

Product Summary

B120Q/BQ-B140Q/BQ

V _{RRM} (V)	I _O (A)	V _F Max (V) T _A = +25°C	I _R Max (mA) T _A = +25°C
20/30/40	1.0	0.5	0.5

B150Q/BQ, B160Q/BQ

V _{RRM} (V)	I _O (A)	V _F Max (V) T _A = +25°C	I _R Max (mA) T _A = +25°C
50/60	1.0	0.7	0.5

Description and Applications

This Schottky Barrier Rectifier is designed to meet the general requirements of commercial applications. It is ideally suited for use as:

- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode
- Blocking Diode
- Freewheel Diode

Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- Surge Overload Rating to 30A Peak
- For Use in Low-Voltage, High-Frequency Inverters
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

- Case: SMA & SMB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 (E3)
- Polarity: Cathode Band or Cathode Notch
- Weight:
 - SMA 0.064 grams (Approximate)
 - SMB 0.093 grams (Approximate)



Top View



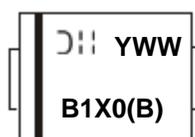
Bottom View

Ordering Information (Note 5)

Part Number	Qualification	Case	Packaging
B1X0Q-13-F	Automotive	SMA	5,000/Tape & Reel
B1X0BQ-13-F	Automotive	SMB	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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



B1X0 = Product Type Marking Code, ex: B140Q (SMA Package)
 B1X0B = Product Type Marking Code, ex: B160BQ (SMB Package)
 3:11 = Manufacturers' Code Marking
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 8 for 2018)
 WW = Week Code (01 to 53)

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

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

Characteristic	Symbol	B120Q/BQ	B130Q/BQ	B140Q/BQ	B150Q/BQ	B160Q/BQ	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	20	30	40	50	60	V
Working Peak Reverse Voltage	V_{RWM}						
DC Blocking Voltage	V_R						
RMS Reverse Voltage	$V_{R(RMS)}$	14	21	28	35	42	V
Average Rectified Output Current @ $T_T = +130^\circ\text{C}$	I_O			1.0			A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}			30			A
Electrostatic Discharge	HBM			4000			V
Electrostatic Discharge	MM			400			V
Electrostatic Discharge	CDM			1			kV

Thermal Characteristics

Characteristic	Symbol	B120Q/BQ	B130Q/BQ	B140Q/BQ	B150Q/BQ	B160Q/BQ	Unit
Typical Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$			115			$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient (Note 7)	$R_{\theta JA}$			65			$^\circ\text{C/W}$
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
Forward Voltage Drop B120Q/BQ, B130Q/BQ, B140Q/BQ B150Q/BQ, B160Q/BQ	V_F	—	—	0.5 0.7	V	$I_F = 1.0\text{A}$ $I_F = 1.0\text{A}$
Leakage Current (Note 8)	I_R	—	—	0.5 10	mA	@ Rated $V_R, T_A = +25^\circ\text{C}$ @ Rated $V_R, T_A = +100^\circ\text{C}$
Total Capacitance	C_T	—	—	110	pF	$V_R = 4\text{V}, f = 1\text{MHz}$
Switching Speed	t_{RR}	—	12	—	ns	$I_F = 0.5\text{A}, I_R = 1\text{A}, I_{RR} = 0.25\text{A (RG1)}$

- Notes:
6. 1*MRP FR-4 PC board, 2oz.
7. With 50mm*50mm*23mm Al heatsink.
8. Short duration pulse test used to minimize self-heating effect.

