

NSR05T40P2

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 – 580 mV (Typ.) @ $I_F = 500$ mA
- Low Reverse Current – 2.0 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

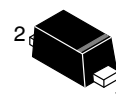
| Rating | Symbol | Value | Unit |
|---|-----------|------------|------|
| Reverse Voltage | V_R | 40 | V |
| Forward Current (DC) | I_F | 500 | mA |
| Forward Surge Current (60 Hz @ 1 cycle) | I_{FSM} | 3.0 | A |
| Repetitive Peak Forward Current (Pulse Wave = 1 sec, Duty Cycle = 66%) | I_{FRM} | 1.0 | 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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SOD-923
CASE 514AB

YK = Specific Device Code
M = Date Code

MARKING DIAGRAM



ORDERING INFORMATION

| Device | Package | Shipping† |
|---------------|----------------------|--------------------------------|
| NSR05T40P2T5G | SOD-923 (Pb-Free) | 2 mm Pitch 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 | | | 345 360 | $^\circ\text{C}/\text{W}$ mW |
| Thermal Resistance Junction-to-Ambient (Note 2) Total Power Dissipation @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ P_D | | | 175 715 | $^\circ\text{C}/\text{W}$ 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 50 mm sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.
2. Mounted onto a 4 in square FR-4 board 650 mm sq. 1 oz. Cu 0.06" thick single sided. Operating to steady state.

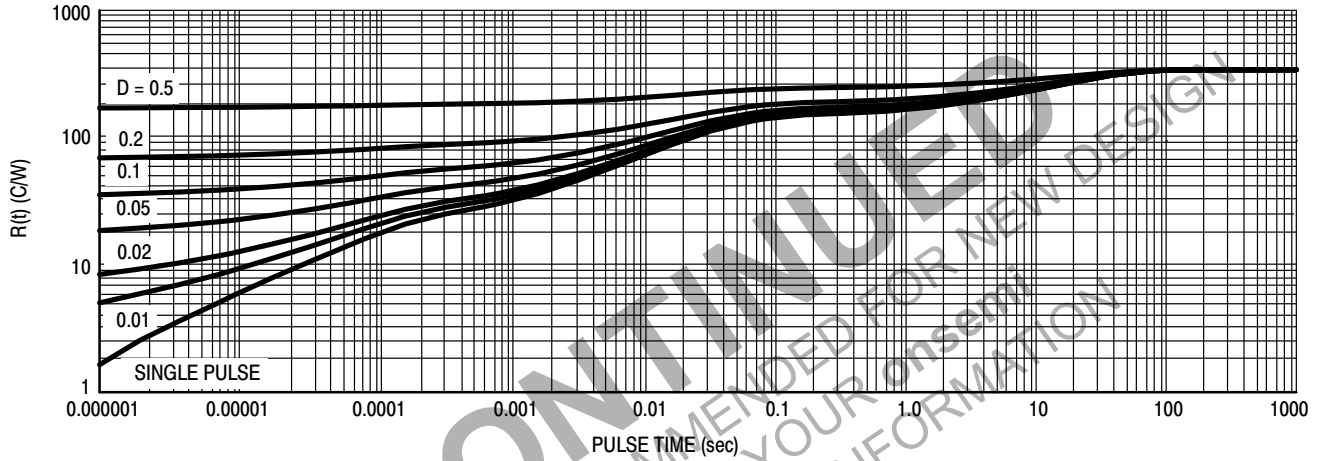


Figure 1. Thermal Response (Note 1)

