

# NSR1020MW2

## 20V SOD-323 Schottky Barrier Diode

This Schottky Barrier Diode in the SOD-323 package offers extremely low Vf performance. The low forward voltage makes them capable of handling high current in a very small package. The resulting device is ideally suited for application as a blocking diode in charging applications or as part of discrete buck converter or discrete boost converter. As part of a buck conversion circuit, a boost conversion circuit or a charging circuit the low Vf drop of the Schottky improves the efficiency of the overall device by consuming less power in the forward mode.

### Features

- Low Forward Voltage – 0.24 Volts (Typ) @  $I_F = 10 \text{ mAdc}$
- High Current Capability
- ESD Rating – Human Body Model: CLASS 3B  
– Machine Model: C
- NSVR Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

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

| Rating                                                                                     | Symbol    | Value       | Unit                       |
|--------------------------------------------------------------------------------------------|-----------|-------------|----------------------------|
| Reverse Voltage                                                                            | $V_R$     | 20          | Vdc                        |
| Peak Reverse Voltage                                                                       | $V_{RM}$  | 30          | V                          |
| Forward Power Dissipation<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_F$     | 200<br>2.0  | mW<br>mW/ $^\circ\text{C}$ |
| Forward Current (DC)<br>Continuous                                                         | $I_F$     | 1           | A                          |
| Forward Current<br>$t = 8.3 \text{ ms}$ Half Sinewave                                      | $I_F$     | 5           | A                          |
| Repetitive Forward Current<br>period = 1.5 s, Duty Cycle = 66.7%                           | $I_{FRM}$ | 2           | A                          |
| Junction Temperature                                                                       | $T_J$     | 125 Max     | $^\circ\text{C}$           |
| Storage Temperature Range                                                                  | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$           |

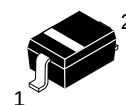
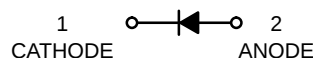
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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## HIGH CURRENT SCHOTTKY BARRIER DIODE



SOD-323  
CASE 477  
STYLE 1

### MARKING DIAGRAM



RE = Specific Device Code

M = Date Code

▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device         | Package              | Shipping†               |
|----------------|----------------------|-------------------------|
| NSR1020MW2T1G  | SOD-323<br>(Pb-Free) | 3000 / Tape &<br>Reel   |
| NSR1020MW2T3G  | SOD-323<br>(Pb-Free) | 10,000 / Tape &<br>Reel |
| NSVR1020MW2T1G | SOD-323<br>(Pb-Free) | 3000 / Tape &<br>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.

# NSR1020MW2

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

| Characteristic                                                    | Symbol | Min | Typ | Max  | Unit               |
|-------------------------------------------------------------------|--------|-----|-----|------|--------------------|
| Total Capacitance ( $V_R = 5.0\text{ V}$ , $f = 1.0\text{ MHz}$ ) | $C_T$  | –   | 25  | 29   | pF                 |
| Reverse Leakage ( $V_R = 15\text{ V}$ )                           | $I_R$  | –   | –   | 40   | $\mu\text{A}_{dc}$ |
| Forward Voltage ( $I_F = 1\text{ mA}_{dc}$ )                      | $V_F$  | –   | –   | 0.20 | Vdc                |
| Forward Voltage ( $I_F = 10\text{ mA}_{dc}$ )                     | $V_F$  | –   | –   | 0.26 | Vdc                |
| Forward Voltage ( $I_F = 100\text{ mA}_{dc}$ )                    | $V_F$  | –   | –   | 0.33 | Vdc                |
| Forward Voltage ( $I_F = 500\text{ mA}_{dc}$ )                    | $V_F$  | –   | –   | 0.44 | Vdc                |
| Forward Voltage ( $I_F = 1000\text{ mA}_{dc}$ )                   | $V_F$  | –   | –   | 0.54 | Vdc                |

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.

