

2-Line Ultra Low Capacitance TVS Diode

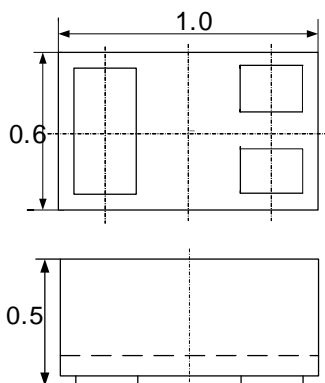
Description

The FTV0502L3 is an uni-directional TVS diode,utilizing leading monolithic silicon technology to provide fast response time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The FTV0502L3 has an ultra-low capacitance with a typical value at 0.6pF, and complies with the IEC 61000-4-2 (ESD) standard with $\pm 25\text{kV}$ air and $\pm 20\text{kV}$ contact discharge. It is assembled into an ultra-small 1.0 x 0.6 x 0.5mm lead-free DFN package. The small size, ultralow capacitance and high ESD surge protection make FTV0502L3 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

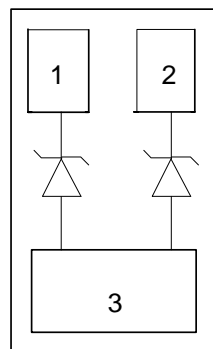
Mechanical Characteristics

- ◆ Package: DFN1006-3 (1.0 x0.6 x0.5mm)
- ◆ Lead Finish: NiPdAu
- ◆ Case Material: "Green" Molding Compound.
- ◆ Moisture Sensitivity: Level 3 per J-STD-020
- ◆ Terminal Connections: See Diagram Below
- ◆ Marking Information: See Below

Dimensions and Pin Configuration



Package Dimensions



Circuit and Pin Schematic

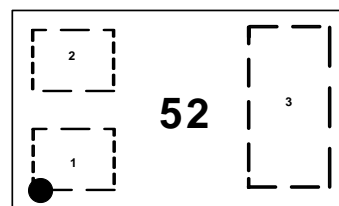
Features

- ◆ Ultra small package: 1.0 x0.6 x0.5mm
- ◆ Ultra low capacitance: 0.6pF typical
- ◆ Ultra low leakage : nA level
- ◆ Operating voltage : 5V
- ◆ Low clamping voltage
- ◆ 3-pin leadless package
- ◆ Up to 2-line protects
- ◆ Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 25\text{kV}$
Contact discharge: $\pm 20\text{kV}$
 - IEC61000-4-5 (Lightning) 5A (8/20 μs)
- ◆ RoHS Compliant

Applications

- ◆ Cellular Handsets and Accessories
- ◆ Display Ports
- ◆ MDDI Ports
- ◆ USB 2.0 and 3.0 Ports
- ◆ HDMI 1.3 and 1.4
- ◆ Digital Visual Interface(DVI)
- ◆ PCI Express and Serial SATA Ports
- ◆ Notebook Computer
- ◆ IEEE 1394

Marking Information



52 = Device Marking Code
Dot denotes Pin1

Ordering Information

Part Number	Marking	Packaging	Reel Size
FTV0502L3	52	10000/Tape & Reel	7 inch

**2-Line Ultra Low Capacitance TVS Diode****Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)**

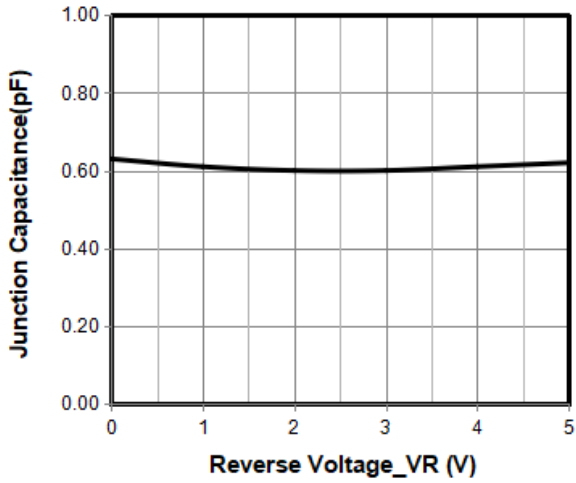
Parameter	Symbol	Value	Unit
Peak Pulse Power(8/20 μs)	Ppk	75	W
Peak Pulse Current(8/20 μs)	I _{PP}	5	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V _{ESD}	± 25 ± 20	kV
Operating Temperature Range	T _J	-55 to +125	$^\circ\text{C}$
Storage Temperature Range	T _{stg}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)

