

### Features

- Glass Passivated Die Construction
- Ultra-Fast Recovery Time for High Efficiency
- High Maximum Junction Temperature
- For Use in High Frequency Inverters, Free Wheeling, and Polarity Protection Applications
- High Forward Surge Current Capability
- **Lead Free Finish, RoHS Compliant (Note 1)**
- **"Green" Molding Compound (No Br, Sb)**
- **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-020C
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 **(e3)**
- Polarity: See Diagram on Page 4
- Marking: See Page 3
- Weight: 0.096 grams (approx.)



TOP VIEW



BOTTOM VIEW

### Maximum Ratings @ T<sub>A</sub> = 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	$V_{RRM}$ $V_{RWM}$ $V_R$	400	V
RMS Reverse Voltage	$V_{R(RMS)}$	283	V
Average Rectified Output Current (See also figure 4)	$I_O$	5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load	$I_{FSM}$	125	A

### Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	$R_{\theta JS}$	—	3.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 2)	$R_{\theta JA}$	95	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 3)	$R_{\theta JA}$	55	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 4)	$R_{\theta JA}$	40	—	°C/W
Operating Temperature Range	$T_j$	-65 to +175		°C
Storage Temperature Range	$T_{STG}$	-65 to +175		°C

- Notes:
1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.
  2. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  3. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.

**Electrical Characteristics** @  $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit	Test Condition
Minimum Reverse Breakdown Voltage (Note 5)	$V_{(BR)R}$	400	V	$I_R = 10\mu\text{A}$
Maximum Forward Voltage	$V_{FM}$	1.185 0.935 1.25 1.00	V	$I_F = 5\text{A}, T_S = 25^\circ\text{C}$ $I_F = 5\text{A}, T_S = 150^\circ\text{C}$ $I_F = 8\text{A}, T_S = 25^\circ\text{C}$ $I_F = 8\text{A}, T_S = 150^\circ\text{C}$
Maximum Reverse Leakage Current (Note 5)	$I_{RM}$	10 500	$\mu\text{A}$	$T_S = 25^\circ\text{C}, V_R = 400\text{V}$ $T_S = 100^\circ\text{C}, V_R = 400\text{V}$
Maximum Reverse Recovery Time	$t_{rr}$	35	ns	$I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{RR} = 0.25\text{A}$ (See figure 7)

Notes: 5. Short duration test pulse used to minimize self-heating effect.

