

Product Summary

| V_R (V) | I_F (A) | $V_{F\ MAX}$ (V) @ +25°C | $I_{R\ MAX}$ (mA) @ +25°C |
|-----------|-----------|-----------------------------|------------------------------|
| 100 | 5.0 | 0.79 | 0.2 |

Description and Applications

This Schottky Barrier Rectifier is designed to meet the stringent requirements of automotive applications. It is ideally suited to use as:

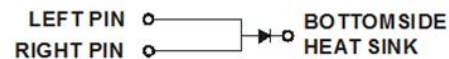
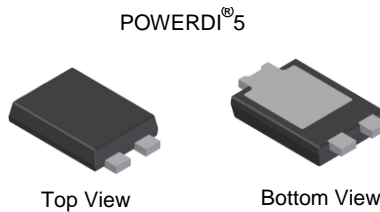
- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode

Features and Benefits

- Guard Ring Die Construction for Transient Protection
- High Surge Current Capability
- Low Leakage Current
- Low Forward Voltage Drop
- High Forward Surge Current Capability
- **Lead-Free Finish; 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: 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
- Polarity: See Diagram
- Weight: 0.093 grams (Approximate)



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

Ordering Information (Note 5)

| Part Number | Compliance | Case | Packaging |
|--------------|------------|------------------------|-------------------|
| PDS5100Q-13D | Automotive | POWERDI [®] 5 | 5,000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.
 6. "D" suffix designate for the 12mm Tape and Reel option.

Marking Information



S5100 = Product type Marking Code
 D I I = Manufacturers' Code Marking
 YYWW = Date Code Marking
 YY = Last Digit of Year (ex: 15 for 2015)
 WW = Week Code (01 - 53)
 K = Factory Designator

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 Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 100 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 71 | V |
| Average Rectified Output Current | I_O | 5 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I_{FSM} | 120 | A |

Thermal Characteristics

| Characteristic | Symbol | Typ | Max | Unit |
|---|-----------------|-------------|-----|--------------------|
| Thermal Resistance Junction to Soldering Point | $R_{\theta JS}$ | — | 2.6 | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient Air (Note 7) $T_A = +25^\circ\text{C}$ | $R_{\theta JA}$ | 90 | — | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient Air (Note 8) $T_A = +25^\circ\text{C}$ | $R_{\theta JA}$ | 70 | — | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient Air (Note 9) $T_A = +25^\circ\text{C}$ | $R_{\theta JA}$ | 50 | — | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | | $^\circ\text{C}$ |

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-------------------------------------|-------------|-----|-------|------|------|---|
| Reverse Breakdown Voltage (Note 10) | $V_{(BR)R}$ | 100 | — | — | V | $I_R = 200\mu\text{A}$ |
| Forward Voltage | V_F | — | 0.74 | 0.79 | V | $I_F = 5\text{A}, T_S = +25^\circ\text{C}$ |
| | | — | 0.64 | 0.68 | | $I_F = 5\text{A}, T_S = +100^\circ\text{C}$ |
| | | — | 0.60 | 0.64 | | $I_F = 5\text{A}, T_S = +125^\circ\text{C}$ |
| | | — | 0.81 | 0.89 | | $I_F = 10\text{A}, T_S = +25^\circ\text{C}$ |
| | | — | 0.68 | 0.73 | | $I_F = 10\text{A}, T_S = +125^\circ\text{C}$ |
| Reverse Leakage Current (Note 10) | I_R | — | 0.002 | 0.2 | mA | $T_S = +25^\circ\text{C}, V_R = 100\text{V}$ |
| | | — | 0.5 | 5 | | $T_S = +100^\circ\text{C}, V_R = 100\text{V}$ |
| | | — | 2 | 20 | | $T_S = +125^\circ\text{C}, V_R = 100\text{V}$ |

- Notes:
7. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
 8. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
 9. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
 10. Short duration pulse test used to minimize self-heating effect.

