

Product Summary (@ T_A = +25°C)

| V _{RRM} (V) | I _O (A) | V _F MAX (V) @ +25°C | I _R MAX (mA) @ +25°C |
|----------------------|--------------------|-----------------------------------|------------------------------------|
| 50 | 15 | 0.52 | 0.5 |

Description

Packaged in the compact thermally efficient PowerDI5 package, the SBR15U50SP5 provides very low V_F and provides excellent reverse leakage stability at high temperatures. It is ideal for use as a rectification, freewheeling or polarity protection diode.

Applications

- DC/DC Converters
- AC/DC Adaptors

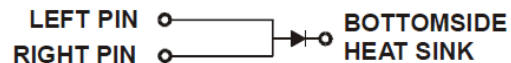
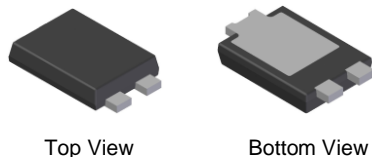
Features and Benefits

- Low Forward Voltage Drop (V_F) Helps – Minimizes Power Losses
- Excellent Stability at Higher Temperatures
- Thermally Efficient Package for Cooler Running Applications
- 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)**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([SBR15U50SP5Q](#))**

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
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)

PowerDI5

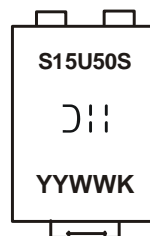


Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|----------------|----------|------------------|
| SBR15U50SP5-13 | PowerDI5 | 5000/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free/ 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


= Manufacturer's Marking
 S15U50S = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 18 = 2018)
 WW = Week Code (01 to 53)
 K = Factory Designator

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|------------------|-------|------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V _{RRM} | 50 | V |
| Average Rectified Output Current | I _o | 15 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms | I _{FSM} | 256 | A |
| Non-Repetitive Avalanche Energy at I _{AS} = 10A, L = 50mH | E _{AS} | 1600 | mJ |
| Non-Repetitive Avalanche Energy at I _{AS} = 40A, L = 1mH | E _{AS} | 300 | mJ |
| Electrostatic Discharge | HBM | 8000 | V |
| Electrostatic Discharge | MM | 400 | V |
| Electrostatic Discharge | CDM | 1000 | V |

