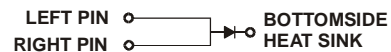
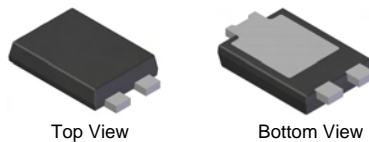


Features

- Designed as Bypass Diodes for Solar Panels
- Selectively Rated for 200°C Maximum Junction Temperature for High Thermal Reliability
- Patented Super Barrier Rectifier Technology
- Low Forward Voltage Drop
- Excellent High Temperature Stability
- **Lead Free Finish, RoHS Compliant (Note 1)**

Mechanical Data

- Case: PowerDI^{®5}
- 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 ^{Ⓔ3}
- Weight: 0.093 grams (approximate)



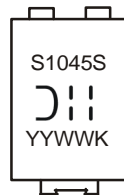
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 2)

| Part Number | Case | Packaging |
|---------------|-----------------------|------------------|
| SBR1045SP5-13 | PowerDI ^{®5} | 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



S1045S = 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°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} | 45 | V |
| Working Peak Reverse Voltage | V _{RWM} | | |
| DC Blocking Voltage | V _{RM} | | |
| RMS Reverse Voltage | V _{R(RMS)} | 32 | V |
| Average Rectified Output Current | I _O | 10 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I _{FSM} | 180 | A |
| Repetitive Peak Avalanche Power (1μs, 25°C) | P _{ARM} | 10,000 | W |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|--|---------------------------------------|-------------|
| Typical Thermal Resistance | R _{θJL} R _{θJC} R _{θJA} R _{θJA} | 3 6 102 60 | °C/W |
| Thermal Resistance Junction to Lead | | | |
| Thermal Resistance Junction to Case (Note 3) | | | |
| Thermal Resistance Junction to Ambient (Note 3) | | | |
| Thermal Resistance Junction to Ambient (Note 4) | R _{θJA} | 60 | |
| Operating Temperature Range | T _J | V _R ≤ 80% V _{RRM} | -65 to +150 |
| | | V _R ≤ 50% V _{RRM} | ≤180 |
| | | DC Forward Mode | ≤200 |
| Storage Temperature Range | T _{STG} | -65 to +175 | °C |

Electrical Characteristics @T_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------------|--------------------|-----|--------------|--------------|------|---|
| Reverse Breakdown Voltage (Note 5) | V _{(BR)R} | 45 | - | - | V | I _R = 0.5mA |
| Forward Voltage Drop | V _F | - | - | 0.51 | V | I _F = 8A, T _J = 25°C |
| | | - | 0.49 0.47 | 0.55 0.53 | | I _F = 10A, T _J = 25°C I _F = 10A, T _J = 125°C |
| Leakage Current (Note 5) | I _R | - | 0.03 | 0.45 | mA | V _R = 45V, T _J = 25°C |
| | | - | - | 18 | | V _R = 45V, T _J = 100°C |
| | | - | 17 | 100 | | V _R = 45V, T _J = 150°C |

Notes: 3. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
4. Polyimide PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
5. Short duration pulse test used to minimize self-heating effect.