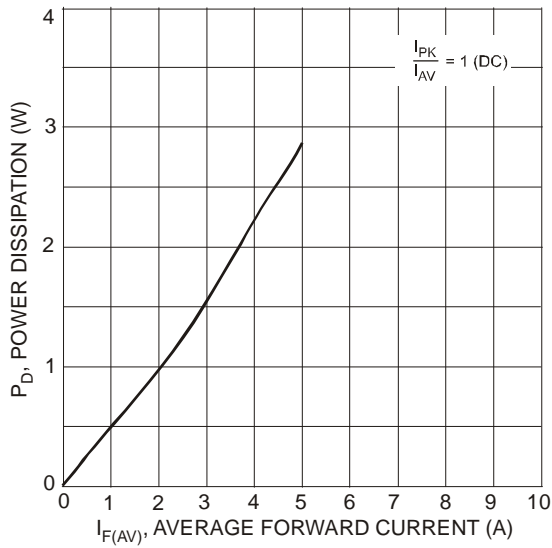


Fig. 1 Forward Power Dissipation

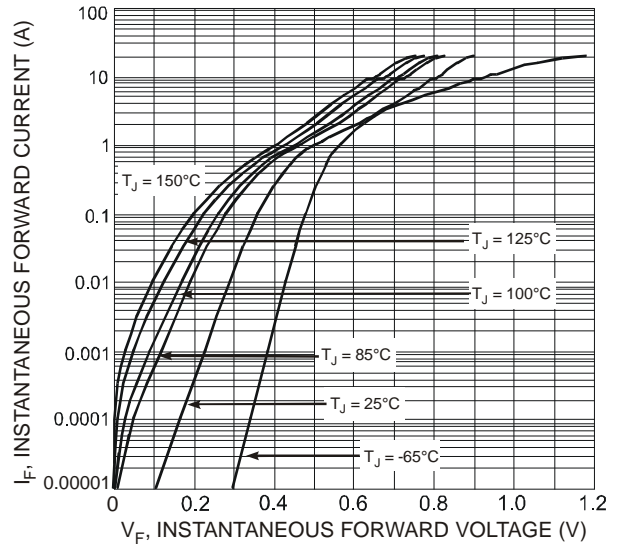


Fig. 2 Typical Forward Characteristics

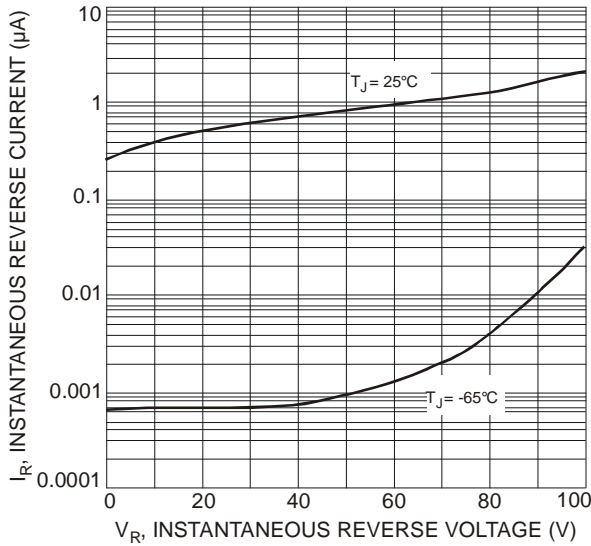


Fig. 3 Typical Reverse Characteristics

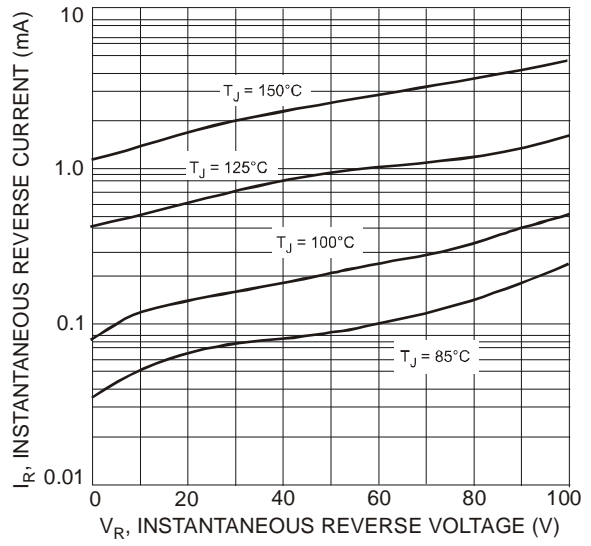


Fig. 4 Typical Reverse Characteristics

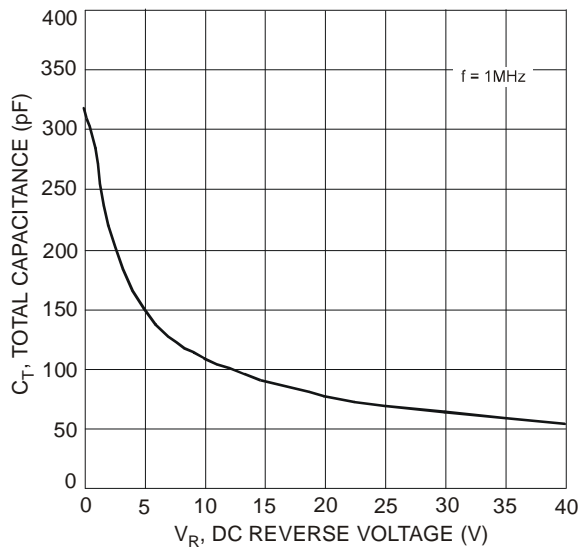


Fig. 5 Total Capacitance vs. Reverse Voltage

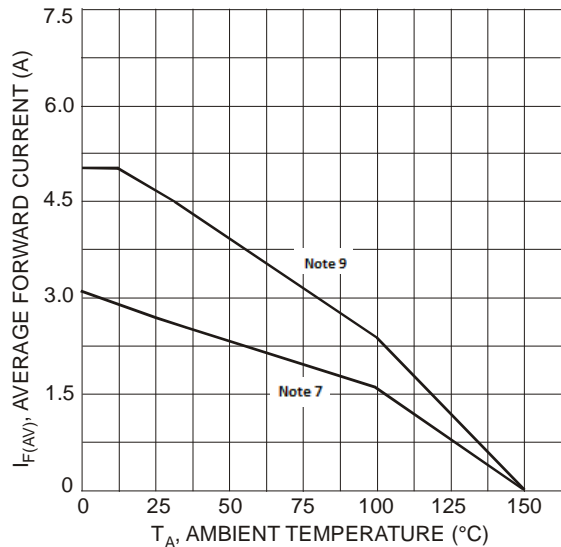


Fig. 6 Forward Current Derating Curve

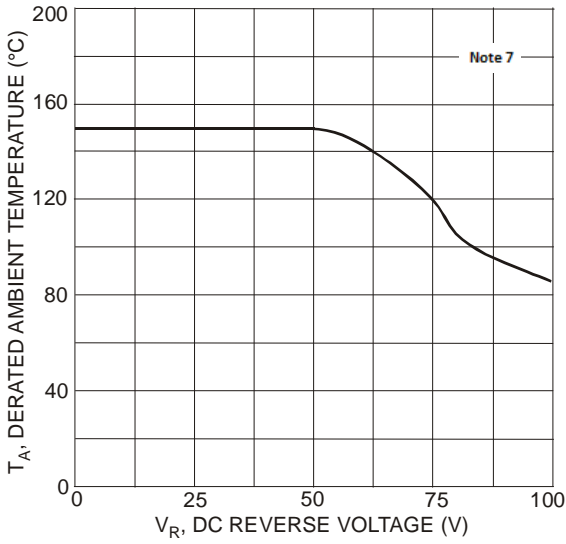
