

Product Summary (@ T_A = +25°C)

V _{RRM} (V)	I _O (A)	V _F (MAX) (V)	I _R (MAX) (mA)
40	4	0.50	0.15

Features

- Patented SBR[®] technology provides an avalanche capability five times larger than Schottky diodes ensuring more rugged and reliable end applications.
- Lower reverse leakage ensuring greater stability at higher temperatures.
- Low-forward voltage (V_F) minimizes conduction losses and improving efficiency.
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- The SBR440SBQ 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/>

Description and Applications

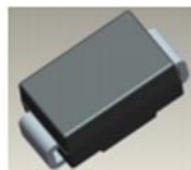
The SBR440SBQ is a 4A 40V single rectifier packaged in the low-profile SMB package. Providing low V_F and excellent high temperature stability this device is ideal for use in general rectification applications such as:

- Boost diodes
- Blocking diodes
- Recirculating diodes

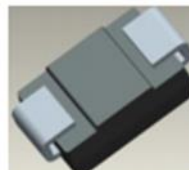
Mechanical Data

- Package: SMB
- 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: 0.093 grams (Approximate)

SMB



Top View

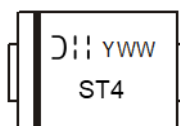


Bottom View

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SBR440SBQ-13	SMB	3,000	Tape & Reel

- Notes:
- EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


ST4 = Product Type Marking Code
 J = Manufacturer's Code Marking
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 4 for 2024)
 WW = Week Code (01 to 53)

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}	40	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _{RM}		
Average Rectified Output Current	I _O	4	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load	I _{FSM}	100	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance Junction to Ambient (Note 5)	R _{θJA}	95	°C/W
Thermal Resistance Junction to Case (Note 5)	R _{θJC}	36	°C/W
Thermal Resistance Junction to Case (Note 6)	R _{θJC}	26	°C/W
Operating and Storage Temperature Range (Note 7)	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	V _F	—	0.45	0.50	V	I _F = 4.0A, T _J = +25°C
		—	0.43	0.48	V	I _F = 4.0A, T _J = +125°C
Leakage Current (Note 8)	I _R	—	0.02	0.15	mA	V _R = 40V, T _J = +25°C
		—	5	20	mA	V _R = 40V, T _J = +125°C
Typical Total Capacitance	C _T	—	211	—	pF	V _R = 4V, f = 1MHz
Reverse-Recovery Time	t _{RR}	—	15	—	ns	I _F = 0.5A, I _{RR} = 1A

- Notes:
5. Device mounted on FR-4 substrate, 1" x 1", 2oz, single-sided, PC boards with 0.1" x 0.15" copper pad.
 6. Device mounted on FR-4 substrate, 0.4" x 0.5", 2oz, single-sided, PC boards with 0.2" x 0.25" copper pad.
 7. The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D / dT_J < 1 / R_{\theta JA}$.
 8. Short duration pulse test used to minimize self-heating effect.

