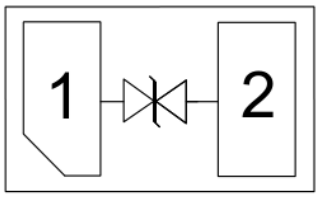
Features

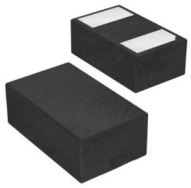
- Ultra small package: 1.0x0.6x0.5mm
- Ultra low capacitance: 0.8pF typical
- Ultra low leakage: nA level
- Low operating voltage: 5V
- Low clamping voltage
- 2-pin leadless package
- Complies with following standards:
  – IEC 61000-4-2 (ESD) immunity test
  Air discharge: ±15kV
  Contact discharge: ±8kV
  – IEC61000-4-5 (Lightning) 2A (8/20μs)
- RoHS Compliant

Description

The ESDA5B0R0D2 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 high-speed data lines.The ESDA5B0R0D2 has an ultra-low capacitance with a typical value at 0.8pF, and complies with the IEC 61000-4-2 (ESD) standard with ±15kV air and ±8kV contact discharge. It is assembled into an ultra-small 1.0x0.6x0.5mm lead-free 0402 package. The small size, ultra-low capacitance and high ESD surge protection make ESDA5B0R0D2 an ideal choice to protect cell phone, digital video interfaces and other high speed ports.

Circuit Diagram





Applications

- Smart phones
- Display Ports
- MDDI Ports
- USB Ports
- Digital Video Interface (DVI)
- PCI Express and Serial SATA Ports

Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

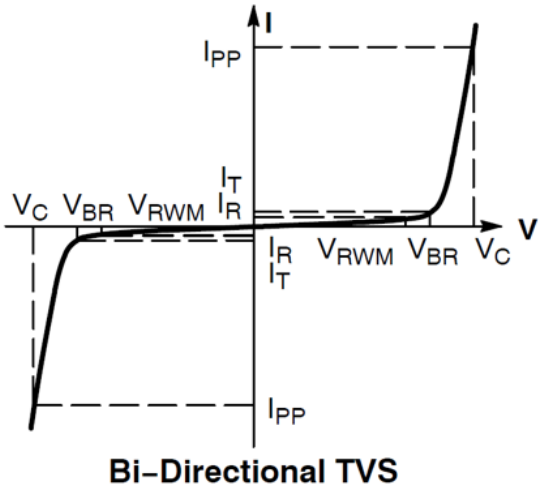
Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	30	W
Peak Pulse Current (8/20μs)	IPP	2	A
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	VESD	±15 ±8	kV
Operating Temperature Range	TJ	−55 to +125	°C
Storage Temperature Range	Tstg	−55 to +150	°C

Electrical Characteristics： (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Reverse Working Voltage	V_{RWM}				5.0	V
Breakdown Voltage	V_{BR}	I_T = 1mA	6.5	7.5	9.0	V
Reverse Leakage Current	I_R	V_{RWM} = 5. 0V			0.1	μA
Clamping Voltage	V_C	I_{PP} = 1A (8 / 20μs pulse)			11.0	V
Clamping Voltage	V_C	I_{PP} = 2A (8 / 20μs pulse)			15.0	V
Junction Capacitance	C_J	VR = 0V, f = 1MHz		0.8	1.0	pF

