

Schottky Barrier Diode

NSR0170

Schottky barrier diodes are optimized for very low forward voltage drop and low leakage current making them ideal devices to be used in a wide range of dc-dc converter, clamping and protection applications. NSR0170 in SOD-323, SOD-923 and X2DFNW2 miniature packages enable designers to meet the challenging task of achieving higher efficiency while meeting reduced PCB space requirements.

Features

- Very Low Forward Voltage Drop - 560 mV @ 10 mA
- Low Reverse Current - 25 nA @ 50 V VR
- 70 mA of Continuous Forward Current
- Power Dissipation of 240 mW with Minimum Trace
- Very High Switching Speed
- Low Capacitance - $C_T = 2$ pF
- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- NSVR0170MX2WT5G - Wettable Flank Package for Optimal Automated Optical Inspection (AOI)
- 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 and MP3 Players
- Digital Camera and Camcorders
- Notebook PCs & PDAs
- GPS
- Automotive ECUs

MAXIMUM RATINGS

| Symbol | Rating | Value | Unit |
|--------|---|--------------------|------|
| V_R | Reverse Voltage | 70 | V |
| I_F | Forward Current (DC) | 70 | mA |
| ESD | ESD Rating: Human Body Model Machine Model | Class 2 Class B | |

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.

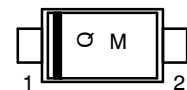
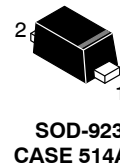
70 V SCHOTTKY BARRIER DIODE



MARKING DIAGRAMS



Q = Specific Device Code
M = Month Code



Q = Specific Device Code
M = Month Code



Q = Specific Device Code
M = Date Code

ORDERING INFORMATION

| Device | Package | Shipping [†] |
|-----------------|----------------------|------------------------------------|
| NSR0170HT1G | SOD-323 (Pb-Free) | 3,000 / Tape & Reel |
| NSVR0170HT1G | | |
| NSR0170P2T5G | SOD-923 (Pb-Free) | 2 mm Pitch 8000/ Tape & Reel |
| NSVR0170P2T5G | | |
| NSVR0170MX2WT5G | X2DFNW2 (Pb-Free) | 8,000/ 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](#).

NSR0170

THERMAL CHARACTERISTICS

| Symbol | Characteristic | Min | Typ | Max | Unit |
|--------------------------|--|-----|-----|----------------|---------------------------------|
| $R_{\theta JA}$ P_D | Thermal Resistance Junction-to-Ambient (Note 1) Total Power Dissipation @ $T_A = 25^\circ\text{C}$ | – | – | 520 240 | $^\circ\text{C}/\text{W}$ mW |
| $R_{\theta JA}$ P_D | Thermal Resistance Junction-to-Ambient (Note 2) Total Power Dissipation @ $T_A = 25^\circ\text{C}$ | – | – | 175 710 | $^\circ\text{C}/\text{W}$ mW |
| T_J, T_{stg} | Junction and Storage Temperature Range | – | – | –55 to +150 | $^\circ\text{C}$ |

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

| Symbol | Characteristic | Min | Typ | Max | Unit |
|--------|--|-----|----------------------|----------------------|---------------------|
| I_R | Reverse Leakage ($V_R = 50\text{ V}$) ($V_R = 70\text{ V}$) | – | 25 – | 90 3.0 | nA μA |
| V_F | Forward Voltage ($I_F = 1.0\text{ mA}$) ($I_F = 10\text{ mA}$) ($I_F = 15\text{ mA}$) | – | 0.34 0.56 0.65 | 0.39 0.64 0.73 | V |
| C_T | Total Capacitance ($V_R = 0\text{ V}$, $f = 1\text{ MHz}$) | – | 2.0 | – | 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.

