SBR3U40P1

3.0A SBR®
SUPER BARRIER RECTIFIER
POWERDI®

Product Summary (@ TA = +25°C)

V_{RRM} (V)	I_O (A)	$V_{F(MAX)}$ (V)	$I_{R(MAX)}$ (μA)
40	3	0.47	400

Features and Benefits

- Ultra Low Forward Voltage Drop
- Superior Reverse Avalanche Capability
- Patented Interlocking Clip Design for High Surge Current Capacity
- Patented Super Barrier Rectifier Technology
- Soft, Fast Switching Capability
- +150°C Operating Junction Temperature
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Applications

- DC-DC Converter
- AC-DC Rectifier
- SMPS

Mechanical Data

- Case: POWERDI123
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Polarity Indicator: Cathode Band
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.018 grams (Approximate)

POWERDI123

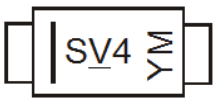
Top View

Ordering Information (Note 4)

Part Number	Case	Packaging
SBR3U40P1-7	POWERDI123	3,000/Tape & Reel
SBR3U40P1Q-7	POWERDI123	3,000/Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free.html 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 http://www.diodes.com/products/packages.html.

Marking Information



SV4 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: U = 2007)
M = Month (ex: 9 = September)

Date Code Key

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	U	V	W	X	Y	Z	A	B	C	D	E

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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Maximum Ratings (@T_A = +25°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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{RM}	40	V
RMS Reverse Voltage	$V_{R(RMS)}$	28	V
Average Rectified Output Current (See Figure 1)	I_O	3	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	75	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance Thermal Resistance Junction to Soldering (Note 5) Thermal Resistance Junction to Ambient (Note 6) Thermal Resistance Junction to Ambient (Note 7)	 $R_{\theta JS}$ $R_{\theta JA}$ $R_{\theta JA}$	 5 175 100	°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
Reverse Breakdown Voltage (Note 8)	$V_{(BR)R}$	40	-	-	V	I_R = 400µA
Forward Voltage Drop	V_F	-	0.30	0.34	V	I_F = 0.5A, T_J = +25°C
		-	0.34	0.39		I_F = 1.0A, T_J = +25°C
		-	0.42	0.47		I_F = 3.0A, T_J = +25°C
Leakage Current (Note 8)	I_R	-	70	400	µA	V_R = 40V, T_J = +25°C
		-	8	40	mA	V_R = 40V, T_J = +125°C

Notes:
5. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB cathode tab solder junction.
6. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com.
7. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com.
8. Short duration pulse test used to minimize self-heating effect.

