# Schottky Barrier Diode

# NSR0240H

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. NSR0240H in a SOD−323 miniature package enables designers to meet the challenging task of achieving higher efficiency and meeting reduced space requirements.

### Features

- Very Low Forward Voltage Drop −480 mV @ 100 mA
- Low Reverse Current − 0.2 μA @ 25 V VR
- 250 mA of Continuous Forward Current
- Power Dissipation of 160 mW with Minimum Trace
- Very High Switching Speed
- Low Capacitance − CT = 4 pF
- 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

- LCD and Keypad Backlighting
- Camera Photo Flash
- Buck and Boost dc−dc Converters
- Reverse Voltage and Current Protection
- Clamping & Protection

### Markets

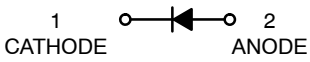
- Mobile Handsets
- MP3 Players
- Digital Camera and Camcorders
- Notebook PCs and PDAs
- GPS

### MAXIMUM RATINGS

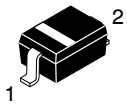
| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Reverse Voltage | $V_R$ | 40 | Vdc |
| Forward Continuous Current (DC) | $I_F$ | 250 | mA |
| Non−Repetitive Peak Forward Surge Current | $I_{FSM}$ | 1.0 | A |
| ESD Rating: Human Body Model<br>Machine Model | ESD | Class 1C<br>Class M2 | |

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.

## 40 VOLT SCHOTTKY BARRIER DIODE




### MARKING DIAGRAM




**SOD−323**
**CASE 477**
**STYLE 1**




AC = Specific Device Code
M = Date Code
▪ = Pb−Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| NSR0240HT1G | SOD−323 (Pb−Free) | 3000 / Tape & Reel |
| NSVR0240HT1G | SOD−323 (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 Specifications Brochure, BRD8011/D.

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## THERMAL CHARACTERISTICS

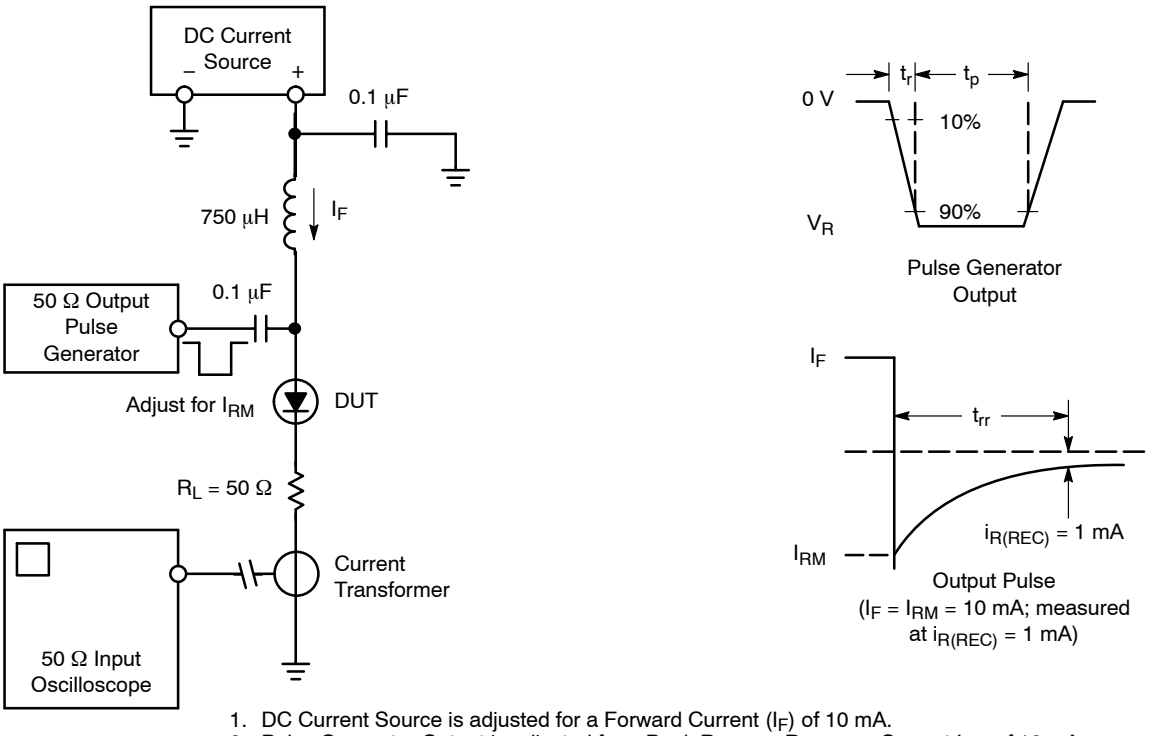
| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance<br>Junction–to–Ambient (Note 1)<br>Total Power Dissipation @ $T_A$ = 25°C | <br>$R_{\theta JA}$<br>$P_D$ | <br>740<br>160 | <br>°C/W<br>mW |
| Thermal Resistance<br>Junction–to–Ambient (Note 2)<br>Total Power Dissipation @ $T_A$ = 25°C | <br>$R_{\theta JA}$<br>$P_D$ | <br>460<br>270 | <br>°C/W<br>mW |
| Junction and Storage Temperature Range | $T_J$, $T_{stg}$ | –55 to +150 | °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.
2. Mounted onto a 4 in square FR–4 board 1 in sq. 1 oz. Cu 0.06” thick single–sided. Operating to steady state.

## ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Reverse Leakage<br>($V_R$ = 10 V)<br>($V_R$ = 25 V)<br>($V_R$ = 40 V) | $I_R$ | | <br>0.2<br>0.6 | <br>0.55<br>2.0<br>10 | μA |
| Forward Voltage<br>($I_F$ = 10 mA)<br>($I_F$ = 100 mA)<br>($I_F$ = 200 mA) | $V_F$ | | <br>345<br>480<br>585 | <br>450<br>550<br>710 | mV |
| Total Capacitance<br>($V_R$ = 5.0 V, f = 1 MHz) | CT | | <br>4.0 | | pF |
| Reverse Recovery Time<br>($I_F$ = $I_R$ = 10 mA, $I_R$ = 1.0 mA) | $t_{rr}$ | | <br>3.0 | | ns |

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.




1. DC Current Source is adjusted for a Forward Current ($I_F$) of 10 mA.
2. Pulse Generator Output is adjusted for a Peak Reverse Recovery Current $I_{RM}$ of 10 mA.
3. Pulse Generator transition time << $t_{rr}$.
4. IR(REC) is measured at 1 mA. Typically 0.1 X $I_{RM}$ or 0.25 X $I_{RM}$.
5. $t_p$ » $t_{rr}$

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

## TYPICAL CHARACTERISTICS

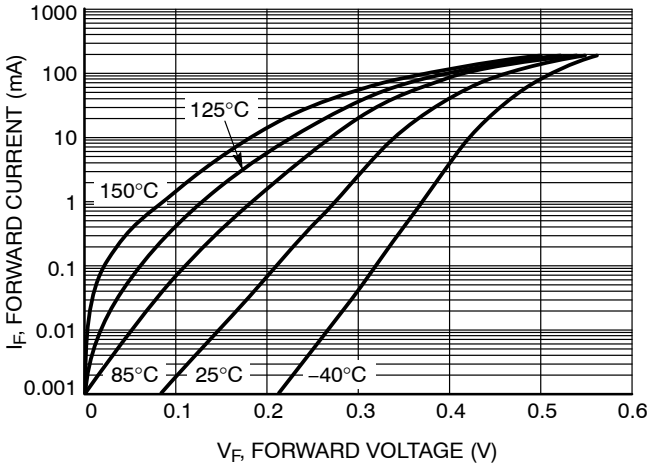



**Figure 2. Forward Voltage**

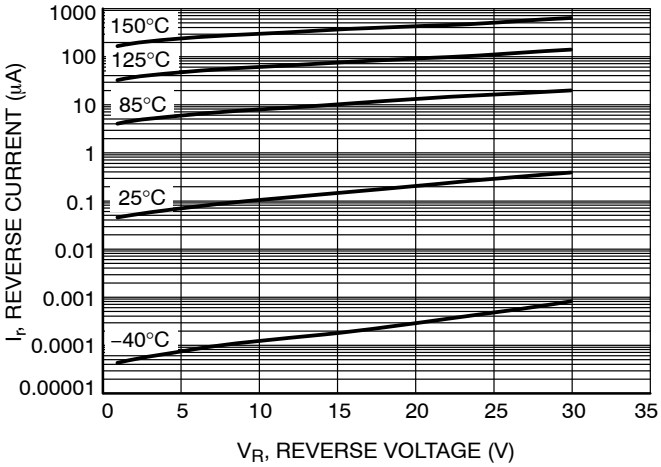



**Figure 3. Leakage Current**

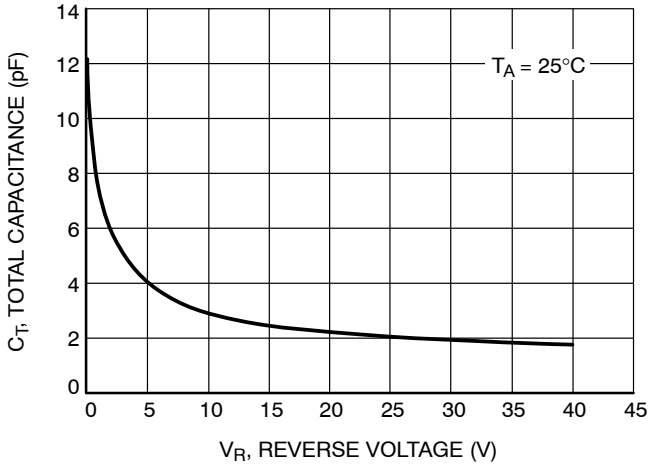
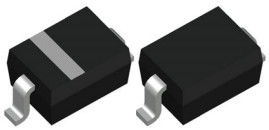
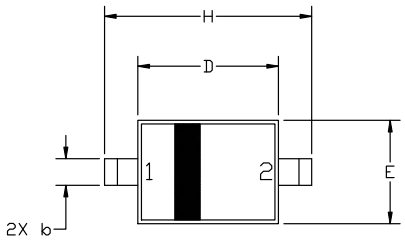



