

Product Summary (@ T_A = +25°C)

V _{RRM} (V)	I _O (A)	V _{F(MAX)} (V)	I _{R(MAX)} (mA)
50	10	0.45	0.3

Description and Applications

Packaged in the compact thermally efficient POWERDI5 package, the TrenchSBR SBRT10U50SP5 provides ultra-low forward voltage drop (V_F) and provides excellent low reverse leakage stability at high temperatures. It is ideal for use as a rectification, freewheeling or polarity protection diode in applications such as:

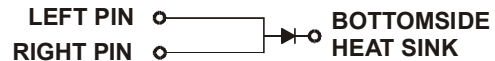
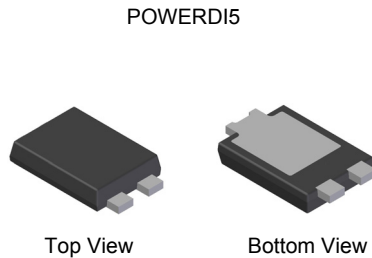
- >10W AC/DC Adaptors/Chargers
- DC/DC Converters

Features and Benefits

- Ultra low forward voltage drop (V_F) helps – minimizes power losses
- Excellent reverse leakage (I_R) stability at higher temperatures.
- Thermally efficient package for cooler running applications
- Less than 1.1mm package profile ideal for thin applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: POWERDI5
- Case Material: Molded Plastic, "Green" Molding compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (approximate)



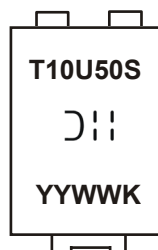
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

Part Number	Case	Packaging
SBRT10U50SP5-13	POWERDI5	5000/Tape & Reel
SBRT10U50SP5-13D	POWERDI5	5000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>. POWERDI5 available in 5K quantity on 13inch reel & 12mm tape, part number suffix "13D".

Marking Information



T10U50S = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 13 = 2013)
 K = Factory Designator

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM}	50	V
Average Rectified Output Current	I_o	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms	I_{FSM}	320	A
1st Rating for fusing ($t < 8.3\text{ms}$)	I^2t	425	A^2S

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	18	$^\circ\text{C}/\text{W}$
Typical Thermal Resistance Junction to Case (Note 5)	$R_{\theta JC}$	2	$^\circ\text{C}/\text{W}$
Typical Thermal Resistance Junction to Lead (Note 5, 6)	$R_{\theta JL}$	4	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	V_F	—	—	0.31	V	$I_F = 1\text{A}, T_J = +25^\circ\text{C}$
		—	0.29	—		$I_F = 5\text{A}, T_J = +85^\circ\text{C}$
		—	—	0.43		$I_F = 8\text{A}, T_J = +25^\circ\text{C}$
		—	0.40	0.45		$I_F = 10\text{A}, T_J = +25^\circ\text{C}$
		—	0.34	0.39		$I_F = 10\text{A}, T_J = +125^\circ\text{C}$
Leakage Current (Note 7)	I_R	—	0.1	0.3	mA	$V_R = 50\text{V}, T_J = +25^\circ\text{C}$
		—	4	15		$V_R = 50\text{V}, T_J = +85^\circ\text{C}$
		—	29	75		$V_R = 50\text{V}, T_J = +125^\circ\text{C}$

- Notes: 5. Device mounted on FR4 PCB with 1inch copper pad layout with AL substrate and additional HK1(37mm x 55mm x15mm)
6. Junction to Lead (Cathode Terminal)
7. Short duration pulse test used to minimize self-heating effect.

