

## Product Summary (@ T<sub>A</sub> = +25°C)

| V <sub>RRM</sub> (V) | I <sub>o</sub> (A) | V <sub>F</sub> Max (V) @ +25°C | I <sub>R</sub> Max (mA) @ +25°C |
|----------------------|--------------------|--------------------------------|---------------------------------|
| 60                   | 3                  | 0.60                           | 0.06                            |

## Description & Applications

Packaged in the compact thermally efficient PowerDI<sup>®</sup>5, the SBR3U60P5Q provides low V<sub>F</sub> and low reverse leakage at high temperatures. It is ideal for use in the following applications:

- Bridge diodes
- Freewheeling diodes
- Blocking diodes
- Reverse protection diodes

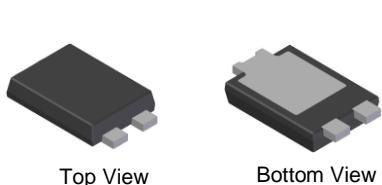
## Features and Benefits

- Very Low-Forward Voltage Drop
- Excellent High-Temperature Stability
- Patented SBR<sup>®</sup> technology provides superior avalanche capability than Schottky diodes, ensuring more rugged and reliable end applications
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- The SBR3U60P5Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Package: PowerDI5
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)



PowerDI5

LEFT PIN    o    BOTTOMSIDE  
RIGHT PIN    o    HEAT SINK

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

## Ordering Information (Note 4)

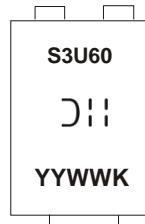
| Orderable Part Number   | Package  | Packing |             |
|-------------------------|----------|---------|-------------|
|                         |          | Qty.    | Carrier     |
| SBR3U60P5Q-13           | PowerDI5 | 5,000   | Tape & Reel |
| SBR3U60P5Q-13D (Note 5) | PowerDI5 | 5,000   | Tape & Reel |
| SBR3U60P5Q-7 (Note 5)   | PowerDI5 | 1,500   | Tape & Reel |
| SBR3U60P5Q-7D (Note 5)  | PowerDI5 | 1,500   | Tape & Reel |

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/>.
5. PowerDI5 available in 5k quantity on 13 inch reel & 12mm tape, part number suffix "13D"; 1.5k quantity on 7 inch reel, part number suffix "7". Diodes Incorporated also provides 12mm tape with 7 inch reel, part number suffix "7D".

## Marking Information

PowerDI5



DII = Manufacturers' Marking  
S3U60 = Product Type Marking Code  
YYWW = Date Code Marking  
YY = Last Two Digits of Year (ex: 25 = 2025)  
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   |           |       |      |
| Working Peak Reverse Voltage  | $V_{RRM}$ | 60    | V    |
| DC Blocking Voltage   |           |       |      |
| Average Rectified Output Current  | $I_o$     | 3     | A    |
| Non-Repetitive Avalanche Energy<br>( $T_J = +25^\circ\text{C}$ , $I_{AS} = 2\text{A}$ , $L = 50\text{mH}$ ) | $E_{AS}$  | 120   | mJ   |
| Non-Repetitive Peak Forward Surge Current 8.3ms   | $I_{FSM}$ | 80    | A    |

**Thermal Characteristics**

| Characteristic                          | Symbol          | Value       | Unit                      |
|---|-----------------|-------------|---------------------------|
| Typical Thermal Resistance (Note 6)     | $R_{\theta JA}$ | 95          | $^\circ\text{C}/\text{W}$ |
| Typical Thermal Resistance (Note 7)     | $R_{\theta JA}$ | 35          | $^\circ\text{C}/\text{W}$ |
| Typical Thermal Resistance (Note 6)     | $R_{\theta JC}$ | 15          | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range | $T_J, T_{STG}$  | -55 to +175 | $^\circ\text{C}$          |

