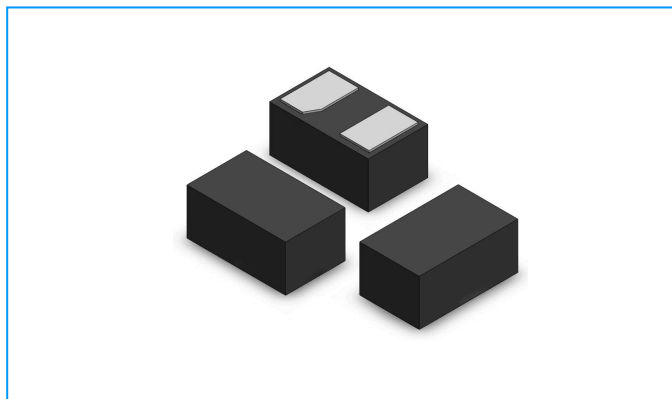


## Transient Voltage Suppressors for ESD Protection

### ESD18V02D-CKN

#### Description

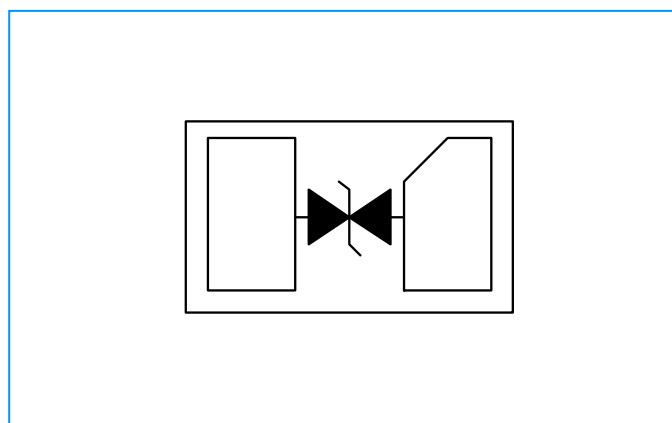
The ESD18V02D-CKN is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium. Because of its small size, it is suited 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: 18.0 V
- ◆ Low leakage current
- ◆ 76 Watts Peak Pulse Power per Line (tp=8/20μs)
- ◆ IEC61000-4-5 (LIGHTING) 2.0A (8/20μs)
- ◆ Provides ESD protection to IEC61000-4-2(ESD):  
     ±15kV (air discharge)  
     ±8kV (contact discharge);

#### Functional Diagram



#### Applications

- ◆ Cell Phone Handsets and Accessories
- ◆ I<sup>2</sup>C 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 <sub>PP</sub>	Peak Pulse Power (tp=8/20μs waveform)	76	Watts
T <sub>L</sub>	Lead Soldering Temperature	260 (10 sec.)	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-40 to +125	°C

# Transient Voltage Suppressors for ESD Protection

## ESD18V02D-CKN

### Electrical Characteristics (@ 25°C Unless Otherwise Specified)

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse Working Voltage	$V_{RWM}$	--	--	--	18.0	V
Reverse Breakdown Voltage	$V_{BR}$	$I_T=1mA$	19.5	--	--	V
Reverse Leakage Current	$I_R$	$V_{RWM}=18.0V, T=25^{\circ}C;$	--	--	1.0	$\mu A$
Junction capacitance	$C_J$	$V_R=0V, f=1MHz;$	--	3.0	--	pF
Positive Clamping Voltage	$V_C$	$I_{PP}=2.0A, T_P=8/20\mu s;$	--	35.0	38.0	V
TLP Clamping Voltage	$V_{CL}$	$I_{PP}=1A$	--	24.0	--	V
		$I_{PP}=5A$	--	30.0	--	V
		$I_{PP}=8A$	--	36.0	--	V

