



#### SBR10U45SP5Q

**10A SBR** SUPER BARRIER RECTIFIER PowerDI5

#### **Product Summary**

ſ	VRRM (V)	lo (A)	VF MAX (V) @+25°C	I <sub>R MAX</sub> (mA) @+25°С
I	45	10	0.47	0.3

# **Description and Applications**

This Super Barrier Rectifier (SBR<sup>®</sup>) diode has been designed to meet the stringent requirements of Automotive Applications. It is ideally suited to use as :

- Polarity Protection Diode
- **Re-Circulating Diode**
- Switching Diode

#### **Features and Benefits**

- 100% Avalanche Tested
- Patented SBR technology provides a superior avalanche capability than Schottky diodes ensuring more rugged and reliable end applications
- Reduced ultra-low forward voltage drop (VF); better efficiency and cooler operation
- Reduced high temperature reverse leakage; increased reliability against thermal runaway failure at high temperature
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The SBR10U45SP5Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 gualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

https://www.diodes.com/quality/product-definitions/

## **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
- Terminals: Finish Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (23)
- Weight: 0.093 grams (Approximate)



PowerDI5

Bottom View

LEFT PIN O-RIGHT PIN o-

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

#### Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
SBR10U45SP5Q-13	Automotive	PowerDI5	5000/Tape & Reel
SBR10U45SP5Q-13D	Automotive	PowerDI5	5000/Tape & Reel

Notes:

1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied. 2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

# **Marking Information**



S10U45S = Product Type Marking Code DII = Manufacturers' Code Marking K = Factory Designator YYWW = Date Code Marking YY = Last Two Digits of Year (ex: 21 for 2021) WW = Week Code (01 to 53)

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## Maximum Ratings (@TA = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load. For capacitive load, derate current by 20%

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	Vrrm		
Working Peak Reverse Voltage	V <sub>RWM</sub>	45	V
DC Blocking Voltage	V <sub>RM</sub>		
RMS Reverse Voltage	Vr(rms)	32	V
Average Rectified Output Current	lo	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	IFSM	275	A
Repetitive Peak Avalanche Power (1µs, +25°C)	PARM	5630	W
Non-Repetitive Avalanche Energy (TJ = +25°C, I <sub>AS</sub> = 12A, L = 10mH)	Eas	530	mJ

#### **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance Thermal Resistance Junction to Ambient (Note 5) Thermal Resistance Junction to Ambient (Note 6)	Reja Reja	73 31	°C/W
Storage Temperature Range	Tstg	-55 to +150	°C

## Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	V(BR)R	45	_	_	V	I <sub>R</sub> = 0.3mA
Forward Voltage Drop	VF		0.41 0.44 0.38	0.47	V	IF = 8A, TJ = +25°C IF = 10A, TJ = +25°C IF = 10A, TJ = +125°C
Leakage Current (Note 7)	IR	_	0.09 30	0.3	mA	V <sub>R</sub> = 45V, T <sub>J</sub> = +25°C V <sub>R</sub> = 45V, T <sub>J</sub> = +125°C

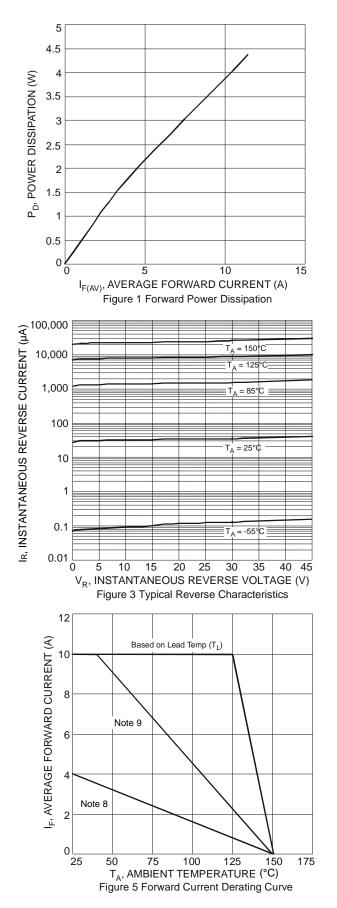
5. FR-4 PCB, 2oz. Copper. Minimum recommended pad layout per http://www.diodes.com/package-outlines.html.

