SBR2M30P1

2.0A SBR
SURFACE MOUNT SUPER BARRIER RECTIFIER
POWERDI

Features

- Patented Super Barrier Rectifier SBR® Technology
- Ultra Low Leakage Current
- Excellent High Temperature Stability
- Superior Reverse Avalanche Capability
- Patented Interlocking Clip Design for High Surge Current Capacity
- Patented Super Barrier Rectifier Technology
- Soft, Fast Switching Capability
- +175ºC Operating Junction Temperature
- ±16KV ESD Protection (HBM, 3B)
- ±25KV ESD Protection (IEC61000-4-2 Level 4, Air Discharge)
- **Lead Free Finish; RoHS Compliant (Note 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: POWERDI®123
- 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: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.018 grams (Approximate)

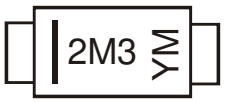
Top View

Ordering Information (Note 4)

Part Number	Case	Packaging
SBR2M30P1-7	POWERDI®123	3000/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



2M3 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: C = 2015)
M = Month (ex: 9 = September)

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	T	U	V	W	X	Y	Z	A	B	C

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}	30	V
RMS Reverse Voltage	$V_{R(RMS)}$	21	V
Average Rectified Output Current (See Figure 1)	I_O	2.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	75	A
Non-Repetitive Avalanche Energy (T_J = +25°C, I_{AS} = 5A, L = 8.5 mH)	E_{AS}	105	mJ
Repetitive Peak Avalanche Energy (1µs, + 25°C)	P_{ARM}	1100	W

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)	 $R_{\theta JS}$ $R_{\theta JA}$ $R_{\theta JA}$	 5 183 125	ºC/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175	ºC

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/datasheets/ap02001.pdf.
7. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	$V_{(BR)R}$	30	-	-	V	I_R = 200µA
Forward Voltage Drop	V_F	- - - - - -	0.26 0.37 0.42 0.16 0.29 0.36	0.30 0.41 0.46 0.19 0.32 0.39	V	I_F = 0.1A, T_J = +25ºC I_F = 1.0A, T_J = +25ºC I_F = 2.0A, T_J = +25ºC I_F = 0.1A, T_J = +125ºC I_F = 1.0A, T_J = +125ºC I_F = 2.0A, T_J = +125ºC
Leakage Current (Note 8)	I_R	-	10 20 1.7 3.1	100 200 8 12	µA µA mA mA	V_R = 5V, T_J = +25ºC V_R = 30V, T_J = +25ºC V_R = 5V, T_J = +125ºC V_R = 30V, T_J = +125ºC

Notes: 8. Short duration pulse test used to minimize self-heating effect.

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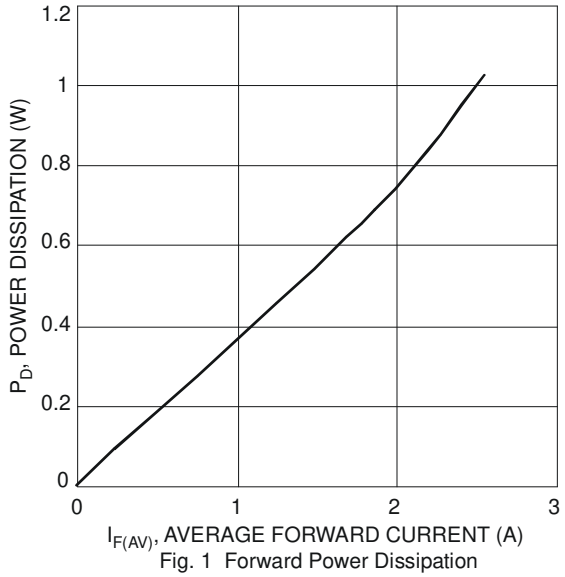

