

# NSR1030QMUTAG

## 1A, 30V Schottky Full Bridge

These full bridge Schottky barrier diodes are designed for the rectification of the high speed signal of wireless charging. The NSR1030QMUTAG has a very low forward voltage that will reduce conduction loss. It is housed in a UDFN 3.0 x 3.0 x 0.5 mm package that is ideal for space constrained wireless applications.

### Features

- Extremely Fast Switching Speed
- Low Forward Voltage – 0.49 V (Typ) @  $I_F = 1$  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)

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	30	V
Forward Current (DC)	$I_F$	1.0	A
Forward Current Surge Peak (60 Hz, 1 cycle)	$I_{FSM}$	12	A
Non-Repetitive Peak Forward Current (Square Wave, $T_J = 25^\circ\text{C}$ prior to surge)	$I_{FSM}$		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.

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$ (Note 2)	1.80 18	W mW/ $^\circ\text{C}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$ (Note 2)	55.5	$^\circ\text{C}/\text{W}$
Total Device Dissipation $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$ (Note 3)	0.70 7.0	W mW/ $^\circ\text{C}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$ (Note 3)	142	$^\circ\text{C}/\text{W}$
Total Device Dissipation $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$ (Note 4)	0.80 8.0	W mW/ $^\circ\text{C}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$ (Note 4)	125	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	+125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-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.



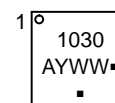
ON Semiconductor®

[www.onsemi.com](http://www.onsemi.com)

### MARKING DIAGRAM



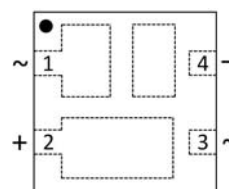
UDFN4 3x3  
CASE 517DB



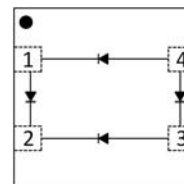
1030 = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### PIN CONNECTIONS



### DEVICE SCHEMATIC



### ORDERING INFORMATION

Device	Package	Shipping†
NSR1030QMUTAG	UDFN4 (Pb-Free)	3000 / Tape & Reel

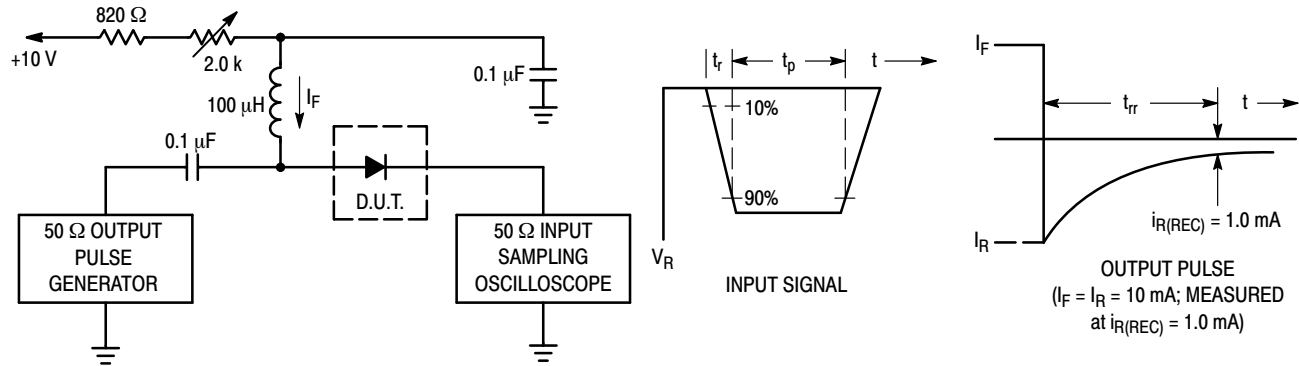
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

# NSR1030QMUTAG

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

Characteristic	Symbol	Min	Typ	Max	Unit
Reverse Breakdown Voltage ( $I_R = 1.0\text{ mA}$ )	$V_{(BR)}$	30	–	–	V
Reverse Leakage ( $V_R = 30\text{ V}$ )	$I_R$	–	4.0	20	$\mu\text{A}$
Forward Voltage ( $I_F = 0.5\text{ A}$ )	$V_F$	–	0.43	0.49	V
Forward Voltage ( $I_F = 1.0\text{ A}$ )	$V_F$	–	0.49	0.60	V
Reverse Recovery Time ( $I_F = I_R = 10\text{ mA}$ , $I_{R(REC)} = 1.0\text{ mA}$ )	$t_{rr}$	–	25	–	ns
Input Capacitance (pins 1 to 3) ( $V_R = 1.0\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_T$	–	70	–	pF

