

## Product Summary

B120/B, B130/B, B140/B

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

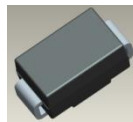
- Polarity protection diodes
- Re-circulating diodes
- Switching diodes

## Features and Benefits

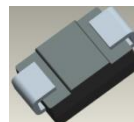
- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- Surge Overload Rating to 30A Peak
- For Use in Low-Voltage, High-Frequency Inverters, Free Wheeling, and Polarity Protection Application
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Package: SMA/SMB
- Package 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

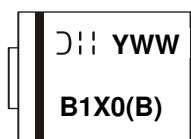
## Ordering Information (Note 4)

| Part Number | Package | Packing |             |
|-------------|---------|---------|-------------|
|             |         | Qty.    | Carrier     |
| B1XX-13-F   | SMA     | 5,000   | Tape & Reel |
| B1XXB-13-F  | 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) & 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



B1X0 = Product Type Marking Code, e.g., B120 (SMA Package)  
 B1X0B = Product Type Marking Code, e.g., B160B (SMB Package)  
 3|| = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 3 for 2023)  
 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 capacitive load, derate current by 20%.

| Characteristic  | Symbol              | B120/B | B130/B | B140/B | B150/B | B160/B | Unit |
|---|---------------------|--------|--------|--------|--------|--------|------|
| Peak Repetitive Reverse Voltage   | V <sub>RRM</sub>    |        |        |        |        |        |      |
| Working Peak Reverse Voltage  | V <sub>RWM</sub>    | 20     | 30     | 40     | 50     | 60     | V    |
| 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<br>Single Half Sine Wave Superimposed on Rated Load | I <sub>FSM</sub>    | 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 <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<br>B120/B, B130/B, B140/B<br>B150/B, B160/B | V <sub>F</sub> | —   | —   | 0.5<br>0.7 | V    | I <sub>F</sub> = 1.0A<br>I <sub>F</sub> = 1.0A  |
| Leakage Current (Note 6)   | I <sub>R</sub> | —   | —   | 0.5<br>10  | mA   | @ Rated V <sub>R</sub> , T <sub>A</sub> = +25°C<br>@ 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: 5. Thermal Resistance: Junction to terminal, unit mounted on PC board with 5.0mm<sup>2</sup> (0.013mm thick) copper pads as heat sink.  
 6. Short duration pulse test used to minimize self-heating effect.

