-0.020)}$
D	$\frac{0.65}{(0.026)}$
E	$\frac{0.10-0.35}{(0.004-0.014)}$
F	$\frac{0.40-0.50}{(0.016-0.020)}$

DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$



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Performance Graphs

Figure 1: Power Derating Curve

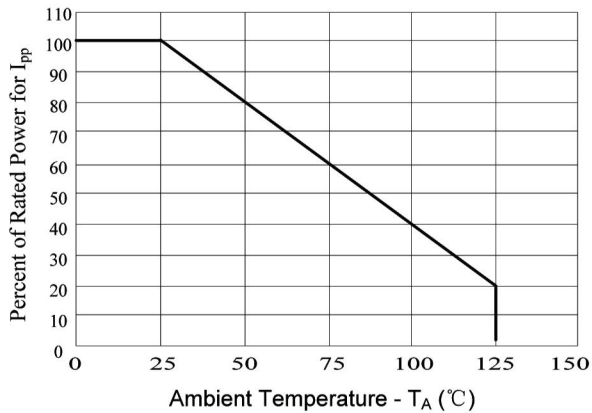


Figure 2: Insertion Loss



Figure 3: Normalized Junction Capacitance vs. Reverse Voltage

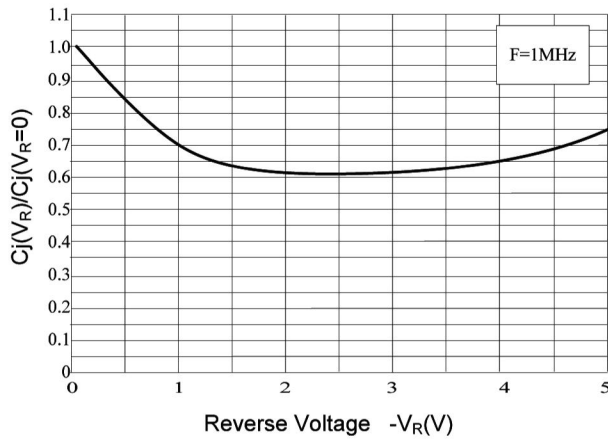


Table 1. IEC 61000-4-2 Discharge Parameters

Level	First Peak Current (A)	Peak Current at 30 ns (A)	Peak Current at 60 ns (A)	Test Voltage (Contact Discharge) (kV)	Test Voltage (Air Discharge) (kV)
1	7.5	4	2	2	2
2	15	8	4	4	4
3	22.5	12	6	6	8
4	30	16	8	8	15

