

# NSR0520V2, NSVR0520V2

## Schottky Barrier Diode

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. NSR0520V2 in a SOD–523 miniature package enables designers to meet the challenging task of achieving higher efficiency and meeting reduced space requirements.

### Features

- Very Low Forward Voltage Drop – 325 mV @ 100 mA
- Low Reverse Current – 8.0  $\mu$ A @ 10 V
- Continuous Forward Current – 500 mA
- Power Dissipation with Minimum Trace – 170 mW
- Very High Switching Speed – 12 ns @ 10 mA
- Low Capacitance – 35 pF @ 1.0 V
- 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 and Protection

### Markets

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

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Reverse Voltage	$V_R$	20	Vdc
Forward Continuous Current (DC)	$I_F$	500	mA
Non–Repetitive Peak Forward Surge Current	$I_{FSM}$	2.0	A
Repetitive Peak Forward Current (Pulse Wave = 1 sec, Duty Cycle = 66%)	$I_{FRM}$	1.5	A
ESD Rating: Human Body Model Machine Model	ESD	Class 3B Class C	

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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## 20 VOLT SCHOTTKY BARRIER DIODE



SOD–523  
CASE 502  
STYLE 1

### MARKING DIAGRAM



AA = Device Code  
M = Date Code\*  
■ = Pb–Free Package

(Note: Microdot may be in either location)

\*Date Code orientation position may vary depending upon manufacturing location.

### ORDERING INFORMATION

Device	Package	Shipping†
NSR0520V2T1G	SOD–523 (Pb–Free)	3000/Tape & Reel
NSVR0520V2T1G	SOD–523 (Pb–Free)	3000/Tape & Reel
NSR0520V2T5G	SOD–523 (Pb–Free)	8000/Tape & Reel
NSVR0520V2T5G	SOD–523 (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.

# NSR0520V2, NSVR0520V2

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction-to-Ambient (Note 1) Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$ $P_D$	600 170	$^\circ\text{C/W}$ mW
Thermal Resistance Junction-to-Ambient (Note 2) Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$ $P_D$	300 340	$^\circ\text{C/W}$ mW
Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to +125	$^\circ\text{C}$

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 ( $V_R = 10\text{ V}$ ) ( $V_R = 20\text{ V}$ )	$I_R$		8.0 75	30	$\mu\text{A}$
Forward Voltage ( $I_F = 10\text{ mA}$ ) ( $I_F = 100\text{ mA}$ ) ( $I_F = 500\text{ mA}$ )	$V_F$		255 325 410	320 390 480	mV
Total Capacitance ( $V_R = 1.0\text{ V}$ , $f = 1\text{ MHz}$ )	$C_T$		35		pF
Reverse Recovery Time ( $I_F = I_R = 10\text{ mA}$ , $I_R = 1.0\text{ mA}$ )	$t_{rr}$		12.0		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.