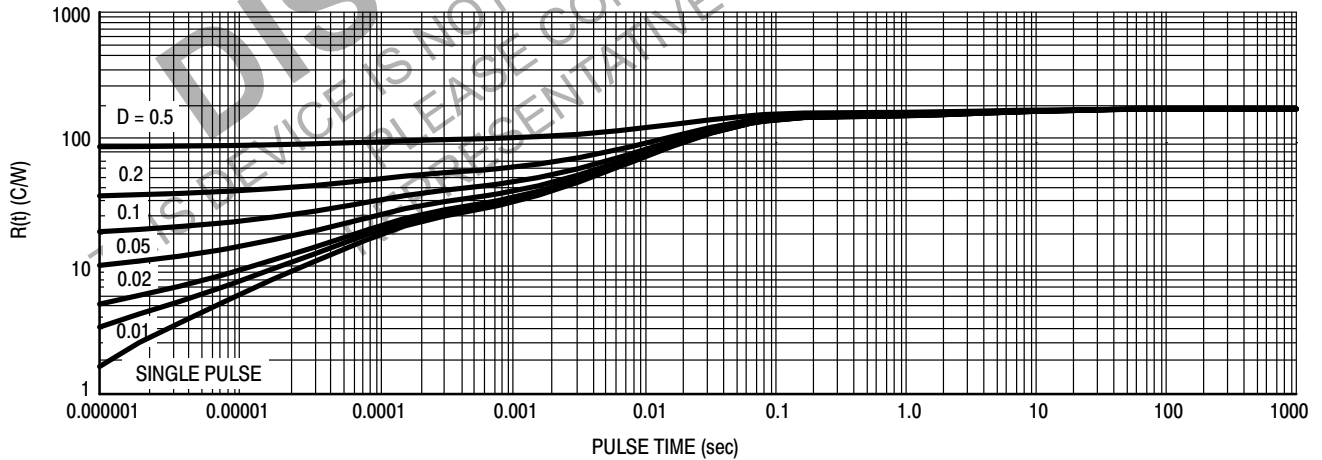


Figure 2. Thermal Response (Note 2)

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|------------------|-----|--------------------------|--------------------------|------|
| Reverse Leakage (V _R = 10 V) (V _R = 40 V) | I _R | | 0.2 2.0 | 5.0 55 | μA |
| Forward Voltage (I _F = 10 mA) (I _F = 100 mA) (I _F = 200 mA) (I _F = 500 mA) | V _F | | 360 450 490 580 | 410 500 550 700 | mV |
| Total Capacitance (V _R = 1.0 V, f = 1.0 MHz) | C _T | | 29 | | pF |
| Reverse Recovery Time (I _F = I _R = 10 mA, I _{R(REC)} = 1.0 mA, Figure 3) | t _{rr} | | 8.0 | | ns |
| Peak Forward Recovery Voltage (I _F = 100 mA, t _r = 20 ns, Figure 4) | V _{FRM} | | 560 | | mV |

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.

