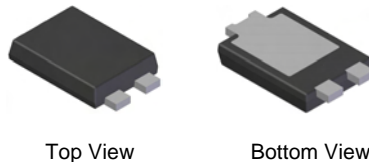


## Features

- Designed as Bypass Diodes for Solar Panels
- Selectively Rated for 200°C Maximum Junction Temperature for High Thermal Reliability
- Patented Super Barrier Rectifier Technology
- High Forward Surge Capability
- Ultra Low Forward Voltage Drop
- Excellent High Temperature Stability
- **Lead Free Finish, RoHS Compliant (Note 1)**
- **“Green” Molding Compound (No Br, Sb)**

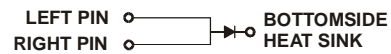
## Mechanical Data

- Case: POWERDI<sup>®5</sup>
- 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 <sup>Ⓔ3</sup>
- Weight: 0.093 grams (approximate)



Top View

Bottom View



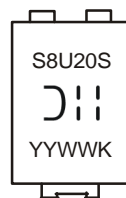
**Note:** Pins Left & Right must be electrically connected at the printed circuit board.

## Ordering Information (Note 2)

| Part Number   | Case                  | Packaging        |
|---------------|-----------------------|------------------|
| SBR8U20SP5-13 | POWERDI <sup>®5</sup> | 5000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes*
  2. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



- S8U20S = Product Type Marking Code
- ⌋|| = Manufacturers' Code Marking
- K = Factory Designator
- YYWW = Date Code Marking
- YY = Last Two Digits of Year (ex: 08 for 2008)
- WW = Week code (01 - 53)

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  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  | $V_{RRM}$ | 20    | V    |
| Working Peak Reverse Voltage   | $V_{RWM}$ |       |      |
| DC Blocking Voltage  | $V_{RM}$  |       |      |
| Average Rectified Output Current   | $I_O$     | 8     | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 180   | A    |

**Thermal Characteristics**

| Characteristic                                  | Symbol          | Value                   | Unit                      |
|---|-----------------|-------------------------|---------------------------|
| Maximum Thermal Resistance                      |                 |                         |                           |
| Thermal Resistance Junction to Ambient (Note 3) | $R_{\theta JA}$ | 102                     | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance Junction to Ambient (Note 4) | $R_{\theta JA}$ | 60                      |                           |
| Operating Temperature Range                     | $T_J$           | $V_R \leq 80\% V_{RRM}$ | -65 to +150               |
|   |                 | $V_R \leq 50\% V_{RRM}$ | $\leq 180$                |
|   |                 | DC Forward Mode         | $\leq 200$                |
| Storage Temperature Range                       | $T_{STG}$       | -65 to +175             | $^\circ\text{C}$          |

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic           | Symbol | Min | Typ  | Max  | Unit | Test Condition                             |
|--------------------------|--------|-----|------|------|------|--|
| Forward Voltage Drop     | $V_F$  | -   | 0.41 | 0.51 | V    | $I_F = 8\text{A}, T_J = 25^\circ\text{C}$  |
|                          |        |     | 0.33 | 0.43 |      | $I_F = 8\text{A}, T_J = 125^\circ\text{C}$ |
| Leakage Current (Note 5) | $I_R$  | -   | 0.08 | 0.2  | mA   | $V_R = 4\text{V}, T_J = 25^\circ\text{C}$  |
|                          |        |     | 0.2  | 0.5  |      | $V_R = 20\text{V}, T_J = 25^\circ\text{C}$ |

- Notes:
- FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  - Polymide PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.
  - Short duration pulse test used to minimize self-heating effect.