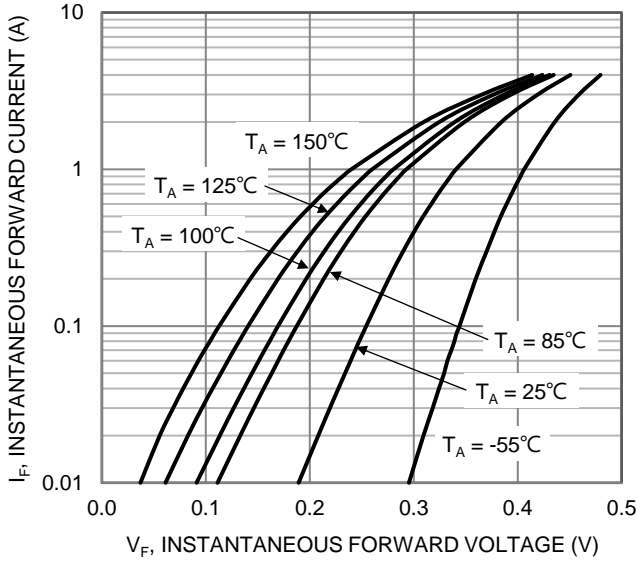


Figure 1. Typical Forward Characteristics

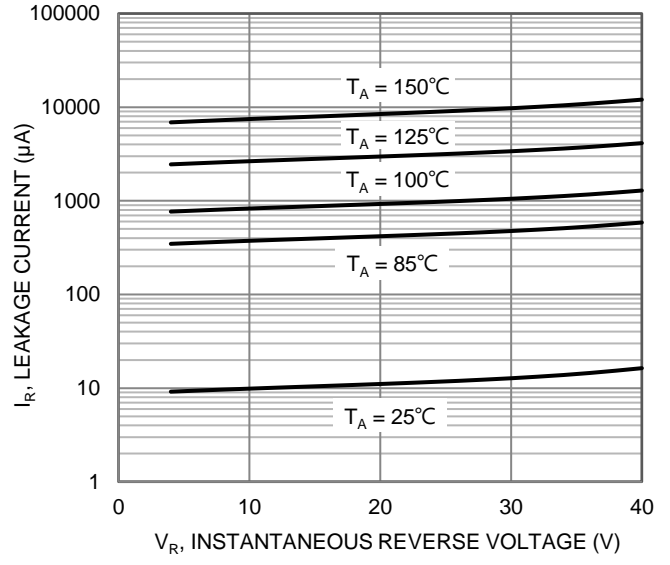


Figure 2. Typical Reverse Characteristics

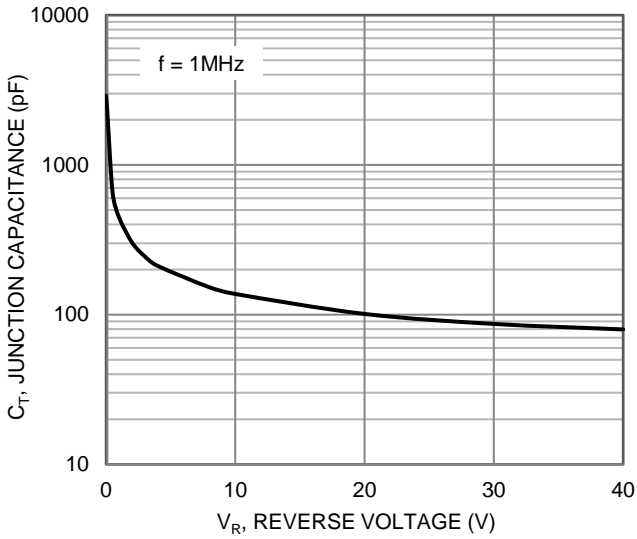


Figure 3. Typical Junction Capacitance

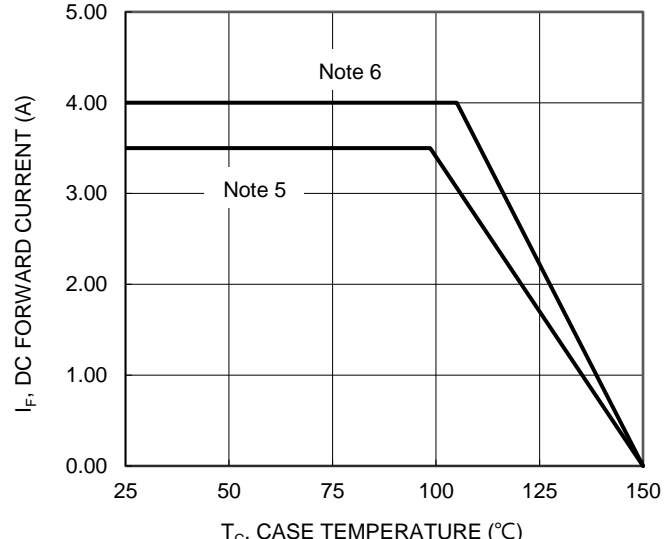


Figure 4. DC Forward Current Derating

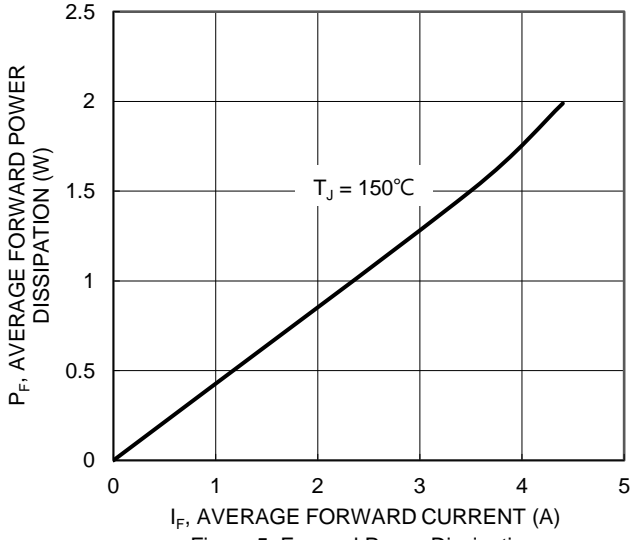


Figure 5. Forward Power Dissipation

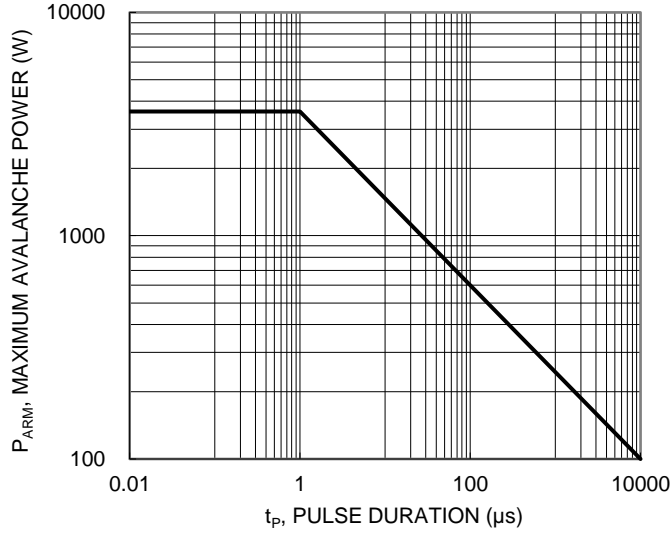
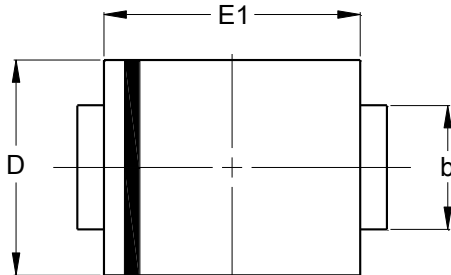


Figure 6. Maximum Avalanche Power Curve

