

Product Summary (@T_A = +25°C)

V _{RRM} (V)	I _O (A)	V _F Max (V)	I _R Max (µA)
60	2	0.58	12

Description and Application

This Super Barrier Rectifier (SBR[®]) diode is ideally suited for applications requiring ultra-low blocking mode. Leading to lower operation temperatures and increased system reliability. Packaged in the compact thermally efficient PowerDI[®]123 package. Applications are:

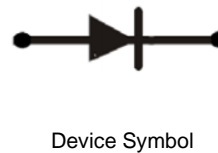
- Polarity protection diodes
- DC/DC converters
- AC/DC adaptors
- Flyback diodes
- Re-circulating diodes


Features and Benefits

- Reduced Ultra-Low Forward Voltage Drop (V_F) Increased Efficiency and Cooler Operation
- Patented Super Barrier Rectifier SBR Technology
- Superior Avalanche Capability (See maximum Ratings)
- Excellent Reverse Leakage (I_R) Stability in High-Temperature Circumstance. Increased Reliability Against Thermal Runaway Failure in High-Temperature Operation
- <1.1mm Package Profile – Ideal for Thin Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **The SBRFP2M60P1Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

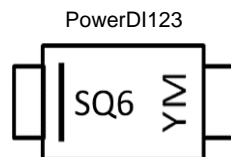
Mechanical Data

- Package: PowerDI123
- Package Material: Molded Plastic, “Green” Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 ^(e3)
- Polarity: Cathode Band
- Weight: 0.01 grams (Approximate)


Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SBRFP2M60P1Q-7	PowerDI123	3,000	Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


SQ6 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: L = 2024)
 M = Month (ex: 6 = June)

Date Code Key

Year	2020	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	H	-	L	M	N	P	R	S	T	U	V	W

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 capacitive load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V _{RRM}	60	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _{RM}		
Average Rectified Output Current	I _o	2	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	50	A
Non-Repetitive Avalanche Energy (T _J = +25°C, I _{AS} = 2A, L = 50mH)	E _{AS}	145	mJ
Non-Repetitive Avalanche Energy (T _J = +25°C, I _{AS} = 7.5A, L = 1mH)	E _{AS}	40	mJ
Electrostatic Discharge – Human Body Model	HBM	4000	V
Electrostatic Discharge – Contact Discharge Model	CDM	1	kV

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	R _{θJA}	53	°C/W
Typical Thermal Resistance Junction to Case (Note 5)	R _{θJC}	10	°C/W
Operating and Storage Temperature Range (Note 5)	T _J , T _{STG}	-55 to +175	°C

Note: 5. Device mounted on 1inch² copper pad, 2oz. The heat generated must be less than the thermal conductivity from junction to case: $dP_D/dT_J < 1/R_{\theta JC}$ or junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop (Note 6)	V _F	—	0.45	—	V	I _F = 1A, T _J = +25°C
		—	0.40	—		I _F = 1A, T _J = +125°C
		—	0.52	0.58		I _F = 2A, T _J = +25°C
		—	0.49	0.55		I _F = 2A, T _J = +125°C
Leakage Current (Note 6)	I _R	—	1.5	12	μA	V _R = 60V, T _J = +25°C
		—	0.7	3	mA	V _R = 60V, T _J = +125°C
Junction Capacitance	C _J	—	50	—	pF	V _R = 60V, T _J = +25°C
Reverse Recovery Time	t _{RR}	—	15	—	ns	I _F = 0.5A, I _{RR} = 1A, I _{RR} = 0.25A (RG1)

Note: 6. Short duration pulse test used to minimize self-heating effect.