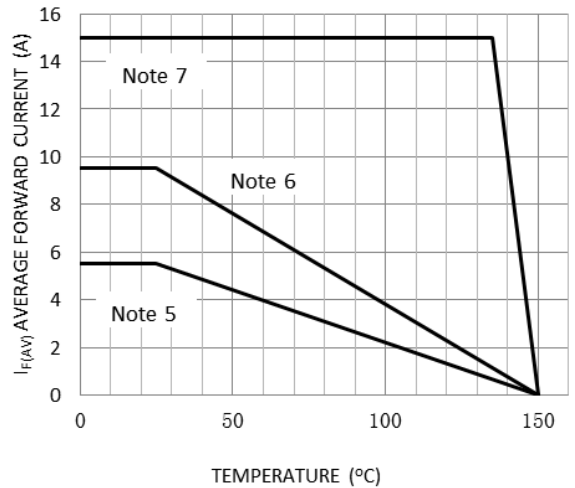
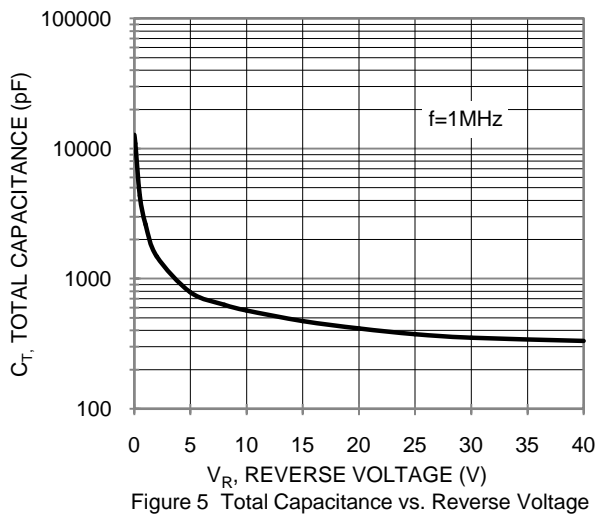
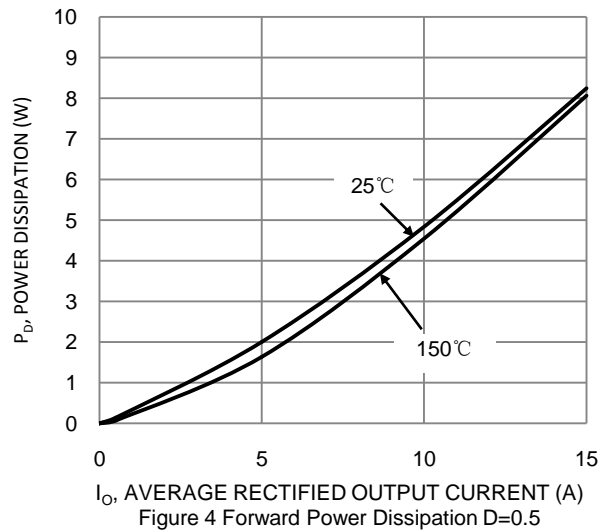
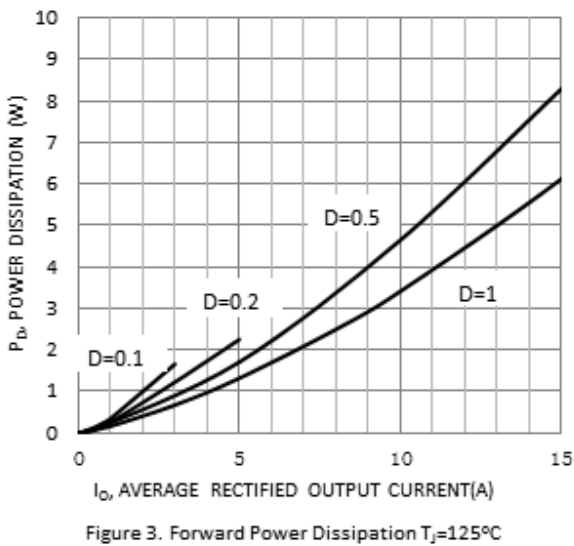
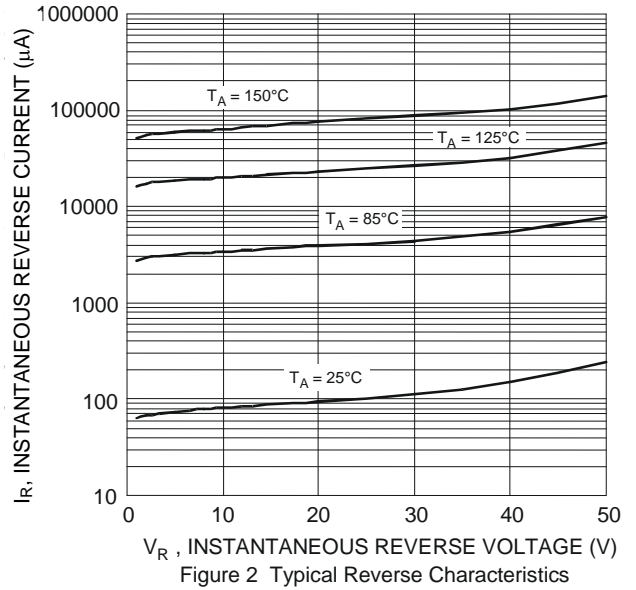
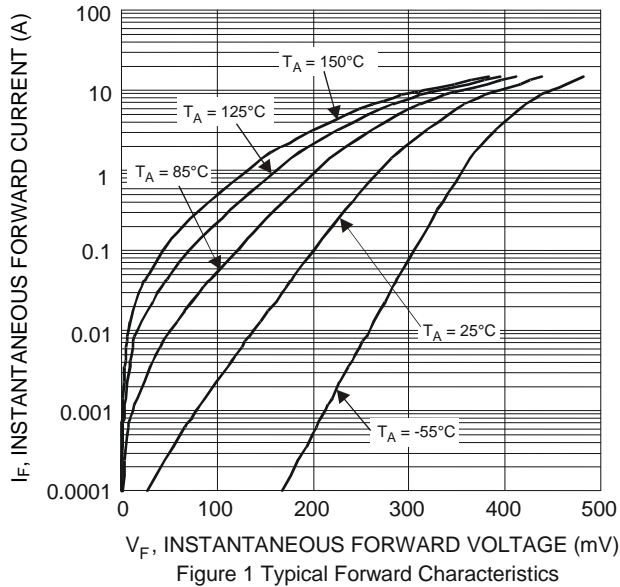
Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Typical Thermal Resistance (Note 5) | R _{θJA} | 90 | °C/W |
| Typical Thermal Resistance (Note 6) | R _{θJA} | 39 | °C/W |
| Typical Thermal Resistance (Note 7) | R _{θJL} | 2.5 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -65 to +150 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---------------------------------|-----------------|-----|------|------|------|---|
| Forward Voltage Drop (Note 8) | V _F | — | — | 0.48 | V | I _F = 10A, T _J = +25°C |
| | | — | 0.33 | — | | I _F = 10A, T _J = +125°C |
| | | — | 0.44 | 0.52 | | I _F = 15A, T _J = +25°C |
| | | — | 0.40 | — | | I _F = 15A, T _J = +125°C |
| Leakage Current (Note 8) | I _R | — | — | 0.5 | mA | V _R = 50V, T _J = +25°C |
| | | — | 50 | — | | V _R = 50V, T _J = +125°C |
| Junction Capacitance | C _J | — | 400 | — | pF | V _R = 25V, T _J = +25°C |
| Switching Speed t _{RR} | t _{RR} | — | 50 | — | ns | I _F = 0.5A, I _R = 1A, I _{RR} = 0.25A (RG1) |