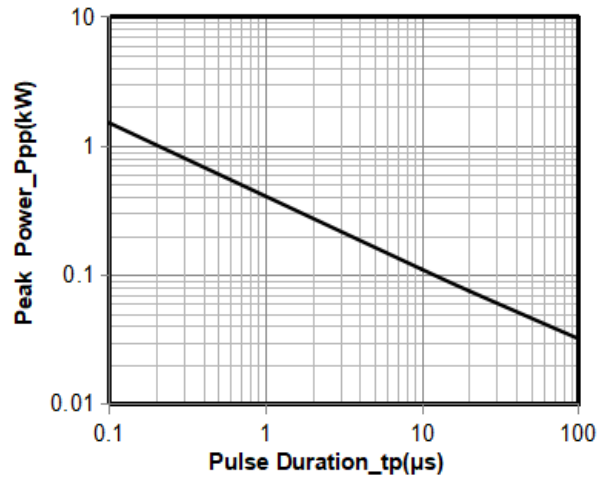
Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V _{RWM}			5	V	Pin 1 or pin 2 to pin 3 and between pin 1 and pin 2
Breakdown Voltage	V _{BR}	6			V	I _T = 1mA, pin 1 or pin 2 to pin 3 and between pin 1 and pin 2
Reverse Leakage Current	I _R			0.5	μA	V _{RWM} = 5V, Pin 1 or pin 2 to pin 3 and between pin 1 and pin 2
Clamping Voltage	V _C			10	V	I _{PP} = 1A (8 x 20 μs pulse), pin 1 or pin 2 to pin 3
Clamping Voltage	V _C			15	V	I _{PP} = 5A (8 x 20 μs pulse), pin 1 or pin 2 to pin 3
Junction Capacitance	C _J		0.3	0.5	pF	V _R = 0V, f = 1MHz, between pin 1 and pin 2
Junction Capacitance	C _J			0.8	pF	V _R = 0V, f = 1MHz, pin 1 or pin 2 to pin 3

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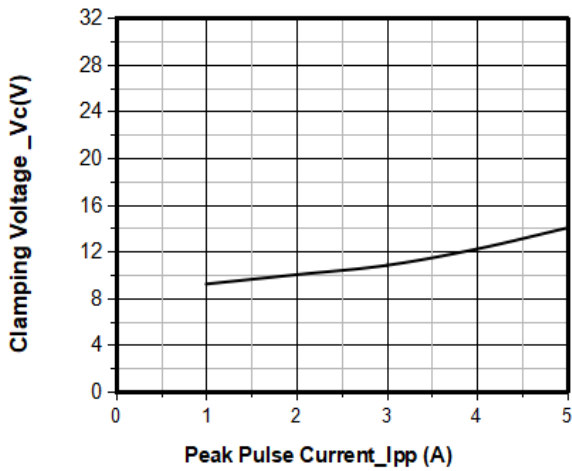
Typical Performance Characteristics (TA=25°C unless otherwise Specified)



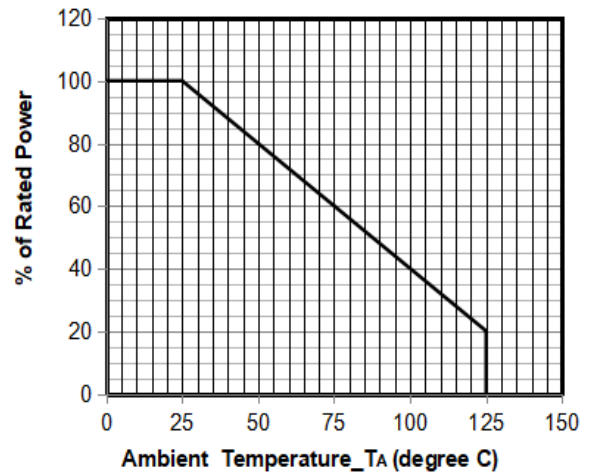
Junction Capacitance vs. Reverse Voltage