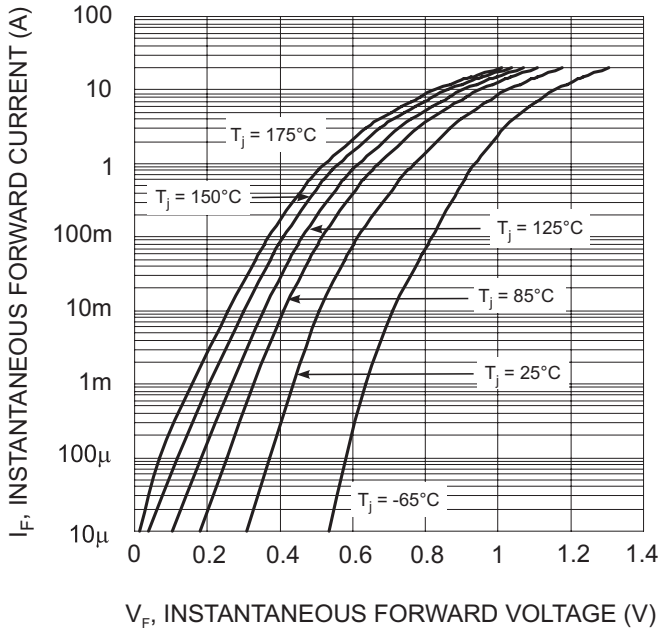


Fig. 1 Typical Forward Characteristics

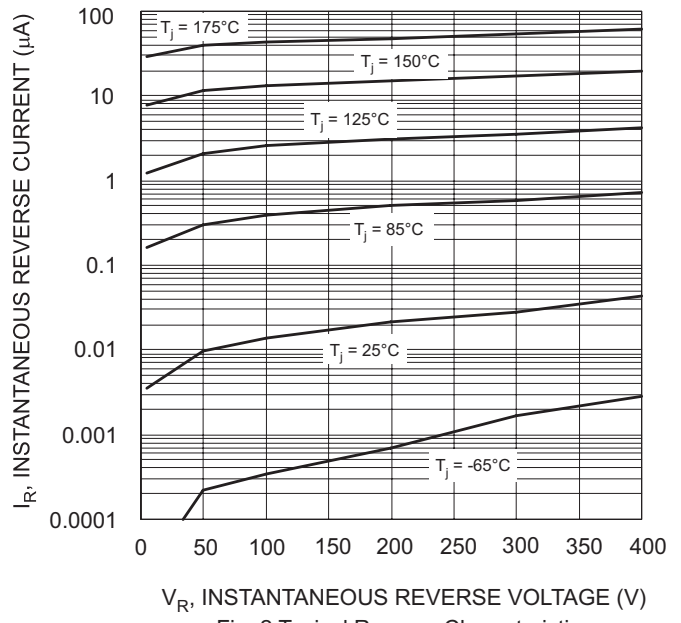


Fig. 2 Typical Reverse Characteristics

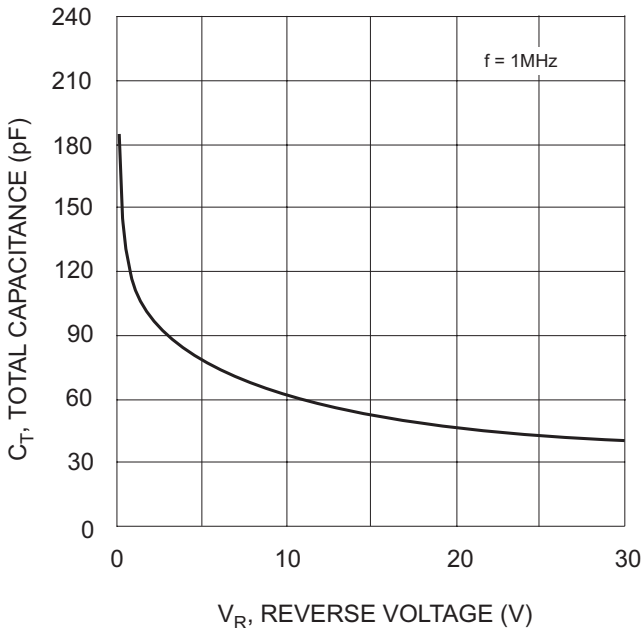


Fig. 3 Typical Total Capacitance vs. Reverse Voltage

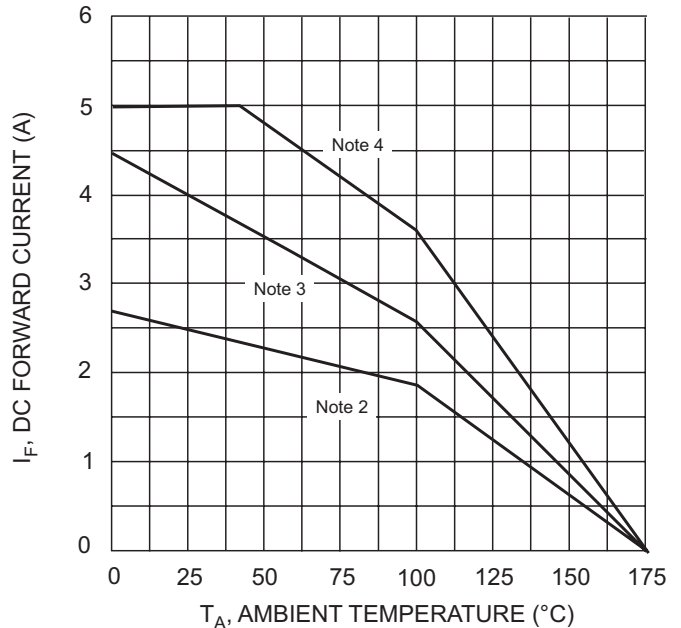


Fig. 4 DC Forward Current Derating

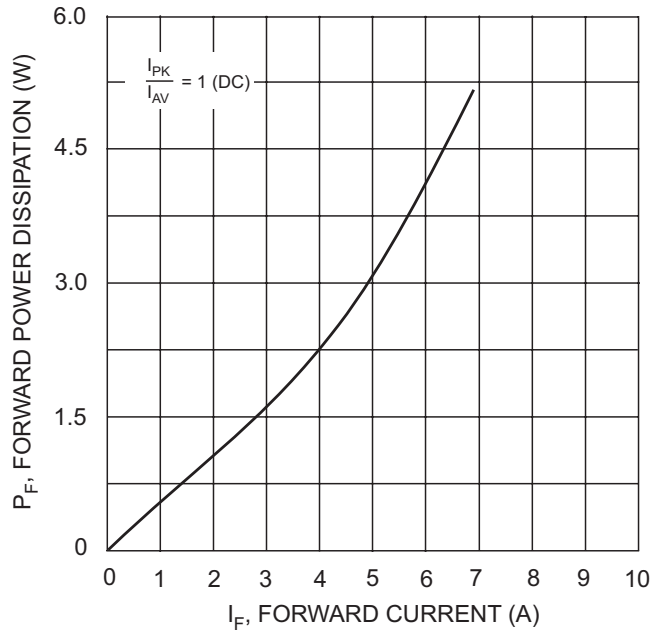


Fig. 5 Forward Power Dissipation

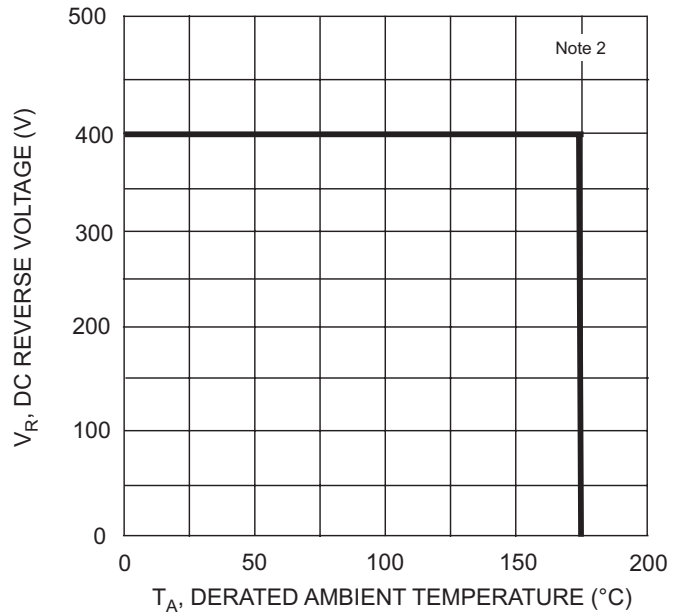
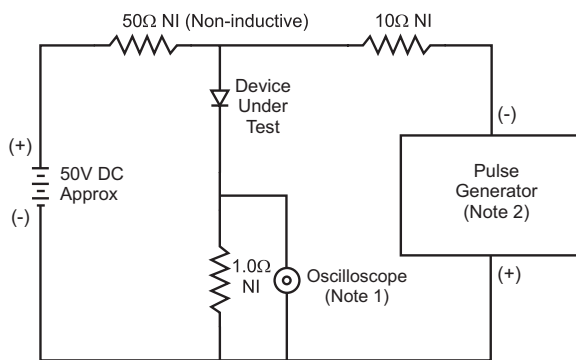
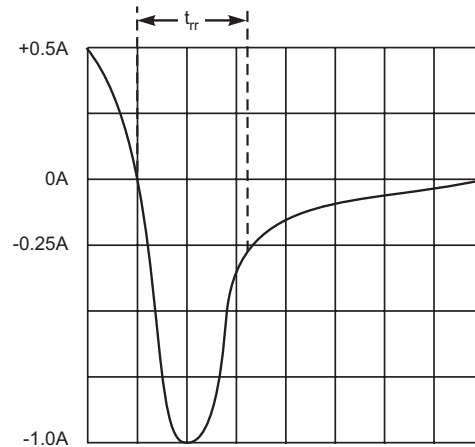


Fig. 6 Operating Temperature Derating



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



Set time base for 50/100 ns/cm

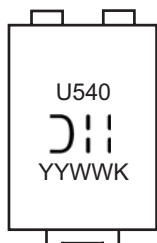
Fig. 7 Reverse Recovery Time Characteristic and Test Circuit

