

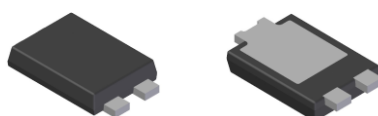
## Features

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Low Forward Voltage Drop
- For Use in Low-Voltage, High-Frequency Inverters, Free Wheeling, and Polarity Protection Applications
- 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**

## Mechanical Data

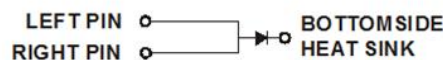
- Case: POWERDI®5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 
- Polarity: See Diagram
- Weight: 0.093 grams (Approximate)

POWERDI®5



Top View

Bottom View



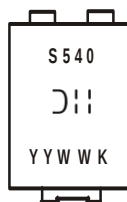
**Note:** Pins Left & Right must be electrically connected at the printed circuit board.

## Ordering Information (Note 4)

| Part Number         | Case      | Packaging         |
|---------------------|-----------|-------------------|
| PDS540-13           | POWERDI®5 | 5,000/Tape & Reel |
| PDS540-13D (Note 5) | 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](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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.
  5. Suffix -13D is designated for 12mm tape width.

## Marking Information



S540 = Product Type Marking Code  
 = 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<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                                                                     | V <sub>RRM</sub>    | 40    | V    |
| Working Peak Reverse Voltage                                                                        | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage                                                                                 | V <sub>R</sub>      |       |      |
| RMS Reverse Voltage                                                                                 | V <sub>R(RMS)</sub> | 28    | 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>    | 150   | A    |