### Characteristic Curves

Fig1. 8/20 $\mu s$  Pulse Waveform

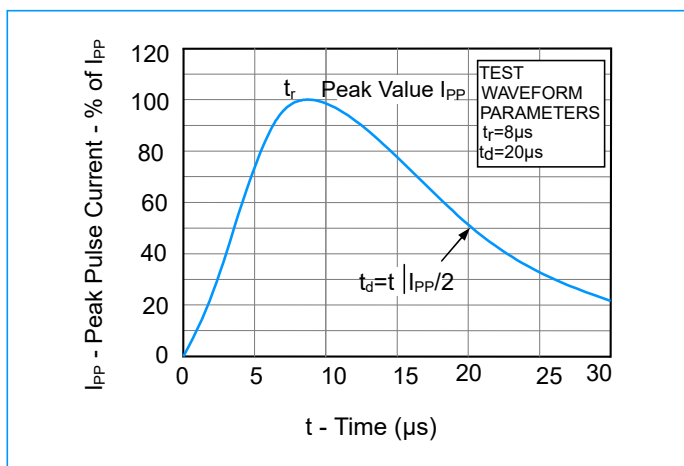


Fig2. Power Rating Derating Curve

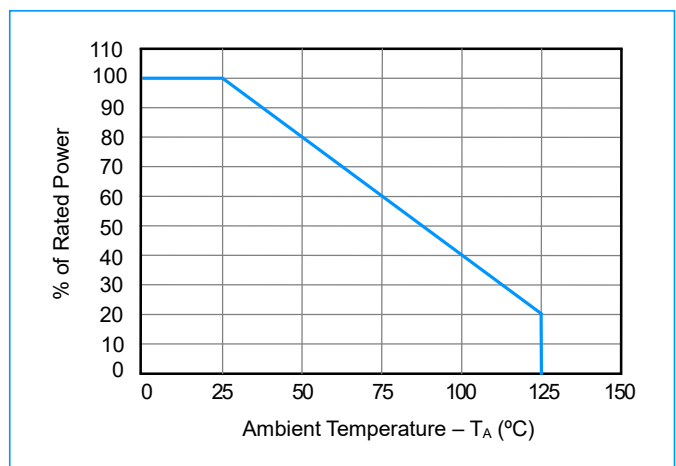


Fig3. Clamping Voltage vs. Peak Pulse Current

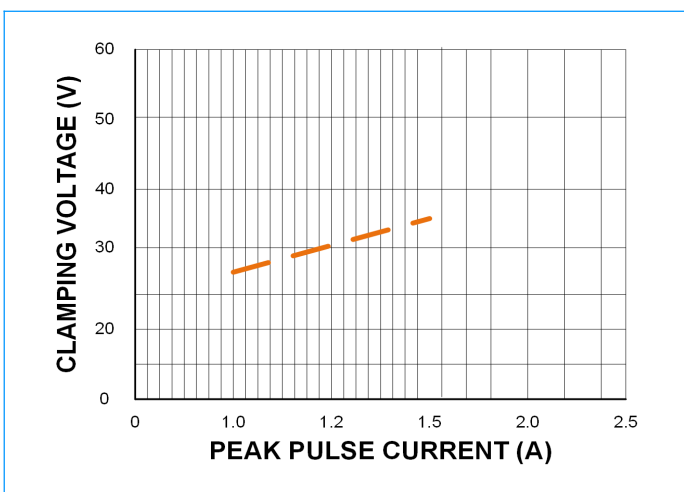
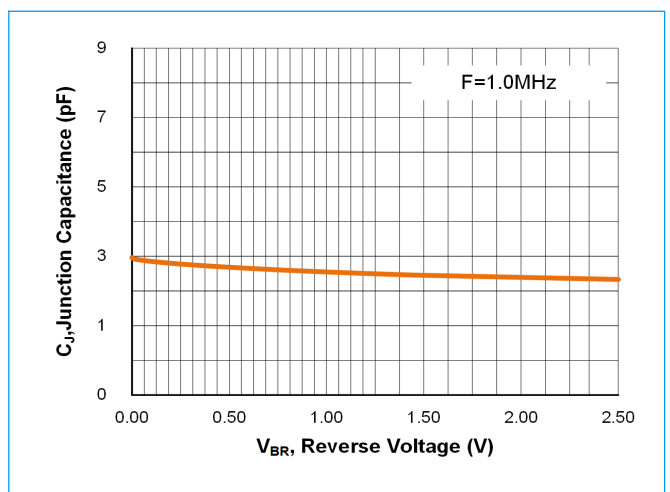


