



# 4A TrenchSBR TRENCH SUPER BARRIER RECTIFIER

#### **Product Summary**

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F(MAX)</sub> (V) @ +25°C	I <sub>R(MAX)</sub> (mA) @ +25°C
45	4	0.52	0.1

#### **Features and Benefits**

- Patented TrenchSBR technology provides superior avalanche capability versus schottky diodes, ensuring more rugged and reliable end applications.
- Reduced ultra-low forward voltage drop (V<sub>F</sub>); Better efficiency and cooler operation.
- Reduced high temperature reverse leakage. Increased reliability against thermal runaway failure in high temperature operation.
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability

## **Description and Applications**

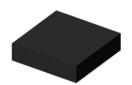
The SBRT4U45LP provides very low  $V_F$  and excellent reverse leakage stability at high temperatures. It is ideal for use as bypass diode and rectifier, freewheel diode or blocking diode in applications such as:

- Solar Panels
- Blocking Diode
- Bypass Diode
- Boost Diode
- · Recirculating Diode

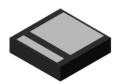
#### **Mechanical Data**

- Case: U-DFN2020-2 (Type B)
- 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)
- Polarity: See Below
- Weight: 6.757 mg (Approximate)

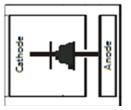
#### U-DFN2020-2 (Type B)







Bottom View



Top View Internal Schematic

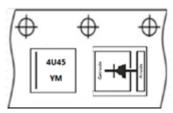
#### **Ordering Information** (Note 4)

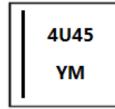
Part Number	Case	Packaging
SBRT4U45LP-7	U-DFN2020-2 (Type B)	3,000/Tape & Reel

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
- 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.

### **Marking Information**





4U45 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: B = 2014)

M = Month (ex. 6 = June)

Bar = Cathode

Date Code Key

Year	2014	20	15	2016	2017	20	18	2019	2020	20:	21	2022
Code	В	(	2	D	Е	F	-	G	Н			J
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



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

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

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>RM</sub>	45	>
Average Rectified Output Current	Io	4	Α
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	45	А

### **Thermal Characteristics**

Characteristic			Value	Unit
Typical Thermal Resistance Junction to Case (Note 5)			5	°C/W
Typical Thermal Resistance Junction to Ambient (Note 5)			65	°C/W
Operating Temperature Range	$V_R \le 80\% V_{RRM}$ $V_R \le 50\% V_{RRM}$ DC Forward Mode (Note 7)	$T_J$	-55 to +150 ≤+175 ≤+200	ô
Storage Temperature Range		T <sub>STG</sub>	-55 to +150	°C

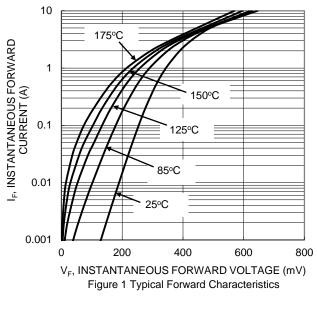
### Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

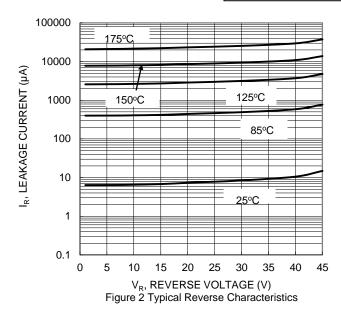
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Forward Voltage Drop (Note 6)	$V_{F}$	_	_	0.52	V	$I_F = 4A, T_J = +25^{\circ}C$
Leakage Current (Note 6)	1-	_	_	100	μA	$V_R = 45V, T_J = +25^{\circ}C$
Leakage Current (Note 6)	IR	_	4.7	_	mA	$V_R = 45V, T_J = +125^{\circ}C$

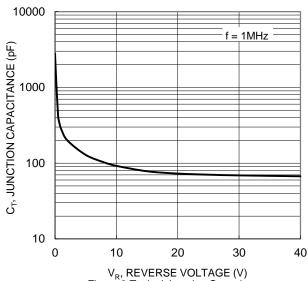
Notes:

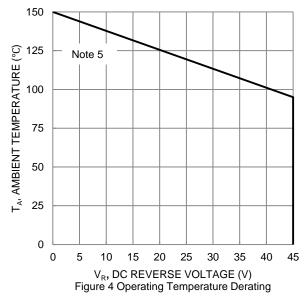
- 5. Device mounted on FR-4 PCB pad layout 1-inch 2oz copper.
- 6. Short duration pulse test used to minimize self-heating effect.
- 7. Max junction temperature guaranteed for two hours.

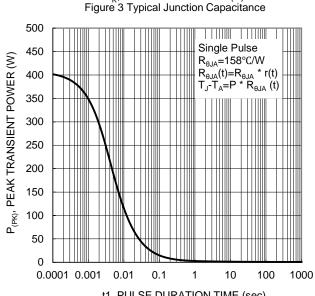


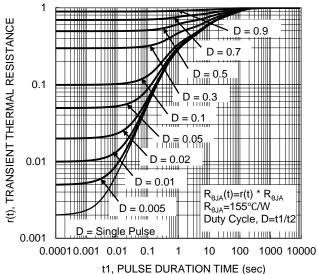










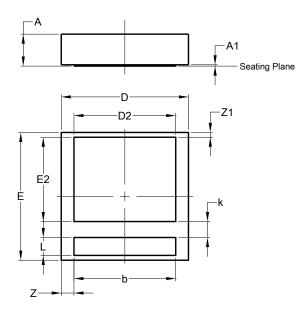


t1, PULSE DURATION TIME (sec) Figure 5 Single Pulse Maximum Power Dissipation



### **Package Outline Dimensions**

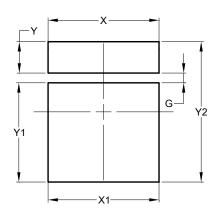
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



U-DFN2020-2 (Type B)							
Dim	Min Max Typ						
Α	0.47	0.53	0.50				
A1	0.00	0.05	0.02				
b	1.55	1.65	1.60				
D	1.95 2.05 2.00						
D2	1.50 1.70 1.60						
Е	1.95 2.05 2.00						
E2	1.22	1.42	1.32				
k	0.25 BSC						
L	0.23	0.33	0.28				
Z	0.20 BSC						
<b>Z</b> 1	0.075 BSC						
All Dimensions in mm							

# **Suggested Pad Layout**

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



Dimensions	Value		
Dimensions	(in mm)		
G	0.150		
Х	1.700		
X1	1.700		
Υ	0.480		
Y1	1.520		
Y2	2.150		



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