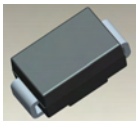
# 1.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER

## Features

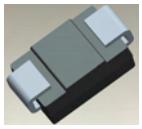
- Guard Ring Die Construction for Transient Protection
- Ideally Suited for Automated Assembly
- Low Power Loss, High Efficiency
- Surge Overload Rating to 30A Peak
- For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Application
- **Lead-Free Finish; RoHS Compliant (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 e3
- Polarity: Cathode Band or Cathode Notch
- Weight: SMA 0.064 grams (approximate)
  SMB 0.093 grams (approximate)



Top View



Bottom View

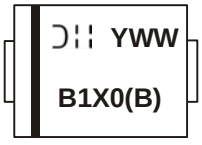
## Ordering Information (Note 5)

| Part Number | Case | Packaging |
|---|---|---|
| B1XX-13-F | SMA | 5000/Tape & Reel |
| B150Q-13-F | SMA | 5000/Tape & Reel |
| B1XXB-13-F | 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 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.

## Marking Information




B1X0 = Product type marking code, ex: B120 (SMA package)
B1X0B = Product type marking code, ex: B160B (SMB package)
= Manufacturers' code marking
YWW = Date code marking
Y = Last digit of year (ex: 2 for 2002)
WW = Week code (01 to 53)

## Maximum Ratings (@$T_A$ = +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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 20 | 30 | 40 | 50 | 60 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 14 | 21 | 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<br>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 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 | B120/B, B130/B, B140/B<br>B150/B, B160/B | $V_F$ | -<br>- | -<br>- | 0.5<br>0.7 | V | $I_F$ = 1.0A<br>$I_F$ = 1.0A |
| Leakage Current (Note 7) | | $I_R$ | -<br>- | -<br>- | 0.5<br>10 | mA | @ Rated $V_R$, $T_A$ = +25°C<br>@ 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.

