

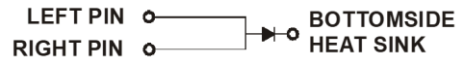
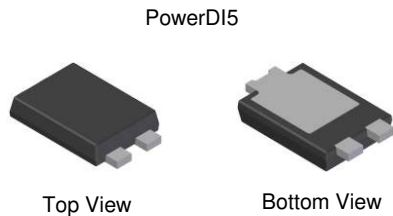
Product Summary (@ T_A = +25°C)

| V _{RRM} (V) | I _O (A) | V _F Max (V) | I _R Max (mA) |
|----------------------|--------------------|------------------------|-------------------------|
| 45 | 10 | 0.51 | 0.6 |

Features

- Guard Ring Die Construction for Transient Protection
- Very Low Forward Voltage Drop
- High Forward Surge Current Capability
- For Use in Low Voltage, High Frequency Inverters, Freewheeling, and Polarity Protection Applications
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- The DIODES PDS1045Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

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

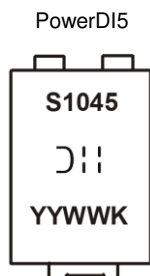


Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

| Part Number | Package | Packing | |
|--------------|----------|---------|-------------|
| | | Qty. | Carrier |
| PDS1045Q-13 | PowerDI5 | 5,000 | Tape & Reel |
| PDS1045Q-13D | PowerDI5 | 5,000 | Tape & Reel |

- Notes:
- EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


S1045 = Product Type Marking Code
 ⌋|| = Manufacturer's Code Marking
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 23 for 2023)
 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 | V _{RRM} | 45 | V |
| Working Peak Reverse Voltage | V _{RWM} | | |
| DC Blocking Voltage | V _R | | |
| RMS Reverse Voltage | V _{R(RMS)} | 32 | V |
| Average Rectified Output Current | I _O | 10 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load | I _{FSM} | 275 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|----------------------------------------------------------------------------|------------------|-------------|------|
| Thermal Resistance Junction to Ambient Air (Note 5) T _A = +25°C | R _{θJA} | 85 | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 6) T _A = +25°C | R _{θJA} | 18 | °C/W |
| Operating Junction Temperature Range (Note 7) | T _J | -55 to +150 | °C |
| Storage Temperature Range | T _{STG} | -55 to +150 | °C |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|------------------------------------|--------------------|-----|------|------|------|-----------------------------------------------|
| Reverse Breakdown Voltage (Note 8) | V _{(BR)R} | 45 | — | — | V | I _R = 600μA |
| Forward Voltage | V _F | — | 0.40 | 0.45 | V | I _F = 5A, T _S = +25°C |
| | | — | 0.45 | 0.51 | | I _F = 10A, T _S = +25°C |
| | | — | 0.29 | 0.35 | | I _F = 5A, T _S = +125°C |
| | | — | 0.37 | 0.43 | | I _F = 10A, T _S = +125°C |
| Reverse Leakage Current (Note 8) | I _R | — | 0.03 | 0.3 | mA | T _S = +25°C, V _R = 35V |
| | | — | 10 | 25 | | T _S = +100°C, V _R = 35V |
| | | — | 0.1 | 0.6 | | T _S = +25°C, V _R = 45V |
| | | — | 65 | 150 | | T _S = +125°C, V _R = 45V |

- Notes:
5. 1 x MRP FR-4 PC board, 2oz.
 6. 2inch x 2inch Al board.
 7. The heat generated must be less than the thermal conductivity from junction to case: $dP_D/dT_J < 1/R_{\theta JC}$ or junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$.
 8. Short duration pulse test used to minimize self-heating effect.