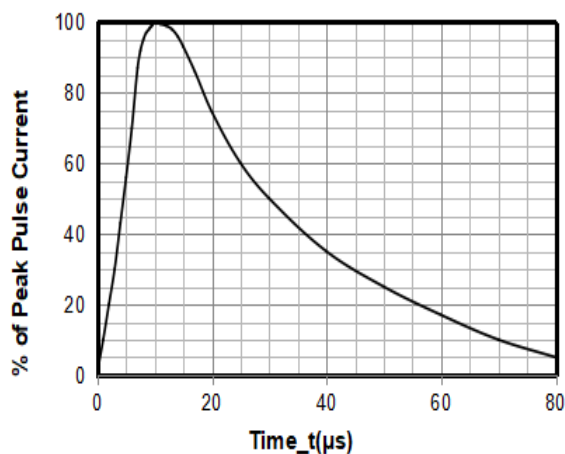
Peak Pulse Power vs. Pulse Time



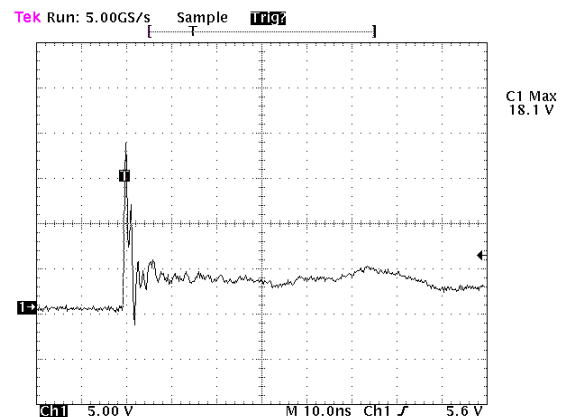
Clamping Voltage vs. Peak Pulse Current



Power Derating Curve



8 X 20μs Pulse Waveform



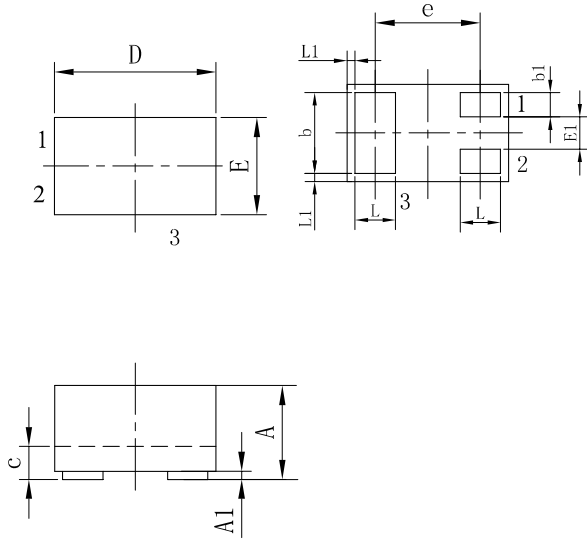
Note : Data is taken with a 10x attenuator

ESD Clamping Voltage

8 kV Contact per IEC61000-4-2

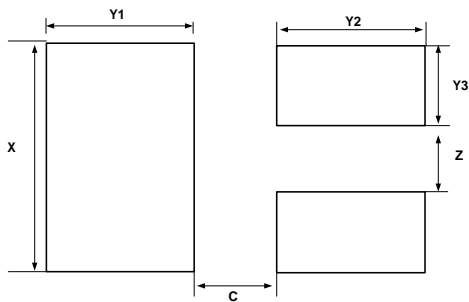
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DFN1006-3 Package Outline Drawing



SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
b1	0.10	0.15	0.20	0.004	0.006	0.008
c	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
E1	0.15	0.20	0.25	0.006	0.008	0.010
L	0.20	0.25	0.30	0.008	0.010	0.012
L1	0.05 REF			0.0002 REF		

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
C	0.25	0.010
X	0.65	0.024
Y1	0.50	0.020
Y2	0.50	0.020
Y3	0.25	0.010
Z	0.20	0.008