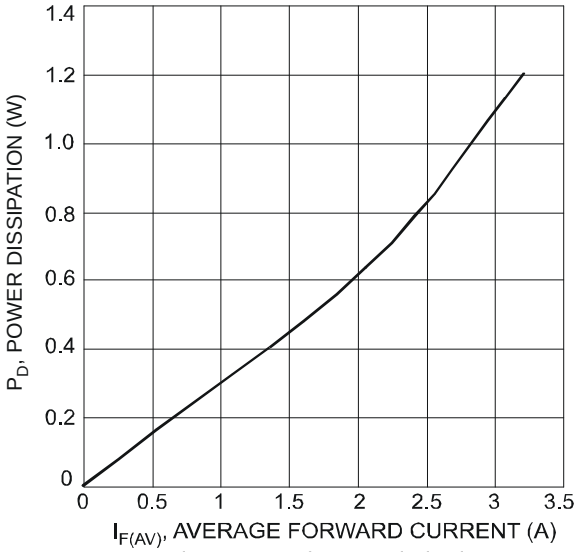

Fig. 1 Forward Power Dissipation

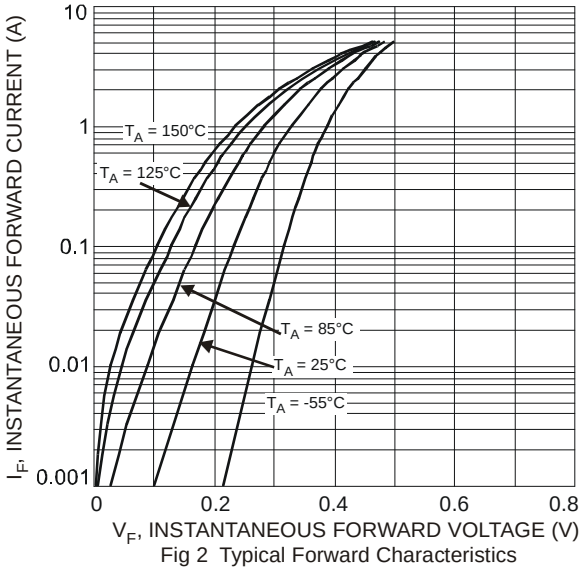

Fig 2 Typical Forward Characteristics

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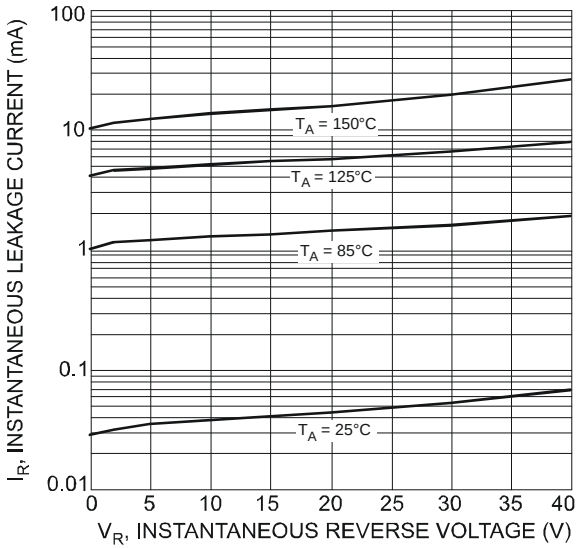