Portion Electronics Parameter

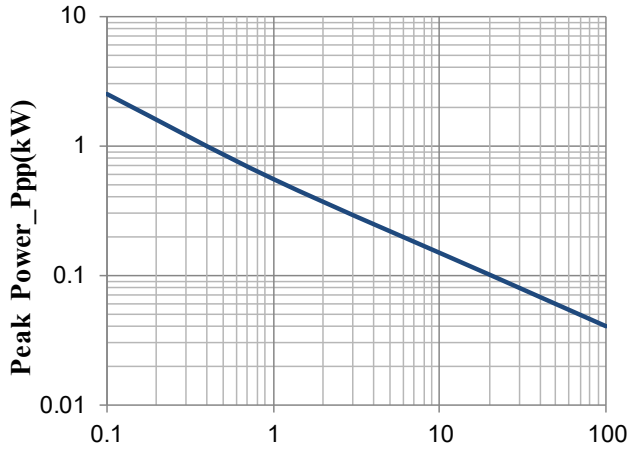
Symbol	Parameter
V_{RWM}	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Breakdown Voltage @I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @I_{PP}



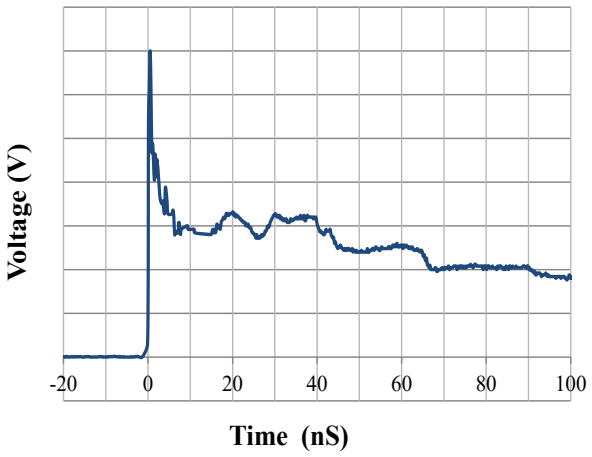
Bi−Directional TVS

Typical Characteristics：

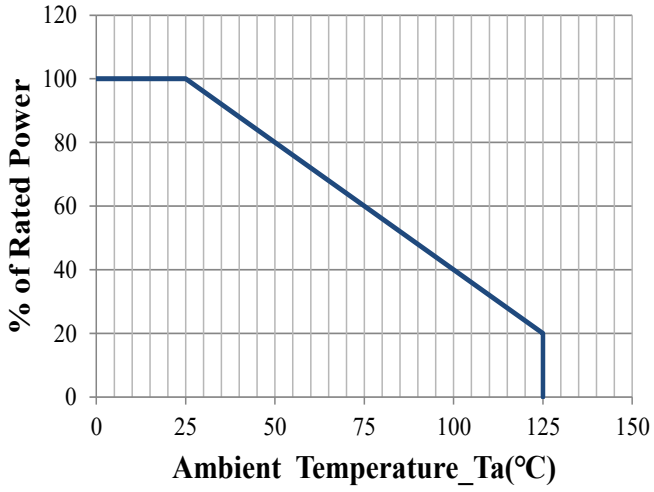
(T_C=25℃ unless otherwise noted)



