

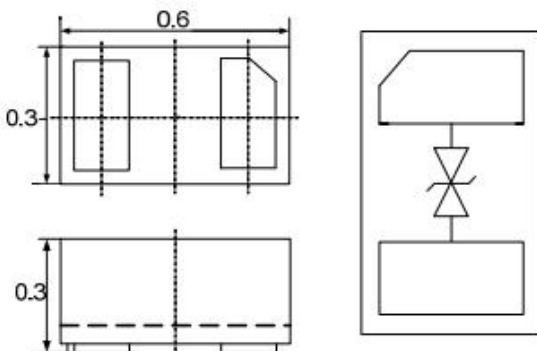
Description

The E063V309 is a bi-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 data and power line. The E063V309 complies with the IEC 61000-4-2 (ESD) standard with $\pm 15\text{kV}$ air and $\pm 15\text{kV}$ contact discharge. It is assembled into an ultra-small 0.6x0.3x0.3mm lead-free DFN package. The ultra small size and high ESD surge protection make E063V309 an ideal choice to replace 0201 size multilayer varistors (MLVs) and protect cell phone, digital camera.

Features

- Ultra small package: 0.6X0.3X0.3mm
- Ultra low capacitance: 7.5pF typical
- Working voltage: 3.3V
- Low clamping voltage
- 2-pin leadless package
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 15\text{kV}$
 - Contact discharge: $\pm 15\text{kV}$
 - IEC61000-4-4 (EFT) 40A (5/50ns)
 - IEC61000-4-5 (Lightning) 7A (8/20 μs)
- RoHS Compliant

Dimensions & Symbol (Unit: mm Max)



Mechanical Characteristics

- Package: DFN0603-2 (0.6X0.3X0.3mm)
- Lead Finish: NiPdAu
- Case Material: "Green" Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Digital Cameras
- Peripherals
- Audio Players
- Keypads, Side Keys, USB 2.0, LCD Displays

Ordering information

Part Number	Packaging	Reel Size
E063V309	15000/Tape & Reel	7 inch

Absolute maximum ratings ($T_A=25^{\circ}\text{C}$, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power (tp=8/20μs waveform)	P_{ppp}	100	W
Peak Pulse Current (8/20μs)	I_{pp}	7	A
ESD per IEC 61000-4-2 (Air)	VESD	±15	kV
ESD per IEC 61000-4-2 (Contact)		±15	
Operating Temperature Range	T_J	-55 to +125	$^{\circ}\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			3.3	V	
Breakdown Voltage	V_{BR}	3.7			V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R			0.1	μA	$V_{RWM} = 3.3\text{V}$
Clamping Voltage	V_C		5.5	7.0	V	$I_{PP} = 1\text{A}$ (8 x 20μs pulse)
Clamping Voltage	V_C		8	10	V	$I_{PP} = 7\text{A}$ (8 x 20μs pulse)
Junction Capacitance	C_J		7.5	8.5	pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

