



**THE DATASHEET OF
SBRT20U50SLP-13**



Product Summary

V_{RRM} (V)	I_o (A)	$V_F(MAX)$ (V) @ +25°C	$I_R(MAX)$ (mA) @ +25°C
50	20	0.5	0.5

Description and Applications

Packaged in the compact thermally efficient POWERDI5060-8 package, the SBRT20U50SLP provides very low V_F and excellent reverse leakage stability at high temperatures. It is ideal for use as a rectifier, freewheel diode or blocking diode in:

- DC-DC Converters
- AC-DC Adaptors

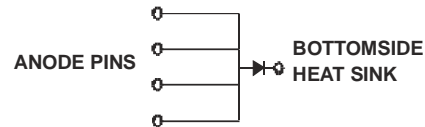
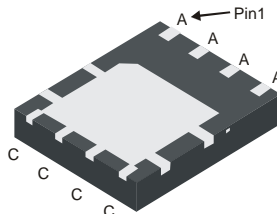
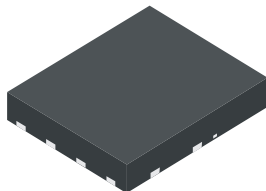
Features and Benefits

- 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.
- 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: POWERDI5060-8
- 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 (63)
- Polarity: See Below
- Weight: 0.097 grams (Approximate)

Top View POWERDI5060-8 Bottom View



Note: All four anode pins must be electrically connected at the printed circuit board.

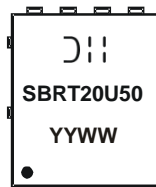
Ordering Information (Note 4)

Part Number	Case	Packaging
SBRT20U50SLP-13	POWERDI5060-8	2,500/Tape & Reel

- Notes:
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>.

Marking Information

POWERDI5060-8



SBRT20U50 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 15 = 2015)
WW = Week (01-53)

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	V _{RRM}	50	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _{RM}		
RMS Reverse Voltage	V _{R(RMS)}	35	V
Average Rectified Output Current	I _O	20	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	200	A
Non-Repetitive Avalanche Energy (T _J = +25°C, I _{AS} = 14.5A, L = 8.5mH)	E _{AS}	640	mJ
Repetitive Peak Avalanche Energy (1μs, +25°C)	P _{ARM}	40,000	W

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	R _{θJA}	12	°C/W
Operating Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{STG}	-55 to +175	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop (Note 6)	V _F	—	0.375	0.420	V	I _F = 10A, T _J = +25°C
		—	0.445	0.500		I _F = 20A, T _J = +25°C
Leakage Current (Note 6)	I _R	—	0.144	0.500	mA	V _R = 50V, T _J = +25°C
		—	—	100		V _R = 50V, T _J = +125°C
Total Capacitance	C _T	—	350	—	pF	V _R = 50V, f = 1MHz

Notes: 5. Device mounted on Al substrate PCB (30mm*30mm) with additional heat sink (Al 48mm*35mm*80mm)
6. Short duration pulse test used to minimize self-heating effect.

