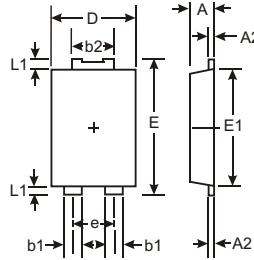


### Features

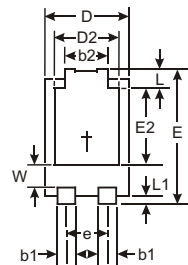
- Guard Ring Die Construction for Transient Protection
- Very Low Forward Voltage Drop
- High Forward Surge Current Capability
- For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Applications
- Lead Free Finish, RoHS Compliant (Note 1)**
- "Green" Molding Compound (No Br, Sb)**
- Qualified to AEC-Q101 Standards for High Reliability**



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>		

### 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 (approximate)



LEFT PIN ○ RIGHT PIN ○ BOTTOMSIDE HEAT SINK

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

### 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 <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	45	V
RMS Reverse Voltage	V <sub>R(RMS)</sub>	32	V
Average Rectified Output Current (see also Figure 4)	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

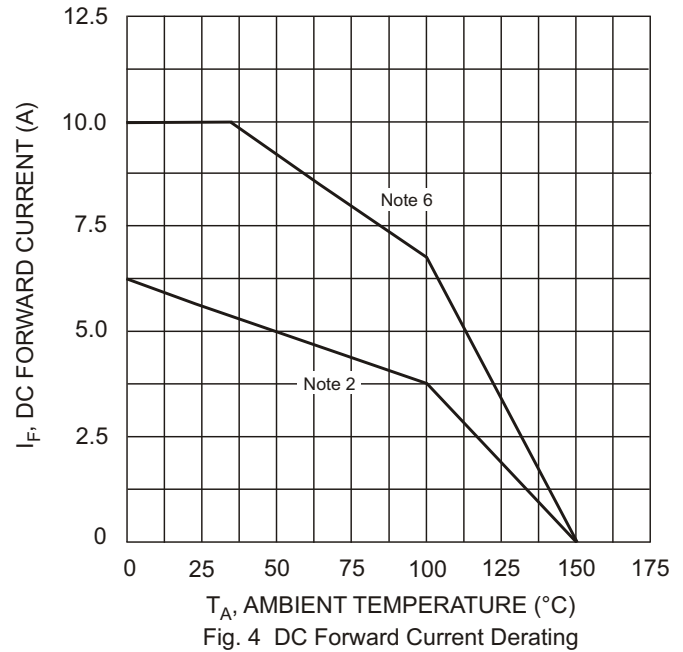
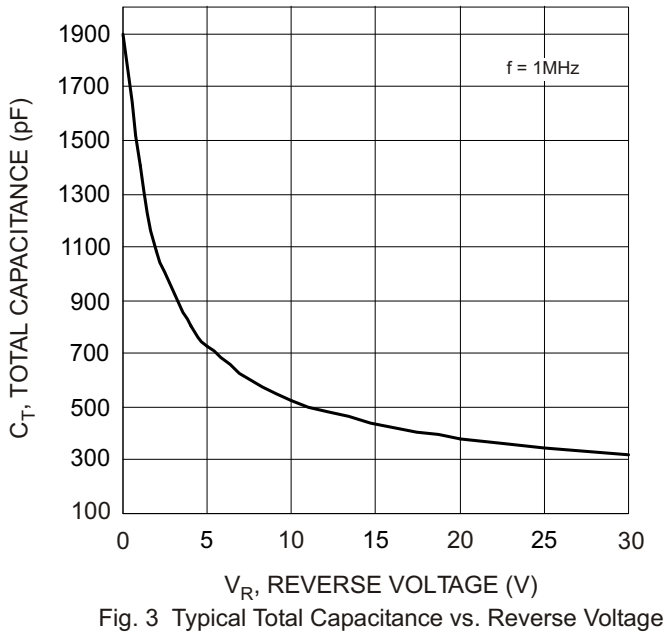
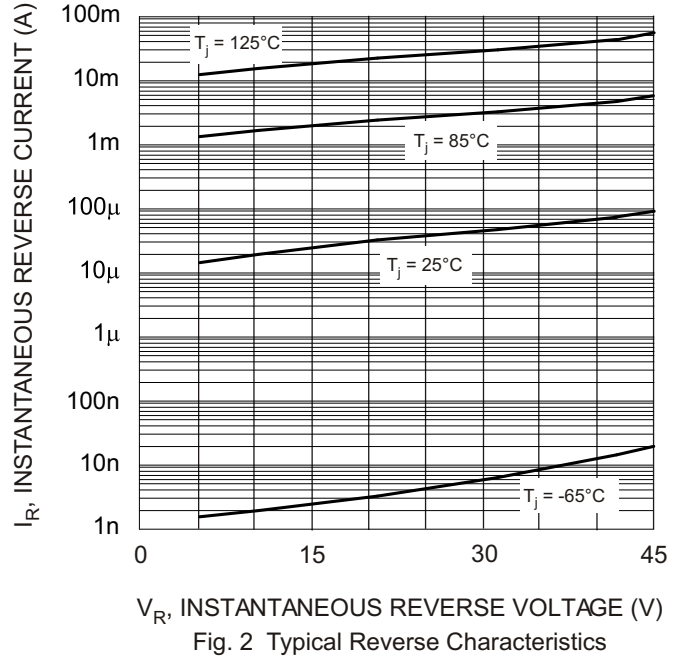
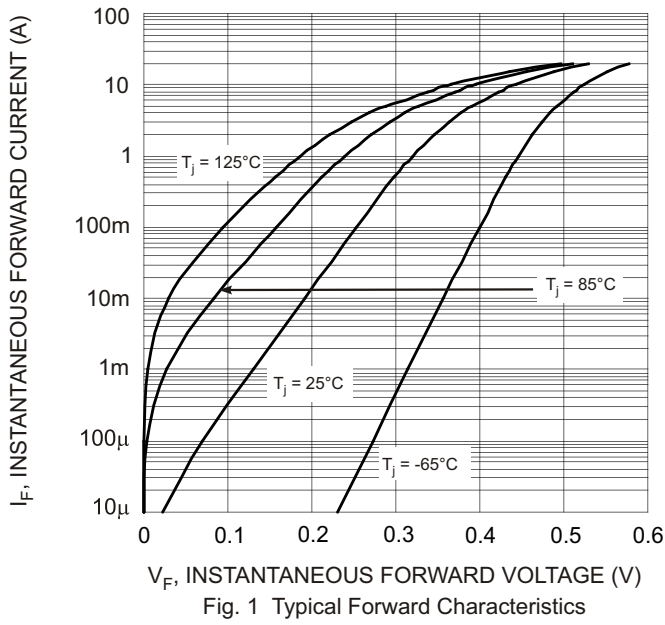
Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R <sub>JS</sub>		0.8	C/W
