

## 4A TrenchSBR TRENCH SUPER BARRIER RECTIFIER

### Product Summary

$V_{RRM}$ (V)	$I_o$ (A)	$V_{F(MAX)}$ (V) @ +25°C	$I_{R(MAX)}$ (mA) @ +25°C
45	4	0.52	0.1

### 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

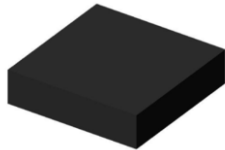
### Features and Benefits

- Patented TrenchSBR technology provides superior avalanche capability versus schottky diodes, ensuring more rugged and reliable end applications.
- Reduced ultra-low forward voltage drop ( $V_F$ ); 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**

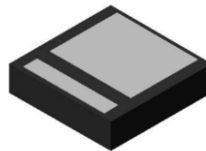
### Mechanical Data

- 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 (e3)
- Polarity: See Below
- Weight: 6.757 mg (Approximate)

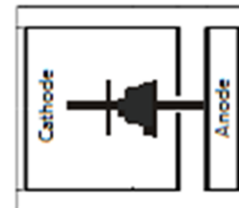
U-DFN2020-2 (Type B)



Top View



Bottom View



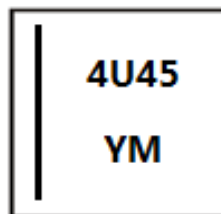
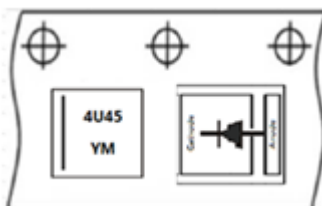
Top View  
Internal Schematic

### 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](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	2015	2016	2017	2018	2019	2020	2021	2022
Code	B	C	D	E	F	G	H	I	J

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

**Maximum Ratings** (@T<sub>A</sub> = +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	V <sub>RRM</sub>	45	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>RM</sub>		
Average Rectified Output Current	I <sub>O</sub>	4	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	45	A

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Case (Note 5)	R <sub>θJC</sub>	5	°C/W
Typical Thermal Resistance Junction to Ambient (Note 5)	R <sub>θJA</sub>	65	°C/W
Operating Temperature Range V <sub>R</sub> ≤ 80% V <sub>RRM</sub> V <sub>R</sub> ≤ 50% V <sub>RRM</sub> DC Forward Mode (Note 7)	T <sub>J</sub>	-55 to +150 ≤+175 ≤+200	°C
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	Typ	Max	Unit	Test Condition
Forward Voltage Drop (Note 6)	V <sub>F</sub>	—	—	0.52	V	I <sub>F</sub> = 4A, T <sub>J</sub> = +25°C
Leakage Current (Note 6)	I <sub>R</sub>	—	4.7	100	μA	V <sub>R</sub> = 45V, T <sub>J</sub> = +25°C
				—	mA	V <sub>R</sub> = 45V, T <sub>J</sub> = +125°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.