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

| Characteristic           | Symbol   | Min | Typ   | Max  | Unit | Test Condition   |
|--------------------------|----------|-----|-------|------|------|--|
| Forward Voltage Drop     | $V_F$    | —   | 0.43  | —    | V    | $I_F = 1.5\text{A}, T_J = +25^\circ\text{C}$                         |
|                          |          | —   | 0.53  | 0.60 |      | $I_F = 3.0\text{A}, T_J = +25^\circ\text{C}$                         |
|                          |          | —   | 0.40  | —    |      | $I_F = 1.5\text{A}, T_J = +125^\circ\text{C}$                        |
|                          |          | —   | 0.52  | —    |      | $I_F = 3.0\text{A}, T_J = +125^\circ\text{C}$                        |
| Leakage Current (Note 8) | $I_R$    | —   | 0.009 | 0.06 | mA   | $V_R = 60\text{V}, T_J = +25^\circ\text{C}$                          |
| Total Capacitance        | $C_T$    | —   | 2.7   | 15   | pF   | $V_R = 60\text{V}, T_J = +125^\circ\text{C}$                         |
|                          |          | —   | 110   | —    |      | $V_R = 4\text{V}, T_J = +25^\circ\text{C}, f = 1\text{MHz}$          |
| Switching Speed $t_{RR}$ | $t_{RR}$ | —   | 13    | —    | ns   | $I_F = 0.5\text{A}, I_R = 1\text{A}, I_{RR} = 0.25\text{A}$<br>(RG1) |

Notes:

6. Device mounted on FR-4 PCB, 2oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
7. Device mounted on 2 inch x 2 inch Al board.
8. Short duration pulse test used to minimize self-heating effect.

