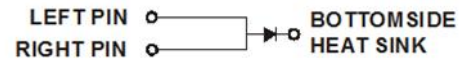
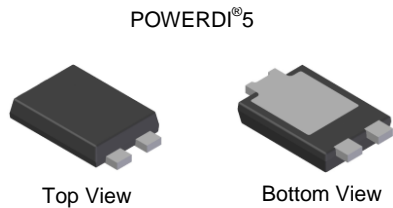


## Features

- 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)**
- **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 (E3)
- Polarity: See Diagram
- Weight: 0.096 grams (Approximate)



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

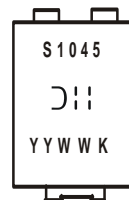
## Ordering Information (Note 4)

Part Number	Case	Packaging
PDS1045-13	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>.

## Marking Information

POWERDI®5



S1045 = Product Type Marking Code  
 ⌋⌋⌋ = Manufacturer's Code Marking  
 YYWW = Date Code Marking  
 YY = Last Two Digits 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>	45	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	32	V
Average Rectified Output Current	I <sub>O</sub>	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	275	A

**Thermal Characteristics**

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R <sub>θJS</sub>	—	0.8	°C/W
Thermal Resistance Junction to Ambient Air (Note 5) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	85	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 6) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	65	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	50	—	°C/W
Operating Junction Temperature Range V <sub>R</sub> ≤ 80% V <sub>RRM</sub> V <sub>R</sub> ≤ 50% V <sub>RRM</sub>	T <sub>J</sub>	-65 to +125 -65 to +150		°C
Storage Temperature Range	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 8)	V <sub>(BR)R</sub>	45	—	—	V	I <sub>R</sub> = 600μA
Forward Voltage	V <sub>F</sub>	—	0.40	0.45	V	I <sub>F</sub> = 5A, T <sub>S</sub> = +25°C
		—	0.45	0.51		I <sub>F</sub> = 10A, T <sub>S</sub> = +25°C
		—	0.29	0.35		I <sub>F</sub> = 5A, T <sub>S</sub> = +125°C
		—	0.37	0.43		I <sub>F</sub> = 10A, T <sub>S</sub> = +125°C
Reverse Leakage Current (Note 8)	I <sub>R</sub>	—	0.03	0.3	mA	T <sub>S</sub> = +25°C, V <sub>R</sub> = 35V
		—	10	25		T <sub>S</sub> = +100°C, V <sub>R</sub> = 35V
		—	0.1	0.6		T <sub>S</sub> = +25°C, V <sub>R</sub> = 45V
		—	65	150		T <sub>S</sub> = +125°C, V <sub>R</sub> = 45V

- Notes:
- FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  - Polyimide PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  - Polyimide PCB, 2oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
  - Short duration pulse test used to minimize self-heating effect.
  - Polyimide PCB, 2oz. Copper. Cathode pad dimensions 16.0mm x 12.4mm. Anode pad dimensions 4.7mm x 2.7mm.
  - Devices mounted such that R<sub>θJA</sub> @ 19°C/W.

