

# 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 – CT = 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

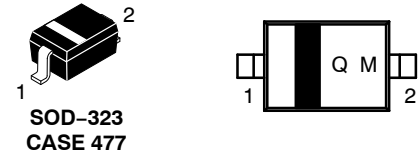
Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	70	V
Forward Current (DC)	$I_F$	70	mA
ESD Rating: Human Body Model Machine Model	ESD	Class 2 Class B	

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.

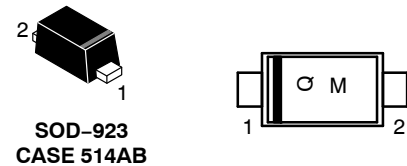
## 70 V SCHOTTKY BARRIER DIODE



### 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)	3000/ Tape & Reel
NSVR0170HT1G		
NSR0170P2T5G	SOD-923 (Pb-Free)	2 mm Pitch 8000/ Tape & Reel
NSVR0170P2T5G		
NSVR0170MX2WT5G	X2DFNW2 (Pb-Free)	8000/ 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.

# THERMAL CHARACTERISTICS

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

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

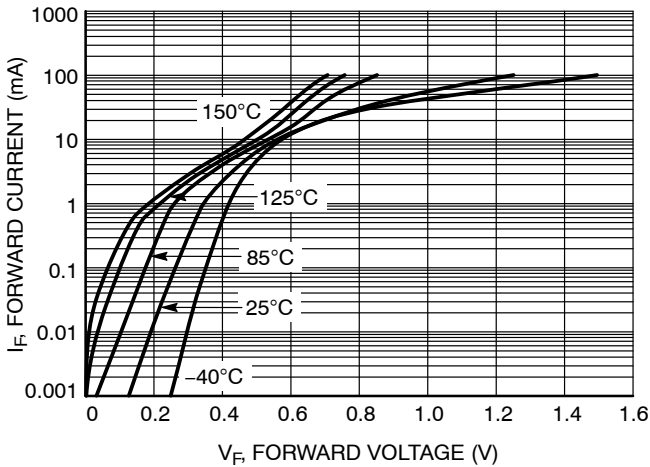


Figure 1. Forward Voltage

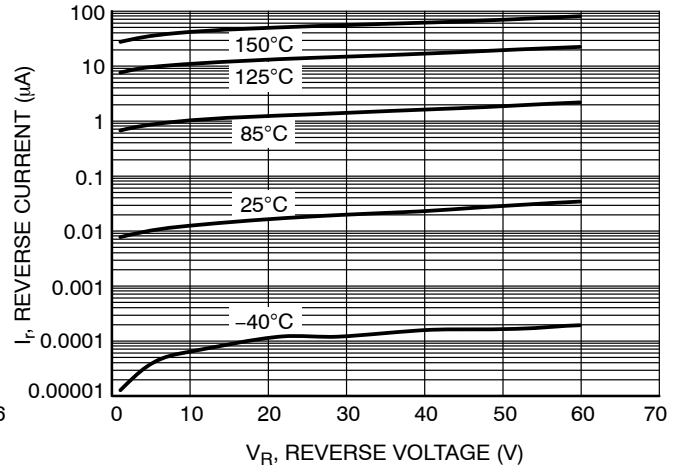


Figure 2. Leakage Current

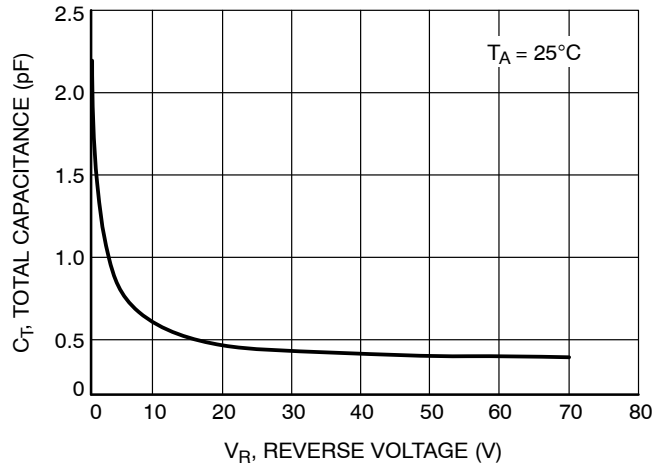
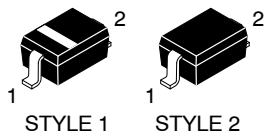


