

NSR05T40XV2

500 mA, 40 V Schottky Barrier Diode

These Schottky barrier diodes are optimized for low forward voltage drop and low leakage current that offers the most optimal power dissipation in applications. They are housed in spacing saving micro-packaging ideal for space constraint applications.

Features

- Low Forward Voltage Drop – 530 mV (Typ.) @ $I_F = 500$ mA
- Low Reverse Current – 3.0 μ A (Typ.) @ $V_R = 40$ V
- 500 mA of Continuous Forward Current
- ESD Rating: – Human Body Model: Class 3B
– Charged Device Model: Class IV
- High Switching Speed
- 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

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|-----------|------------|------|
| Reverse Voltage | V_R | 40 | V |
| Forward Current (DC) | I_F | 500 | mA |
| Forward Surge Current (60 Hz @ 1 cycle) | I_{FSM} | 3.0 | A |
| Repetitive Peak Forward Current (Pulse Wave = 1 sec, Duty Cycle = 66%) | I_{FRM} | 1.5 | A |
| ESD Rating: Human Body Model Charged Device Model | ESD | > 8 > 1 | kV |

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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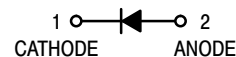
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MARKING DIAGRAM



YK = Specific Device Code
M = Date Code



ORDERING INFORMATION

| Device | Package | Shipping† |
|----------------|----------------------|-----------------------|
| NSR05T40XV2T5G | 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.

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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 | | | 489 250 | $^\circ\text{C/W}$ mW |
| Thermal Resistance Junction-to-Ambient (Note 2) Total Power Dissipation @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ P_D | | | 358 350 | $^\circ\text{C/W}$ mW |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | | | $^\circ\text{C}$ |

- Mounted onto a 4 in square FR-4 board 50 mm sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.
- Mounted onto a 4 in square FR-4 board 650 mm sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.

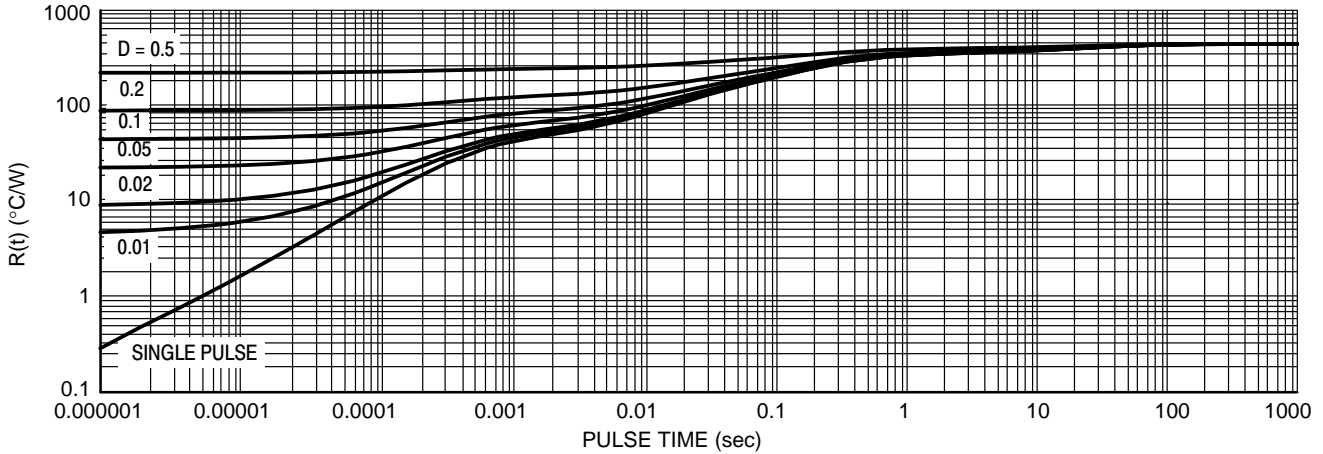


Figure 1. Thermal Response (Note 1)