Thermal Resistance Junction to Ambient Air (Note 2) T <sub>A</sub> = 25°C	R <sub>JA</sub>	85		C/W
Thermal Resistance Junction to Ambient Air (Note 3) T <sub>A</sub> = 25°C	R <sub>JA</sub>	65		C/W
Thermal Resistance Junction to Ambient Air (Note 4) T <sub>A</sub> = 25°C	R <sub>JA</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

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

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 5)	$V_{(BR)R}$	45			V	$I_R = 600\text{ A}$
Forward Voltage	$V_F$		0.40 0.45 0.29 0.37	0.45 0.51 0.35 0.43	V	$I_F = 5\text{ A}, T_S = 25\text{ C}$ $I_F = 10\text{ A}, T_S = 25\text{ C}$ $I_F = 5\text{ A}, T_S = 125\text{ C}$ $I_F = 10\text{ A}, T_S = 125\text{ C}$
Reverse Leakage Current (Note 5)	$I_R$		0.03 10 0.1 65	0.3 25 0.6 150	mA	$T_S = 25\text{ C}, V_R = 35\text{ V}$ $T_S = 100\text{ C}, V_R = 35\text{ V}$ $T_S = 25\text{ C}, V_R = 45\text{ V}$ $T_S = 125\text{ C}, V_R = 45\text{ V}$

Notes: 5. Short duration test pulse used to minimize self-heating effect.  
6. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 16.0mm x 12.4mm. Anode pad dimensions 4.7mm x 2.7mm.



