

## 1.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER

### Product Summary

B120/B, B130/B, B140/B

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

B150/B, B160/B

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F max</sub> (V) T <sub>A</sub> = +25°C | I <sub>R max</sub> (mA) T <sub>A</sub> = +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, Free Wheeling, and Polarity Protection Application
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3)**

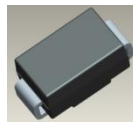
### Description and Applications

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

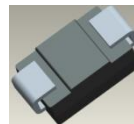
- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode

### 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 Ⓔ
- Polarity: Cathode Band or Cathode Notch
- Weight: SMA 0.064 grams (Approximate)  
SMB 0.093 grams (Approximate)



Top View



Bottom View

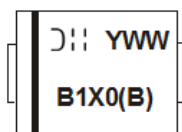
### Ordering Information (Note 4)

| 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)  
 DII = 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<br>0.7 | V    | $I_F = 1.0\text{A}$<br>$I_F = 1.0\text{A}$  |
| Leakage Current (Note 6) | $I_R$  | -   | -   | 0.5<br>10  | mA   | @ Rated $V_R, T_A = +25^\circ\text{C}$<br>@ 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.

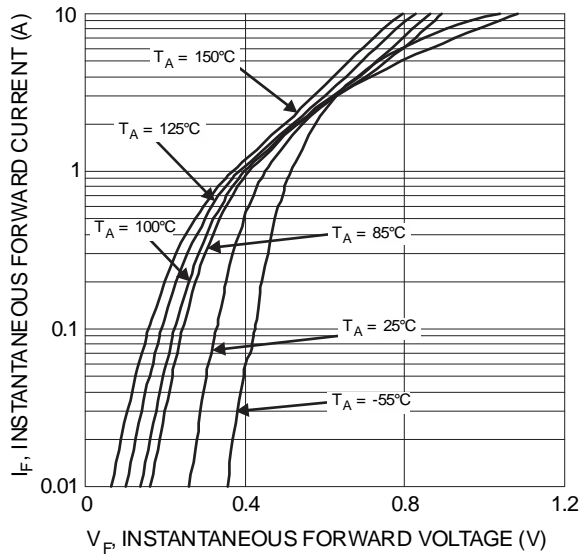


Figure 1 Typical Forward Characteristics

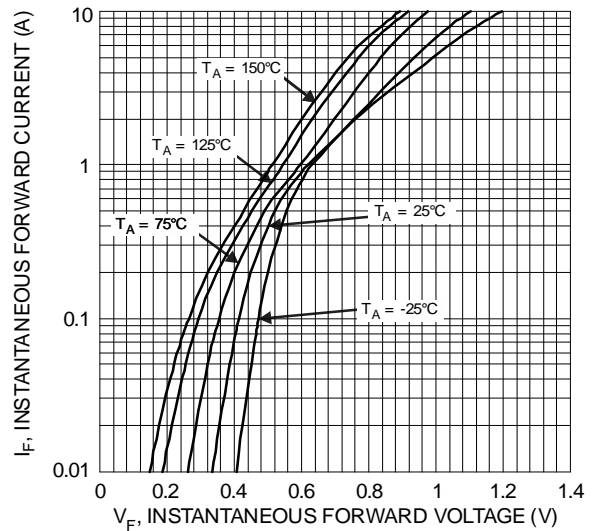


Figure 2 Typical Forward Characteristics  
 B150/B through B160/B

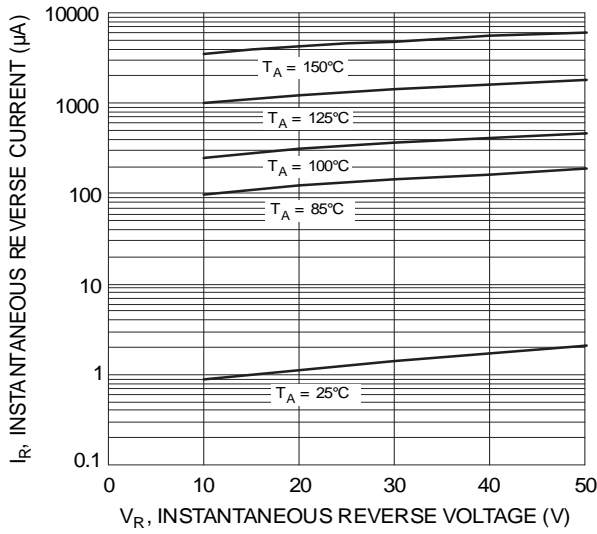


Figure 3 Typical Reverse Characteristics  
B120/B through B140/B

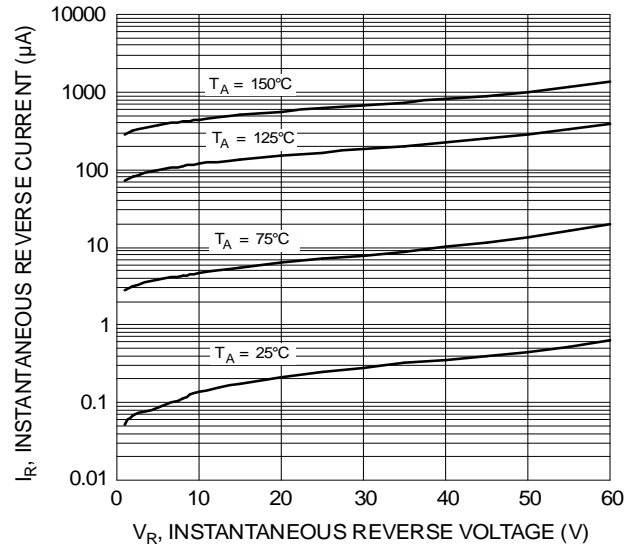


Figure 4 Typical Reverse Characteristics  
B150/B through B160/B

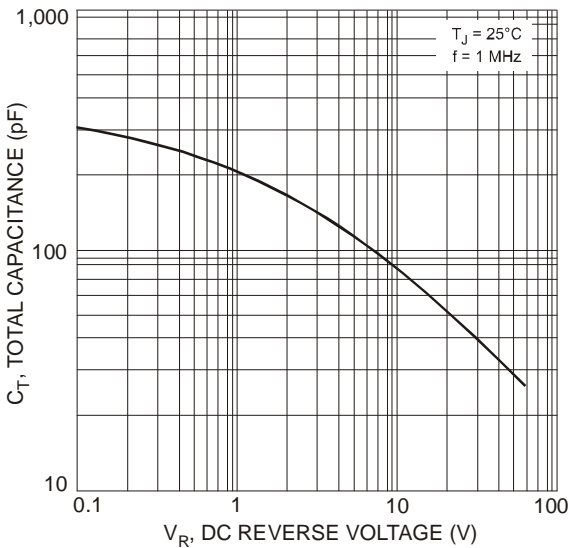


Fig. 5 Total Capacitance vs. Reverse Voltage

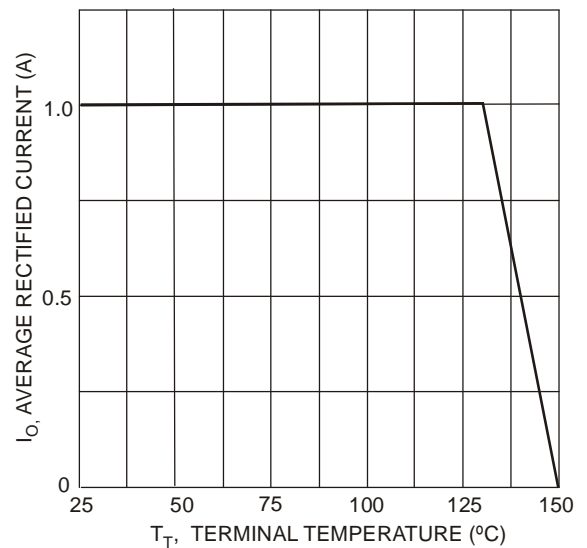


Fig. 6 Forward Current Derating Curve

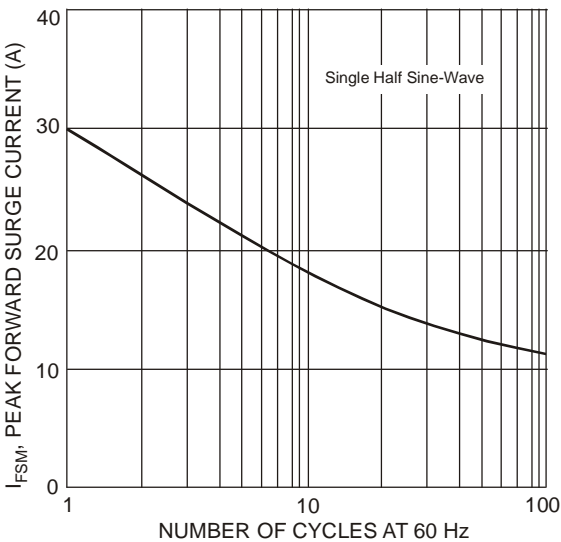
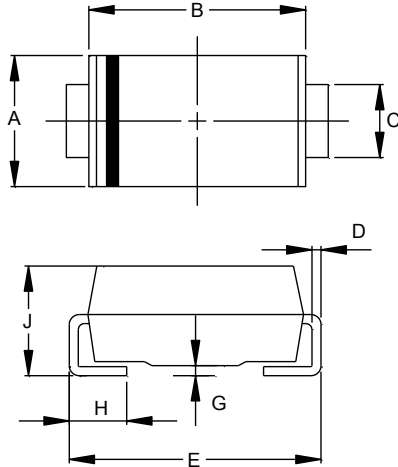


Fig. 7 Max Non-Repetitive Peak Forward Surge Current

## Package Outline Dimensions

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

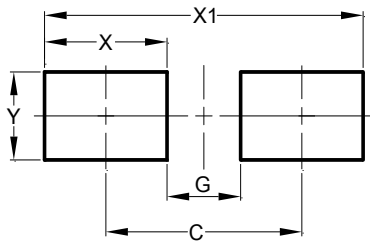


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 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<br>(in mm) | SMB<br>(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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