NEW PRODUCT

SBR3U30P1

3.0A 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-020C
- Polarity Indicator: Cathode Band
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Marking Information: See Page 4
- Ordering Information: See Page 4

Maximum Ratings @ T_A = 25ºC unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive 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	3.0	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
Maximum Thermal Resistance Thermal Resistance Junction to Soldering (Note 2) Thermal Resistance Junction to Ambient (Note 3) Thermal Resistance Junction to Ambient (Note 4)	 $R_{\Theta JS}$ $R_{\Theta JA}$	 5 178 123	°C/W
Operating and Storage Temperature Range (Note 5)	T_J, T_{STG}	-65 to +150	ºC

Notes:
1. RoHS revision 13.2.2003. High temperature solder exemption applied, see *EU Directive Annex Note 7.*
2. Theoretical $R_{\Theta JS}$ calculated from the top center of the die straight down to the PCB cathode tab solder junction.
3. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf.
4. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf

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Electrical Characteristics @ T_A = 25ºC unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 5)	$V_{(BR)R}$	30	-	-	V	I_R = 400 µA
Forward Voltage Drop	V_F	-	0.28 0.31 0.39 0.20 0.23 0.35	0.32 0.35 0.43 0.23 0.26 0.38	V	I_F = 0.5A, T_J = 25ºC I_F = 1.0A,T_J = 25ºC I_F = 3.0A,T_J = 25ºC I_F = 0.5A, T_J = 125ºC I_F = 1.0A,T_J = 125ºC I_F = 3.0A,T_J = 125ºC
Leakage Current (Note 5)	I_R	-	70 150 6 12	150 400 15 20	µA µA mA mA	V_R = 5V, T_J = 25 ºC V_R = 30V, T_J = 25 ºC V_R = 5V, T_J = 125 ºC V_R = 30V, T_J = 125 ºC

Notes: 5. Short duration pulse test used to minimize self-heating effect.

