

Transient Voltage Suppressors for ESD Protection

ESD3.3V02D-CKN

Description

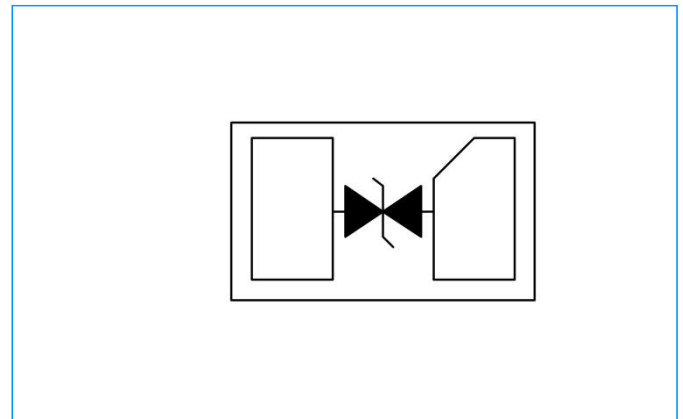
The ESD3.3V02D-CKN is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium. Because of its small size, it is suited for use in cellular phones, MP3 players, digital cameras and many other portable applications where board space is at a premium.



Feature

- ◆ Protects One Bidirectional I/O Line
- ◆ Low Clamping Voltage
- ◆ Surface mount package.
- ◆ Ultra small SMD package.
- ◆ Stand-off Voltage: 3.3 V
- ◆ Low leakage current
- ◆ 125 Watts Peak Pulse Power per Line (tp=8/20μs)
- ◆ IEC61000-4-5 (LIGHTING) 8.5A (8/20μs)
- ◆ Provides ESD protection to IEC61000-4-2(ESD):
 - ±30kV (air discharge)
 - ±30kV (contact discharge);

Functional Diagram



Applications

- ◆ Cell Phone Handsets and Accessories
- ◆ I²C Bus Protection
- ◆ Personal Digital Assistants (PDA)
- ◆ Notebooks, Desktops, and Servers
- ◆ Micro controller Input Protection
- ◆ Peripherals
- ◆ Parallel & Serial Port Protection

Mechanical Data

- ◆ Case: 0201/DFN0603 package, molded plastic.
- ◆ Molding Compound Flammability Rating : UL 94V-0
- ◆ Weight 0.3 Milligrams (Approximate)
- ◆ Mounting position: Any

Mechanical Characteristics

Symbol	Parameter	Value	Units
P _{PP}	Peak Pulse Power (tp=8/20μs waveform)	125	Watts
T _L	Lead Soldering Temperature	260 (10 sec.)	°C
T _{STG}	Storage Temperature Range	-55 to +150	°C
T _J	Operating Junction Temperature Range	-40 to +125	°C

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Electrical Characteristics (@ 25°C Unless Otherwise Specified)

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse Working Voltage	V_{RWM}	--	--	--	3.3	V
Reverse Breakdown Voltage	V_{BR}	$I_T=1mA$	3.8	--	--	V
Reverse Leakage Current	I_R	$V_{RWM}=3.3V, T=25^{\circ}C;$	--	--	0.1	μA
Junction capacitance	C_J	$V_R=0V, f=1MHz;$	--	10	--	pF
Positive Clamping Voltage	V_C	$I_{PP}=8.5A, T_P=8/20\mu s;$	--	9.5	15.0	V
TLP Clamping Voltage	V_{CL}	$I_{PP}=1A$	--	5.0	--	V
		$I_{PP}=8A$	--	7.7	--	V
		$I_{PP}=16A$	--	10.0	--	V

