

1-Line Low Capacitance Bi-directional TVS Diode

Description

The BV05C is a 5V bi-directional TVS diode, utilizing leading monolithic silicon technology to provide fast re-sponse time and low ESD clamping voltage, making this device an ideal solution for protecting voltage sensitive high-speed data lines. The BV05C 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 BV05C 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: 5.0V
- 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) 17A (8/20 μs)
- RoHS Compliant

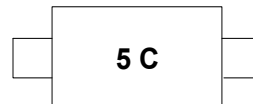
Mechanical Characteristics

- 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

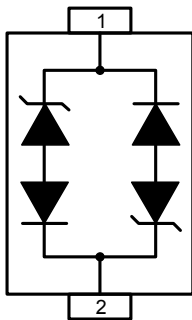
Applications

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

Marking Information



Dimensions and Pin Configuration



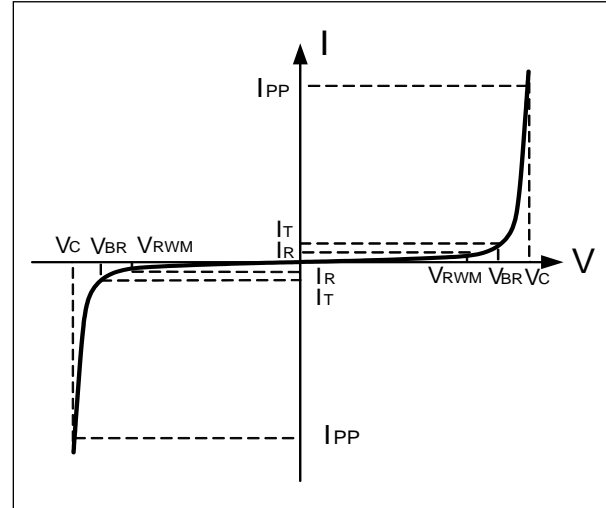
Circuit and Pin Schematic

Ordering Information

Part Number	Packaging	Reel Size
BV05C	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}	17	A
ESD per IEC 61000-4-2 (Air)	V _{ESD}	±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}			5.0	V	
Snap-Back Voltage	V _{BR}	6.0		9.0	V	I _T = 1mA
Reverse Leakage Current	I _R			0.5	μA	V _{RWM} = 5V
Clamping Voltage	V _C			9	V	I _{PP} = 1A (8 x 20μs pulse)
Clamping Voltage	V _C			20	V	I _{PP} = 10A (8 x 20μs pulse)
Junction Capacitance	C _J		1		pF	V _R = 0V, f = 1MHz

Note: 1. TLP Setting : t_p=100ns, t_r=0.2ns, I_{TLP} and V_{TLP} sample window:t₁=70ns to t₂=90ns.
2. Dynamic resistance calculated from I_{PP}=4A to I_{PP}=16A using "Best Fit"

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

Figure 1: Peak Pulse Power Vs Pulse Time

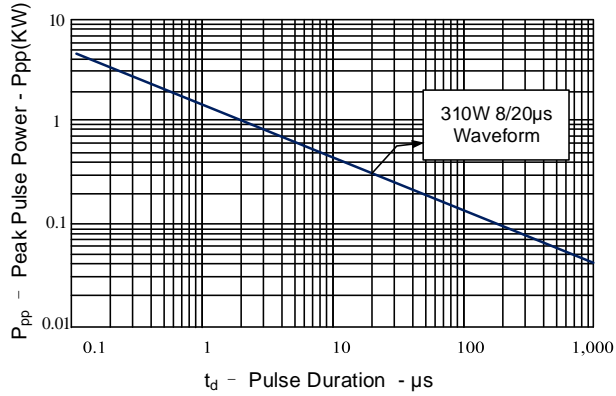


Figure 2: Power Derating Curve

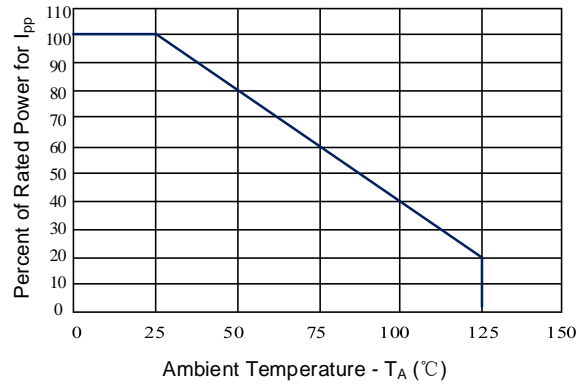


Figure 3: Clamping Voltage vs. Peak Pulse Current

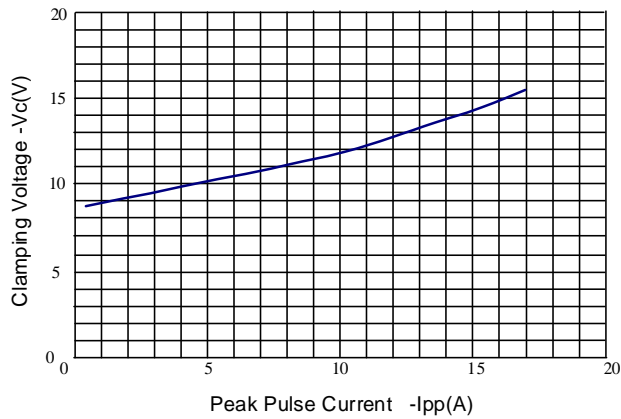


Figure 4: Normalized Junction Capacitance vs. Reverse Voltage