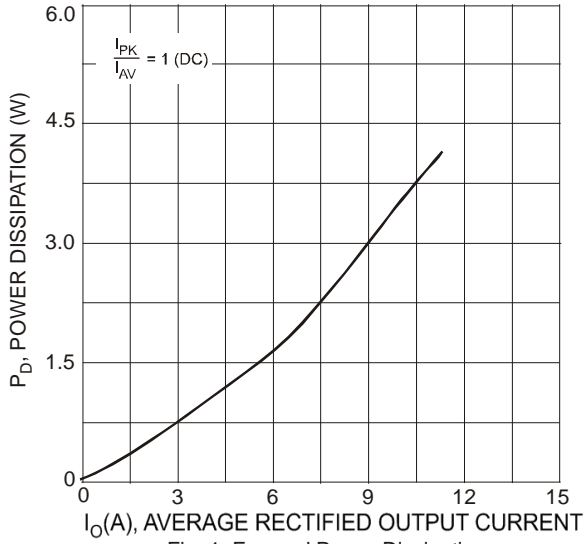


Fig. 1 Forward Power Dissipation

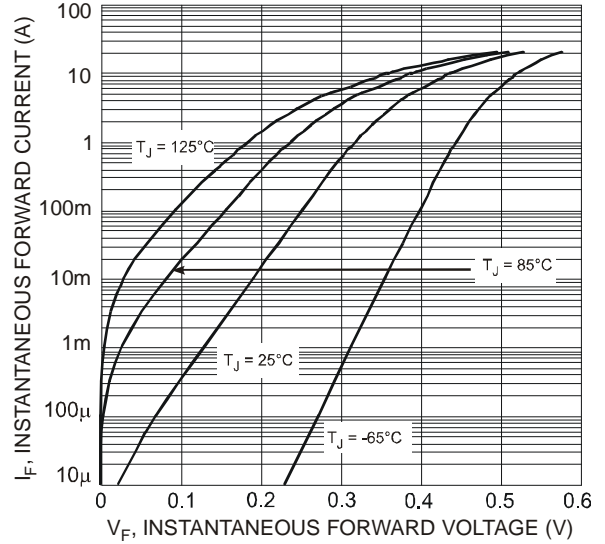


Fig. 2 Typical Forward Characteristics

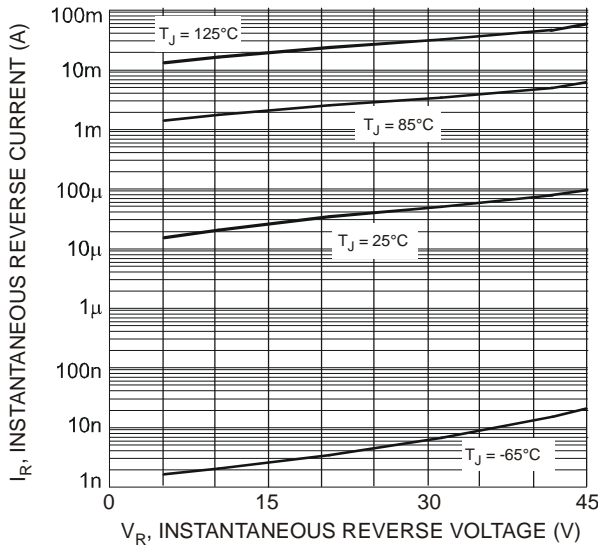


Fig. 3 Typical Reverse Characteristics

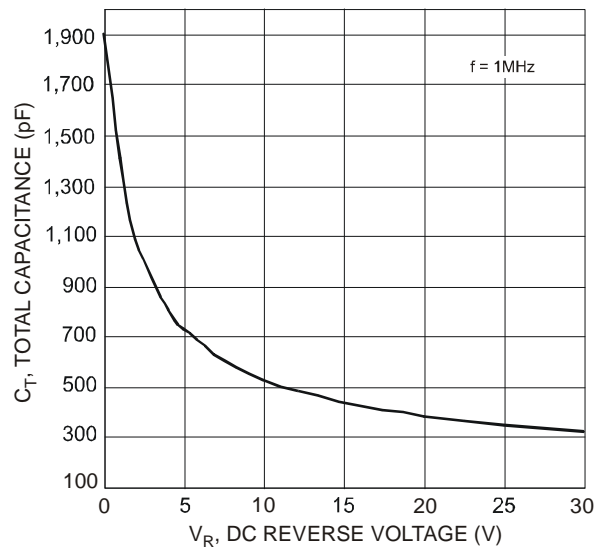


Fig. 4 Total Capacitance vs. Reverse Voltage

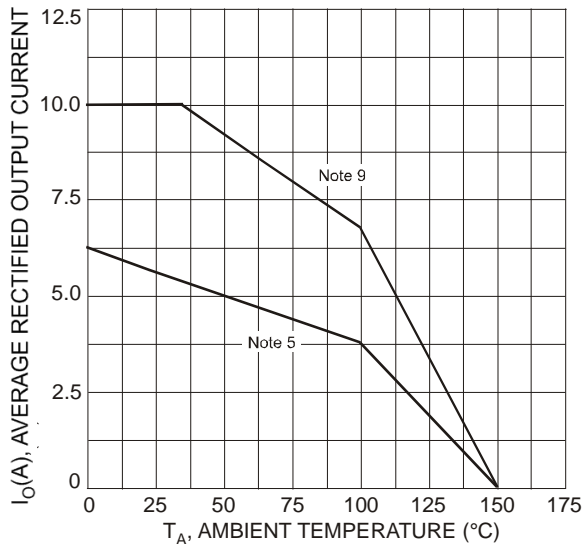


