

## Product Summary

B120Q/BQ-B140Q/BQ

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max (V) T <sub>A</sub> = +25°C	I <sub>R</sub> Max (mA) T <sub>A</sub> = +25°C
20/30/40	1.0	0.5	0.5

B150Q/BQ, B160Q/BQ

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max (V) T <sub>A</sub> = +25°C	I <sub>R</sub> Max (mA) T <sub>A</sub> = +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:

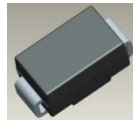
- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode
- Blocking Diode
- Freewheel Diode

## Features and Benefits

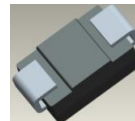
- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- Surge Overload Rating to 30A Peak
- For Use in Low-Voltage, High-Frequency Inverters
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 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) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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.
  4. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



B1X0 = Product Type Marking Code, ex: B140Q (SMA Package)  
 B1X0B = Product Type Marking Code, ex: B160BQ (SMB Package)  
 D;: = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 16 for 2016)  
 WW = Week Code (01 to 53)

### Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

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

Characteristic	Symbol	B120Q/BQ	B130Q/BQ	B140Q/BQ	B150Q/BQ	B160Q/BQ	Unit
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	20	30	40	50	60	V
Working Peak Reverse Voltage	V <sub>RWM</sub>						
DC Blocking Voltage	V <sub>R</sub>						
RMS Reverse Voltage	V <sub>R(RMS)</sub>	14	21	28	35	42	V
Average Rectified Output Current @ T <sub>T</sub> = +130°C	I <sub>O</sub>	1.0					A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	30					A

### Thermal Characteristics

Characteristic	Symbol	B120Q/BQ	B130Q/BQ	B140Q/BQ	B150Q/BQ	B160Q/BQ	Unit
Typical Thermal Resistance Junction to Terminal (Note 6)	R <sub>θJT</sub>	20					°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150					°C

### Electrical Characteristics (@T<sub>A</sub> = +25°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 <sub>F</sub>	—	—	0.5 0.7	V	I <sub>F</sub> = 1.0A I <sub>F</sub> = 1.0A
Leakage Current (Note 7)	I <sub>R</sub>	—	—	0.5 10	mA	@ Rated V <sub>R</sub> , T <sub>A</sub> = +25°C @ Rated V <sub>R</sub> , T <sub>A</sub> = +100°C
Total Capacitance	C <sub>T</sub>	—	—	110	pF	V <sub>R</sub> = 4V, f = 1MHz

Notes: 6. Thermal Resistance: Junction to terminal, unit mounted on PC board with 5.0 mm<sup>2</sup> (0.013 mm thick) copper pads as heat sink.  
 7. Short duration pulse test used to minimize self-heating effect.



