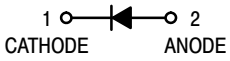
Schottky Barrier Diode

NSR0170

70 V SCHOTTKY BARRIER DIODE



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

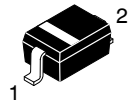
- Mobile Handsets and MP3 Players
- Digital Camera and Camcorders
- Notebook PCs & PDAs
- GPS
- Automotive ECUs

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	

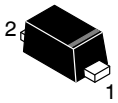
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

MARKING DIAGRAMS

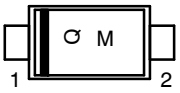


SOD−323
CASE 477

Q = Specific Device Code
M = Month Code



SOD−923
CASE 514AB



Q = Specific Device Code
M = Month Code

X2DFNW2
CASE 711BG

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°C	 $R_{\theta JA}$ P_D			 520 240	 °C/W mW
Thermal Resistance Junction–to–Ambient (Note 2) Total Power Dissipation @ T_A = 25°C	 $R_{\theta JA}$ P_D			 175 710	 °C/W 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 (V_R = 50 V) (V_R = 70 V)	I_R		 25 –	 90 3.0	 nA μA
Forward Voltage (I_F = 1.0 mA) (I_F = 10 mA) (I_F = 15 mA)	V_F		 0.34 0.56 0.65	 0.39 0.64 0.73	V
Total Capacitance (V_R = 0 V, f = 1 MHz)	CT		2.0		pF

