

1-Line Ultra Low Capacitance Bi-directional TVS Diode

Features

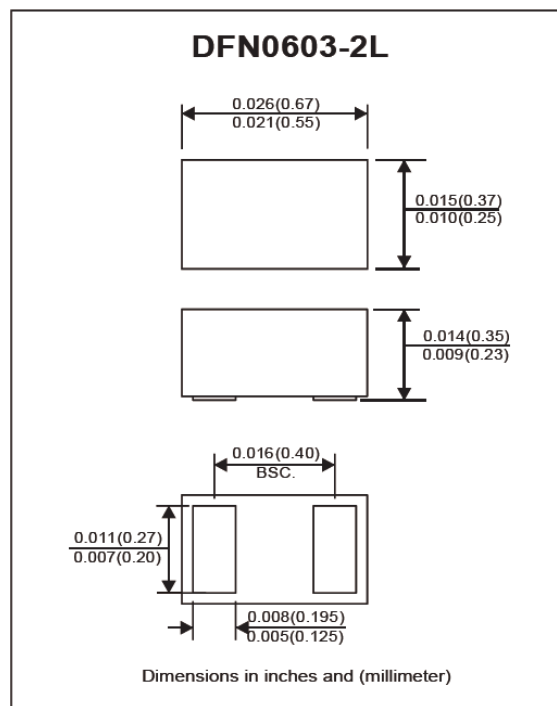
- IEC 61000-4-2 (ESD) $\pm 20\text{kV}$ (air), $\pm 20\text{kV}$ (contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 9A (8/20 μs)
- Ultra low capacitance: 0.14pF typical
- Ultra small package: 0.6x0.3x0.3mm
- Operating voltage: 3.3V
- Low clamping voltage

Applications

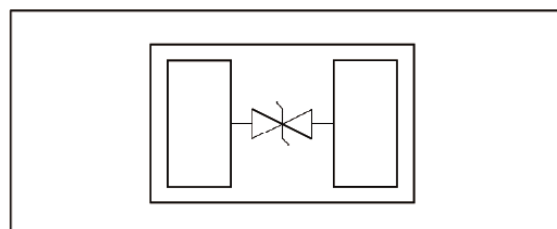
- Cellular Handsets and Accessories
- Display Ports
- MDDI Ports
- USB Ports
- Digital Visual Interface (DVI)
- PCI Express and Serial SATA Ports

Mechanical Characteristics

- Package: DFN0603-2L (0.6x0.3x0.3mm)
- Case Material: "Green" Molding Compound.
- Moisture Sensitivity: Level 1 per J-STD-020
- Material : Halogen free , RoHS compliant



Circuit diagram



Absolute Maximum Ratings (T_A = 25°C Unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power (t _p = 8/20 μs)	P _{PP}	50	W
Peak Pulse Current (t _p = 8/20 μs)	I _{PP}	9	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	± 20	KV
ESD per IEC 61000-4-2 (Contact)		± 20	KV
Operating Temperature Range	T _J	-55 to + 150	°C
Storage Temperature Range	T _{STG}	-55 to + 150	°C
Lead Solder Temperature-Maximum (10 Second Duration)	T _L	260	°C

Electrical Parameters (T_A = 25°C Unless otherwise noted)

Symbol	Parameter
I _{PP}	Reverse Peak Pulse Current
V _C	Clamping Voltage @ I _{PP}
V _{RWM}	Reverse Stand-Off Voltage
I _R	Reverse Leakage Current @ V _{RWM}
V _{BR}	Breakdown Voltage @ I _T
V _T	Trigger Voltage
I _T	Test Current
V _H	Holding Voltage
I _H	Holding Current