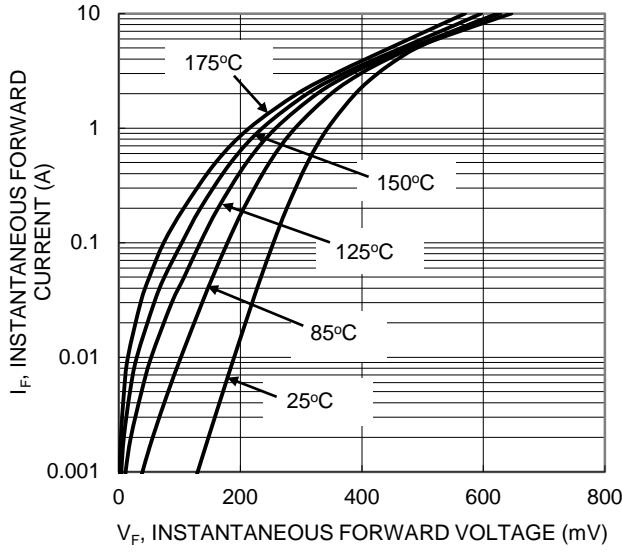


Figure 1 Typical Forward Characteristics

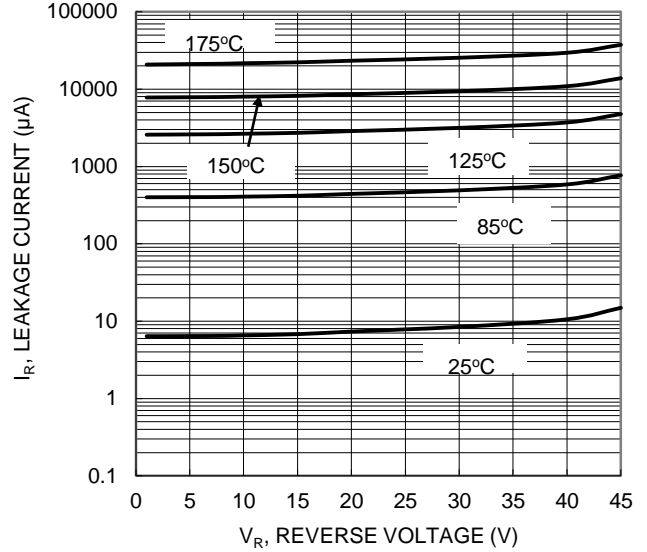


Figure 2 Typical Reverse Characteristics

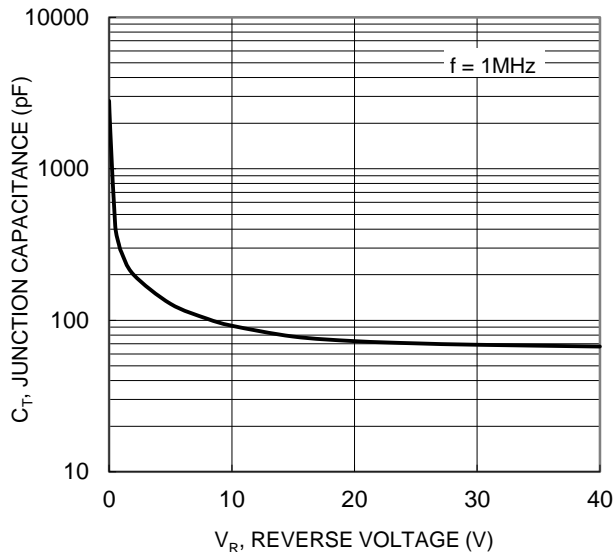


Figure 3 Typical Junction Capacitance

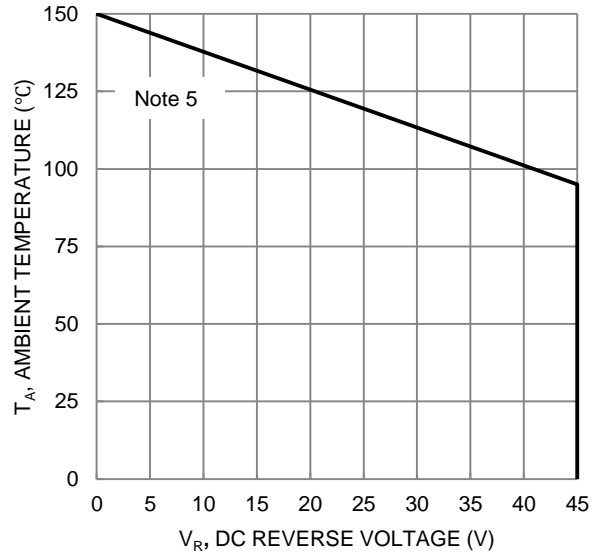


Figure 4 Operating Temperature Derating

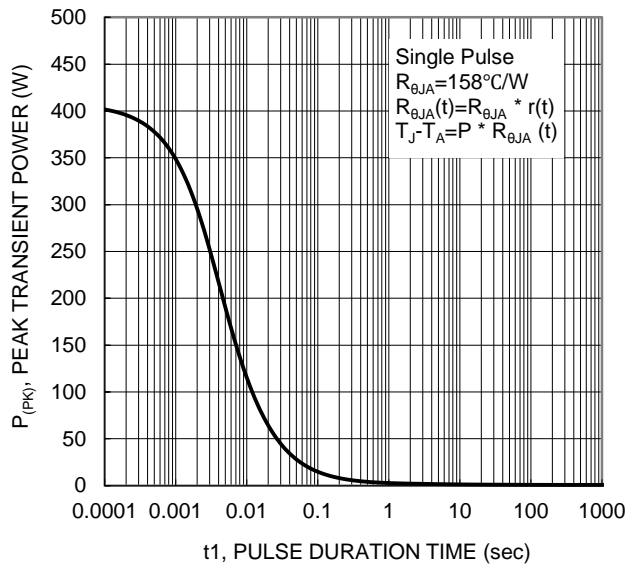


Figure 5 Single Pulse Maximum Power Dissipation

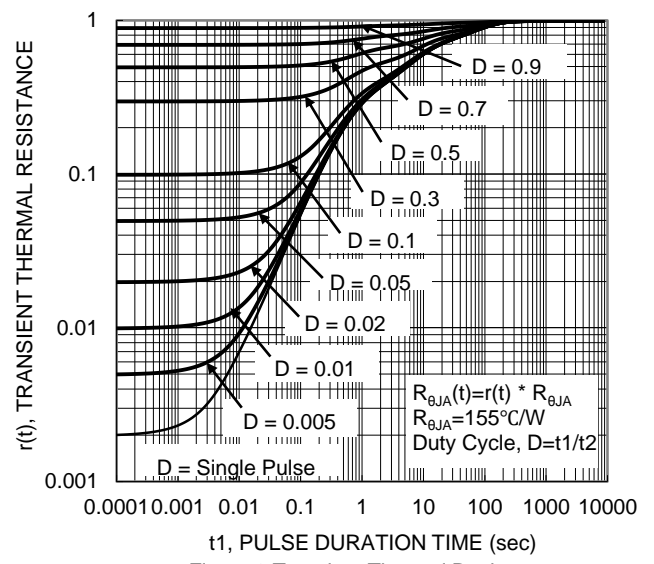
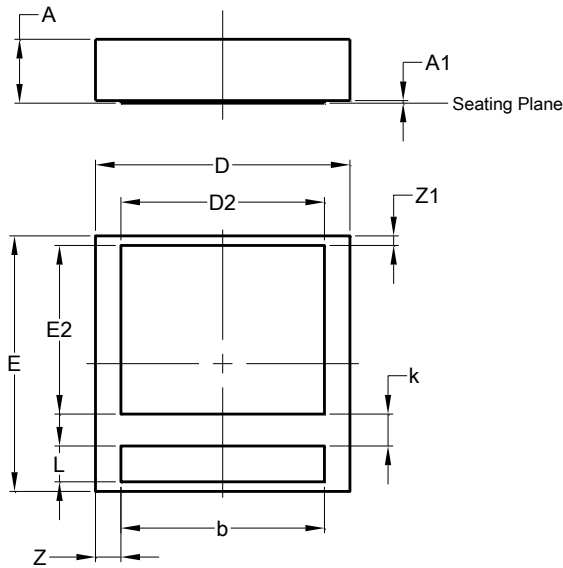


Figure 6 Transient Thermal Resistance

**Package Outline Dimensions**

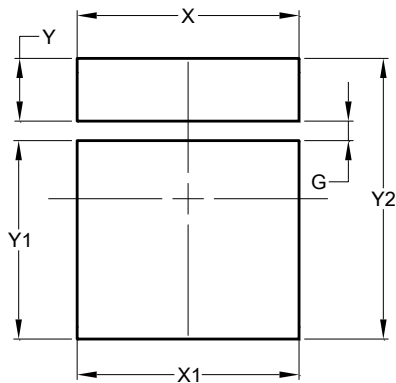
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



U-DFN2020-2 (Type B)			
Dim	Min	Max	Typ
A	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
E	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		
Z1	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 (in mm)
G	0.150
X	1.700
X1	1.700
Y	0.480
Y1	1.520
Y2	2.150

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