Characteristic Curves

Fig1. 8/20 μs Pulse Waveform

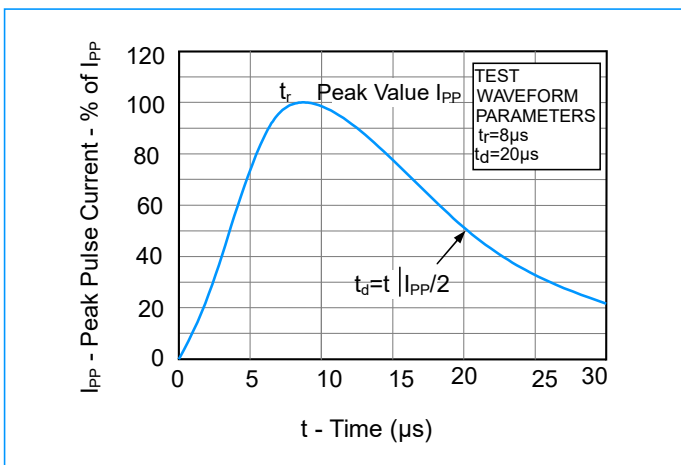


Fig2. Power Rating Derating Curve

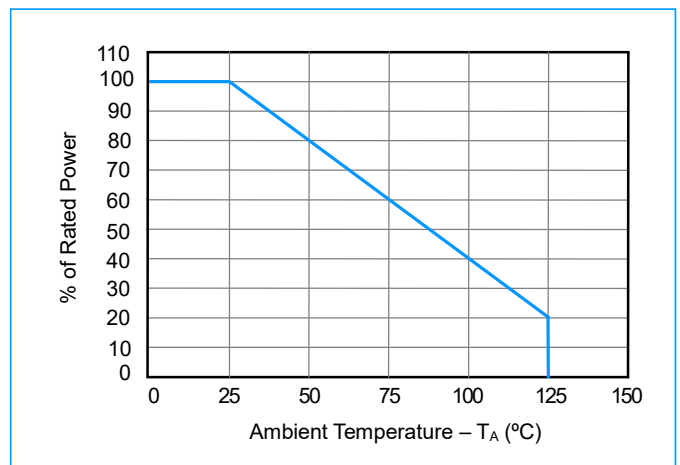


Fig3. Clamping Voltage vs. Peak Pulse Current

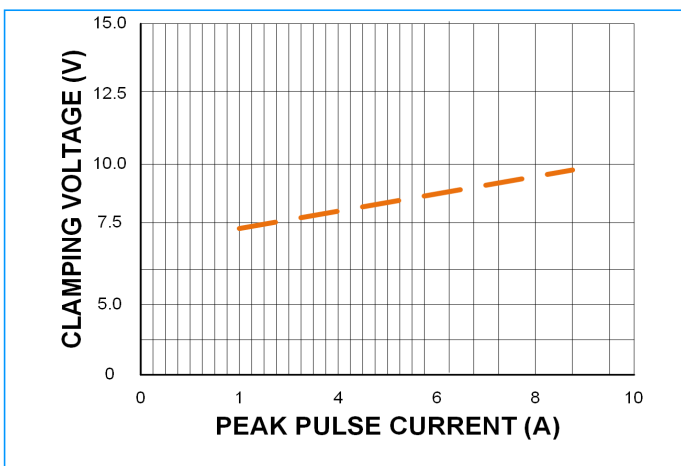
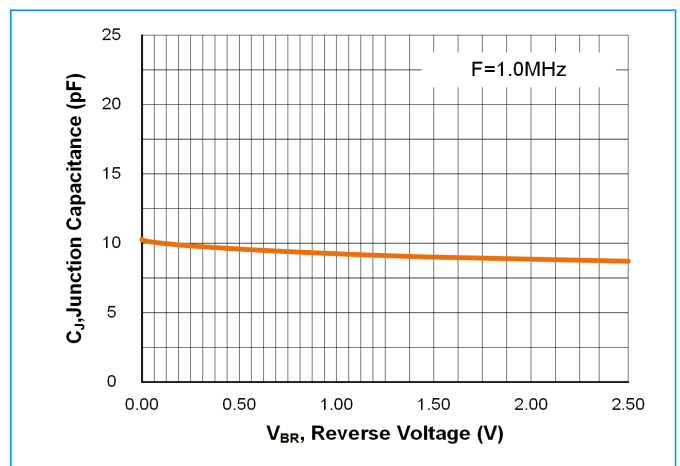


