



**THE DATASHEET OF  
B140B-13-F**



## 1.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER

### Product Summary

B120/B, B130/B, B140/B

$V_{RRM}$ (V)	$I_o$ (A)	$V_F$ max (V) $T_A = +25^\circ\text{C}$	$I_R$ max (mA) $T_A = +25^\circ\text{C}$
20/30/40	1.0	0.5	0.5

B150/B, B160/B

$V_{RRM}$ (V)	$I_o$ (A)	$V_F$ max (V) $T_A = +25^\circ\text{C}$	$I_R$ max (mA) $T_A = +25^\circ\text{C}$
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, Free Wheeling, and Polarity Protection Application
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3)**

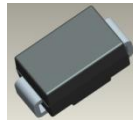
### Description and Applications

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

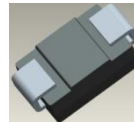
- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode

### 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  $\text{E3}$
- Polarity: Cathode Band or Cathode Notch
- Weight: SMA 0.064 grams (Approximate)  
SMB 0.093 grams (Approximate)



Top View



Bottom View

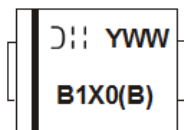
### Ordering Information (Note 4)

Part Number	Qualification	Case	Packaging
B1XX-13-F	Commercial	SMA	5,000/Tape & Reel
B1XXB-13-F	Commercial	SMB	3,000/Tape & Reel

\*xx = Device Type, e.g. B120-13-F (SMA Package); B120B-13-F (SMB Package).

- 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

### Marking Information



B1X0 = Product Type Marking Code, ex: B120 (SMA package)  
 B1X0B = Product Type Marking Code, ex: B160B (SMB package)  
 D11 = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 15 for 2015)  
 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 capacitance load, derate current by 20%.

Characteristic	Symbol	B120/B	B130/B	B140/B	B150/B	B160/B	Unit
Peak Repetitive Reverse Voltage	$V_{RRM}$						
Working Peak Reverse Voltage	$V_{RWM}$	20	30	40	50	60	V
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					30		A
Single Half Sine-Wave Superimposed on Rated Load	$I_{FSM}$				30		A

### Thermal Characteristics

Characteristic	Symbol	B120/B	B130/B	B140/B	B150/B	B160/B	Unit
Typical Thermal Resistance Junction to Terminal (Note 5)	$R_{\theta JT}$				20		$^\circ\text{C/W}$
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	$V_F$	-	-	0.5 0.7	V	$I_F = 1.0\text{A}$ $I_F = 1.0\text{A}$
Leakage Current (Note 6)	$I_R$	-	-	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	$V_R = 4\text{V}, f = 1\text{MHz}$

Notes: 5. 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.  
 6. Short duration pulse test used to minimize self-heating effect.

