

1-Line Bi-directional TVS Diode

Features

- Ultra low leakage: nA level
- Operating voltage: 30V
- Low clamping voltage
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
Air discharge: $\pm 25\text{kV}$
Contact discharge: $\pm 15\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 3A (8/20 μs)
- RoHS Compliant

Applications

- Cellular Handsets & Accessories
- Keypads, Side keys, Audio Ports
- Portable Instrumentation
- Notebooks, Desktops, and Servers
- Digital Lines
- Tablet PC

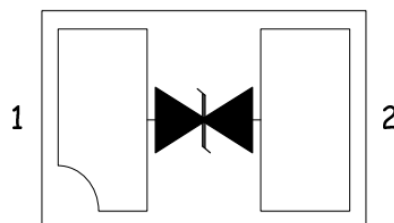
Mechanical Characteristics

- Package: DFN1006
- Lead Finish: Lead Free
- UL Flammability Classification Rating 94V-0
- Quantity Per Reel: 10,000pcs
- Reel Size: 7 inch
- Device Marking: DL

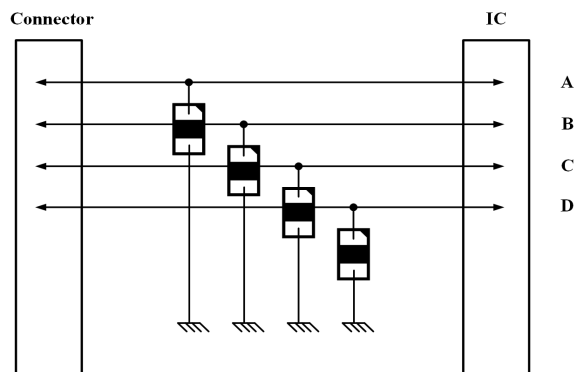
Dimensions DFN1006



Pin Configuration



Typic Application Schematic



Absolute Maximum Ratings (T_{amb}=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20 μs)	P _{pp}	171	W
ESD per IEC 61000-4-2 (Air)	V _{ESD}	± 25	Kv
ESD per IEC 61000-4-2 (Contact)		± 15	
Operating Temperature Range	T _J	-40 to +125	°C
Storage Temperature Range	T _{STJ}	-55 to +150	°C

Electrical Characteristics (TA=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				30	V
Breakdown Voltage	V_{BR}	$I_T = 1\text{mA}$	30.8	33.7	37	V
Reverse Leakage Current	I_R	$V_{RWM} = 30\text{V}$			1	μA
Clamping Voltage	V_C	$I_{PP} = 3\text{A}$ (8 x 20 μs pulse)			57	V
Junction Capacitance	C_J	$V_R = 0\text{V}$, $f = 1\text{MHz}$		16		pF

Typical Characteristics

Fig1. 8/20 μs Pulse Waveform

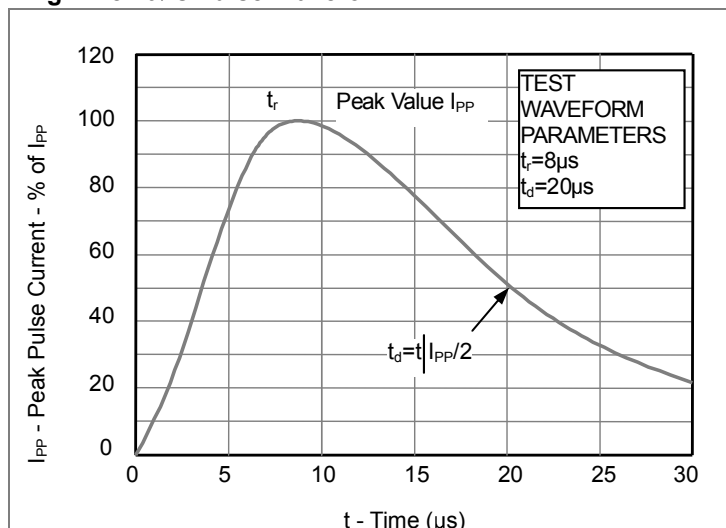


Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)

