

Product Summary (@T_A = +25°C)

| V _{RRM} (V) | I _{O(MAX)} (A) | V _{F(MAX)} (V) | I _{R(MAX)} (μA) |
|----------------------|-------------------------|-------------------------|--------------------------|
| 200 | 4 | 0.84 | 1 |

Features and Benefits

- Lower Forward Voltage Drop than Ultrafast Rectifiers
- Very Low Leakage Current
- Soft Recovery Characteristics: Softness Factor (t_{tr}/t_r) ≥ 1 (See Figure 9)
- 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)**
- **The DIODES™ PDS4200HQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

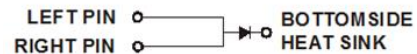
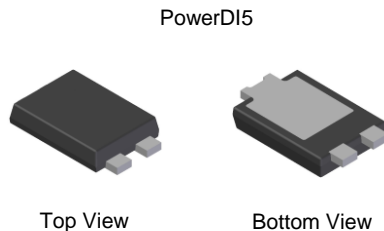
<https://www.diodes.com/quality/product-definitions/>

Applications

- SMPS
- DC-DC converters
- Freewheeling diodes
- AC-DC

Mechanical Data

- Package: PowerDI[®]5
- Package 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 Lead-Frame. Solderable per MIL-STD-202, Method 208
- Polarity: See Diagram
- Weight: 0.095 grams (Approximate)

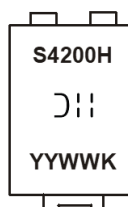


Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

| Part Number | Package | Packing | |
|------------------------|----------|---------|-------------|
| | | Qty. | Carrier |
| PDS4200HQ-13 | PowerDI5 | 5,000 | Tape & Reel |
| PDS4200HQ-13D (Note 5) | PowerDI5 | 5,000 | Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
 5. Suffix -13D is designated for 12mm tape width.

Marking Information


S4200H = Product Type Marking Code
 = Manufacturers' Code Marking
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 22 for 2022)
 WW = Week Code (01 to 53)
 K = Factory Designator

Maximum Ratings (@ T_A = +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 Working Peak Reverse Voltage DC Blocking Voltage | V _{RRM} V _{RWM} V _R | 200 | V |
| RMS Reverse Voltage | V _{R(RMS)} | 141 | V |
| Average Rectified Output Current | I _O | 4 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-wave Superimposed on Rated Load | I _{FSM} | 100 | A |
| Electrostatic Discharge | HBM | 4 | kV |
| Electrostatic Discharge | CDM | 1 | kV |

Thermal Characteristics (Note 6)

| Characteristic | Symbol | Typ | Max | Unit |
|---|-----------------------------------|-------------|-----|------|
| Thermal Resistance Junction to Soldering Point | R _{θJS} | — | 3.0 | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 7) | R _{θJA} | 80 | — | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 8) | R _{θJA} | 65 | — | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 9) | R _{θJA} | 45 | — | °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 10) | V _{(BR)R} | 200 | — | — | V | I _R = 5μA |
| Forward Voltage | V _F | — | 0.76 | 0.82 | V | I _F = 3A, T _S = +25°C |
| | | — | — | 0.59 | | I _F = 3A, T _S = +150°C |
| | | — | 0.785 | 0.84 | | I _F = 4A, T _S = +25°C |
| | | — | 0.61 | 0.64 | | I _F = 4A, T _S = +150°C |
| | | — | 0.84 | 0.89 | | I _F = 8A, T _S = +25°C |
| | | — | 0.68 | 0.75 | | I _F = 8A, T _S = +150°C |
| Reverse Leakage Current (Note 10) | I _R | — | 0.2 | 1 | μA mA | T _S = +25°C, V _R = 200V T _S = +150°C, V _R = 200V |
| Reverse Recovery Time | t _{RR} | — | 13 | 25 | ns | I _F = 0.5A, I _R = 1.0A I _{RR} = 0.25A (See Figure 9) |

- Notes:
6. The heat generated must be less than thermal conductivity from junction-to-ambient: $\Delta P_D / \Delta T_J < 1/R_{\theta JA}$.
 7. FR-4 PCB, 2 oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
 8. Polyimide PCB, 2 oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
 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 test pulse used to minimize self-heating effect.

