

## Product Summary (Per Leg)

| $V_{RRM}$ (V) | $I_O$ (A) | $V_{F(MAX)}$ (V)<br>@ +25°C | $I_{R(MAX)}$ (mA)<br>@ +25°C |
|---------------|-----------|-----------------------------|------------------------------|
| 200           | 20        | 0.93                        | 0.2                          |

## Description and Applications

Packaged in the robust industry-standard TO263AB (D2PAK) package, the SBR40U200CTBQ provides very low  $V_F$  and excellent reverse leakage stability at high temperatures. They are ideal for use as a rectifier, freewheel diode or blocking diode in:

- SMPS
- DC-DC Converters
- AC-DC Adaptors

TO263AB (D2PAK)



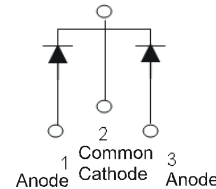
Top View

## Features and Benefits

- Ultra Low Forward Voltage Drop
- Low Leakage Current
- Excellent High-Temperature Stability
- Patented Super Barrier Rectifier SBR® Technology
- Soft, Fast Switching Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: TO263AB
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish. Solderable per MIL-STD-202, Method 208 **e3**
- Polarity: See Below
- Weight: 1.6 grams (Approximate)



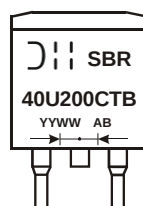
Package Pin Out Configuration

## Ordering Information (Note 5)

| Part Number      | Compliance | Case            | Packaging       |
|------------------|------------|-----------------|-----------------|
| SBR40U200CTBQ    | Automotive | TO263AB (D2PAK) | 50/Tube         |
| SBR40U200CTBQ-13 | Automotive | TO263AB (D2PAK) | 800/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Please refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



JII = Manufacturers' Code Marking  
 SBR40U200CTB = Product Type Marking Code  
 AB = Foundry and Assembly Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 19 = 2019)  
 WW = Week (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                                                  | Value    | Unit |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage              | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>RM</sub> | 200      | V    |
| Average Rectified Output Current (Per Leg)<br>(Total)                                               | I <sub>O</sub>                                          | 20<br>40 | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | I <sub>FSM</sub>                                        | 280      | A    |

**Thermal Characteristics** (Per Leg)

| Characteristic                                             | Symbol                            | Value       | Unit |
|------------------------------------------------------------|-----------------------------------|-------------|------|
| Typical Thermal Resistance, Junction to Case (Note 6)      | R <sub>θJC</sub>                  | 14          | °C/W |
| Typical Thermal Resistance, Junction to Ambient (Note 6)   | R <sub>θJA</sub>                  | 60          | °C/W |
| Typical Thermal Resistance, Junction to Ambient (Note 7)   | R <sub>θJA</sub>                  | 15          | °C/W |
| Typical Thermal Resistance, Junction to Lead (Cathode Tab) | R <sub>θJL</sub>                  | 3           | °C/W |
| Operating and Storage Temperature Range                    | T <sub>J</sub> , T <sub>STG</sub> | -65 to +175 | °C   |

**Electrical Characteristics** (Per Leg) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                | Symbol          | Min    | Typ          | Max          | Unit | Test Condition                                                                                  |
|-------------------------------|-----------------|--------|--------------|--------------|------|-------------------------------------------------------------------------------------------------|
| Forward Voltage Drop (Note 8) | V <sub>F</sub>  | —<br>— | 0.85<br>0.70 | 0.93<br>0.75 | V    | I <sub>F</sub> = 20A, T <sub>J</sub> = +25°C<br>I <sub>F</sub> = 20A, T <sub>J</sub> = +125°C   |
| Leakage Current (Note 8)      | I <sub>R</sub>  | —<br>— | —<br>—       | 0.2<br>40    | mA   | V <sub>R</sub> = 200V, T <sub>J</sub> = +25°C<br>V <sub>R</sub> = 200V, T <sub>J</sub> = +125°C |
| Junction Capacitance          | C <sub>J</sub>  | —      | 500          | —            | pF   | V <sub>R</sub> = 4V, T <sub>J</sub> = +25°C                                                     |
| Switching Speed               | t <sub>RR</sub> | —      | 26           | —            | ns   | I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1A, I <sub>RR</sub> = 0.25A (RG1)                       |