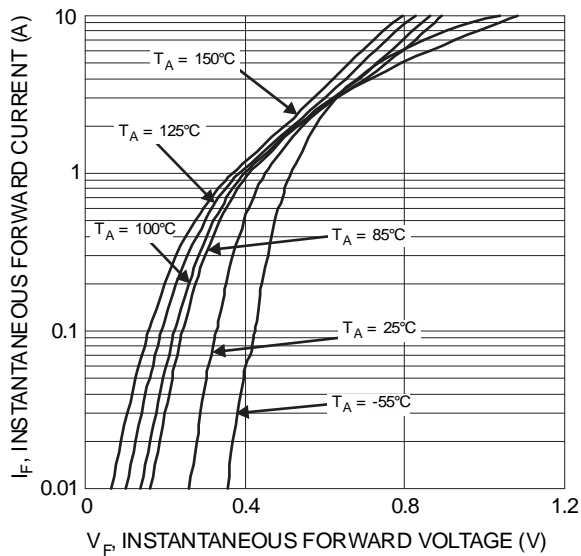


Figure 1 Typical Forward Characteristics

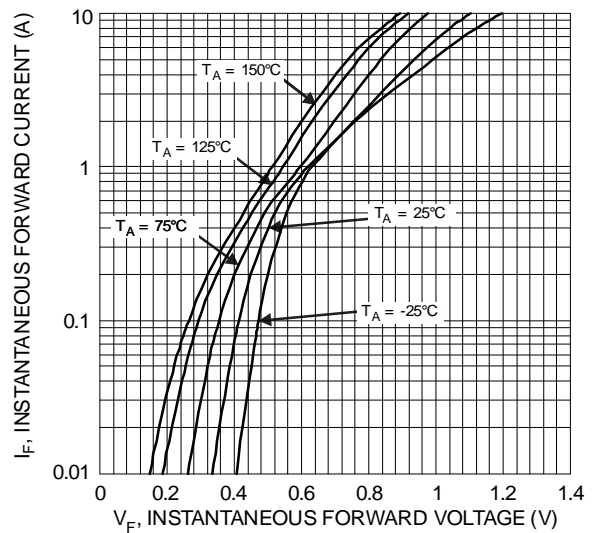


Figure 2 Typical Forward Characteristics  
 B150/B through B160/B

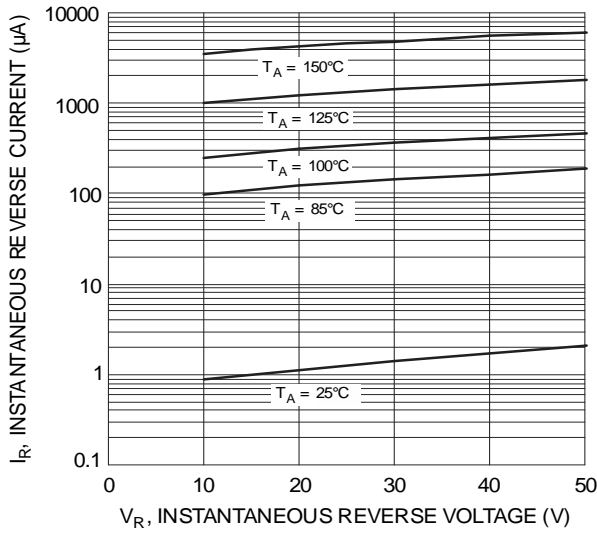


Figure 3 Typical Reverse Characteristics  
B120/B through B140/B

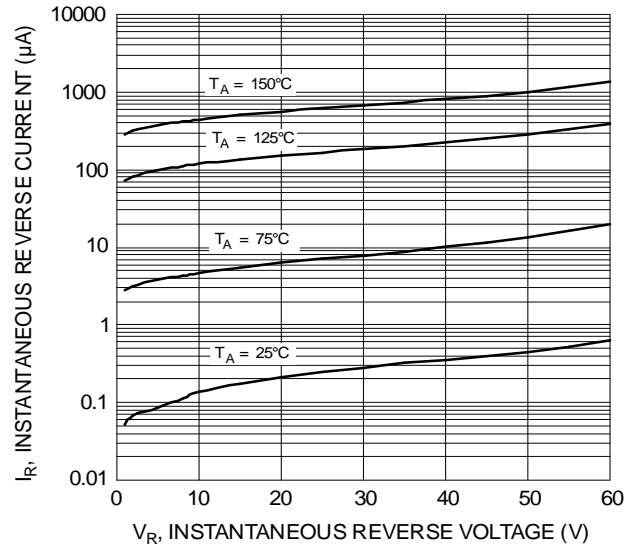


Figure 4 Typical Reverse Characteristics  
B150/B through B160/B

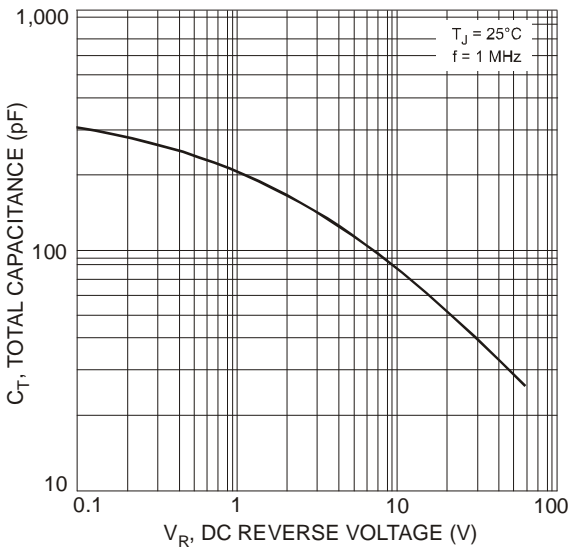


Fig. 5 Total Capacitance vs. Reverse Voltage

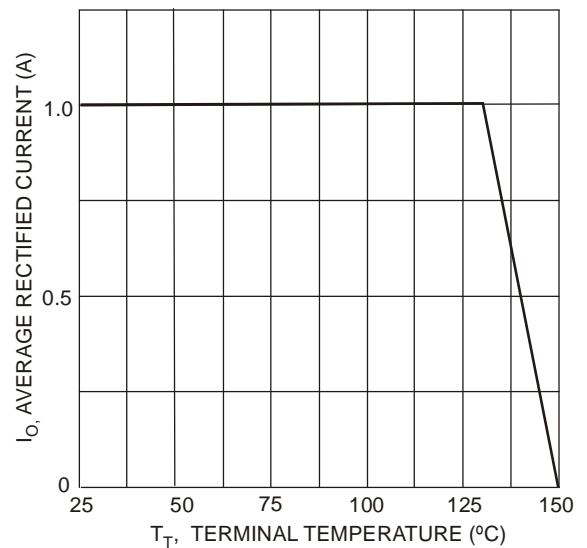


Fig. 6 Forward Current Derating Curve