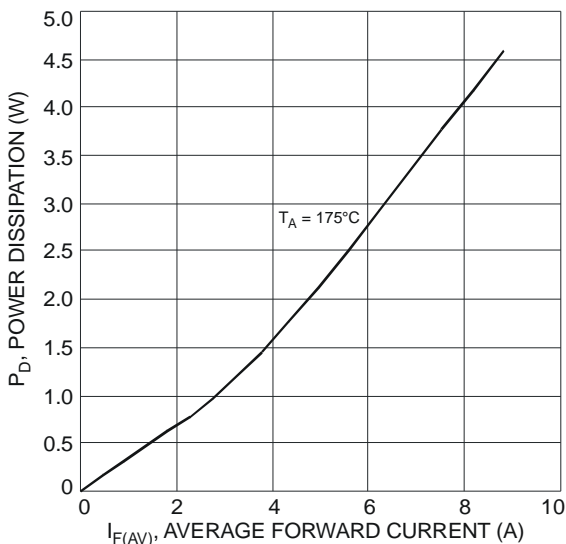


Fig. 1 Forward Power Dissipation

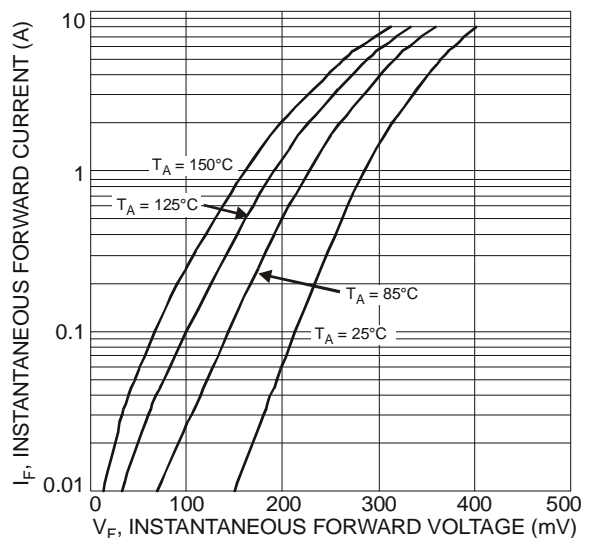


Fig. 2 Typical Forward Characteristics

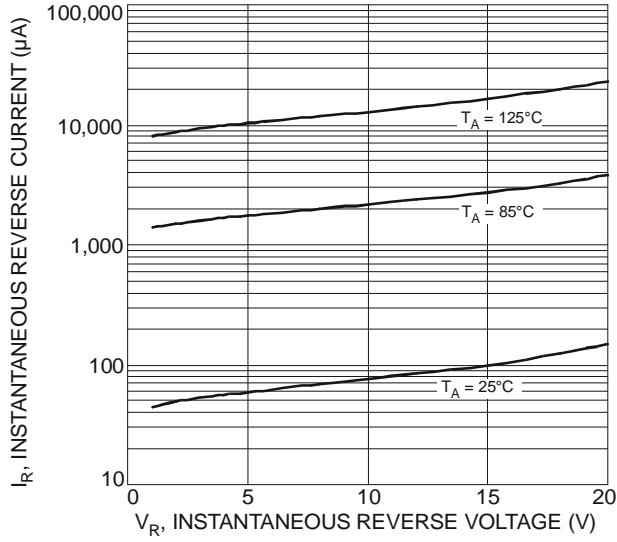


Fig. 3 Typical Reverse Characteristics

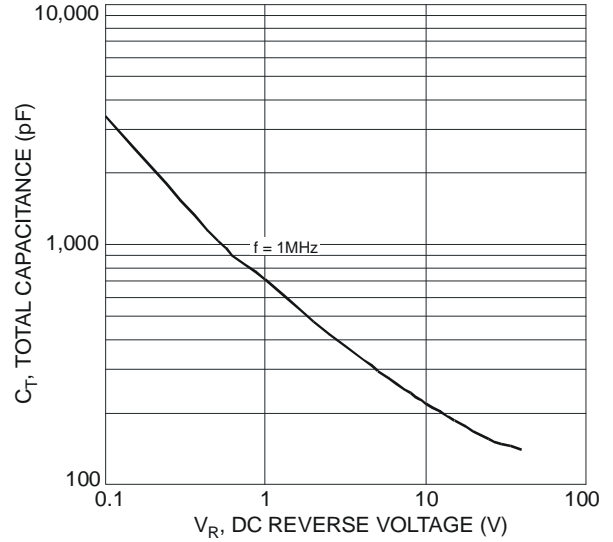


Fig. 4 Total Capacitance vs. Reverse Voltage

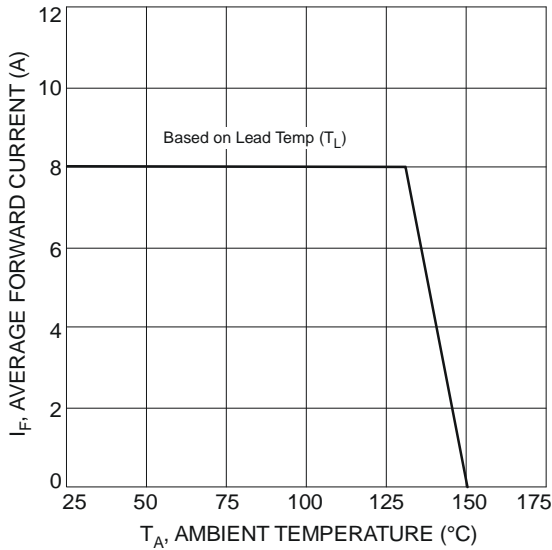
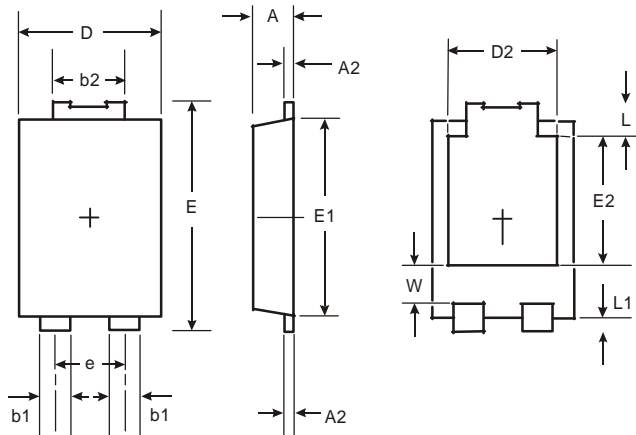


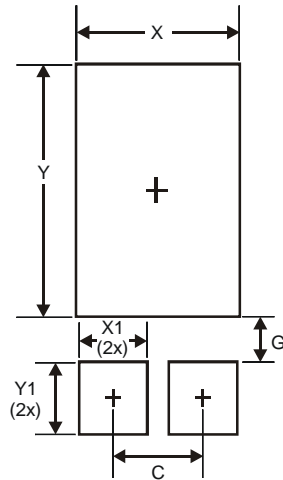
Fig. 5 Forward Current Derating Curve

**Package Outline Dimensions**



| POWERDI <sup>®</sup> 5      |           |      |
|-----------------------------|-----------|------|
| Dim                         | Min       | Max  |
| A                           | 1.05      | 1.15 |
| A2                          | 0.33      | 0.43 |
| b1                          | 0.80      | 0.99 |
| b2                          | 1.70      | 1.88 |
| D                           | 3.90      | 4.05 |
| D2                          | 3.054 Typ |      |
| E                           | 6.40      | 6.60 |
| e                           | 1.84 Typ  |      |
| E1                          | 5.30      | 5.45 |
| E2                          | 3.549 Typ |      |
| L                           | 0.75      | 0.95 |
| L1                          | 0.50      | 0.65 |
| W                           | 1.10      | 1.41 |
| <b>All Dimensions in mm</b> |           |      |

## Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| <b>C</b>   | 1.840         |
| <b>G</b>   | 0.852         |
| <b>X</b>   | 3.360         |
| <b>X1</b>  | 1.390         |
| <b>Y</b>   | 4.860         |
| <b>Y1</b>  | 1.400         |

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