- Notes:
5. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
 6. FR-4 PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.
 7. Junction to Lead (Cathode Terminal).
 8. Short duration pulse test used to minimize self-heating effect.



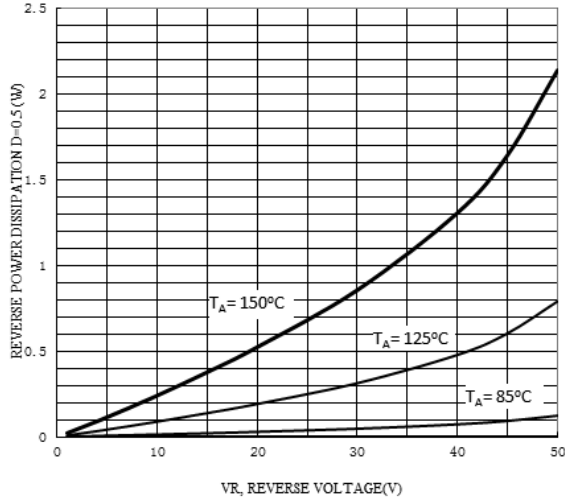


Figure 7 Reverse power dissipation D=0.5

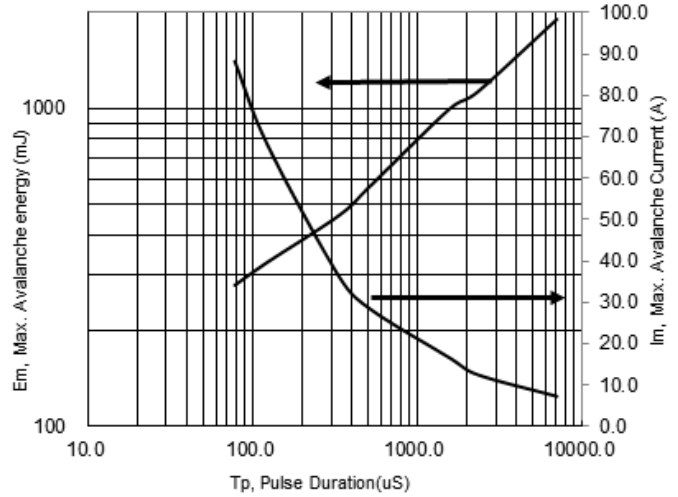


Figure 8: Single pulse Max. Avalanche Energy and Current

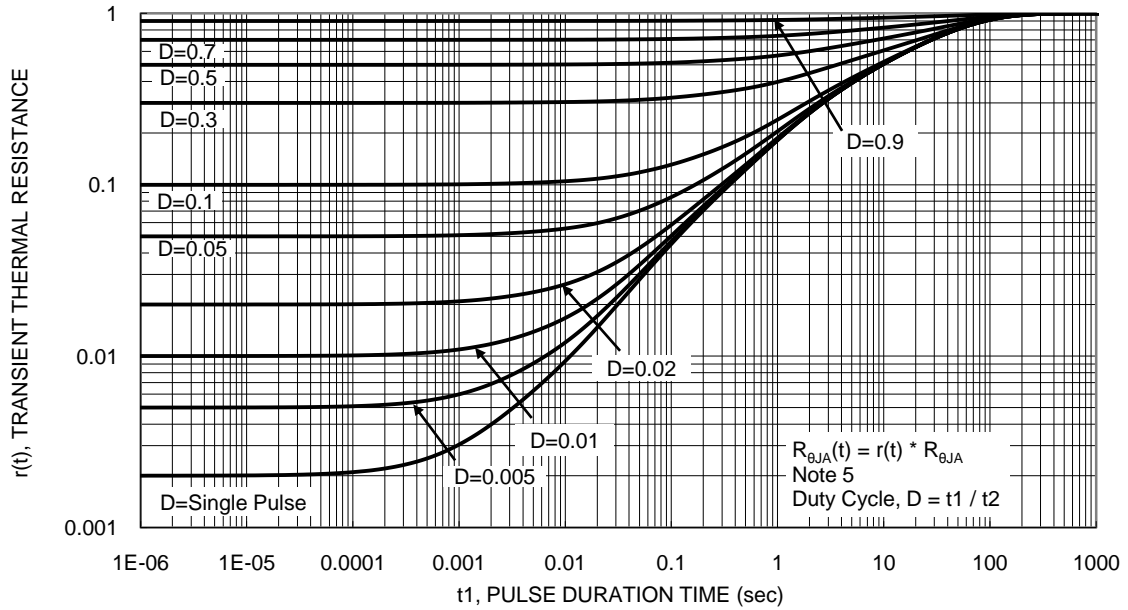
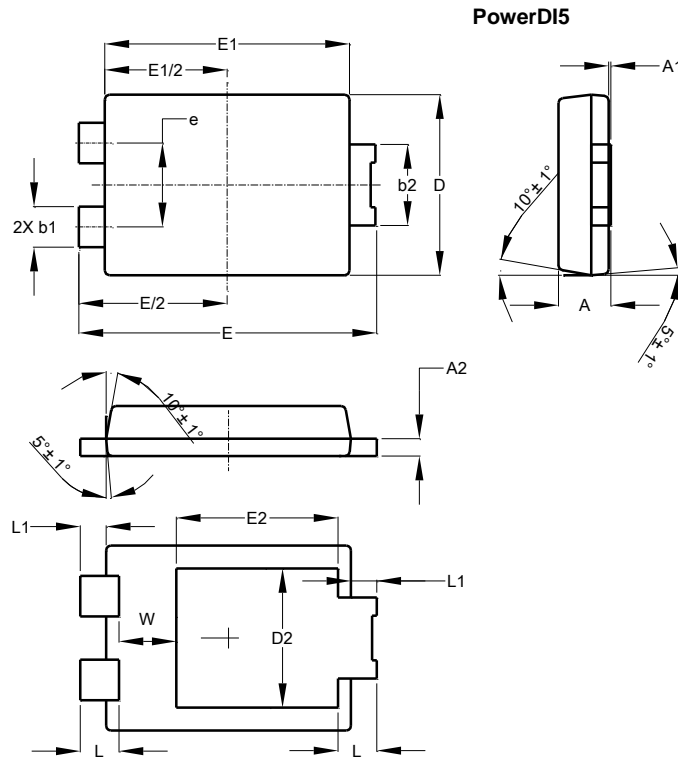


Figure 9. Transient Thermal Resistance

Package Outline Dimensions

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

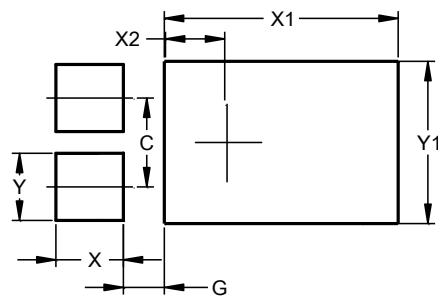


| PowerDI5 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 1.05 | 1.15 | 1.10 |
| A1 | 0.00 | 0.05 | -- |
| A2 | 0.33 | 0.43 | 0.381 |
| b1 | 0.80 | 0.99 | 0.89 |
| b2 | 1.70 | 1.88 | 1.78 |
| D | 3.90 | 4.05 | 3.966 |
| D2 | -- | -- | 3.054 |
| E | 6.40 | 6.60 | 6.51 |
| e | -- | -- | 1.84 |
| E1 | 5.30 | 5.45 | 5.37 |
| E2 | -- | -- | 3.549 |
| L | 0.75 | 0.95 | 0.85 |
| L1 | 0.50 | 0.65 | 0.57 |
| W | 1.10 | 1.41 | 1.255 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

PowerDI5



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.840 |
| G | 0.852 |
| X | 1.400 |
| X1 | 4.860 |
| X2 | 1.310 |
| Y | 1.390 |
| Y1 | 3.360 |

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