

# Schottky Barrier Diode

## NSVR02HL40MX2W

Schottky barrier diodes are optimized for very low forward voltage drop and low leakage current and are used in a wide range of dc-dc converter, clamping and protection applications in portable devices. NSVR02HL40MX2W in a X2DFNW2 (0402) miniature package enables designers to meet the challenging task of achieving higher efficiency and meeting reduced space requirements.

### Features

- Low Forward Voltage Drop
- Low Reverse Current
- Very High Switching Speed
- 175°C  $T_{J(max)}$  – Rated for High Temperature, Mission Critical Applications
- Small Body Outline Dimensions:  
0.039" x 0.024" (1.00 mm x 0.60 mm)
- Low Body Height: 0.016" (0.40 mm)
- Wettable Flank Package for optimal Automated Optical Inspection (AOI)
- NSV 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

### Typical Applications

- Buck and Boost dc-dc Converters
- Reverse Voltage and Current Protection
- Clamping & Protection

### MAXIMUM RATINGS

| Rating                                        | Symbol    | Value               | Unit |
|-----------------------------------------------|-----------|---------------------|------|
| Reverse Voltage                               | $V_R$     | 40                  | V    |
| Forward Current (DC)                          | $I_F$     | 200                 | mA   |
| Non-Repetitive Peak Forward Surge Current     | $I_{FSM}$ | 2.0                 | A    |
| ESD Rating: Human Body Model<br>Machine Model | ESD       | Class 1C<br>Class A |      |

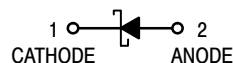
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



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### 40 V SCHOTTKY BARRIER DIODE



**X2DFNW2  
CASE 711BG**

### MARKING DIAGRAM



XX = Specific Device Code  
M = Date Code

### ORDERING INFORMATION

| Device            | Package              | Shipping†             |
|-------------------|----------------------|-----------------------|
| NSVR02HL40MX2WT5G | X2DFNW2<br>(Pb-Free) | 8000 / Tape<br>& Reel |

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

# THERMAL CHARACTERISTICS

| Characteristic                                          | Symbol           | Min | Typ | Max         | Unit                 |
|---------------------------------------------------------|------------------|-----|-----|-------------|----------------------|
| Thermal Resistance<br>Junction-to-Ambient (Note 1)      | $R_{\theta JA}$  |     |     | 400         | $^{\circ}\text{C/W}$ |
| Thermal Resistance<br>Junction-to-Solder Point (Note 1) | $R_{\theta JSP}$ |     |     | 100         | $^{\circ}\text{C/W}$ |
| Junction and Storage Temperature Range                  | $T_J, T_{stg}$   |     |     | -55 to +175 | $^{\circ}\text{C}$   |

1. Mounted onto a 4 in square FR-4 board 10 mm sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.

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

| Characteristic                                                                                                                                                                    | Symbol   | Min | Typ                        | Max                          | Unit          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------------------------|------------------------------|---------------|
| Reverse Leakage<br>( $V_R = 25\text{ V}$ )<br>( $V_R = 40\text{ V}$ )<br>( $V_R = 30\text{ V}, T_J = 150^{\circ}\text{C}$ )<br>( $V_R = 40\text{ V}, T_J = 150^{\circ}\text{C}$ ) | $I_R$    |     | 0.03<br>0.04<br>150<br>200 | 0.1<br>0.5<br>200<br>500     | $\mu\text{A}$ |
| Forward Voltage<br>( $I_F = 1\text{ mA}$ )<br>( $I_F = 10\text{ mA}$ )<br>( $I_F = 40\text{ mA}$ )<br>( $I_F = 100\text{ mA}$ )                                                   | $V_F$    |     | 0.32<br>0.43<br>0.62       | 0.38<br>0.50<br>0.80<br>1.20 | V             |
| Total Capacitance<br>( $V_R = 1.0\text{ V}, f = 1\text{ MHz}$ )                                                                                                                   | CT       |     | 2.0                        | 5.0                          | pF            |
| Reverse Recovery Time<br>( $I_F = I_R = 10\text{ mA}, I_R = 1.0\text{ mA}$ )                                                                                                      | $t_{RR}$ |     | 1.5                        | 4.0                          | ns            |

