

# Schottky Full Bridge

2 A, 30 V

## NSR2030QMU

These full bridge Schottky barrier diodes are designed for the rectification of the high speed signal of wireless charging. The NSR2030QMU has a very low forward voltage that will reduce conduction loss. It is housed in a UDFN 3.5 x 3.5 x 0.5 mm package that is ideal for space constrained wireless applications.

### Features

- Extremely Fast Switching Speed
- Low Forward Voltage – 0.54 V (Typ) @  $I_F = 2$  A
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

### Typical Applications

- Low Voltage Full Bridge Rectification & Wireless Charging

### MAXIMUM RATINGS ( $T_J = 125^\circ\text{C}$ unless otherwise noted) (Note 1)

| Symbol    | Rating                                                                                        | Value | Unit |
|-----------|-----------------------------------------------------------------------------------------------|-------|------|
| $V_R$     | Reverse Voltage                                                                               | 30    | V    |
| $I_F$     | Forward Current (DC)                                                                          | 2.0   | A    |
| $I_{FSM}$ | Forward Current Surge Peak<br>(60 Hz, 1 cycle)                                                | 12.5  | A    |
| $I_{FSM}$ | Non-Repetitive Peak Forward Current<br>(Square Wave, $T_J = 25^\circ\text{C}$ prior to surge) |       | A    |
|           | $t = 1 \mu\text{s}$                                                                           | 40    |      |
|           | $t = 1 \text{ ms}$                                                                            | 10    |      |
|           | $t = 1 \text{ s}$                                                                             | 3.0   |      |

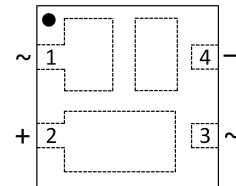
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. All specifications pertain to a single diode.

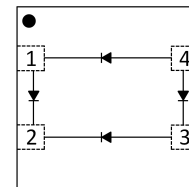


UDFN4 3.5x3.5  
CASE 517DA

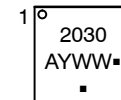
### PIN CONNECTIONS



### DEVICE SCHEMATIC



### MARKING DIAGRAM



2030 = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package  
(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device        | Package            | Shipping†              |
|---------------|--------------------|------------------------|
| NSR2030QMUTWG | UDFN4<br>(Pb-Free) | 3,000 /<br>Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](#).

# THERMAL CHARACTERISTICS

| Symbol                      | Characteristic                                                                                     | Max          | Unit                      |
|-----------------------------|----------------------------------------------------------------------------------------------------|--------------|---------------------------|
| $P_D$<br>(Note 2)           | Total Device Dissipation FR-5 Board<br>$T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | 2.08<br>20.8 | W<br>mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$<br>(Note 2) | Thermal Resistance Junction to Ambient                                                             | 48           | $^\circ\text{C}/\text{W}$ |
| $P_D$<br>(Note 3)           | Total Device Dissipation FR-5 Board<br>$T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | 0.75<br>7.6  | W<br>mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$<br>(Note 3) | Thermal Resistance Junction to Ambient                                                             | 132          | $^\circ\text{C}/\text{W}$ |
| $P_D$<br>(Note 4)           | Total Device Dissipation FR-5 Board<br>$T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | 0.87<br>8.8  | W<br>mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$<br>(Note 4) | Thermal Resistance Junction to Ambient                                                             | 114          | $^\circ\text{C}/\text{W}$ |
| $T_J$                       | Junction Temperature                                                                               | +125         | $^\circ\text{C}$          |
| $T_{stg}$                   | Storage Temperature Range                                                                          | -55 to +150  | $^\circ\text{C}$          |