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  $I_{R(\text{peak})}$  is equal to 10 mA.  
 3.  $t_p \gg t_{rr}$

**Figure 1. Recovery Time Equivalent Test Circuit**

# NSR1030QMUTAG

## TYPICAL CHARACTERISTICS

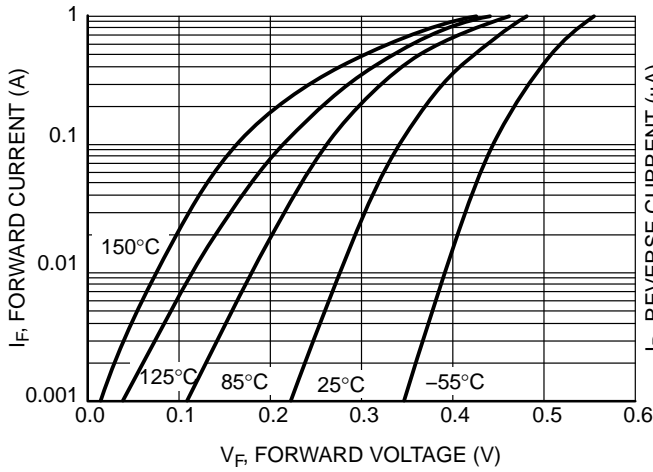


Figure 1. Forward Voltage

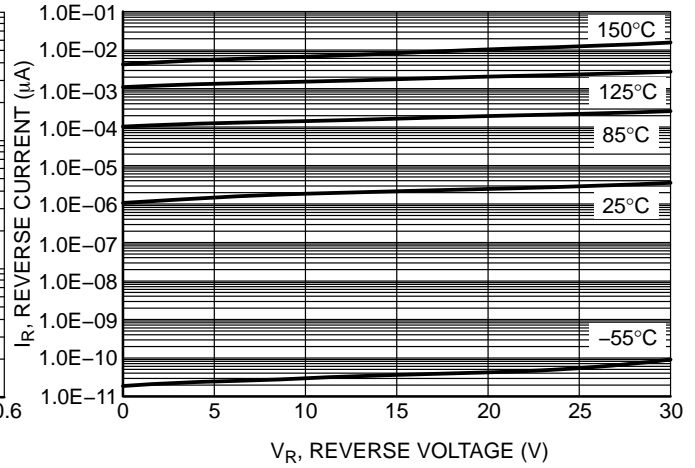


Figure 2. Reverse Leakage

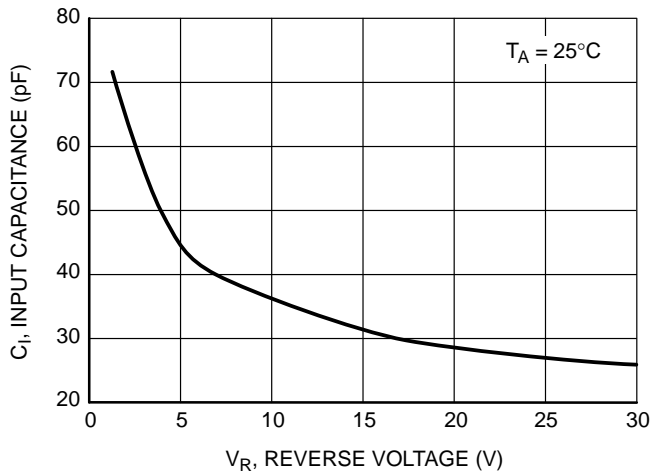


Figure 3. Input Capacitance

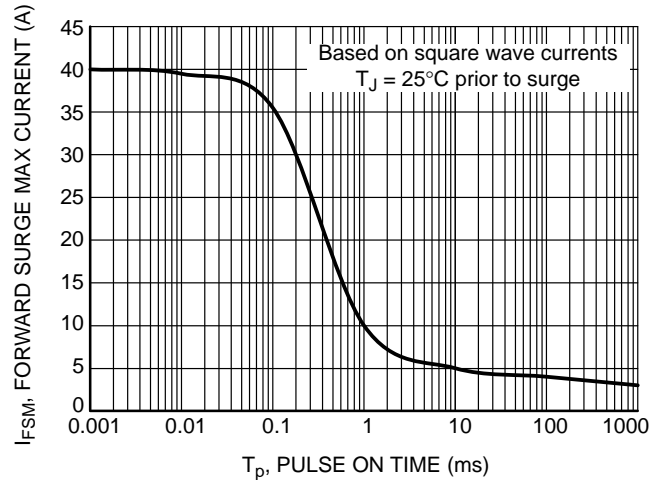


Figure 4. Forward Surge Current

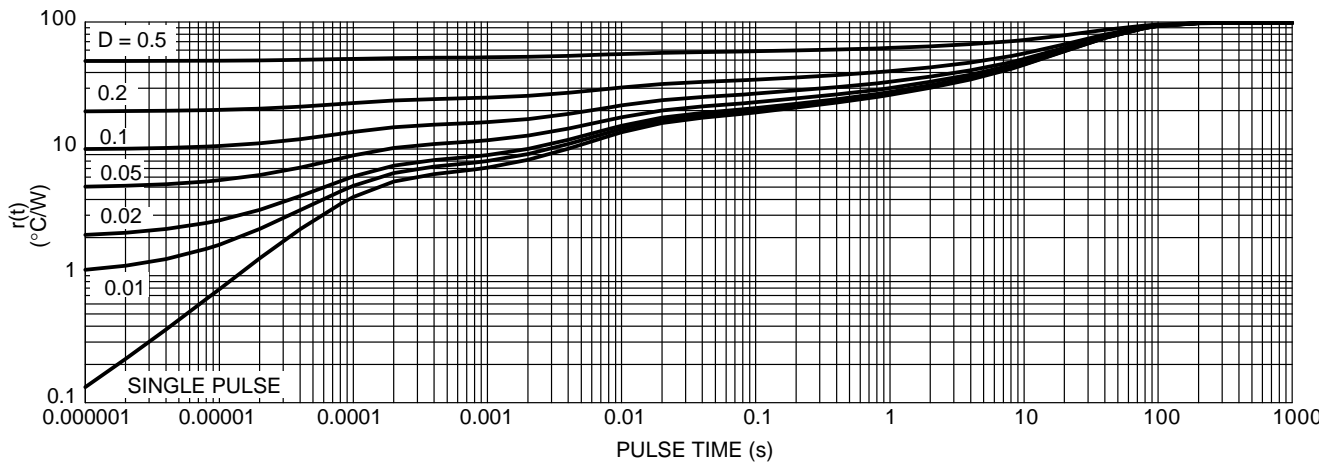
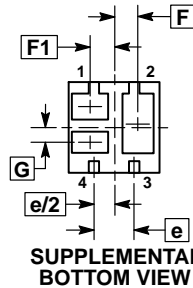
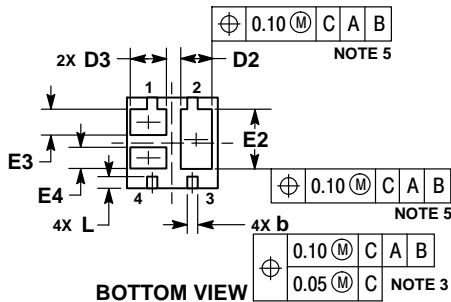
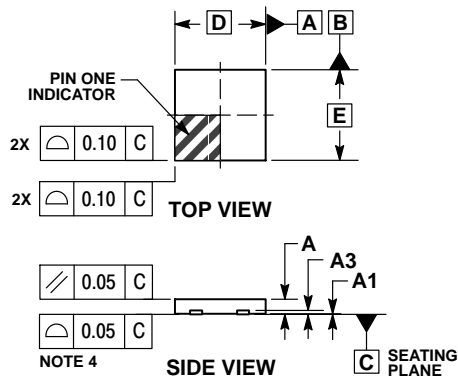


Figure 5. Thermal Response

# NSR1030QMUTAG

## PACKAGE DIMENSIONS

UDFN4 3.0x3.0, 1.30P  
CASE 517DB  
ISSUE A

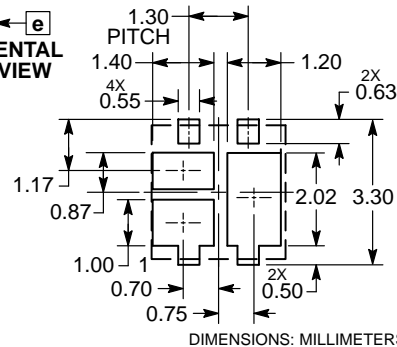


**NOTES:**

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	3.00 BSC	
D2	0.95	1.05
D3	1.15	1.25
E	3.00 BSC	
E2	1.80	1.90
E3	0.75	0.85
E4	0.65	0.75
e	1.30 BSC	
F	0.75 BSC	
F1	0.70 BSC	
G	0.48 BSC	
L	0.35	0.55

**RECOMMENDED SOLDERING FOOTPRINT\***



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

ON Semiconductor and the are registered trademarks of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries. SCILLC owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of SCILLC's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

**PUBLICATION ORDERING INFORMATION**

**LITERATURE FULFILLMENT:**  
Literature Distribution Center for ON Semiconductor  
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5817-1050

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local Sales Representative