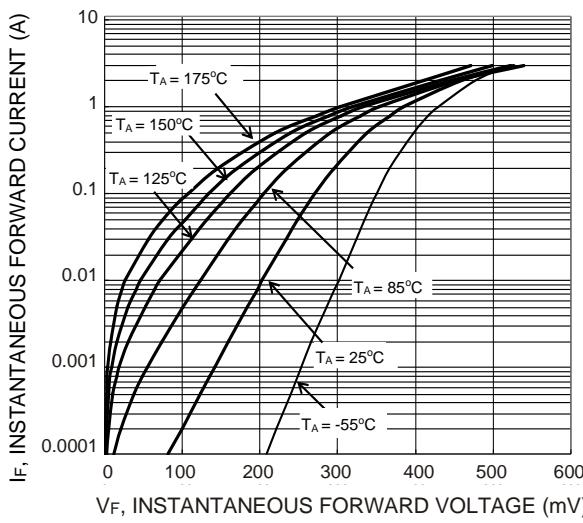


Figure 1 Typical Forward Characteristics

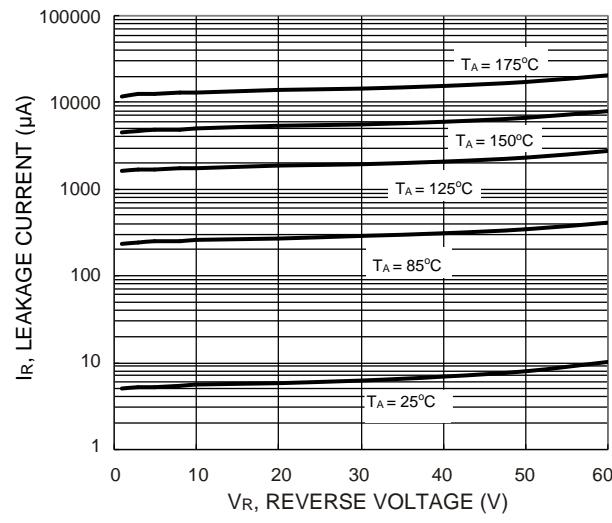
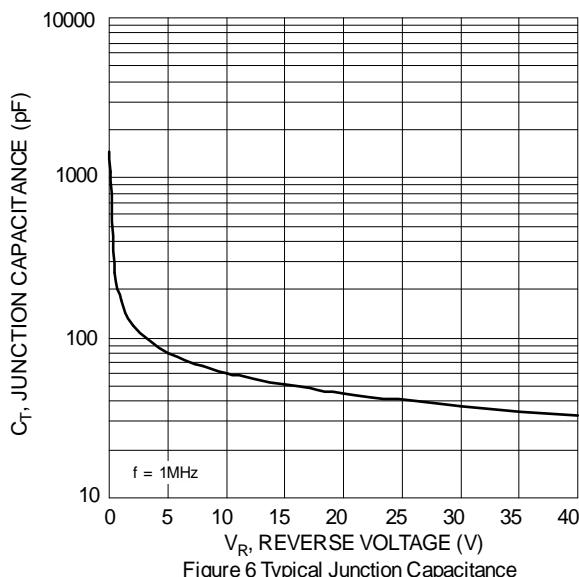
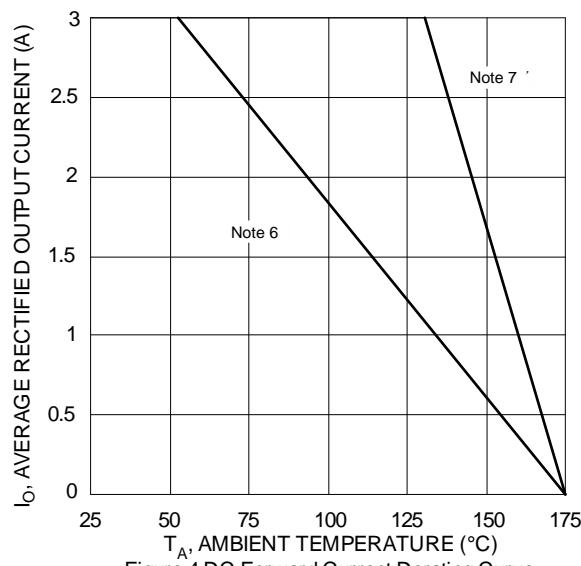
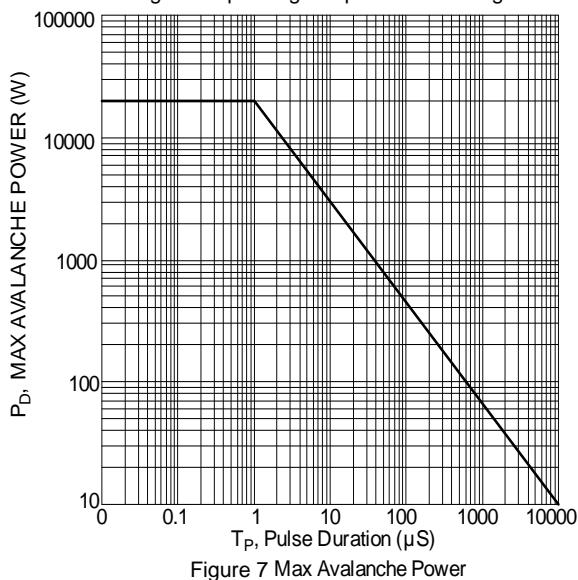
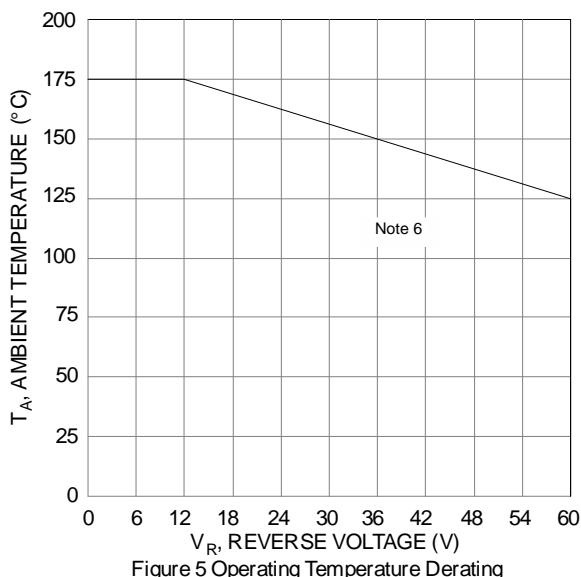
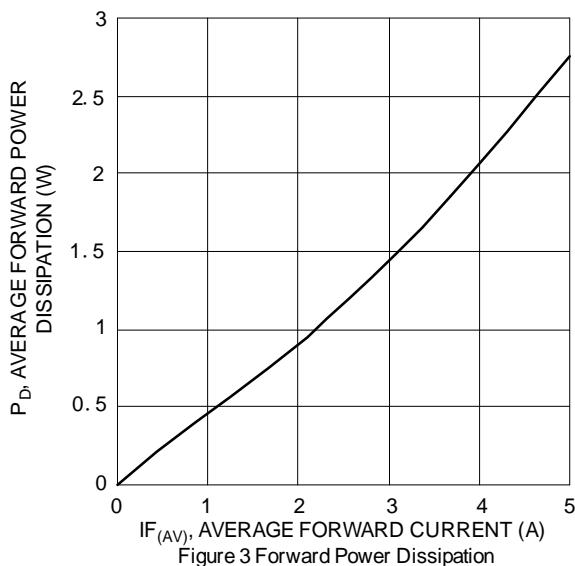