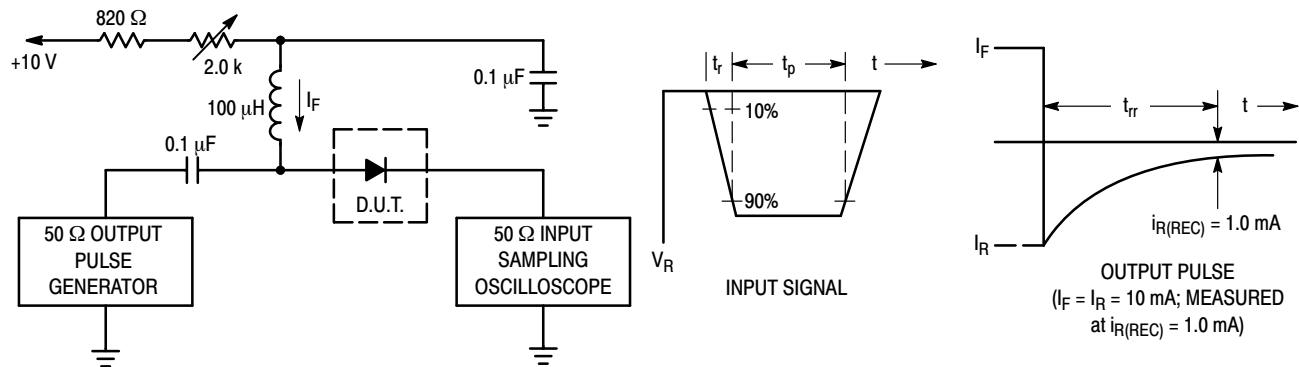
2. 4 Layer JEDEC JESD51.7 FR-4 @ 10 mm<sup>2</sup>, 1 oz. copper trace, still air.
3. Single Layer JEDEC JESD51.3 FR-4 @ 100 mm<sup>2</sup>, 1 oz. copper trace, still air.
4. Single Layer JEDEC JESD51.3 FR-4 @ 100 mm<sup>2</sup>, 2 oz. copper trace, still air.

# ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 5)

| Symbol     | Characteristic                                                                         | Min | Typ  | Max   | Unit          |
|------------|----------------------------------------------------------------------------------------|-----|------|-------|---------------|
| $V_{(BR)}$ | Reverse Breakdown Voltage ( $I_R = 1.0\text{ mA}$ )                                    | 30  | –    | –     | V             |
| $I_R$      | Reverse Leakage ( $V_R = 30\text{ V}$ )                                                | –   | 5.0  | 20    | $\mu\text{A}$ |
| $V_F$      | Forward Voltage ( $I_F = 0.5\text{ A}$ )                                               | –   | 0.41 | 0.455 | V             |
| $V_F$      | Forward Voltage ( $I_F = 1.0\text{ A}$ )                                               | –   | 0.46 | 0.55  | V             |
| $V_F$      | Forward Voltage ( $I_F = 2.0\text{ A}$ )                                               | –   | 0.54 | 0.65  | V             |
| $t_{rr}$   | Reverse Recovery Time<br>( $I_F = I_R = 10\text{ mA}$ , $I_{R(REC)} = 1.0\text{ mA}$ ) | –   | 34   | –     | ns            |
| $C_T$      | Input Capacitance (pins 1 to 3) ( $V_R = 1.0\text{ V}$ , $f = 1.0\text{ MHz}$ )        | –   | 102  | –     | pF            |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

5. All specifications pertain to a single diode.



- Notes:
1. A 2.0 k $\Omega$  variable resistor adjusted for a Forward Current ( $I_F$ ) of 10 mA.
  2. Input pulse is adjusted so  $I_{R(peak)}$  is equal to 10 mA.
  3.  $t_p \gg t_{rr}$