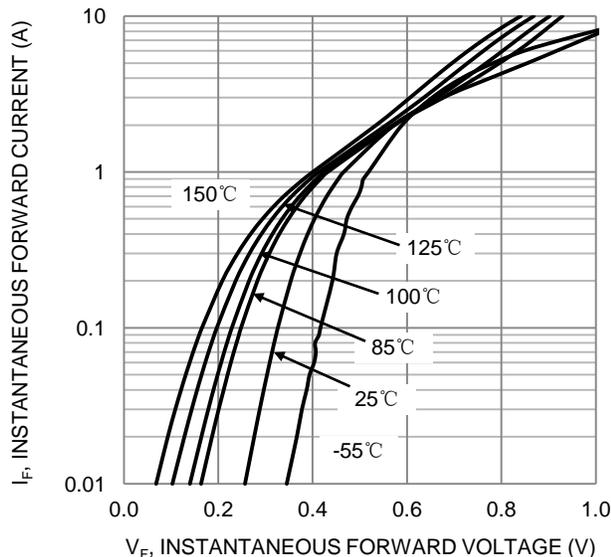


Figure 1. Typical Forward Characteristics
B120Q/BQ-B140Q/BQ

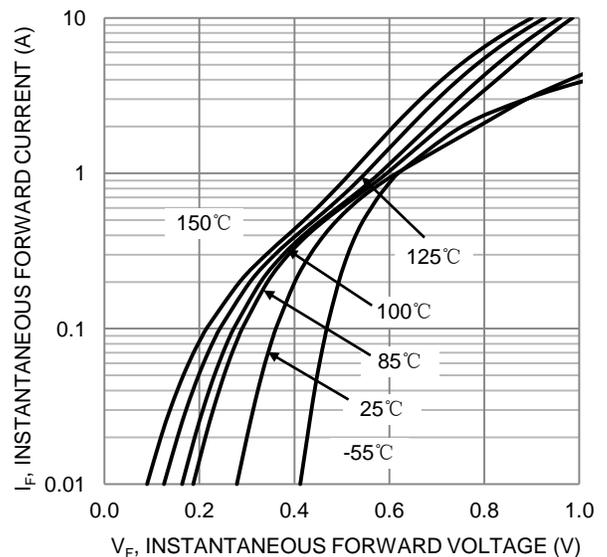


Figure 2. Typical Forward Characteristics
B150Q/BQ - B160Q/BQ

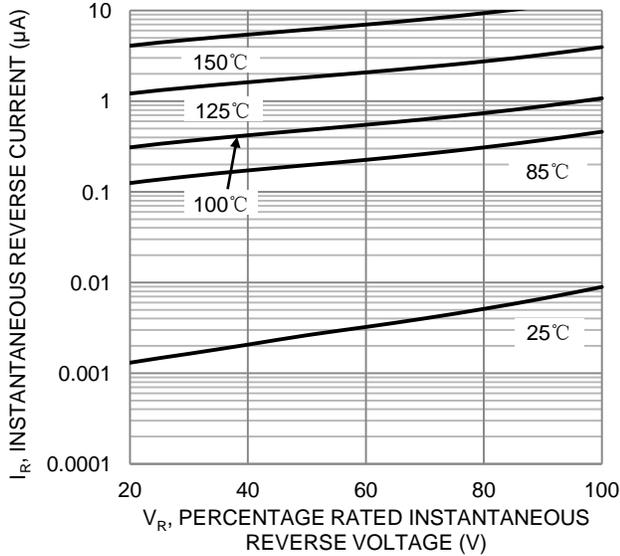


Figure 3. Typical Reverse Characteristics
B120Q/BQ - B140Q/BQ

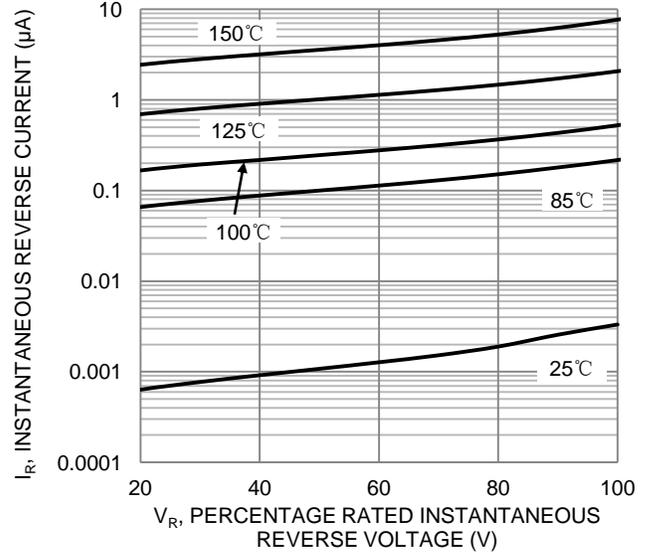


Figure 4. Typical Reverse Characteristics
