

4A ULTRA-FAST RECOVERY RECTIFIER PowerDI 5

Features

Glass Passivated Die Construction
 Ultra-Fast Recovery Time for High Efficiency
 High Maximum Junction Temperature
 For Use in Low Voltage, 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
 Ordering Information: See Page 3
 Weight: 0.096 grams (approximate)



TOP VIEW



BOTTOM VIEW

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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	200	V
RMS Reverse Voltage	$V_{R(RMS)}$	141	V
Average Rectified Output Current (See also figure 4)	I_O	4	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load	I_{FSM}	125	A

Thermal Characteristics

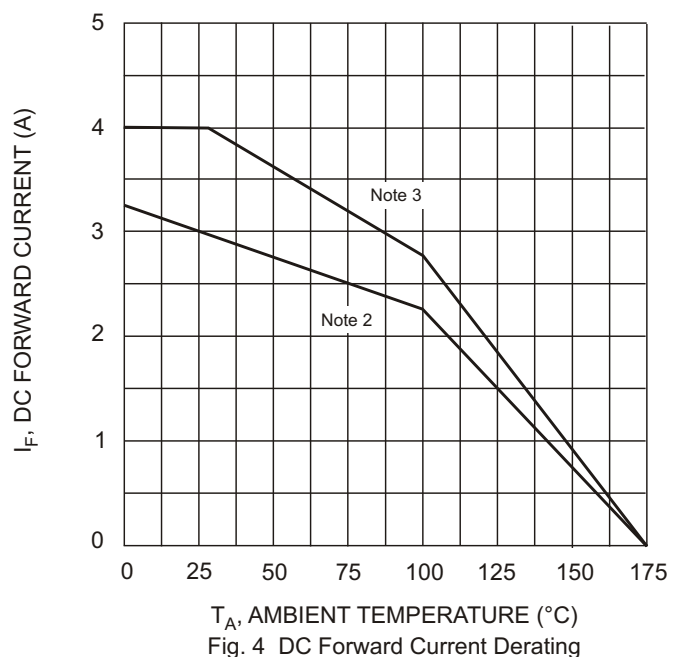
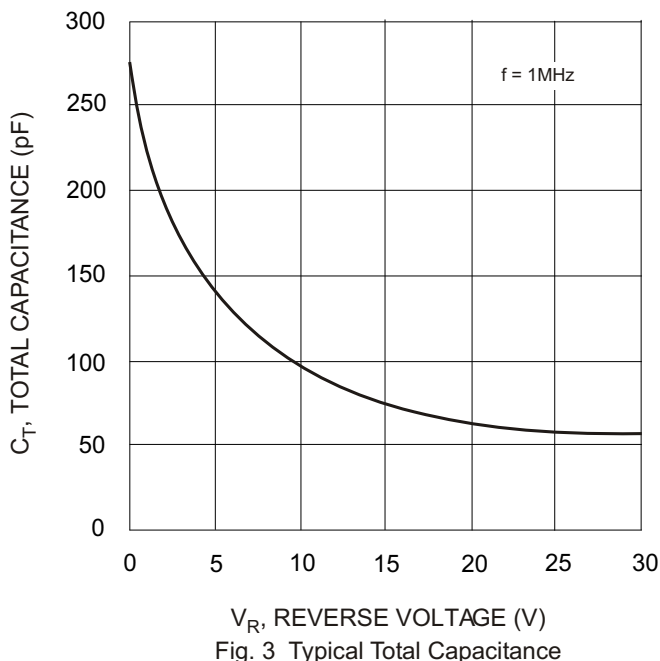
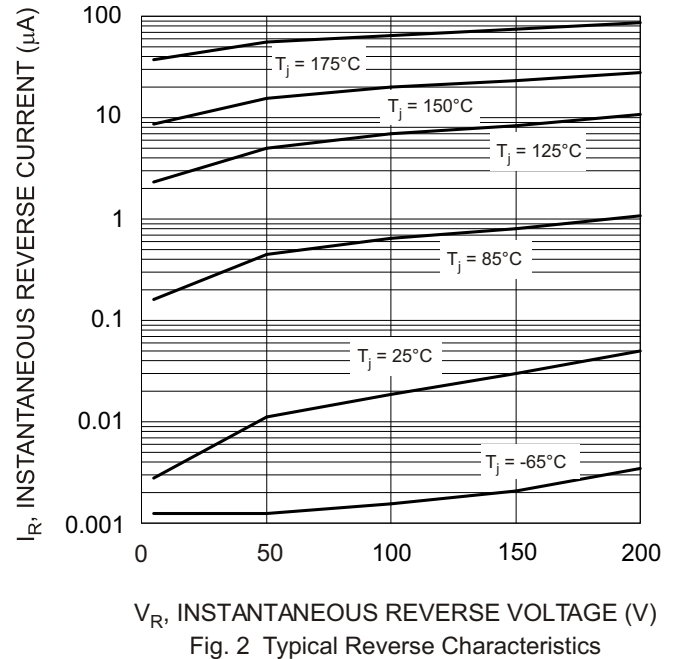
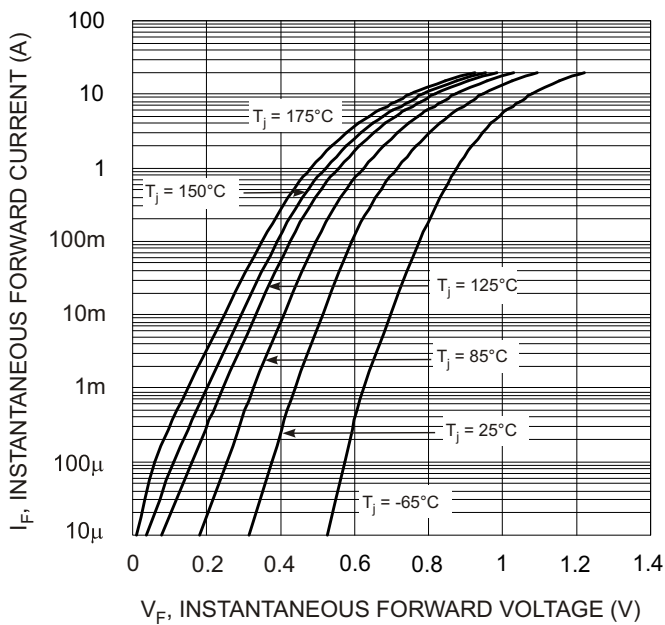
Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R_{JS}		3.0	C/W
Thermal Resistance Junction to Ambient Air (Note 2) T _A = 25 °C	R_{JA}	85		C/W
Thermal Resistance Junction to Ambient Air (Note 3) T _A = 25 °C	R_{JA}	60		C/W
Thermal Resistance Junction to Ambient Air (Note 4) T _A = 25 °C	R_{JA}	40		C/W
Operating Temperature Range	T_j	-65 to +175		°C
Storage Temperature Range	T_{STG}	-65 to +175		°C

