SBR2U30P1

2.0A SBR®
SUPER BARRIER RECTIFIER
POWERDI®123

Features

- 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
- 150ºC 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)**
- **"Green" Molding Compound (No Br, Sb)**
- **Qualified to AEC-Q 101 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)

POWERDI®123

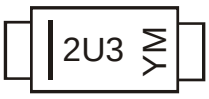
Top View

Ordering Information (Note 2)

Part Number	Case	Packaging
SBR2U30P1-7	POWERDI®123	3000/Tape & Reel

Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2). All applicable RoHS exemptions applied
2. For packaging details, go to our website at http://www.diodes.com.

Marking Information



2U3 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: T = 2006)
M = Month (ex: 9 = September)

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Code	T	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

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 (T_P = 1µs, T_J = 25°C)	P_{ARM}	1100	W

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance Thermal Resistance Junction to Soldering (Note 3) Thermal Resistance Junction to Ambient (Note 4) Thermal Resistance Junction to Ambient (Note 5)	 $R_{\theta JS}$ $R_{\theta JA}$ $R_{\theta JA}$	 5 178 123	ºC/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	ºC

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 6)	$V_{(BR)R}$	30	-	-	V	I_R = 400µA
Forward Voltage Drop	V_F	-	0.22	0.26	V	I_F = 0.1A, T_J = 25ºC
		-	0.31	0.35		I_F = 1.0A, T_J = 25ºC
		-	0.36	0.40		I_F = 2.0A, T_J = 25ºC
		-	0.12	0.15		I_F = 0.1A, T_J = 125ºC
		-	0.27	0.30		I_F = 1.0A, T_J = 125ºC
		-	0.30	0.33		I_F = 2.0A, T_J = 125ºC
Leakage Current (Note 6)	I_R	-	75	150	µA	V_R = 5V, T_J = 25ºC
		-	150	400	µA	V_R = 30V, T_J = 25ºC
		-	6	15	mA	V_R = 5V, T_J = 125ºC
		-	12	20	mA	V_R = 30V, T_J = 125ºC

Notes:
3. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB cathode tab solder junction.
4. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf.
5. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf.
6. Short duration pulse test used to minimize self-heating effect.