B150Q/BQ - B160Q/BQ

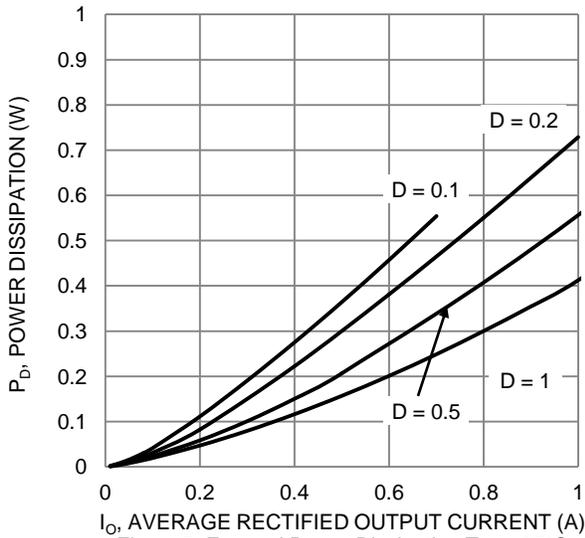


Figure 5. Forward Power Dissipation $T_J = 125^\circ\text{C}$
B120Q/BQ - B140Q/BQ

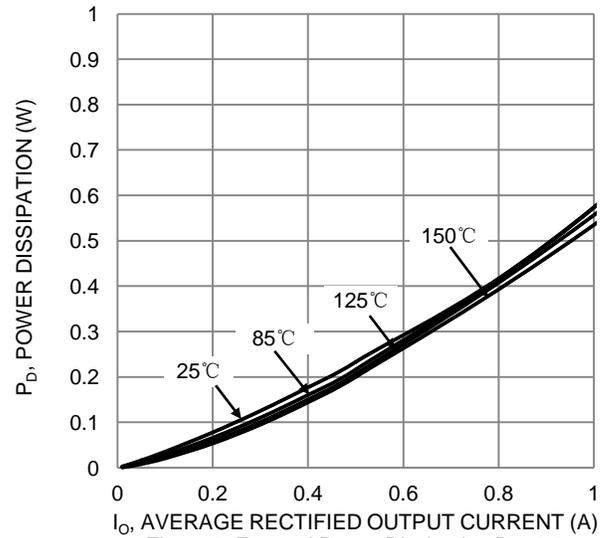


Figure 6. Forward Power Dissipation $D = 0.5$
B120Q/BQ - B140Q/BQ

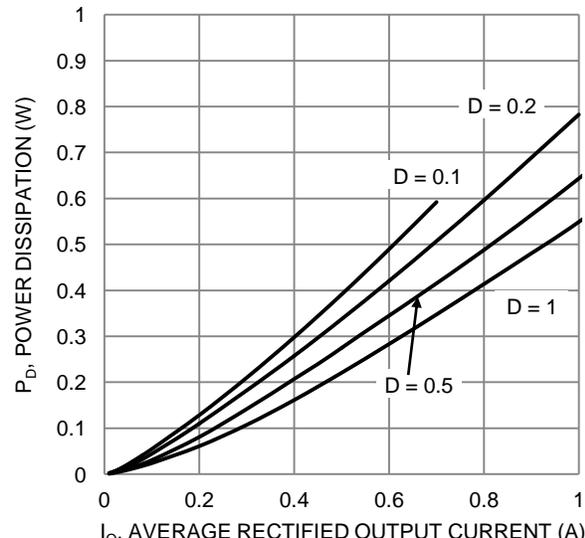


Figure 7. Forward Power Dissipation $T_J = 125^\circ\text{C}$
B150Q/BQ - B160Q/BQ

