


## 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
- 150°C 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<sup>®</sup>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 
- Weight: 0.018 grams (approximate)

POWERDI<sup>®</sup>123



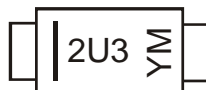
Top View

## Ordering Information (Note 2)

Part Number	Case	Packaging
SBR2U30P1-7	POWERDI <sup>®</sup> 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

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**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  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	$V_{RRM}$	30	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_{RM}$		
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 ( $T_J = 25^\circ\text{C}$ , $I_{AS} = 5\text{A}$ , $L = 8.5\text{mH}$ )	$E_{AS}$	105	mJ
Repetitive Peak Avalanche Energy ( $T_P = 1\mu\text{s}$ , $T_J = 25^\circ\text{C}$ )	$P_{ARM}$	1100	W

**Thermal Characteristics**

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

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

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

- 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. Polyimide 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.

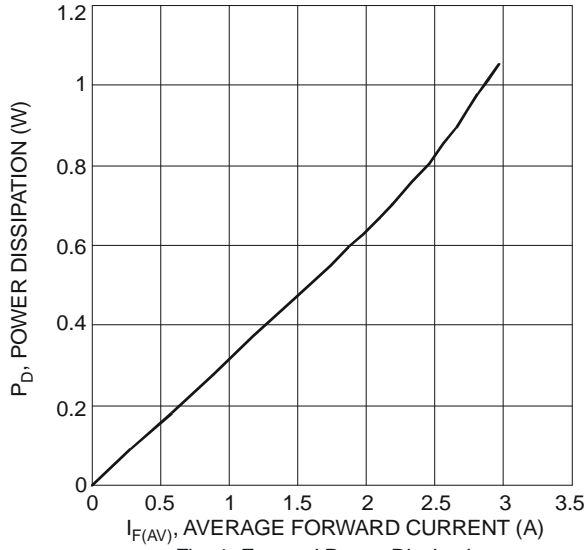


Fig. 1 Forward Power Dissipation

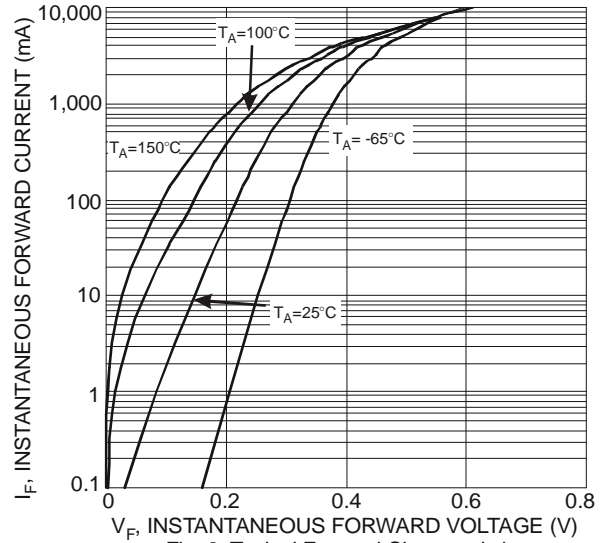


Fig. 2 Typical Forward Characteristics

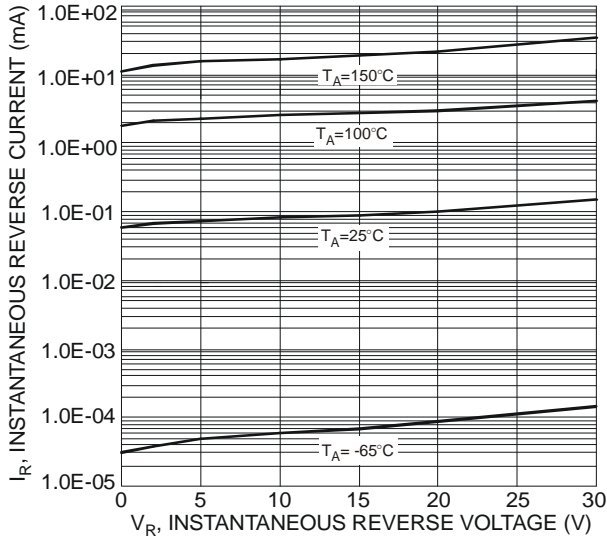


Fig. 3 Typical Reverse Characteristics

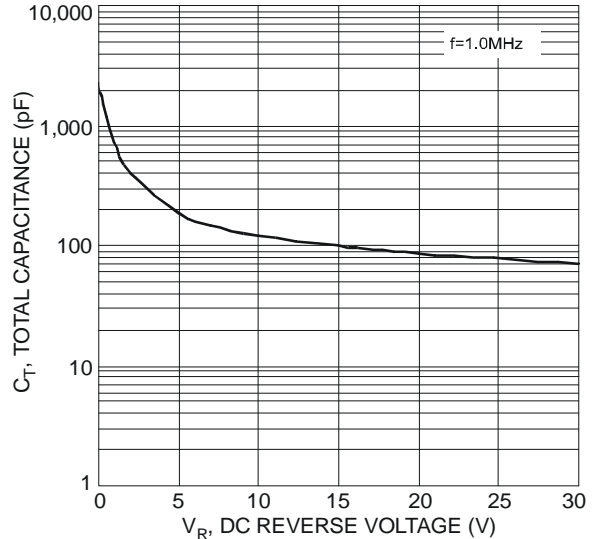


Fig. 4 Total Capacitance vs. Reverse Voltage

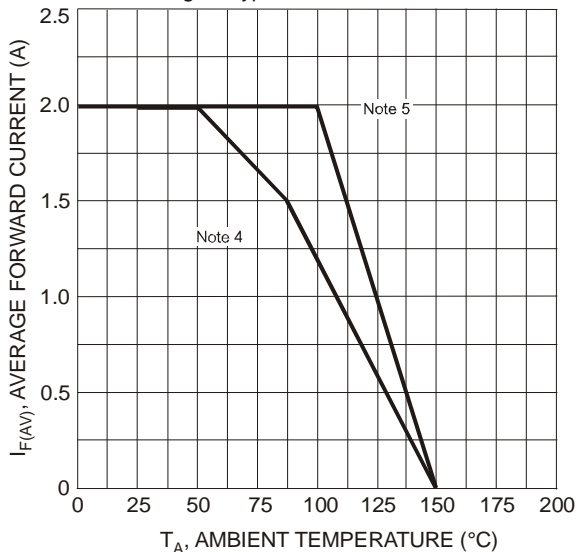


Fig. 5 Forward Current Derating Curve

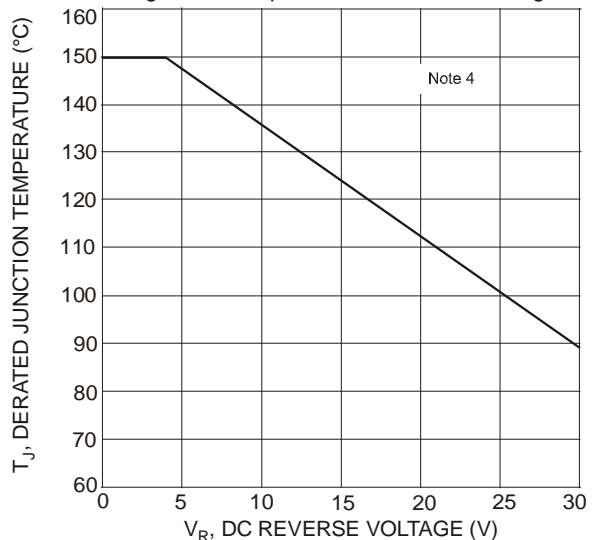


Fig. 6 Operating Temperature Derating

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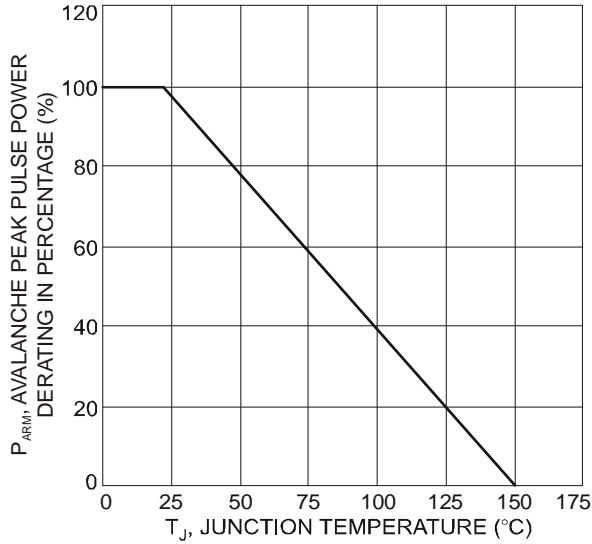