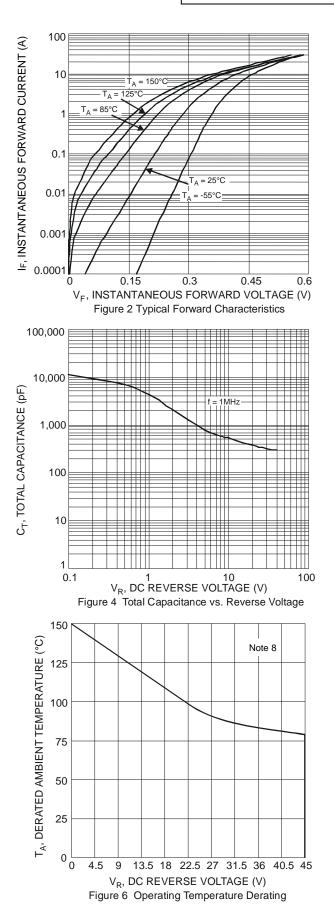
Polymide PCB, 2oz. Copper. Cathode pad dimensions 184.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.
Short duration pulse test used to minimize self-heating effect.

Notes:



# SBR10U45SP5Q



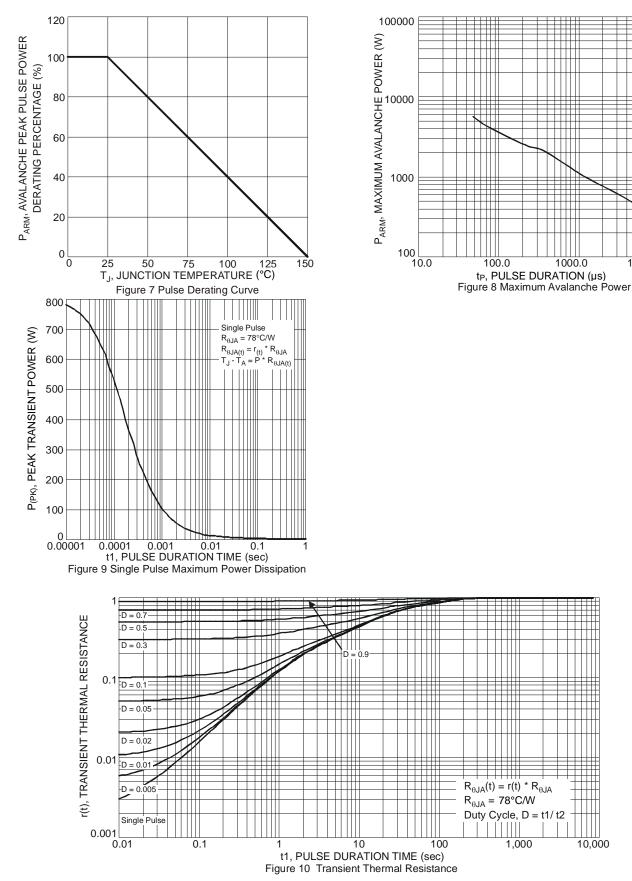




## SBR10U45SP5Q

1000.0

10000.0



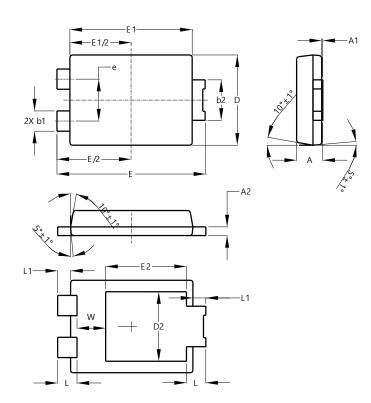
8. Device mounted on FR-4 substrate, 2oz copper, with minimum recommended pad layout. Notes: 9. Device mounted on FR-4 substrate, 2oz copper, with 10cm x 10cm pad layout.

10,000



# **Package Outline Dimensions**

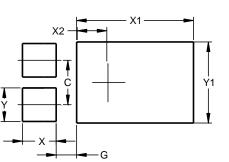
Please see http://www.diodes.com/package-outlines.html for the latest version.



PowerDI5						
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	6.51			
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 http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
С	1.840
G	0.852
Х	1.400
X1	4.860
X2	1.310
Y	1.390
Y1	3.360

#### PowerDI5



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