

# Zener Diodes

## 1N5221B - 1N5252B

### ABSOLUTE MAXIMUM RATINGS (Note 1)

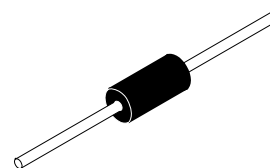
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol    | Parameter                                      | Value       | Unit                 |
|-----------|------------------------------------------------|-------------|----------------------|
| $P_D$     | Power Dissipation                              | 500         | mW                   |
|           | Derate above $50^\circ\text{C}$                | 4.0         | mW/ $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature Range                      | -65 to +200 | $^\circ\text{C}$     |
| $T_J$     | Operating Junction Temperature Range           | -65 to +200 | $^\circ\text{C}$     |
|           | Lead Temperature (1/16 inch from case for 10s) | +230        | $^\circ\text{C}$     |

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.

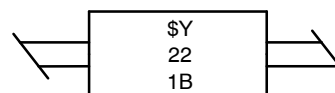
- These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Non-recurrent square wave Pulse Width = 8.3 ms,  $T_A = 50^\circ\text{C}$ .



AXIAL LEAD  
CASE 017AG

### MARKING DIAGRAM



\$Y = Logo  
221B = Specific Device Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 3 of this data sheet.

# 1N5221B – 1N5252B

**ELECTRICAL CHARACTERISTICS** Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Device                                                                           | $V_Z$ (V) @ $I_Z$ (Note 2) |      |        | $Z_Z$ ( $\Omega$ ) @ $I_Z$ (mA) |     | $Z_{ZK}$ ( $\Omega$ ) @ $I_{ZK}$ (mA) |      | $I_R$ ( $\mu\text{A}$ ) @ $V_R$ (V) |      | $T_C$ (%/°C) |
|----------------------------------------------------------------------------------|----------------------------|------|--------|---------------------------------|-----|---------------------------------------|------|-------------------------------------|------|--------------|
|                                                                                  | Min.                       | Typ. | Max.   |                                 |     |                                       |      |                                     |      |              |
| 1N5221B                                                                          | 2.280                      | 2.4  | 2.52   | 30                              | 20  | 1,200                                 | 0.25 | 100                                 | 1.0  | -0.085       |
| 1N5222B                                                                          | 2.375                      | 2.5  | 2.625  | 30                              | 20  | 1,250                                 | 0.25 | 100                                 | 1.0  | -0.085       |
| 1N5223B                                                                          | 2.565                      | 2.7  | 2.835  | 30                              | 20  | 1,300                                 | 0.25 | 75                                  | 1.0  | -0.080       |
| 1N5225B                                                                          | 2.850                      | 3.0  | 3.150  | 29                              | 20  | 1,600                                 | 0.25 | 50                                  | 1.0  | -0.075       |
| 1N5226B                                                                          | 3.135                      | 3.3  | 3.465  | 28                              | 20  | 1,600                                 | 0.25 | 25                                  | 1.0  | -0.070       |
| 1N5227B                                                                          | 3.420                      | 3.6  | 3.780  | 24                              | 20  | 1,700                                 | 0.25 | 15                                  | 1.0  | -0.065       |
| 1N5228B                                                                          | 3.705                      | 3.9  | 4.095  | 23                              | 20  | 1,900                                 | 0.25 | 10                                  | 1.0  | -0.060       |
| 1N5229B                                                                          | 4.085                      | 4.3  | 4.515  | 22                              | 20  | 2,000                                 | 0.25 | 5.0                                 | 1.0  | $\pm 0.055$  |
| 1N5230B                                                                          | 4.465                      | 4.7  | 4.935  | 19                              | 20  | 1,900                                 | 0.25 | 5.0                                 | 2.0  | $\pm 0.030$  |
| 1N5231B                                                                          | 4.845                      | 5.1  | 5.355  | 17                              | 20  | 1,600                                 | 0.25 | 5.0                                 | 2.0  | $\pm 0.030$  |
| 1N5232B                                                                          | 5.320                      | 5.6  | 5.880  | 11                              | 20  | 1,600                                 | 0.25 | 5.0                                 | 3.0  | 0.038        |
| 1N5233B                                                                          | 5.700                      | 6.0  | 6.300  | 7                               | 20  | 1,600                                 | 0.25 | 5.0                                 | 3.5  | 0.038        |