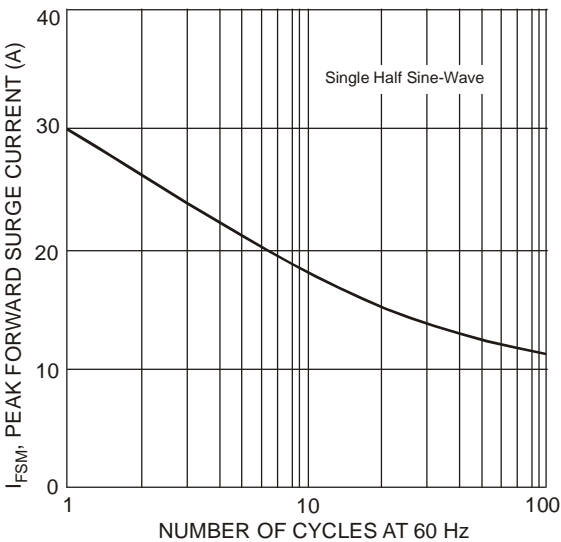
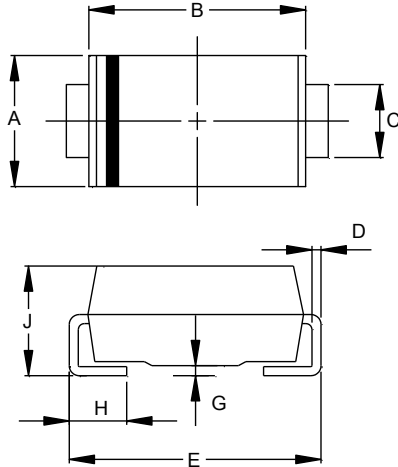


Fig. 7 Max Non-Repetitive Peak Forward Surge Current

## Package Outline Dimensions

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

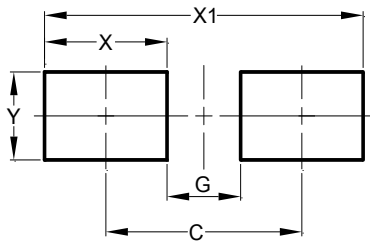


SMA		
Dim	Min	Max
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.05	0.20
H	0.76	1.52
J	1.96	2.40
All Dimensions in mm		

SMB		
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.



Dimensions	SMA (in mm)	SMB (in mm)
C	4.00	4.30
G	1.50	1.80
X	2.50	2.50
X1	6.50	6.80
Y	1.70	2.30

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