**Ordering Information** (Note 6)

Device	Packaging	Shipping
PDU540-13	PowerDI™5	5000/Tape & Reel

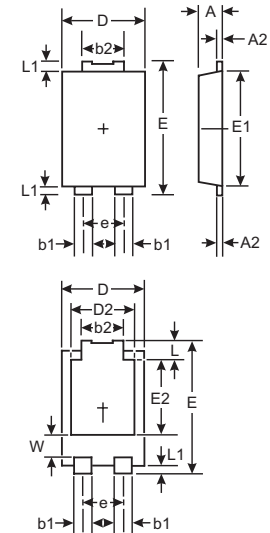
Notes: 6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



U540 = Product type marking code  
 Ⓜ; = Manufacturers' code marking  
 YYWW = Date code marking  
 YY = Last digit of year ex: 06 for 2006  
 WW = Week code 01 to 52  
 K = Factory Designator

**Package Outline Dimensions**



LEFT PIN ○  
 RIGHT PIN ○  
 BOTTOMSIDE HEAT SINK ○

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

PowerDI™5		
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	3.05 NOM	
E	6.40	6.60
e	1.84 NOM	
E1	5.30	5.45
E2	3.55 NOM	
L	0.75	0.95
L1	0.50	0.65
W	1.20	1.50
<b>All Dimensions in mm</b>		

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