

**5A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER**  
**POWERDI<sup>®</sup>5**
**Product Summary**

| $V_R$<br>(V) | $I_F$<br>(A) | $V_F$ MAX (V)<br>@ +25°C | $I_R$ MAX (mA)<br>@ +25°C |
|--------------|--------------|--------------------------|---------------------------|
| 100          | 5.0          | 0.71                     | 0.0035                    |

**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

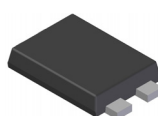
**Features and Benefits**

- Guard Ring Die Construction for Transient Protection
- High Maximum Junction Temperature
- Very Low Leakage Current
- Highly Stable Oxide Passivated Junction
- 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 (See Note 4)**

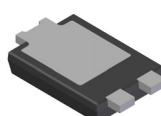
**Mechanical Data**

- 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<sup>③</sup>
- Polarity: See Diagram
- Weight: 0.096 grams (approximate)

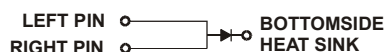
POWERDI5



Top View



Bottom View

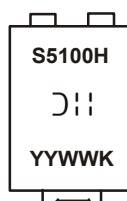


**Note:** Pins Left & Right must be electrically connected at the printed circuit board.

**Ordering Information** (Note 5)

| Part Number            | Compliance | Case     | Packaging        |
|------------------------|------------|----------|------------------|
| PDS5100H-13            | AEC-Q101   | POWERDI5 | 5000/Tape & Reel |
| PDS5100HQ-13           | Automotive | POWERDI5 | 5000/Tape & Reel |
| PDS5100HQ-13D (Note 6) | 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](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/](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. Suffix -13D is designated for 12mm tape width.

**Marking Information**


S5100H = Product type marking code  
 JII = Manufacturers' code marking  
 YYWW = Date code marking  
 YY = Last two digits of year (ex: 14 for 2014)  
 WW = Week code (01 - 53)  
 K = Factory Designator

## Maximum Ratings (@T<sub>A</sub> = +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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage              | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>R</sub> | 100   | V    |
| RMS Reverse Voltage                                                                                 | V <sub>R(RMS)</sub>                                    | 71    | V    |
| Average Rectified Output Current                                                                    | I <sub>O</sub>                                         | 5     | A    |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single half sine-wave Superimposed on Rated Load | I <sub>FSM</sub>                                       | 250   | A    |

