1.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER

Product Summary

B140Q/BQ

V_{RRM} (V)	I_O (A)	V_F Max (V) T_A = +25°C	I_R Max (mA) T_A = +25°C
40	1.0	0.5	0.5

B150Q, B160Q

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

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)**

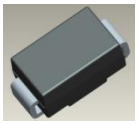
Description and Applications

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

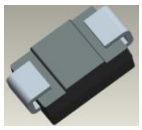
- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode
- Blocking Diode
- Freewheel Diode

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



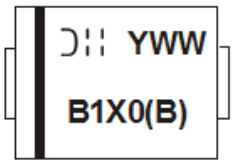
Bottom View

Ordering Information (Note 5)

Part Number	Qualification	Case	Packaging
B140Q-13-F	Automotive	SMA	5,000/Tape & Reel
B150Q-13-F	Automotive	SMA	5,000/Tape & Reel
B160Q-13-F	Automotive	SMA	3,000/Tape & Reel
B140BQ-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 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. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
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)
B160B = Product Type Marking Code, ex: B160BQ (SMB package)
= Manufacturers' Code Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 15 for 2015)
WW = Week Code (01 to 53)

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

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

Characteristic	Symbol	B140Q/BQ	B150Q	B160Q	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	40	50	60	V
RMS Reverse Voltage	$V_{R(RMS)}$	28	35	42	V
Average Rectified Output Current @ T_T = +130°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

Thermal Characteristics

Characteristic	Symbol	B140Q/BQ	B150Q	B160Q	Unit
Typical Thermal Resistance Junction to Terminal (Note 6)	$R_{\theta JT}$	20			°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150			°C

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	B140Q/BQ B150Q, B160Q	V_F	— —	— —	0.5 0.7	V	I_F = 1.0A I_F = 1.0A
Leakage Current (Note 7)		I_R	— —	— —	0.5 10	mA	@ Rated V_R, T_A = +25°C @ Rated V_R, T_A = +100°C
Total Capacitance		C_T	—	—	110	pF	V_R = 4V, f = 1MHz

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

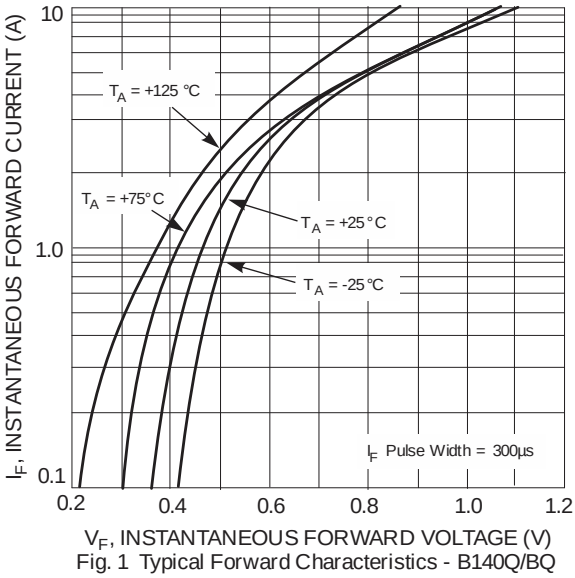

Fig. 1 Typical Forward Characteristics - B140Q/BQ

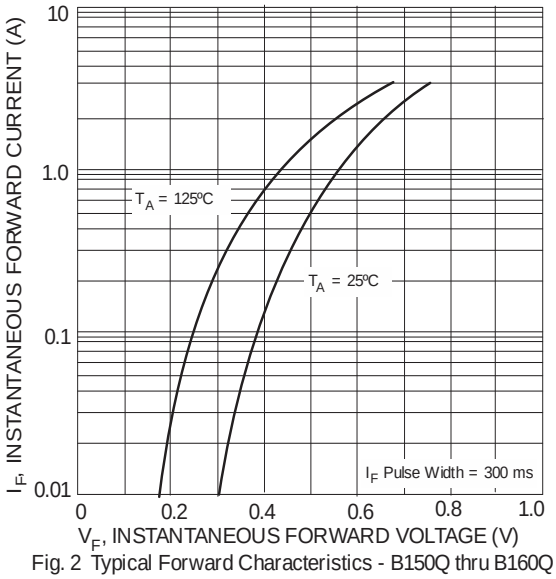

Fig. 2 Typical Forward Characteristics - B150Q thru B160Q

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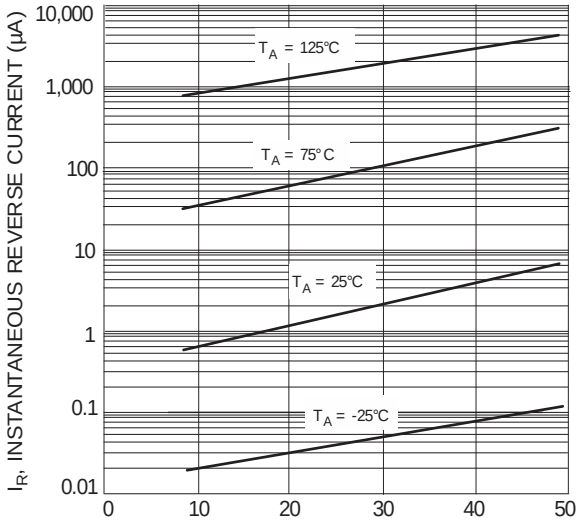