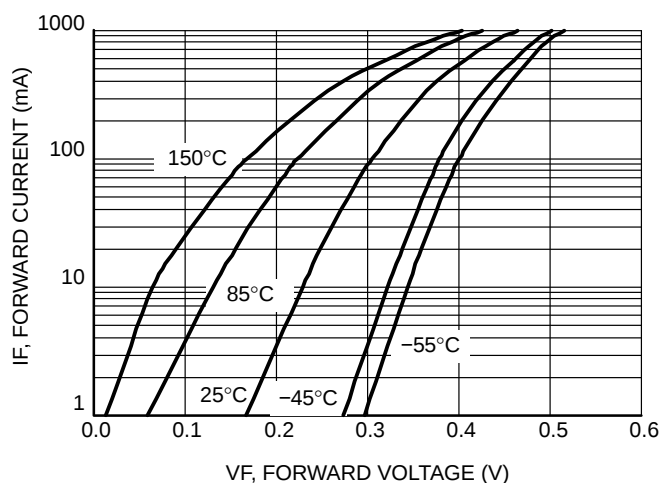


Figure 1. Forward Voltage

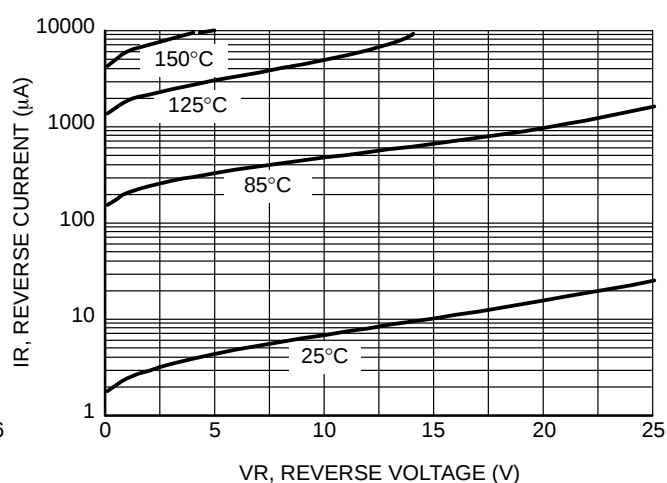


Figure 2. Leakage Current

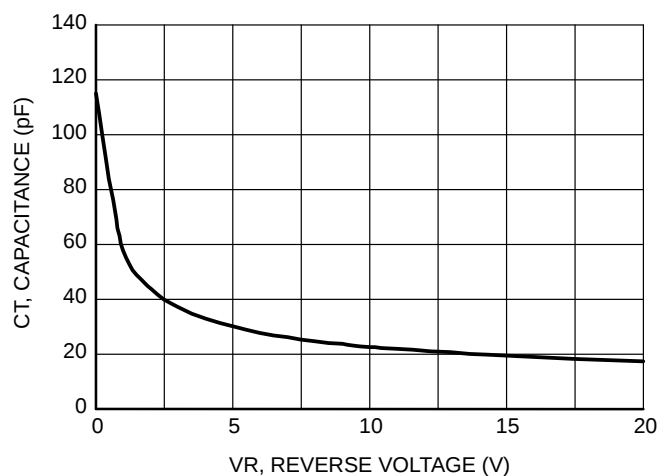


Figure 3. Total Capacitance

# MECHANICAL CASE OUTLINE

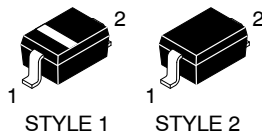
## PACKAGE DIMENSIONS

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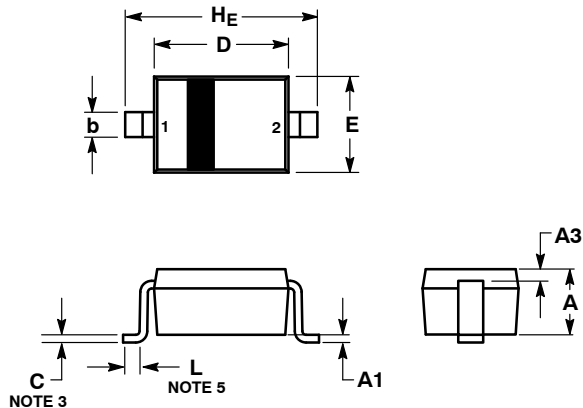
ON

SOD-323  
CASE 477-02  
ISSUE H

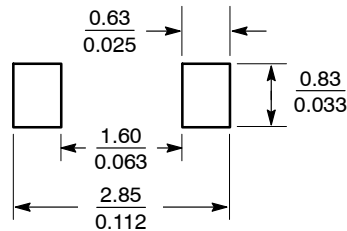
DATE 13 MAR 2007



SCALE 4:1



### SOLDERING FOOTPRINT\*



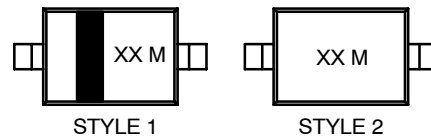
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS SPECIFIED PER L/F DRAWING WITH SOLDER PLATING.
4. DIMENSIONS A AND B DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DIMENSION L IS MEASURED FROM END OF RADIUS.

| DIM | MILLIMETERS |      |       | INCHES    |       |       |
|-----|-------------|------|-------|-----------|-------|-------|
|     | MIN         | NOM  | MAX   | MIN       | NOM   | MAX   |
| A   | 0.80        | 0.90 | 1.00  | 0.031     | 0.035 | 0.040 |
| A1  | 0.00        | 0.05 | 0.10  | 0.000     | 0.002 | 0.004 |
| A3  | 0.15 REF    |      |       | 0.006 REF |       |       |
| b   | 0.25        | 0.32 | 0.4   | 0.010     | 0.012 | 0.016 |
| C   | 0.089       | 0.12 | 0.177 | 0.003     | 0.005 | 0.007 |
| D   | 1.60        | 1.70 | 1.80  | 0.062     | 0.066 | 0.070 |
| E   | 1.15        | 1.25 | 1.35  | 0.045     | 0.049 | 0.053 |
| L   | 0.08        |      |       | 0.003     |       |       |
| HE  | 2.30        | 2.50 | 2.70  | 0.090     | 0.098 | 0.105 |

### GENERIC MARKING DIAGRAM\*



XX = Specific Device Code  
M = Date Code

\*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.

STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

STYLE 2:  
NO POLARITY

|                  |             |                                                                                                                                                                                  |
|------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | SOD-323     | PAGE 1 OF 1                                                                                                                                                                      |

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