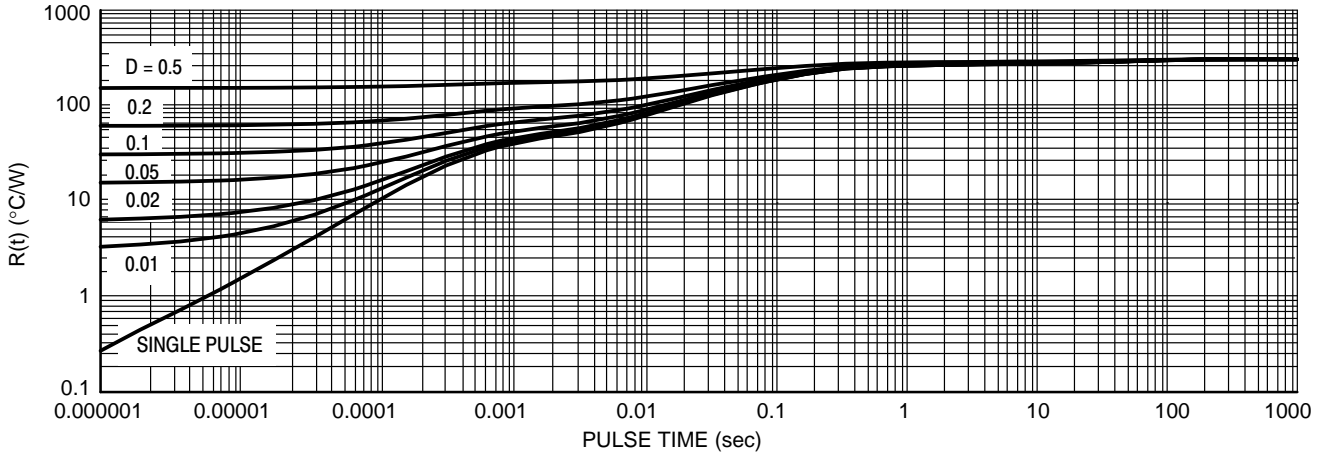


Figure 2. Thermal Response (Note 2)

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|-----------|-----|--------------------------|--------------------------|---------------|
| Reverse Leakage ($V_R = 10\text{ V}$) ($V_R = 40\text{ V}$) | I_R | | 0.5 3.0 | 5.0 55 | μA |
| Forward Voltage ($I_F = 10\text{ mA}$) ($I_F = 100\text{ mA}$) ($I_F = 200\text{ mA}$) ($I_F = 500\text{ mA}$) | V_F | | 360 420 450 530 | 400 465 525 640 | mV |
| Total Capacitance ($V_R = 1.0\text{ V}$, $f = 1.0\text{ MHz}$) | C_T | | 70 | | pF |
| Reverse Recovery Time ($I_F = I_R = 10\text{ mA}$, $I_{R(\text{REC})} = 1.0\text{ mA}$, Figure 3) | t_{rr} | | 20 | | ns |
| Peak Forward Recovery Voltage ($I_F = 100\text{ mA}$, $t_r = 20\text{ ns}$, Figure 4) | V_{FRM} | | 540 | | mV |