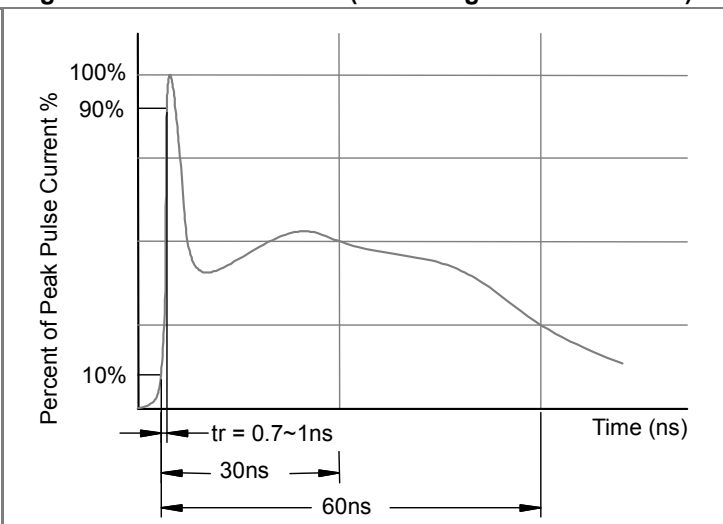
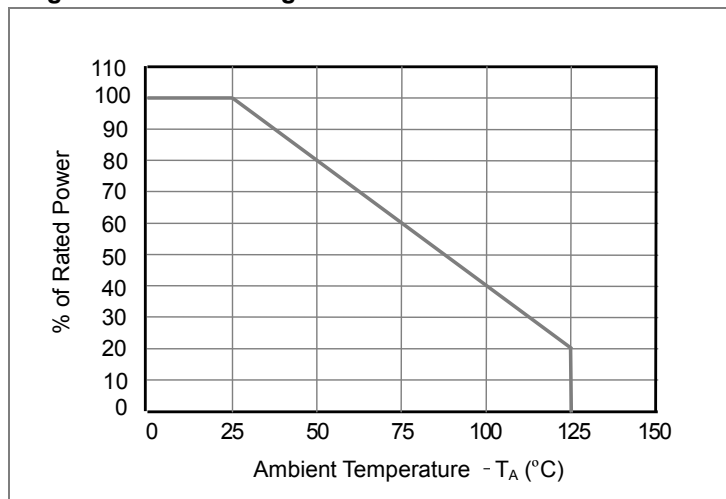
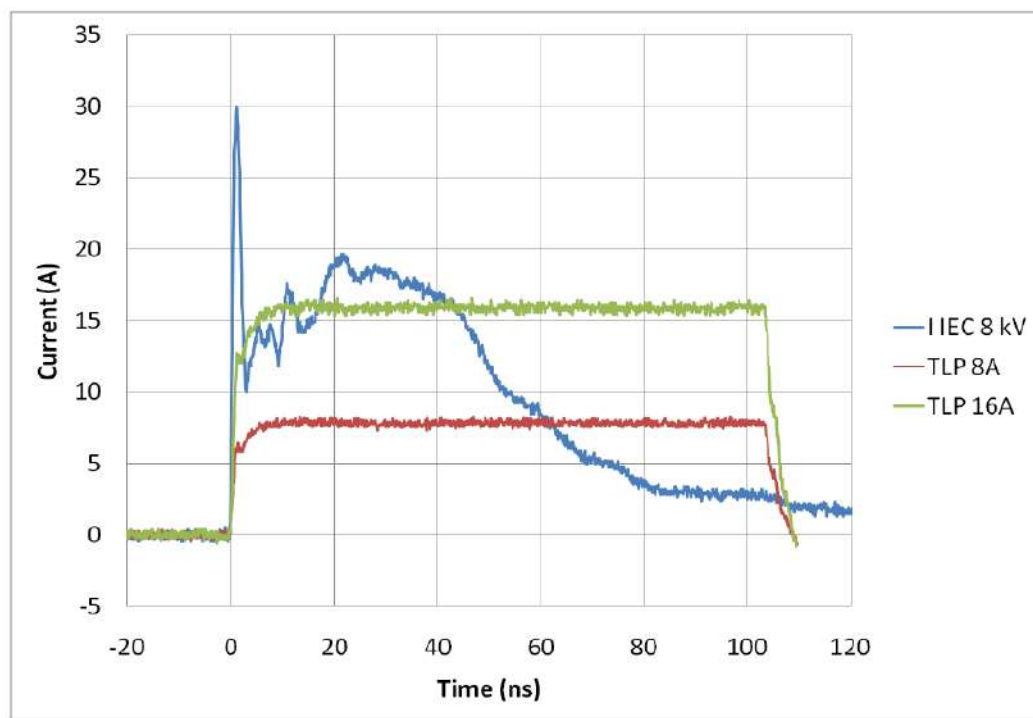