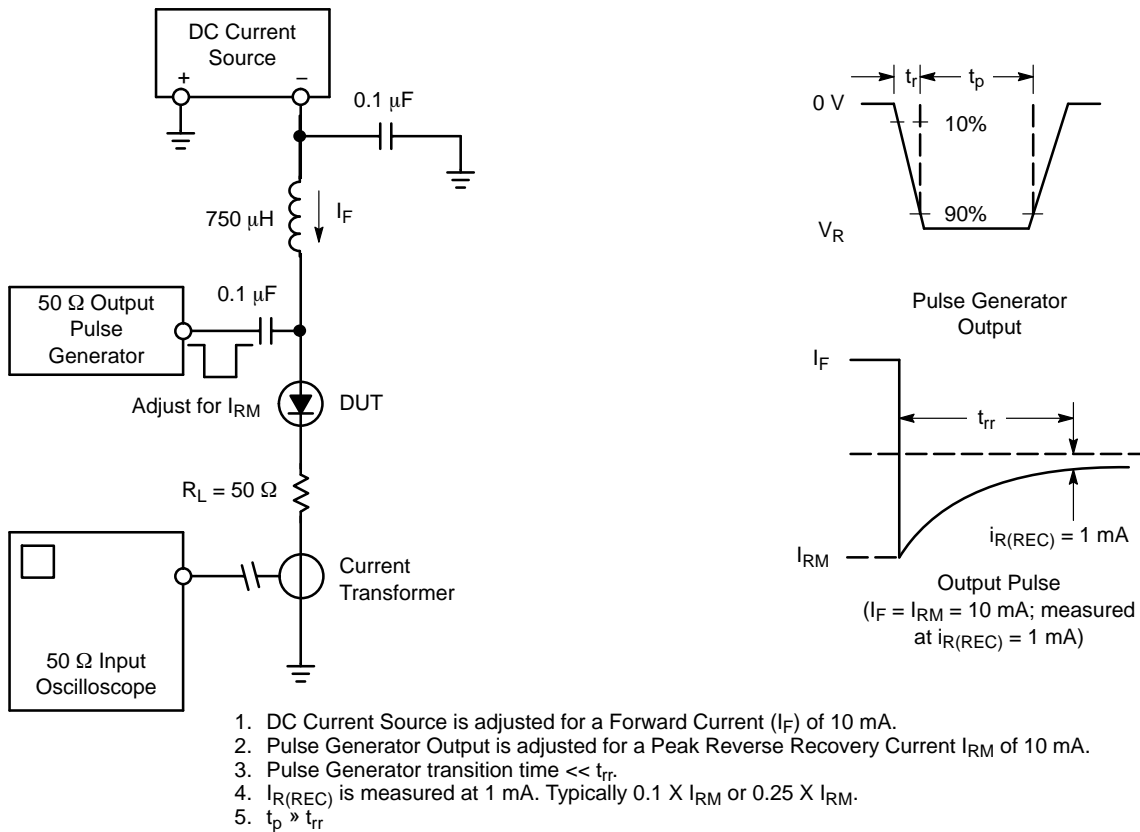


Figure 1. Recovery Time Equivalent Test Circuit

# NSR0520V2, NSVR0520V2

## TYPICAL CHARACTERISTICS

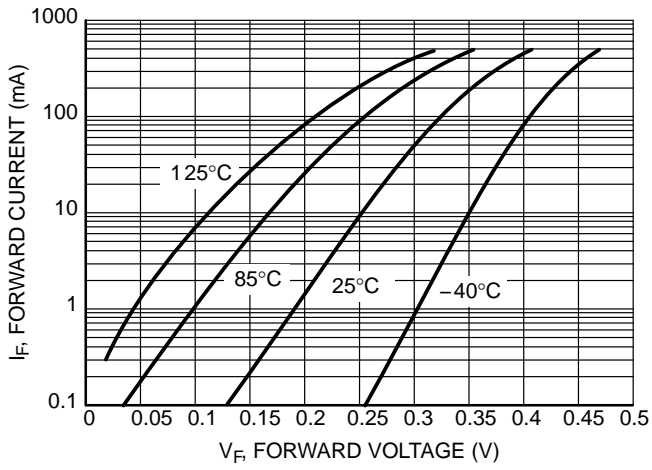


Figure 2.

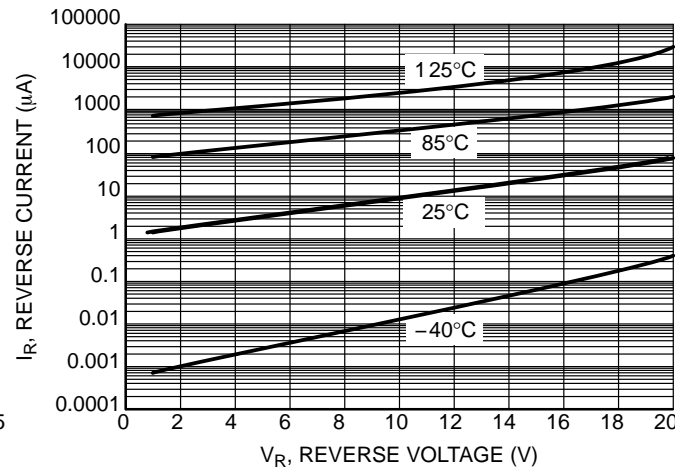


Figure 3.

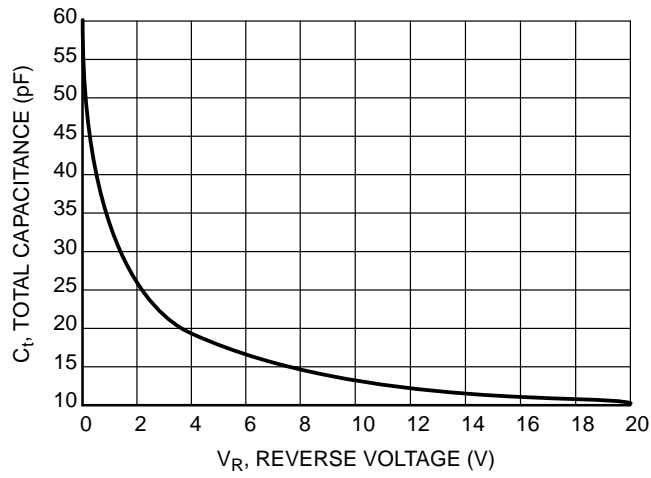
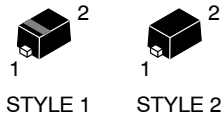


Figure 4.

# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

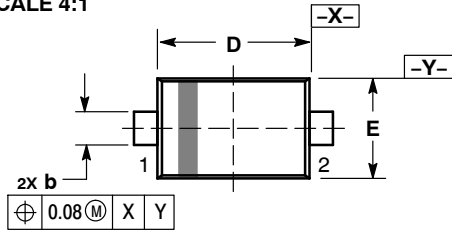
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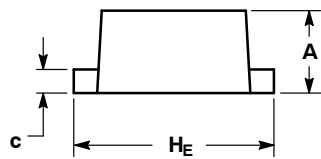
**SOD-523**  
CASE 502-01  
ISSUE E

DATE 28 SEP 2010

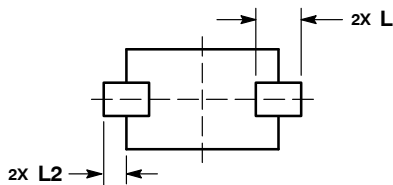
SCALE 4:1



TOP VIEW

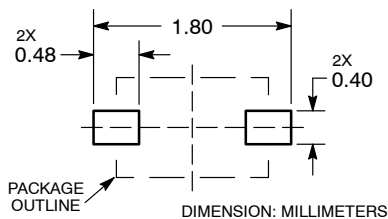


SIDE VIEW



BOTTOM VIEW

### RECOMMENDED SOLDERING FOOTPRINT\*



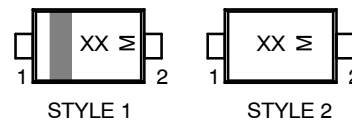
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

NOTES:

1. DIMENSIONING AND TOLERANCING 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.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.50	0.60	0.70
b	0.25	0.30	0.35
c	0.07	0.14	0.20
D	1.10	1.20	1.30
E	0.70	0.80	0.90
H <sub>E</sub>	1.50	1.60	1.70
L	0.30 REF		
L2	0.15	0.20	0.25

### 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.

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

STYLE 2: NO POLARITY

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