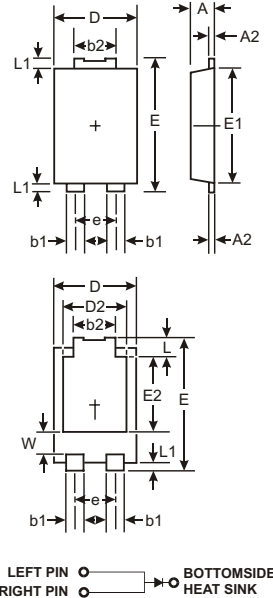


## Features

- 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 (Note 1)**
- "Green" Molding Compound (No Br, Sb)**
- 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-020C
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Polarity: See Diagram
- Marking: See Page 3
- Weight: 0.093 grams (approximate)



| PowerDI™5            |          |      |
|----------------------|----------|------|
| 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                   | 3.05 NOM |      |
| E                    | 6.40     | 6.60 |
| e                    | 1.84 NOM |      |
| E1                   | 5.30     | 5.45 |
| E2                   | 3.55 NOM |      |
| L                    | 0.75     | 0.95 |
| L1                   | 0.50     | 0.65 |
| W                    | 1.20     | 1.50 |
| All Dimensions in mm |          |      |

## Maximum Ratings @ T<sub>A</sub> = 25°C unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitive 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 (See also figure 5)                                                | 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>                                       | 120         | A    |
| Operating Temperature Range                                                                         | T <sub>j</sub>                                         | -65 to +150 | °C   |
| Storage Temperature Range                                                                           | T <sub>STG</sub>                                       | -65 to +175 | °C   |

## Thermal Characteristics @ T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                                      | Symbol           | Typ | Max | Unit |
|-----------------------------------------------------|------------------|-----|-----|------|
| Thermal Resistance Junction to Soldering Point      | R <sub>θJS</sub> | 1.3 | 2.6 | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 2) | R <sub>θJA</sub> | 90  | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 3) | R <sub>θJA</sub> | 70  | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 4) | R <sub>θJA</sub> | 50  | —   | °C/W |

- Notes:
- RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.
  - FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.

**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

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

Notes: 5. Short duration test pulse used to minimize self-heating effect.