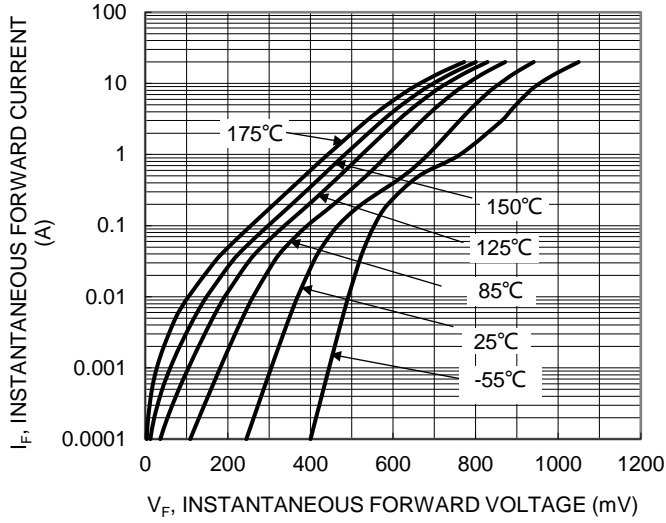


Figure 1. Typical Forward Characteristics

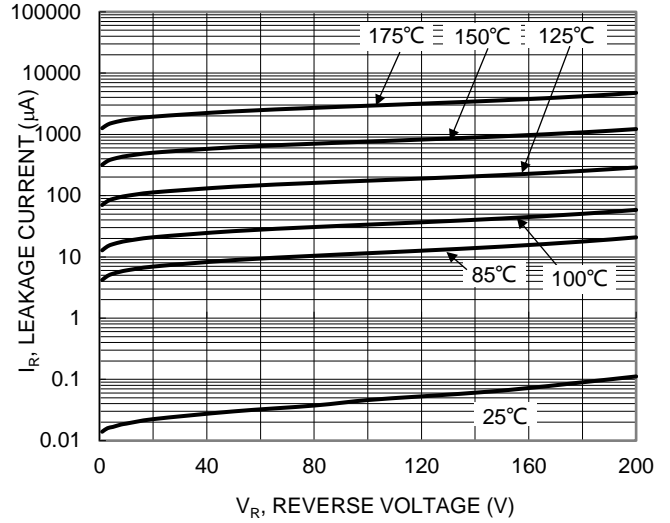


Figure 2. Typical Reverse Characteristics

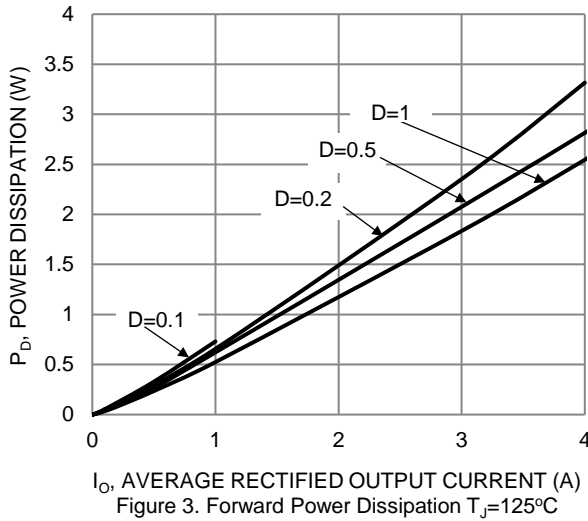


Figure 3. Forward Power Dissipation $T_J=125^\circ\text{C}$

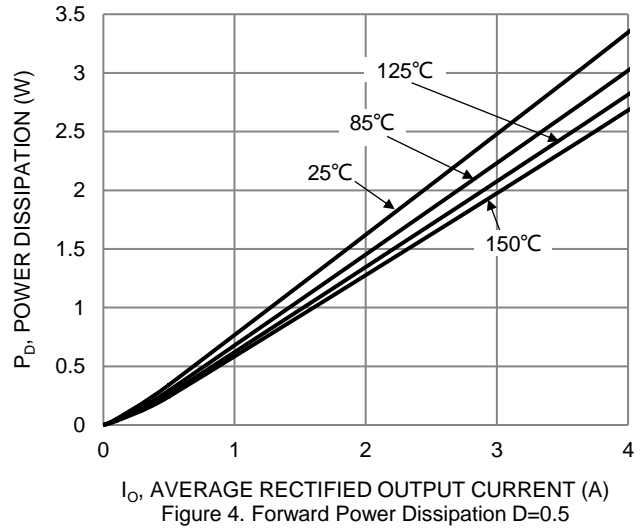


Figure 4. Forward Power Dissipation $D=0.5$

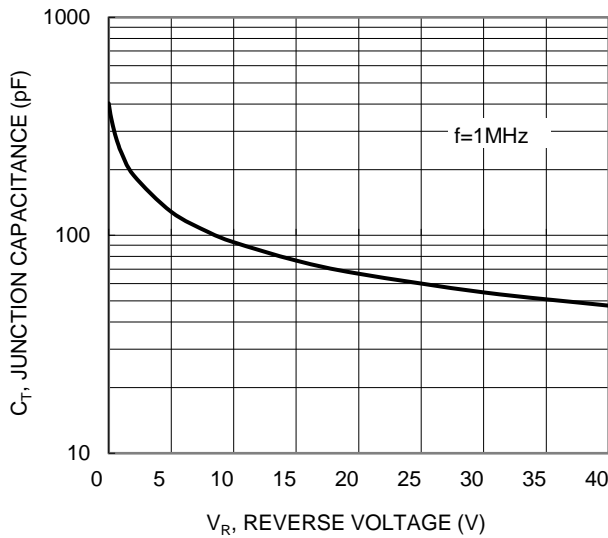


Figure 5. Typical Junction Capacitance

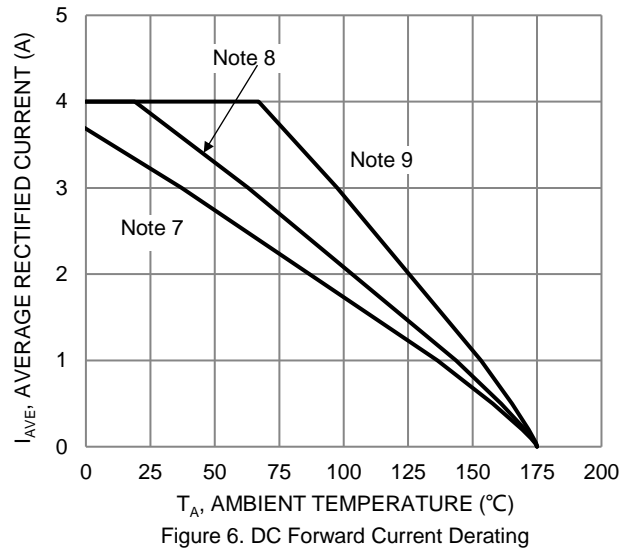


Figure 6. DC Forward Current Derating

