

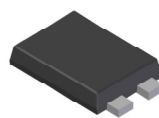
**Product Summary (@ T<sub>A</sub> = +25 °C)**

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F(MAX)</sub> (V)	I <sub>R(MAX)</sub> (mA)
50	10	0.45	0.3

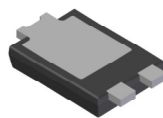
**Description and Applications**

Packaged in the compact thermally efficient POWERDI5 package, the TrenchSBR SBRT10U50SP5 provides ultra-low forward voltage drop (V<sub>F</sub>) 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

 POWERDI<sup>®</sup>5


Top View



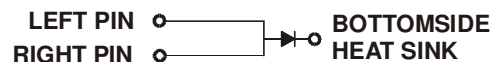
Bottom View

**Features and Benefits**

- Ultra low forward voltage drop (V<sub>F</sub>) helps – minimizes power losses
- Excellent reverse leakage (I<sub>R</sub>) 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<sup>®</sup>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)



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

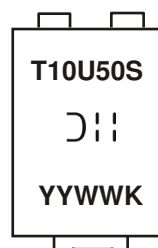
**Ordering Information (Note 4)**

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](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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub>	50	V
Average Rectified Output Current	I <sub>O</sub>	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms	I <sub>FSM</sub>	320	A
1st Rating for fusing (t < 8.3ms)	I <sup>2</sup> t	425	A <sup>2</sup> S

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	R <sub>θJA</sub>	18	°C/W
Typical Thermal Resistance Junction to Case (Note 5)	R <sub>θJC</sub>	2	°C/W
Typical Thermal Resistance Junction to Lead (Notes 5 & 6)	R <sub>θJL</sub>	4	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	V <sub>F</sub>	—	—	0.31	V	I <sub>F</sub> = 1A, T <sub>J</sub> = +25°C
		—	0.29	—		I <sub>F</sub> = 5A, T <sub>J</sub> = +85°C
		—	—	0.43		I <sub>F</sub> = 8A, T <sub>J</sub> = +25°C
		—	0.40	0.45		I <sub>F</sub> = 10A, T <sub>J</sub> = +25°C
		—	0.34	0.39		I <sub>F</sub> = 10A, T <sub>J</sub> = +125°C
Leakage Current (Note 7)	I <sub>R</sub>	—	0.1	0.3	mA	V <sub>R</sub> = 50V, T <sub>J</sub> = +25°C
		—	4	15		V <sub>R</sub> = 50V, T <sub>J</sub> = +85°C
		—	29	75		V <sub>R</sub> = 50V, T <sub>J</sub> = +125°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.

