

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

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max (V)	I <sub>R</sub> Max (mA)
20	0.5	0.39	0.05

## Description

Packaged in the compact DFN1006 package, the Trench SBR SBRT05U20LP 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.

## Applications

- SMPS
- Freewheeling Diodes
- Reverse Polarity Protection
- DC-DC Converters
- General Switching Applications

## Features and Benefits

- Ultra-Low Forward Voltage Drop
- Superior Reverse Avalanche Capability
- Patented SBR<sup>®</sup> (Super Barrier Rectifier) Technology
- Soft, Fast Switching Capability
- +150°C Operating Junction Temperature
- **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**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: X1-DFN1006-2
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Dot
- Terminals: Finish – NiPdAu over Copper Leadframe.  
Solderable per MIL-STD-202, Method 208<sup>④</sup>
- Weight: 0.001 grams (Approximate)

X1-DFN1006-2



Top View



Bottom View

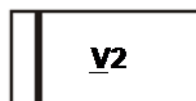
## Ordering Information (Note 5)

Part Number	Case	Packaging
SBRT05U20LPQ-7B	X1-DFN1006-2	10,000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information

X1-DFN1006-2



V2 = Product Type Marking Code

## 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 Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>RM</sub>	20	V
RMS Reverse Voltage	V <sub>R(RMS)</sub>	14	V
Average Rectified Output Current (See Figure 4)	I <sub>O</sub>	500	mA
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	10	A

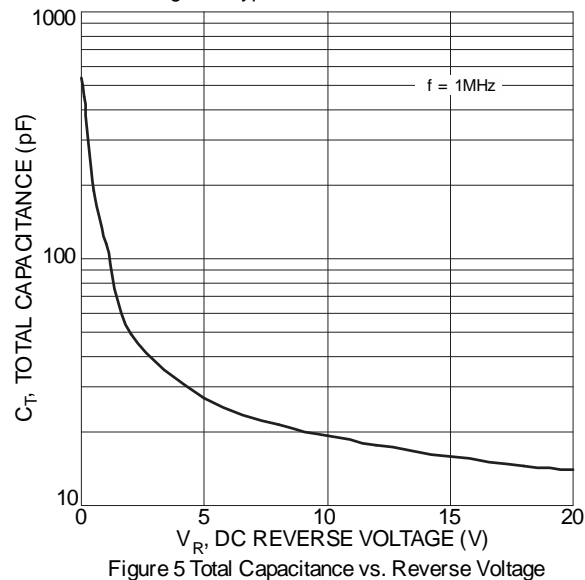
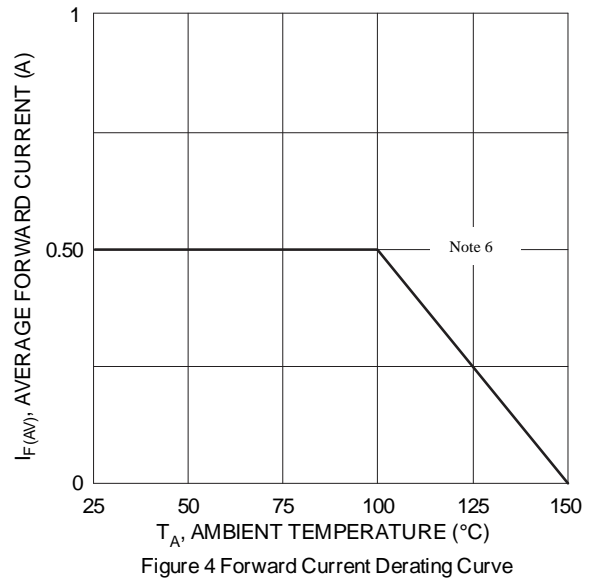
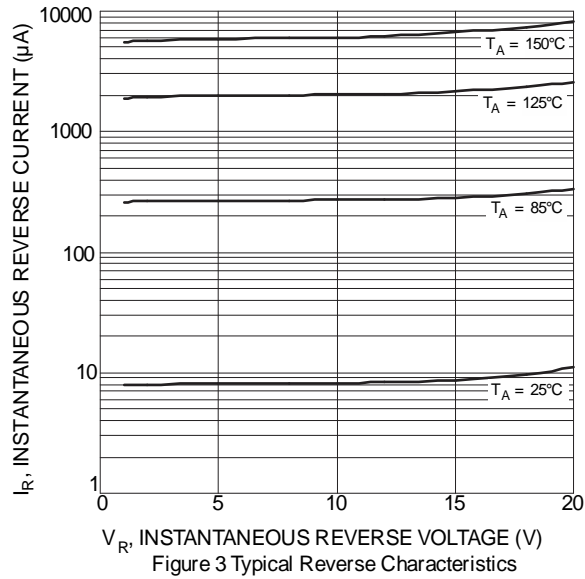
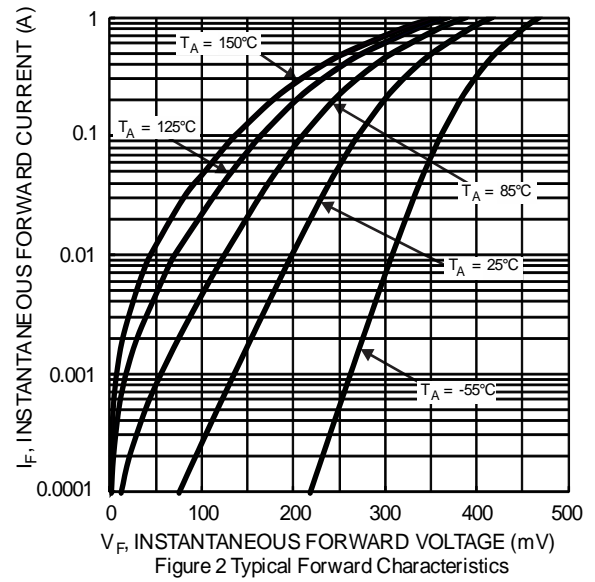
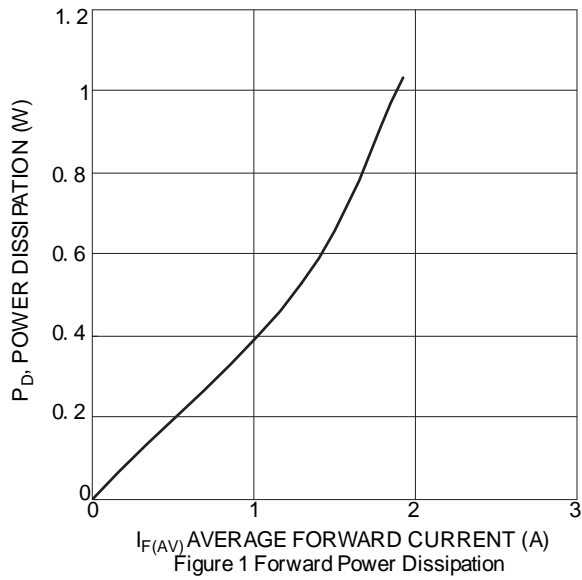
## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 6)	R <sub>θJA</sub>	236	°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	Typ	Max	Unit	Test Condition
Forward Voltage Drop	V <sub>F</sub>	—	0.28 0.30 0.35	0.32 0.34 0.39	V	I <sub>F</sub> = 0.1A, T <sub>J</sub> = +25°C I <sub>F</sub> = 0.2A, T <sub>J</sub> = +25°C I <sub>F</sub> = 0.5A, T <sub>J</sub> = +25°C
Leakage Current (Note 7)	I <sub>R</sub>	—	11 2.5	50 10	μA mA	V <sub>R</sub> = 20V, T <sub>J</sub> = +25°C V <sub>R</sub> = 20V, T <sub>J</sub> = +125°C
Total Capacitance	C <sub>T</sub>	—	14	—	pF	f = 1MHz, V <sub>R</sub> = 20V
Reverse Recovery Time	t <sub>RR</sub>	—	15 6	—	ns	I <sub>F</sub> = I <sub>R</sub> = 10mA, I <sub>R(REC)</sub> = 1mA, R <sub>L</sub> = 100Ω I <sub>F</sub> = 500mA, di/dt = 600A/μs, V <sub>R</sub> = 10V

