

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 Adapters/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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: POWERDI[®]5
- 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)

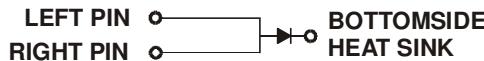
POWERDI[®]5



Top View



Bottom View



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

Ordering Information (Note 4)

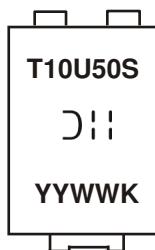
Part Number	Case	Packaging
SBRT10U50SP5-13	POWERDI5	5,000/Tape & Reel
SBRT10U50SP5-13D	POWERDI5	5,000/Tape & Reel

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

POWERDI5



T10U50S = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 15 = 2015)
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	V_{RRM}	50	V
DC Blocking Voltage			
Average Rectified Output Current	I_o	10	A
Non-Repetitive Peak Forward Surge Current 8.3mS	I_{FSM}	320	A
I _{st} Rating for fusing (t < 8.3ms)	I^2t	425	A^2s

Thermal Characteristics

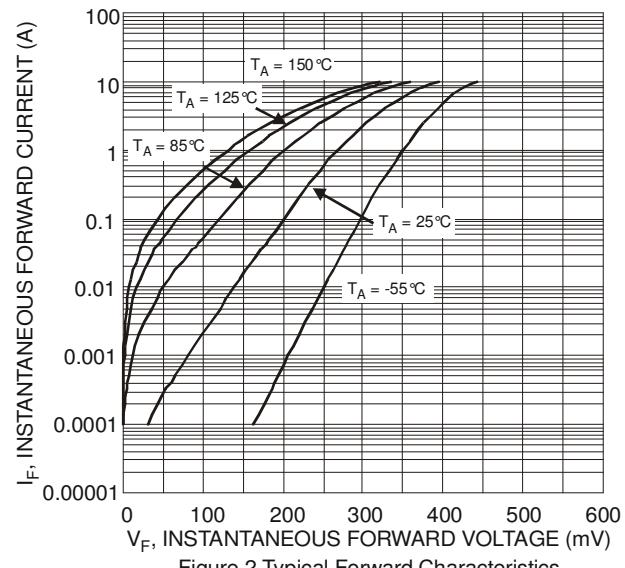
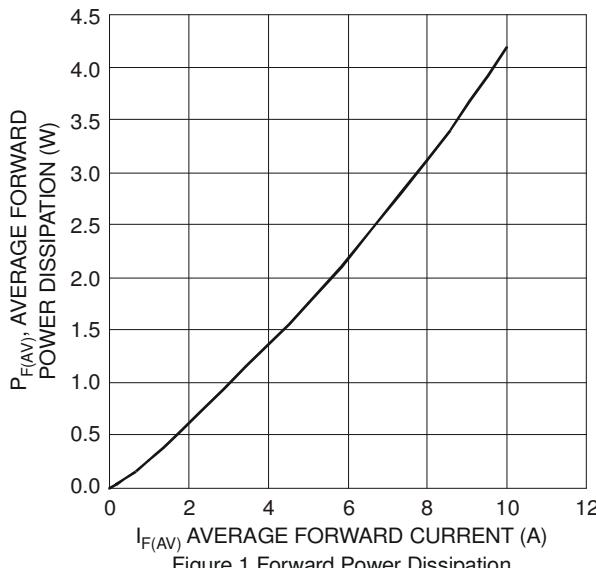
Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	18	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Case (Note 5)	$R_{\theta JC}$	2	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Lead (Notes 5 & 6)	$R_{\theta JL}$	4	$^\circ\text{C/W}$
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	—		$I_F = 5\text{A}, T_J = +85^\circ\text{C}$
		—	0.40	0.45		$I_F = 8\text{A}, T_J = +25^\circ\text{C}$
		—	0.34	0.39		$I_F = 10\text{A}, T_J = +25^\circ\text{C}$
		—	0.1	0.3		$I_F = 10\text{A}, T_J = +125^\circ\text{C}$
		—	4	15		$V_R = 50\text{V}, T_J = +25^\circ\text{C}$
		—	29	75		$V_R = 50\text{V}, T_J = +85^\circ\text{C}$
		—	—	—		$V_R = 50\text{V}, T_J = +125^\circ\text{C}$
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.



