

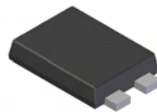
## Features

- 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, Free Wheeling, and Polarity Protection Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

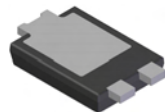
## Mechanical Data

- Case: 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
- Polarity: See Diagram
- Weight: 0.096 grams (approximate)

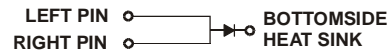
POWERDI5



Top View



Bottom View



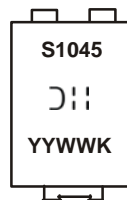
**Note:** Pins Left & Right must be electrically connected at the printed circuit board.

## Ordering Information (Note 4)

Part Number	Case	Packaging
PDS1045-13	POWERDI5	5000/Tape & Reel
PDS1045-7	POWERDI5	1500/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> 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>.

## Marking Information



- S1045 = Product type marking code
- J11 = Manufacturers' code marking
- YYWW = Date code marking
- YY = Last two digits of year (ex: 05 for 2005)
- WW = Week code (01 - 53)
- K = Factory designator

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , 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	$V_{RRM}$	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 (see also Figure 4)	$I_O$	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	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	$R_{\theta JS}$	—	0.8	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 5) $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	85	—	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 6) $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	65	—	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 7) $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	50	—	$^\circ\text{C/W}$
Operating Junction Temperature Range $V_R \leq 80\% V_{RRM}$ $V_R \leq 50\% V_{RRM}$	$T_J$	-65 to +125 -65 to +150		$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to +150		$^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	$V_{(BR)R}$	45	—	—	V	$I_R = 600\mu\text{A}$
Forward Voltage	$V_F$	—	0.40	0.45	V	$I_F = 5\text{A}, T_S = +25^\circ\text{C}$
		—	0.45	0.51		$I_F = 10\text{A}, T_S = +25^\circ\text{C}$
		—	0.29	0.35		$I_F = 5\text{A}, T_S = +125^\circ\text{C}$
		—	0.37	0.43		$I_F = 10\text{A}, T_S = +125^\circ\text{C}$
Reverse Leakage Current (Note 8)	$I_R$	—	0.03	0.3	mA	$T_S = +25^\circ\text{C}, V_R = 35\text{V}$
		—	10	25		$T_S = +100^\circ\text{C}, V_R = 35\text{V}$
		—	0.1	0.6		$T_S = +25^\circ\text{C}, V_R = 45\text{V}$
		—	65	150		$T_S = +125^\circ\text{C}, V_R = 45\text{V}$

- Notes:
5. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  6. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  7. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
  8. Short duration pulse test used to minimize self-heating effect.
  9. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 16.0mm x 12.4mm. Anode pad dimensions 4.7mm x 2.7mm.
  10. Devices mounted such that  $R_{\theta JA} @ 19^\circ\text{C/W}$ .