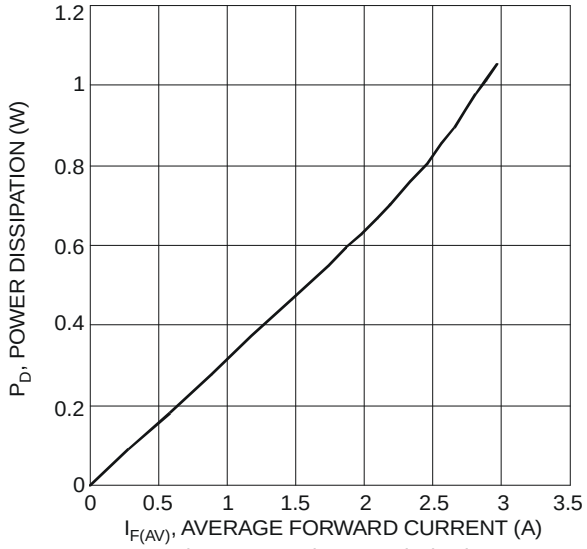


Fig. 1 Forward Power Dissipation

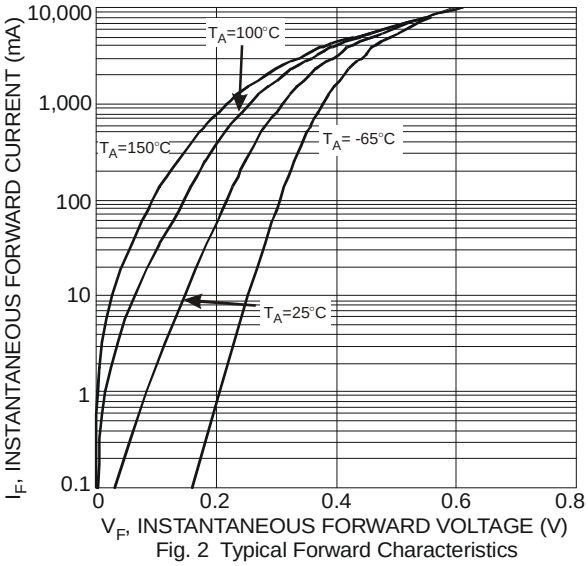


Fig. 2 Typical Forward Characteristics

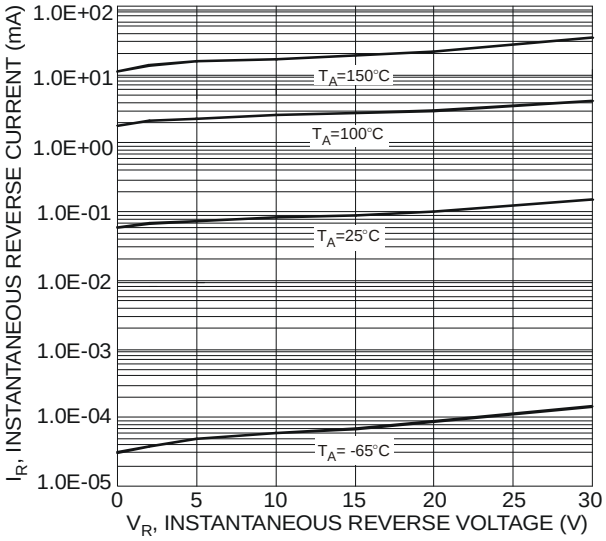


Fig. 3 Typical Reverse Characteristics

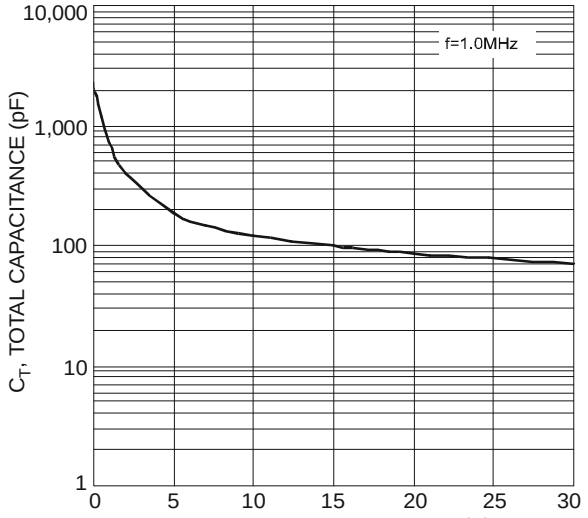


Fig. 4 Total Capacitance vs. Reverse Voltage

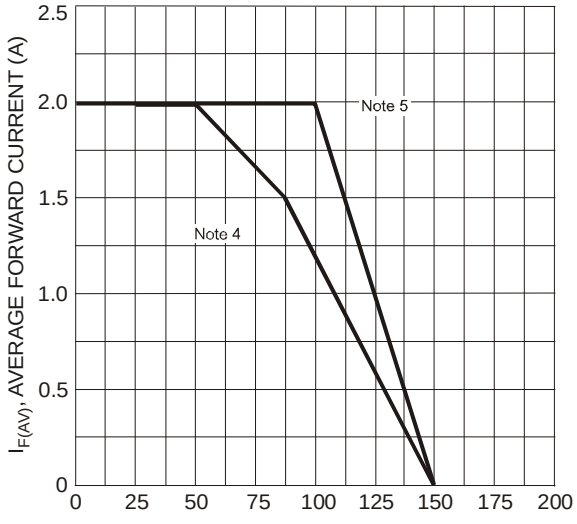


Fig. 5 Forward Current Derating Curve

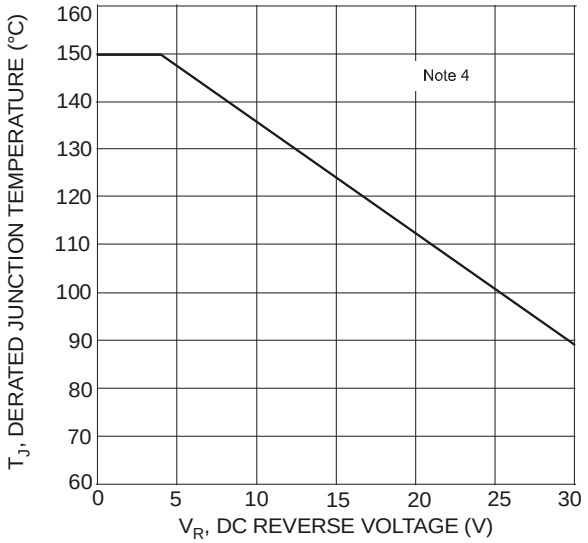


Fig. 6 Operating Temperature Derating

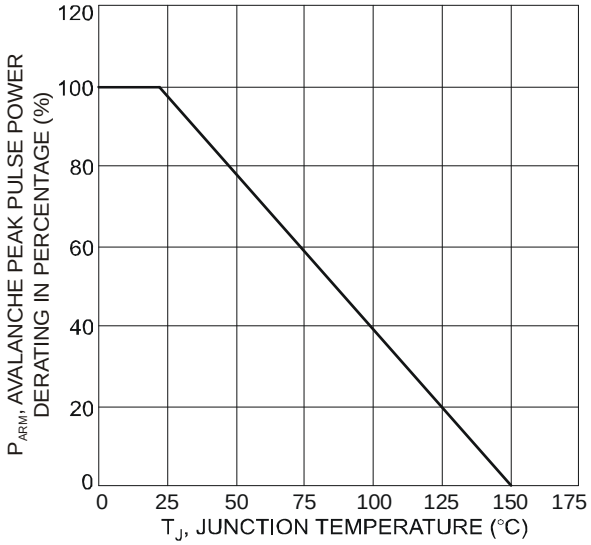


Fig. 7 Pulse Derating Curve