Fig3. Power Derating Curve



Transmission Line Pulse (TLP)

Transmission Line Pulse (TLP) is a measurement technique used in the Electrostatic Discharge (ESD) arena to characterize performance attributes of devices under ESD stresses. TLP is able to obtain current versus voltage (I-V) curves in which each data point is obtained with a 100 ns long pulse, with currents up to 40 A. TLP was first used in the ESD field to study human body model (HBM) in integrated circuits, but it is an equally valid tool in the field of system level ESD. The applicability of TLP to system level ESD is illustrated in Figure 1, which compares an 8 kV IEC 61000-4-2 current waveform with TLP current pulses of 8 and 16 A. The current levels and time duration for the pulses are similar and the initial rise time for the TLP pulse is comparable to the rise time of the IEC 61000-4-2's initial current spike. This application note will give a basic introduction to TLP measurements and explain the datasheet parameters extracted from TLP for SDI Technology's protection products.



Comparison
Between 8 kV IEC
61000-4-2 and 8
A and 16 A TLP
Waveforms

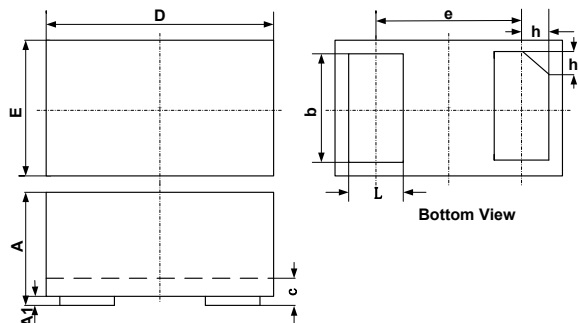
Comparison of a Current Waveform of IEC 61000-4-2 with TLP Pulses at 8 and 16 A.

The IEC 61000-4-2 ESD waveforms is true to the Standard and is shown here as captured on an oscilloscope.

The points A, B, and C show the points on the waveforms specified in IEC 61000-4-2.

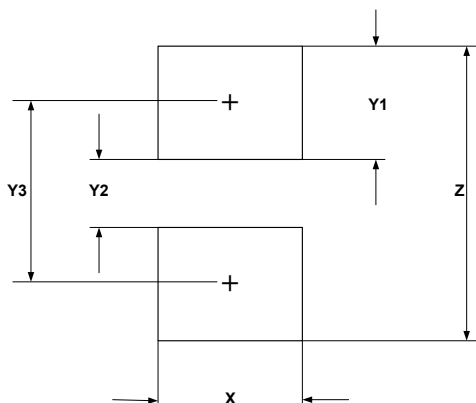
Transmission Line Pulse (TLP) Version.

DFN1006 PACKAGE OUTLINE & DIMENSIONS



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
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
L	0.20	0.25	0.30	0.008	0.010	0.012
h	0.07	0.12	0.17	0.003	0.005	0.007

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.60	0.024
Y1	0.50	0.020
Y2	0.30	0.012
Y3	0.80	0.032
Z	1.30	0.052