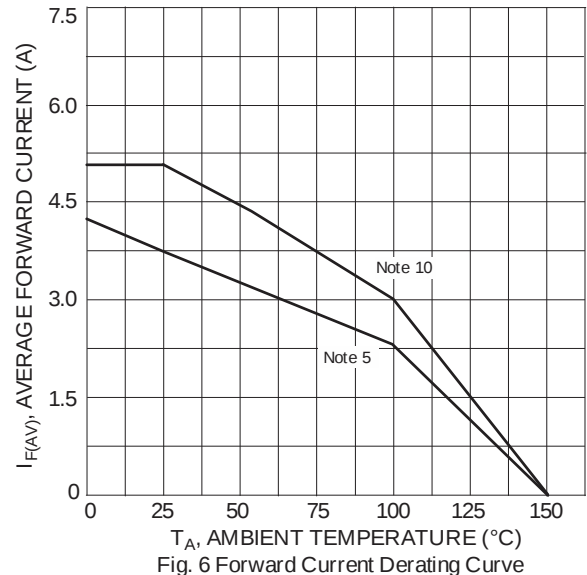
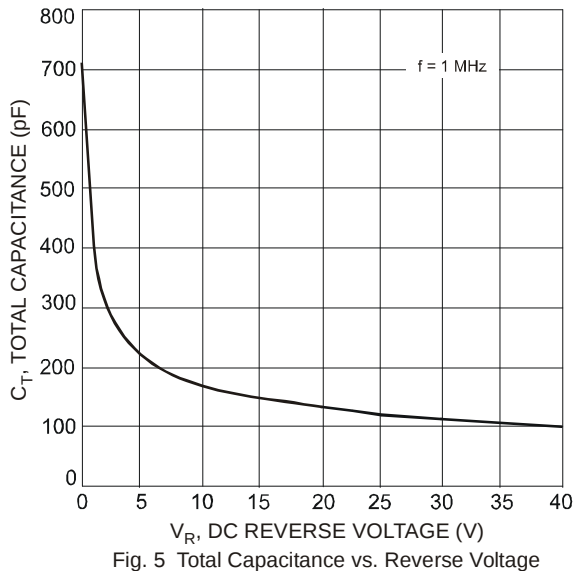
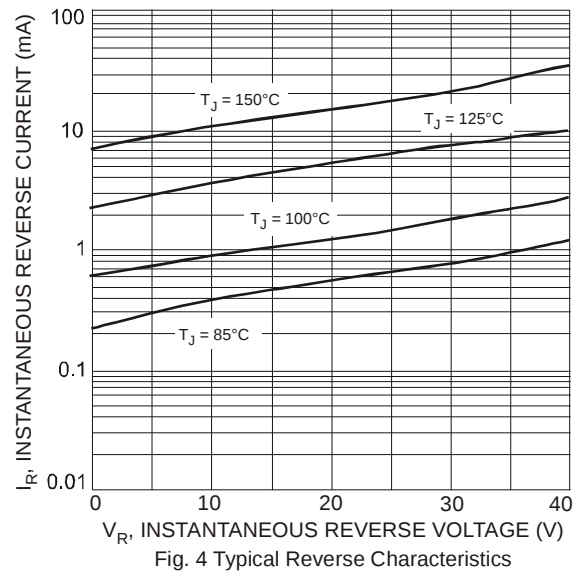
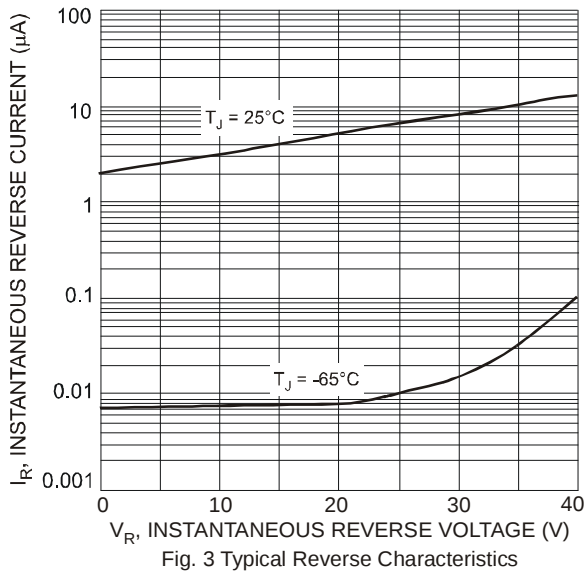
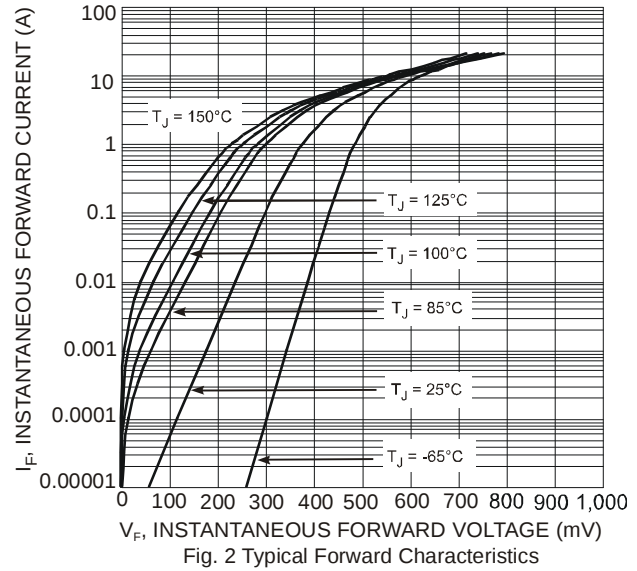
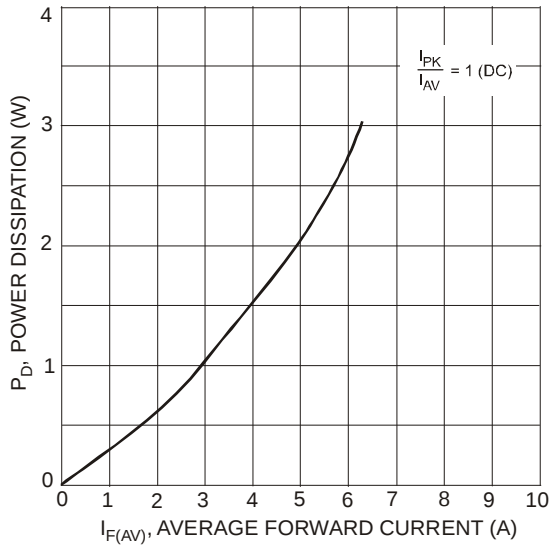
## Thermal Characteristics

| Characteristic                                      | Symbol                            | Typ         | Max | Unit |
|-----------------------------------------------------|-----------------------------------|-------------|-----|------|
| Thermal Resistance Junction to Soldering Point      | R <sub>θJS</sub>                  | —           | 4.0 | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 6) | R <sub>θJA</sub>                  | 90          | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 7) | R <sub>θJA</sub>                  | 65          | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 8) | R <sub>θJA</sub>                  | 50          | —   | °C/W |
| Operating and Storage Temperature Range             | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 |     | °C   |