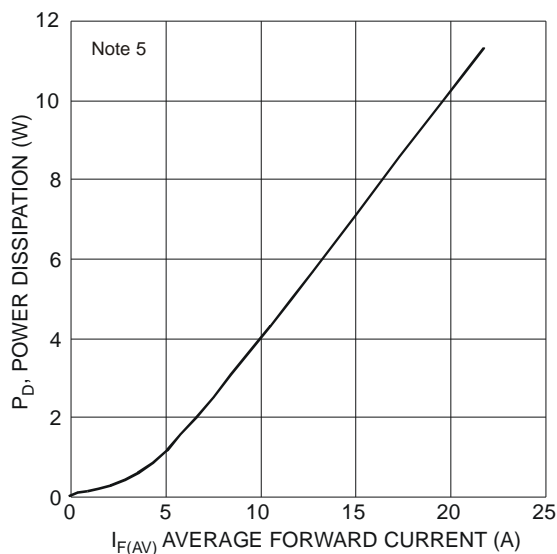


Figure 1 Forward Power Dissipation

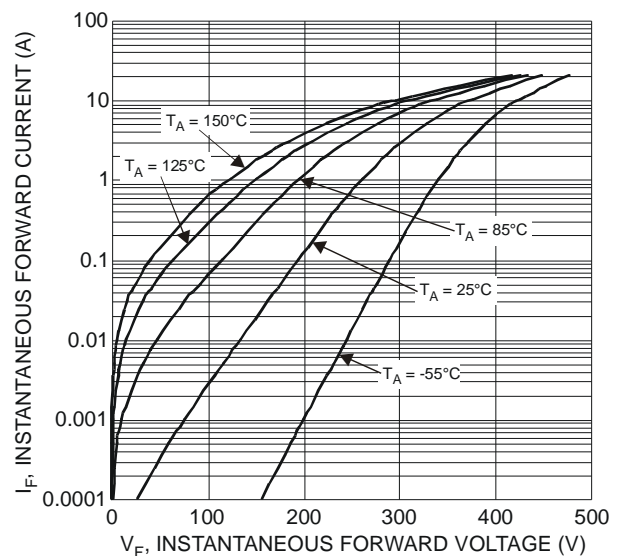


Figure 2 Typical Forward Characteristics

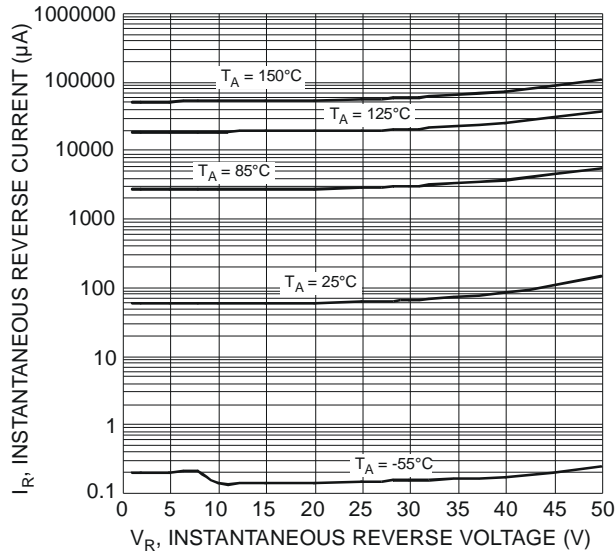


Figure 3 Typical Reverse Characteristics

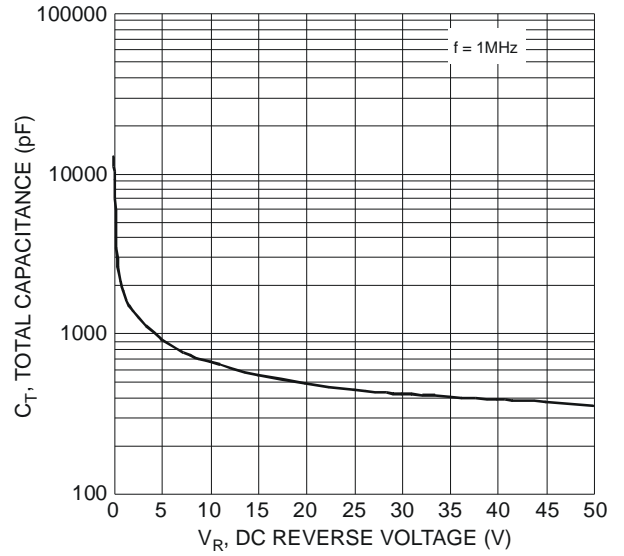


Figure 4 Total Capacitance vs. Reverse Voltage

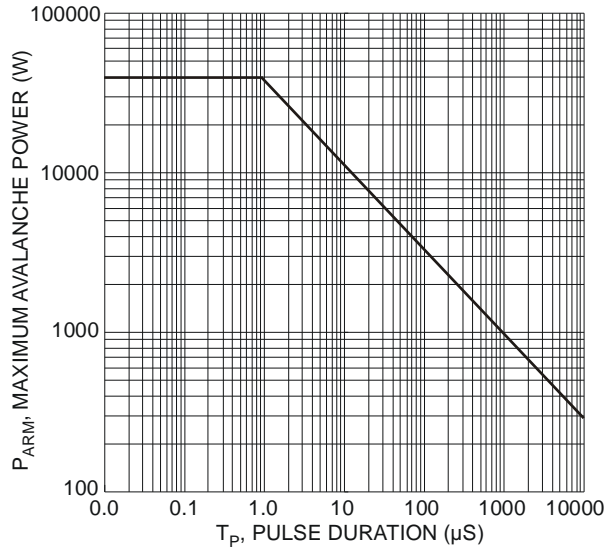


Figure 5 Maximum Avalanche Power Curve

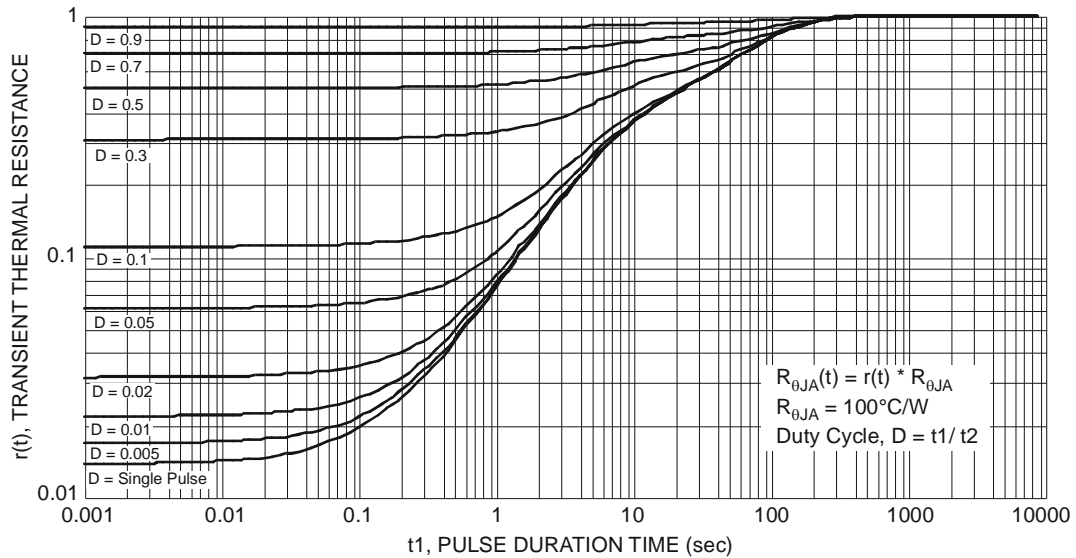


Figure 6 Transient Thermal Resistance

$$R_{\theta JA}(t) = r(t) * R_{\theta JA}$$

$$R_{\theta JA} = 100^{\circ}\text{C/W}$$

$$\text{Duty Cycle, } D = t1 / t2$$

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