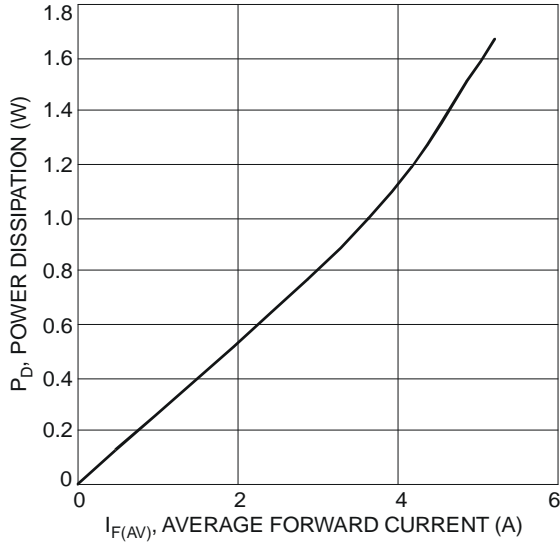


Fig. 1 Forward Power Dissipation

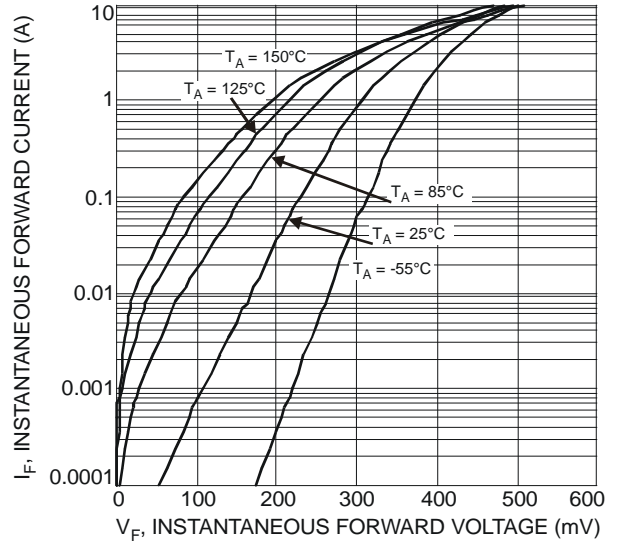


Fig. 2 Typical Forward Characteristics

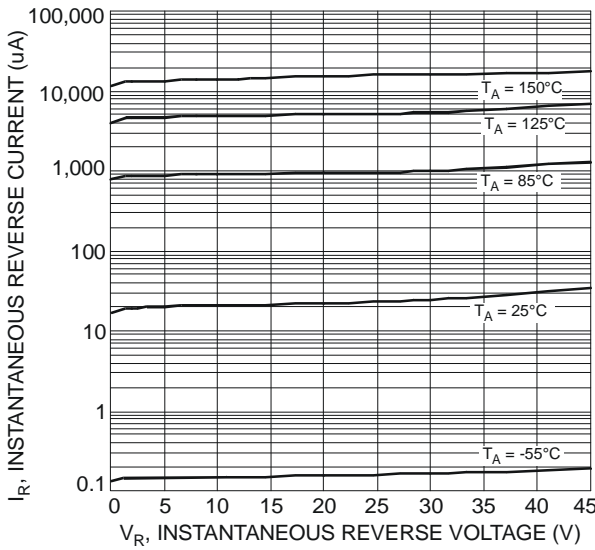


Fig. 3 Typical Reverse Characteristics

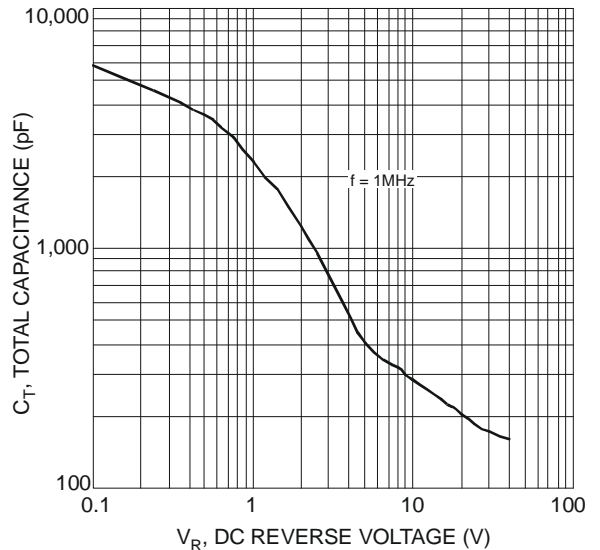


Fig. 4 Total Capacitance vs. Reverse Voltage

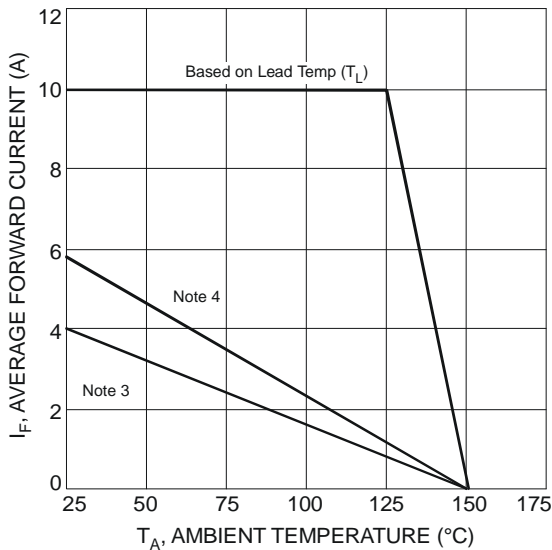


Fig. 5 Forward Current Derating Curve

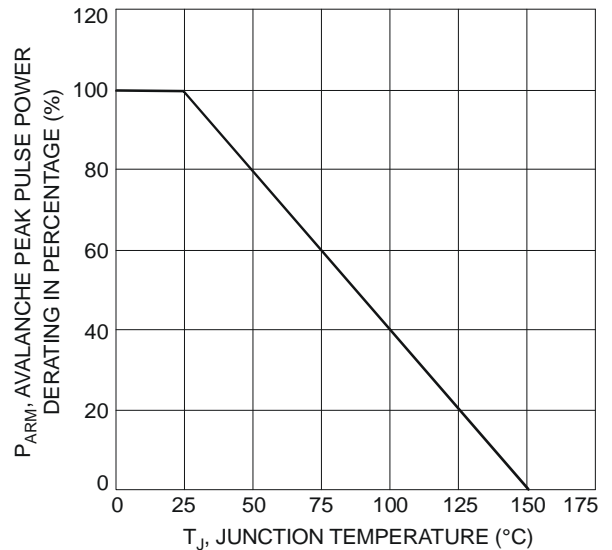


