

## Product Summary

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F(MAX)$ (V)<br>@ +25°C | $I_R(MAX)$ (mA)<br>@ +25°C |
|---------------|-----------|---------------------------|----------------------------|
| 10            | 4         | 0.5                       | 0.2                        |

## Description and Applications

The SBRT4U10LP provides very low  $V_F$  and excellent reverse leakage stability at high temperatures. It is ideal for use as bypass diode and rectifier, freewheel diode or blocking diode in applications such as:

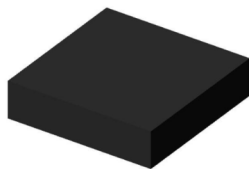
- Solar Panels
- Blocking Diode
- Bypass Diode
- Boost Diode
- Recirculating Diode

## Features and Benefits

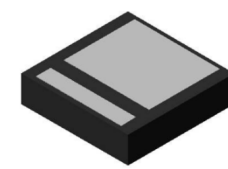
- Patented TrenchSBR technology provides superior avalanche capability versus Schottky diodes, ensuring more rugged and reliable end applications
- Reduced ultra-low forward voltage drop ( $V_F$ ).  
Better efficiency and cooler operation
- Reduced high temperature reverse leakage.  
Increased reliability against thermal runaway failure in high temperature operation
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

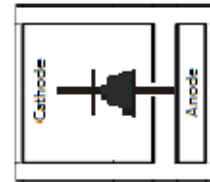
- Case: U-DFN2020-2 (Type B)
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe.  
Solderable per MIL-STD-202, Method 208 Ⓔ③
- Polarity: See Below
- Weight: 6.757mg (Approximate)



Top View



Bottom View

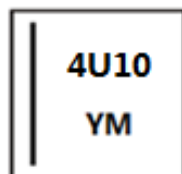
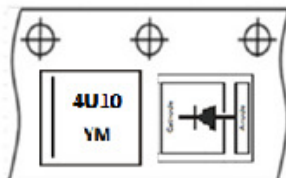

 Top View  
Internal Schematic

## Ordering Information (Note 4)

| Part Number  | Case                 | Packaging         |
|--------------|----------------------|-------------------|
| SBRT4U10LP-7 | U-DFN2020-2 (Type B) | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  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>.

## Marking Information



4U10 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: B = 2014)  
 M = Month (ex: 6 = June)  
 Bar = Cathode

### Date Code Key

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|------|------|------|------|------|
| Code | B    | C    | D    | E    | F    | G    | H    | I    | J    |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

## 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           | Value | Unit |
|---|------------------|-------|------|
| Peak Repetitive Reverse Voltage   | V <sub>RRM</sub> | 10    | V    |
| Working Peak Reverse Voltage  | V <sub>RWM</sub> |       |      |
| DC Blocking Voltage   | V <sub>RM</sub>  |       |      |
| Average Rectified Output Current  | I <sub>O</sub>   | 4     | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | I <sub>FSM</sub> | 35    | A    |

## Thermal Characteristics

| Characteristic  | Symbol           | Value                           | Unit |
|---|------------------|---------------------------------|------|
| Typical Thermal Resistance Junction to Case (Note 5)  | R <sub>θJC</sub> | 6                               | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 5)   | R <sub>θJA</sub> | 65                              | °C/W |
| Operating Temperature Range<br>V <sub>R</sub> ≤ 80% V <sub>RRM</sub><br>V <sub>R</sub> ≤ 50% V <sub>RRM</sub> | T <sub>J</sub>   | -55 to +150<br>≤ +175<br>≤ +200 | °C   |
| DC Forward Mode (Note 7)  |                  |                                 |      |
| Storage Temperature Range   | T <sub>STG</sub> | -55 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 (Note 6) | V <sub>F</sub> | —   | —   | 0.500 | V    | I <sub>F</sub> = 4A, T <sub>J</sub> = +25°C   |
| Leakage Current (Note 6)      | I <sub>R</sub> | —   | —   | 200   | μA   | V <sub>R</sub> = 10V, T <sub>J</sub> = +25°C  |
|                               |                | —   | 6.5 | —     | mA   | V <sub>R</sub> = 10V, T <sub>J</sub> = +125°C |

Notes: 5. Device mounted on FR4 PCB pad layout 1inch 2oz copper  
 6. Short duration pulse test used to minimize self-heating effect.  
 7. Max junction temperature guaranteed for two hours.