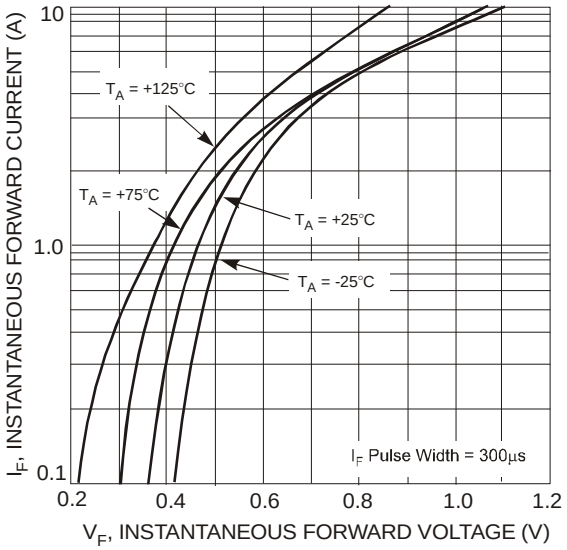



Fig. 1 Typical Forward Characteristics - B120/B thru B140/B

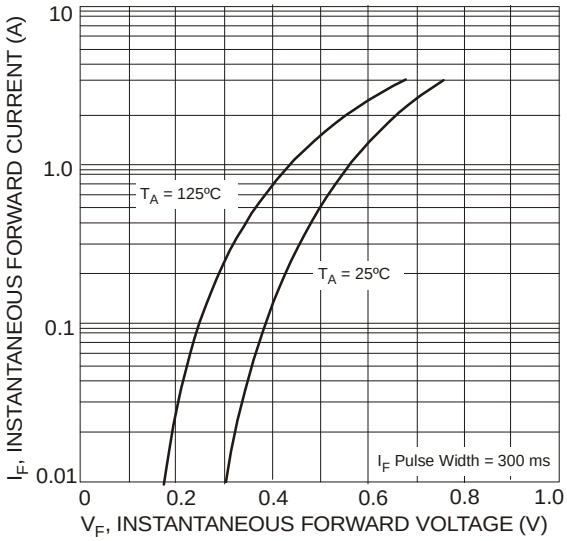



Fig. 2 Typical Forward Characteristics - B150/B thru B160/B

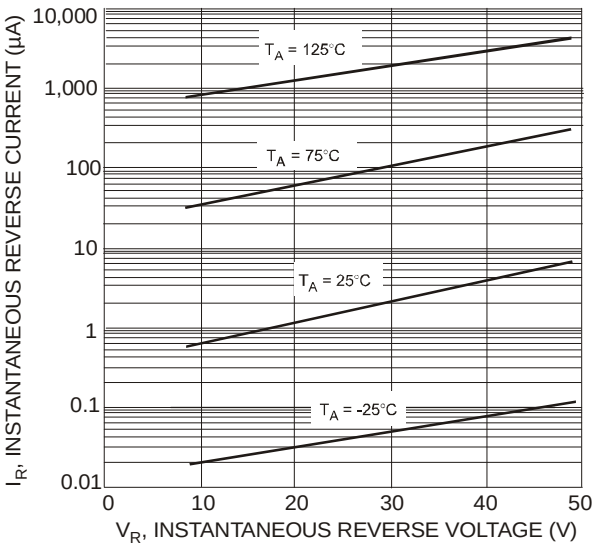



Fig. 3 Typical Reverse Characteristics, B120/B thru B140/B

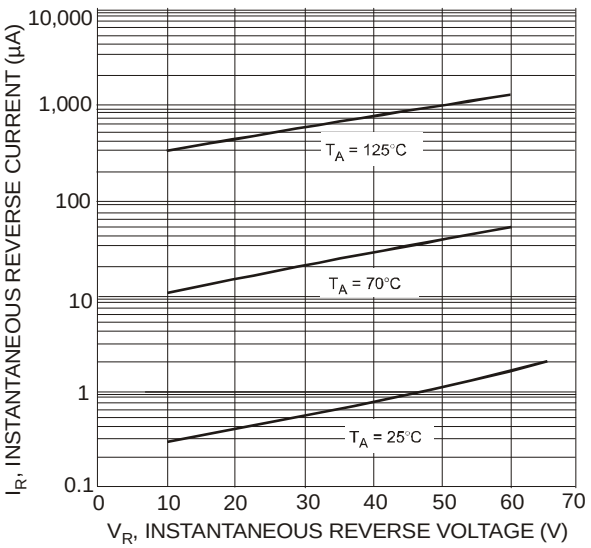



Fig. 4 Typical Reverse Characteristics, B150/B thru B160/B

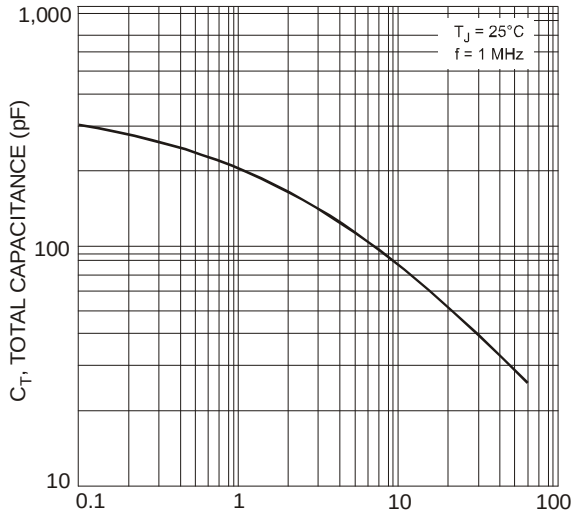



Fig. 5 Total Capacitance vs. Reverse Voltage

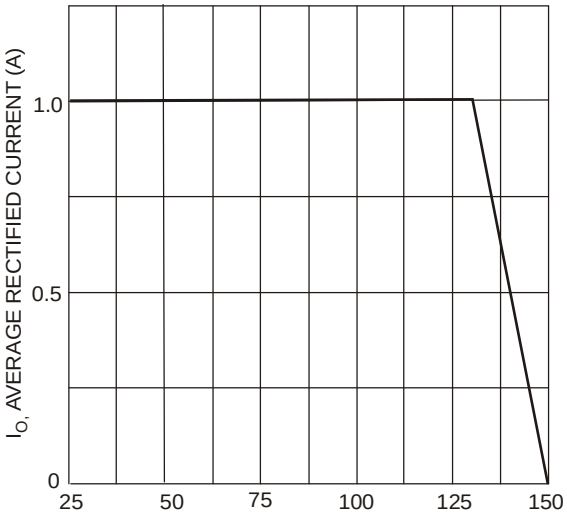



Fig. 6 Forward Current Derating Curve

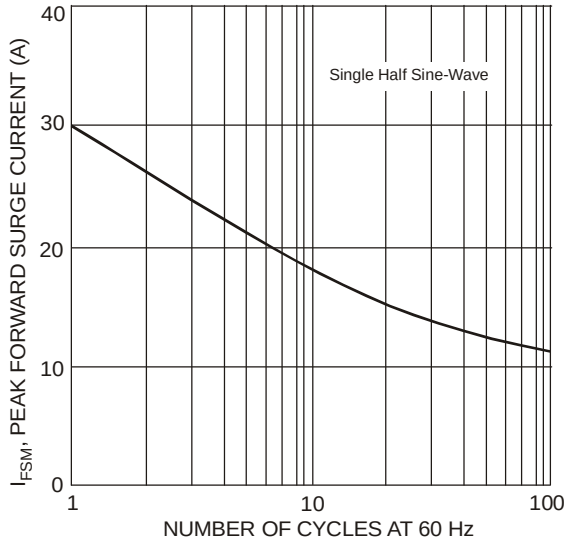
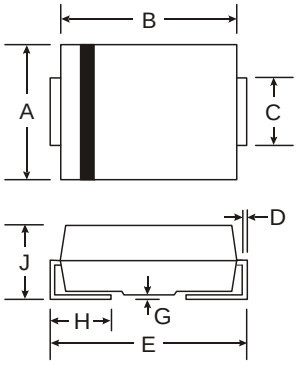



Fig. 7 Max Non-Repetitive Peak Forward Surge Current

## Package Outline Dimensions

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

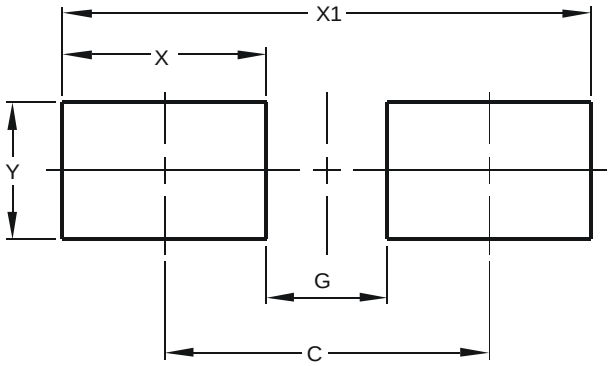



| SMA | | |
|---|---|---|
| Dim | Min | Max |
| A | 2.29 | 2.92 |
| B | 4.00 | 4.60 |
| C | 1.27 | 1.63 |
| D | 0.15 | 0.31 |
| E | 4.80 | 5.59 |
| G | 0.05 | 0.20 |
| H | 0.76 | 1.52 |
| J | 2.01 | 2.30 |
| All Dimensions in mm | | |

| 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 (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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