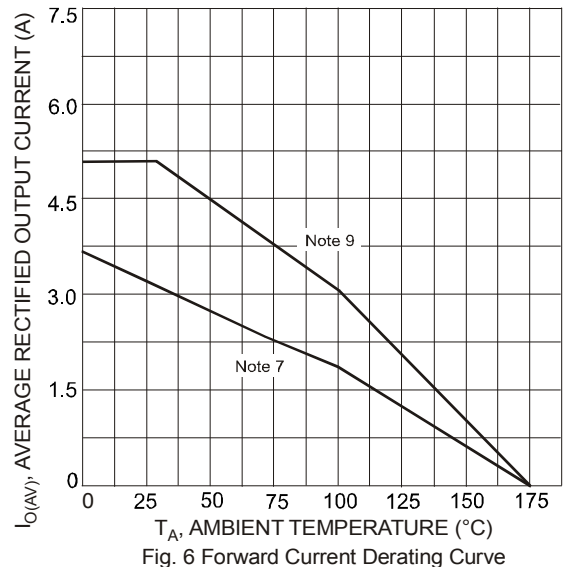
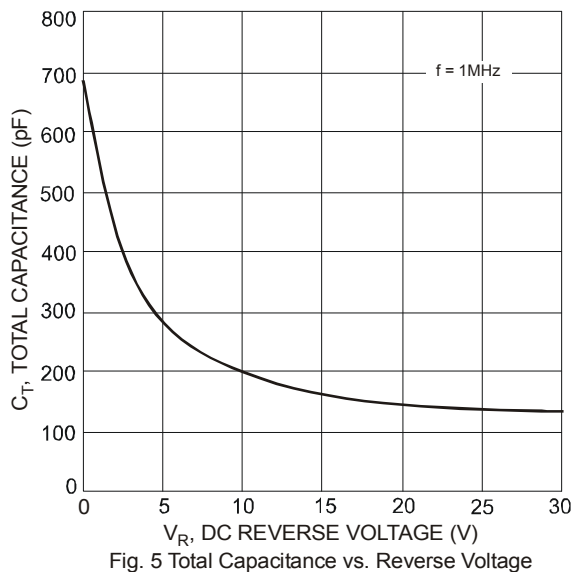
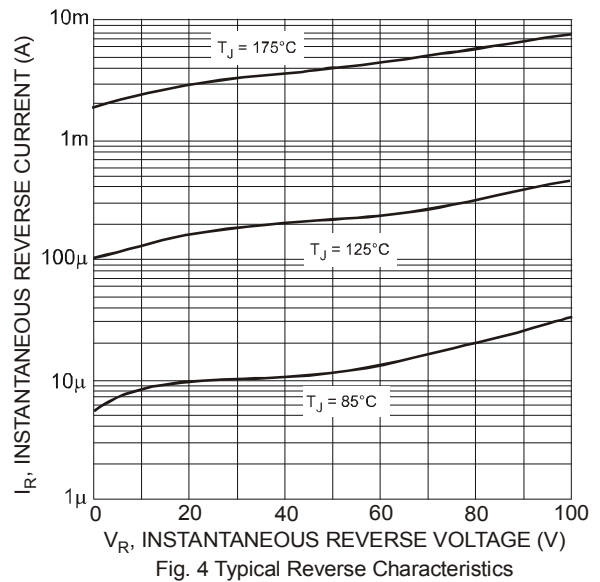
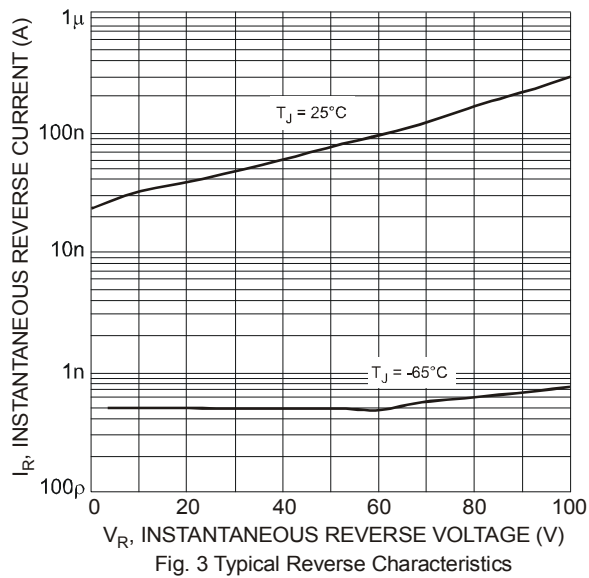
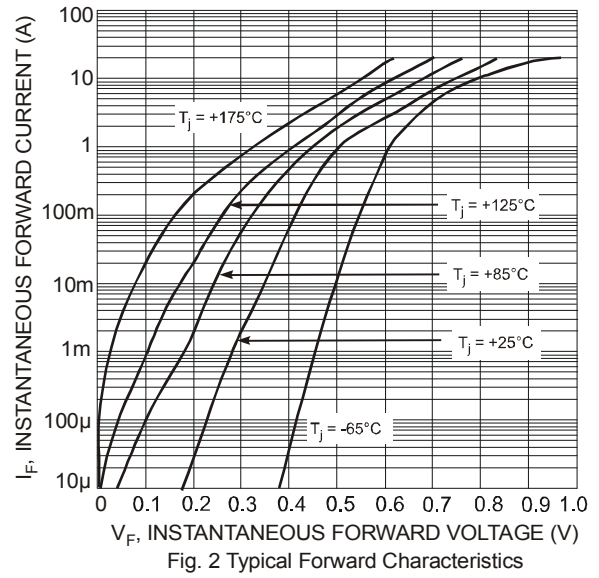
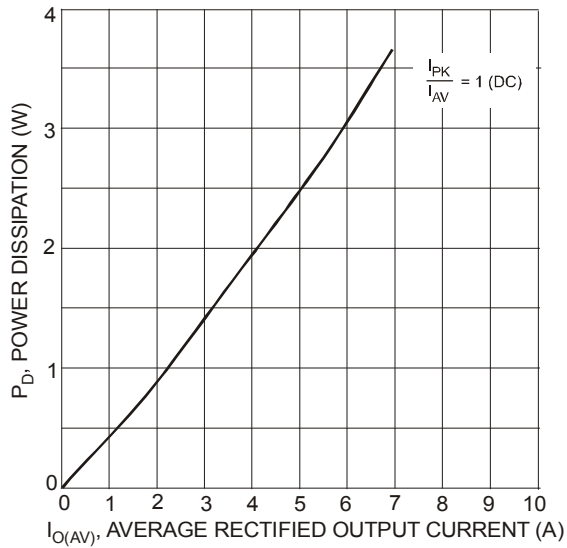
## Thermal Characteristics