Fig4. Typic Capacitance vs. Reverse Voltage

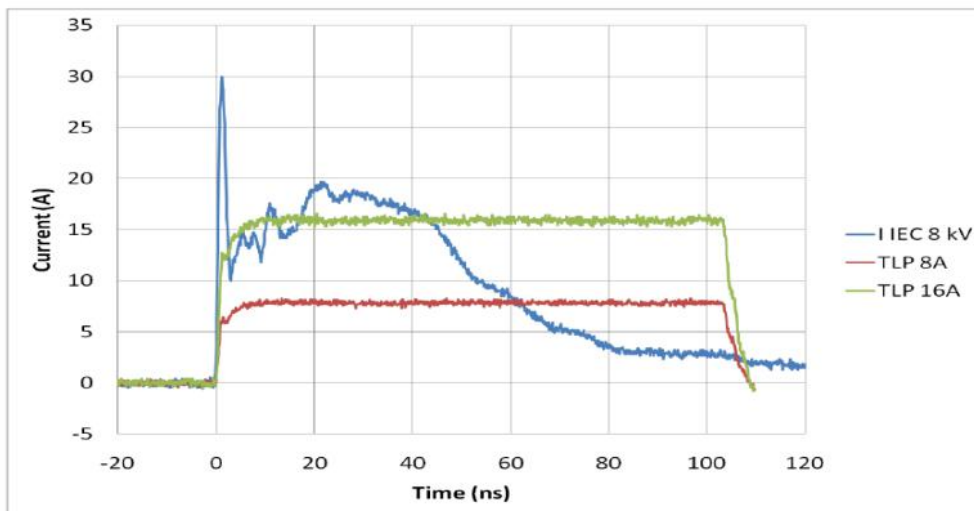


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Transmission Line Pulse (TLP)

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.

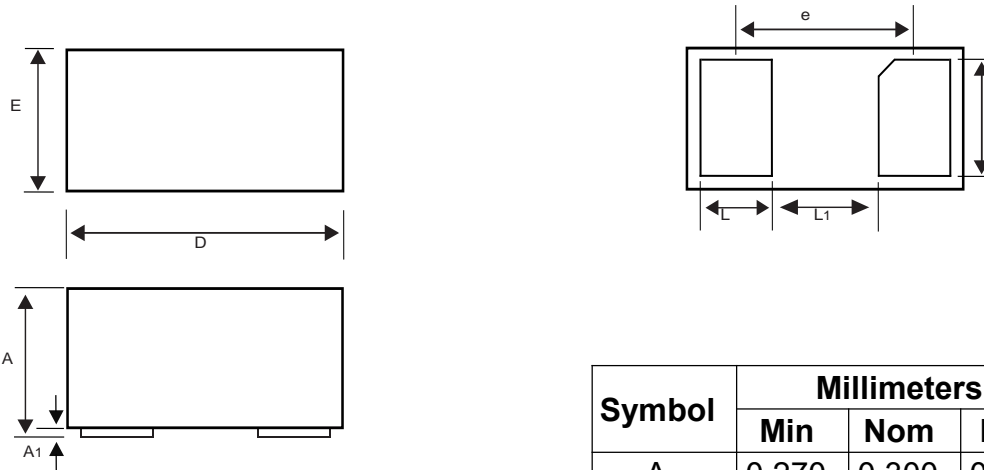
Transmission Line Pulse (TLP) Version.

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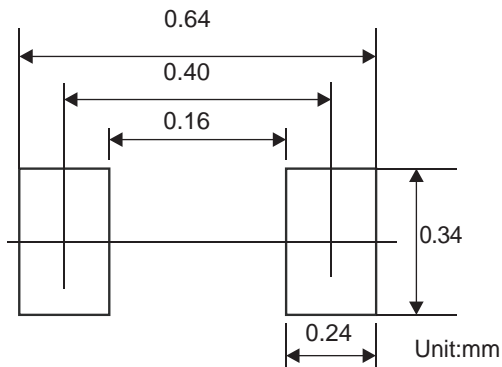
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0201/DFN0603 Package Outline & Dimensions

0201/DFN0603



Suggested PAD Layout



Symbol	Millimeters		
	Min	Nom	Max
A	0.270	0.300	0.340
A1	0	0.020	0.050
D	0.550	0.600	0.650
E	0.250	0.300	0.350
e	0.340REF		
L	0.140	0.180	0.240
b	0.200	0.250	0.300
L1	0.150REF		

Ordering Information

Device	Marking	Package	Quantity	Reel Size
ESD3.3V02D-CKN	F	0201/DFN0603	12,000pcs/Reel	7 inch