

**4A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER
POWERDI®**
Product Summary

| V_R (V) | I_F (A) | $V_{F\ MAX}$ (V) @ +25°C | $I_{R\ MAX}$ (mA) @ +25°C |
|-----------|-----------|-----------------------------|------------------------------|
| 150 | 4.0 | 0.76 | 0.01 |

Description and Applications

This Schottky Barrier Rectifier has been designed to meet the stringent requirements of Automotive Applications. It is ideally suited to use as:

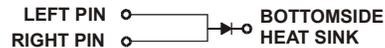
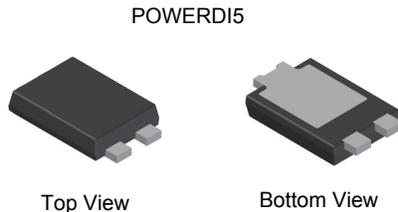
- Polarity Protection Diode
- Re-circulating Diode
- Switching Diode

Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Low Forward Voltage Drop
- Very Low Leakage Current
- High Maximum Junction Temperature Capability
- Highly Stable Oxide Passivated Junction
- 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: POWERDI5
- 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 (e3)
- Polarity: See Diagram
- Weight: 0.096 grams (approximate)

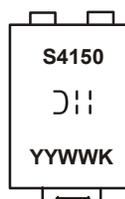


Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 5)

| Part Number | Compliance | Case | Packaging |
|-------------|------------|----------|------------------|
| PDS4150-13 | Standard | POWERDI5 | 5000/Tape & Reel |
| PDS4150Q-13 | Automotive | POWERDI5 | 5000/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>.

Marking Information


S4150 = Product type marking code
 D11 = Manufacturers' code marking
 YYWW = Date code marking
 YY = Last two digits of year (ex: 05 for 2014)
 WW = Week code (01 - 53)
 K = Factory Designator

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} | 150 | V |
| Working Peak Reverse Voltage | V _{RWM} | | |
| DC Blocking Voltage | V _R | | |
| RMS Reverse Voltage | V _{R(RMS)} | 106 | V |
| Average Rectified Output Current (See also Figure 4) | I _O | 4 | 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 | Typ | Max | Unit |
|--|-----------------------------------|-------------|-----|------|
| Thermal Resistance Junction to Soldering Point | R _{θJS} | — | 2.0 | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 6) T _A = +25°C | R _{θJA} | 90 | — | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 7) T _A = +25°C | R _{θJA} | 60 | — | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 8) T _A = +25°C | R _{θJA} | 40 | — | °C/W |
| Operating and Storage Temperature Range | T _J , 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 9) | V _{(BR)R} | 150 | — | — | V | I _R = 10μA |
| Forward Voltage | V _F | — | 0.71 | 0.76 | V | I _F = 4A, T _S = +25°C |
| | | — | 0.57 | 0.64 | | I _F = 4A, T _S = +125°C |
| | | — | 0.77 | 0.81 | | I _F = 8A, T _S = +25°C |
| | | — | 0.63 | 0.70 | | I _F = 8A, T _S = +125°C |
| Reverse Leakage Current (Note 9) | I _R | — | 0.3 | 10 | μA | T _S = +25°C, V _R = 150V |
| | | — | 0.35 | 0.8 | | T _S = +125°C, V _R = 100V |
| | | — | 0.4 | 4.5 | | T _S = +125°C, V _R = 150V |

- Notes: 6. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
7. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
8. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
9. Short duration pulse test used to minimize self-heating effect.

