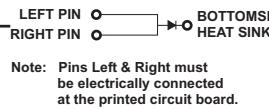


### Features

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Low Forward Voltage Drop
- Very Low Leakage Current
- High Forward Surge Current Capability
- For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Applications
- **Lead Free Finish, RoHS Compliant (Note 1)**
- **"Green" Molding Compound (No Br, Sb)**

### 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
- Marking: See Page 3
- Weight: 0.096 grams (approx.)



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		

### 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	V <sub>RRM</sub>	40	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	28	V
Average Rectified Output Current (see also Figure 5)	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
Operating Temperature Range	T <sub>j</sub>	-65 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-65 to +150	°C

### Thermal Characteristics @ T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R <sub>θJS</sub>	—	2.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 2)	R <sub>θJA</sub>	95	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 3)	R <sub>θJA</sub>	75	—	
Thermal Resistance Junction to Ambient Air (Note 4)	R <sub>θJA</sub>	50	—	

- 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	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 5)	$V_{(BR)R}$	40	—	—	V	$I_R = 1\text{mA}$
Forward Voltage	$V_F$	—	0.45 0.47 — 0.42	0.51 0.55 — 0.49	V	$I_F = 8\text{A}, T_S = 25^\circ\text{C}$ $I_F = 10\text{A}, T_S = 25^\circ\text{C}$ $I_F = 8\text{A}, T_S = 125^\circ\text{C}$ $I_F = 10\text{A}, T_S = 125^\circ\text{C}$
Reverse Leakage Current (Note 5)	$I_R$	—	0.02 5.5 0.03 6.5	0.7 35 1.0 50	mA	$T_S = 25^\circ\text{C}, V_R = 35\text{V}$ $T_S = 100^\circ\text{C}, V_R = 35\text{V}$ $T_S = 25^\circ\text{C}, V_R = 40\text{V}$ $T_S = 100^\circ\text{C}, V_R = 40\text{V}$