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

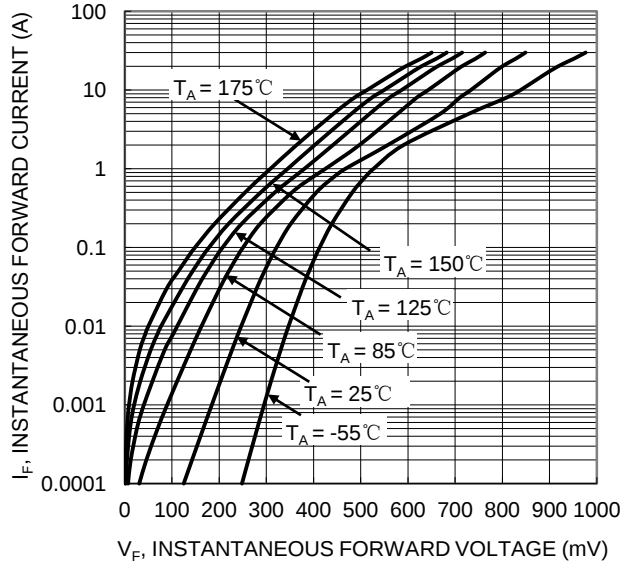


Figure 1. Typical Forward Characteristics

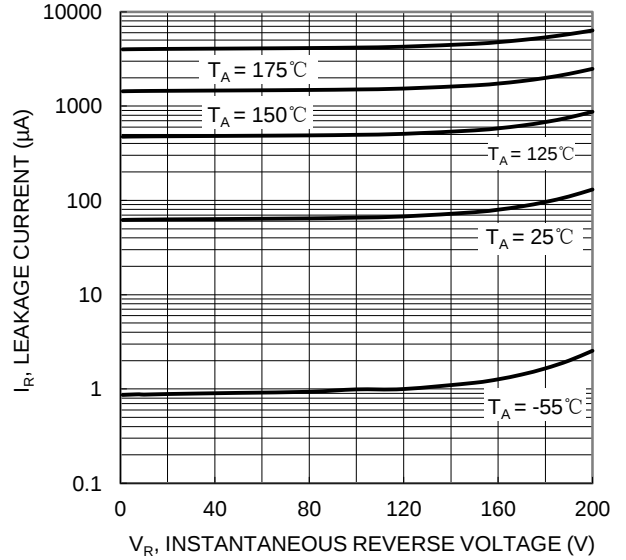


Figure 2. Typical Reverse Characteristics

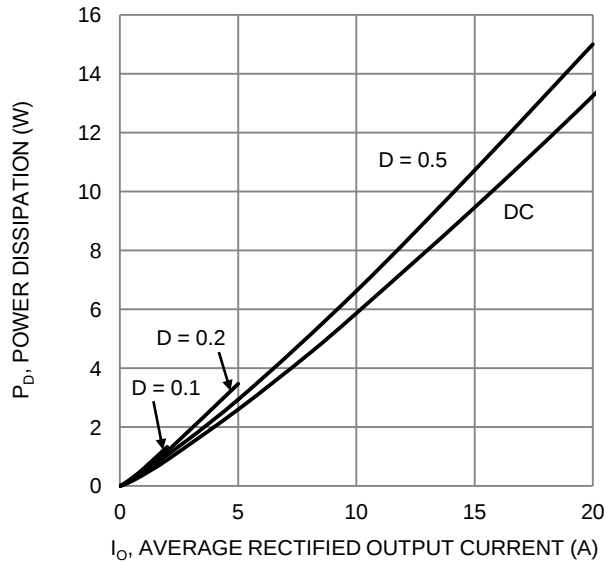


Figure 3. Forward Power Dissipation  $T_J = 125^\circ\text{C}$

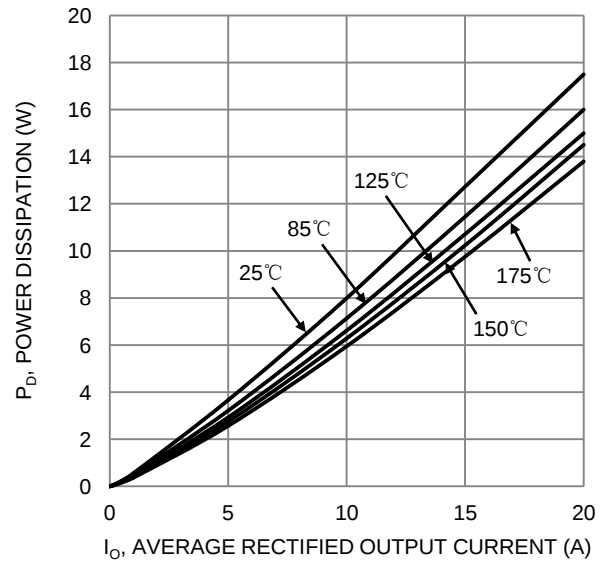


Figure 4. Forward Power Dissipation  $D = 0.5$

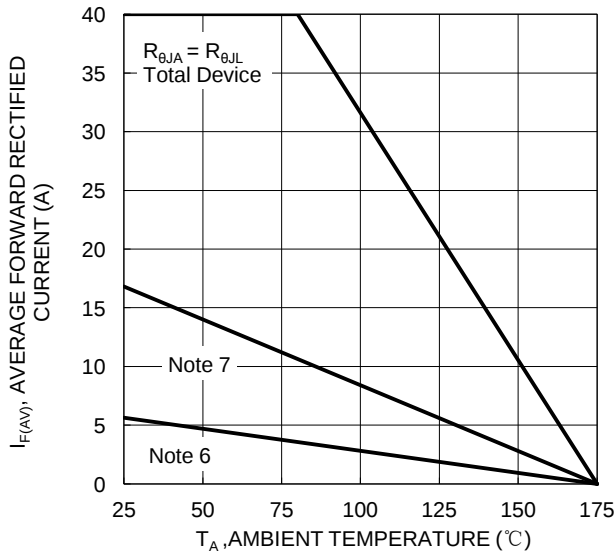


Figure 5. Forward Current Derating Curve

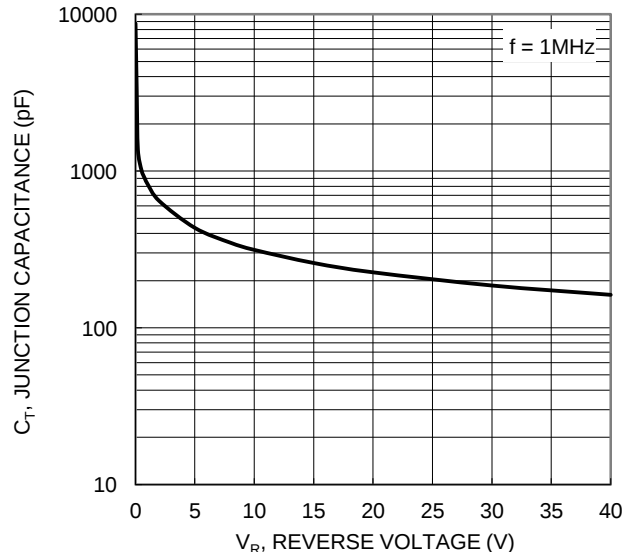
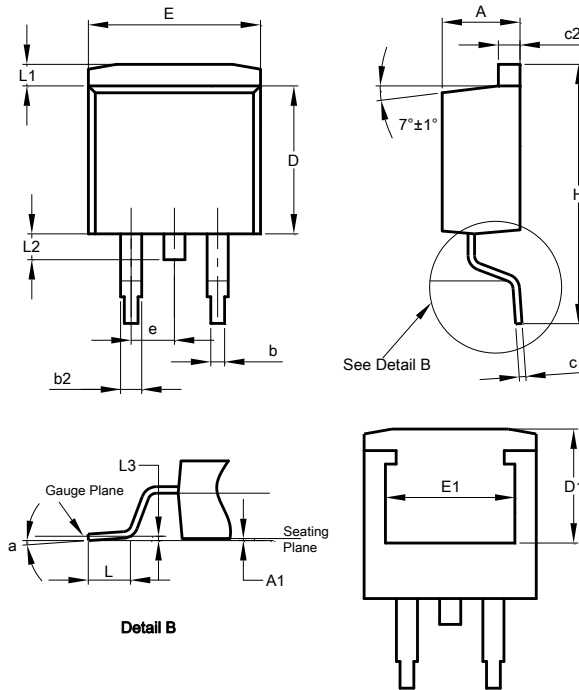


Figure 6. Typical Junction Capacitance

## Package Outline Dimensions

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

**TO263AB (D2PAK)**

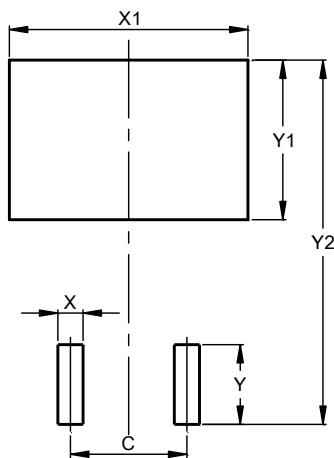


| TO263AB (D2PAK)      |          |       |       |
|----------------------|----------|-------|-------|
| Dim                  | Min      | Max   | Typ   |
| A                    | 4.07     | 4.82  | -     |
| A1                   | 0.00     | 0.25  | -     |
| b                    | 0.51     | 0.99  | -     |
| b2                   | 1.15     | 1.77  | -     |
| c                    | 0.356    | 0.73  | -     |
| c2                   | 1.143    | 1.65  | -     |
| D                    | 8.39     | 9.65  | -     |
| D1                   | 6.55     | 6.95  | -     |
| e                    | 2.54 TYP |       |       |
| E                    | 9.66     | 10.66 | -     |
| E1                   | 6.23     | 8.23  | -     |
| H                    | 14.61    | 15.87 | -     |
| L                    | 1.78     | 2.79  | -     |
| L1                   | -        | 1.67  | -     |
| L2                   | -        | 1.77  | -     |
| L3                   | -        | -     | 0.254 |
| a                    | 0°       | 8°    | -     |
| All Dimensions in mm |          |       |       |

## Suggested Pad Layout

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

**TO263AB (D2PAK)**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 5.08          |
| X          | 1.10          |
| X1         | 10.41         |
| Y          | 3.50          |
| Y1         | 7.01          |
| Y2         | 15.99         |

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