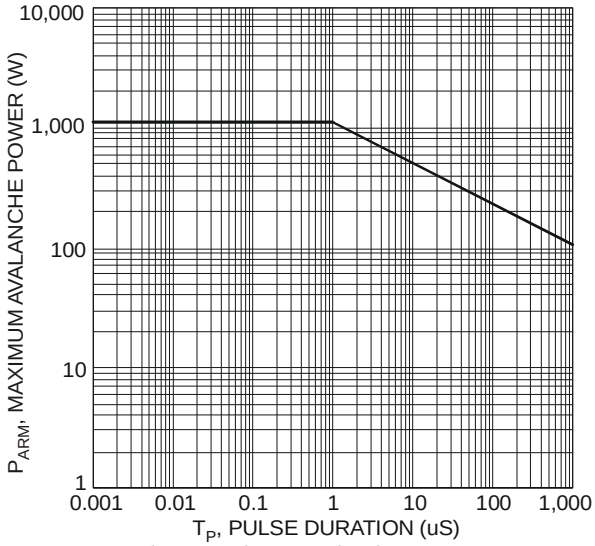


Fig. 8 Maximum Avalanche Power Curve

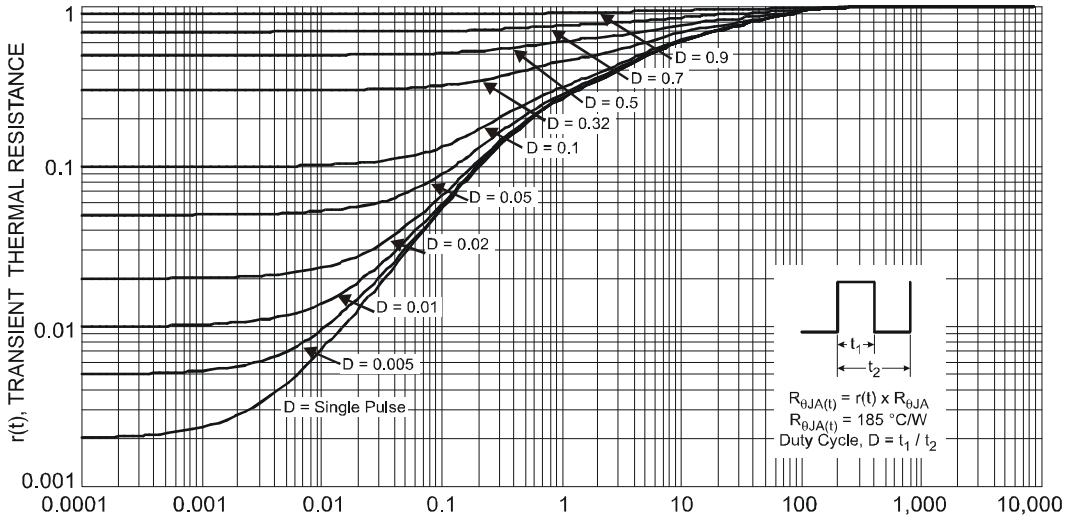
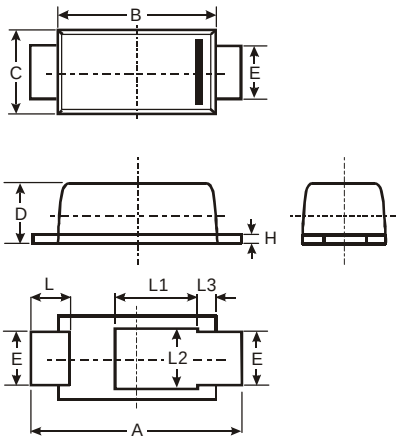


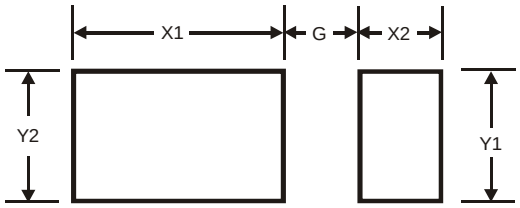
Fig. 9 Transient Thermal Resistance

Package Outline Dimensions



POWERDI®123			
Dim	**Min**	**Max**	**Typ**
A	3.50	3.90	3.70
B	2.60	3.00	2.80
C	1.63	1.93	1.78
D	0.93	1.00	0.98
E	0.85	1.25	1.00
H	0.15	0.25	0.20
L	0.40	0.50	0.45
L1	-	-	1.35
L2	-	-	1.10
L3	-	-	0.20
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
G	1.0
X1	2.2
X2	0.9
Y1	1.4
Y2	1.4