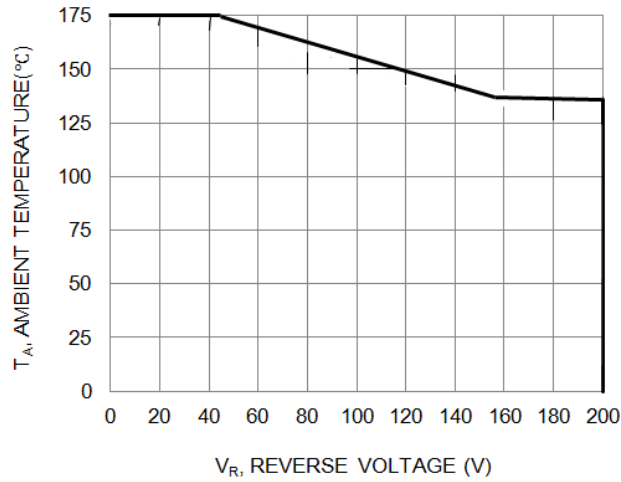


Figure 7. Operating Temperature Derating

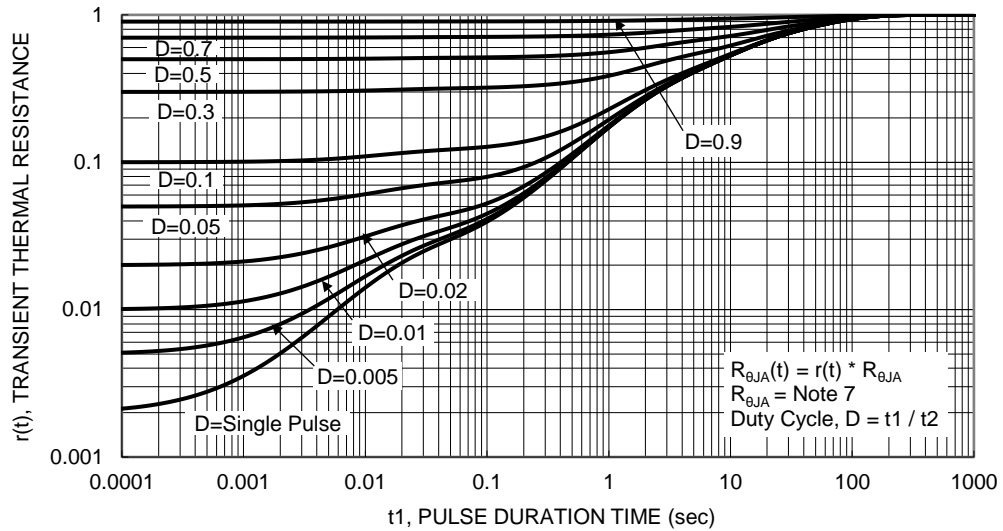


Figure 8. Transient Thermal Resistance

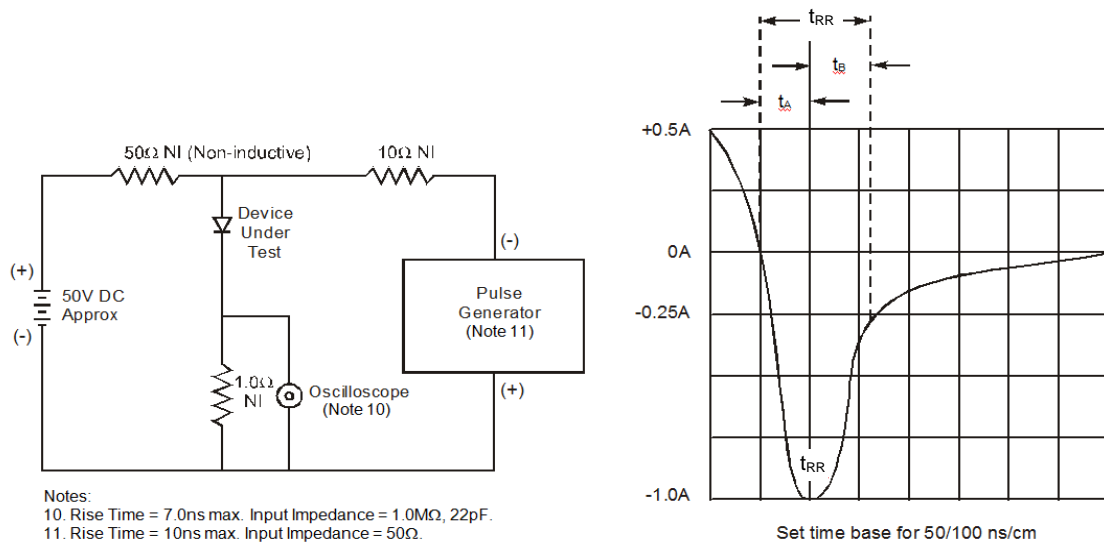
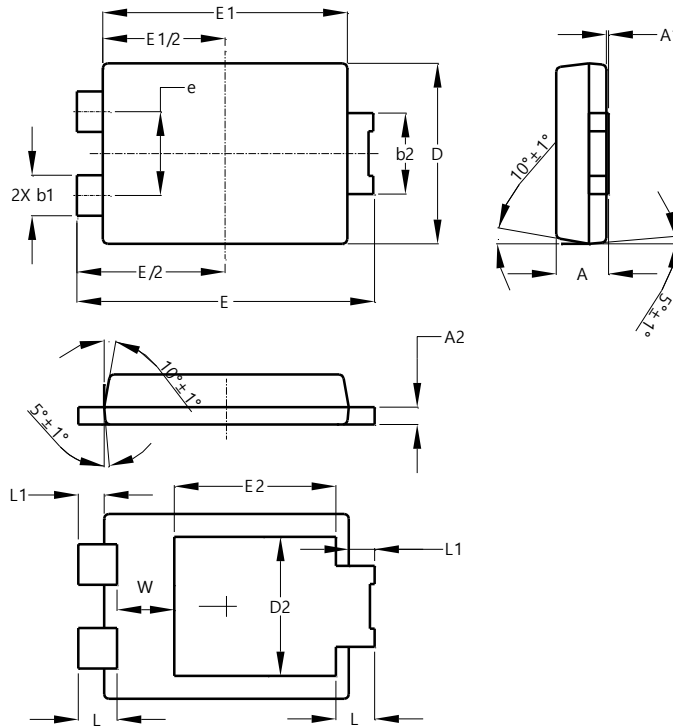


Figure 9. Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI5

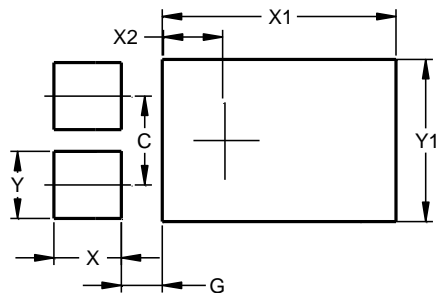


| PowerDI5 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 1.05 | 1.15 | 1.10 |
| A1 | 0.00 | 0.05 | -- |
| A2 | 0.33 | 0.43 | 0.381 |
| b1 | 0.80 | 0.99 | 0.89 |
| b2 | 1.70 | 1.88 | 1.78 |
| D | 3.90 | 4.05 | 3.966 |
| D2 | -- | -- | 3.054 |
| E | 6.40 | 6.60 | 6.51 |
| 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 <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI5



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.840 |
| G | 0.852 |
| X | 1.400 |
| X1 | 4.860 |
| X2 | 1.310 |
| Y | 1.390 |
| Y1 | 3.360 |

Note: Dimension L and W does not include mold flash and protrusions. Mold flash or protrusion shall not exceed 0.25mm per side.

Note: The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary depending on application. These dimensions may be modified based on user equipment capability or fabrication criteria. A more robust pattern may be desired for wave soldering and is calculated by adding 0.2 mm to the 'Z' dimension. For further information, please reference document IPC-7351A, Naming Convention for Standard SMT Land Patterns, and for International grid details, please see document IEC, Publication 97.

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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