Fig. 7 Pulse Derating Curve

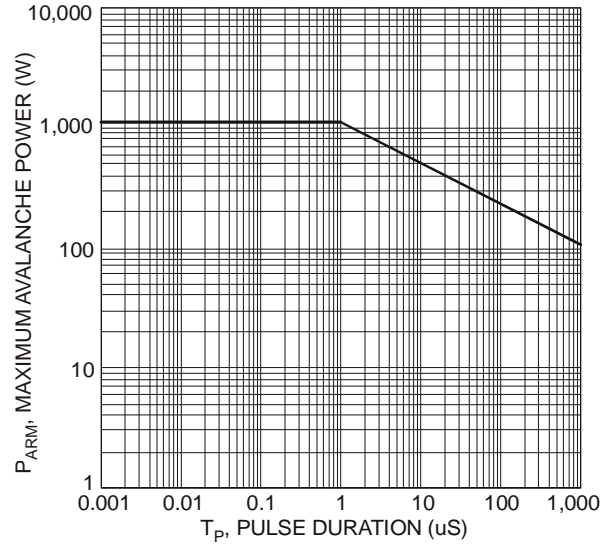


Fig. 8 Maximum Avalanche Power Curve

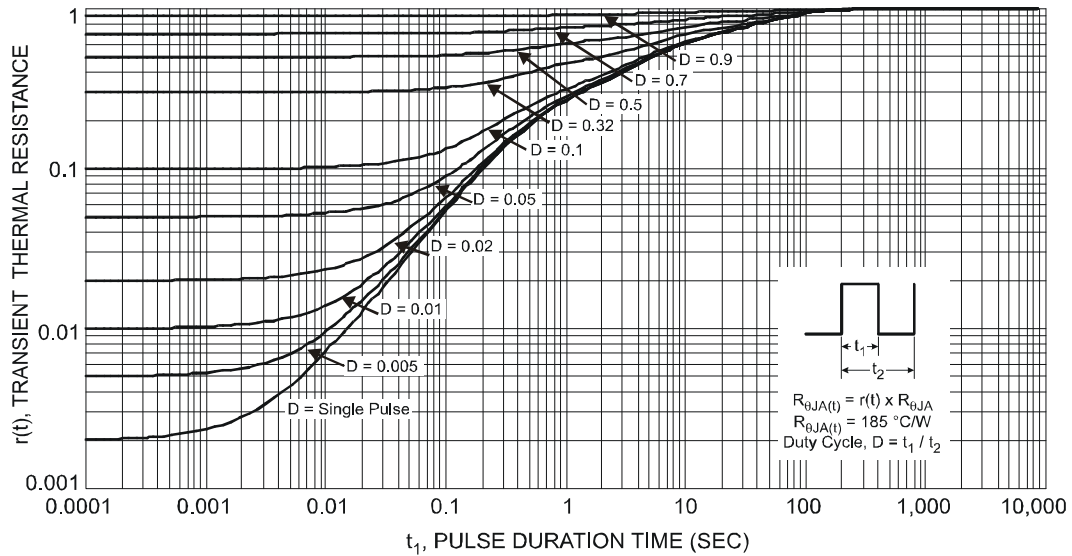
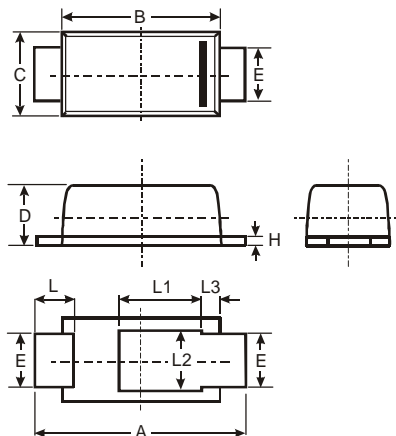


Fig. 9 Transient Thermal Resistance

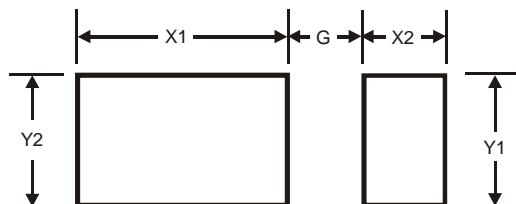
**Package Outline Dimensions**



POWERDI <sup>®</sup> 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			

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## Suggested Pad Layout



Dimensions	Value (in mm)
<b>G</b>	1.0
<b>X1</b>	2.2
<b>X2</b>	0.9
<b>Y1</b>	1.4
<b>Y2</b>	1.4

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