| 1N5234B                                                                          | 5.890                      | 6.2  | 6.510  | 7                               | 20  | 1,000                                 | 0.25 | 5.0                                 | 4.0  | 0.045        |
| 1N5235B                                                                          | 6.460                      | 6.8  | 7.140  | 5                               | 20  | 750                                   | 0.25 | 3.0                                 | 5.0  | 0.050        |
| 1N5236B                                                                          | 7.125                      | 7.5  | 7.875  | 6                               | 20  | 500                                   | 0.25 | 3.0                                 | 6.0  | 0.058        |
| 1N5237B                                                                          | 7.790                      | 8.2  | 8.610  | 8                               | 20  | 500                                   | 0.25 | 3.0                                 | 6.5  | 0.062        |
| 1N5238B                                                                          | 8.265                      | 8.7  | 9.135  | 8                               | 20  | 600                                   | 0.25 | 3.0                                 | 6.5  | 0.065        |
| 1N5239B                                                                          | 8.645                      | 9.1  | 9.555  | 10                              | 20  | 600                                   | 0.25 | 3.0                                 | 7.0  | 0.068        |
| 1N5240B                                                                          | 9.500                      | 10.0 | 10.500 | 17                              | 20  | 600                                   | 0.25 | 3.0                                 | 8.0  | 0.075        |
| 1N5241B                                                                          | 10.450                     | 11.0 | 11.550 | 22                              | 20  | 600                                   | 0.25 | 2.0                                 | 8.4  | 0.076        |
| 1N5242B                                                                          | 11.400                     | 12.0 | 12.600 | 30                              | 20  | 600                                   | 0.25 | 1.0                                 | 9.1  | 0.077        |
| 1N5243B                                                                          | 12.350                     | 13.0 | 13.650 | 13                              | 9.5 | 600                                   | 0.25 | 0.5                                 | 9.9  | 0.079        |
| 1N5244B                                                                          | 13.300                     | 14.0 | 14.700 | 15                              | 9.0 | 600                                   | 0.25 | 0.1                                 | 10.0 | 0.080        |
| 1N5245B                                                                          | 14.250                     | 15.0 | 15.750 | 16                              | 8.5 | 600                                   | 0.25 | 0.1                                 | 11.0 | 0.082        |
| 1N5246B                                                                          | 15.200                     | 16.0 | 16.800 | 17                              | 7.8 | 600                                   | 0.25 | 0.1                                 | 12.0 | 0.083        |
| 1N5247B                                                                          | 16.150                     | 17.0 | 17.850 | 19                              | 7.4 | 600                                   | 0.25 | 0.1                                 | 13.0 | 0.084        |
| 1N5248B                                                                          | 17.100                     | 18.0 | 18.900 | 21                              | 7.0 | 600                                   | 0.25 | 0.1                                 | 14.0 | 0.085        |
| 1N5249B                                                                          | 18.050                     | 19.0 | 19.950 | 23                              | 6.6 | 600                                   | 0.25 | 0.1                                 | 14.0 | 0.085        |
| 1N5250B                                                                          | 19.000                     | 20.0 | 21.000 | 25                              | 6.2 | 600                                   | 0.25 | 0.1                                 | 15.0 | 0.086        |
| 1N5251B                                                                          | 20.900                     | 22.0 | 23.100 | 29                              | 5.6 | 600                                   | 0.25 | 0.1                                 | 17.0 | 0.087        |
| 1N5252B                                                                          | 22.800                     | 24.0 | 25.200 | 33                              | 5.2 | 600                                   | 0.25 | 0.1                                 | 18.0 | 0.088        |
| <b><math>V_F</math> Forward Voltage = 1.2 V Max. @ <math>I_F = 200</math> mA</b> |                            |      |        |                                 |     |                                       |      |                                     |      |              |

2. Zener Voltage ( $V_Z$ ). The zener voltage is measured with the device junction in the thermal equilibrium at the lead temperature ( $T_L$ ) at  $30^\circ\text{C} \pm 1^\circ\text{C}$  and 3/8" lead length.