NSR0170

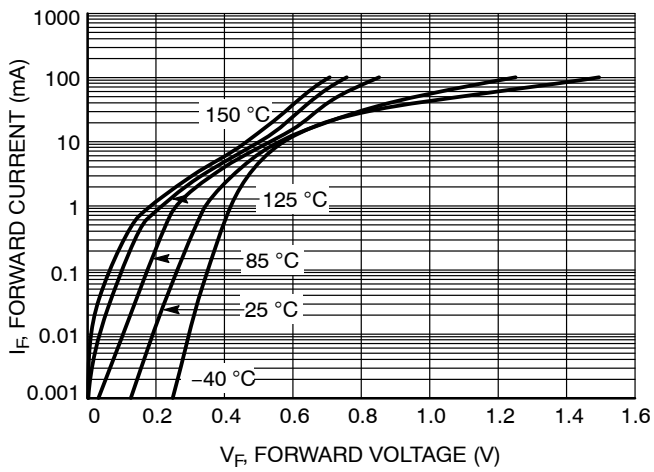


Figure 1. Forward Voltage

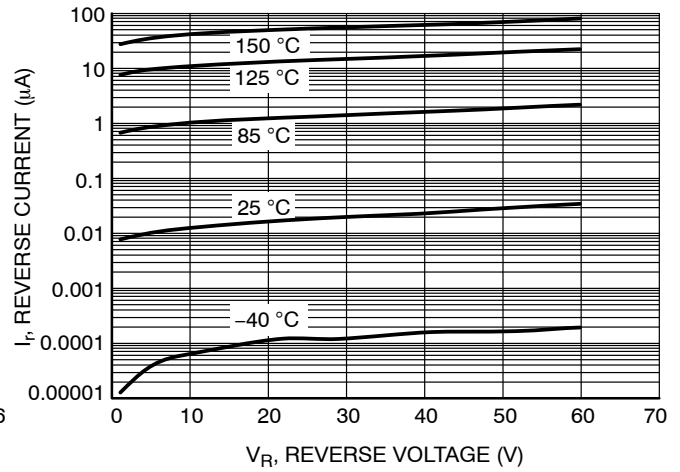


Figure 2. Leakage Current

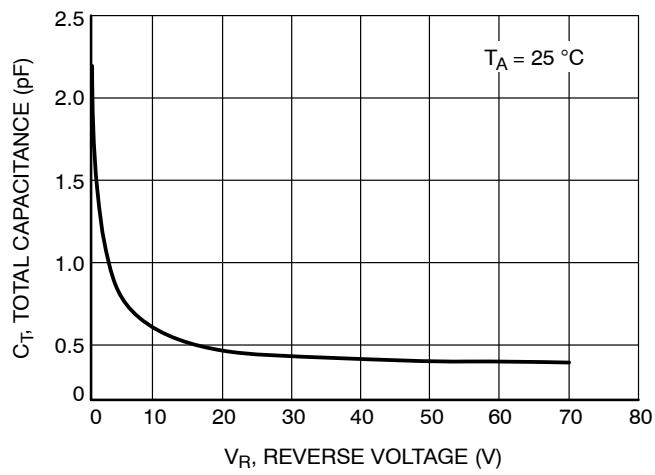


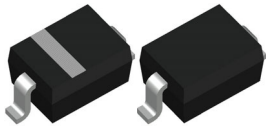
Figure 3. Total Capacitance

NSR0170

REVISION HISTORY

| Revision | Description of Changes | Date |
|----------|---|------------|
| 2 | Update of the front page 711BG case outline 3D model. | 11/19/2025 |

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.



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

DATE 11 MAR 2024



RECOMMENDED MOUNTING FOOTPRINT

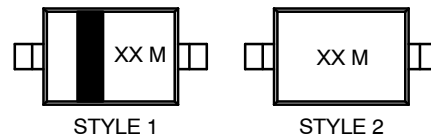
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference manual, SOLDERRM/D.

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) | | |

GENERIC MARKING DIAGRAM*



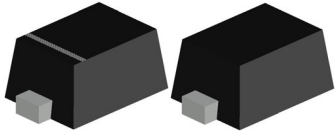
XX = Specific Device Code
M = Date Code

*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. Some products may not follow the Generic Marking.

STYLE 1: PIN 1. CATHODE (POLARITY BAND)
2. ANODE STYLE 2: NO POLARITY

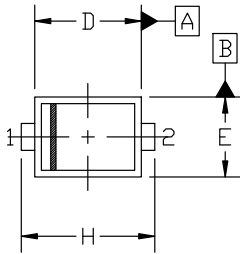
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SOD-923 0.80x0.60x0.37
CASE 514AB
ISSUE E

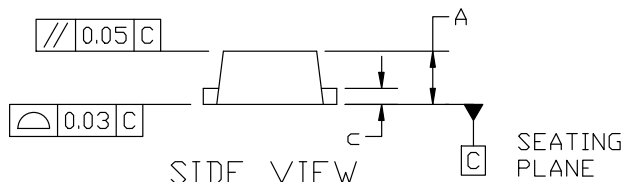
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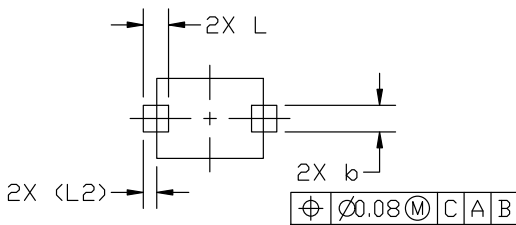
TOP VIEW

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
5. DIMENSION L WILL NOT EXCEED 0.30mm.

