

## Product Summary

$V_{RRM}$ (V)	$I_O$ (A)	$V_F$ (V)	$T_{RR\ max}$ (nS)	$Q_{RR\ typ.}$ (nC)
600	6	3.0	23	135

## Description and Applications

This DIODESTAR rectifier has been optimized for Power Factor Correction circuits operating in continuous conduction mode (CCM). It is also suitable for use as a re-circulating diode in High Intensity Discharge Lighting.

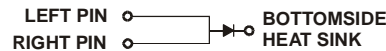
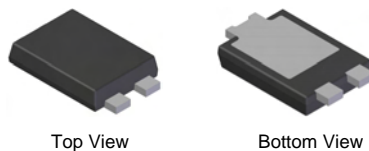
- CCM Power Factor Correction
- High Intensity Discharge Lighting
- Motor control

## Features and Benefits

- Optimized for  $Q_{rr}$  and  $t_{rr}$  to minimize diode reverse recovery losses in Continuous Conduction Mode (CCM) Power Factor Correction circuits
- Soft switching, low EMI
- 175 °C maximum operating junction temperature
- Thermally efficient, small form factor package enables higher density designs.
- Off board profile of 1.1mm, ideal for use in low profile applications
- **Lead Free Finish, RoHS Compliant (Note 1)**
- **“Green” Molding Compound (No Br, Sb)**

## Mechanical Data

- Case: POWERDI<sup>®</sup>5
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208 <sup>(e3)</sup>
- Weight 0.093 grams (approximate)



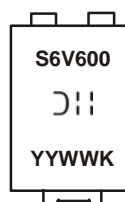
**Note:** Pins Left & Right must be electrically connected at the printed circuit board.

## Ordering Information (Note 2)

Part Number	Case	Packaging
DSR6V600P5-13	POWERDI <sup>®</sup> 5	5000/Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see EU Directive 2002/95/EC Annex Notes.
  2. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



S6V600 = Product Type Marking Code  
 DII = Manufacturers' Code Marking  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 09 for 2009)  
 WW = Week Code (01 – 53)  
 K = Factory Designator

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  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	$V_{RRM}$	600	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_{RM}$		
Average Rectified Output Current	$I_O$	6	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	$I_{FSM}$	55	A

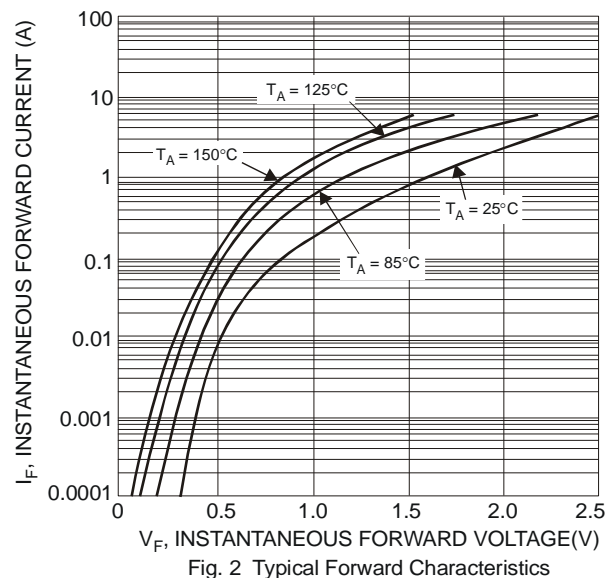
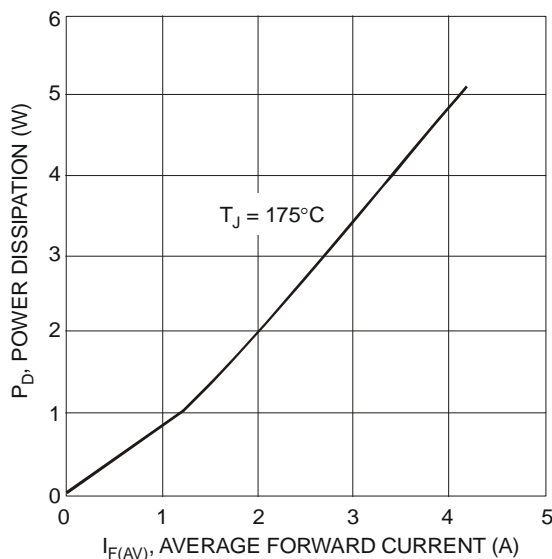
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance			
Thermal Resistance Junction to Ambient (Note 4)	$R_{\theta JA}$	104	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	30	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +175	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	$V_F$	-	2.5	3.0	V	$I_F = 6\text{A}, T_J = 25^\circ\text{C}$
Leakage Current (Note 3)	$I_R$	-	0.2	10	$\mu\text{A}$	$V_R = 600\text{V}, T_J = 25^\circ\text{C}$
Reverse Recovery Time	$t_{rr}$	-	-	23	ns	$I_F = 0.5\text{A}, I_R = 1\text{A}, I_{RR} = 0.25\text{A}$
		-	-	35		$I_F = 1\text{A}, V_R = 30\text{V}, di/dt = 50\text{A}/\mu\text{s}$
Softness Factor	S	-	0.7	-	-	
Reverse Recovery Current	$I_{RM}$	-	3.6	-	A	$I_F = 6\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_R = 400\text{V}, T_J = 125^\circ\text{C}$
Reverse Recovery Charges	$Q_{rr}$	-	135	-	nC	
Junction Capacitance	$C_J$	-	30	-	pF	$V_R = 4.0\text{V}, 1\text{MHz}$

