

## 4A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER POWERDI®

### Features

- Lower Forward Voltage Drop than Ultrafast Rectifiers
- Very Low Leakage Current
- Soft Recovery Characteristics: Softness Factor ( $t_b/t_a$ )  $\geq 1$  (see Figure 8)
- 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)**
- **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@3
- Polarity: See Diagram
- Weight: 0.095 grams (Approximate)



### Ordering Information (Note 4)

Part Number	Case	Packaging
PDS4200H-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> 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



- S4200H = Product Type Marking Code  
 DII = Manufacturers' 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>	200	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	141	V
Average Rectified Output Current	I <sub>O</sub>	4	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load	I <sub>FSM</sub>	100	A

### Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R <sub>θJS</sub>	—	3.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	80	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 6)	R <sub>θJA</sub>	65	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7)	R <sub>θJA</sub>	45	—	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +175		°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>	200	—	—	V	I <sub>R</sub> = 5μA
Forward Voltage	V <sub>F</sub>	—	0.76	0.82	V	I <sub>F</sub> = 3A, T <sub>S</sub> = +25°C
		—	—	0.59		I <sub>F</sub> = 3A, T <sub>S</sub> = +150°C
		—	0.785	0.84		I <sub>F</sub> = 4A, T <sub>S</sub> = +25°C
		—	0.61	0.64		I <sub>F</sub> = 4A, T <sub>S</sub> = +150°C
		—	0.84	0.89		I <sub>F</sub> = 8A, T <sub>S</sub> = +25°C
		—	0.68	0.75		I <sub>F</sub> = 8A, T <sub>S</sub> = +150°C
Reverse Leakage Current (Note 8)	I <sub>R</sub>	—	0.2	1	μA mA	T <sub>S</sub> = +25°C, V <sub>R</sub> = 200V
		—	0.8	4		T <sub>S</sub> = +150°C, V <sub>R</sub> = 200V
Reverse Recovery Time	t <sub>rr</sub>	—	—	25	ns	I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A I <sub>RR</sub> = 0.25A (see Figure 8)

- 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 test pulse used to minimize self-heating effect.