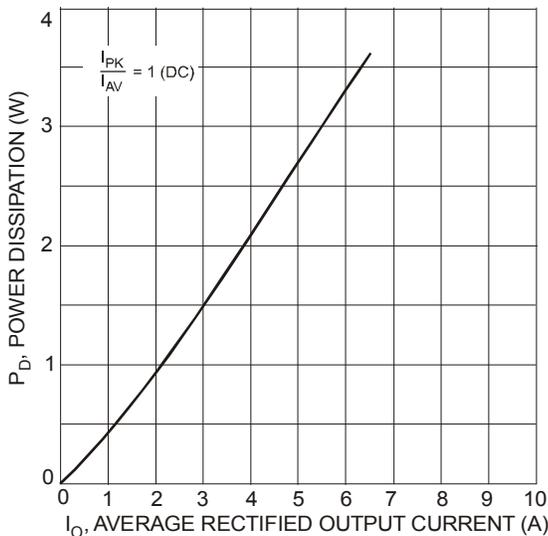


Fig. 1 Forward Power Dissipation

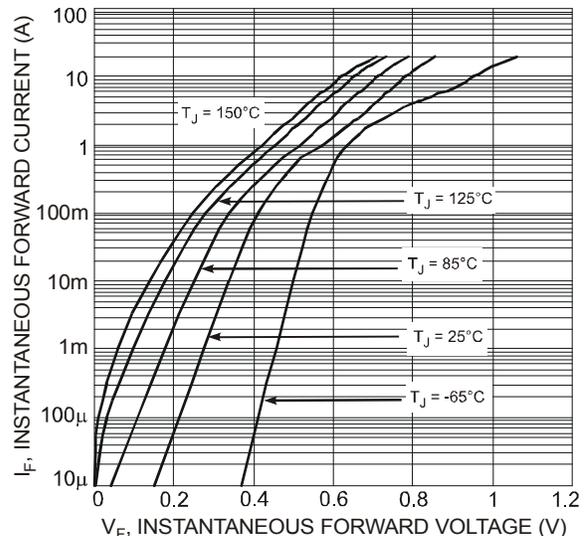


Fig. 2 Typical Forward Characteristics

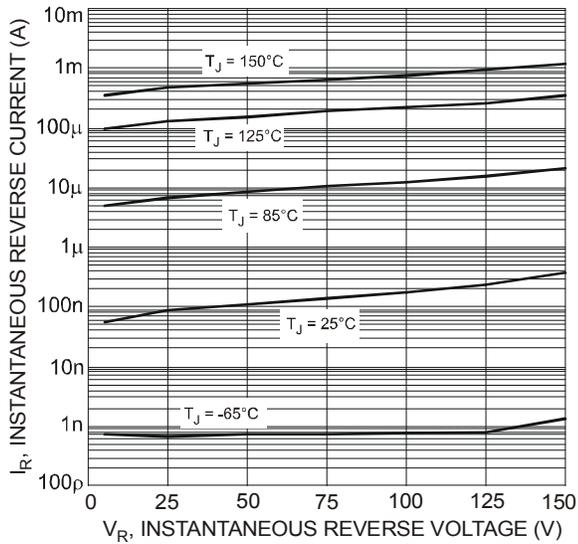


Fig. 3 Typical Reverse Characteristics

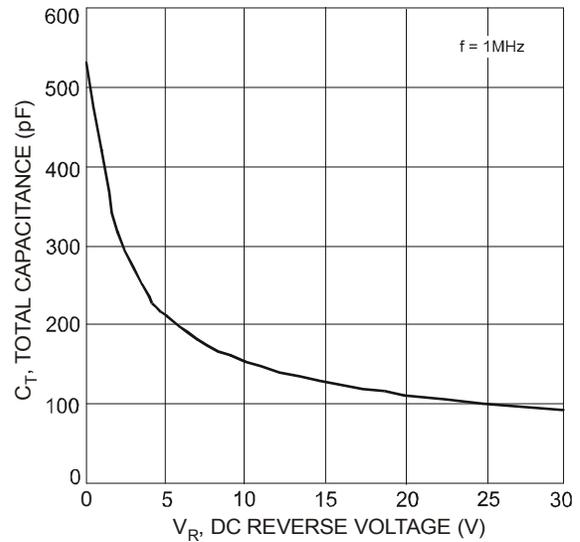


Fig. 4 Total Capacitance vs. Reverse Voltage

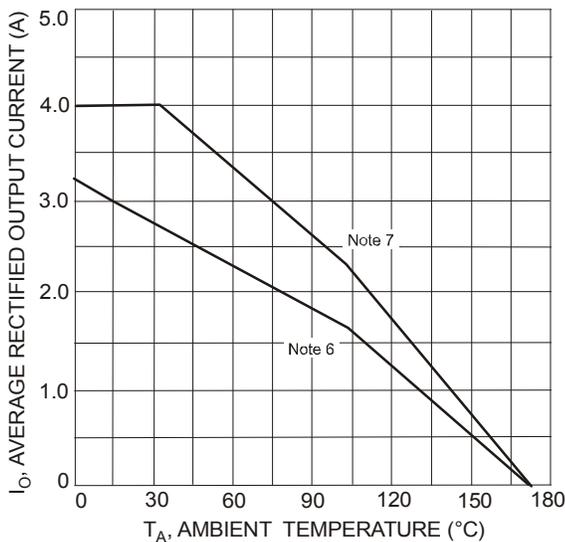


Fig. 5 Forward Current Derating Curve

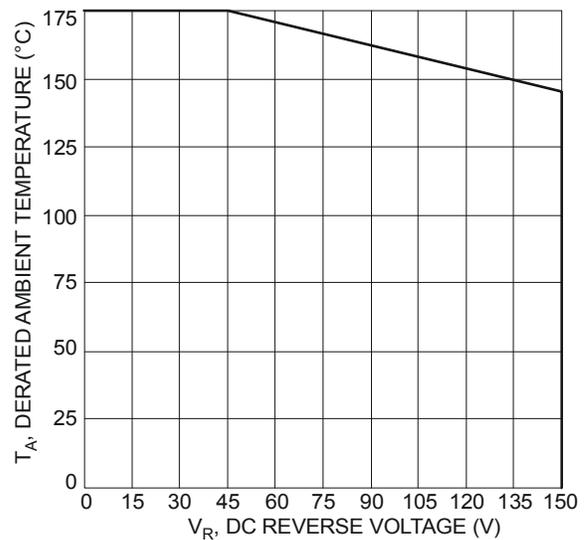