Figure 1. Recovery Time Equivalent Test Circuit

TYPICAL CHARACTERISTICS

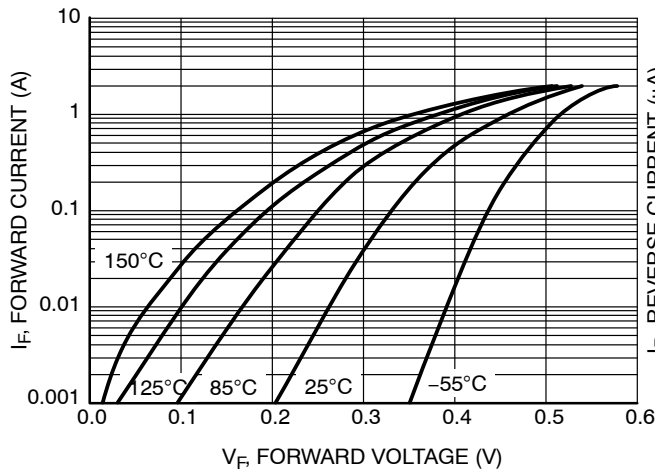


Figure 1. Forward Voltage

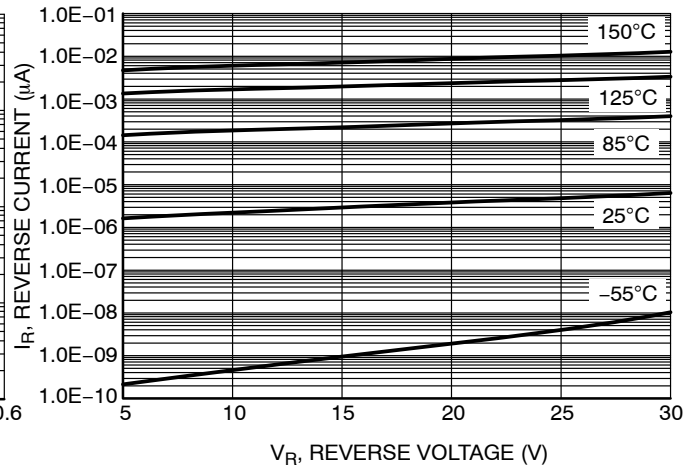


Figure 2. Reverse Leakage

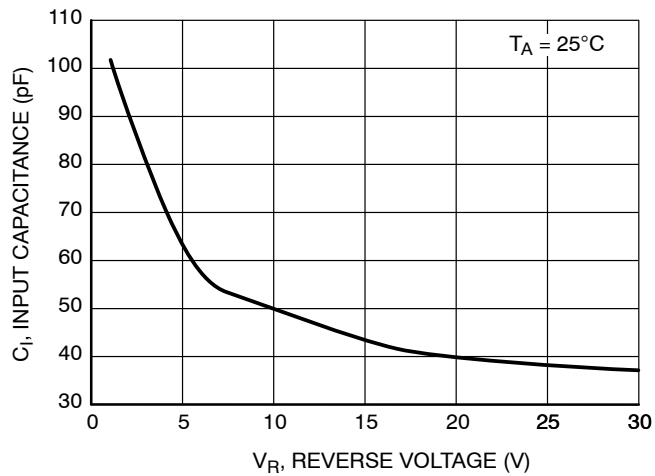


Figure 3. Input Capacitance

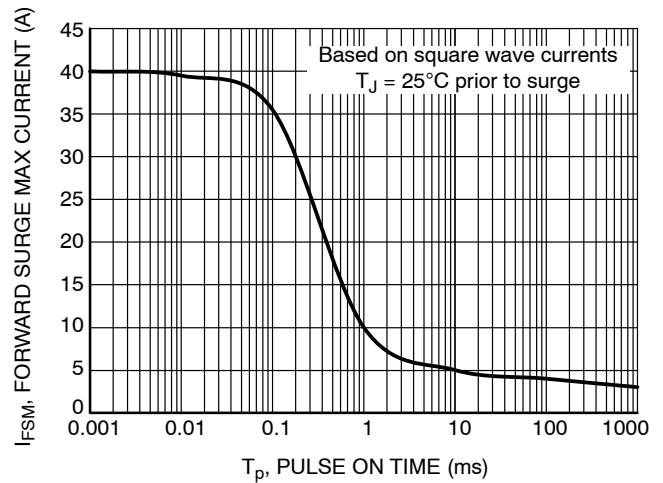


Figure 4. Forward Surge Current

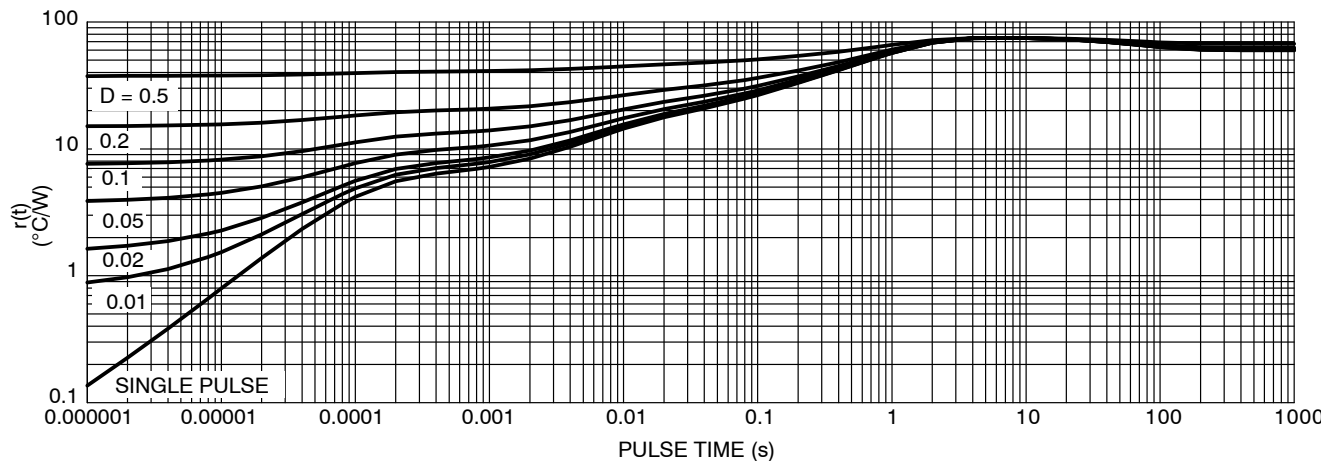


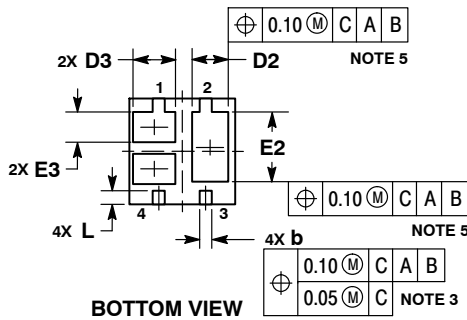
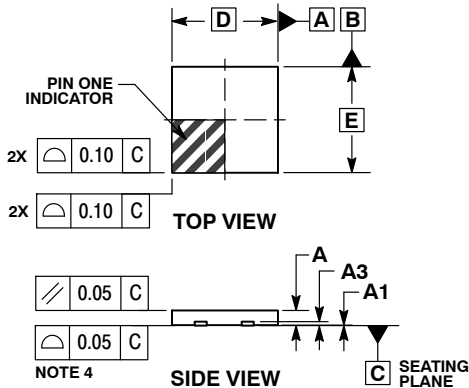
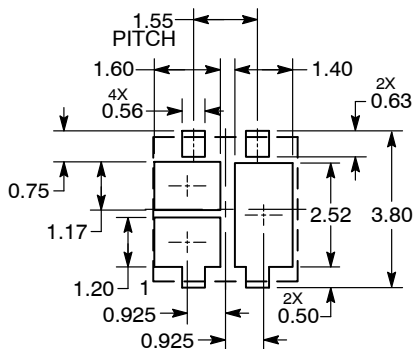
Figure 5. Thermal Response



SCALE 2:1

**UDFN4 3.5x3.5, 1.55P**  
CASE 517DA  
ISSUE A

DATE 25 SEP 2014

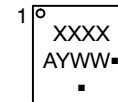

**RECOMMENDED  
SOLDERING FOOTPRINT\***


\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.05 AND 0.15 MM FROM THE TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PADS AS WELL AS THE TERMINALS.
5. POSITIONAL TOLERANCE APPLIES TO ALL OF THE EXPOSED PADS.

| MILLIMETERS |       |      |
|-------------|-------|------|
| DIM         | MIN   | MAX  |
| A           | 0.45  | 0.55 |
| A1          | 0.00  | 0.05 |
| A3          | 0.13  | REF  |
| b           | 0.35  | 0.45 |
| D           | 3.50  | BSC  |
| D2          | 1.15  | 1.25 |
| D3          | 1.35  | 1.45 |
| E           | 3.50  | BSC  |
| E2          | 2.25  | 2.35 |
| E3          | 0.95  | 1.05 |
| e           | 1.55  | BSC  |
| F           | 0.925 | BSC  |
| G           | 0.58  | BSC  |
| L           | 0.35  | 0.55 |

**GENERIC  
MARKING DIAGRAM\***


- XXXX = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

\*This information is generic. Please refer to device data sheet for actual part marking.  
Pb-Free indicator, "G" or microdot "▪", may or may not be present.

|                         |                             |                                                                                                                                                                                     |
|-------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>UDFN4 3.5X3.5, 1.55P</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                                  |

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