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

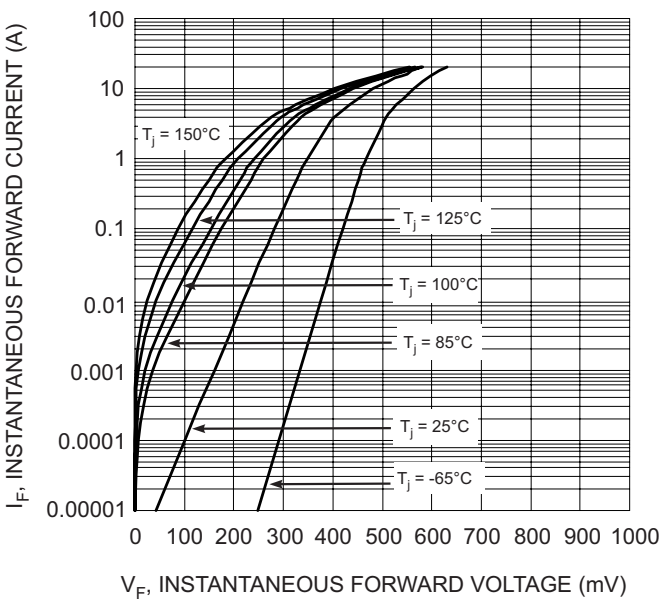


Fig. 1 Typical Forward Characteristics

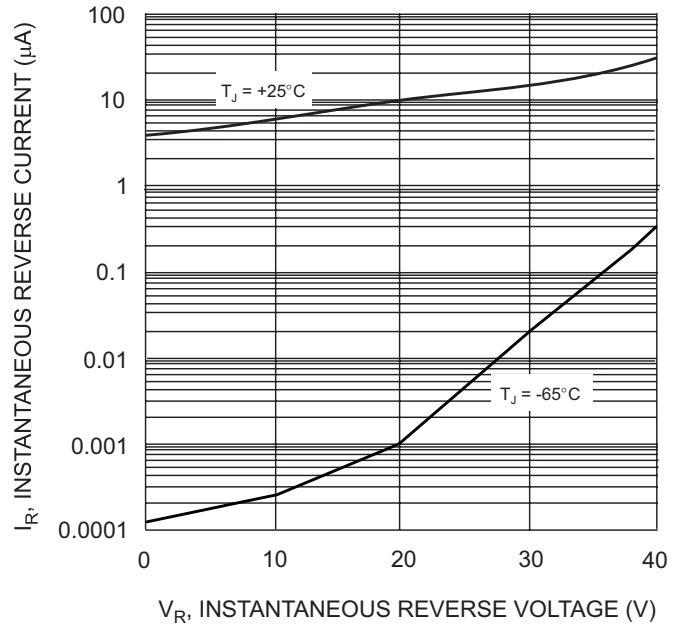


Fig. 2 Typical Reverse Characteristics

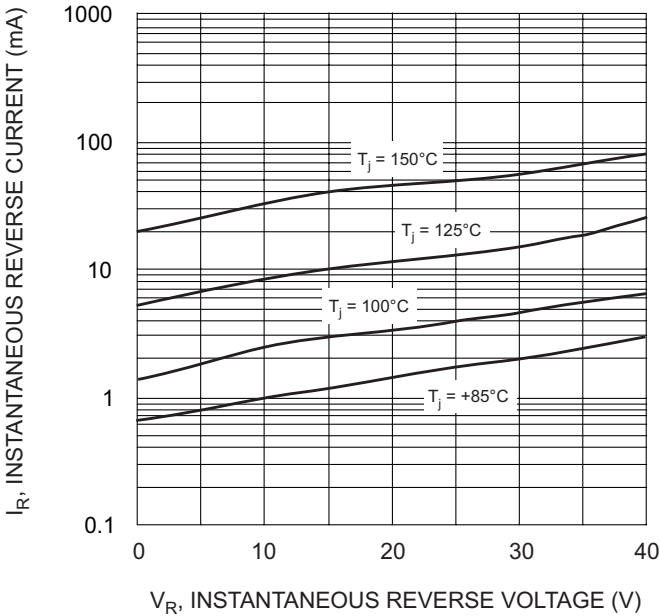


Fig. 3 Typical Reverse Characteristics

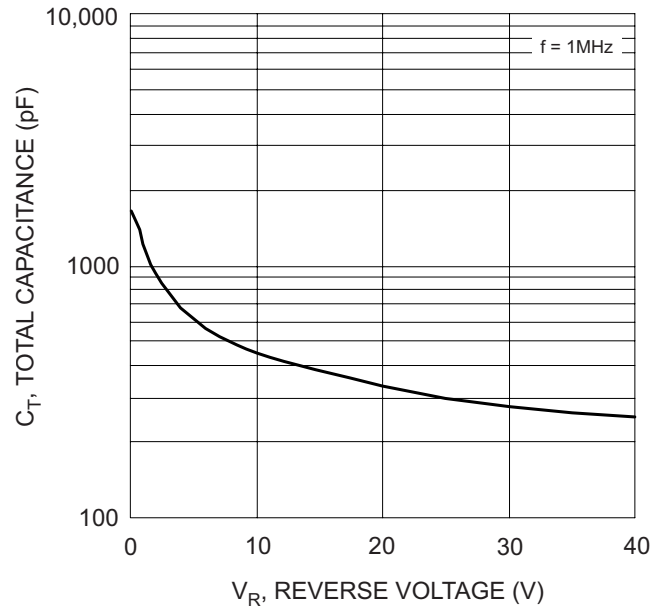


Fig. 4 Typical Total Capacitance vs. Reverse Voltage

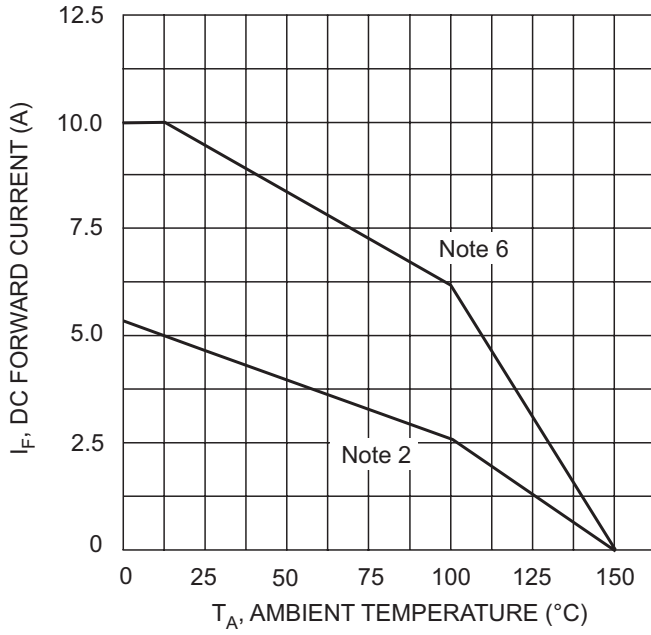


Fig. 5 DC Forward Current Derating

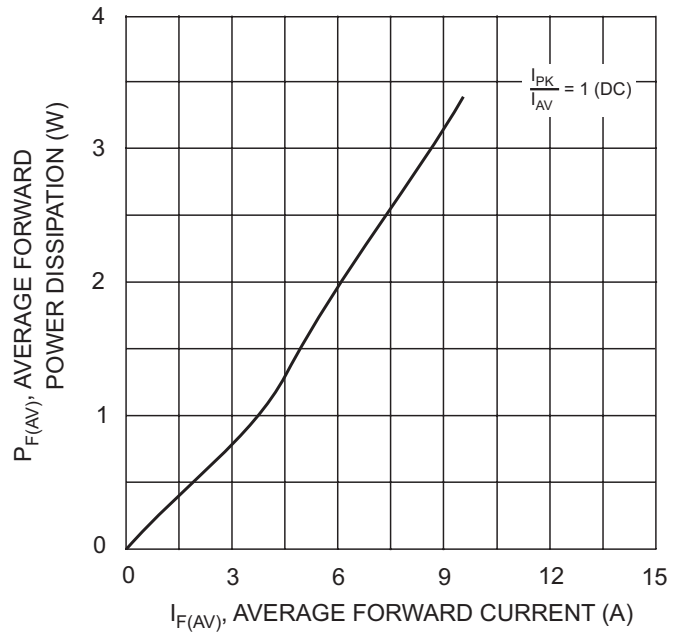


Fig. 6 Forward Power Dissipation

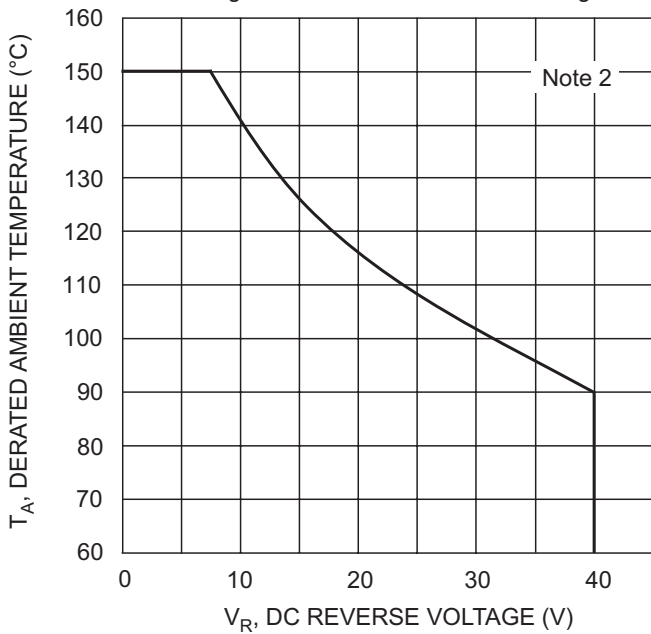


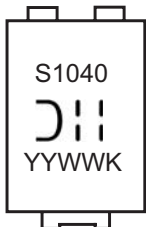
Fig. 7 Operating Temperature Derating

**Ordering Information** (Note 7)

Device	Packaging	Shipping
PDS1040-13	PowerDI™5	5000/Tape & Reel

- Notes:
- FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
  - Short duration test pulse used to minimize self-heating effect.
  - Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 3.0mm.
  - For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



S1040 = Product type marking code  
 DII = Manufacturers' code marking  
 YYWW = Date code marking  
 YY = Last two digits of year ex: 04 for 2004  
 WW = Week code 01 to 52  
 K = Factory designator

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