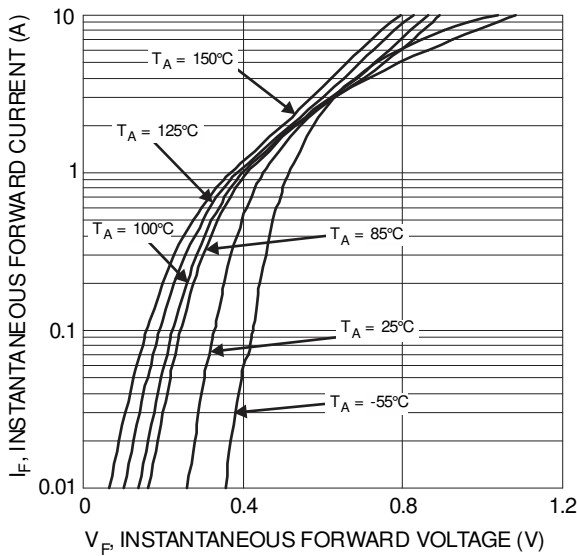


Figure 1. Typical Forward Characteristics

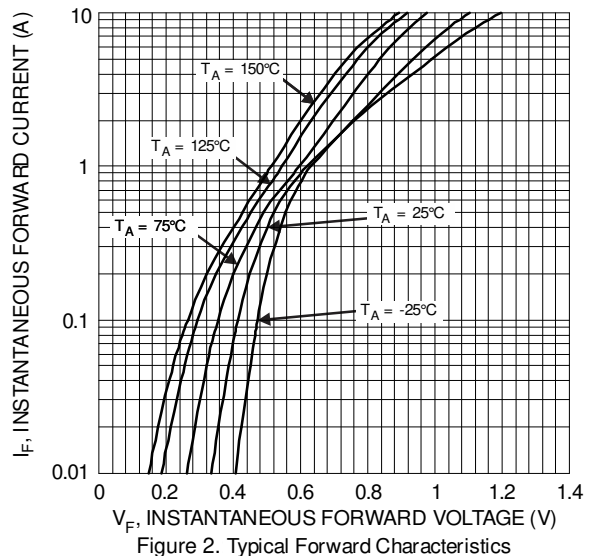


Figure 2. Typical Forward Characteristics  
B150/B through B160/B

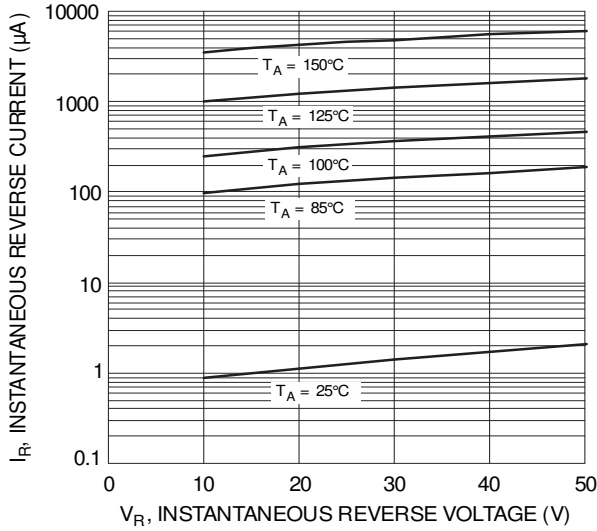


Figure 3. Typical Reverse Characteristics  
B120/B through B140/B

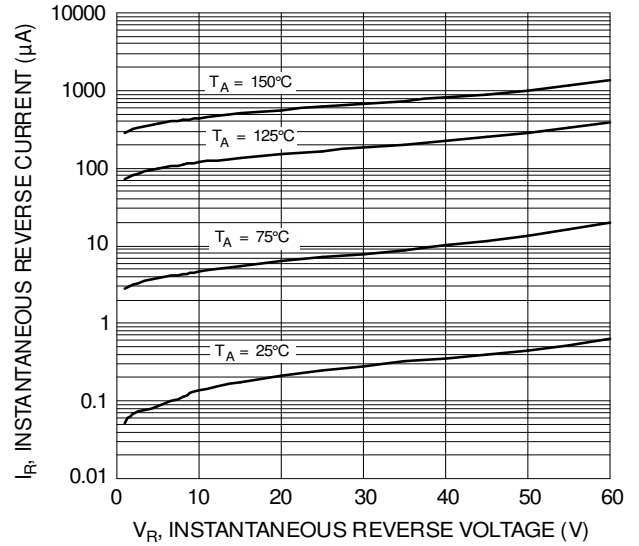


Figure 4. Typical Reverse Characteristics  
B150/B through B160/B

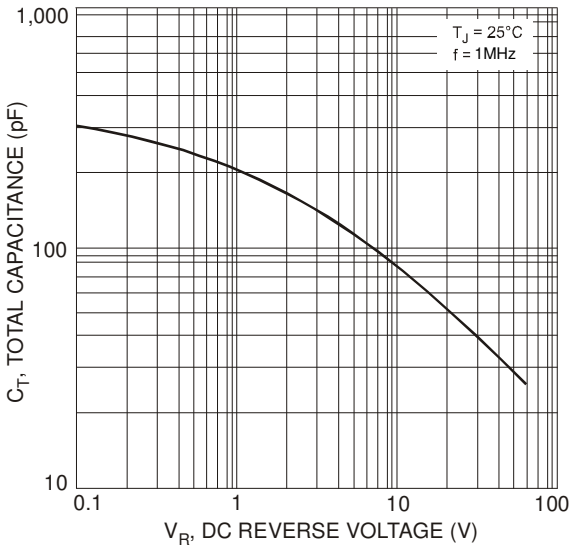


Figure 5. Total Capacitance vs. Reverse Voltage

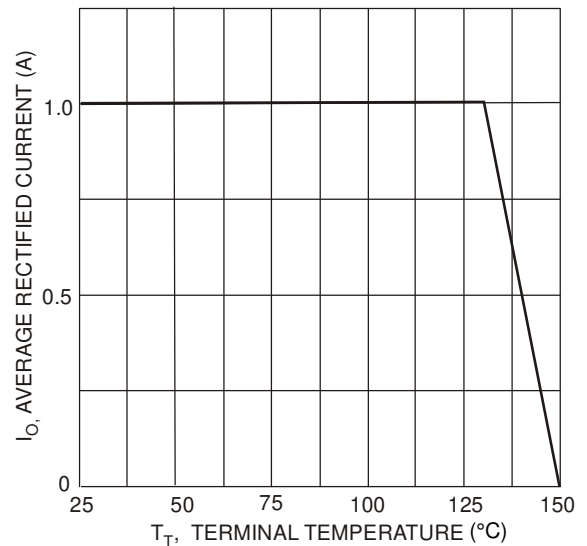


Figure 6. Forward Current Derating Curve

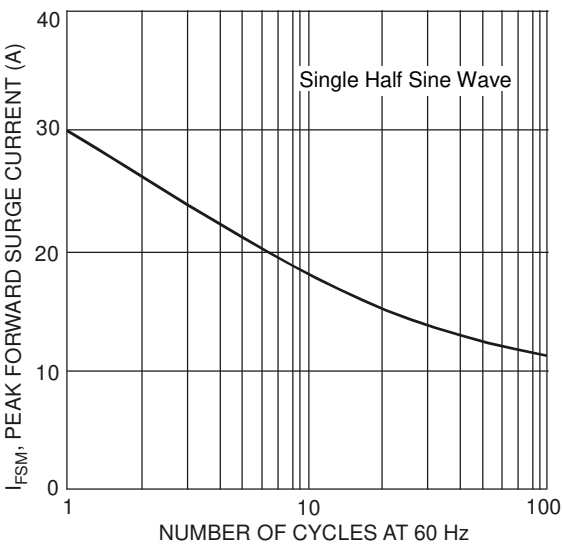
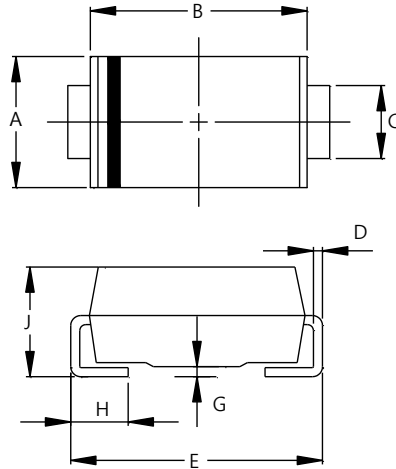


Figure 7. Max Non-Repetitive Peak Forward Surge Current

**Package Outline Dimensions**

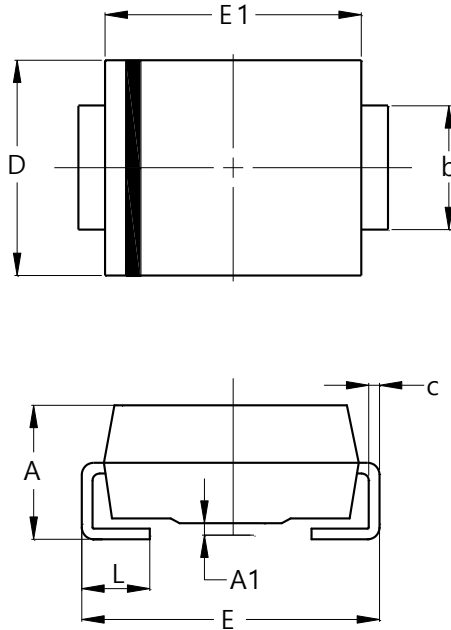
