

Product Summary (@ T_A = +25°C)

V _{RRM} (V)	I _O (A)	V _F MAX (V) @ +25°C	I _R MAX (mA) @ +25°C
50	15	0.52	0.5

Description

Packaged in the compact thermally efficient PowerDI[®]5 package, the SBR15U50SP5 provides very low V_F and excellent reverse leakage stability at high temperatures. It is ideal for use as a rectification, freewheeling or polarity protection diode.

Applications

- DC/DC converters
- AC/DC adaptors

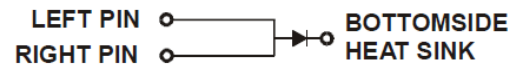
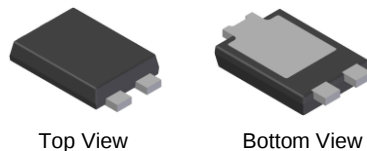
Features and Benefits

- Low-Forward Voltage Drop (V_F) Helps – Minimizes Power Losses
- Excellent Stability at Higher Temperatures
- Patented Super Barrier Rectifier SBR[®] Technology
- Thermally Efficient Package for Cooler Running Applications
- Less than 1.1mm Package Profile Ideal for Thin Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact_us) or your local Diodes representative.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: PowerDI5
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208③
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)

PowerDI5



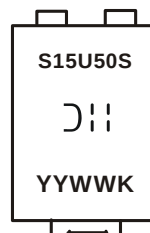
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SBR15U50SP5-13	PowerDI5	5000	Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



)|| = Manufacturer's Marking
 S15U50S = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 25 = 2025)
 WW = Week Code (01 to 53)
 K = Factory Designator

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V _{RRM}	50	V
Average Rectified Output Current	I _O	15	A
Non-Repetitive Peak Forward Surge Current 8.3ms	I _{FSM}	256	A
Non-Repetitive Avalanche Energy at I _{AS} = 10A, L = 50mH	E _{AS}	1600	mJ
Non-Repetitive Avalanche Energy at I _{AS} = 40A, L = 1mH	E _{AS}	300	mJ
Electrostatic Discharge	HBM	8000	V
Electrostatic Discharge	MM	400	V
Electrostatic Discharge	CDM	1000	V

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance (Note 5)	R _{θJA}	90	°C/W
Typical Thermal Resistance (Note 6)	R _{θJA}	39	°C/W
Typical Thermal Resistance (Note 7)	R _{θJL}	2.5	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop (Note 8)	V _F	—	—	0.48	V	I _F = 10A, T _J = +25°C
		—	0.33	—		I _F = 10A, T _J = +125°C
		—	0.44	0.52		I _F = 15A, T _J = +25°C
		—	0.40	—		I _F = 15A, T _J = +125°C
Leakage Current (Note 8)	I _R	—	—	0.5	mA	V _R = 50V, T _J = +25°C
		—	50	—		V _R = 50V, T _J = +125°C
Junction Capacitance	C _J	—	400	—	pF	V _R = 25V, T _J = +25°C
Switching Speed t _{RR}	t _{RR}	—	50	—	ns	I _F = 0.5A, I _R = 1A, I _{RR} = 0.25A (RG1)

Notes: 5. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
6. FR-4 PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.
7. Junction to lead (cathode terminal).
8. Short duration pulse test used to minimize self-heating effect.