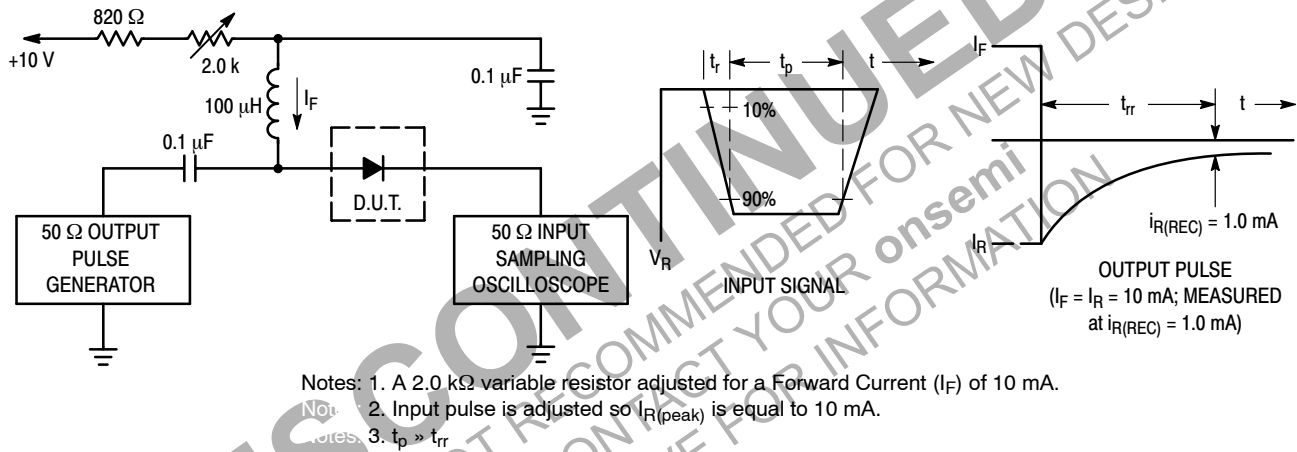


Figure 3. Recovery Time Equivalent Test Circuit

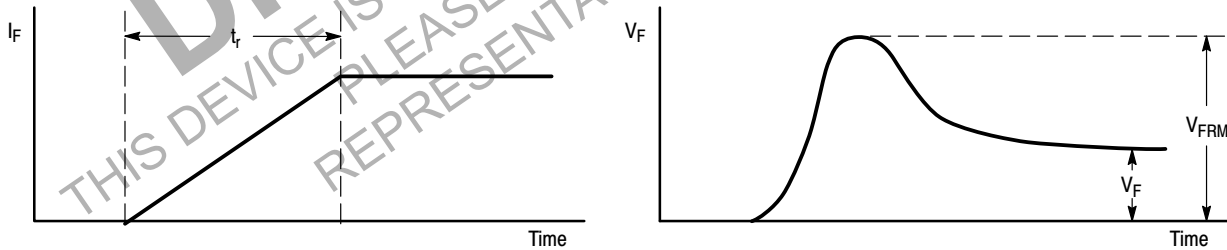


Figure 4. Peak Forward Recovery Voltage Definition

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TYPICAL CHARACTERISTICS

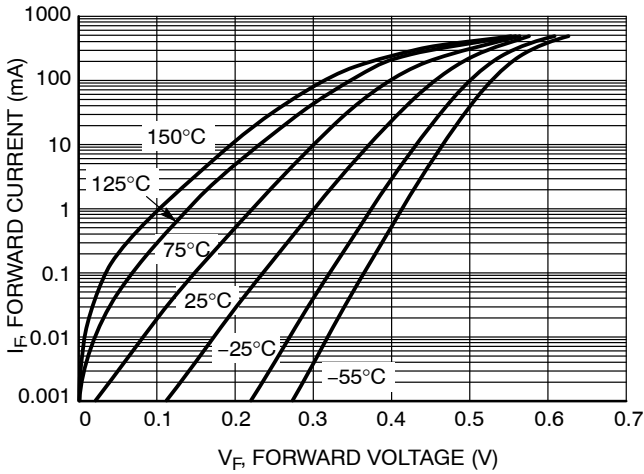


Figure 5. Forward Voltage

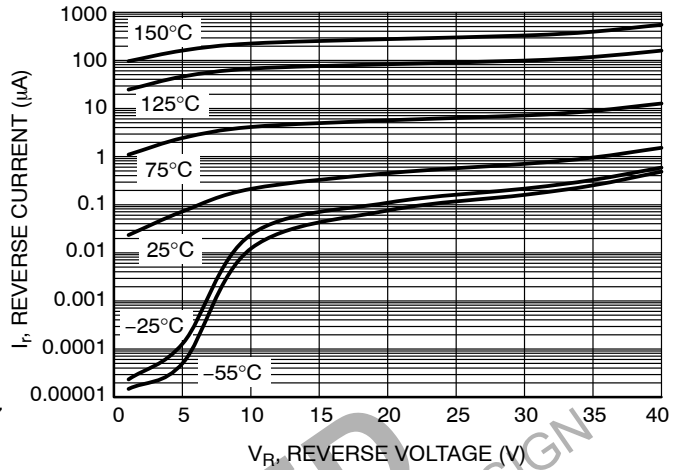


Figure 6. Leakage Current

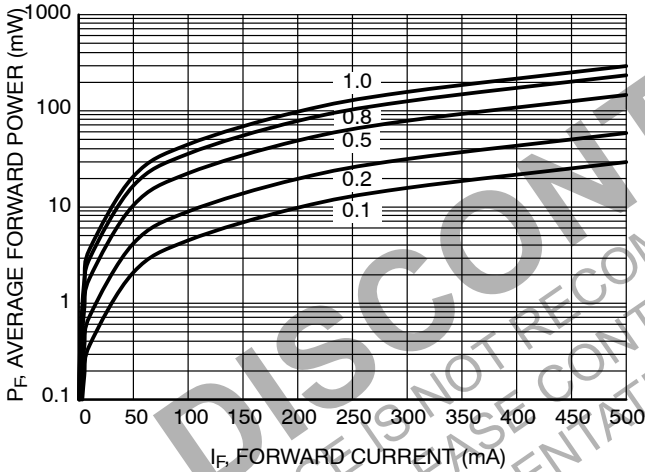


Figure 7. Average Forward Power Dissipation

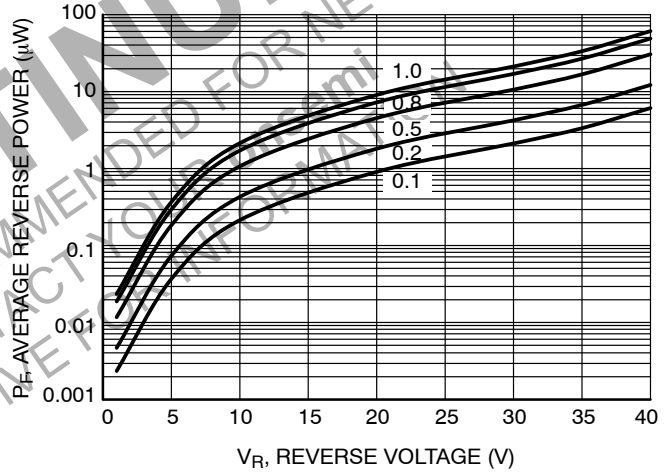


Figure 8. Average Reverse Power Dissipation

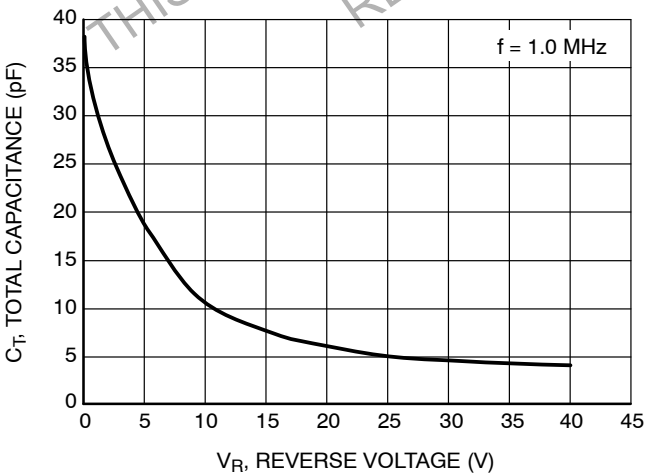


Figure 9. Total Capacitance

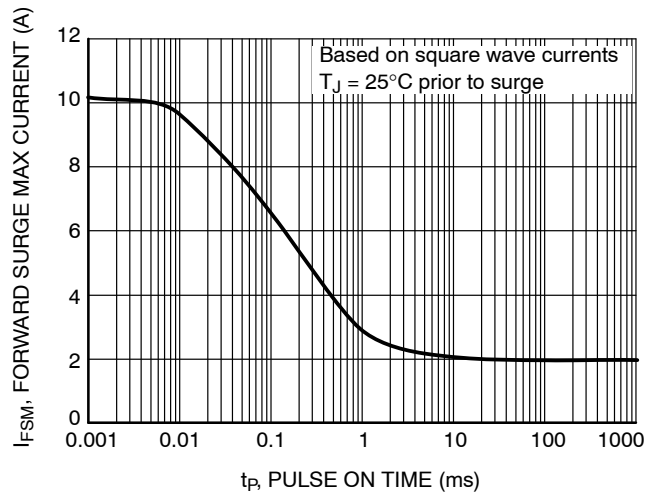