Fig.1 Typical Forward Characteristics - B120Q/BQ thru B140Q/BQ

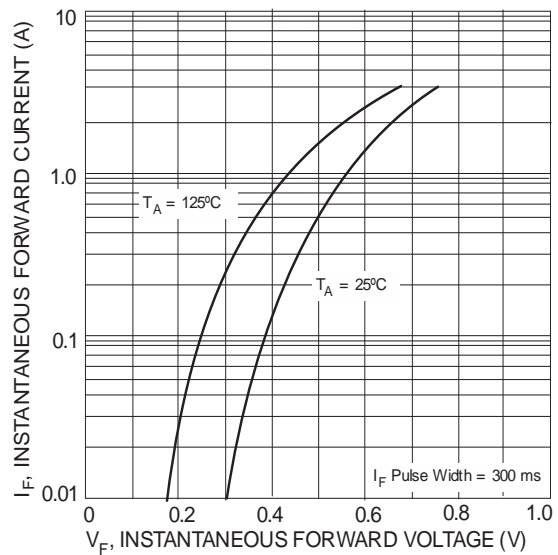


Fig.2 Typical Forward Characteristics - B150Q/BQ thru B160Q/BQ

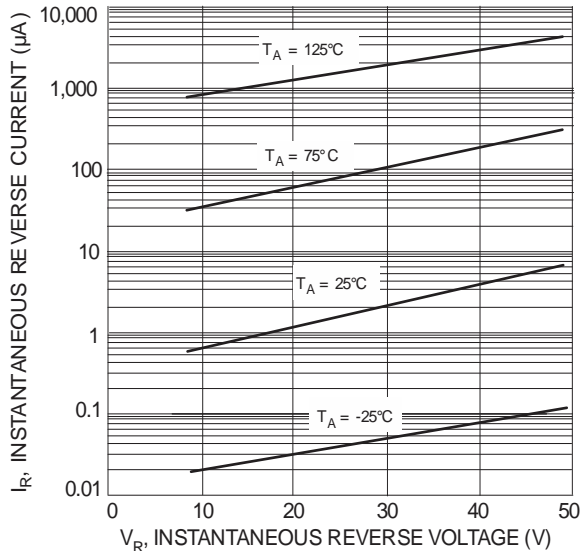


Fig.3 Typical Reverse Characteristics - B120Q/BQ thru B140Q/BQ

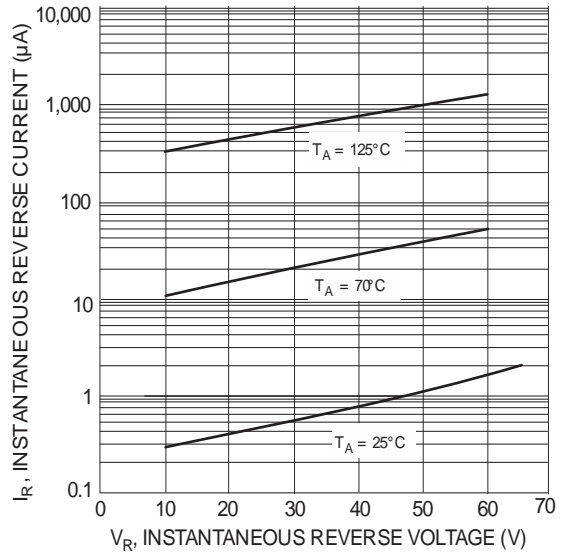


Fig.4 Typical Reverse Characteristics - B150Q/BQ thru B160Q/BQ

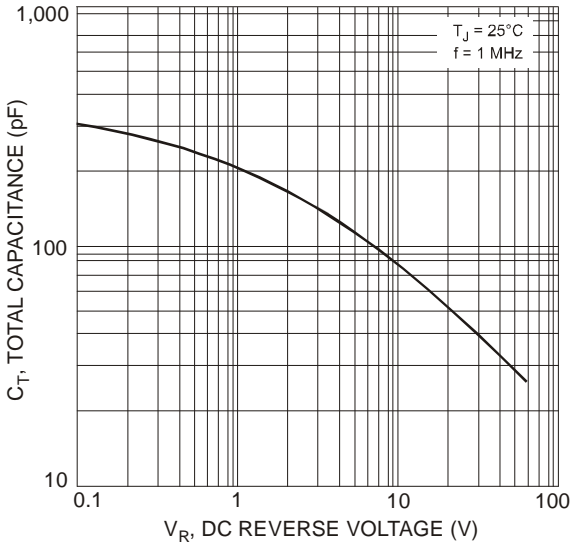


Fig. 5 Total Capacitance vs. Reverse Voltage

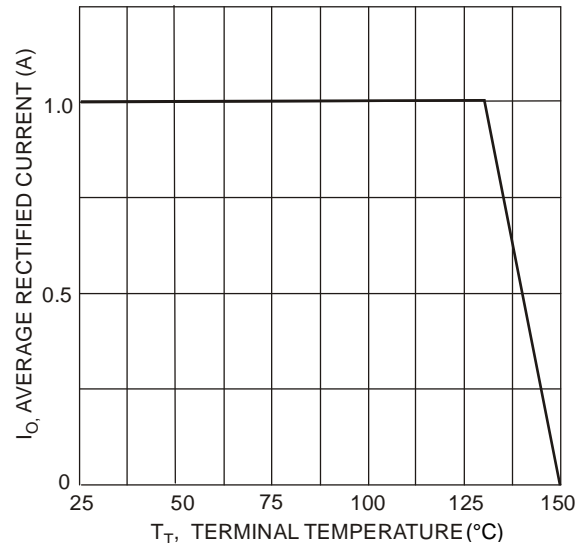


Fig. 6 Forward Current Derating Curve



Fig. 7 Max Non-Repetitive Peak Forward Surge Current

**Package Outline Dimensions**

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) 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**

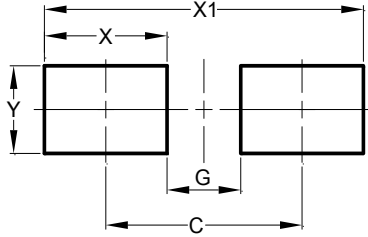


SMB		
Dim	Min	Max
A	3.30	3.94
B	4.06	4.57
C	1.96	2.21
D	0.15	0.31
E	5.00	5.59
G	0.05	0.20
H	0.76	1.52
J	2.00	2.50
All Dimensions in mm		

**Suggested Pad Layout**

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) for the latest version.

**SMA**



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

**SMB**



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

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