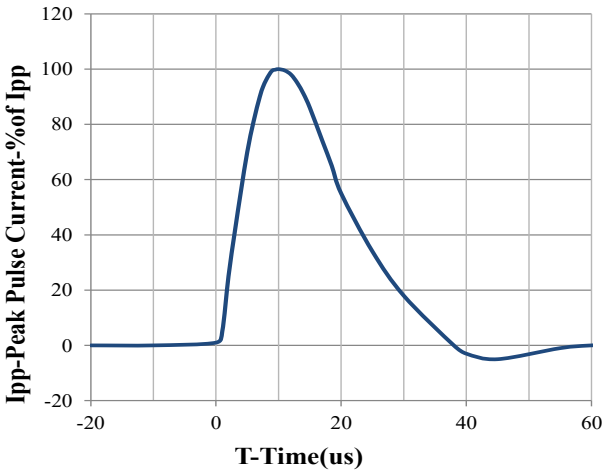
Peak Pulse Power vs. Pulse Time



IEC61000−4−2 Pulse Waveform



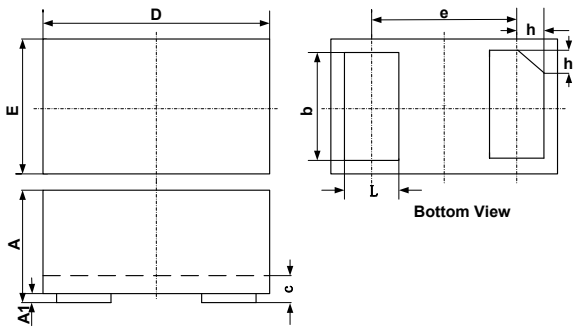
Power Derating Curve



8 X 20us Pulse Waveform

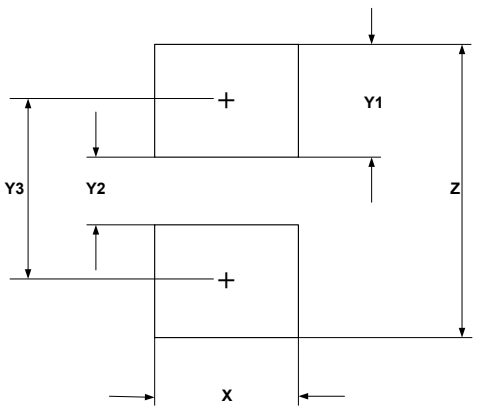
Package Dimension

DFN1006-2(0402) Package Outline



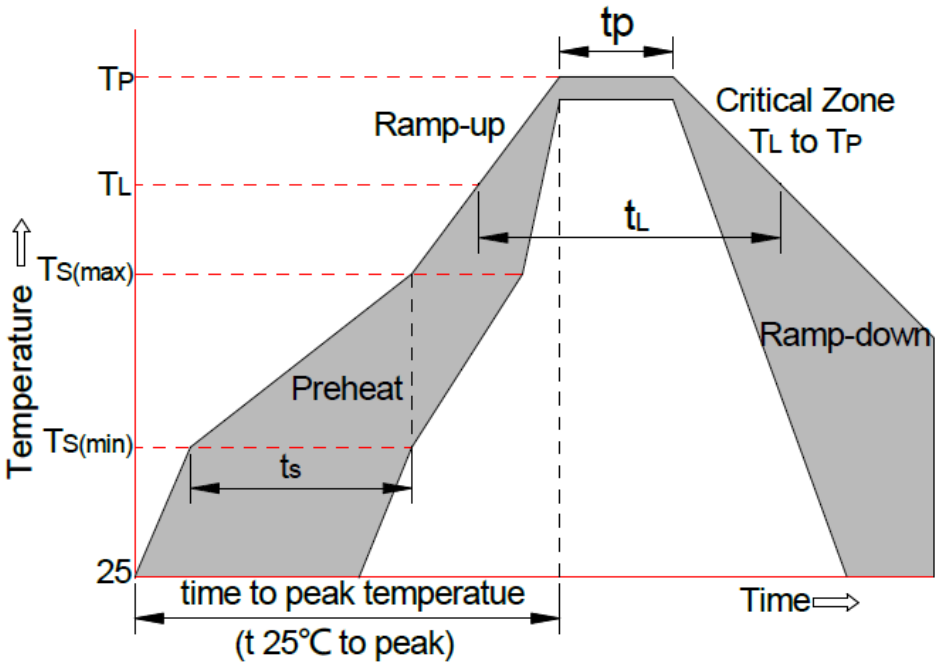
SYM	DIMENSIONS					
	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	0.00	0.02	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
c	0.12	0.15	0.18	0.005	0.006	0.007
D	0.95	1.00	1.05	0.037	0.039	0.041
e	0.65 BSC			0.026 BSC		
E	0.55	0.60	0.65	0.022	0.024	0.026
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

Soldering Parameters



Reflow Condition		Pb-Free Assembly
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 (Tp)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (tp)		30 secs. Max
Ramp-down Rate		6 °C/secs. Max
xTime 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C