Fig. 5 Forward Current Derating Curve

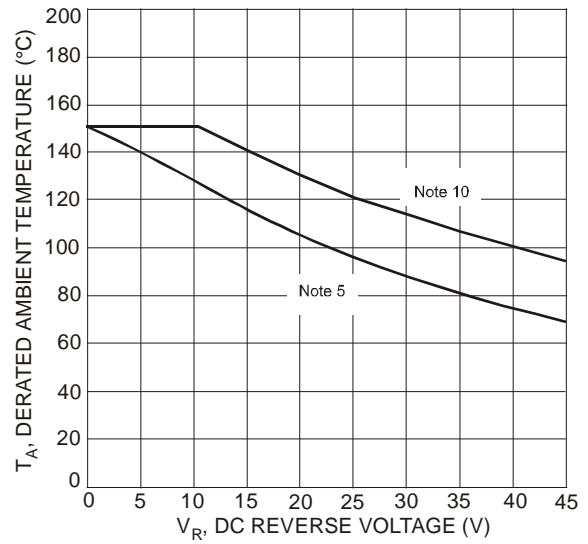
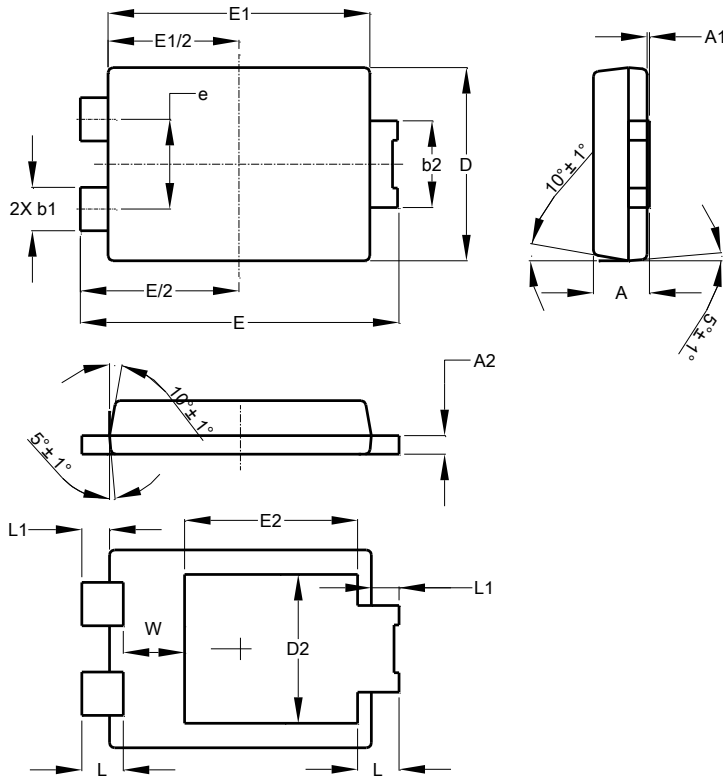


Fig. 6 Operating Temperature Derating

**Package Outline Dimensions**

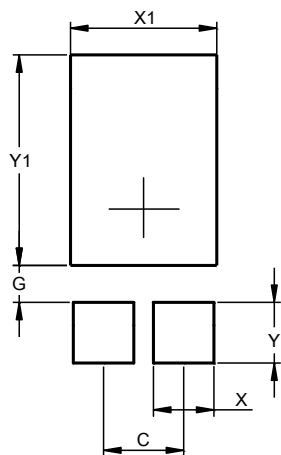
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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