



May 2015

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Features

- Low Forward Voltage Drop
- Low Leakage Current
- Superior Reverse Avalanche Capability
- Excellent High Temperature Stability
- 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 (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q 101 Standards for High Reliability
- PPAP Capable (See Note 4)

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: Finish Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.018 grams (Approximate)

PowerDI®123



Top View

Ordering Information (Notes 5 & 6)

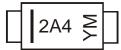
Part Number	Compliance	Case	Packaging
SBR2A40P1-7	AEC-Q101	PowerDI [®] 123	3,000/Tape & Reel
SBR2A40P1Q-7	Automotive	PowerDI [®] 123	3,000/Tape & Reel

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. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
- 4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
- 5. Product manufactured with Data Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
- 6. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

PowerDI®123



2A4 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: C = 2015) M = Month (ex: 9 = September)

Date Code Key

Year	2006	2015	20	16	2017	2018	2019	2020	20	21	2022	2023
Code	Т	С)	Е	F	G	Н		I	J	K
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	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	V_{RRM}		
Working Peak Reverse Voltage	V_{RWM}	40	V
DC Blocking Voltage	V_{RM}		
RMS Reverse Voltage	V _{R(RMS)}	28	V
Average Rectified Output Current (See Figure 1)	lo	2.0	Α
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	50	А
Repetitive Peak Avalanche Power (1µs, +25°C)	P _{ARM}	6,000	W

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance Thermal Resistance Junction to Soldering (Note 7) Thermal Resistance Junction to Ambient (Note 8) Thermal Resistance Junction to Ambient (Note 9)	$egin{array}{c} {\sf R}_{ heta}{\sf JS} \ {\sf R}_{ heta}{\sf JA} \ {\sf R}_{ heta}{\sf JA} \end{array}$	5 180 115	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150	°C

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

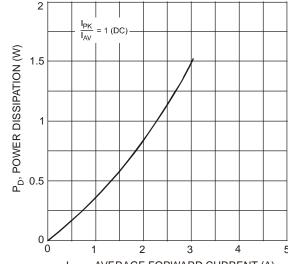
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Reverse Breakdown Voltage	V _{(BR)R}	40	=	=	V	$I_R = 100 \mu A$
Forward Voltage Drop		-	0.265	0.315	V	$I_F = 0.1A$, $T_J = +25$ °C
		-	0.38	0.43		$I_F = 1.0A$, $T_J = +25$ °C
	V	-	0.45	0.50		$I_F = 2.0A$, $T_J = +25$ °C
	VF	-	0.17	0.22		$I_F = 0.1A, T_J = +125$ °C
		-	0.325	0.375		$I_F = 1.0A$, $T_J = +125$ °C
		-	0.42	0.47		$I_F = 2.0A$, $T_J = +125$ °C
Leakage Current (Note 5)		-	8	40	μΑ	$V_R = 5V, T_J = +25^{\circ}C$
	1-	-	16	100	μA	$V_R = 40V, T_J = +25^{\circ}C$
	I _R	-	1.3	8	mA	$V_R = 5V, T_J = +125$ °C
l		-	2.1	10	mA	$V_R = 40V, T_J = +125$ °C

Notes:

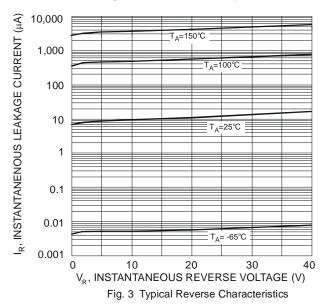
^{7.} Theoretical R_{0JS} calculated from the top center of the die straight down to the PCB cathode tab solder junction.
8. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf.
9. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf.
10. Short duration pulse test used to minimize self-heating effect.

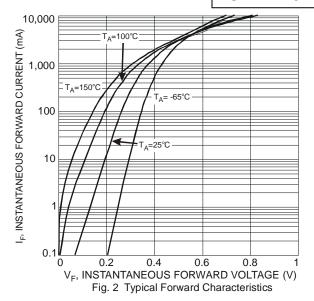


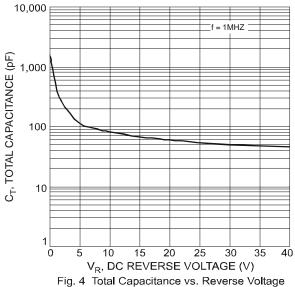
SBR2A40P1



 $I_{F(AV)}$, AVERAGE FORWARD CURRENT (A) Fig. 1 Forward Power Dissipation

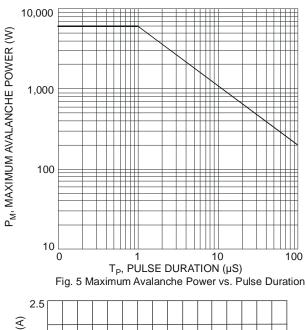


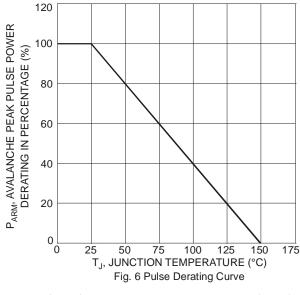


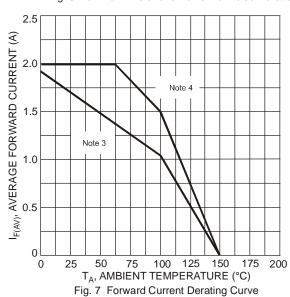


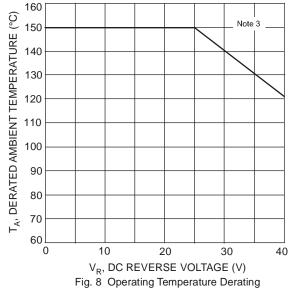


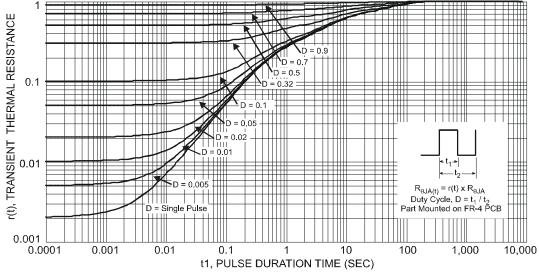








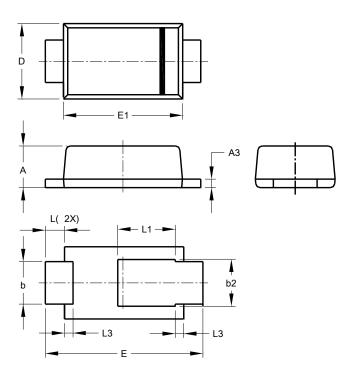






Package Outline Dimensions

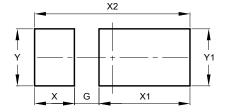
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



POWERDI [®] 123						
Dim	Min	Max	Тур			
Α	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			
Е	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
Х	1.05
X1	2.40
X2	4.10
Υ	1.50
Y1	1.50



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