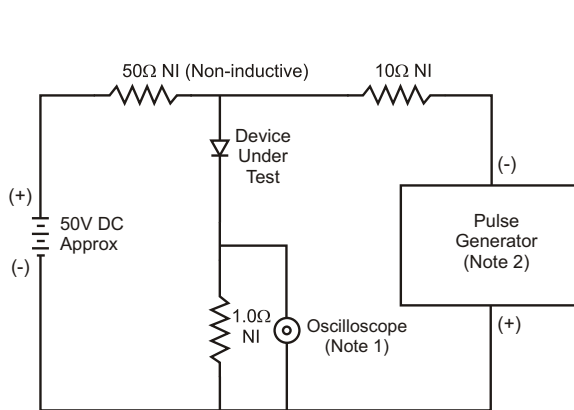
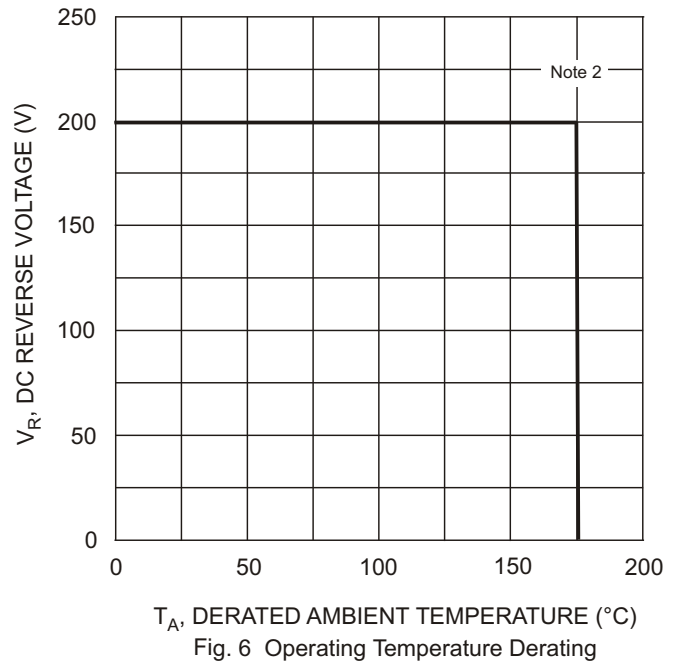
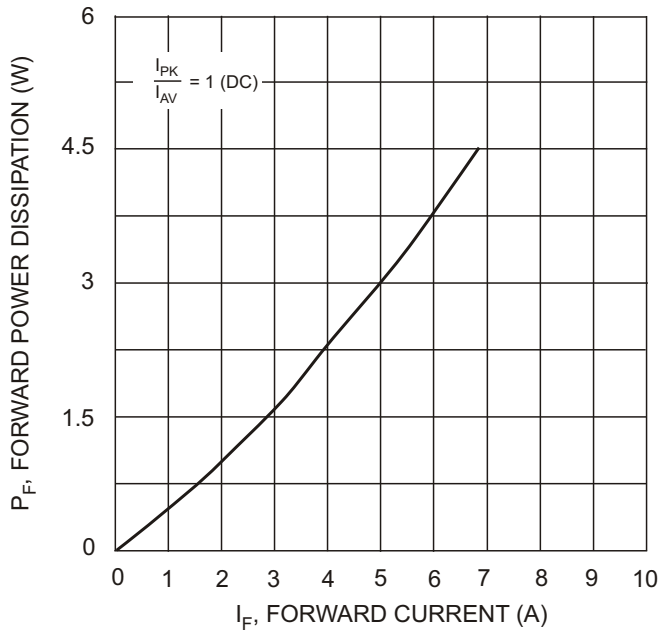
- Notes:
1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.
 2. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
 3. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout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