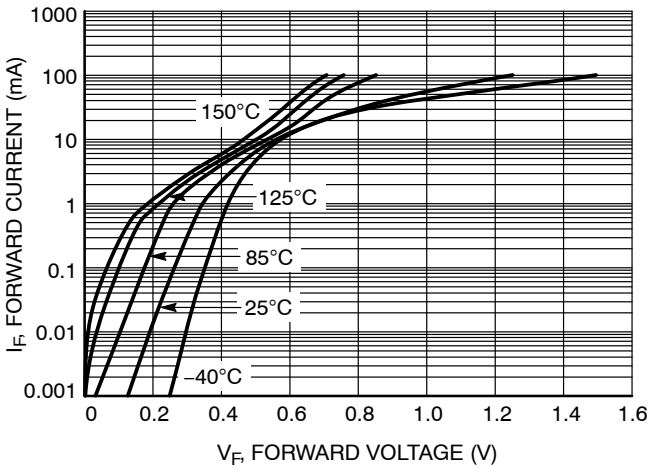


Figure 1. Forward Voltage

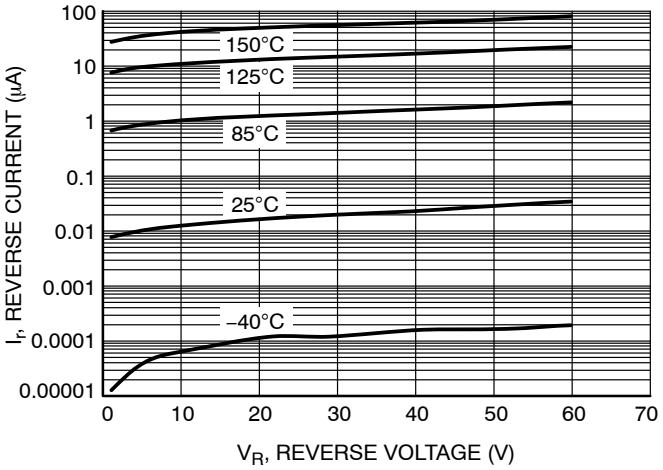


Figure 2. Leakage Current

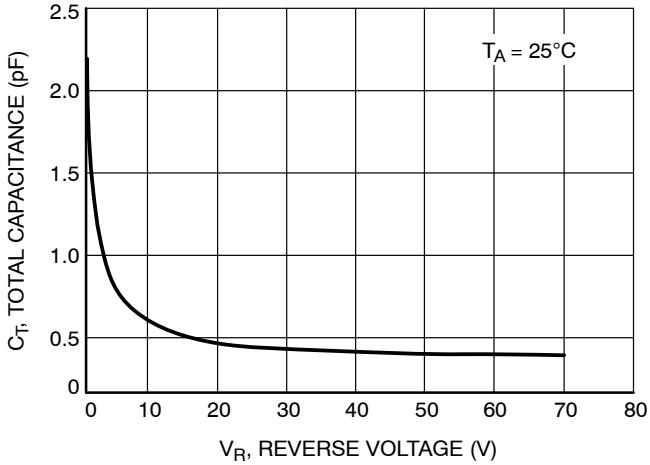
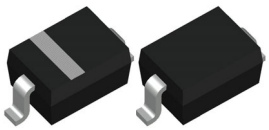
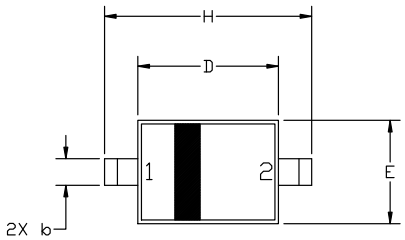


Figure 3. Total Capacitance

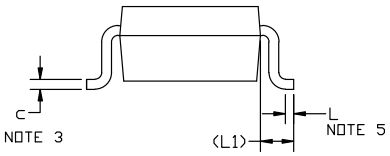


SOD−323 1.70x1.25x0.85
CASE 477
ISSUE K

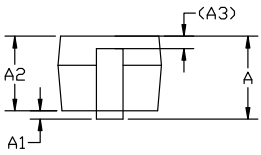
DATE 11 MAR 2024



TOP VIEW



SIDE VIEW

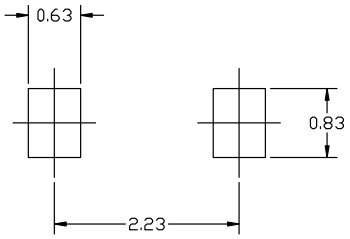


END VIEW

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.

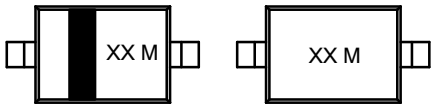
DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.80	0.90	1.00
A1	0.00	0.05	0.10
A2	0.75	0.85	0.95
A3	0.15 (REF)		
b	0.25	0.32	0.4
c	0.09	0.12	0.18
D	1.60	1.70	1.80
E	1.15	1.25	1.35
H	2.30	2.50	2.70
L	0.08	---	---
L1	0.40 (REF)		



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

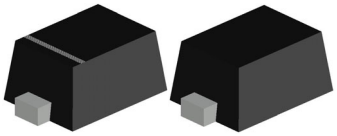
XX = Specific Device Code
M = Date Code

*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

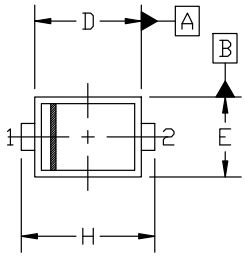
STYLE 2:
NO POLARITY

DOCUMENT NUMBER:	**98ASB17533C**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.	
DESCRIPTION:	**SOD−323 1.70x1.25x0.85**		**PAGE 1 OF 1**