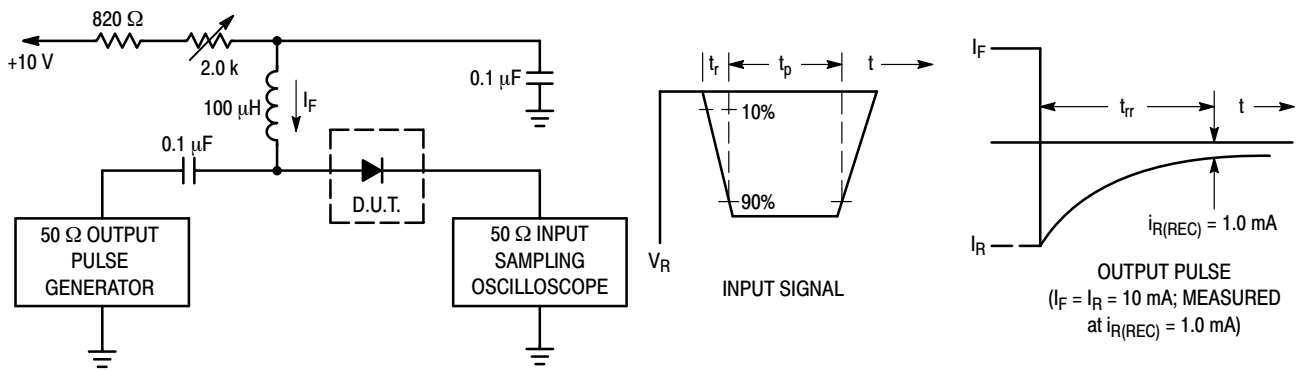


Figure 3. Recovery Time Equivalent Test Circuit

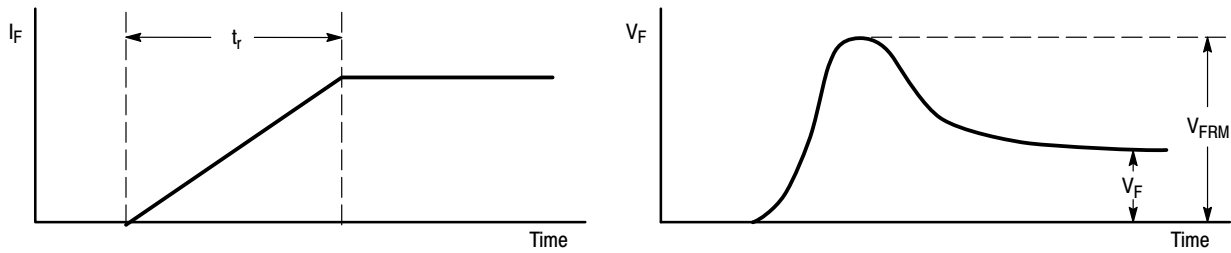


Figure 4. Peak Forward Recovery Voltage Definition

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TYPICAL CHARACTERISTICS

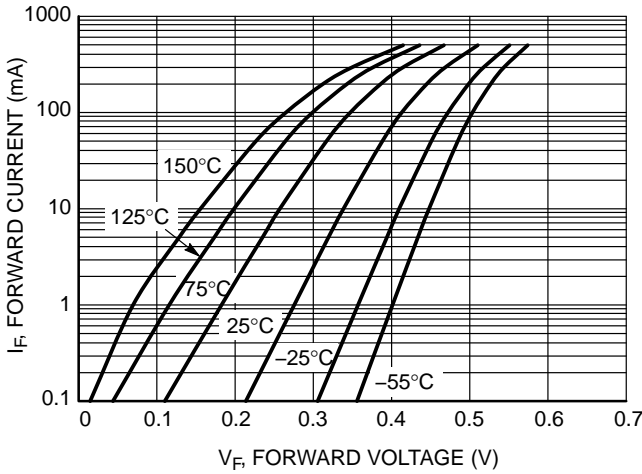


Figure 5. Forward Voltage

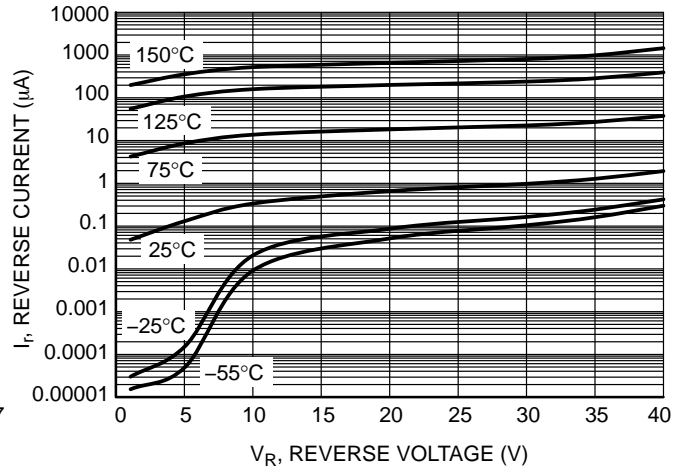


Figure 6. Leakage Current

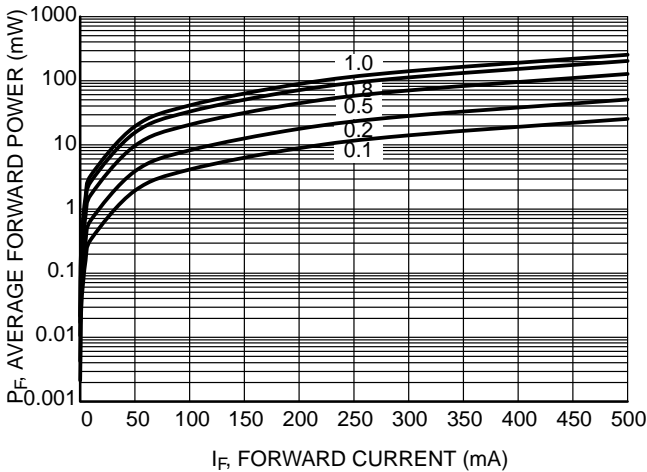


Figure 7. Average Forward Power Dissipation

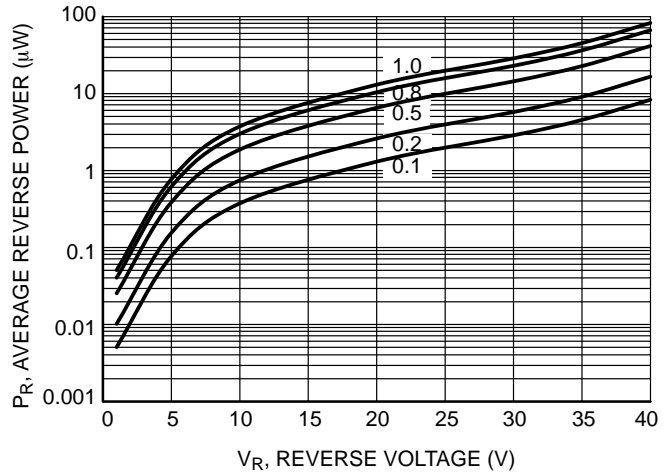


Figure 8. Average Reverse Power Dissipation

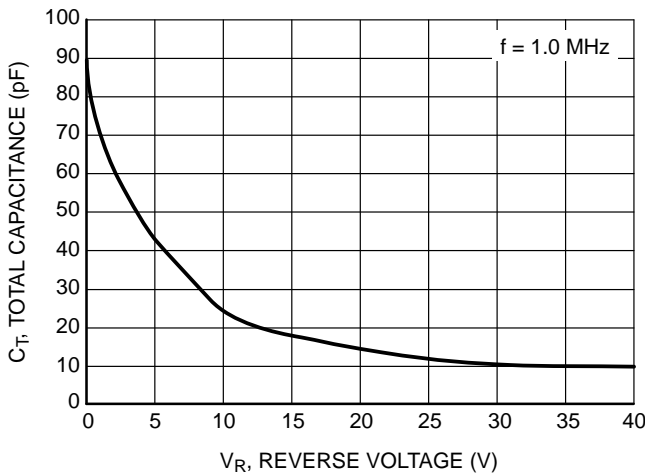


Figure 9. Total Capacitance

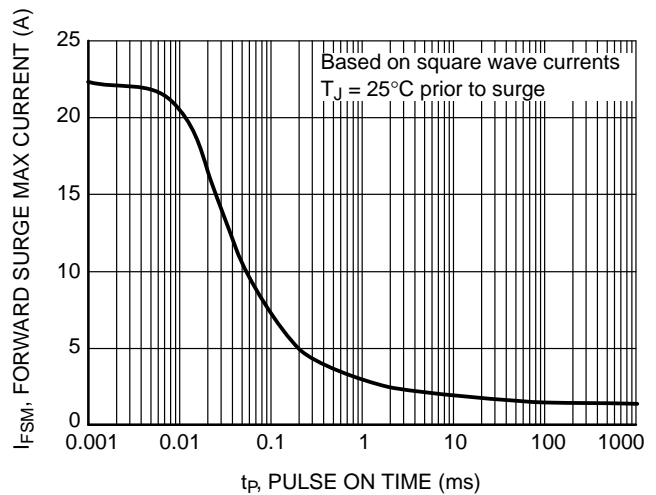
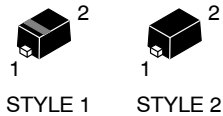


Figure 10. Forward Surge Current