Fig. 1 Forward Power Dissipation

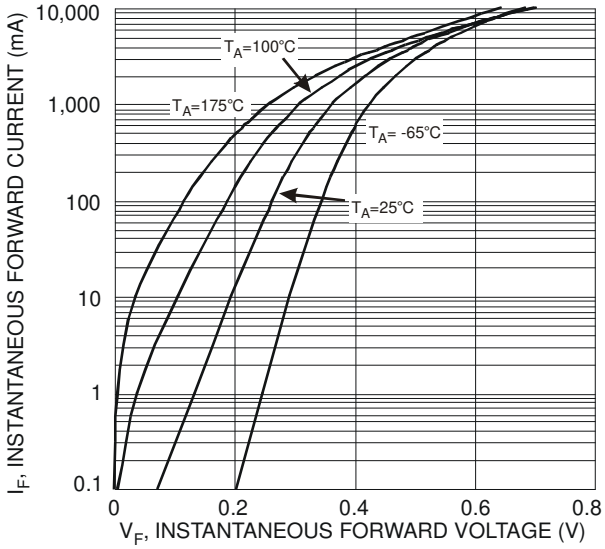

Fig. 2 Typical Forward Characteristics

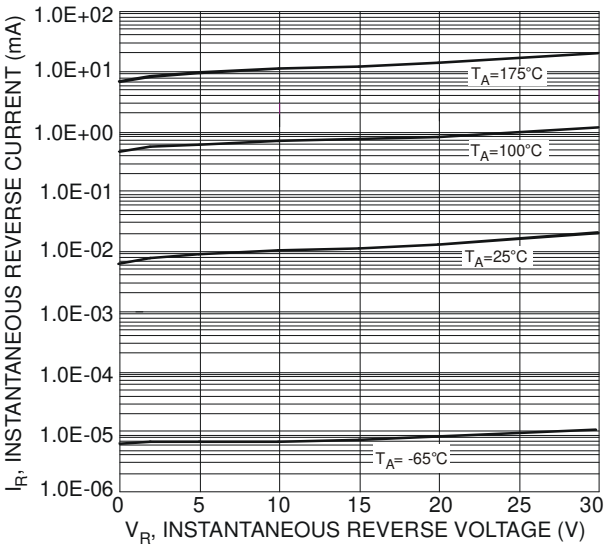

Fig. 3 Typical Reverse Characteristics

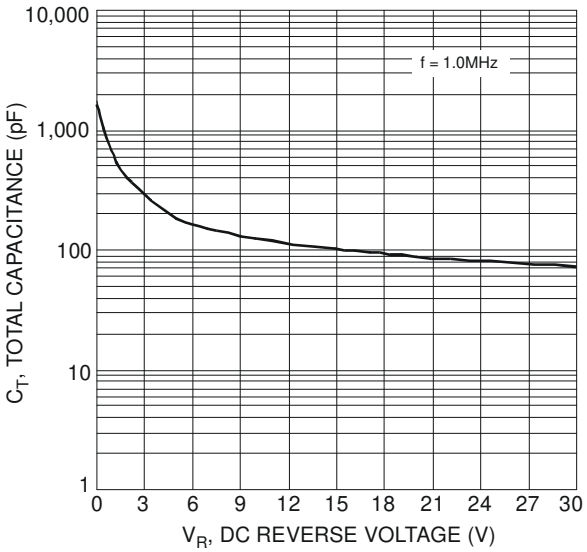

Fig. 4 Total Capacitance vs. Reverse Voltage

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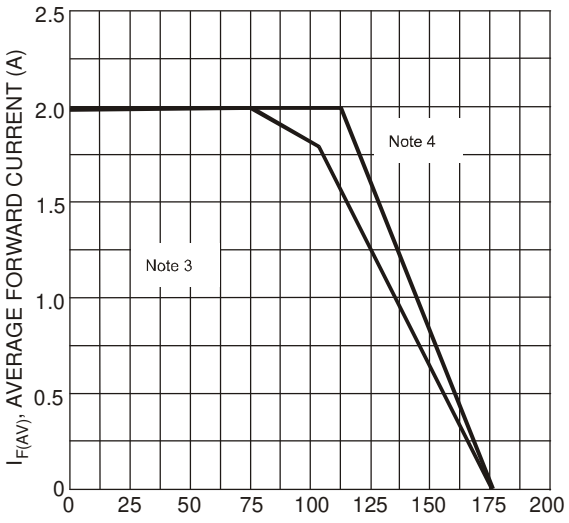