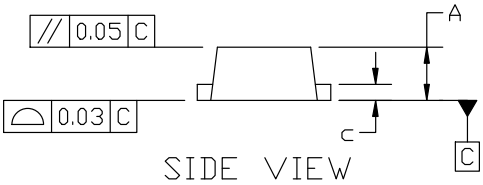


SOD−923 0.80x0.60x0.37
CASE 514AB
ISSUE E

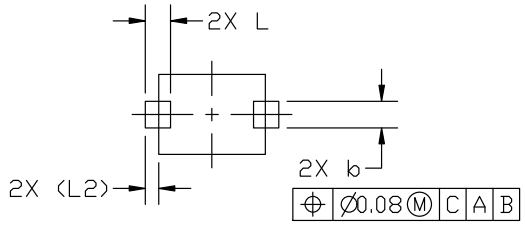
DATE 08 FEB 2024



TOP VIEW



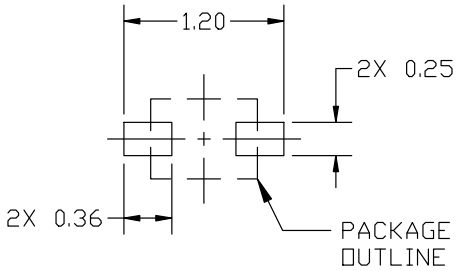
SIDE VIEW



BOTTOM 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.

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

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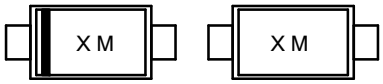
GENERIC MARKING DIAGRAM*



STYLE 1 STYLE 2

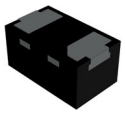
X = Specific Device Code
M = Date Code

*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

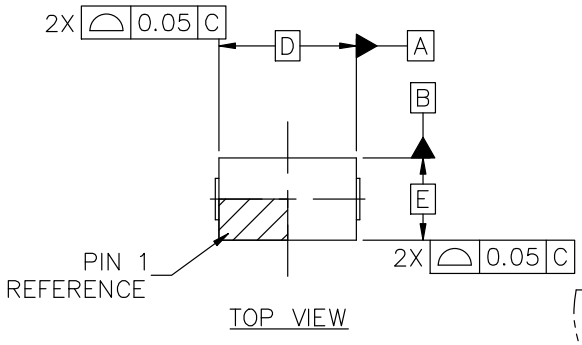
STYLE 2:
NO POLARITY

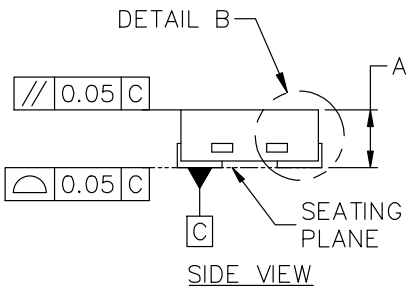
DOCUMENT NUMBER:	**98AON23284D**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.	
DESCRIPTION:	**SOD−923 0.80x0.60x0.37**		**PAGE 1 OF 1**

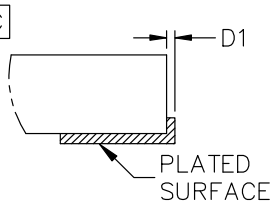


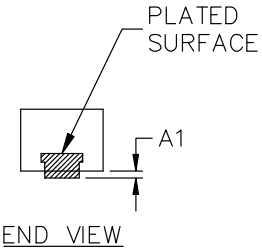
X2DFNW2 1.00x0.60x0.37, 0.65P
CASE 711BG
ISSUE D

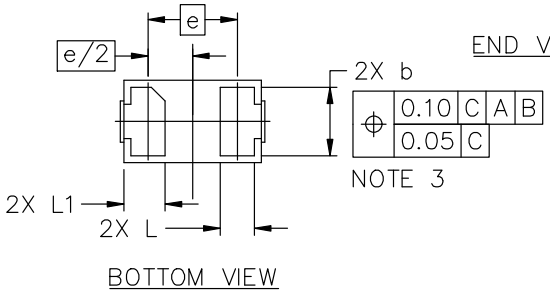
DATE 29 FEB 2024







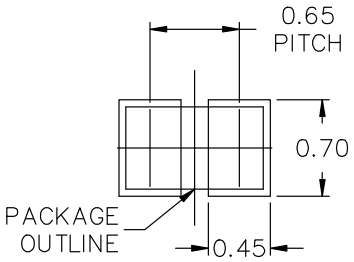




NOTES:

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, SOLDERRM/D.

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.

DOCUMENT NUMBER:	**98AON15241G**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**X2DFNW2 1.00x0.60x0.37, 0.65P**	**PAGE 1 OF 1**

ADDITIONAL INFORMATION

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