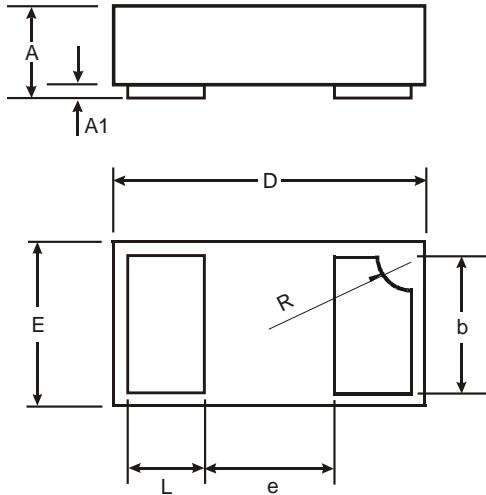
Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.  
7. Short duration pulse test used to minimize self-heating effect.



## Package Outline Dimensions

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

**X1-DFN1006-2**

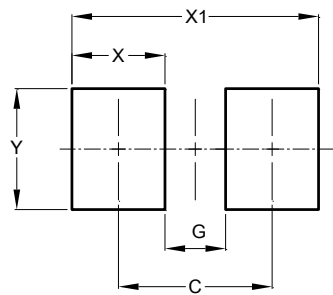


X1-DFN1006-2			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.03
b	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	—	—	0.40
L	0.20	0.30	0.25
R	0.05	0.15	0.10
All Dimensions in mm			

## Suggested Pad Layout

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

**X1-DFN1006-2**



Dimensions	Value (in mm)
C	0.70
G	0.30
X	0.40
X1	1.10
Y	0.70

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