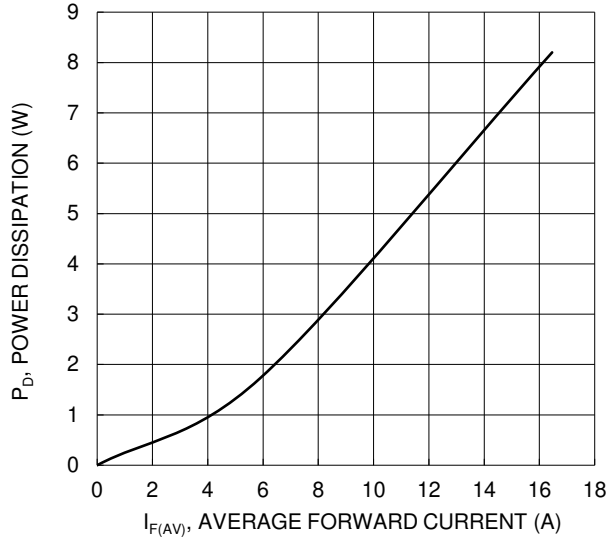


Fig. 1 Forward Power Dissipation

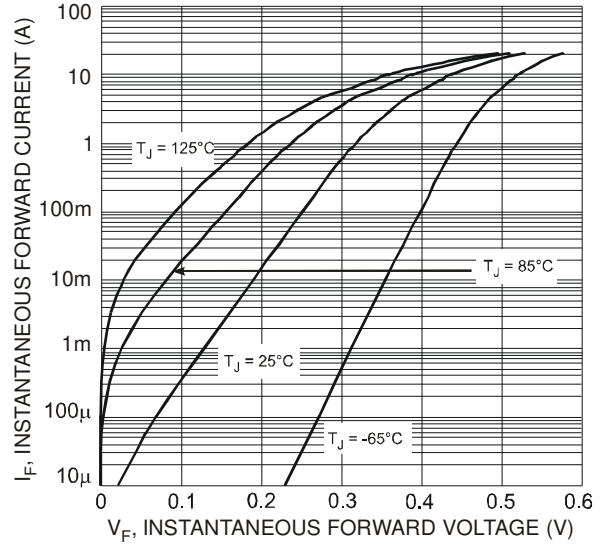


Fig. 2 Typical Forward Characteristics

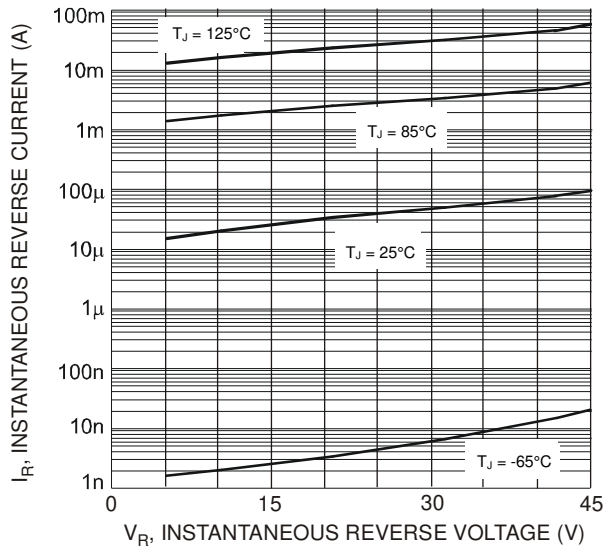


Fig. 3 Typical Reverse Characteristics

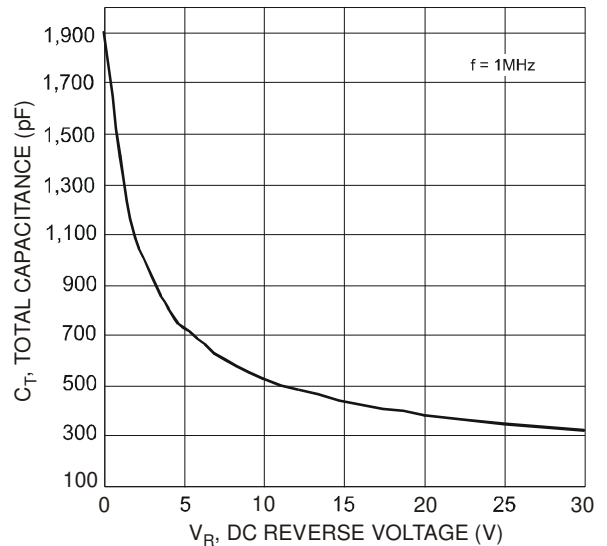


Fig. 4 Total Capacitance vs. Reverse Voltage

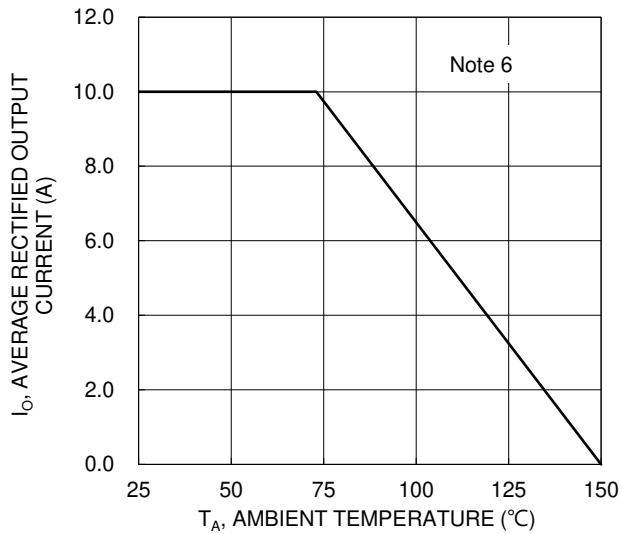
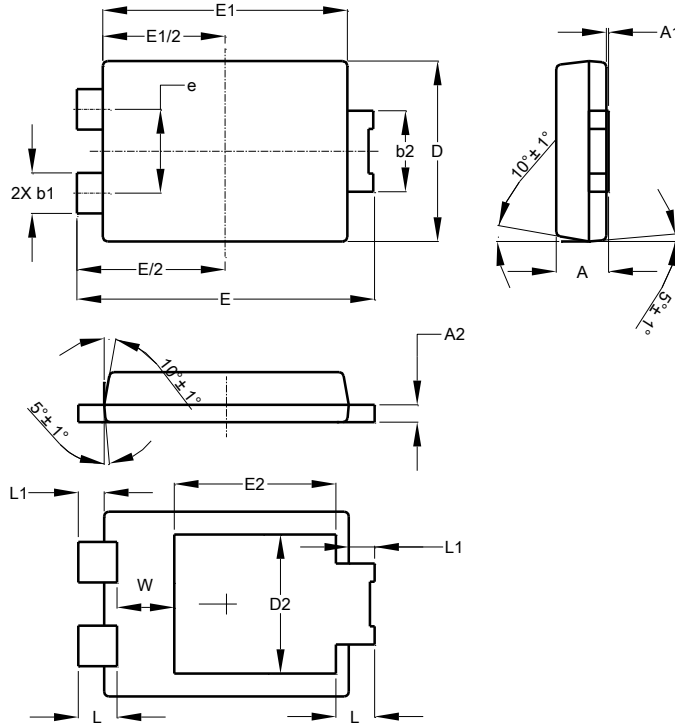


Fig. 5 DC Forward Current Derating

Package Outline Dimensions

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

PowerDI5

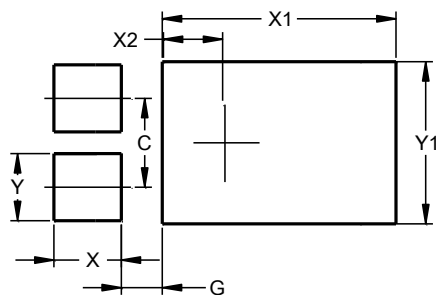


| PowerDI5 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 1.05 | 1.15 | 1.10 |
| A1 | 0.00 | 0.05 | -- |
| A2 | 0.33 | 0.43 | 0.381 |
| b1 | 0.80 | 0.99 | 0.89 |
| b2 | 1.70 | 1.88 | 1.78 |
| D | 3.90 | 4.05 | 3.966 |
| D2 | -- | -- | 3.054 |
| E | 6.40 | 6.60 | 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 |

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