



SBR10M100P5Q

10A SBR SUPER BARRIER RECTIFIER PowerDI5

Product Summary (@TA = +25°C)

V _{RRM} (V)	I _F (A)	V _{F(MAX)} (V)	I _{R(MAX)} (μA)
100	10	0.88	2

Description and Applications

This Super Barrier Rectifier (SBR) diode has been designed to meet the stringent requirements of Automotive Application combining low forward voltage drop with unrivalled ultra low leakage current and avalanche capability. It is ideally suited to such as:

- Polarity Protection Diode
- · Re-Circulating Diode
- Switching Diode
- Blocking Diode
- DC-DC Converter
- AC-DC Converter

This device is suitable to protect sensitive automotive circuits against surges defined in ISO7637-2 (Note 5)

Polarity (ISO7637-2 for 24V System)

Pulse 1: US = -600V Pulse 2a: US = +112V Pulse 3a: US = -300V Pulse 3b: US = +300V

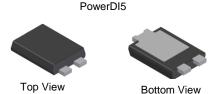
Features and Benefits

- Low Forward Voltage Drop, Ultra Low Leakage
- $T_{J(MAX)} = +175^{\circ}C$
- Excellent High Temperature Stability
- Unrivalled Avalanche Capability
- Patented Super Barrier Rectifier SBR[®] Technology
- Soft, Fast Switching Capability
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The SBR10M100P5Q 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

- Case: PowerDI[®]5
- Case 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 (3)
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)





Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging	
SBR10M100P5Q-13	Automotive	PowerDI5	5000/Tape & Reel	
SBR10M100P5Q-13D (Note 6)	Automotive	PowerDI5	5000/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/.
- 5. Not applicable to parts with stand-off voltage lower than the average battery voltage (13.5V)
- 6. Suffix -13D is designated for 12mm tape width.

Marking Information



S10M100 = Product Type Marking Code

| | = Manufacturers' Code Marking

| YYWW = Date Code Marking
| YY = Last Two Digits of Year (ex: 21 for 2021)

| WW = Week Code (01 to 53)
| K = Factory Designator



Maximum Ratings (@ $T_A = +25^{\circ}C$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	Vrrm	100	V
Average Rectified Output Current	lo	10	Α
Non-Repetitive Peak Forward Surge Current 8.3mS	IFSM	220	Α
Non-Repetitive Avalanche Energy at I _{AS} = 5.0A, L = 50mH	Eas	400	mJ
Non-Repetitive Avalanche Energy at I _{AS} = 20.0A, L = 1mH	Eas	150	mJ

Characteristic	Symbol	Ratings	Unit
Human Body Model ESD Protection	ESD HBM	4000	V
Machine Model ESD Protection	ESD MM	400	V
Charged Device Model	ESD CDM	1	kV

Thermal Characteristics (Note 10)

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Lead (Cathode)	Rejl	3	°C/W
Typical Thermal Resistance Junction to Ambient (Note 7)	Reja	20	°C/W
Typical Thermal Resistance Junction to Ambient (Note 8)	Reja	90	°C/W
Operating and Storage Temperature Range	TJ, TSTG	-55 to +175	°C

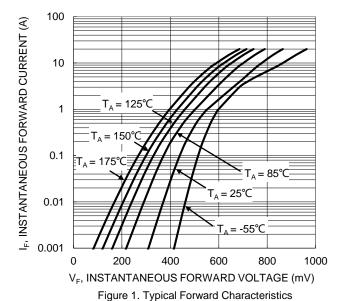
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

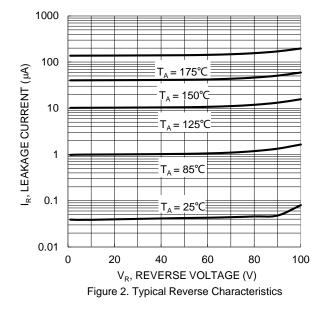
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
		_	0.56			I _F = 1A, T _J = +25°C
		_	0.71	_		$I_F = 5A$, $T_J = +25$ °C
Forward Voltage Drop	VF	_	0.78	0.88	V	I _F = 10A, T _J = +25°C
		_	0.59	_		I _F = 5A, T _J = +125°C
		_	0.65	0.74		I _F = 10A, T _J = +125°C
		_	100	2000	nA	V _R = 100V, T _J = +25°C
Leakage Current (Note 9)	I_{R}	_	0.015	0.1	mA	$V_R = 100V, T_J = +125$ °C
		_	0.060	_	mA	V _R = 100V, T _J = +150°C
Junction Capacitance	Сл	_	245	_	pF	V _R = 4V, T _J = +25°C
Switching Speed trr	t _{RR}	_	18	1	ns	IF = 0.5A, I _R = 1A, I _{RR} = 0.25A (RG1)