# 1N5221B – 1N5252B

## TOP MARKING AND ORDERING INFORMATION

| Device    | Top Marking |        |        | Package                                 | Shipping <sup>†</sup> |
|-----------|-------------|--------|--------|-----------------------------------------|-----------------------|
|           | Line 1      | Line 2 | Line 3 |                                         |                       |
| 1N5221B   | LOGO        | 22     | 1B     | Axial Lead<br>(Pb – Free / Halide Free) | 5000 / Bulk Bag       |
| 1N5222B   |             |        | 2B     |                                         | 5000 / Bulk Bag       |
| 1N5223B   |             |        | 3B     |                                         | 5000 / Bulk Bag       |
| 1N5225B   |             |        | 5B     |                                         | 5000 / Bulk Bag       |
| 1N5226B   |             |        | 6B     |                                         | 5000 / Bulk Bag       |
| 1N5226BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5227B   |             |        | 7B     |                                         | 5000 / Bulk Bag       |
| 1N5227BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5228B   |             |        | 8B     |                                         | 5000 / Bulk Bag       |
| 1N5228BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5229B   |             |        | 9B     |                                         | 5000 / Bulk Bag       |
| 1N5229BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5230B   |             | 23     | 0B     |                                         | 5000 / Bulk Bag       |
| 1N5230BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5231B   |             |        | 1B     |                                         | 5000 / Bulk Bag       |
| 1N5231BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5232B   |             |        | 2B     |                                         | 5000 / Bulk Bag       |
| 1N5232BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5233B   |             |        | 3B     |                                         | 5000 / Bulk Bag       |
| 1N5233BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5234B   |             |        | 4B     |                                         | 5000 / Bulk Bag       |
| 1N5234BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5235B   |             |        | 5B     |                                         | 5000 / Bulk Bag       |
| 1N5235BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5236B   |             |        | 6B     |                                         | 5000 / Bulk Bag       |
| 1N5236BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5237B   |             |        | 7B     |                                         | 5000 / Bulk Bag       |
| 1N5237BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5238B   |             |        | 8B     |                                         | 5000 / Bulk Bag       |
| 1N5239B   |             |        | 9B     |                                         | 5000 / Bulk Bag       |
| 1N5239BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5240B   |             | 24     | 0B     |                                         | 5000 / Bulk Bag       |
| 1N5240BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5241B   |             |        | 1B     |                                         | 5000 / Bulk Bag       |
| 1N5241BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5242B   |             |        | 2B     |                                         | 5000 / Bulk Bag       |
| 1N5242BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5243B   |             |        | 3B     |                                         | 5000 / Bulk Bag       |
| 1N5243BTR |             |        |        |                                         | 5000 / Tape and Reel  |

# 1N5221B – 1N5252B

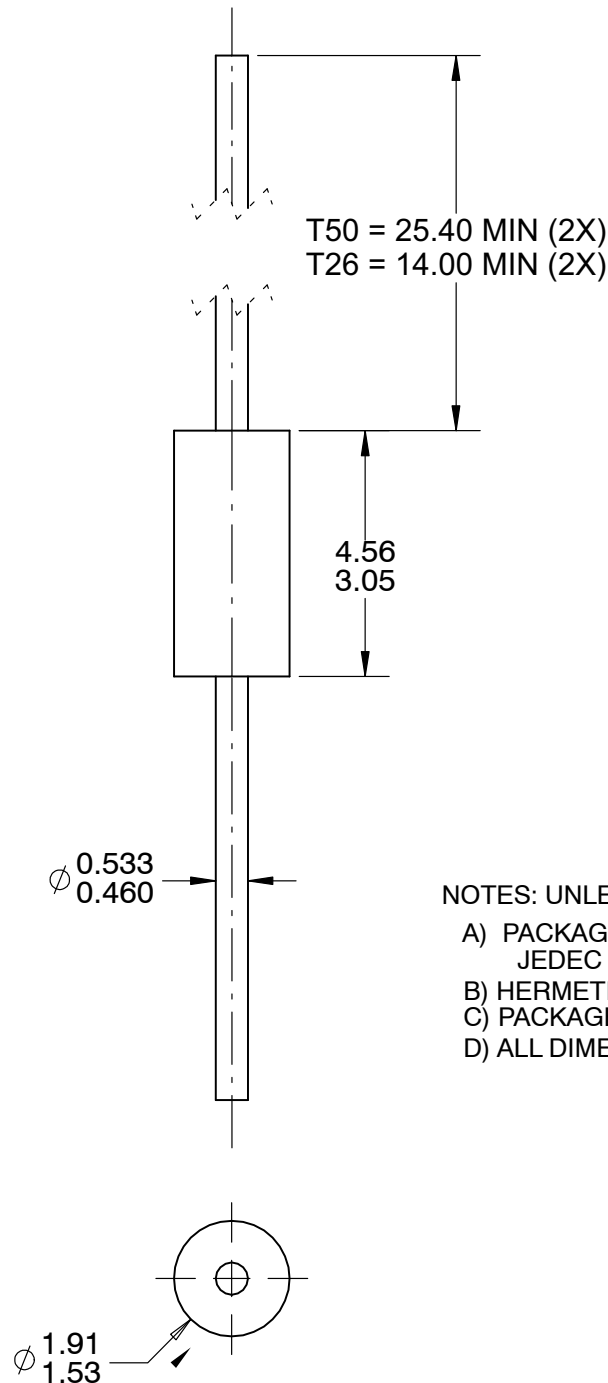
## TOP MARKING AND ORDERING INFORMATION (continued)