Fig. 3 Typical Reverse Characteristics, B140Q/BQ

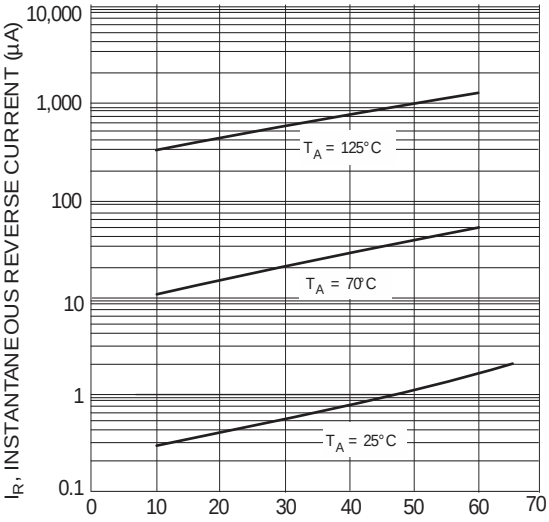

Fig. 4 Typical Reverse Characteristics, B150Q thru B160Q

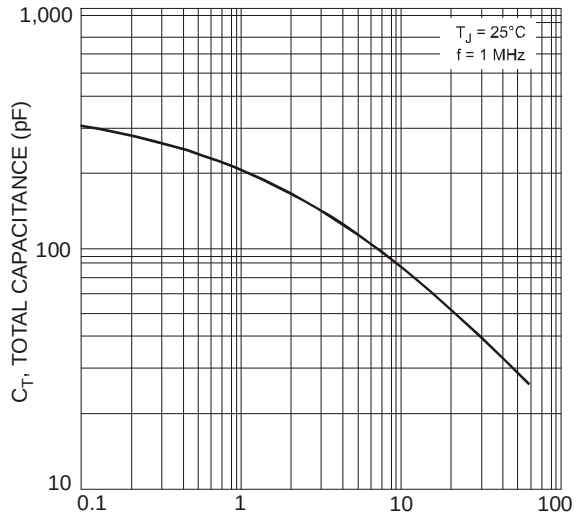

Fig. 5 Total Capacitance vs. Reverse Voltage

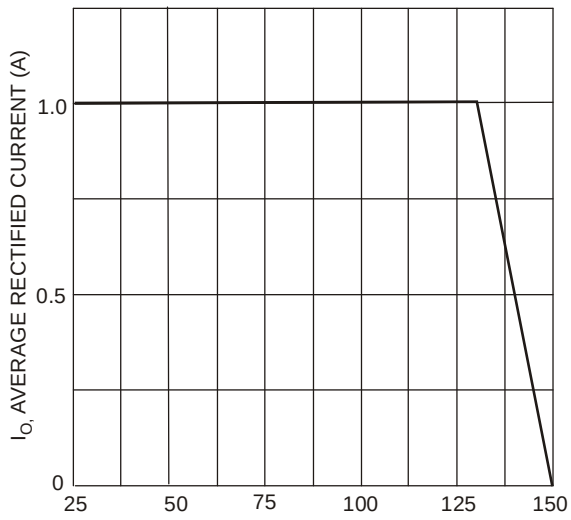

Fig. 6 Forward Current Derating Curve

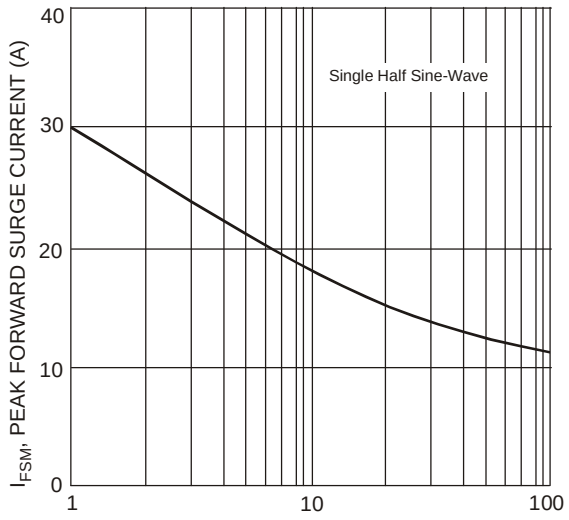

Fig. 7 Max Non-Repetitive Peak Forward Surge Current

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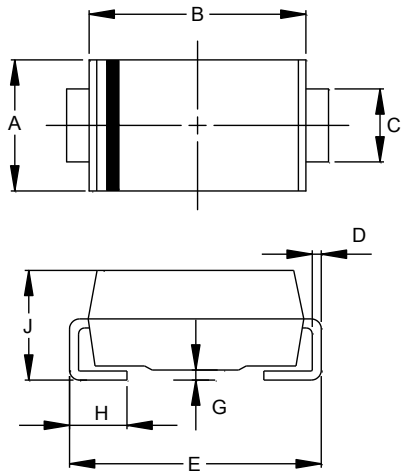
Package Outline Dimensions

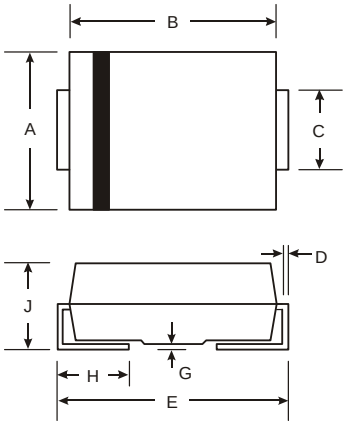
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

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		

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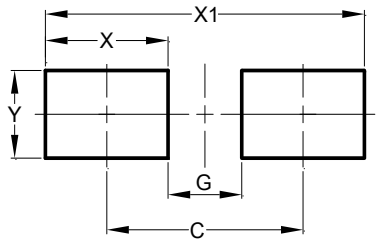
Suggested Pad Layout

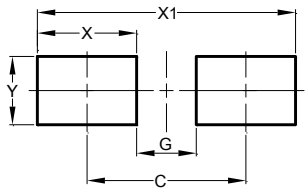
Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

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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