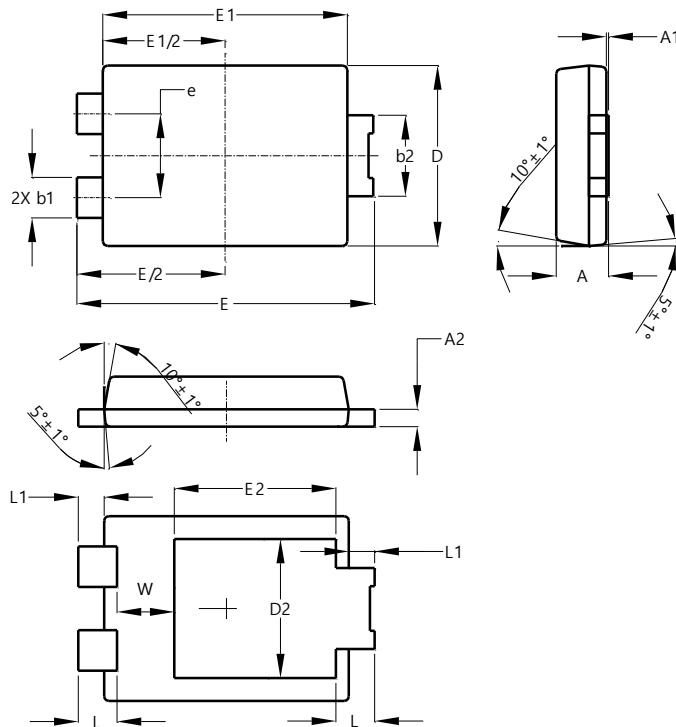
Figure 2 Typical Reverse Characteristics



## Package Outline Dimensions

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

**PowerDI5**



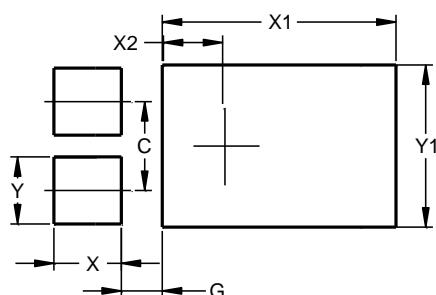
| PowerDI5  |      |      |       |
|-----------|------|------|-------|
| Dim       | Min  | Max  | Typ   |
| <b>A</b>  | 1.05 | 1.15 | 1.10  |
| <b>A1</b> | 0.00 | 0.05 | --    |
| <b>A2</b> | 0.33 | 0.43 | 0.381 |
| <b>b1</b> | 0.80 | 0.99 | 0.89  |
| <b>b2</b> | 1.70 | 1.88 | 1.78  |
| <b>D</b>  | 3.90 | 4.05 | 3.966 |
| <b>D2</b> | --   | --   | 3.054 |
| <b>E</b>  | 6.40 | 6.60 | 6.51  |
| <b>e</b>  | --   | --   | 1.84  |
| <b>E1</b> | 5.30 | 5.45 | 5.37  |
| <b>E2</b> | --   | --   | 3.549 |
| <b>L</b>  | 0.75 | 0.95 | 0.85  |
| <b>L1</b> | 0.50 | 0.65 | 0.57  |
| <b>W</b>  | 1.10 | 1.41 | 1.255 |

All Dimensions in mm

## Suggested Pad Layout

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

**PowerDI5**



| Dimensions | Value (in mm) |
|------------|---------------|
| <b>C</b>   | 1.840         |
| <b>G</b>   | 0.852         |
| <b>X</b>   | 1.400         |
| <b>X1</b>  | 4.860         |
| <b>X2</b>  | 1.310         |
| <b>Y</b>   | 1.390         |
| <b>Y1</b>  | 3.360         |

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