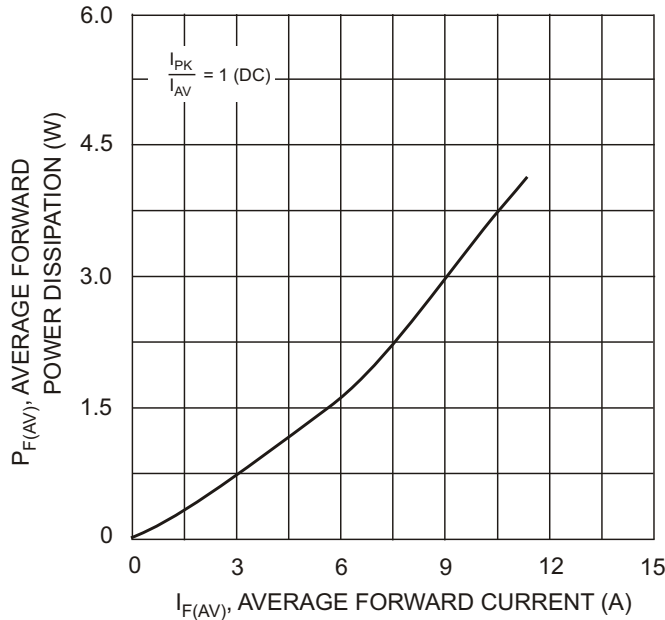


Fig. 5 Forward Power Dissipation

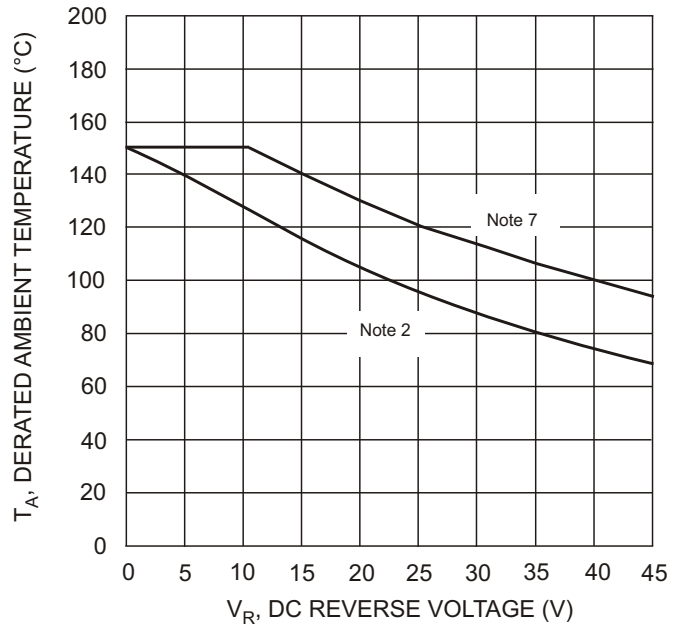


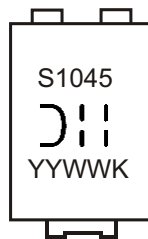
Fig. 6 Operating Temperature Derating

### Ordering Information (Note 8)

Device	Packaging	Shipping
PDS1045-13	PowerDI 5	5000/Tape & Reel

- Notes:
- FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polymide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
  - Polymide PCB, 2 oz. Copper. Cathode pad dimensions 13.2mm x 10.1mm. Anode pad dimensions 4.0mm x 2.2mm.
  - Short duration test pulse used to minimize self-heating effect.
  - Polymide PCB, 2 oz. Copper. Cathode pad dimensions 16.0mm x 12.4mm. Anode pad dimensions 4.7mm x 2.7mm.
  - Devices mounted such that  $R_{JA} = 19 \text{ C/W}$ .
  - For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

### Marking Information



S1045 = Product type marking code  
 ||| = Manufacturers' code marking  
 YYWW = Date code marking  
 YY = Last two digits of year ex: 05 for 2005  
 WW = Week code 01 to 52  
 K = Factory designator

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