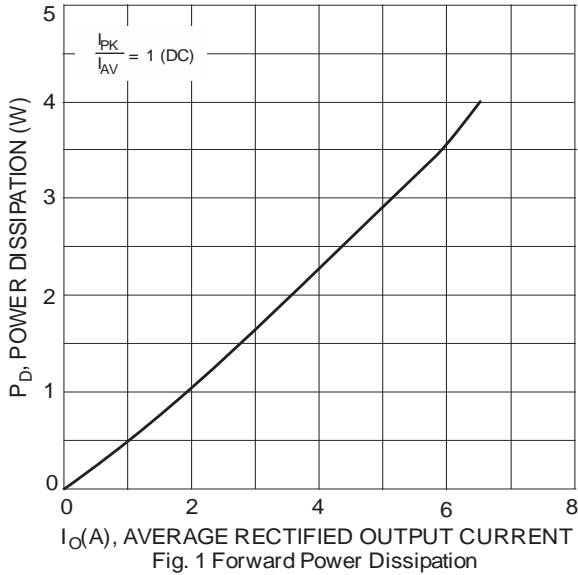


Fig. 1 Forward Power Dissipation

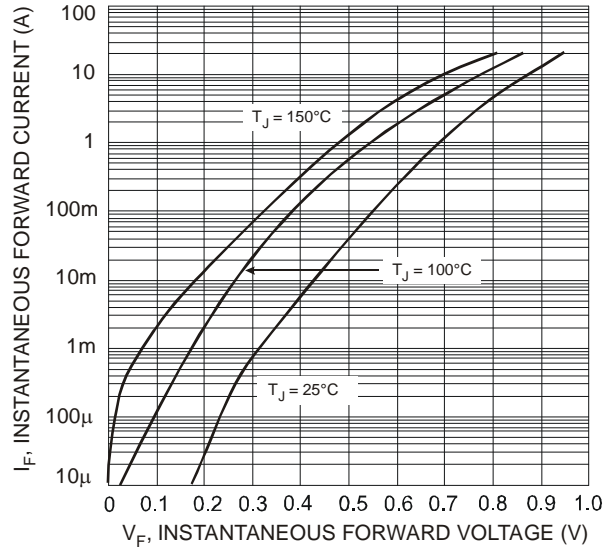


Fig. 2 Typical Forward Characteristics

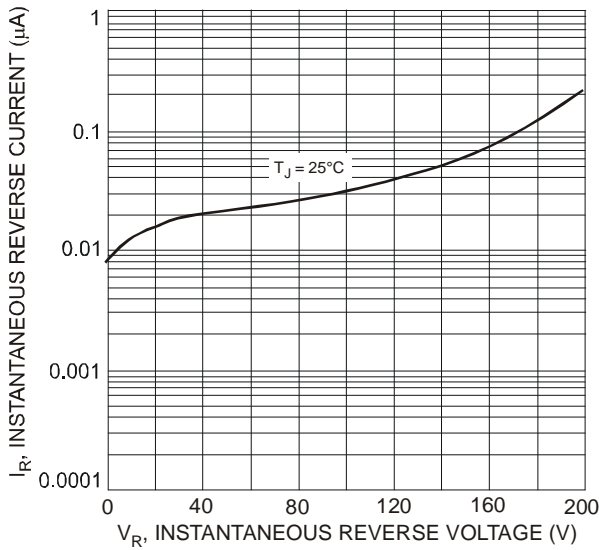


Fig. 3 Typical Reverse Characteristics

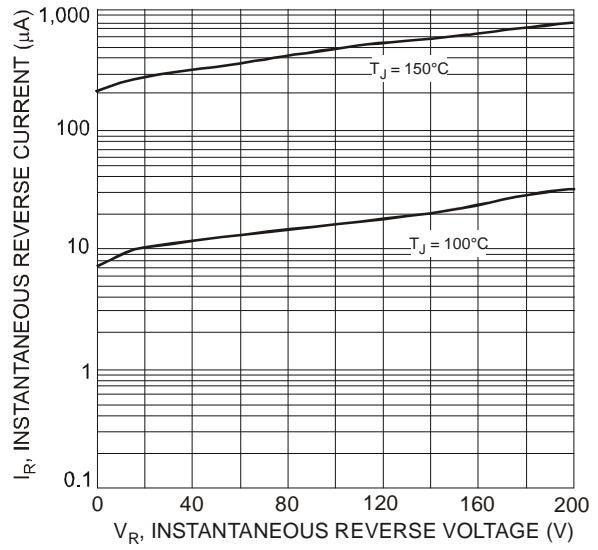


Fig. 4 Typical Reverse Characteristics

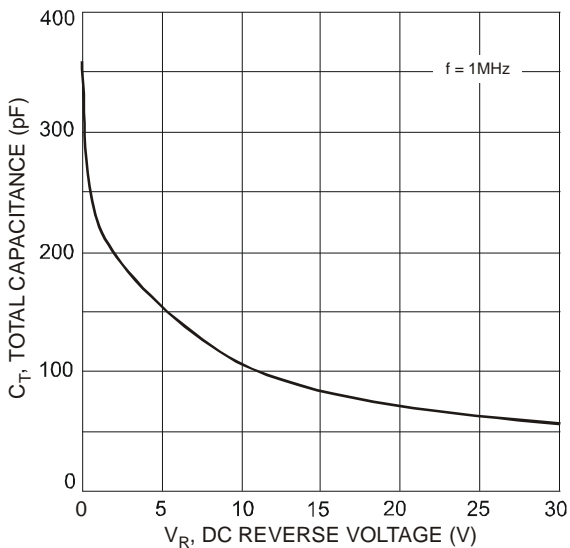


Fig. 5 Total Capacitance vs. Reverse Voltage

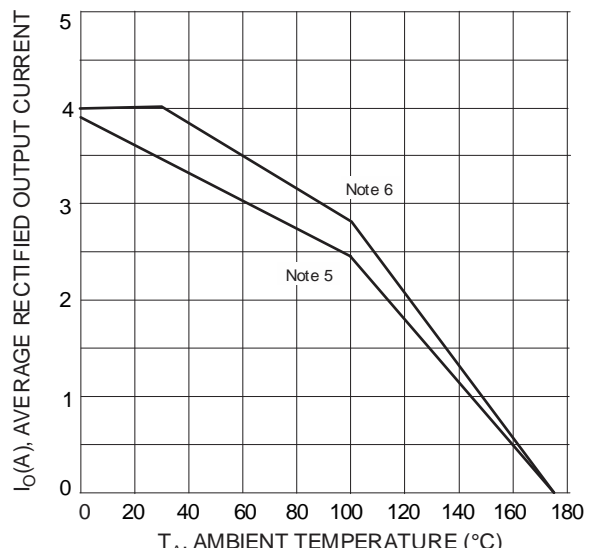


Fig. 6 Forward Current Derating Curve

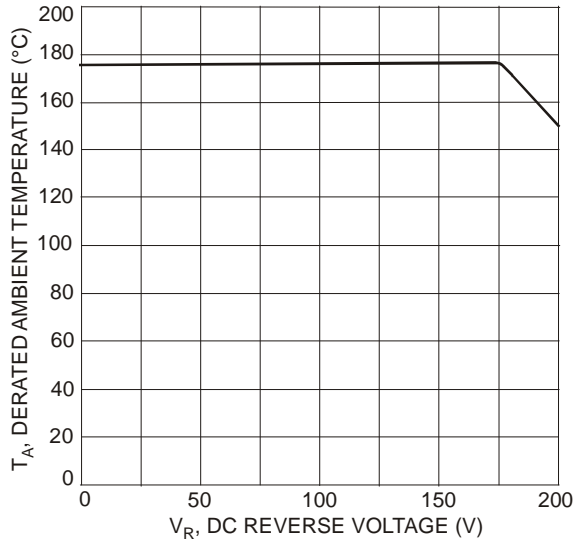