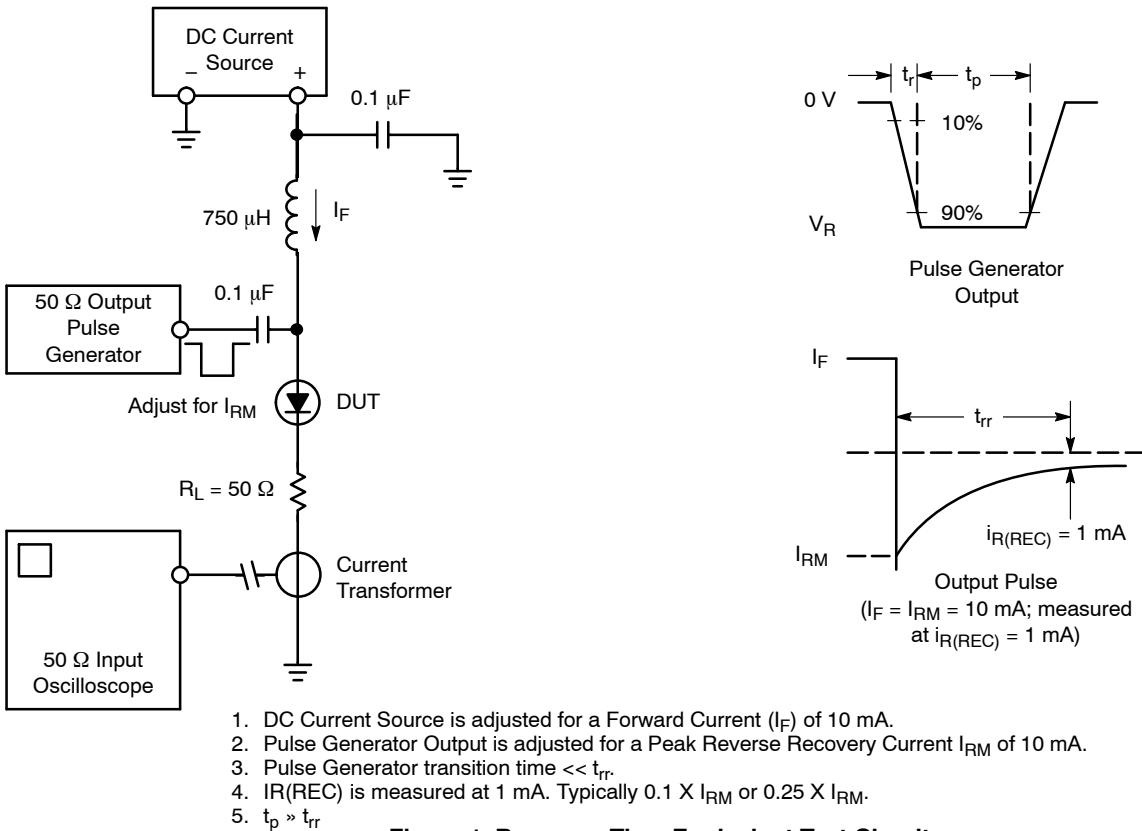


Figure 1. Recovery Time Equivalent Test Circuit

TYPICAL CHARACTERISTICS

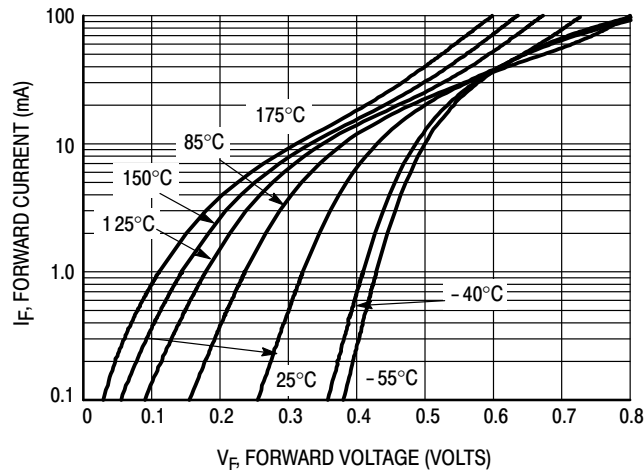


Figure 2. Typical Forward Voltage

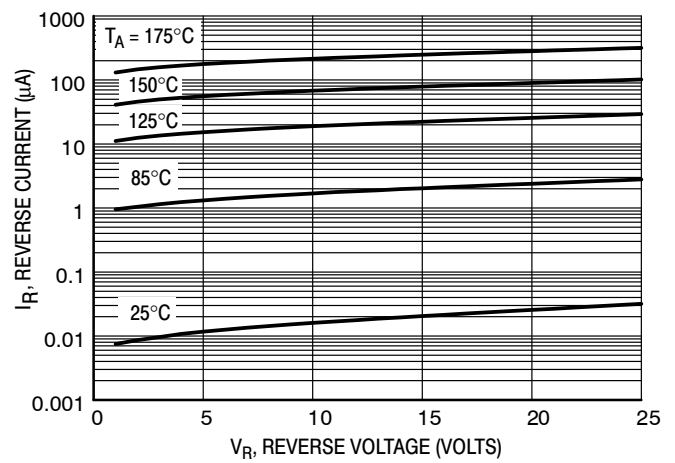


Figure 3. Reverse Current versus Reverse Voltage

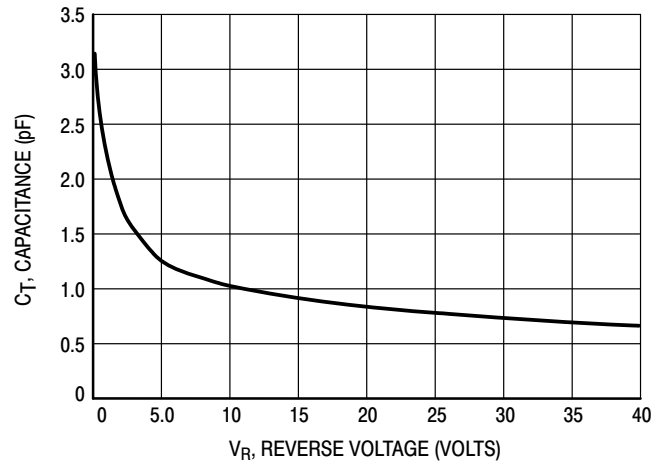
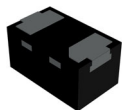


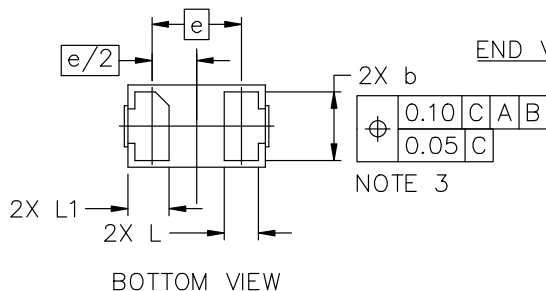
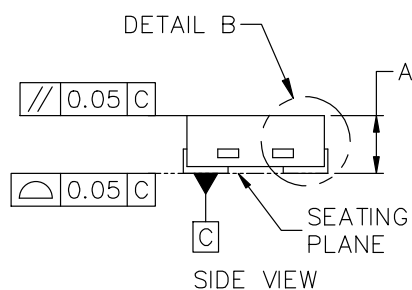
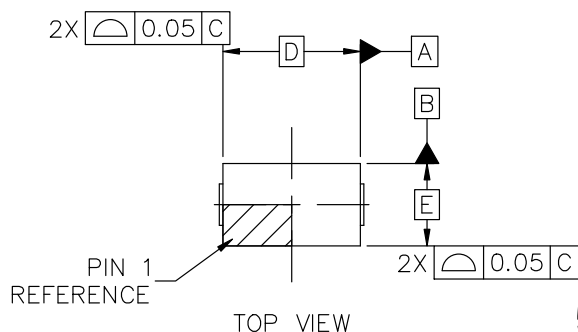
Figure 4. Typical Capacitance

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



**X2DFNW2 1.00x0.60x0.37, 0.65P**  
CASE 711BG  
ISSUE D

DATE 29 FEB 2024



## GENERIC MARKING DIAGRAM\*

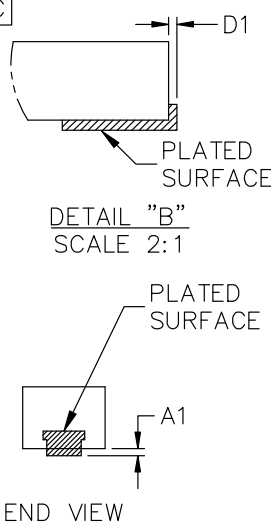


XX = Specific Device Code  
M = Date Code

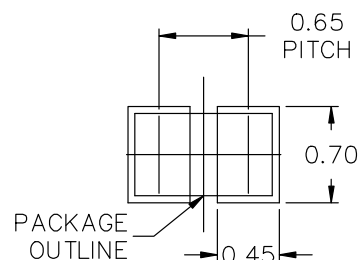
\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G", may or not be present. Some products may not follow the Generic Marking.

## NOTES:

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2018.
2. ALL DIMENSION ARE IN MILLIMETERS.
3. DIMENSION b APPLIES TO THE PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 FROM THE TERMINAL TIP.



| DIM | MILLIMETERS |      |      |
|-----|-------------|------|------|
|     | MIN.        | NOM. | MAX. |
| A   | 0.34        | 0.37 | 0.40 |
| A1  | ---         | ---  | 0.05 |
| b   | 0.45        | 0.50 | 0.55 |
| D   | 1.00 BSC    |      |      |
| D1  | ---         | ---  | 0.05 |
| E   | 0.60 BSC    |      |      |
| e   | 0.65 BSC    |      |      |
| L   | 0.22 REF    |      |      |
| L1  | 0.24        | 0.28 | 0.34 |



## RECOMMENDED MOUNTING FOOTPRINT\*

\* FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERM/D.

|                         |                                      |                                                                                                                                                                                  |
|-------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>X2DFNW2 1.00x0.60x0.37, 0.65P</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                               |

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