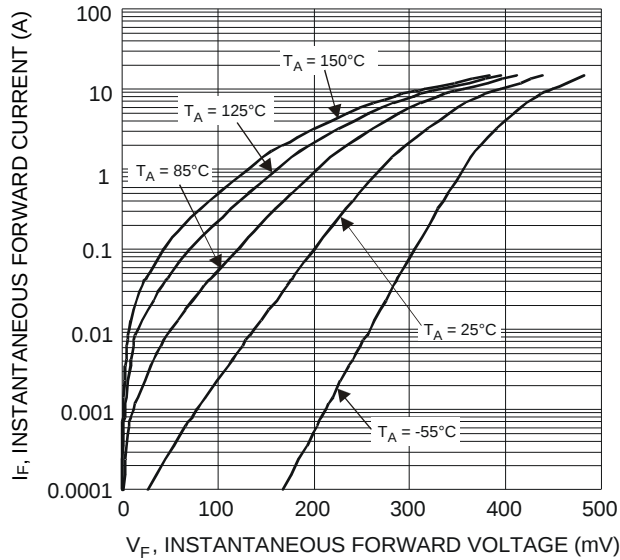


Figure 1 Typical Forward Characteristics

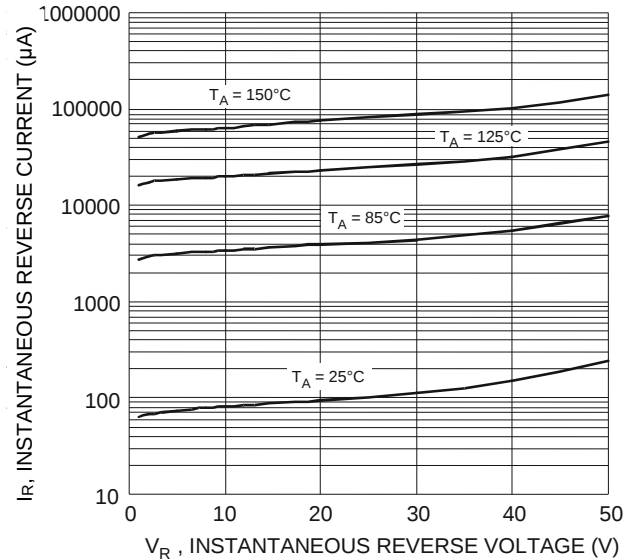


Figure 2 Typical Reverse Characteristics

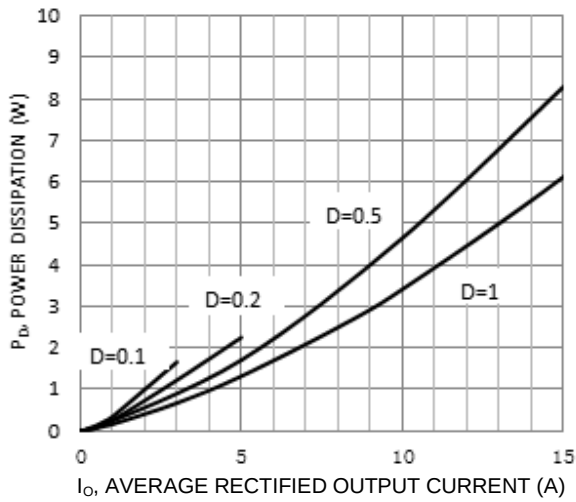


Figure 3 Forward Power Dissipation $T_J = 125^\circ\text{C}$

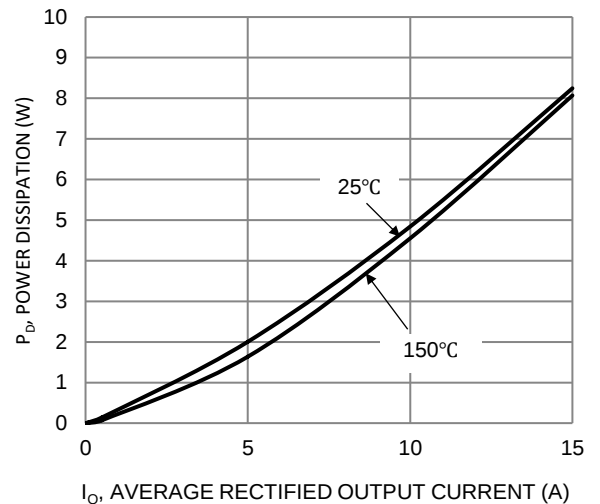


Figure 4 Forward Power Dissipation $D = 0.5$

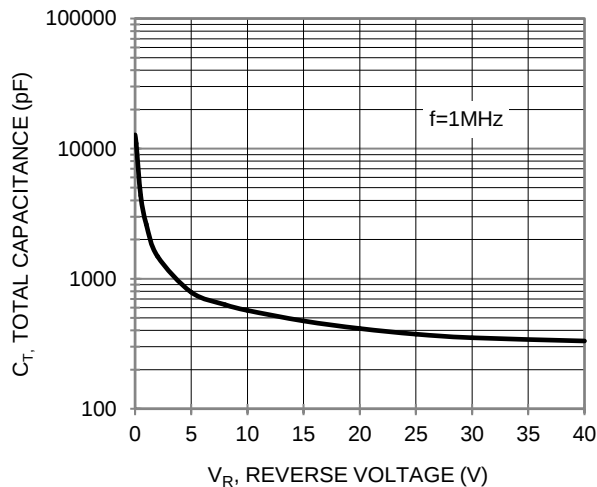