Figure 4. IEC 61000-4-2 Waveform

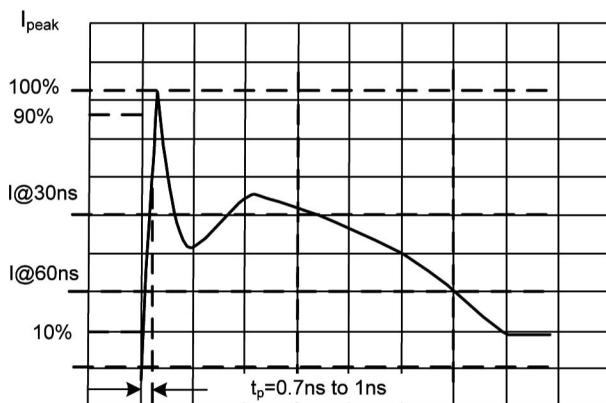
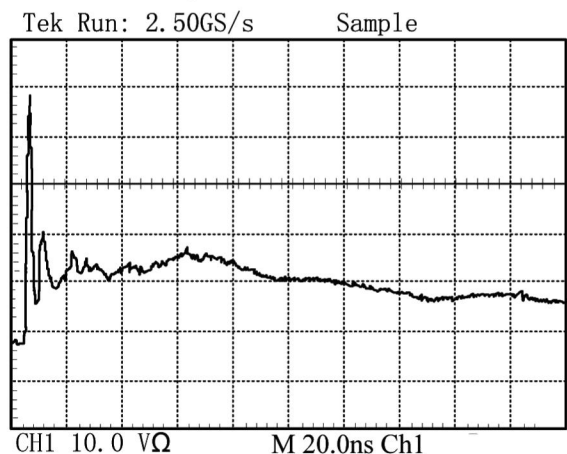
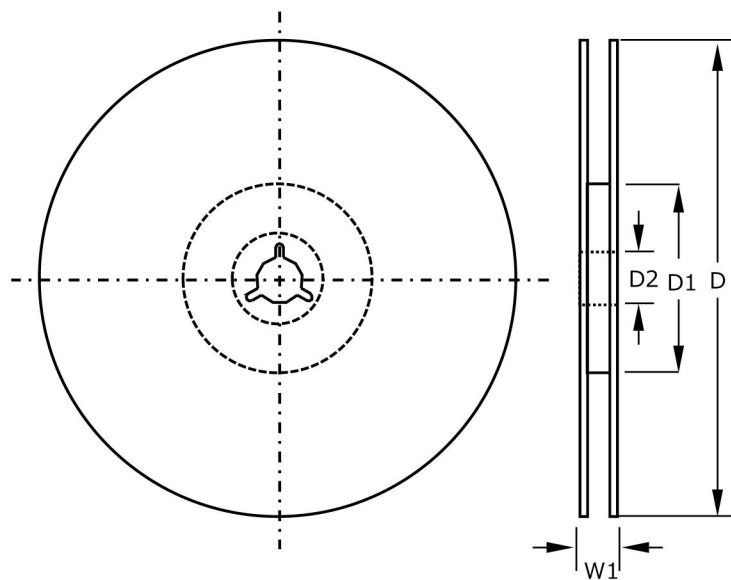
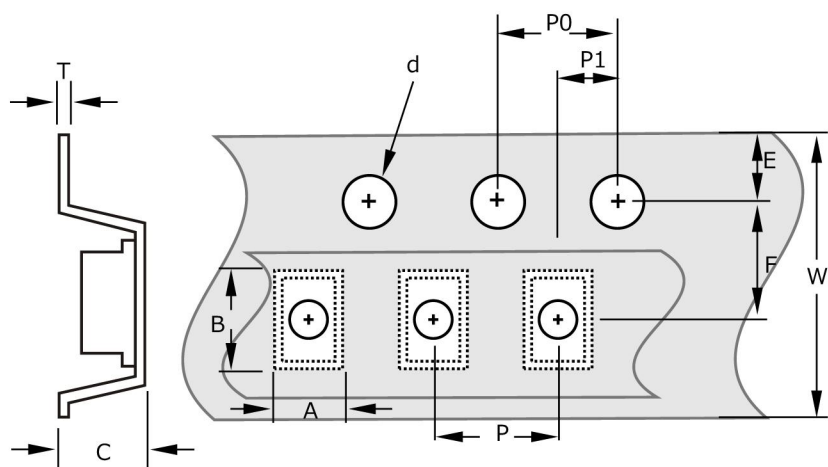


Figure 5: ESD Clamping(8kV Contact per IEC 61000-4-2)



Packaging Information

Symbol	DFN-2L
A	0.7 ± 0.05 (0.028 ± 0.002)
B	1.15 ± 0.05 (0.045 ± 0.002)
C	0.47 ± 0.05 (0.019 ± 0.002)
d	1.55 ± 0.05 (0.061 ± 0.002)
D	180.00 ± 2.00 (7.087 ± 0.079)
D1	60.0 ± 1.00 (2.362 ± 0.039)
D2	13.0 ± 0.20 (0.516 ± 0.008)
E	1.75 ± 0.10 (0.069 ± 0.004)
F	3.50 ± 0.05 (0.138 ± 0.002)
P	4.00 ± 0.10 (0.157 ± 0.004)
P0	4.00 ± 0.10 (0.157 ± 0.004)
P1	2.00 ± 0.05 (0.079 ± 0.002)
T	0.20 ± 0.05 (0.008 ± 0.002)
W	8.00 ± 0.10 (0.315 ± 0.004)
W1	11.6 ± 1.00 (0.457 ± 0.039)



DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

Quantity of products in the taping package

- (1) Standard quantity : 3000 pcs/Reel for the Series.
- (2) Shipping quantity is a multiple of standard quantity.
- (3) For additional information, please contact your local Sales Representative.