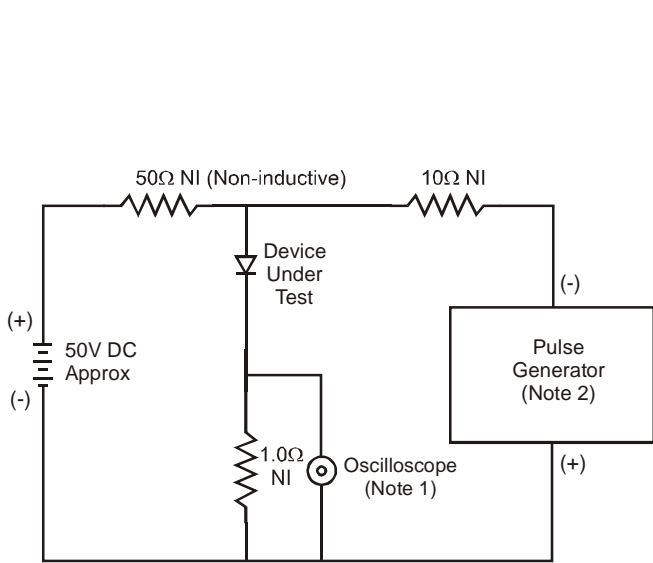


Fig. 7 Operating Temperature Derating



- Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
  2. Rise Time = 10ns max. Input Impedance = 50Ω.

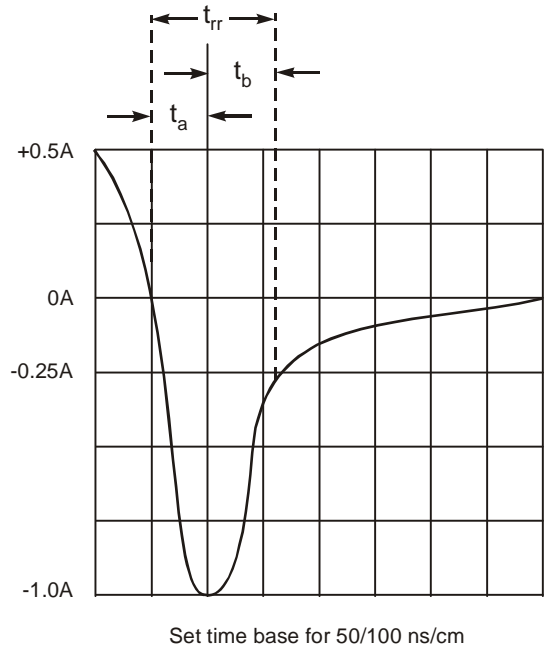
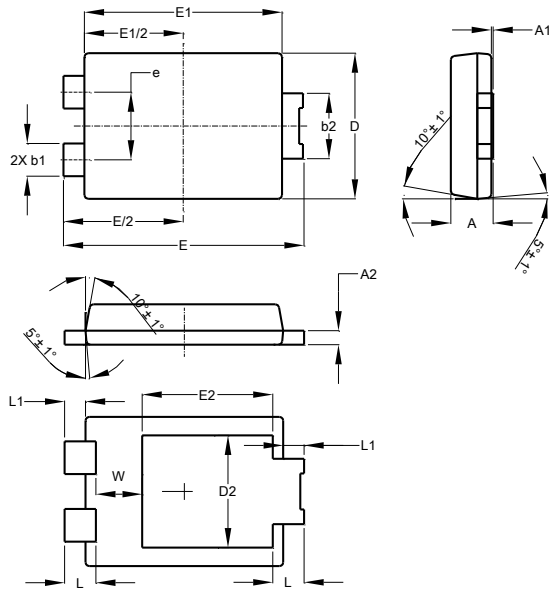


Fig. 8 Reverse Recovery Time Characteristic and Test Circuit

**Package Outline Dimensions**

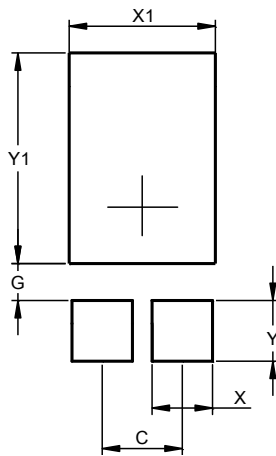
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



POWERDI® 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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