Figure 5 Total Capacitance vs. Reverse Voltage

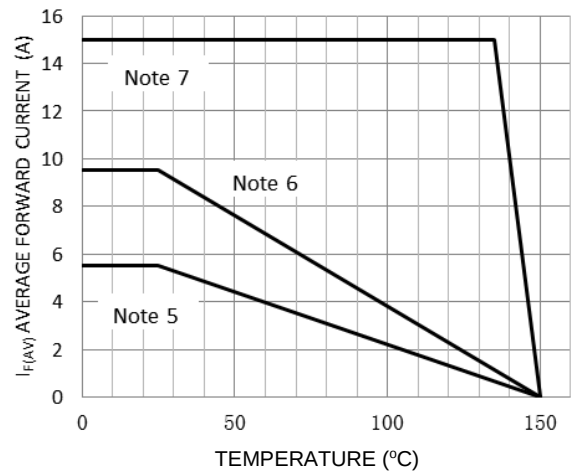


Figure 6 Forward Current Derating Curve $D = 1$

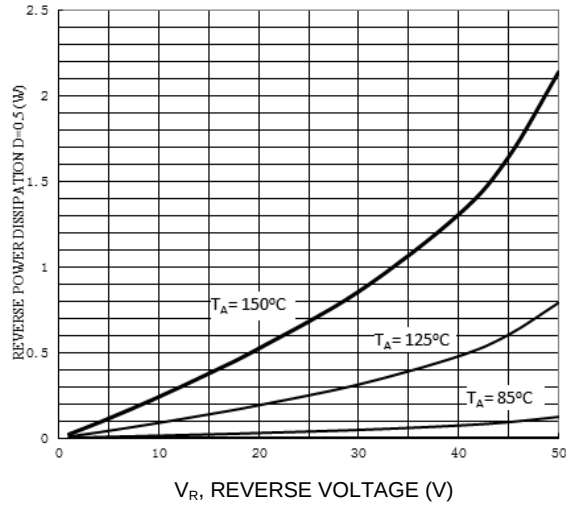


Figure 7 Reverse Power Dissipation $D = 0.5$

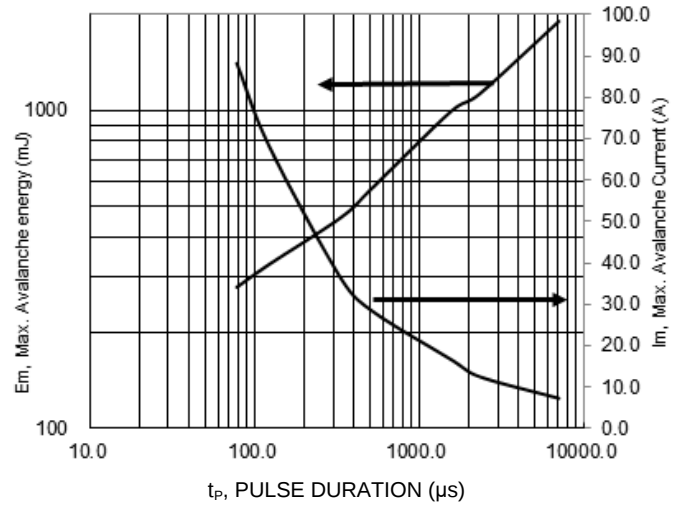


Figure 8 Single Pulse Max. Avalanche Energy and Current

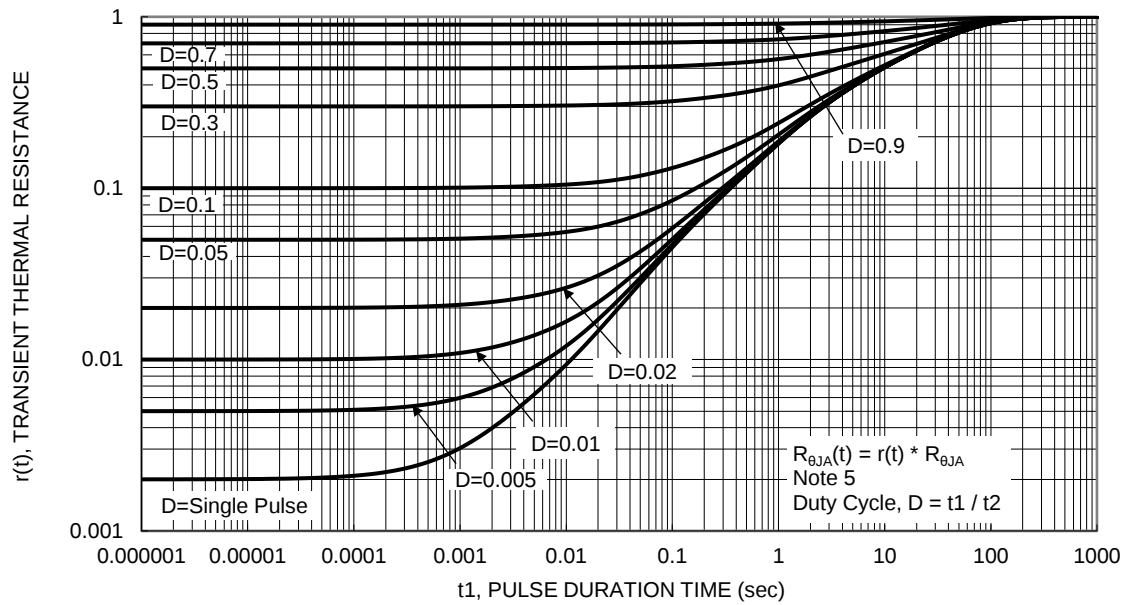
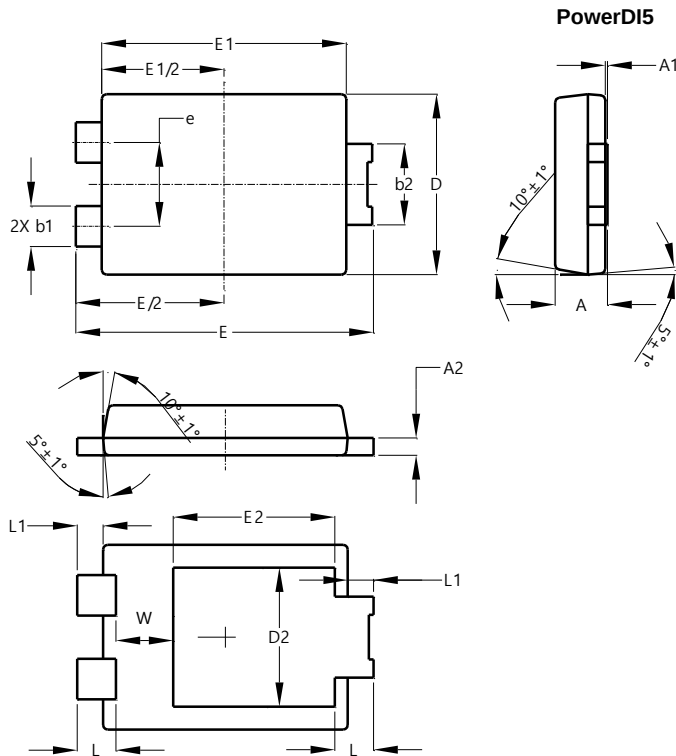


Figure 9 Transient Thermal Resistance

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

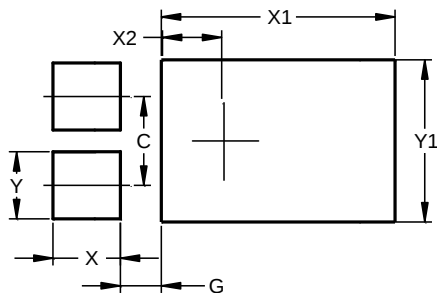


PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.51
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI5



Dimensions	Value (in mm)
C	1.840
G	0.852
X	1.400
X1	4.860
X2	1.310
Y	1.390
Y1	3.360

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