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

| Characteristic                     | Symbol             | Min | Typ   | Max  | Unit | Test Condition                                |
|------------------------------------|--------------------|-----|-------|------|------|-----------------------------------------------|
| Reverse Breakdown Voltage (Note 9) | V <sub>(BR)R</sub> | 40  | —     | —    | V    | I <sub>R</sub> = 0.5mA                        |
| Forward Voltage                    | V <sub>F</sub>     | —   | 0.48  | 0.52 | V    | I <sub>F</sub> = 5A, T <sub>S</sub> = +25°C   |
|                                    |                    | —   | 0.43  | 0.47 |      | I <sub>F</sub> = 5A, T <sub>S</sub> = +125°C  |
|                                    |                    | —   | 0.57  | 0.65 |      | I <sub>F</sub> = 10A, T <sub>S</sub> = +25°C  |
|                                    |                    | —   | 0.55  | 0.59 |      | I <sub>F</sub> = 10A, T <sub>S</sub> = +125°C |
| Reverse Leakage Current (Note 9)   | I <sub>R</sub>     | —   | 0.015 | 0.25 | mA   | T <sub>S</sub> = +25°C, V <sub>R</sub> = 40V  |
|                                    |                    | —   | 3     | 15   |      | T <sub>S</sub> = +100°C, V <sub>R</sub> = 40V |
|                                    |                    | —   | 10    | 40   |      | T <sub>S</sub> = +125°C, V <sub>R</sub> = 40V |

- 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.



Note: 10. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 6.5mm x 5.0mm. Anode pad dimensions 1.8mm x 1.1mm.

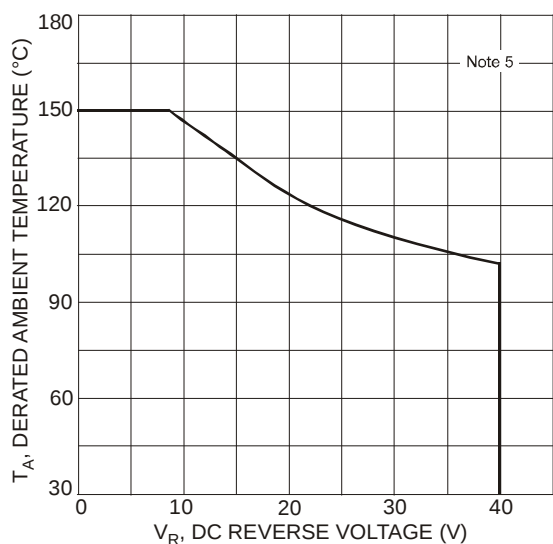
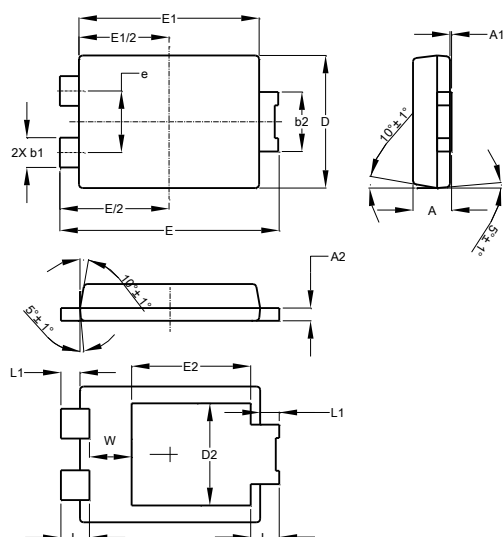


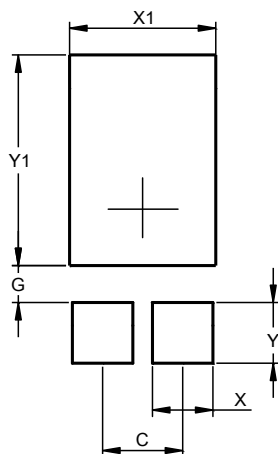
Fig. 7 Operating Temperature Derating

## Package Outline Dimensions

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


| POWERDI <sup>®</sup> 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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