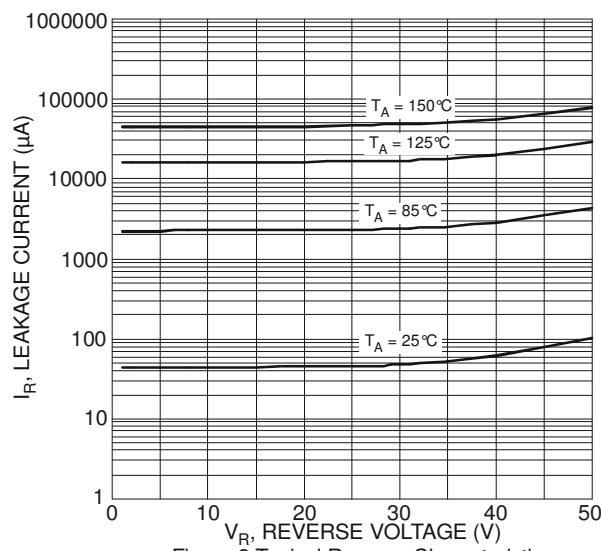


Figure 3 Typical Reverse Characteristics

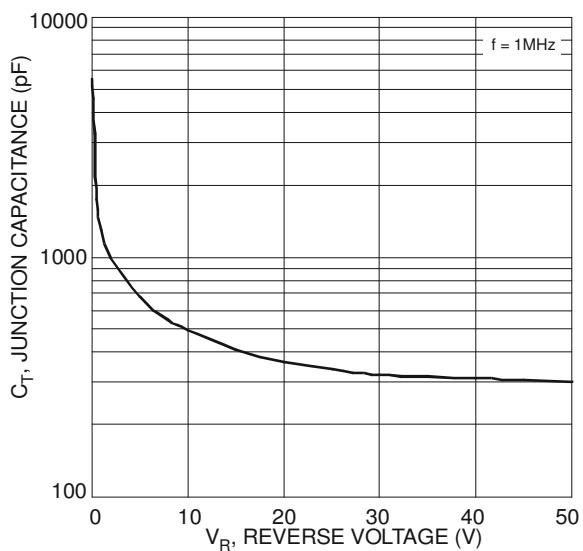


Figure 4 Typical Junction Capacitance

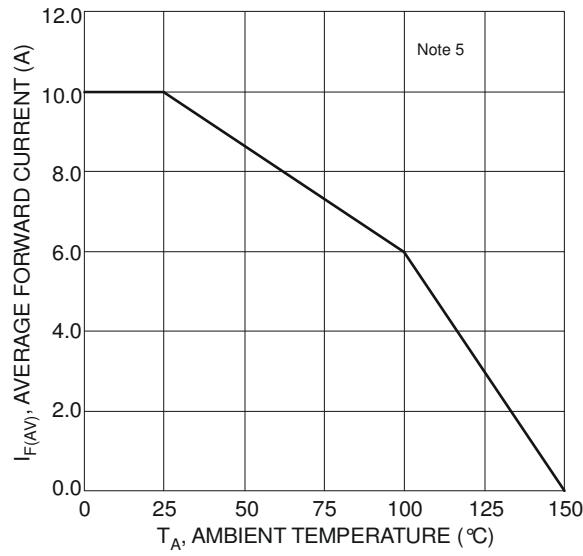
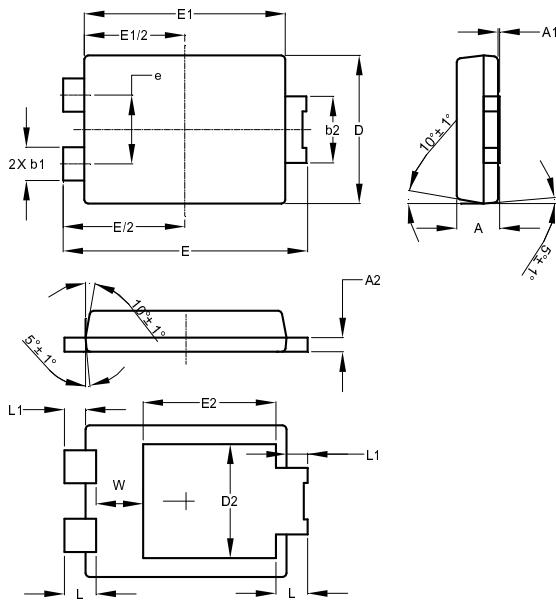


Figure 5 Forward Current Derating Curve

Package Outline Dimensions

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

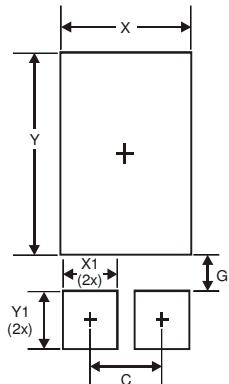


POWERDI [®] 5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	-	-	3.054
E	6.40	6.60	6.504
e	-	-	1.84
E1	5.30	5.45	5.37
E2	-	-	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255

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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