Electrical Characteristics (T_A = 25°C Unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Reverse Working Voltage	V _{RWM}				3.3	V
Reverse breakdown Voltage	V _{BR}	I _T = 1mA	4			V
Reverse leakage current	I _R	V _{RWM} = 3.3V			0.01	μA
Clamping Voltage	V _C	I _{PP} = 1A, t _p = 8/20μs		3.2		V
Clamping Voltage	V _C	I _{PP} = 9A, t _p = 8/20μs		5.5	8.0	V
ESD Clamping Voltage	V _C	I _{PP} = 8A , (TLP=0.2/100ns)		4.5		V
ESD Clamping Voltage	V _C	I _{PP} = 16A , (TLP=0.2/100ns)		6.5		V
Dynamic Resistance	R _{DYN}	TLP=0.2/100ns		0.23		Ω
Junction capacitance	C _J	V _R = 1.0V, f = 1MHz		0.14	0.25	pF
Junction capacitance	C _J	V _R = 1.0V, f = 1GHz		0.13		pF

Typical Performance Characteristics ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

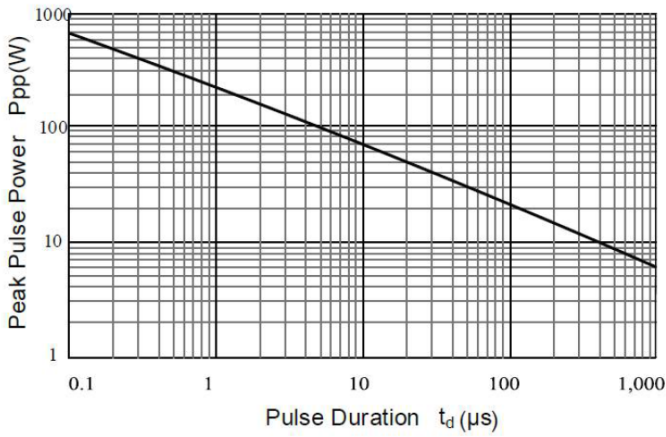