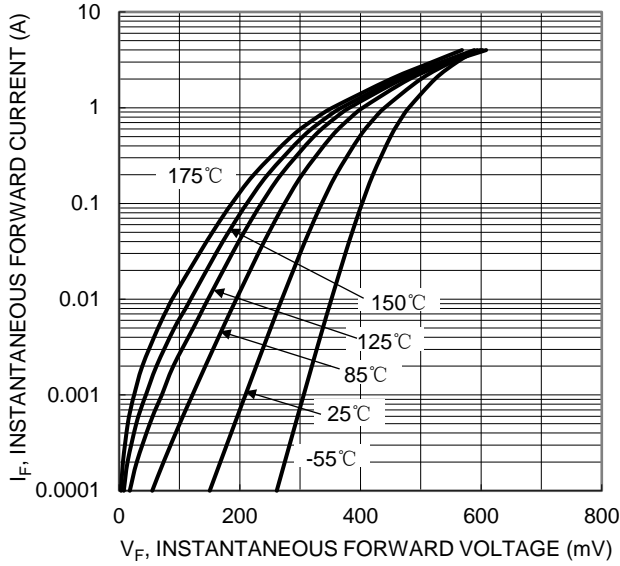


Figure 1. Typical Forward Characteristics

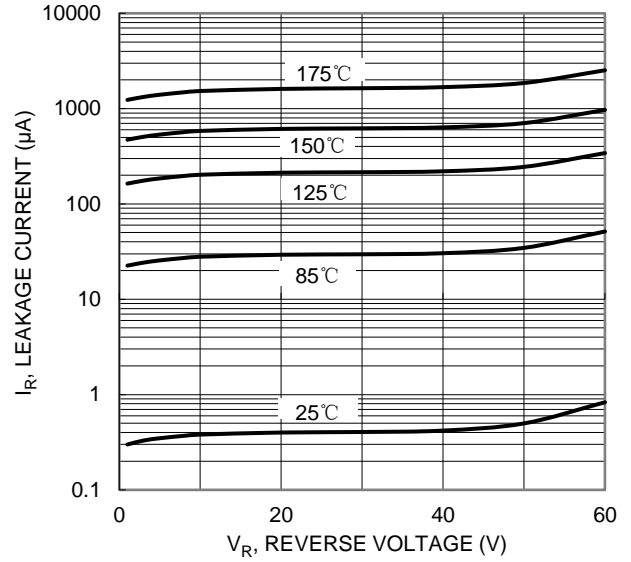


Figure 2. Typical Reverse Characteristics

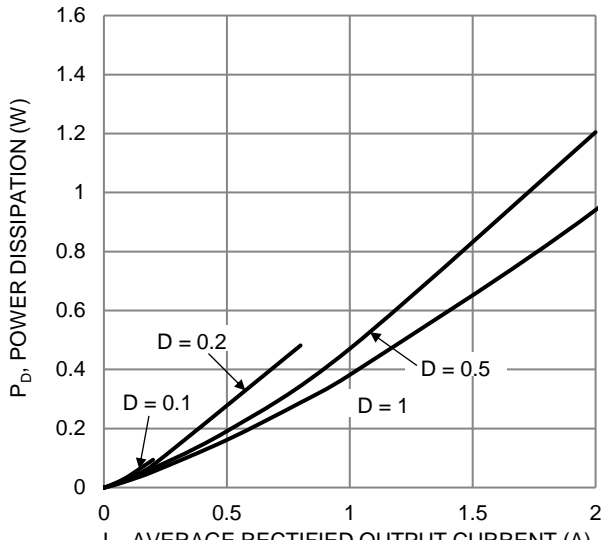


Figure 3. Forward Power Dissipation, $T_j = 125^\circ\text{C}$

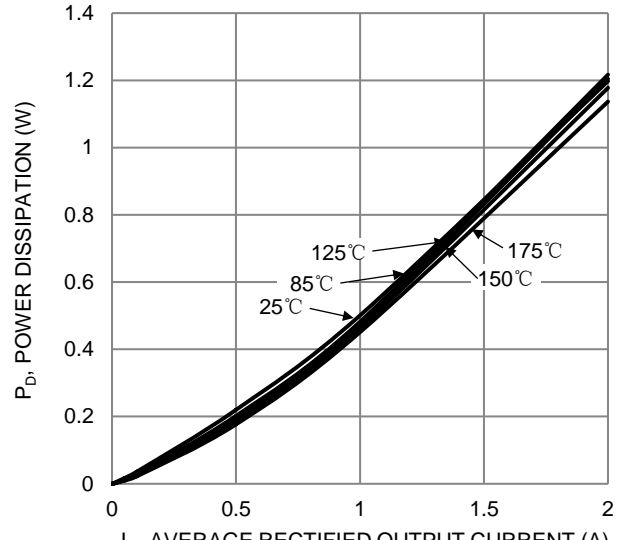


Figure 4. Forward Power Dissipation, $D = 0.5$