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

Figure 1: Peak Pulse Power vs. Pulse Time

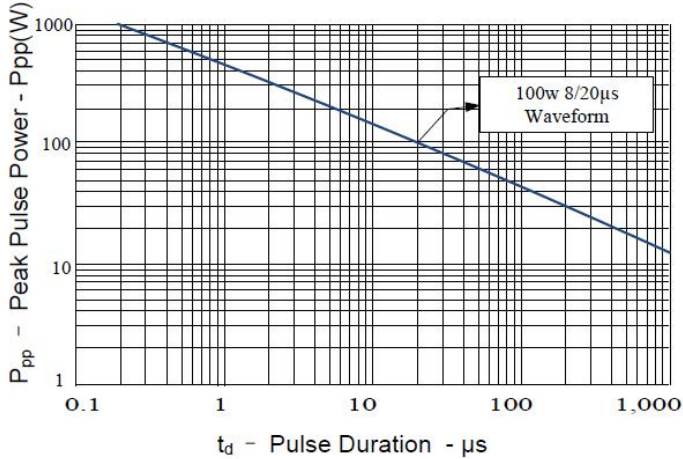


Figure 2: Power Derating Curve

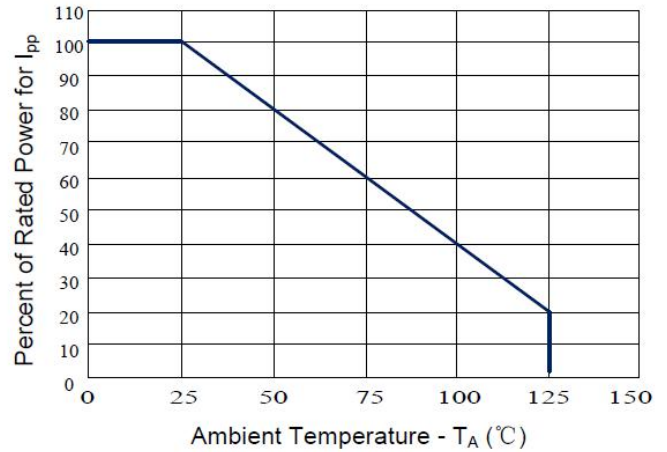


Figure 3: Normalized Junction Capacitance vs. Reverse Voltage

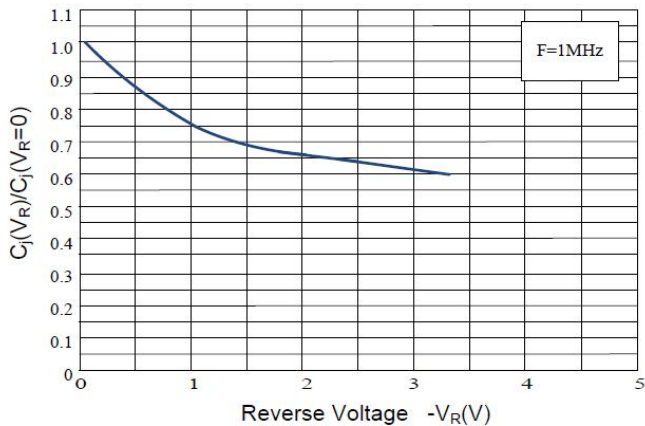


Table 1. IEC 61000-4-2 Discharge Parameters

Level	First Peak Current (A)	Peak Current at 30 ns (A)	Peak Current at 60 ns (A)	Test Voltage (Contact Discharge) (kV)	Test Voltage (Air Discharge) (kV)
1	7.5	4	2	2	2
2	15	8	4	4	4
3	22.5	12	6	6	8
4	30	16	8	8	15

Figure 4: ESD Clamping (8kV Contact per IEC 61000-4-2)

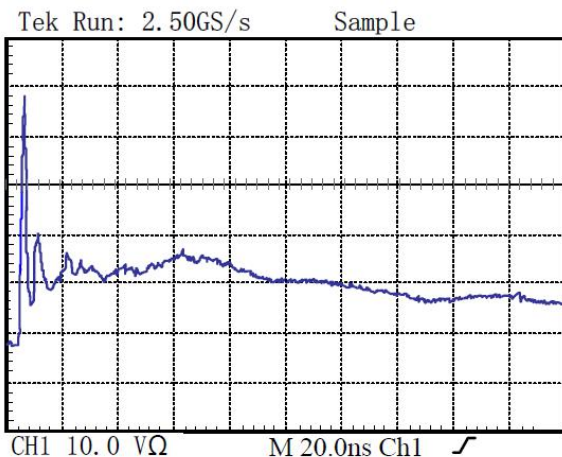
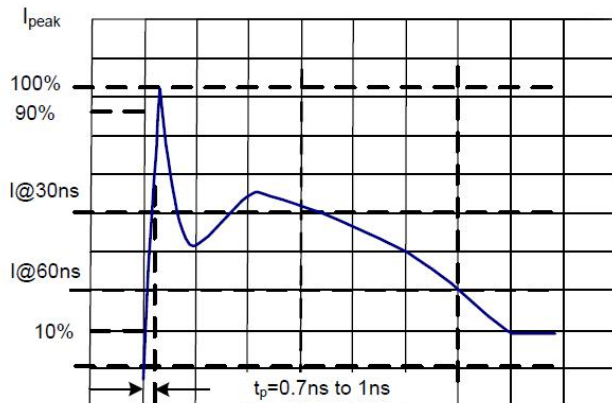
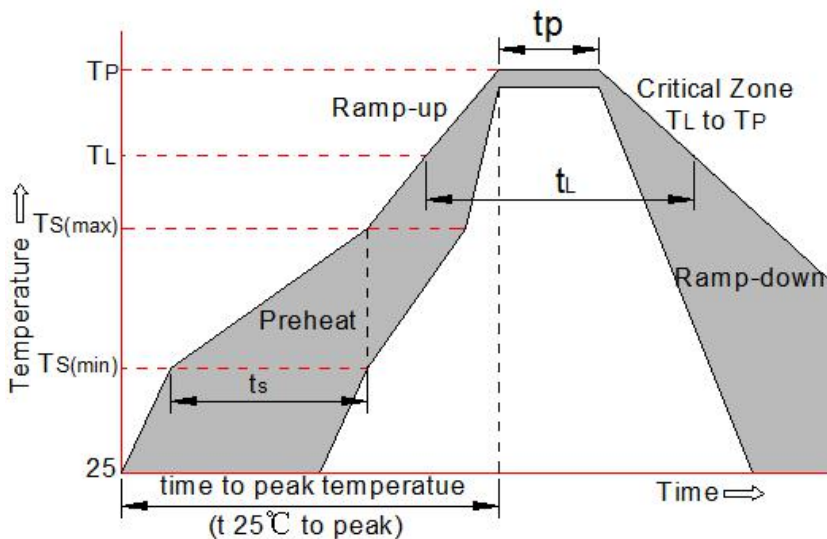


Figure 5: IEC 61000-4-2 Waveform

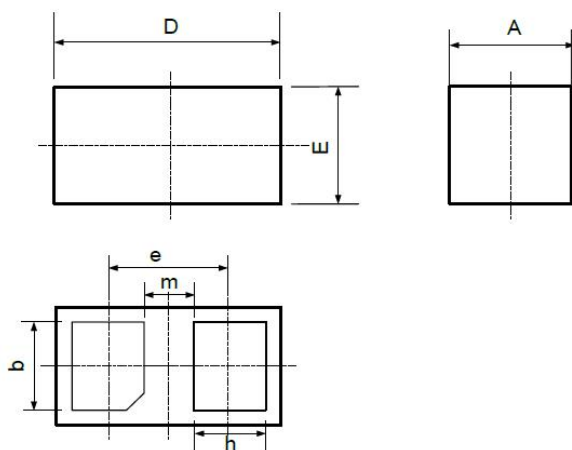


Soldering Parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L) (Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_p)		8 min. Max
Do not exceed		+260°C



Package Mechanical Data



SYM	DIMENSIONS	
	MILLIMETERS	
	MIN	MAX
A	0.28	0.32
D	0.55	0.65
E	0.25	0.35
b	0.20	0.30
e	0.350	
m	0.165	
h	0.07	0.17

Suggested Land Pattern