Figure 3. Total Capacitance

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

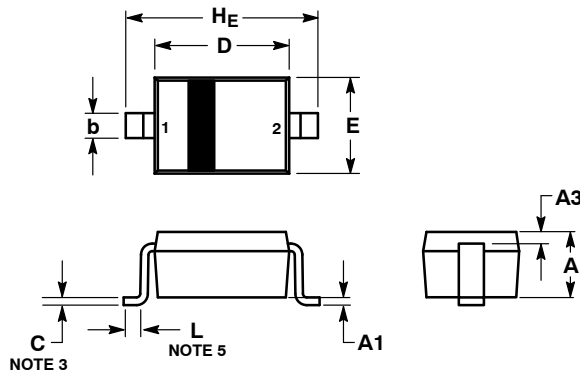


STYLE 1      STYLE 2

SCALE 4:1

**SOD-323**  
**CASE 477-02**  
**ISSUE H**

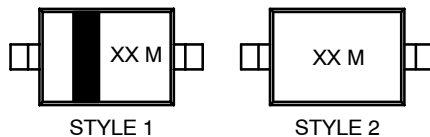
DATE 13 MAR 2007



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

STYLE 2:  
NO POLARITY

## GENERIC MARKING DIAGRAM\*



STYLE 1

STYLE 2

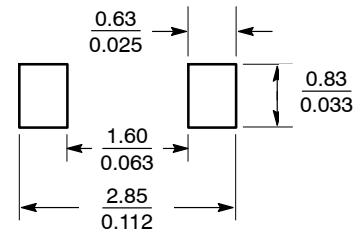
XX = Specific Device Code  
M = Date Code

\*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.

- 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

## RECOMMENDED SOLDERING FOOTPRINT\*

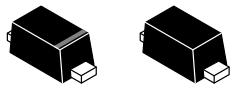


\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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<b>DESCRIPTION:</b>	<b>SOD-323</b>	<b>PAGE 1 OF 1</b>

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# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

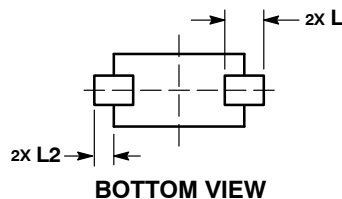
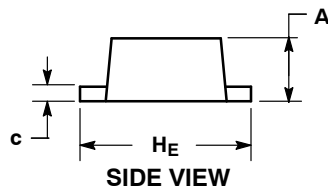
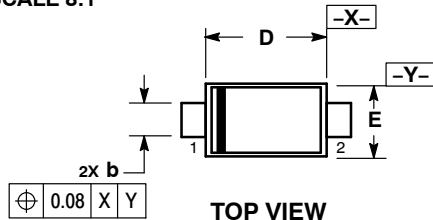


STYLE 1      STYLE 2

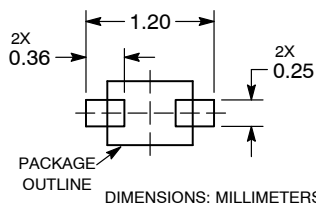
SCALE 8:1

**SOD-923**  
**CASE 514AB**  
**ISSUE D**

DATE 03 SEP 2020



## SOLDERING FOOTPRINT\*



See Application Note AND8455/D for more mounting details

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

## NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
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.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.34	0.37	0.40	0.013	0.015	0.016
b	0.15	0.20	0.25	0.006	0.008	0.010
c	0.07	0.12	0.17	0.003	0.005	0.007
D	0.75	0.80	0.85	0.030	0.031	0.033
E	0.55	0.60	0.65	0.022	0.024	0.026
H <sub>E</sub>	0.95	1.00	1.05	0.037	0.039	0.041
L	0.19 REF			0.007 REF		
L2	0.05	0.10	0.15	0.002	0.004	0.006

## GENERIC MARKING DIAGRAM\*



STYLE 1

STYLE 2

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

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<b>DESCRIPTION:</b>	<b>SOD-923, 1.0x0.6x0.37, MAX HEIGHT 0.40</b>	<b>PAGE 1 OF 1</b>

