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**Product Summary**

| $V_{RRM}$ (V) | $I_o$ (A) | $V_{F(MAX)}$ (V)<br>@+25°C | $I_{R(MAX)}$ (mA)<br>@+25°C |
|---------------|-----------|----------------------------|-----------------------------|
| 120           | 12        | 0.83                       | 0.2                         |

**Features and Benefits**

- Low Forward Voltage Drop ( $V_F$ ) Helps – Minimizes Power Losses
- Ultra Low Reverse Leakage ( $I_R$ ) Stability at Higher Temperatures
- Thermally Efficient Package for Cooler Running Applications
- Less Than 1.1mm Package Profile Ideal for Thin Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

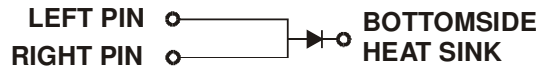
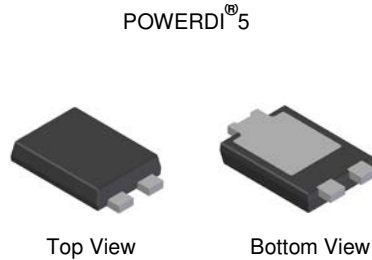
**Description and Applications**

Packaged in the compact thermally efficient POWERDI<sup>®</sup>5 package, SBR12M120P5 provides ultra-low reverse leakage stability at high temperatures and provides low forward voltage drop ( $V_F$ ). It is ideal for use as a rectification, freewheeling or polarity protection diode in applications such as:

- >10W AC/DC Adaptors/Chargers
- DC/DC Converters

**Mechanical Data**

- Case: POWERDI<sup>®</sup>5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)



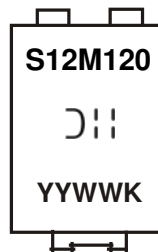
**Note: Pins Left & Right must be electrically connected at the printed circuit board.**

**Ordering Information** (Note 4)

| Part Number              | Case                   | Packaging        |
|--------------------------|------------------------|------------------|
| SBR12M120P5-13           | POWERDI <sup>®</sup> 5 | 5000/Tape & Reel |
| SBR12M120P5-13D (Note 5) | POWERDI <sup>®</sup> 5 | 5000/Tape & Reel |

- 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>.
  5. POWERDI<sup>®</sup>5 available in 5K quantity on 13inch reel & 12mm tape, part number suffix "13D".

**Marking Information**



S12M120 = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 15 = 2015)  
 WW = Week Code (01 to 53)  
 K = Factory Designator

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Characteristic   | Symbol    | Value | Unit |
|--|-----------|-------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$ | 120   | V    |
| Average Rectified Output Current   | $I_O$     | 12    | A    |
| Non-Repetitive Peak Forward Surge Current 8.3mS  | $I_{FSM}$ | 300   | A    |

**Thermal Characteristics**

| Characteristic  | Symbol          | Value       | Unit                      |
|---|-----------------|-------------|---------------------------|
| Typical Thermal Resistance Junction to Ambient (Note 6) | $R_{\theta JA}$ | 18          | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range                 | $T_J, T_{STG}$  | -55 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     | $V_F$  | —   | 0.75 | 0.83<br>0.71 | V    | $I_F = 12\text{A}, T_A = +25^\circ\text{C}$<br>$I_F = 12\text{A}, T_A = +125^\circ\text{C}$   |
| Leakage Current (Note 7) | $I_R$  | —   | 0.01 | 0.2<br>30    | mA   | $V_R = 120\text{V}, T_A = +25^\circ\text{C}$<br>$V_R = 120\text{V}, T_A = +125^\circ\text{C}$ |

Notes: 6. Device mounted on FR-4 substrate PC board 16\*MRP.  
7. Short duration pulse test used to minimize self-heating effect.