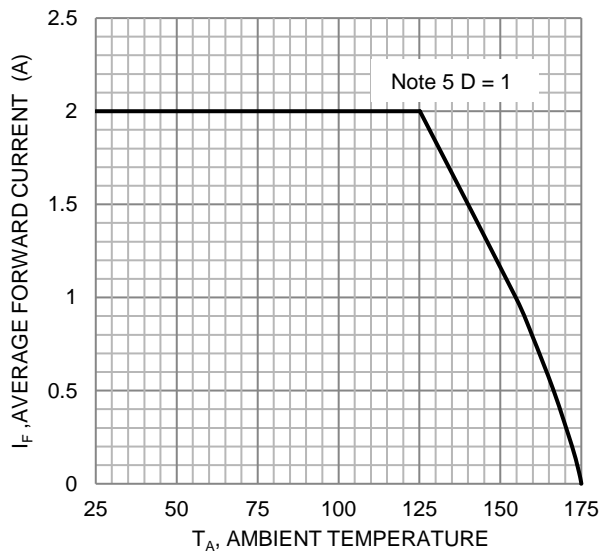


Figure 5. DC Forward Current Derating

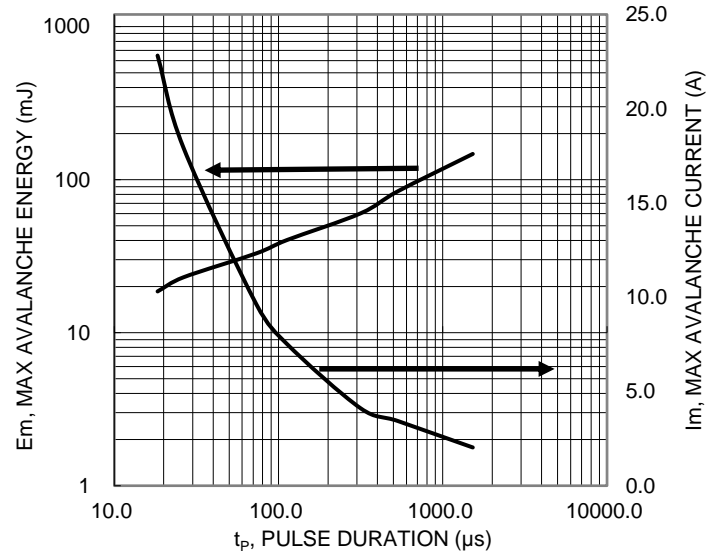


Figure 6. Single Pulse Max. Avalanche Energy and Current

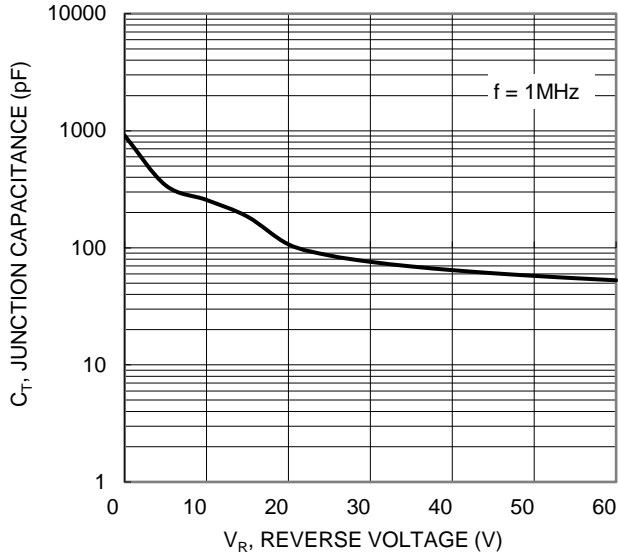


Figure 7. Typical Junction Capacitance

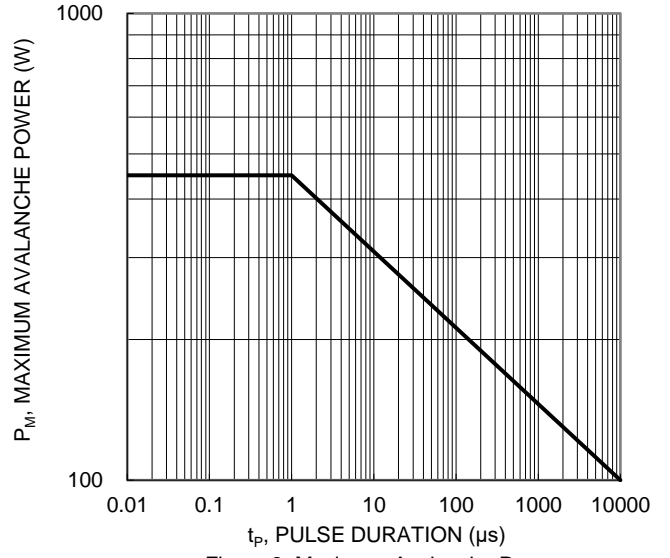
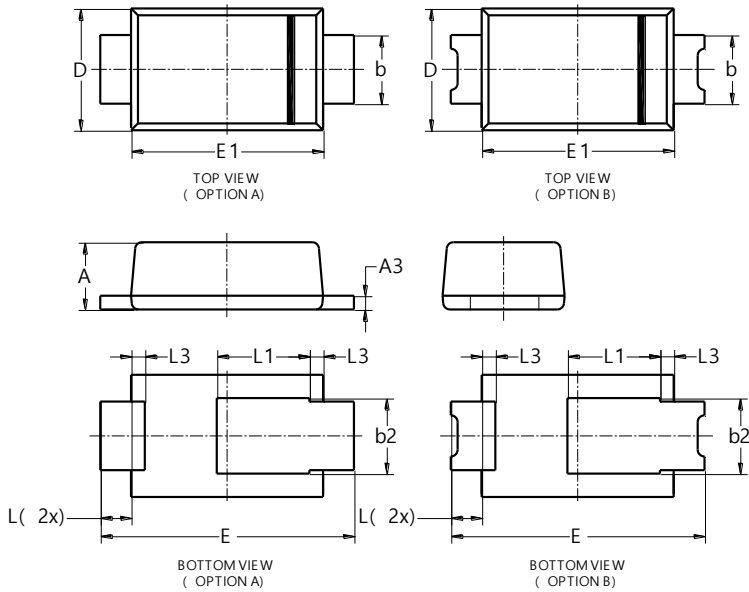


Figure 8. Maximum Avalanche Power

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI123

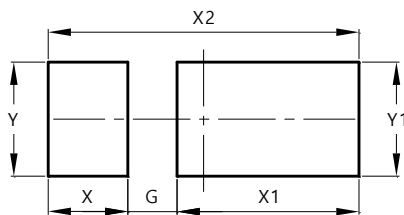


PowerDI123			
Dim	Min	Max	Typ
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI123



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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