- Notes:
3. Short duration pulse test used to minimize self-heating effect.
  4. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  5. Polyimide PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.



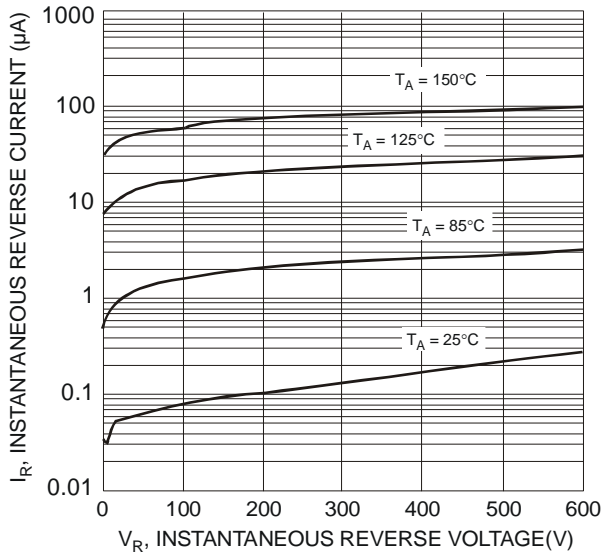


Fig. 3 Typical Reverse Characteristics

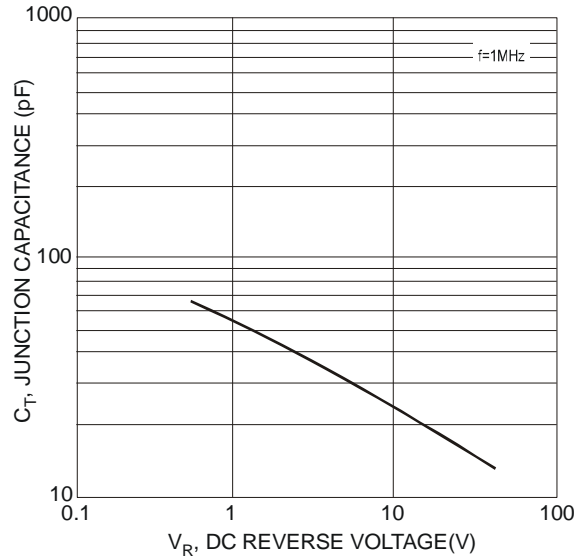


Fig. 4 Total Capacitance vs. Reverse Voltage

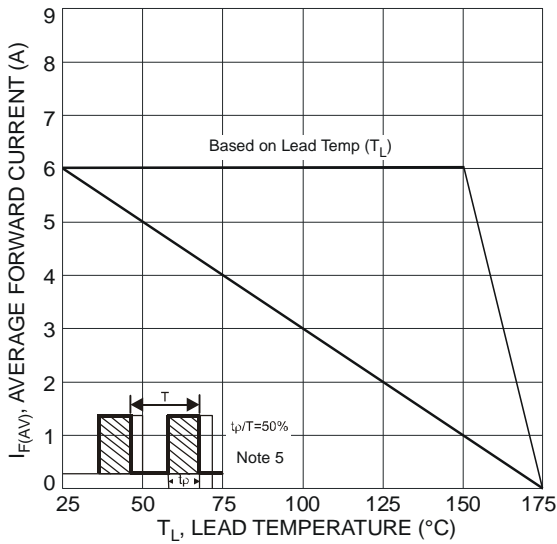


Fig. 5 Forward Current Derating Curve

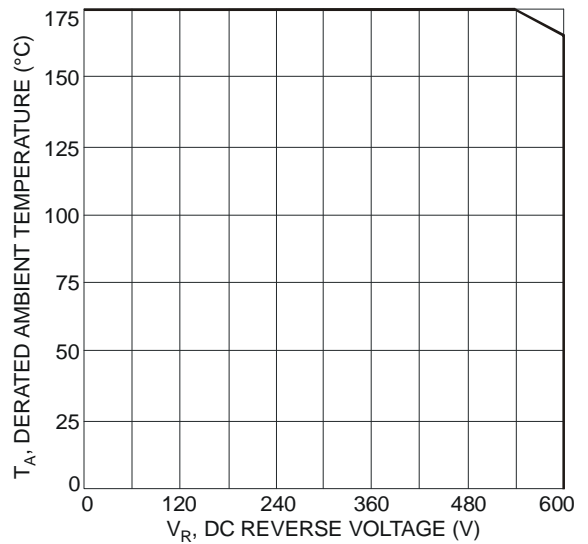