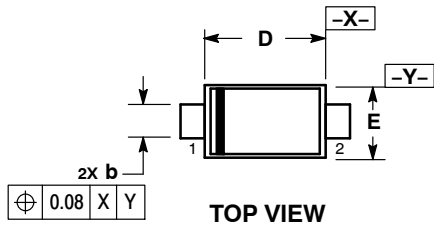


Figure 10. Forward Surge Current

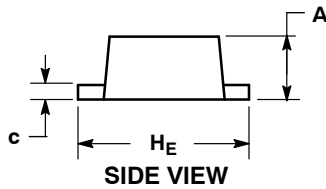
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PACKAGE DIMENSIONS

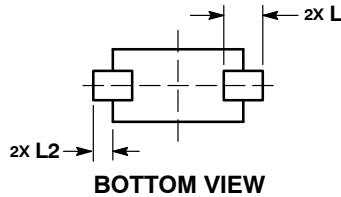
SOD-923
CASE 514AB
ISSUE C



TOP VIEW



SIDE VIEW



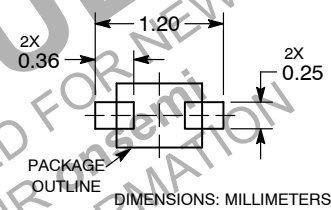
BOTTOM VIEW

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 | | | 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 _E | 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 |

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 ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

DISCONTINUED

THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN. PLEASE CONTACT YOUR SALES REPRESENTATIVE FOR MORE INFORMATION.

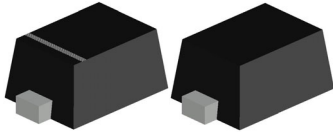
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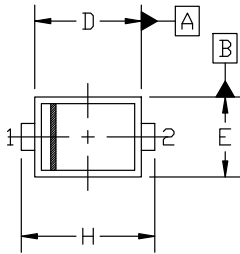
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CASE 514AB
ISSUE E

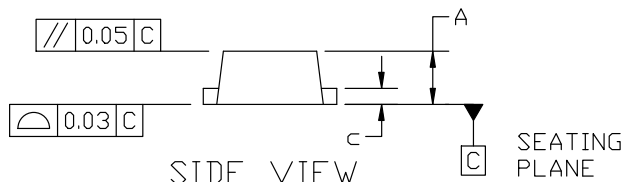
DATE 08 FEB 2024



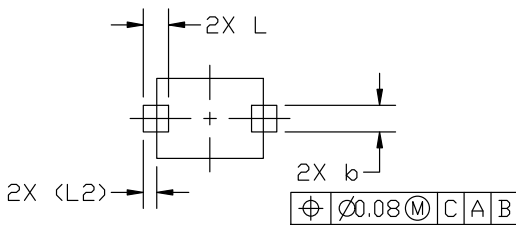
TOP VIEW

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.

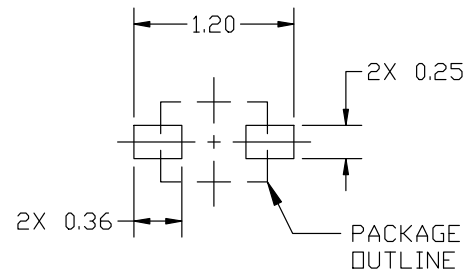


SIDE VIEW



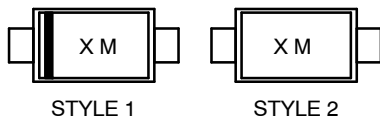
BOTTOM VIEW

| 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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