**Figure 4. Total Capacitance**

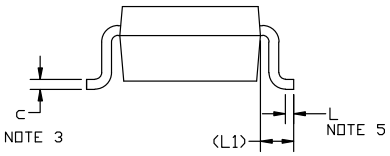


**SOD−323 1.70x1.25x0.85**
CASE 477
ISSUE K

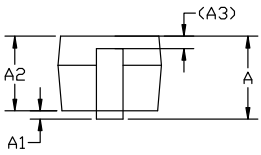
DATE 11 MAR 2024




TOP VIEW




SIDE VIEW

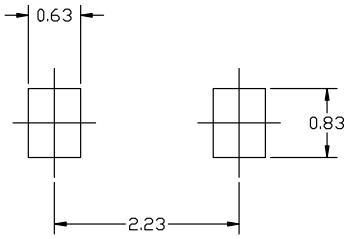



END VIEW

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
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 MEASURE FROM END OF RADIUS.

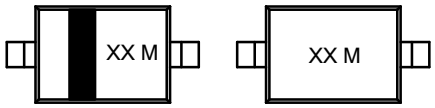
| DIM | MILLIMETERS | | |
|---|---|---|---|
| | MIN. | NOM. | MAX. |
| A | 0.80 | 0.90 | 1.00 |
| A1 | 0.00 | 0.05 | 0.10 |
| A2 | 0.75 | 0.85 | 0.95 |
| A3 | 0.15 (REF) | | |
| b | 0.25 | 0.32 | 0.4 |
| c | 0.09 | 0.12 | 0.18 |
| D | 1.60 | 1.70 | 1.80 |
| E | 1.15 | 1.25 | 1.35 |
| H | 2.30 | 2.50 | 2.70 |
| L | 0.08 | --- | --- |
| L1 | 0.40 (REF) | | |




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, SOLDERRM/D.

**GENERIC MARKING DIAGRAM***




STYLE 1 STYLE 2

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. Some products may not follow the Generic Marking.

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

STYLE 2:
NO POLARITY

| | | | |
|---|---|---|---|
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| **DESCRIPTION:** | **SOD−323 1.70x1.25x0.85** | | **PAGE 1 OF 1** |

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