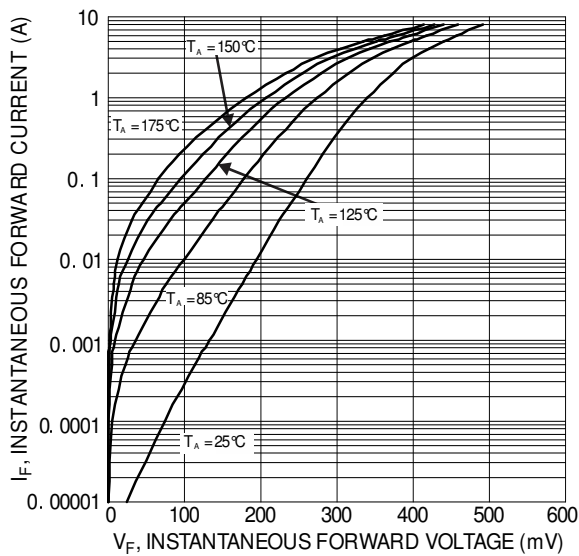


Figure 1 Typical Forward Characteristics

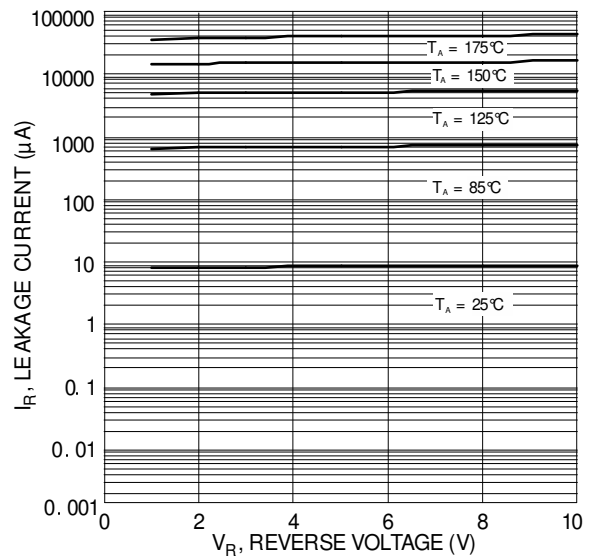
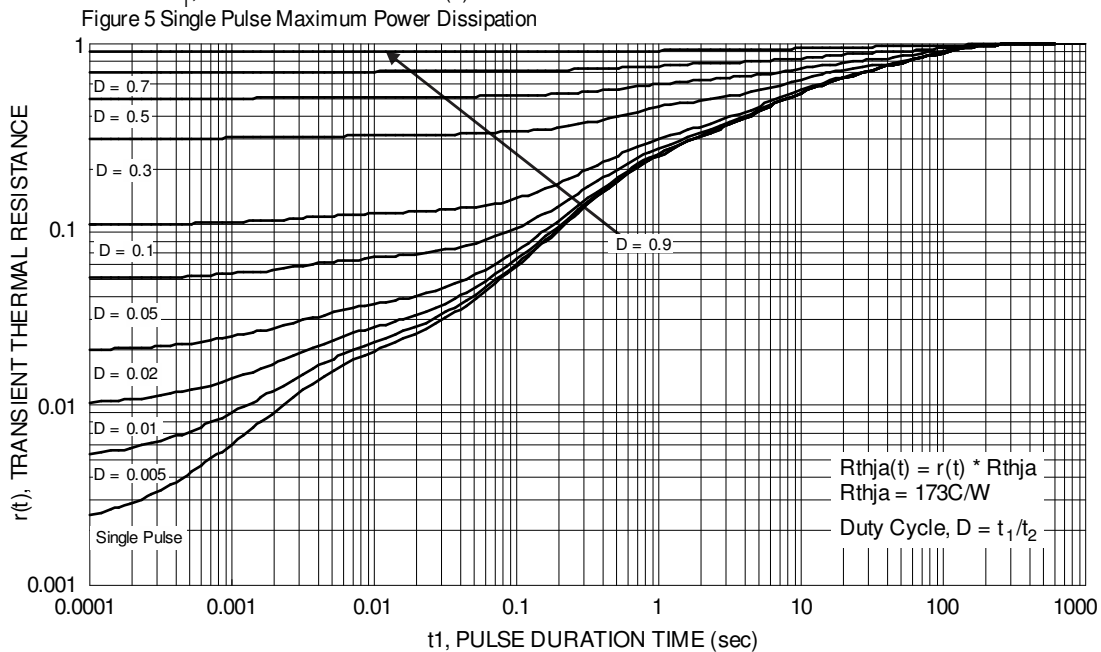
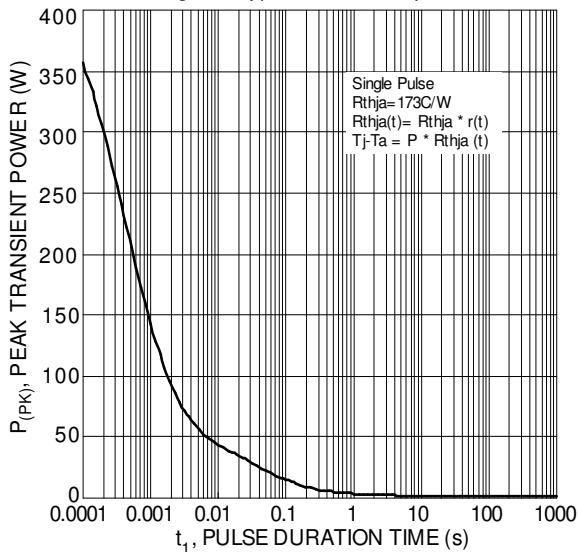
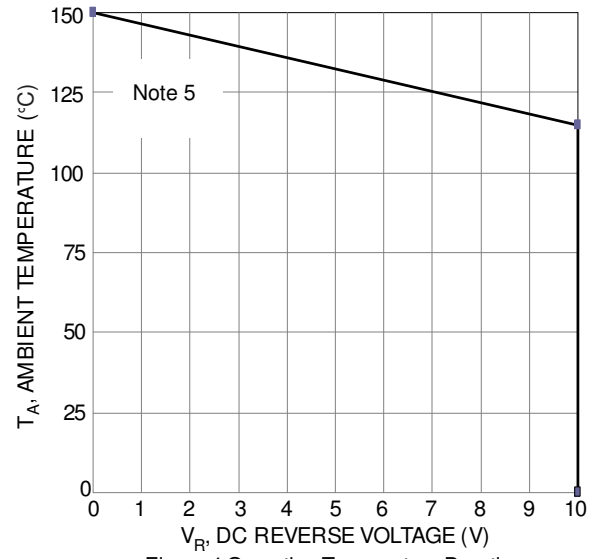
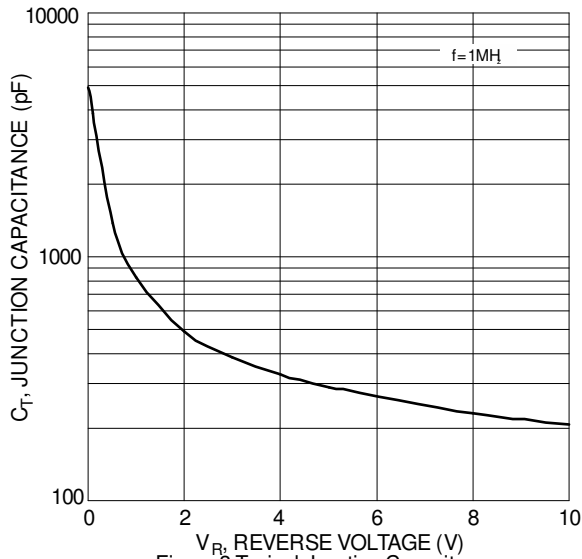
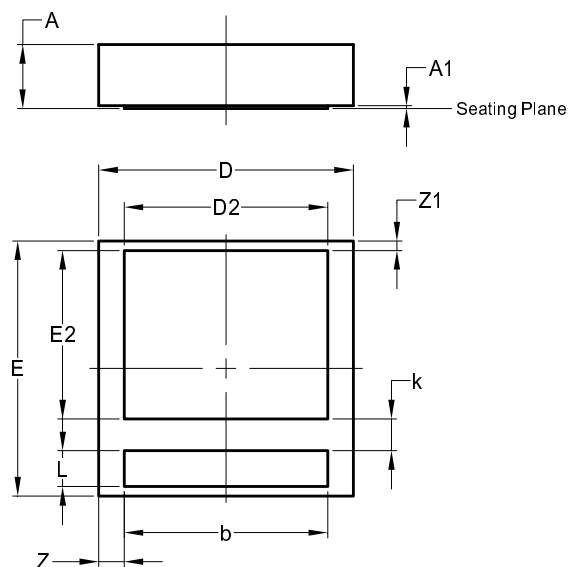