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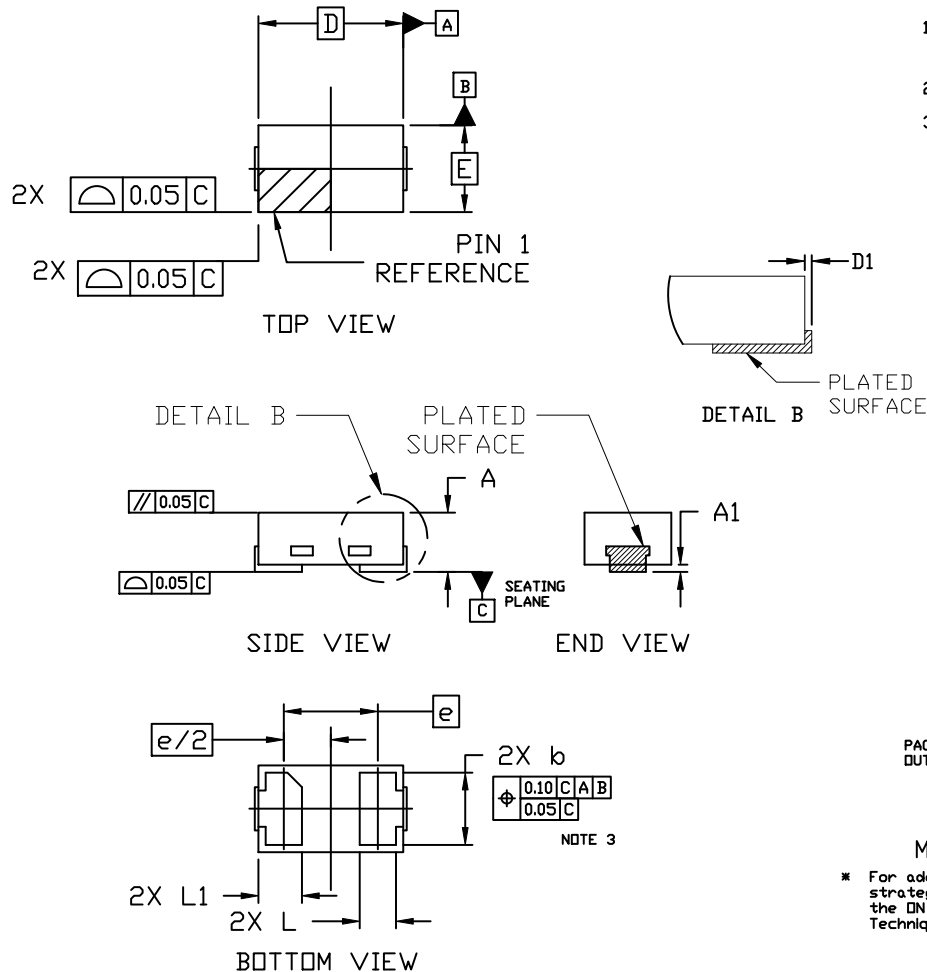
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



SCALE 8:1

**X2DFNW2 1.0x0.6, 0.65P**  
CASE 711BG  
ISSUE C

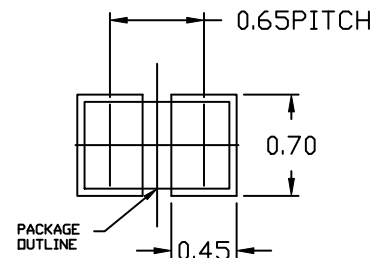
DATE 13 SEP 2019



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: 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.	NDM.	MAX.
A	0.34	0.37	0.40
A1	---	---	0.05
b	0.45	0.50	0.55
D	0.90	1.00	1.10
D1	---	---	0.05
E	0.50	0.60	0.70
e	0.65 BSC		
L	0.22 REF		
L1	0.24	0.285	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, SOLDERRM/D.

## GENERIC MARKING DIAGRAM\*



XX = Specific Device Code  
M = Date Code

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<b>DESCRIPTION:</b>	<b>X2DFNW2 1.0X0.6, 0.65P</b>	<b>PAGE 1 OF 1</b>

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