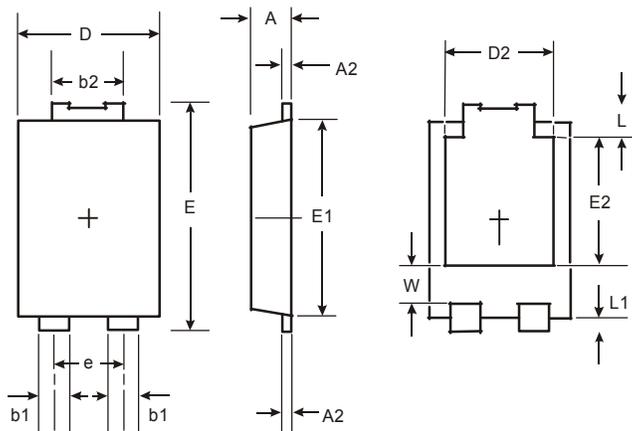


Fig. 6 Operating Temperature Derating

Package Outline Dimensions

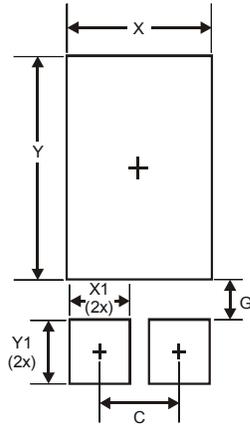
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| POWERDI5 | | |
|-----------------------------|-----------|------|
| 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

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 | 3.360 |
| X1 | 1.390 |
| Y | 4.860 |
| Y1 | 1.400 |

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