Fig. 5 Forward Current Derating Curve

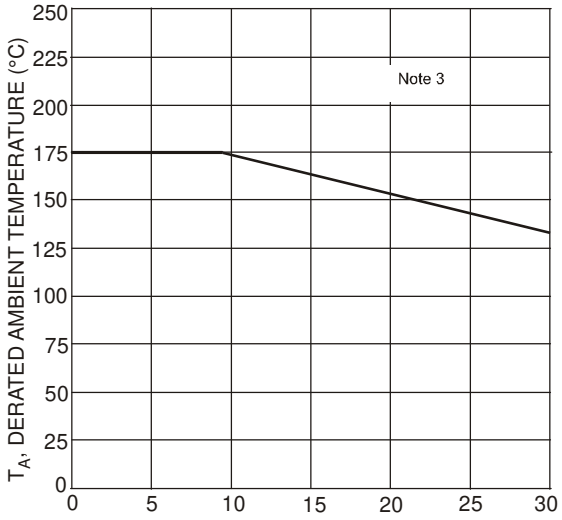

Fig. 6 Operating Temperature Derating

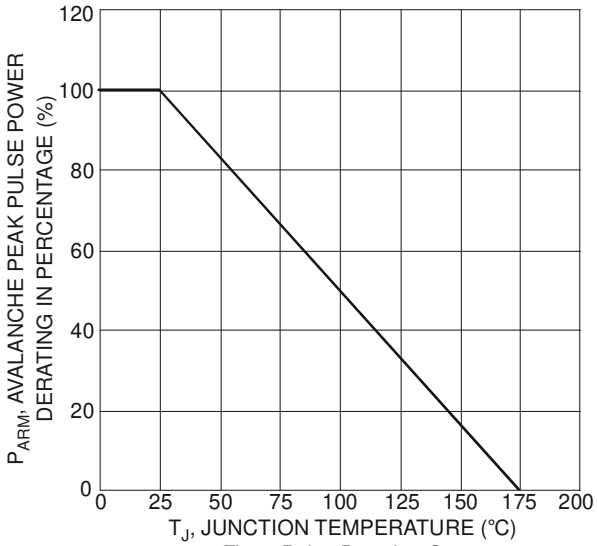

Fig. 7 Pulse Derating Curve

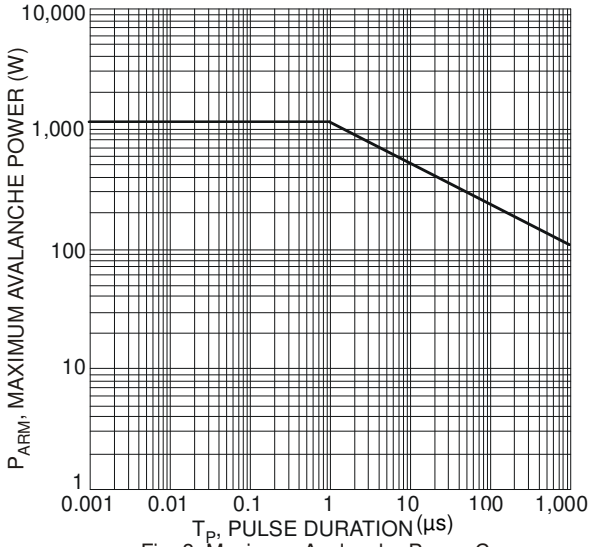

Fig. 8 Maximum Avalanche Power Curve

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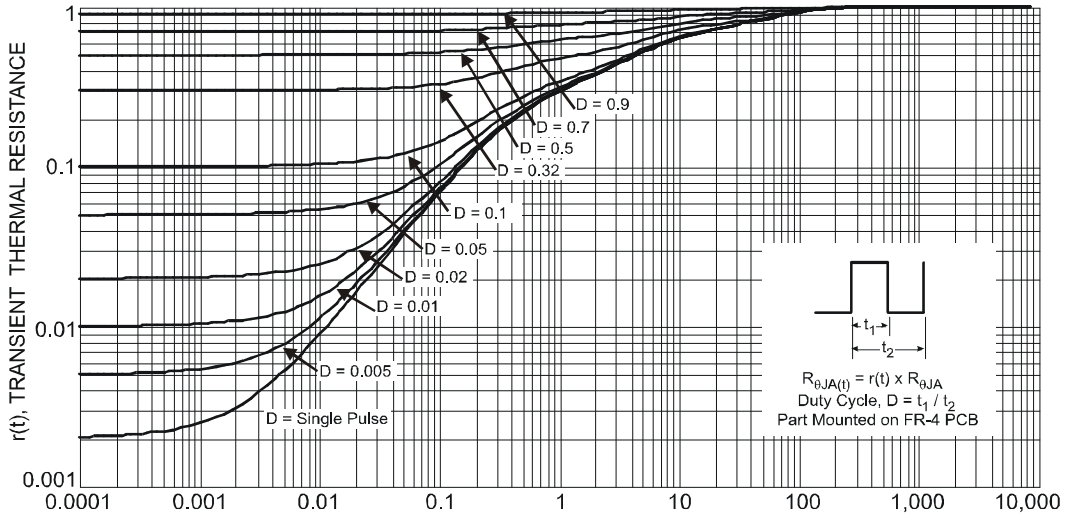

Fig. 9 Transient Thermal Resistance

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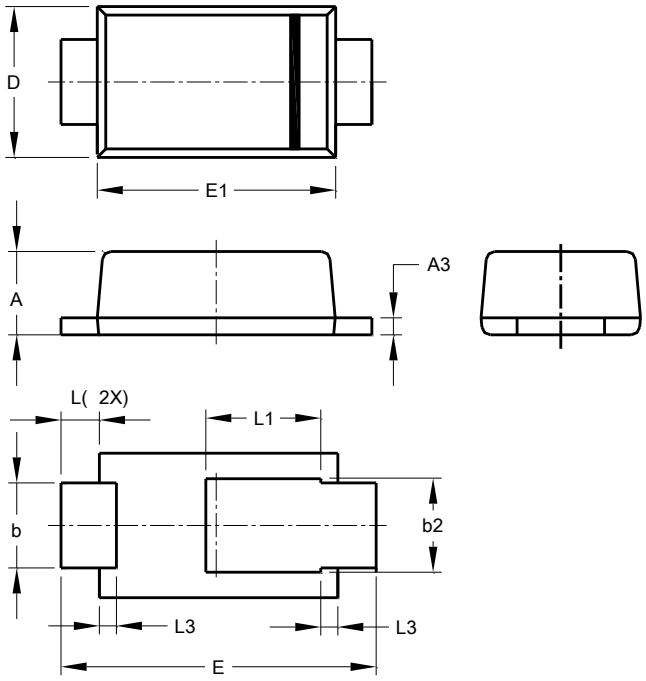
Package Outline Dimensions

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

POWERDI®123

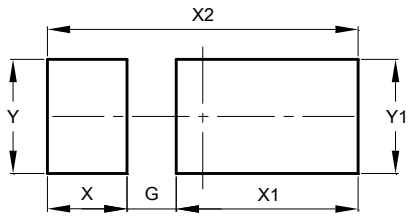


POWERDI®123			
Dim	**Min**	**Max**	**Typ**
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

Suggested Pad Layout

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

POWERDI®123



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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