Fig. 3 Typical Reverse Characteristics

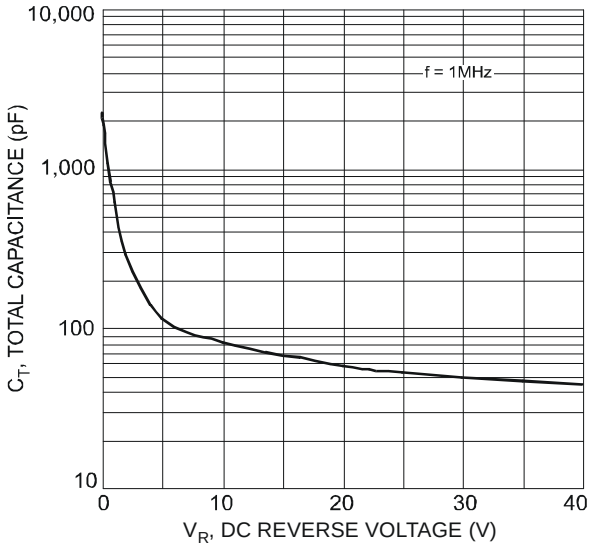

Fig. 4 Total Capacitance vs. Reverse Voltage

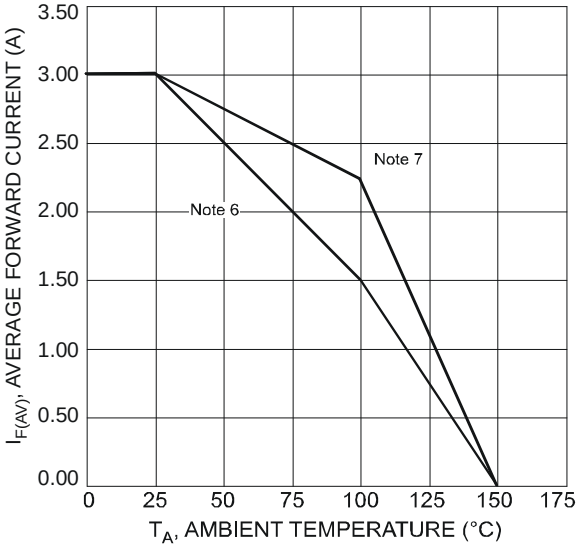

Fig. 5 Forward Current Derating Curve

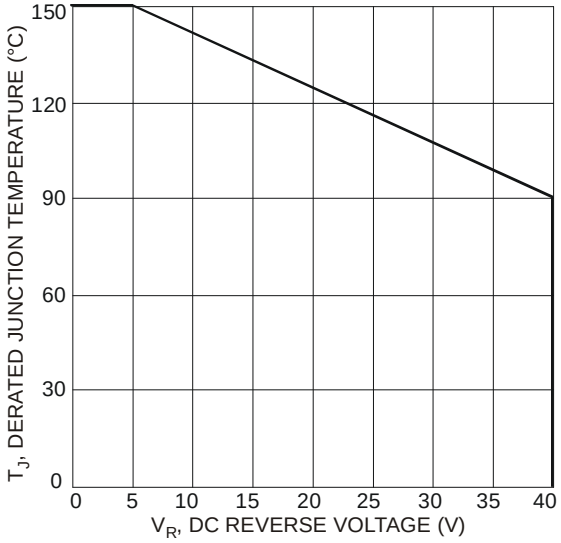

Fig. 6 Operating Temperature Derating

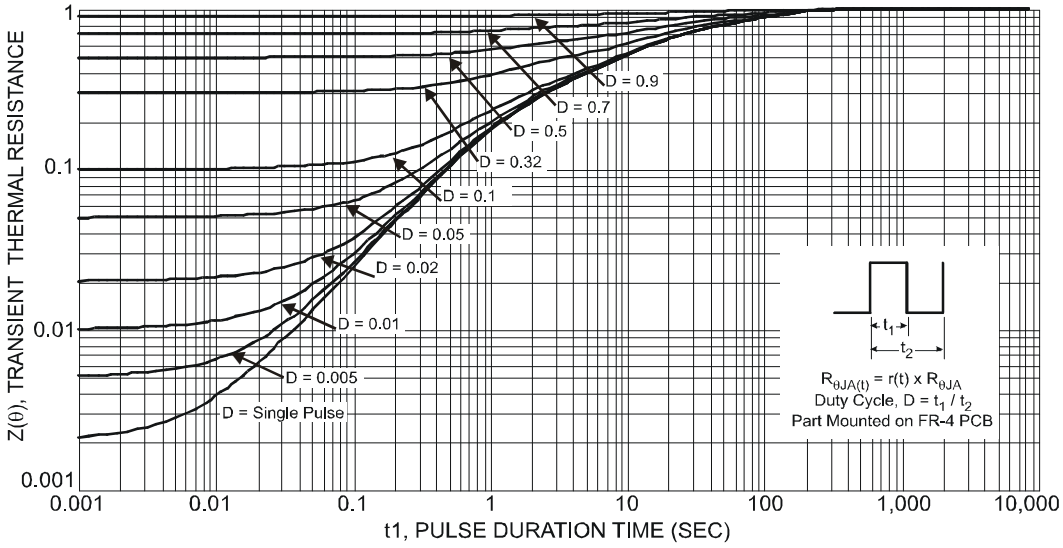

Fig. 7 Transient Thermal Resistance

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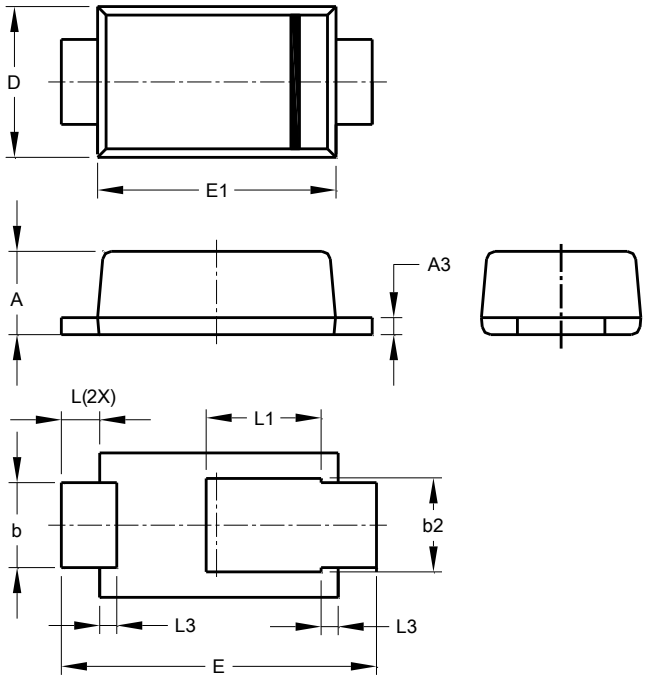
Package Outline Dimensions

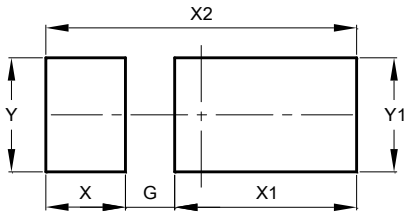
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



POWERDI®123			
Dim	**Min**	**Max**	**Typ**
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
G	0.65
X	1.05
X1	2.40
X2	4.10
Y	1.50
Y1	1.50

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