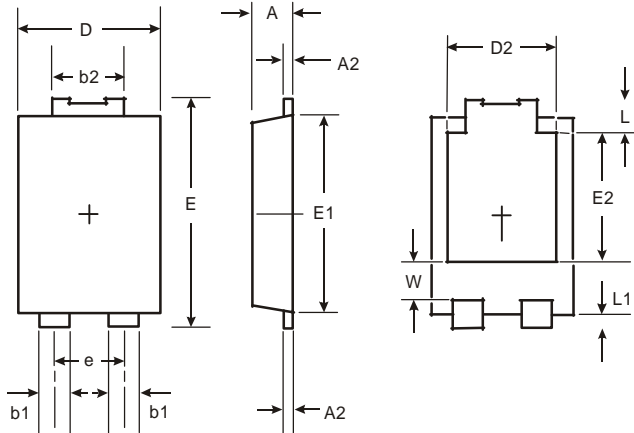


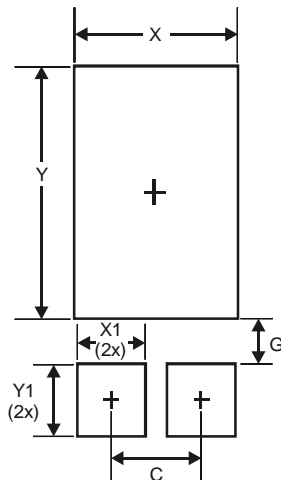
Fig. 6 Operating Temperature Derating

**Package Outline Dimensions**



POWERDI <sup>®</sup> 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	3.054 Typ	
E	6.40	6.60
e	1.84 Typ	
E1	5.30	5.45
E2	3.549 Typ	
L	0.75	0.95
L1	0.50	0.65
W	1.10	1.41
All Dimensions in mm		

**Suggested Pad Layout**



Dimensions	Value (in mm)
C	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400

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