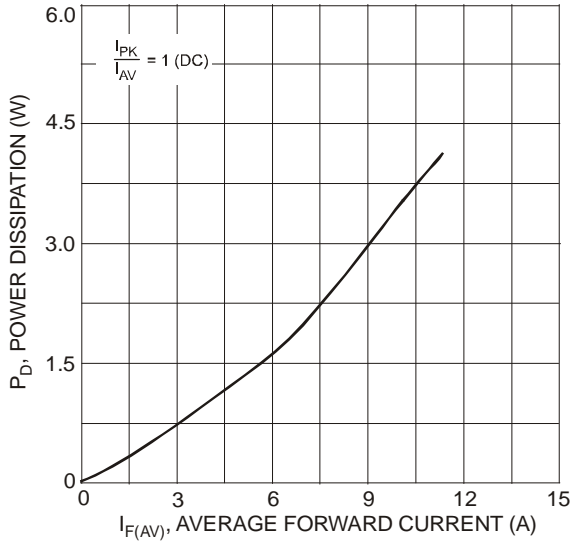


Fig. 1 Forward Power Dissipation

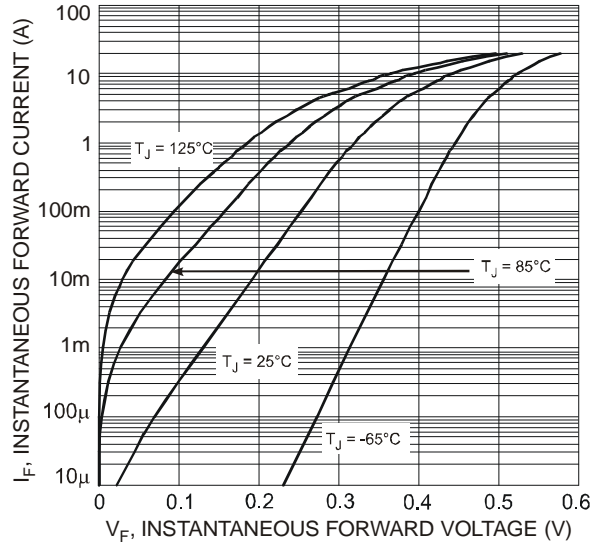


Fig. 2 Typical Forward Characteristics

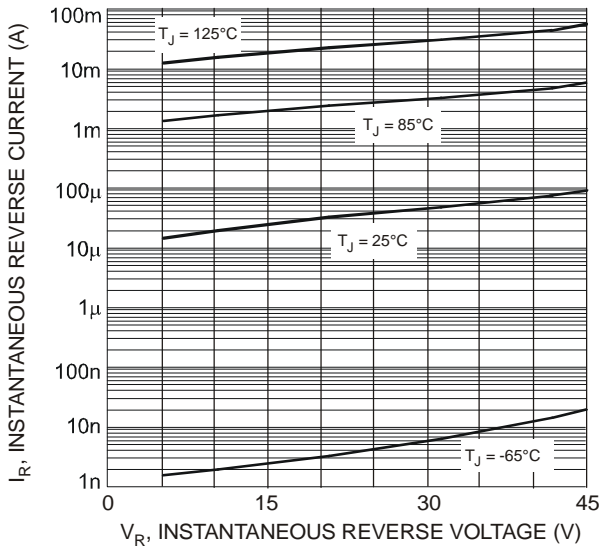


Fig. 3 Typical Reverse Characteristics

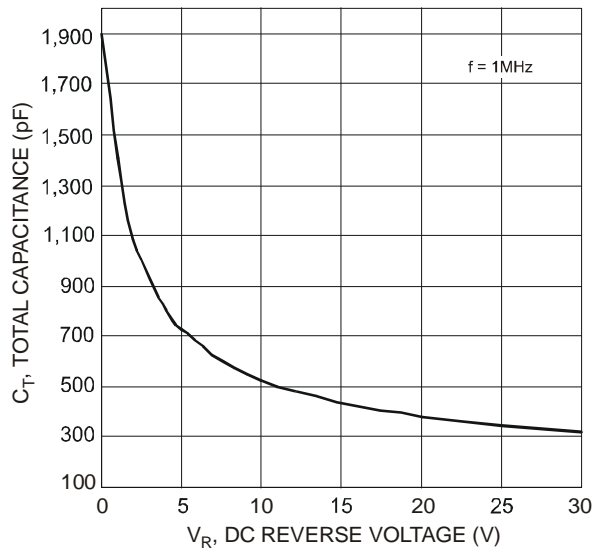


Fig. 4 Total Capacitance vs. Reverse Voltage

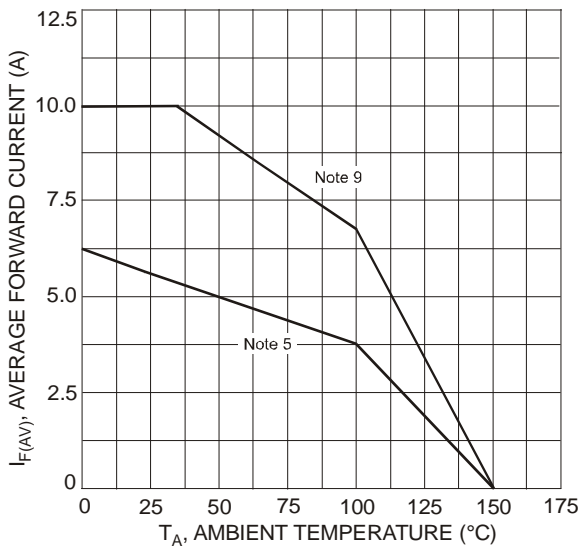


Fig. 5 Forward Current Derating Curve

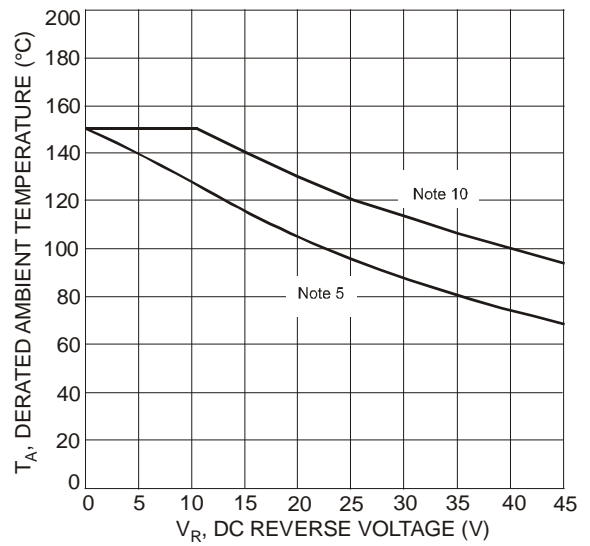
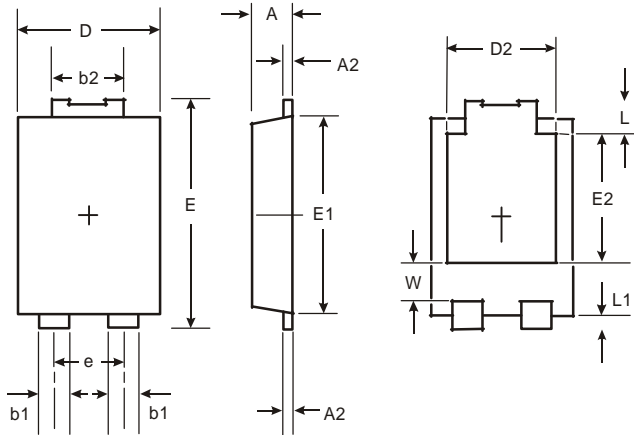


Fig. 6 Operating Temperature Derating

## Package Outline Dimensions

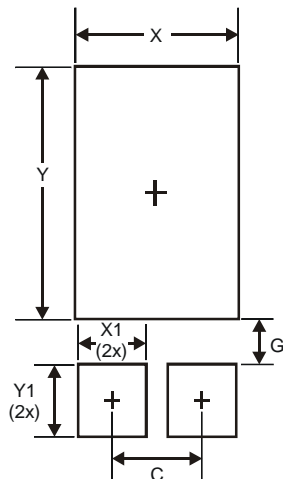
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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
<b>All Dimensions in mm</b>		

## 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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