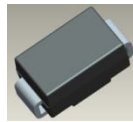


## Features

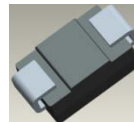
- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- Surge Overload Rating to 30A Peak
- For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Application
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## 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 @3
- Polarity: Cathode Band or Cathode Notch
- Weight: SMA 0.064 grams (approximate)  
SMB 0.093 grams (approximate)



Top View



Bottom View

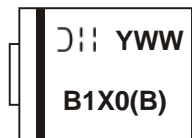
## Ordering Information (Note 5)

| Part Number | Qualification | Case | Packaging        |
|-------------|---------------|------|------------------|
| B1XX-13-F   | Commercial    | SMA  | 5000/Tape & Reel |
| B140Q-13-F  | Automotive    | SMA  | 5000/Tape & Reel |
| B150Q-13-F  | Automotive    | SMA  | 5000/Tape & Reel |
| B1XXB-13-F  | Commercial    | SMB  | 3000/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. Product manufactured with Date Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
  5. 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)  
 D|| = Manufacturers' code marking  
 YWW = Date code marking  
 Y = Last digit of year (ex: 2 for 2002)  
 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              | 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 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 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<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   |
| Leakage Current (Note 7)   | 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: 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.

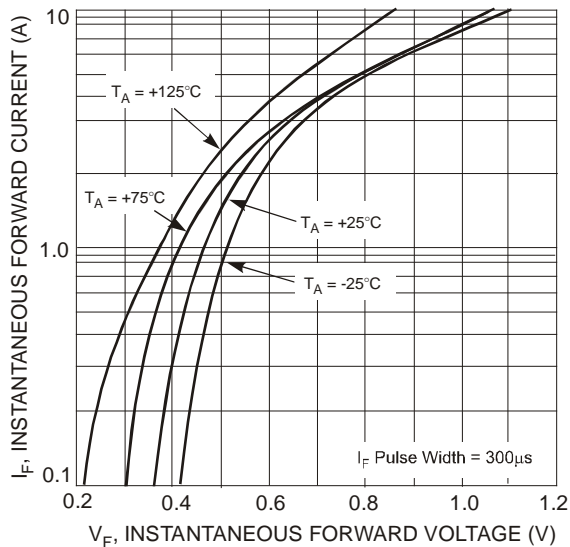


Fig. 1 Typical Forward Characteristics - B120/B thru B140/B

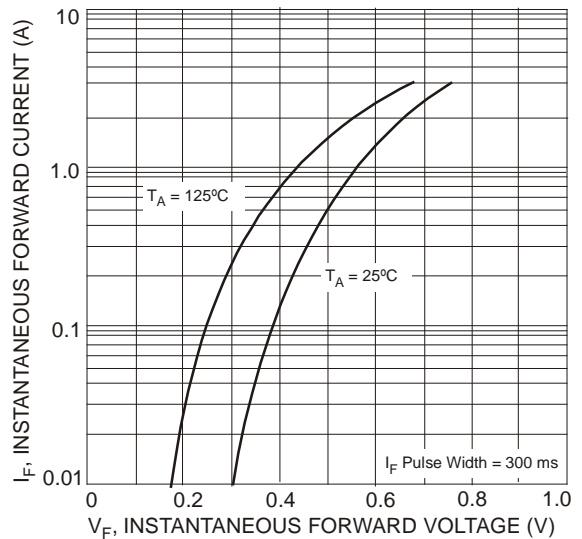


Fig. 2 Typical Forward Characteristics - B150/B thru B160/B

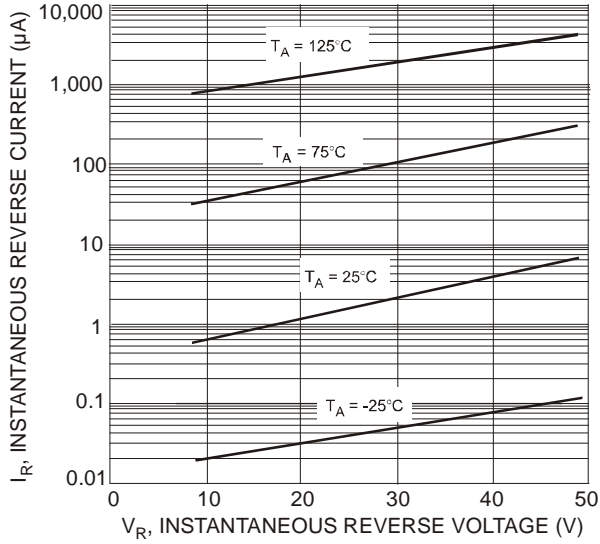


Fig. 3 Typical Reverse Characteristics, B120/B thru B140/B

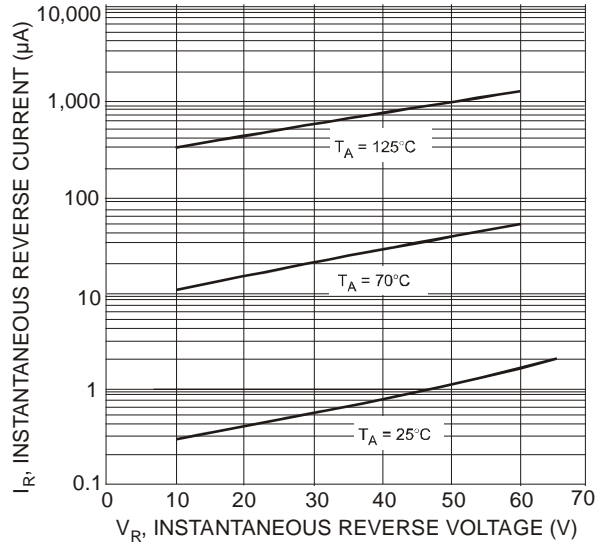


Fig. 4 Typical Reverse Characteristics, B150/B thru B160/B

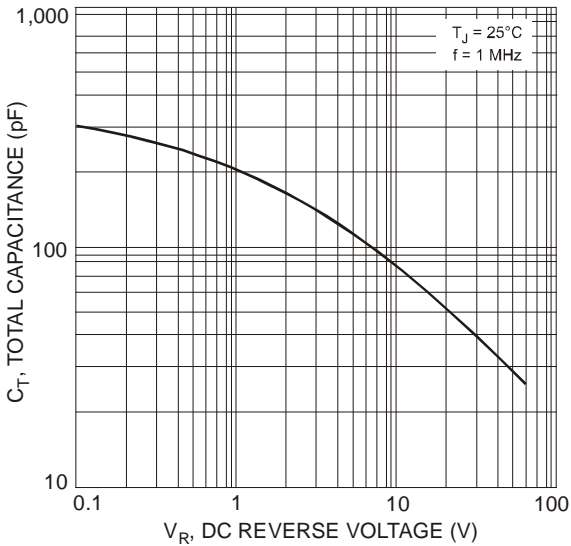


Fig. 5 Total Capacitance vs. Reverse Voltage

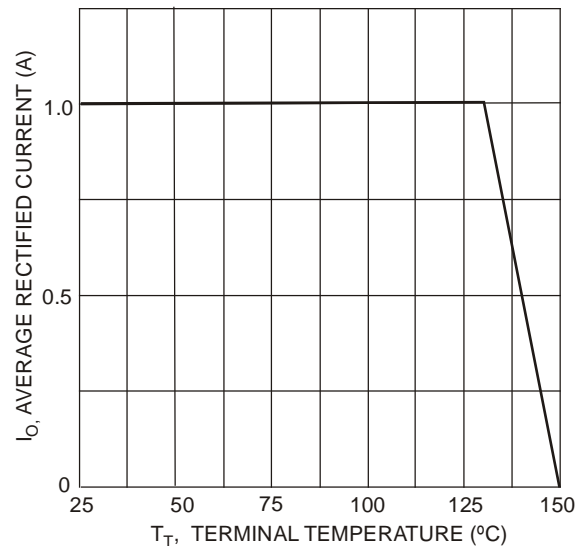


Fig. 6 Forward Current Derating Curve

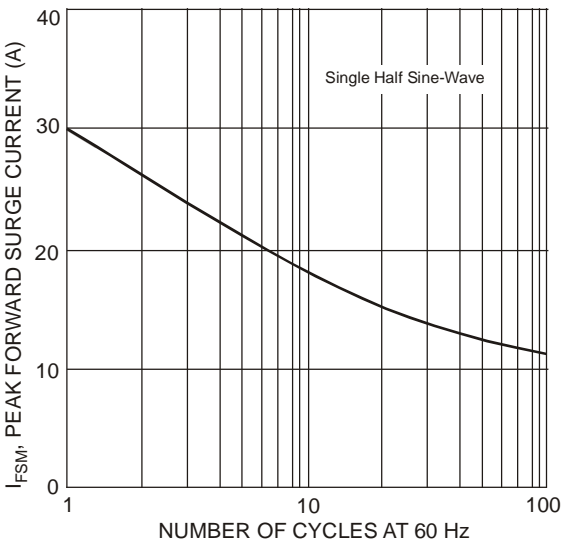
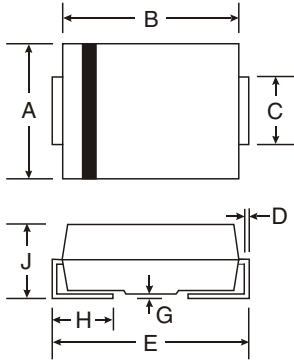


Fig. 7 Max Non-Repetitive Peak Forward Surge Current

## Package Outline Dimensions

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

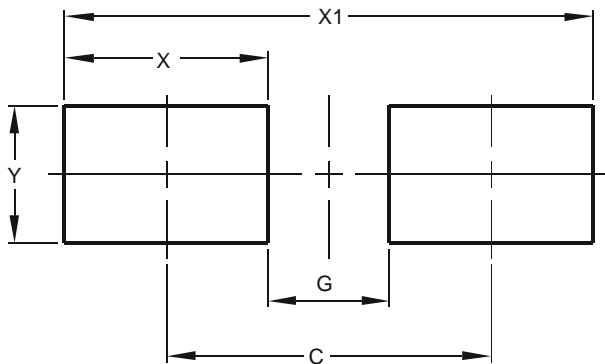


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.01 | 2.30 |
| 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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> 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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