

1-Line Low Capacitance Bi-directional TVS Diode

Description

The BV03C is a 3.3V bi-directional TVS diode, utilizing lead-in 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 BV03C has a low capacitance with a typical value at 1pF, and complies with the IEC 61000-4-2 (ESD) with $\pm 30\text{kV}$ air and $\pm 30\text{kV}$ contact discharge. It is assembled into a lead-free SOD-323 package. The small size, low capacitance and high ESD surge protection make BV03C an ideal choice to protect cell phone, wireless systems, and communication equipment.

Features

- 310W peak pulse power (8/20 μs)
- Ultra low capacitance: 1pF typical
- Ultra low leakage: nA level
- Operating voltage: 3.3V
- Low clamping voltage
- Protects one power line or data line
- Complies with following standards:
 - IEC 61000-4-2 (ESD) immunity test
 - Air discharge: $\pm 30\text{kV}$
 - Contact discharge: $\pm 30\text{kV}$
 - IEC61000-4-4 (Lightning) 20A (8/20 μs)
- RoHS Compliant

Mechanical Characteristics

- Package: SOD-323
- Lead Finish: Matte Tin
- Case Material: "Green" Molding Compound.
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Below

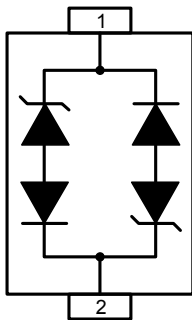
Applications

- USB Ports
- Smart Phones
- Wireless Systems
- Ethernet 10/100/1000 Base T

Marking Information



Dimensions and Pin Configuration



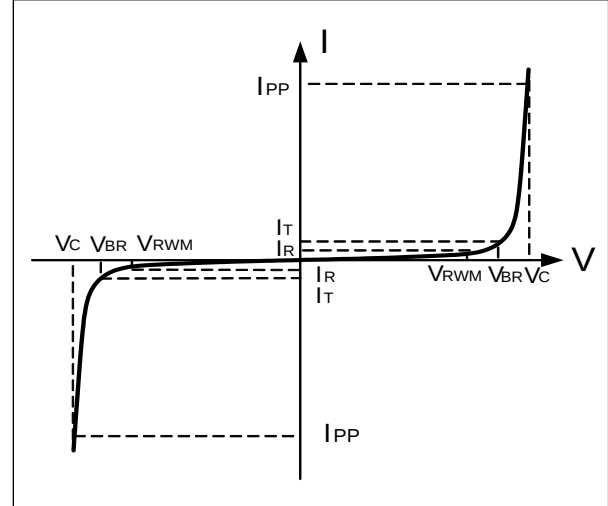
Circuit and Pin Schematic

Ordering Information

Part Number	Packaging	Reel Size
BV03C	3000	7 inch

Electrical Parameters (T=25°C)

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



Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Peak Pulse Power (8/20μs)	Ppk	310	W
Peak Pulse Current (8/20μs)	I_{PP}	20	A
ESD per IEC 61000-4-2 (Air)	VESD	±30	kV
ESD per IEC 61000-4-2 (Contact)		±30	
Operating Temperature Range	T _J	-55 to +125	°C
Storage Temperature Range	T _{stg}	-55 to +150	°C

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

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}			3.3	V	
Snap-Back Voltage	V_{BR}	4.0		7.0	V	$I_T = 1\text{mA}$
Reverse Leakage Current	I_R			0.5	μA	$V_{RWM} = 3.3\text{V}$
Clamping Voltage	V_C			8	V	$I_{PP} = 1\text{A}$ (8 x 20μs pulse)
Clamping Voltage	V_C			20	V	$I_{PP} = 20\text{A}$ (8 x 20μs pulse)
Junction Capacitance	C_J		1		pF	$V_R = 0\text{V}$, $f = 1\text{MHz}$

Note: 1、TLP Setting : $t_p=100\text{ns}$, $t_r=0.2\text{ns}$, I_{TLP} and V_{TLP} sample window: $t_1=70\text{ns}$ to $t_2=90\text{ns}$.

2、Dynamic resistance calculated from $I_{PP}=4\text{A}$ to $I_{PP}=16\text{A}$ using "Best Fit"

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

Figure 1: Peak Pulse Power Vs Pulse Time

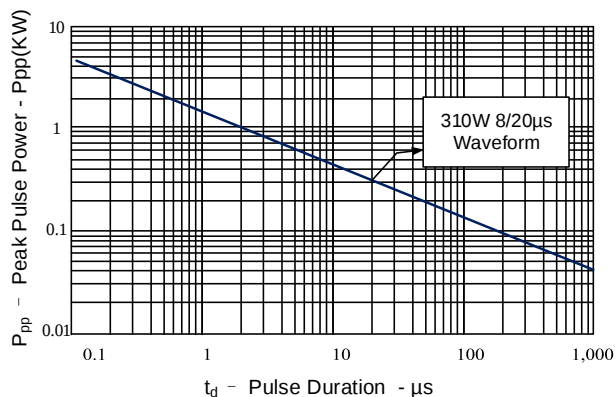


Figure 2: Power Derating Curve

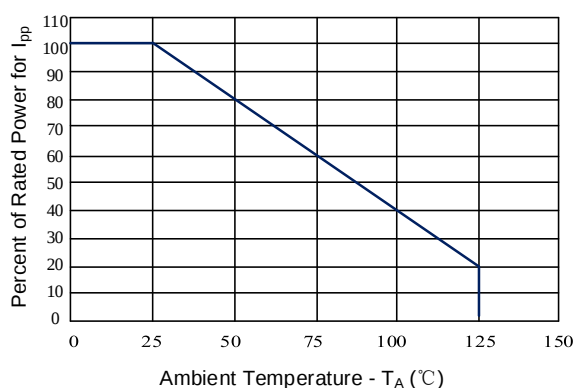


Figure 3: Clamping Voltage vs. Peak Pulse Current

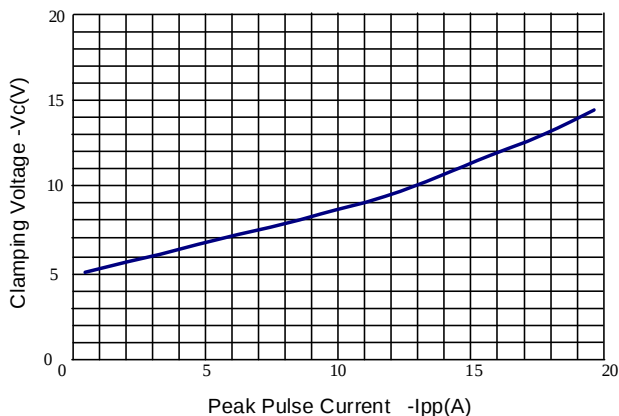


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