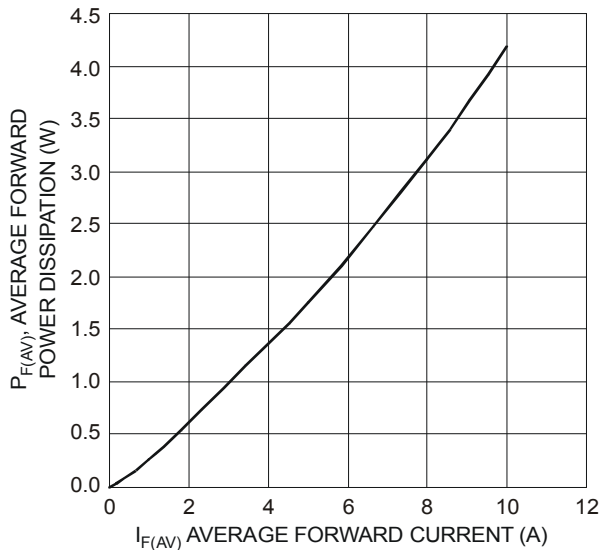


Figure 1 Forward Power Dissipation

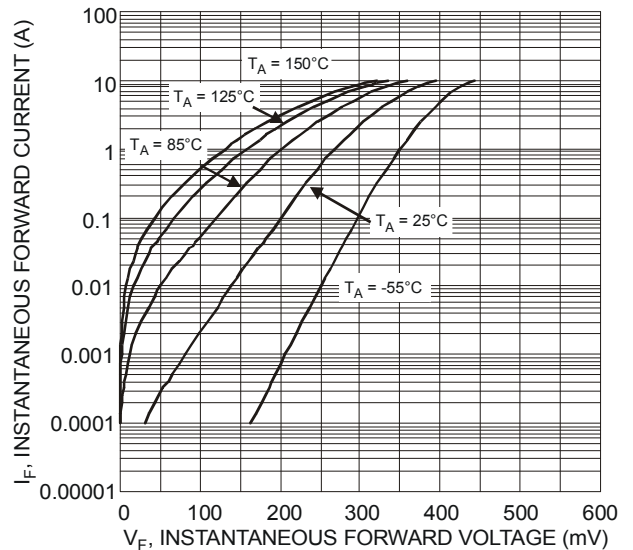


Figure 2 Typical Forward Characteristics

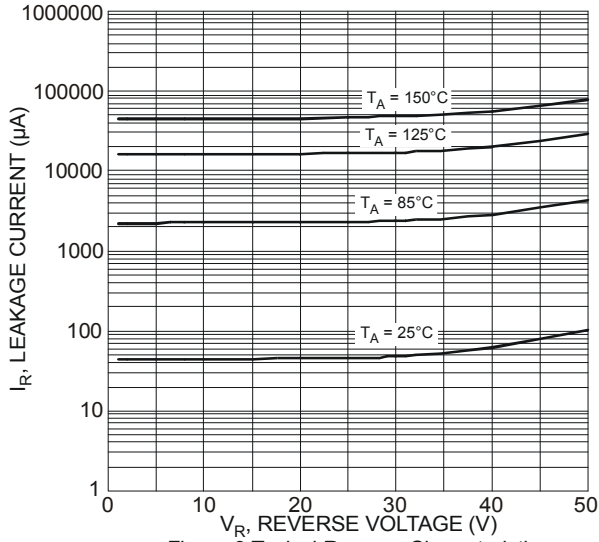


Figure 3 Typical Reverse Characteristics

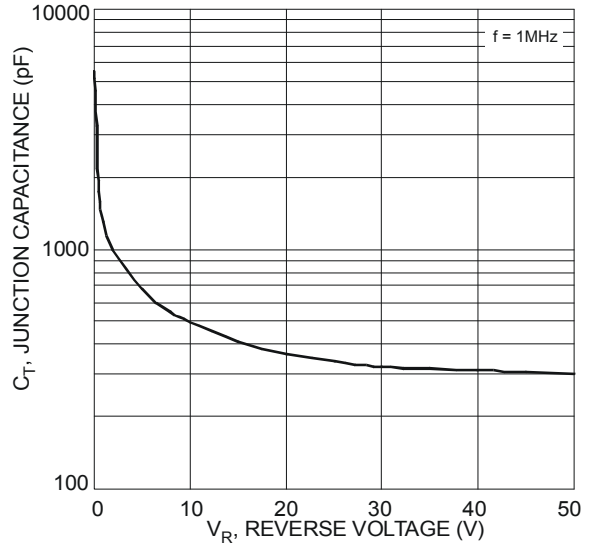


Figure 4 Typical Junction Capacitance

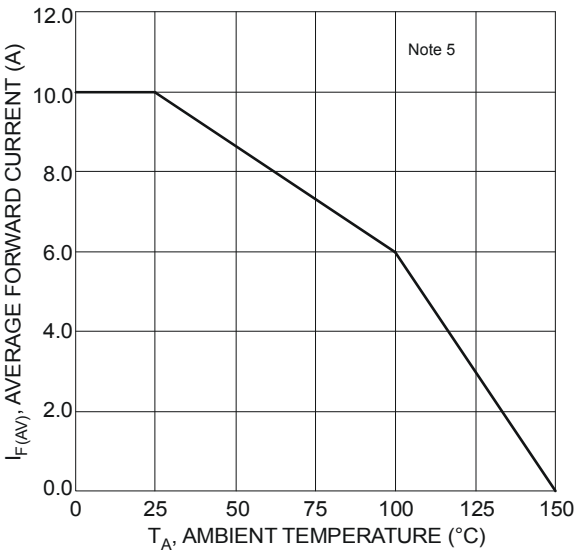
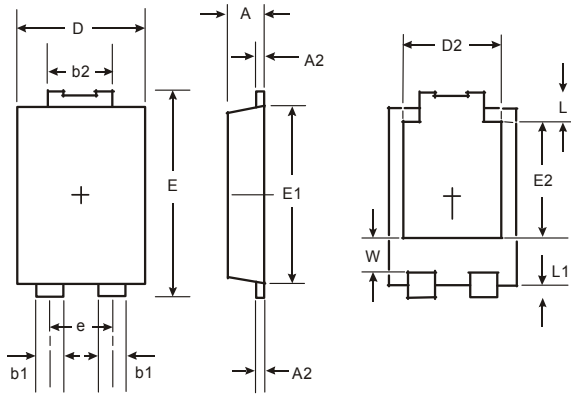


Figure 5 Forward Current Derating Curve

Package Outline Dimensions

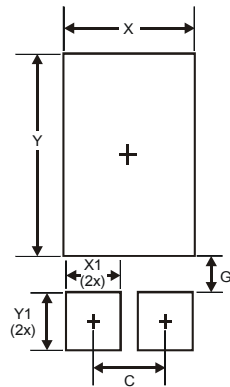
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



POWERDI [®] 5		
Dim	Min	Max
A	1.05	1.15
A2	0.33	0.43
b1	0.80	0.99
b2	1.70	1.88
D	3.90	4.05
D2	3.054 Typ	
E	6.40	6.60
e	1.84 Typ	
E1	5.30	5.45
E2	3.549 Typ	
L	0.75	0.95
L1	0.50	0.65
W	1.10	1.41
All Dimensions in mm		

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
C	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400

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