Fig 1. Peak Pulse Power vs. Pulse Time

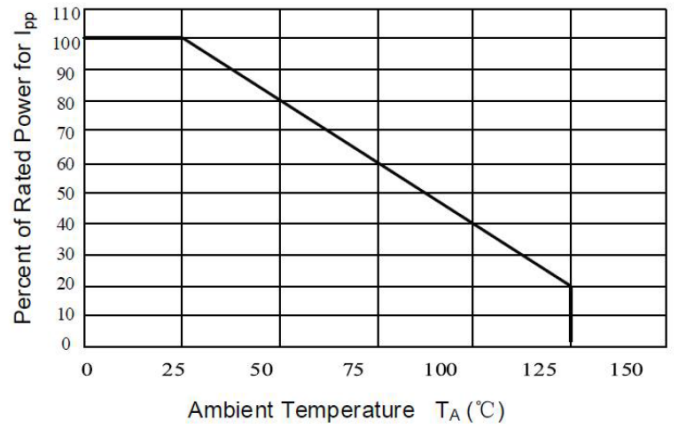


Fig 2. Power Derating Curve

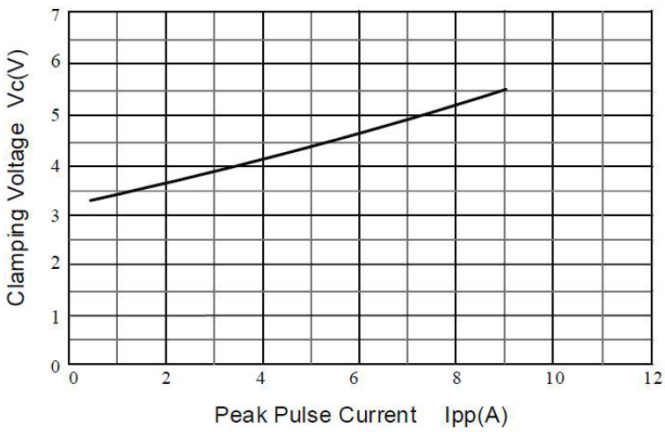


Fig 3. Clamping Voltage vs. Peak Pulse Current

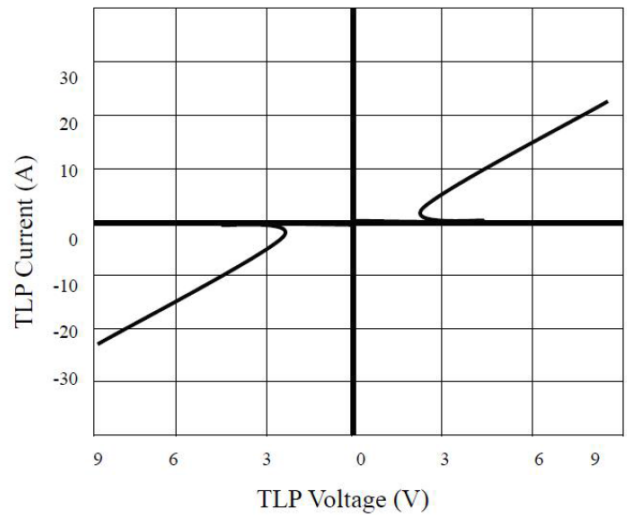


Fig 4. TLP I-V Curve

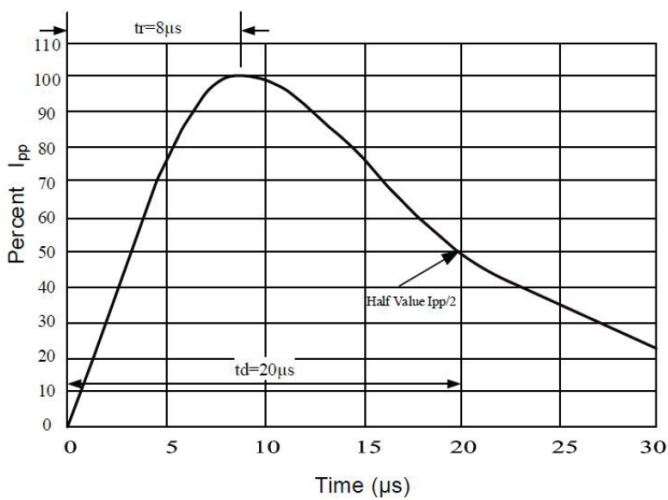
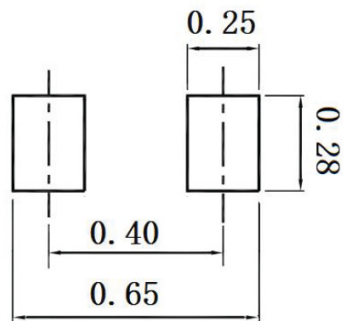


Fig 5. 8/20 μs Pulse Waveform

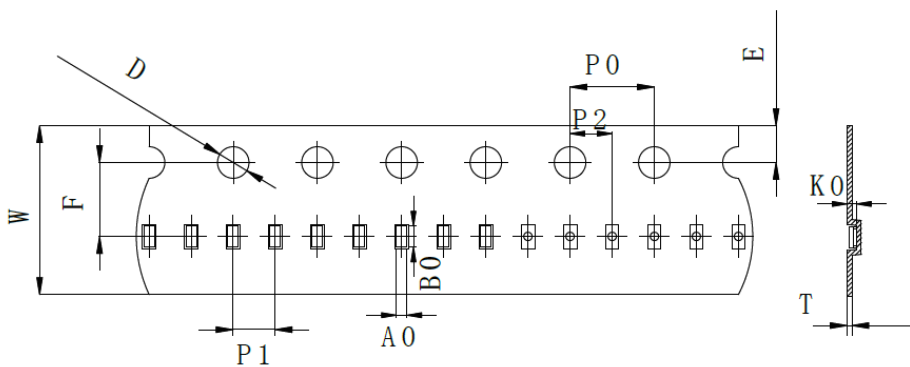
Suggested PAD Layout



Marking Code and Device Orientation in Tape

Marking Code	Device Orientation in Tape

Tape and Reel Specification



Symbol	Millimeters
W	8±0.1
E	1.75±0.1
F	3.5±0.05
P0	4±0.1
D	1.5±0.1
P2	2±0.05
P1	2±0.1
T	0.23±0.02
A0	0.34±0.05
B0	0.67±0.05
K0	0.4±0.05

Ordering information

Part Number	Package	Base qty	Reel Size	Delivery mode
		(pcs)	(inch)	
STWD6033BSL	DFN0603-2L	9,000	7	Tape and reel