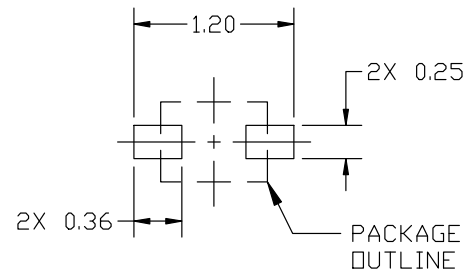


SIDE VIEW



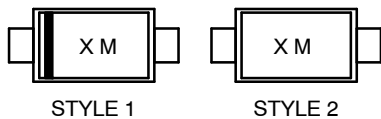
BOTTOM VIEW

| MILLIMETERS | | | |
|-------------|----------|------|------|
| DIM | MIN. | NOM. | MAX. |
| A | 0.34 | 0.37 | 0.40 |
| b | 0.15 | 0.20 | 0.25 |
| c | 0.07 | 0.12 | 0.17 |
| D | 0.75 | 0.80 | 0.85 |
| E | 0.55 | 0.60 | 0.65 |
| H | 0.95 | 1.00 | 1.05 |
| L | 0.19 REF | | |
| L2 | 0.05 | 0.10 | 0.15 |



RECOMMENDED MOUNTING FOOTPRINT

GENERIC MARKING DIAGRAM*



X = 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.

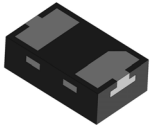
STYLE 1: PIN 1. CATHODE (POLARITY BAND)
2. ANODE

STYLE 2: NO POLARITY

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

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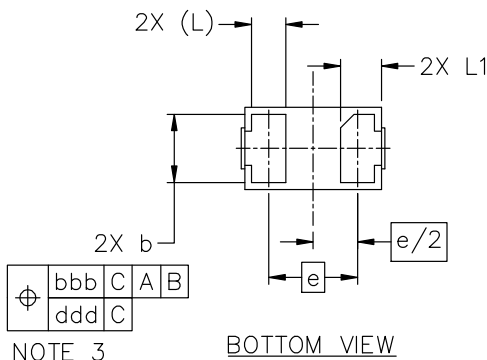
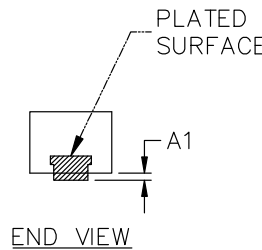
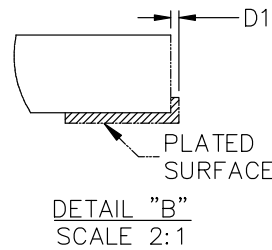
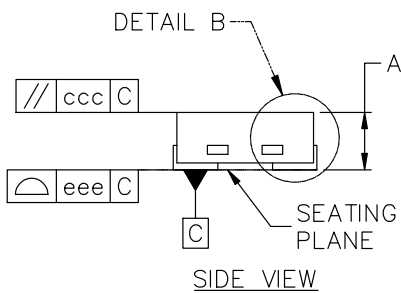
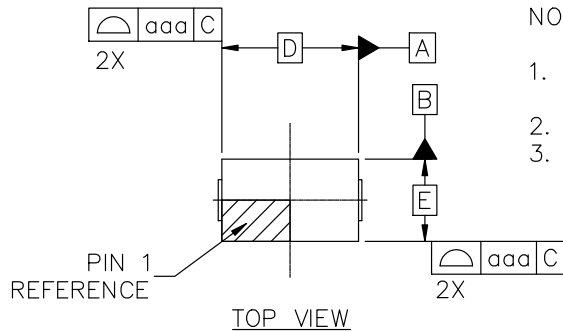


X2DFNW-2 1.00x0.60x0.37, 0.65P
CASE 711BG
ISSUE F

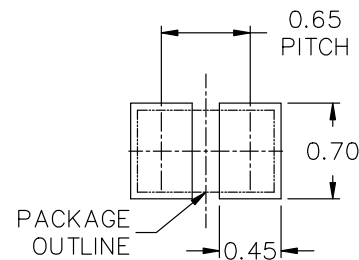
DATE 06 NOV 2025

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.



| MILLIMETERS | | | |
|---------------------------|----------|------|------|
| DIM | 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 |
| TOLERANCE FORM & POSITION | | | |
| aaa | 0.05 | | |
| bbb | 0.10 | | |
| ccc | 0.05 | | |
| ddd | 0.05 | | |
| eee | 0.05 | | |



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.

RECOMMENDED MOUNTING FOOTPRINT*
* FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE onsemi SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

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