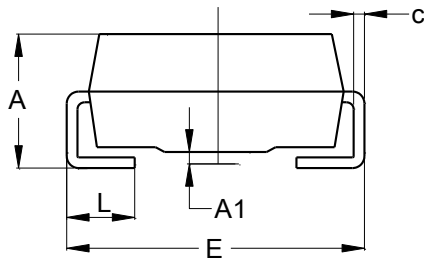
Package Outline Dimensions

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

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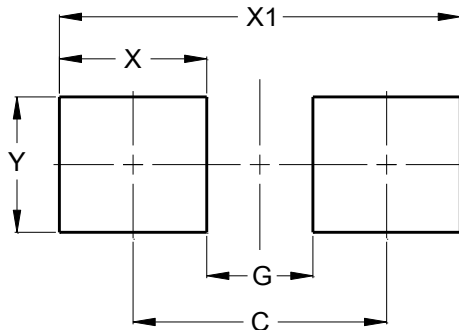
SMB		
Dim	Min	Max
A	2.00	2.50
A1	0.05	0.20
b	1.96	2.21
c	0.15	0.31
D	3.30	3.94
E	5.00	5.59
E1	4.06	4.57
L	0.76	1.52
All Dimensions in mm		



Suggested Pad Layout

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

SMB



Dimensions	Value (in mm)
C	4.30
G	1.80
X	2.50
X1	6.80
Y	2.30

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