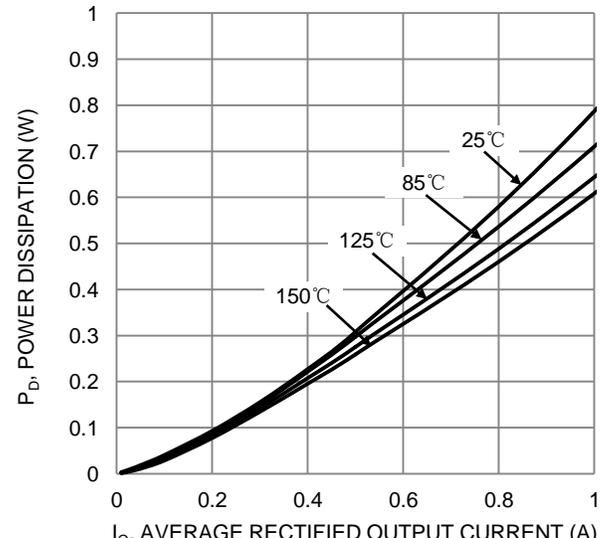


Figure 8. Forward Power Dissipation $D = 0.5$
B150Q/BQ - B160Q/BQ

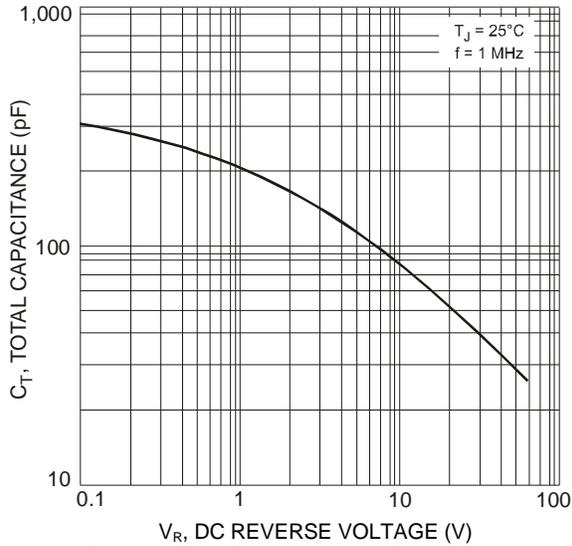


Figure 9. Total Capacitance vs. Reverse Voltage

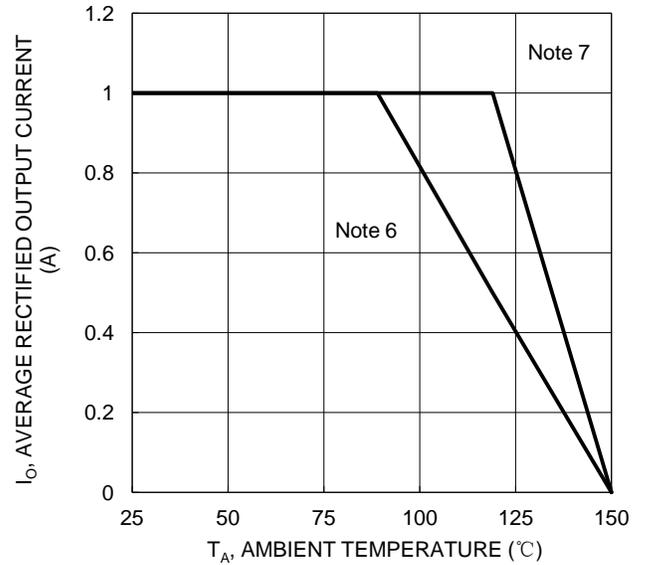


Figure 10. DC Forward Current Derating

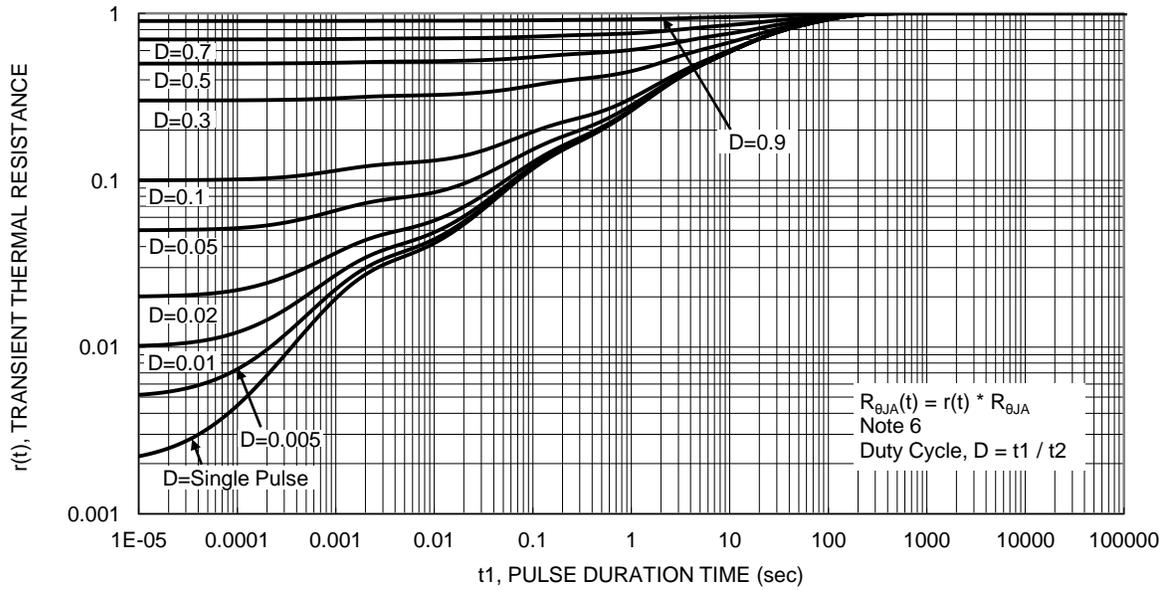
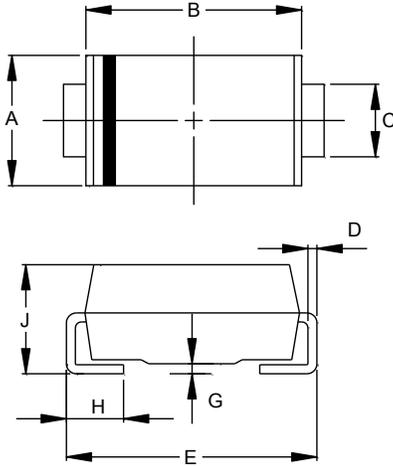


Figure 11. Transient Thermal Resistance: SMA

Package Outline Dimensions

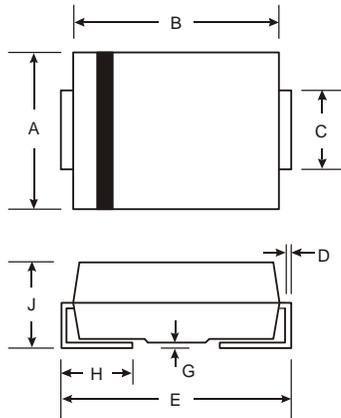
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SMA



SMA		
Dim	Min	Max
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.05	0.20
H	0.76	1.52
J	1.96	2.40
All Dimensions in mm		

SMB

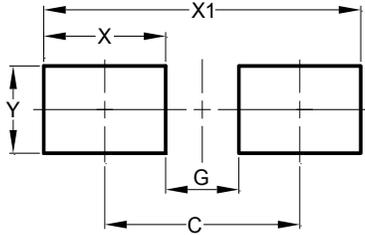


SMB		
Dim	Min	Max
A	3.30	3.94
B	4.06	4.57
C	1.96	2.21
D	0.15	0.31
E	5.00	5.59
G	0.05	0.20
H	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

Suggested Pad Layout

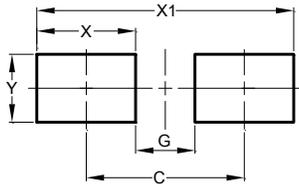
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SMA



Dimensions	Value (in mm)
C	4.00
G	1.50
X	2.50
X1	6.50
Y	1.70

SMB



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

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