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

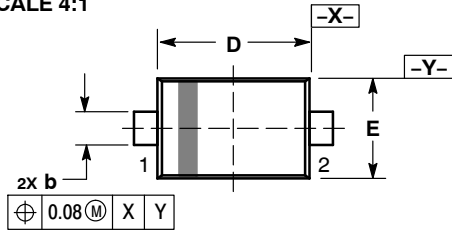
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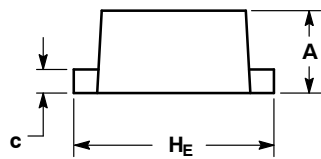
SOD-523
CASE 502-01
ISSUE E

DATE 28 SEP 2010

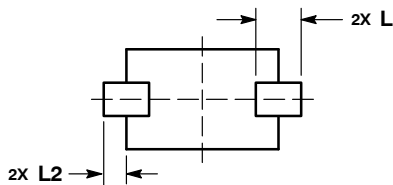
SCALE 4:1



TOP VIEW

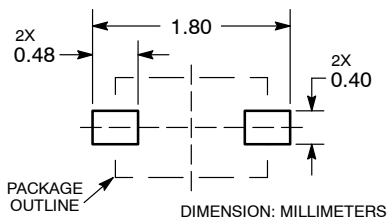


SIDE VIEW



BOTTOM VIEW

RECOMMENDED SOLDERING FOOTPRINT*

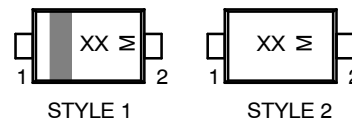


NOTES:

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 _E | 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

*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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| DESCRIPTION: | SOD-523 | PAGE 1 OF 1 |

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