Figure 2 Typical Reverse Characteristics



## Package Outline Dimensions

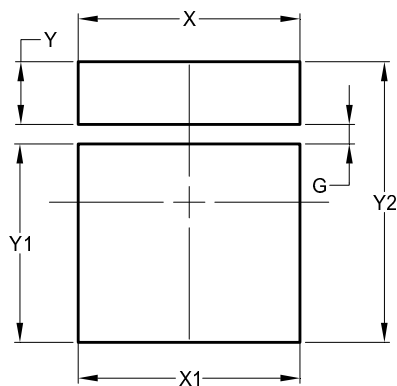
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| U-DFN2020-2<br>(Type B) |           |      |      |
|-------------------------|-----------|------|------|
| Dim                     | Min       | Max  | Typ  |
| A                       | 0.47      | 0.53 | 0.50 |
| A1                      | 0.00      | 0.05 | 0.02 |
| b                       | 1.55      | 1.65 | 1.60 |
| D                       | 1.95      | 2.05 | 2.00 |
| D2                      | 1.50      | 1.70 | 1.60 |
| E                       | 1.95      | 2.05 | 2.00 |
| E2                      | 1.22      | 1.42 | 1.32 |
| k                       | 0.25 BSC  |      |      |
| L                       | 0.23      | 0.33 | 0.28 |
| Z                       | 0.20 BSC  |      |      |
| Z1                      | 0.075 BSC |      |      |
| All Dimensions in mm    |           |      |      |

## Suggested Pad Layout

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



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| G          | 0.150            |
| X          | 1.700            |
| X1         | 1.700            |
| Y          | 0.480            |
| Y1         | 1.520            |
| Y2         | 2.150            |

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