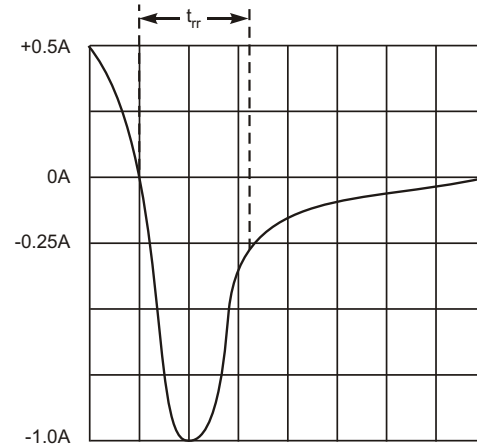
Characteristic	Symbol	Value	Unit	Test Condition
Minimum Reverse Breakdown Voltage (Note 5)	$V_{(BR)R}$	200	V	$I_R = 5\text{ A}$
Maximum Forward Voltage	V_{FM}	0.875 0.71 0.89 0.85 0.72 1.25	V	$I_F = 3\text{A}, T_S = 25^\circ\text{C}$ $I_F = 3\text{A}, T_S = 150^\circ\text{C}$ $I_F = 4\text{A}, T_S = 25^\circ\text{C}$ $I_F = 4\text{A}, T_S = 100^\circ\text{C}$ $I_F = 4\text{A}, T_S = 150^\circ\text{C}$ $I_F = 12\text{A}, T_S = 25^\circ\text{C}$
Maximum Reverse Leakage Current (Note 5)	I_{RM}	5 150	A	$T_S = 25^\circ\text{C}, V_R = 200\text{V}$ $T_S = 150^\circ\text{C}, V_R = 200\text{V}$
Maximum Reverse Recovery Time	t_{rr}	25	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.





- 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

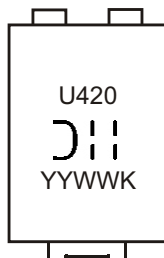
Fig. 7 Reverse Recovery Time Characteristic and Test Circuit

Ordering Information (Note 6)

Device	Packaging	Shipping
PDU420-13	PowerDI 5	5000/Tape & Reel

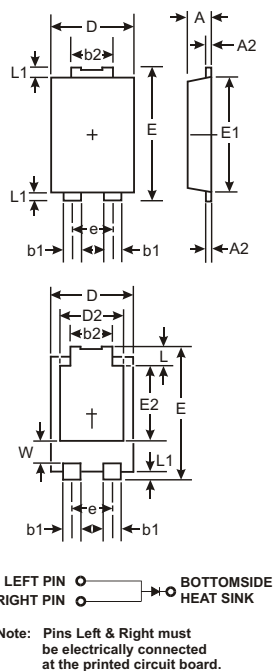
Notes: 6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



U420 = 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



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
All Dimensions in mm		

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