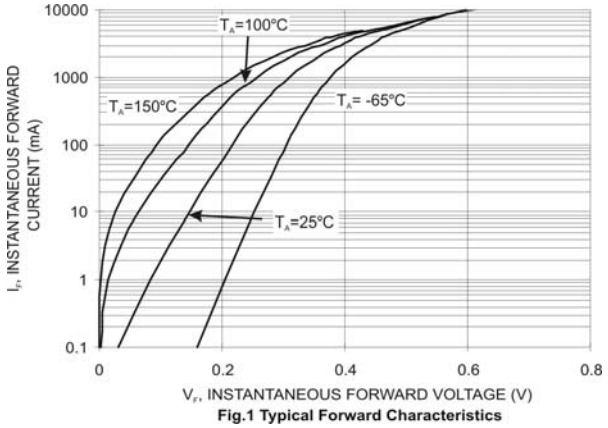

Fig.1 Typical Forward Characteristics

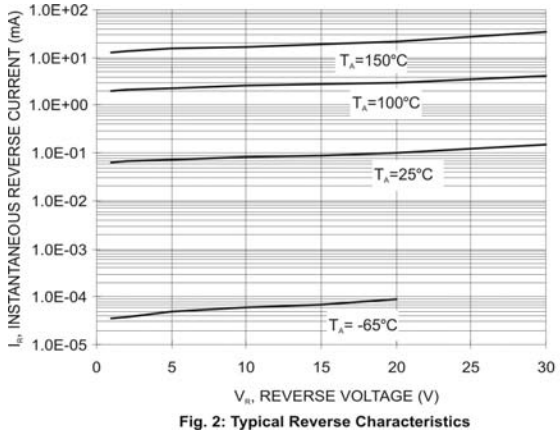

Fig. 2: Typical Reverse Characteristics

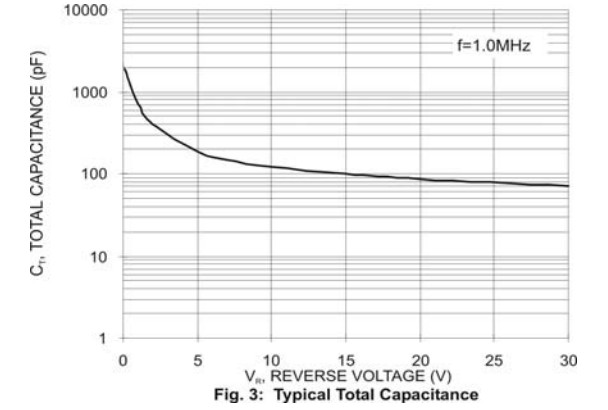

Fig. 3: Typical Total Capacitance

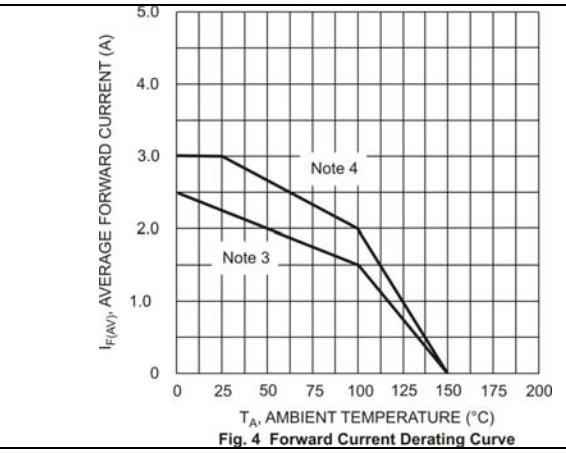

Fig. 4 Forward Current Derating Curve

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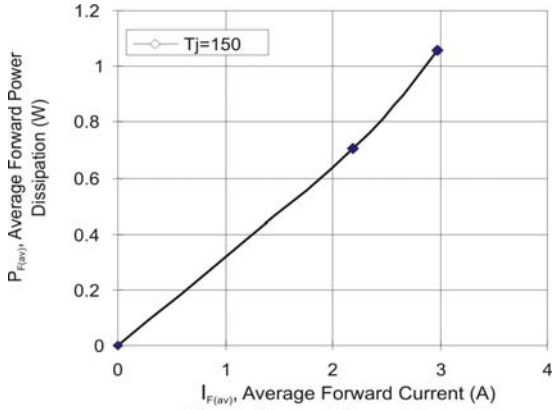


Fig. 5: Forward Power Dissipation

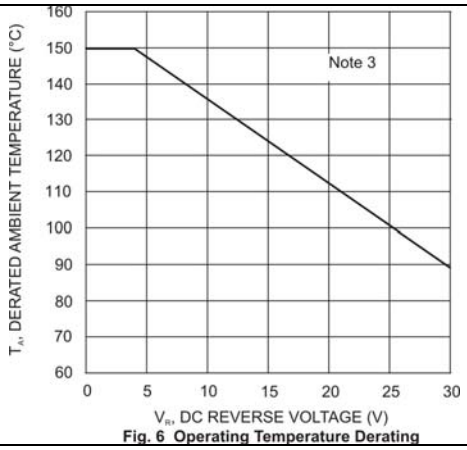


Fig. 6 Operating Temperature Derating

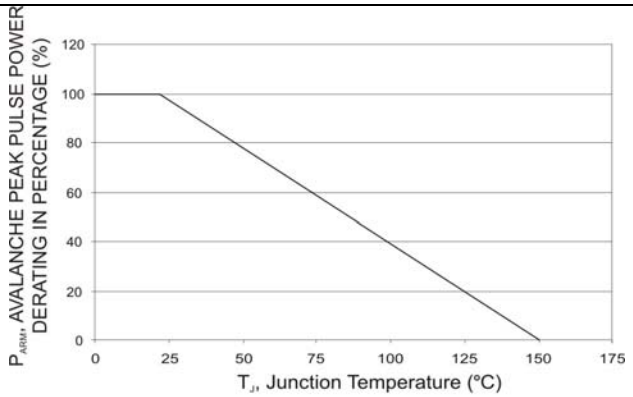


Fig. 7: Pulse Derating Curve, Per Element

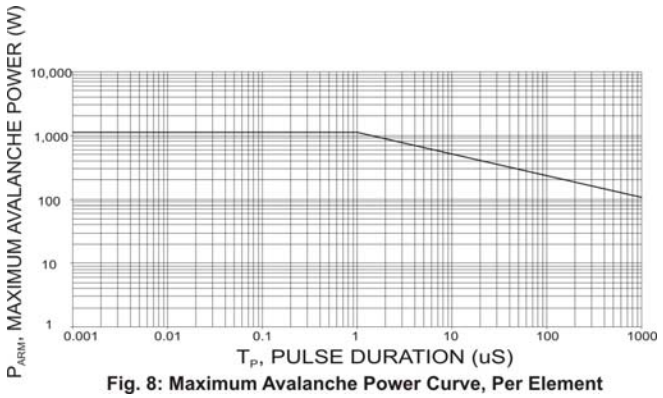
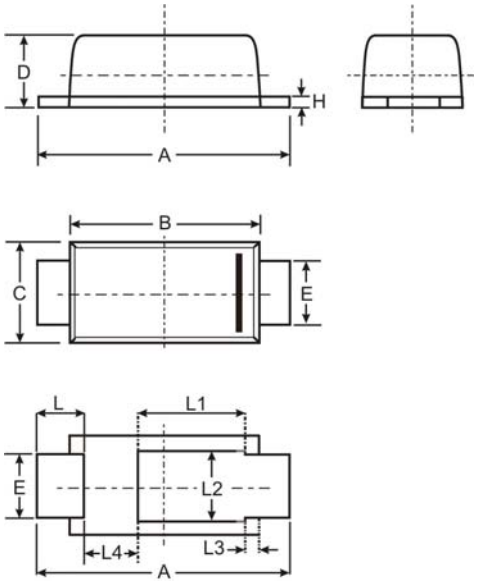


Fig. 8: Maximum Avalanche Power Curve, Per Element

Package Outline Drawings

PowerDI™123



PowerDI™123			
Dim	**Min**	**Max**	**Typ**
A	3.65	3.75	3.70
B	2.775	2.825	2.80
C	1.750	1.800	1.775
D	0.955	1.000	0.98
E	0.95	1.05	1.00
H	0.15	0.25	0.20
L	0.60	0.70	0.65
L1	—	—	1.36
L2	—	—	1.10
L3	—	—	0.20
L4	0.95	1.25	1.05
All Dimensions in mm			

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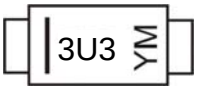
Marking, Polarity, Weight & Ordering Information

	Case Style		Marking	Weight
SBR3U30P1	 Top View	 Back View		0.096g (approx.)

Ordering Information	Date Code
SBR3U30P1-7 3000/Tape & Reel	3U3 = 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
Code	T	U	V	W	X	Y	Z

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