Fig. 6 Pulse Derating Curve

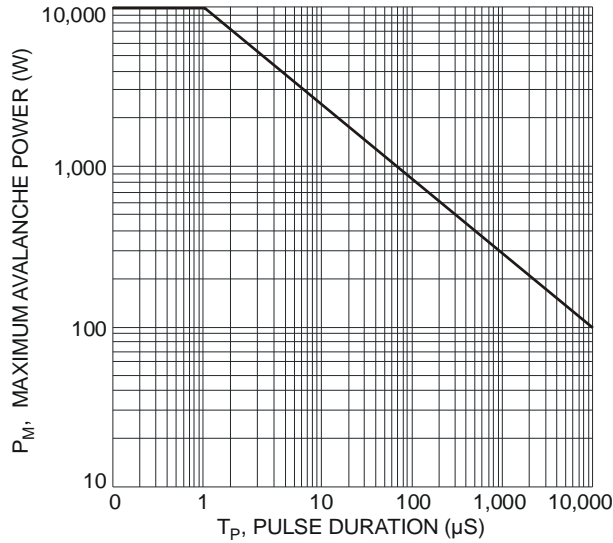
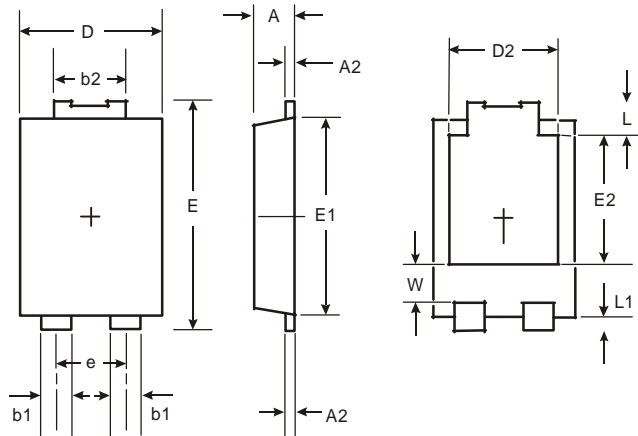


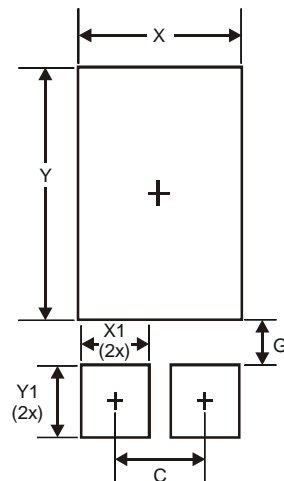
Fig. 7 Maximum Avalanche Power vs. Pulse Duration

Package Outline Dimensions



| PowerDI [®] 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 |
| All Dimensions in mm | | |

Suggested Pad Layout



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

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