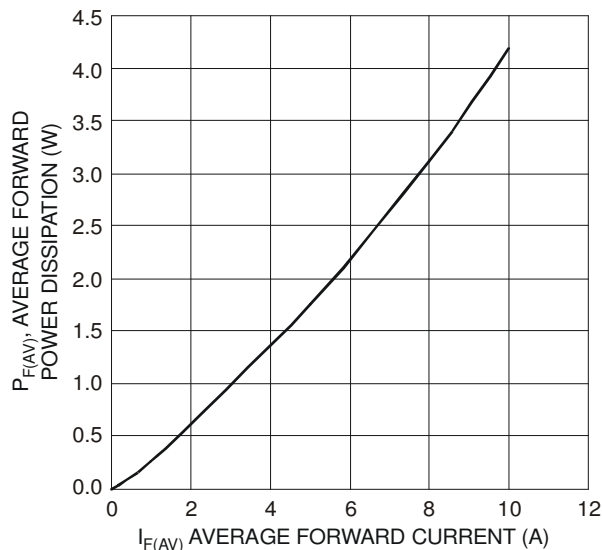


Figure 1 Forward Power Dissipation

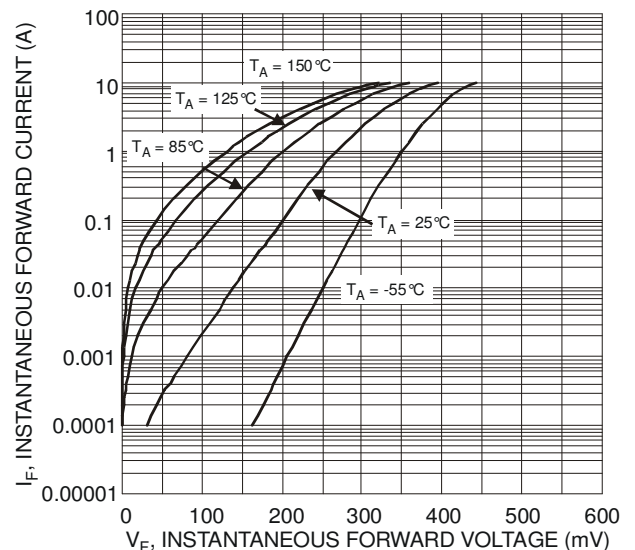


Figure 2 Typical Forward Characteristics

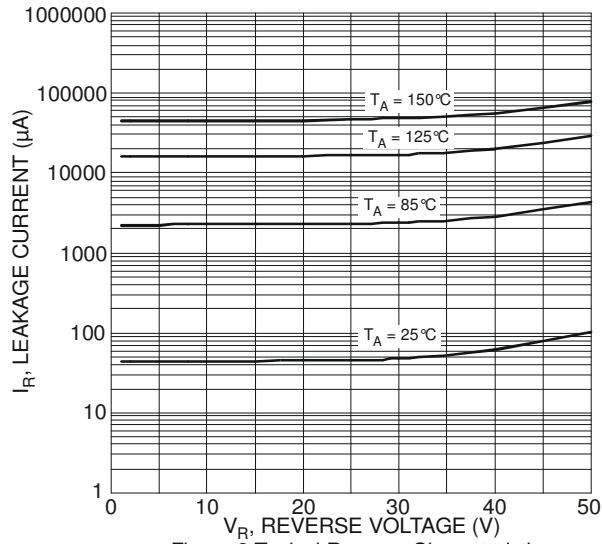


Figure 3 Typical Reverse Characteristics

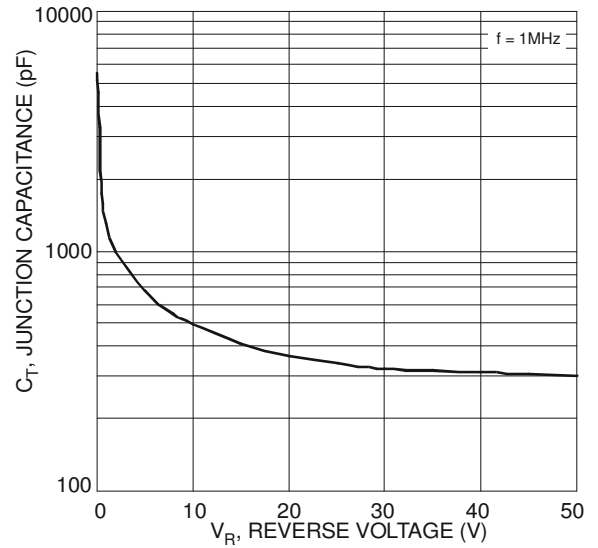


Figure 4 Typical Junction Capacitance

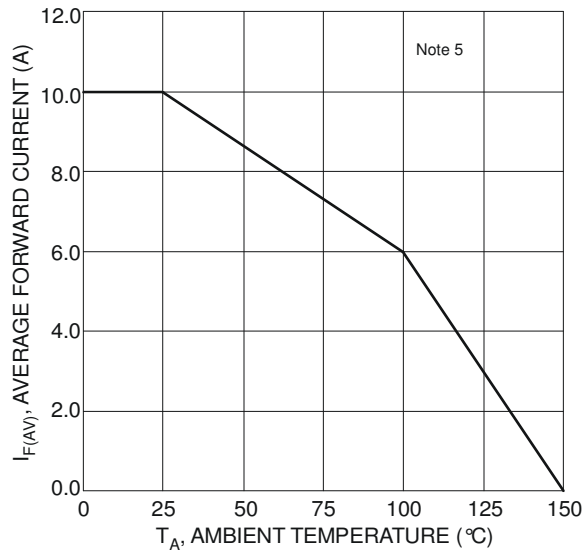
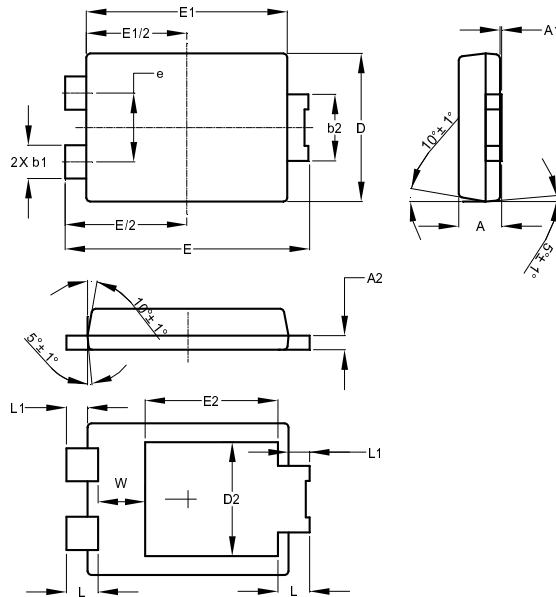


Figure 5 Forward Current Derating Curve

## Package Outline Dimensions

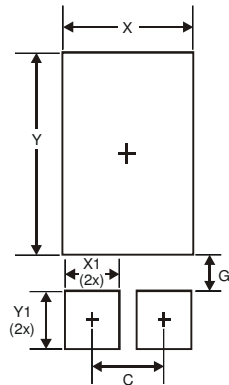
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



POWERDI <sup>®</sup> 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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