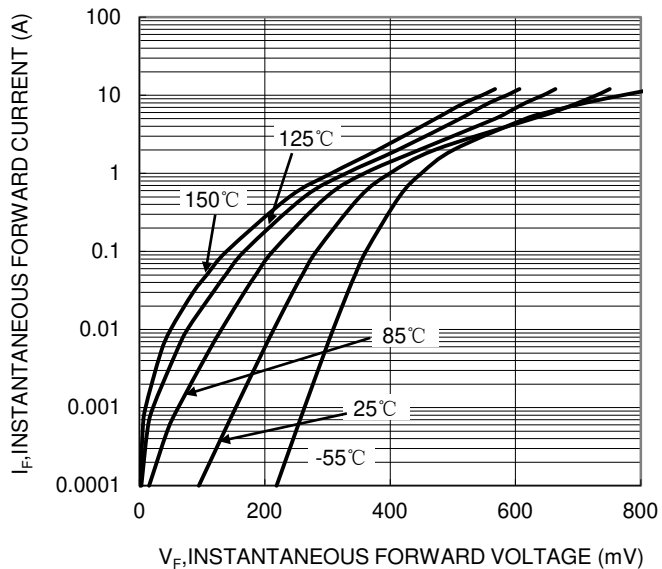


Figure 1. Typical Forward Characteristics

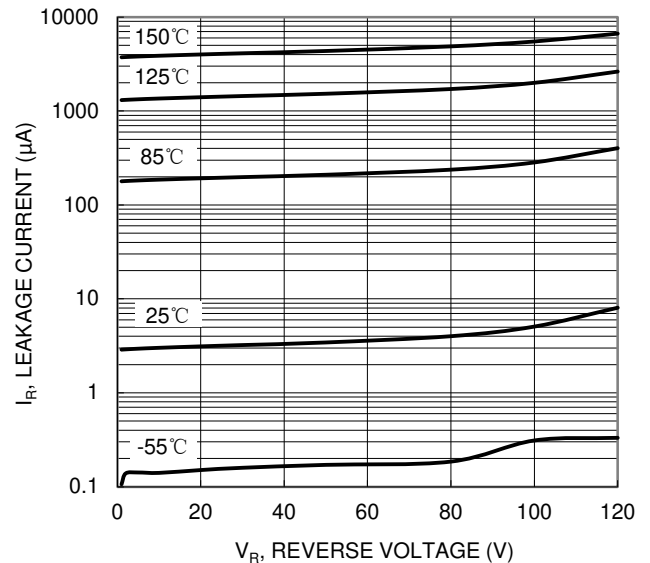


Figure 2. Typical Reverse Characteristics

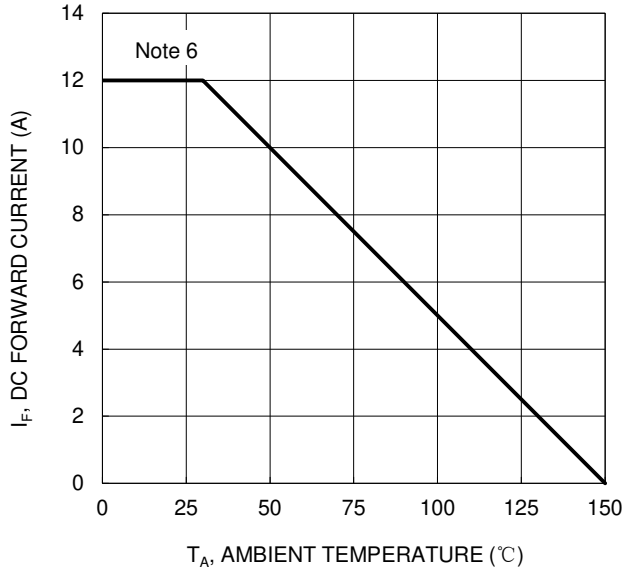


Figure 3. DC Forward Current Derating

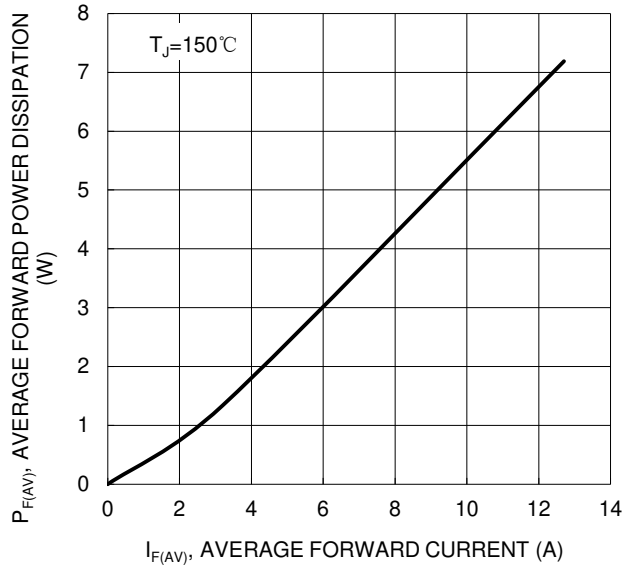


Figure 4. Forward Power Dissipation

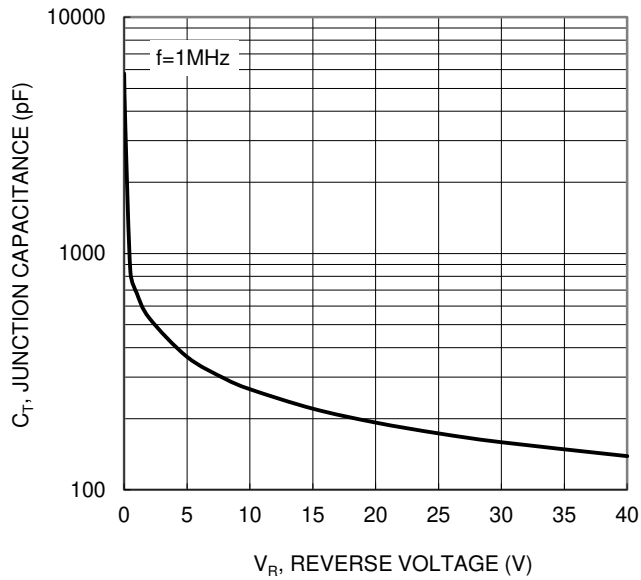
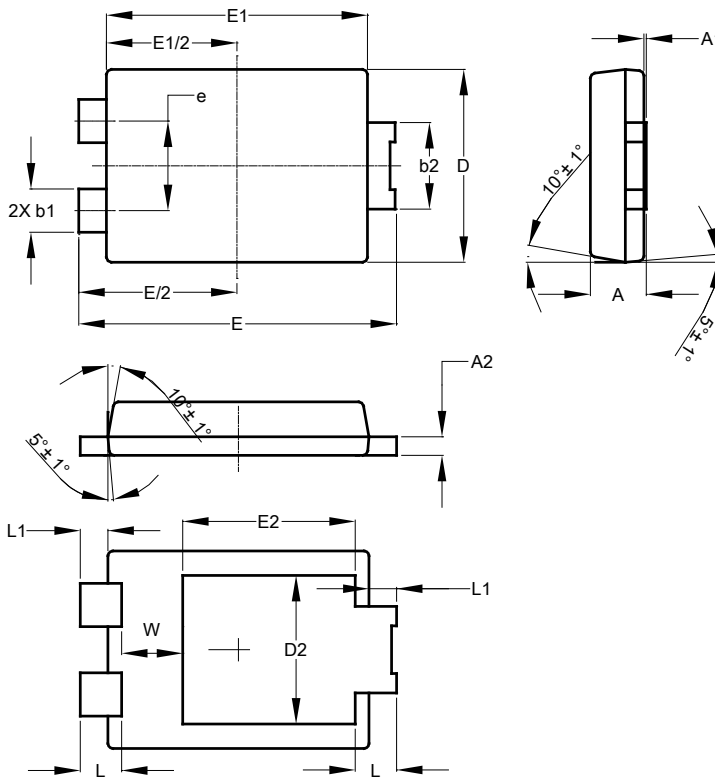


Figure 5. Typical Junction Capacitance

**Package Outline Dimensions**

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

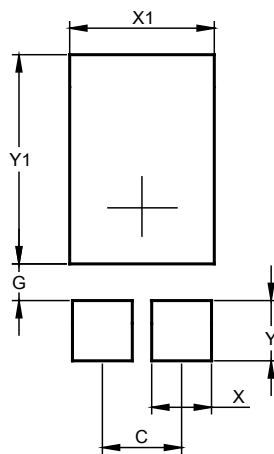


| POWERDI <sup>®</sup> 5 |      |      |       |
|------------------------|------|------|-------|
| Dim                    | Min  | Max  | Typ   |
| A                      | 1.05 | 1.15 | 1.10  |
| A1                     | 0.00 | 0.05 | --    |
| A2                     | 0.33 | 0.43 | 0.381 |
| b1                     | 0.80 | 0.99 | 0.89  |
| b2                     | 1.70 | 1.88 | 1.78  |
| D                      | 3.90 | 4.05 | 3.966 |
| D2                     | --   | --   | 3.054 |
| E                      | 6.40 | 6.60 | 6.504 |
| e                      | --   | --   | 1.84  |
| E1                     | 5.30 | 5.45 | 5.37  |
| E2                     | --   | --   | 3.549 |
| L                      | 0.75 | 0.95 | 0.85  |
| L1                     | 0.50 | 0.65 | 0.57  |
| W                      | 1.10 | 1.41 | 1.255 |
| All Dimensions in mm   |      |      |       |

NEW PRODUCT

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.840         |
| G          | 0.852         |
| X          | 1.390         |
| X1         | 3.360         |
| Y          | 1.400         |
| Y1         | 4.860         |

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