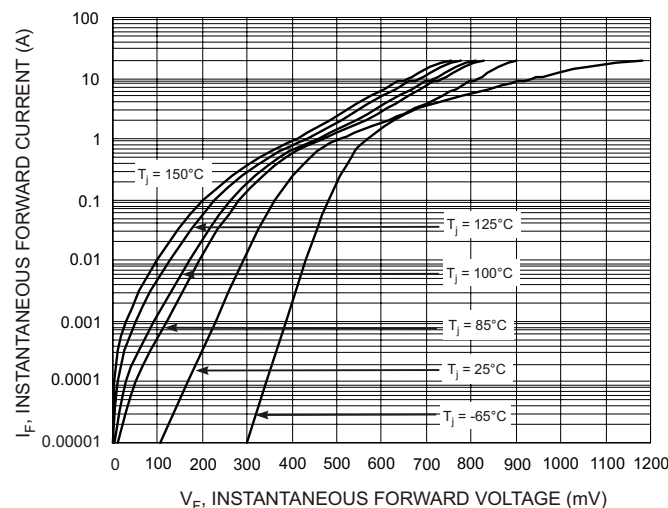


Fig. 1 Typical Forward Characteristics

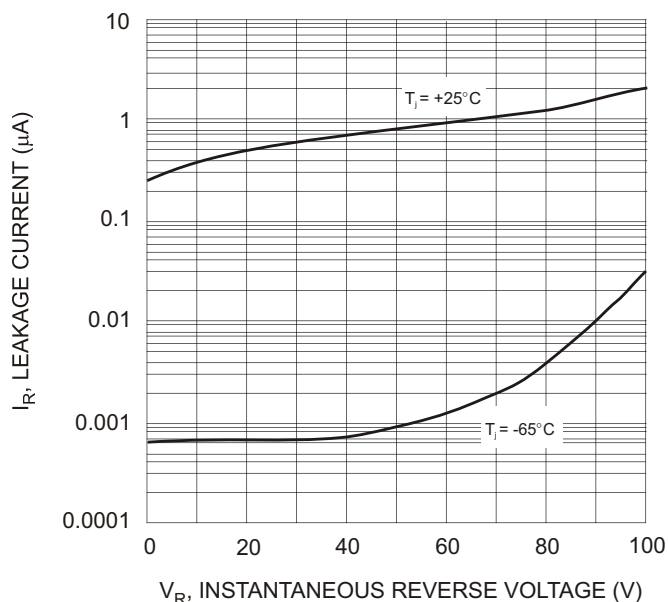


Fig. 2 Typical Reverse Characteristics

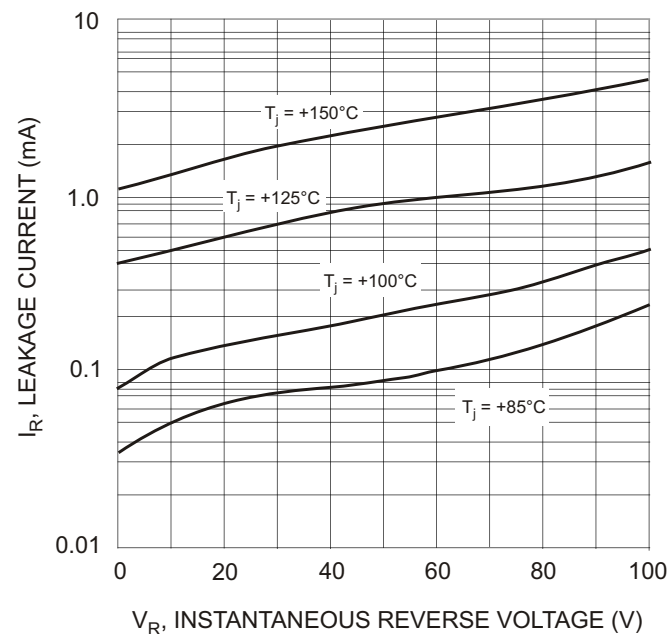


Fig. 3 Typical Reverse Characteristics

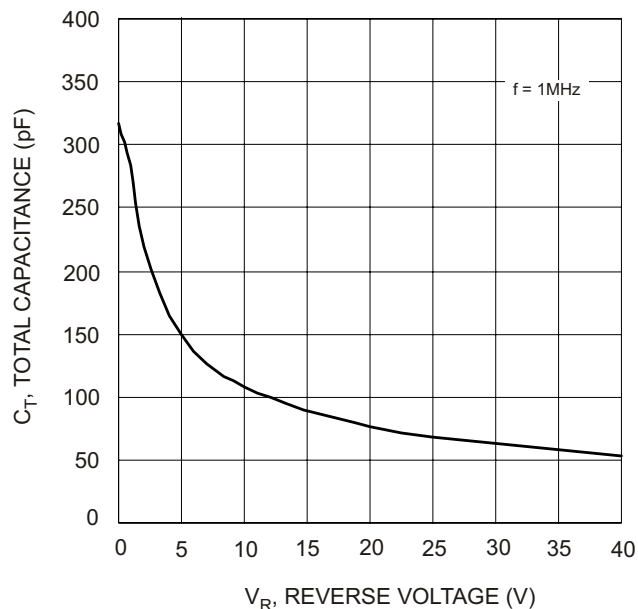
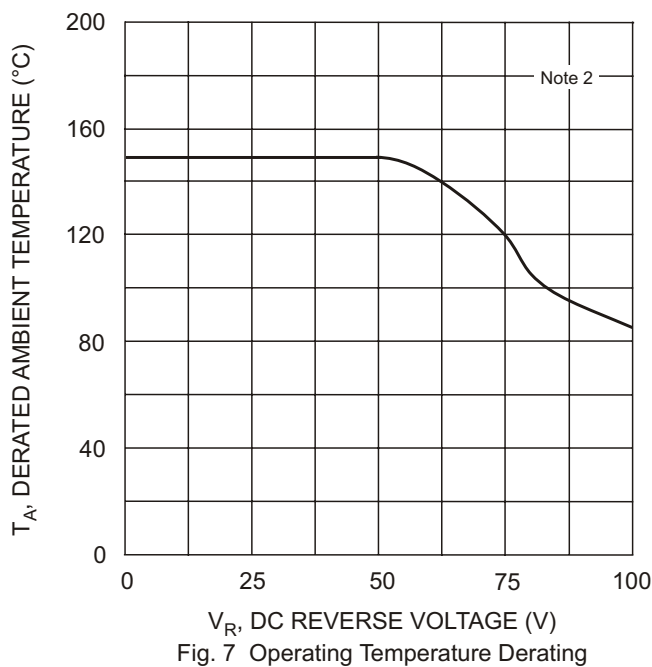
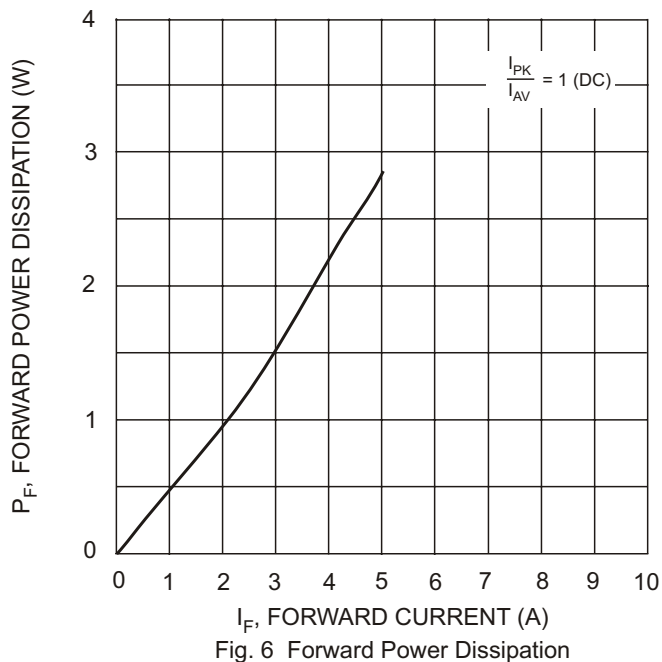
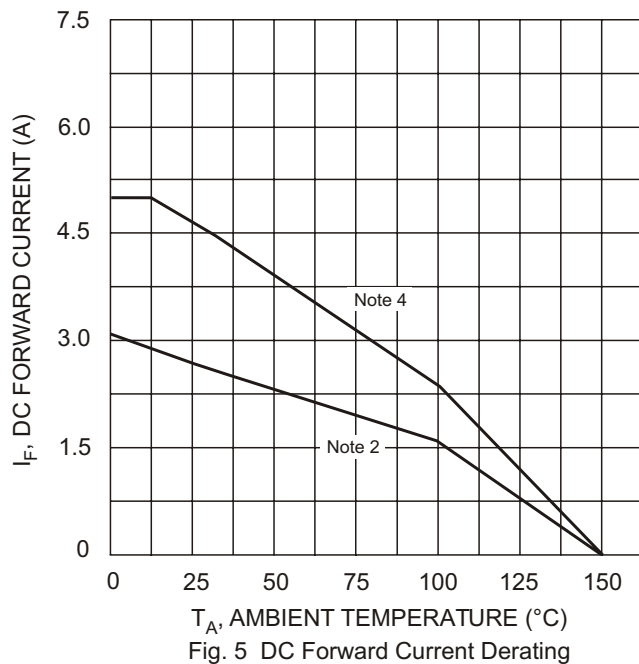


Fig. 4 Typical Total Capacitance vs. Reverse Voltage

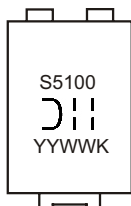


### Ordering Information (Note 6)

| Device     | Packaging | Shipping         |
|------------|-----------|------------------|
| PDS5100-13 | PowerDI™5 | 5000/Tape & Reel |

- Notes:
- FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
  - Short duration test pulse used to minimize self-heating effect.
  - For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information



S5100 = Product type marking code  
 ⌐ = Manufacturers' code marking  
 YYWW = Date code marking  
 YY = Last digit of year ex: 04 for 2004  
 WW = Week code 01 to 52  
 K = Factory Designator