Fig4. Typical Capacitance vs. Reverse Voltage

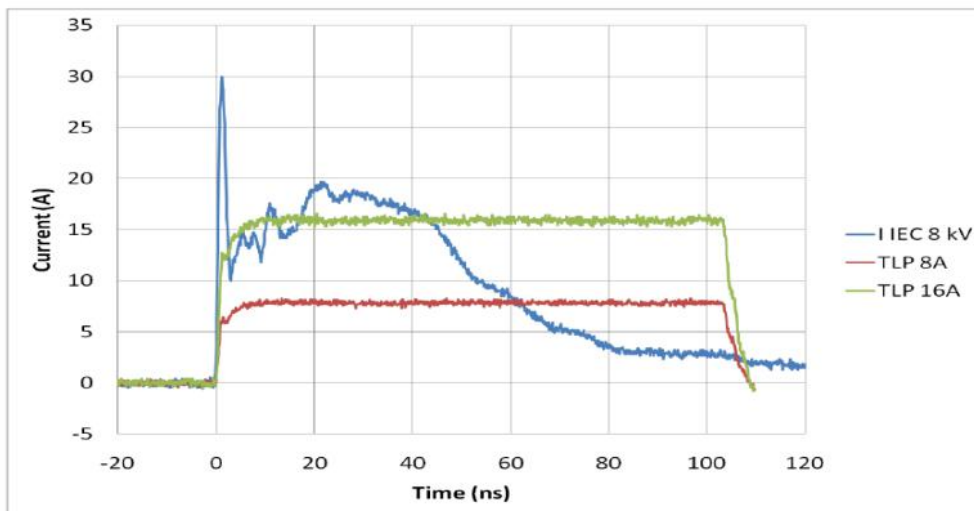


## Transient Voltage Suppressors for ESD Protection

### ESD18V02D-CKN

#### 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.

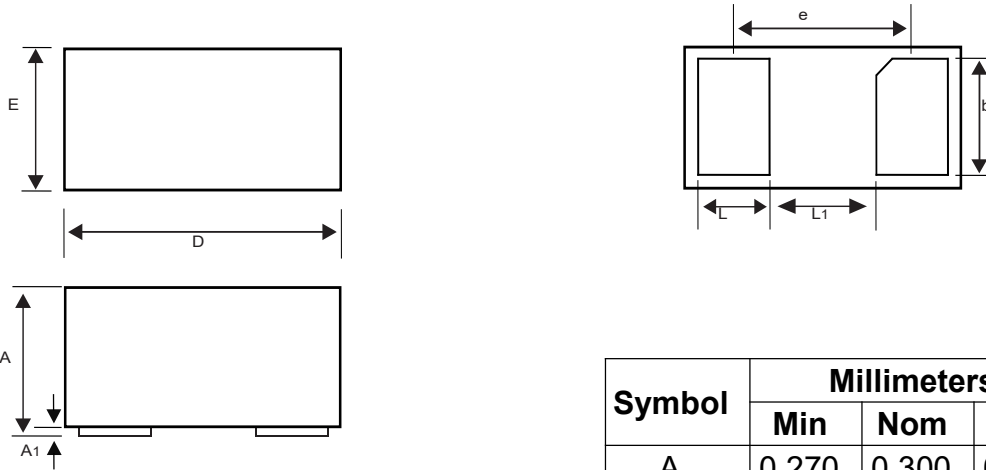
Transmission Line Pulse (TLP) Version.

## Transient Voltage Suppressors for ESD Protection

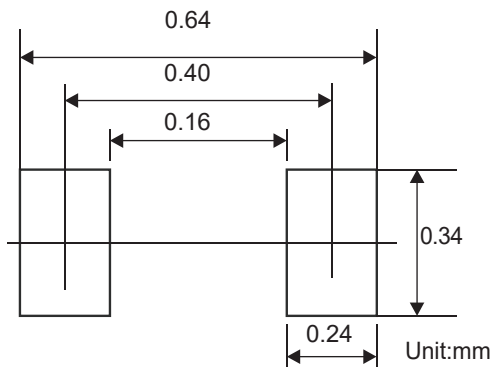
### ESD18V02D-CKN

#### 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
ESD18V02D-CKN	P	0201/DFN0603	10,000pcs/Reel	7 inch