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SMA**



| 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**

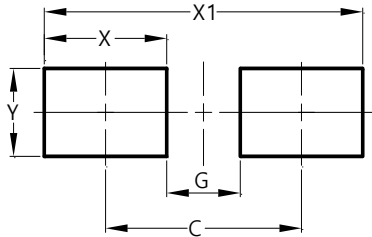


| SMB                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.00 | 2.50 |
| A1                   | 0.05 | 0.20 |
| b                    | 1.96 | 2.21 |
| c                    | 0.15 | 0.31 |
| D                    | 3.30 | 3.94 |
| E                    | 5.00 | 5.59 |
| E1                   | 4.06 | 4.57 |
| L                    | 0.76 | 1.52 |
| All Dimensions in mm |      |      |

**Suggested Pad Layout**

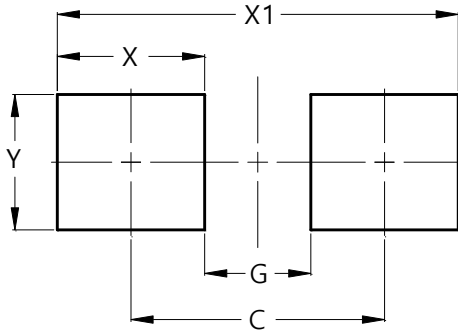
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**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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