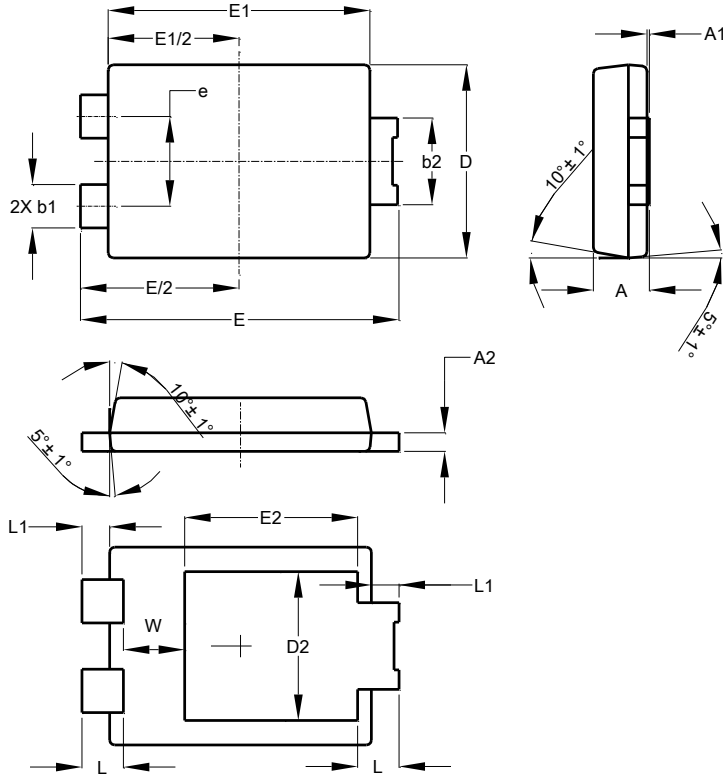


Fig. 7 Operating Temperature Derating

Package Outline Dimensions

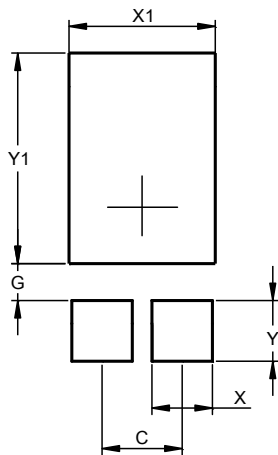
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| POWERDI [®] 5 | | | |
|------------------------|------|------|-------|
| 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 | 6.504 |
| 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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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

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