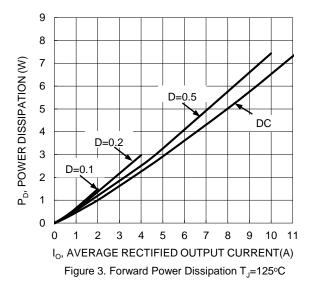
Notes:

- 7. 2inch sq. Al board.
- 8. MRP FR-4 PC board, 2oz.
 9. Short duration pulse test used to minimize self-heating effect.
- 10. The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$.









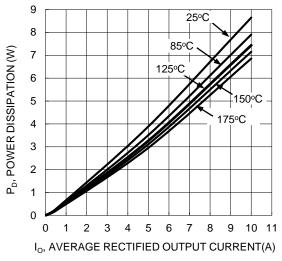
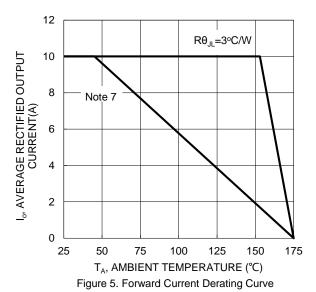


Figure 4. Forward Power Dissipation D=0.5



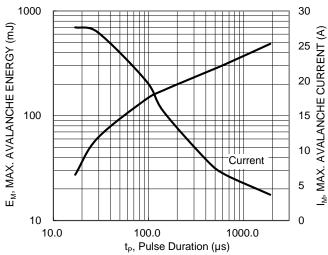
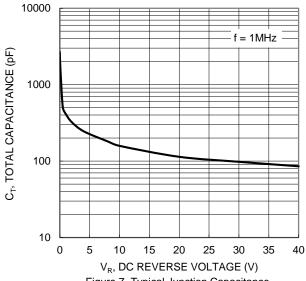


Figure 6. Single pulse Max. Avalanche Energy and Current







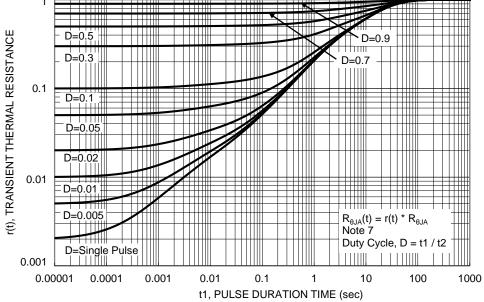


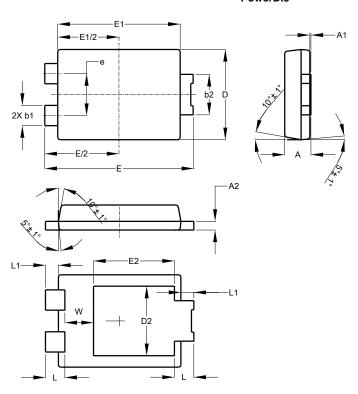
Figure 8. Transient Thermal Resistance MRP



Package Outline Dimensions

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

PowerDI5

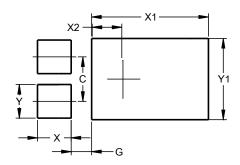


PowerDI5				
Dim	Min	Max	Тур	
Α	1.05	1.15	1.10	
A1	0.00	0.05		
A2	0.33	0.43	0.381	
b1	0.80	0.99	0.89	
b2	1.70	1.88	1.78	
D	3.90	4.05	3.966	
D2			3.054	
Е	6.40	6.60	6.51	
е			1.84	
E1	5.30	5.45	5.37	
E2		-	3.549	
L	0.75	0.95	0.85	
L1	0.50	0.65	0.57	
W	1.10	1.41	1.255	
All Dimensions in mm				

Suggested Pad Layout

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

PowerDI5



Dimensions	Value (in mm)		
С	1.840		
G	0.852		
Х	1.400		
X1	4.860		
X2	1.310		
Υ	1.390		
Y1	3.360		



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