



#### 15A TrenchSBR TRENCH SUPER BARRIER RECTIFIER POWERDI<sup>®</sup>5

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

I	V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F(MAX)</sub> (V)	I <sub>R(MAX)</sub> (mA)
	50	15	0.47	0.5

### **Description and Applications**

Packaged in the compact, thermally efficient POWERDI<sup>®</sup>5, the TrenchSBR SBRT15U50SP5 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 Adaptors/Chargers
- DC-DC Converters



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
SBRT15U50SP5-13	POWERDI <sup>®</sup> 5	5,000/Tape & Reel
SBRT15U50SP5-13D (Note 5)	POWERDI <sup>®</sup> 5	5,000/Tape & Reel
SBRT15U50SP5-7	POWERDI <sup>®</sup> 5	1,500/Tape & Reel
SBRT15U50SP5-7D (Note 5)	POWERDI <sup>®</sup> 5	1,500/Tape & Reel

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.

5. POWERDI®5 available in 5K quantity on 13-inch reel &12mm tape, part number suffix "13D"; 1.5K quantity on 7-inch reel also, part number suffix "7". Diodes also provides 12mm tape with 7-inch reel, part number suffix "7D".

### **Marking Information**

Notes:



T15U50S = Product Type Marking Code YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 14 = 2014) K = Factory Designator

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#### **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	lo	15	A
Non-Repetitive Peak Forward Surge Current 8.3mS Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	290	А

## **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 6)	R <sub>0JA</sub>	101	°C/W
Typical Thermal Resistance Junction to Ambient (Note 7)	R <sub>0JA</sub>	20	°C/W
Typical Thermal Resistance Junction to Lead (Notes 7 & 8)	R <sub>θJL</sub>	4	°C/W
Operating and Storage Temperature Range	T <sub>J,</sub> T <sub>STG</sub>	-65 to +150	°C

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

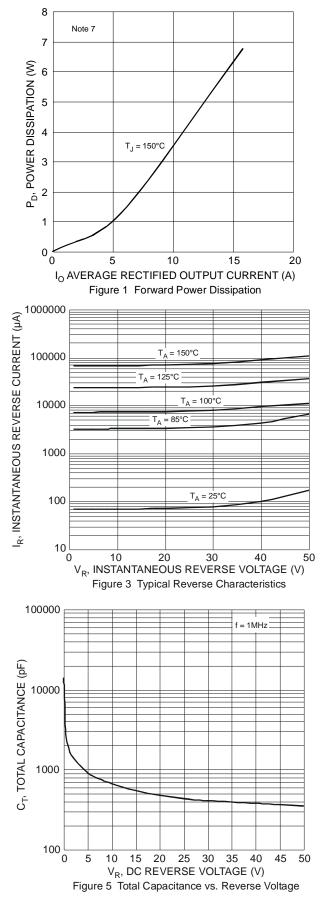
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
		—	_	0.44	V	I <sub>F</sub> =10A, T <sub>J</sub> = +25°C
		—	0.310	—		I <sub>F</sub> =10A, T <sub>J</sub> = +125°C
Forward Voltage Drop	VF	—	0.410	0.47		I <sub>F</sub> =15A, T <sub>J</sub> = +25°C
		—	0.365	—		I <sub>F</sub> =15A, T <sub>J</sub> = +125°C
		—	0.08	0.3	mA	V <sub>R</sub> = 30V , T <sub>J</sub> = +25°C
Laskage Current (Nate 0)		—	0.17	0.5		V <sub>R</sub> = 50V , T <sub>J</sub> = +25°C
Leakage Current (Note 9)	IR	—	3.5	_		V <sub>R</sub> = 30V , T <sub>J</sub> = +85°C
		-	35	105		V <sub>R</sub> = 50V , T <sub>J</sub> = +125°C
Junction Capacitance	CJ	—	440	—	pF	V <sub>R</sub> = 25V , T <sub>J</sub> = +25°C

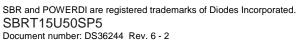
6. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per http://www.diodes.com.
7. Aluminum substrate PCB with 30mm x 30mm, full of 2oz. Copper pad and additional heatsink 42mm x 20mm x 12mm.
8. Junction to Lead (Cathode Terminal)
9. Short duration pulse test used to minimize self-heating effect.

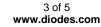
Notes:

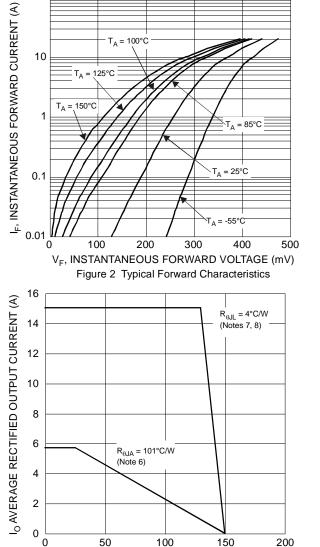


# SBRT15U50SP5









T<sub>A</sub> = 100°C

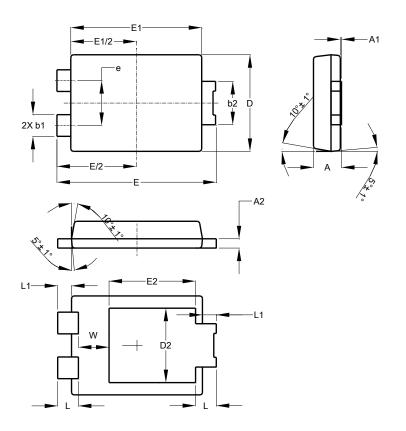
100

TEMPERATURE (°C) Figure 4 Forward Current Derating Curve



# **Package Outline Dimensions**

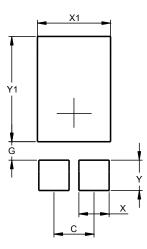
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



POWERDI <sup>®</sup> 5				
Dim	Min	Max	Тур	
Α	1.05	1.15	1.10	
A1	0.00	0.05		
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	
Е	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)
С	1.840
G	0.852
Х	1.390
X1	3.360
Y	1.400
Y1	4.860



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