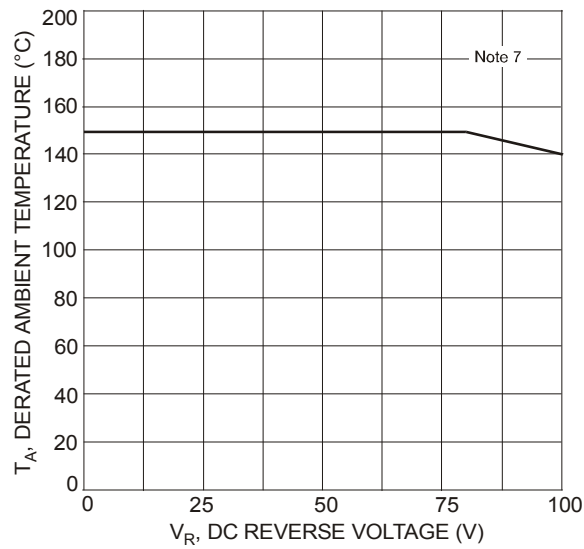
| Characteristic                                                             | Symbol                            | Typ         | Max | Unit |
|----------------------------------------------------------------------------|-----------------------------------|-------------|-----|------|
| Typical Power Dissipation (Note 9)                                         | P <sub>D</sub>                    | 2.5         | —   | W    |
| Thermal Resistance Junction to Case (Note 11)                              | R <sub>θJC</sub>                  | —           | 5   | °C/W |
| Thermal Resistance Junction to Soldering Point                             | R <sub>θJS</sub>                  | —           | 2.0 | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 7) T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 85          | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 8) T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 70          | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 9) T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 45          | —   | °C/W |
| Operating and Storage Temperature Range                                    | T <sub>J</sub> , T <sub>STG</sub> | -65 to +175 |     | °C   |

## Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                      | Symbol             | Min | Typ  | Max  | Unit | Test Condition                                 |
|-------------------------------------|--------------------|-----|------|------|------|------------------------------------------------|
| Reverse Breakdown Voltage (Note 10) | V <sub>(BR)R</sub> | 100 | —    | —    | V    | I <sub>R</sub> = 3.5μA                         |
| Forward Voltage                     | V <sub>F</sub>     | —   | 0.67 | 0.71 | V    | I <sub>F</sub> = 5A, T <sub>S</sub> = +25°C    |
|                                     |                    | —   | 0.55 | 0.58 |      | I <sub>F</sub> = 5A, T <sub>S</sub> = +125°C   |
|                                     |                    | —   | 0.75 | 0.80 |      | I <sub>F</sub> = 10A, T <sub>S</sub> = +25°C   |
|                                     |                    | —   | 0.62 | 0.66 |      | I <sub>F</sub> = 10A, T <sub>S</sub> = +125°C  |
| Reverse Leakage Current (Note 10)   | I <sub>R</sub>     | —   | 0.3  | 3.5  | μA   | T <sub>S</sub> = +25°C, V <sub>R</sub> = 100V  |
|                                     |                    | —   | 0.5  | 4.5  | mA   | T <sub>S</sub> = +125°C, V <sub>R</sub> = 100V |

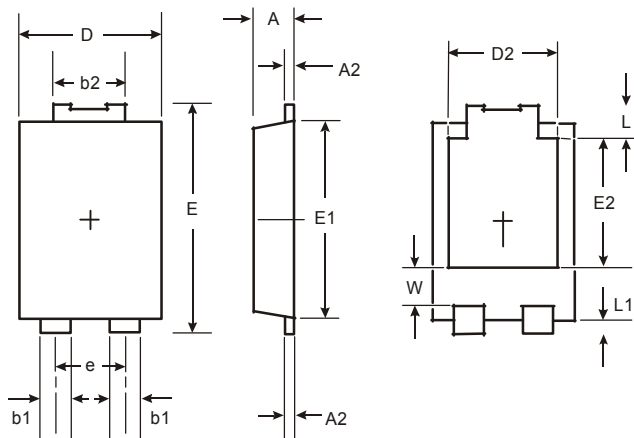
- Notes:
- FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  - Polymide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  - Polymide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
  - Short duration pulse test used to minimize self-heating effect.
  - Device mounted on Polymide 10cm x 10cm copper PC board,





## Package Outline Dimensions

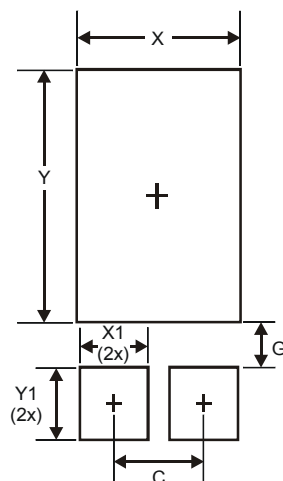
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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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