| Device    | Top Marking |        |        | Package                                 | Shipping <sup>†</sup> |
|-----------|-------------|--------|--------|-----------------------------------------|-----------------------|
|           | Line 1      | Line 2 | Line 3 |                                         |                       |
| 1N5244B   | LOGO        | 24     | 4B     | Axial Lead<br>(Pb – Free / Halide Free) | 5000 / Bulk Bag       |
| 1N5244BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5245B   |             |        | 5B     |                                         | 5000 / Bulk Bag       |
| 1N5245BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5246B   |             |        | 6B     |                                         | 5000 / Bulk Bag       |
| 1N5246BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5247B   |             |        | 7B     |                                         | 5000 / Bulk Bag       |
| 1N5247BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5248B   |             |        | 8B     |                                         | 5000 / Bulk Bag       |
| 1N5248BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5249BTR |             |        | 9B     |                                         | 5000 / Tape and Reel  |
| 1N5250B   |             | 25     | 0B     |                                         | 5000 / Bulk Bag       |
| 1N5250BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5251B   |             |        | 1B     |                                         | 5000 / Bulk Bag       |
| 1N5251BTR |             |        |        |                                         | 5000 / Tape and Reel  |
| 1N5252B   |             |        | 2B     |                                         | 5000 / Bulk Bag       |
| 1N5252BTR |             |        |        |                                         | 5000 / Tape and Reel  |

<sup>†</sup>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.

**AXIAL LEAD**  
CASE 017AG  
ISSUE O

DATE 31 AUG 2016



**NOTES: UNLESS OTHERWISE SPECIFIED**

- A) PACKAGE STANDARD REFERENCE:  
JEDEC DO-204, VARIATION AH.
- B) HERMETICALLY SEALED GLASS PACKAGE.
- C) PACKAGE WEIGHT IS 0.137 GRAM.
- D) ALL DIMENSIONS ARE IN MILLIMETERS.

|                         |                    |                                                                                                                                                                                     |
|-------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DOCUMENT NUMBER:</b> | <b>98AON13443G</b> | Electronic versions are uncontrolled except when accessed directly from the Document Repository.<br>Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red. |
| <b>DESCRIPTION:</b>     | <b>AXIAL LEAD</b>  | <b>PAGE 1 OF 1</b>                                                                                                                                                                  |

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

**onsemi**, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## ADDITIONAL INFORMATION

### TECHNICAL PUBLICATIONS:

Technical Library: [www.onsemi.com/design/resources/technical-documentation](http://www.onsemi.com/design/resources/technical-documentation)  
onsemi Website: [www.onsemi.com](http://www.onsemi.com)

### ONLINE SUPPORT: [www.onsemi.com/support](http://www.onsemi.com/support)

For additional information, please contact your local Sales Representative at  
[www.onsemi.com/support/sales](http://www.onsemi.com/support/sales)