

# 1N5221B - 1N5263B Zener Diodes

Tolerance = 5%



**DO-35 Glass case**

COLOR BAND DENOTES CATHODE

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol    | Parameter                                       | Value       | Units                     |
|-----------|-------------------------------------------------|-------------|---------------------------|
| $P_D$     | Power Dissipation                               | 500         | mW                        |
|           | Derate above $50^\circ\text{C}$                 | 4.0         | $\text{mW}^\circ\text{C}$ |
| $T_{STG}$ | 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 10 s) | +230        | $^\circ\text{C}$          |

### Note:

1. 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,  $T_A = 50^\circ\text{C}$

## Electrical Characteristics

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

| Device  | $V_Z$ (V) @ $I_Z$ <sup>(2)</sup> |      |       | $Z_Z$ ( $\Omega$ ) @ $I_Z$ (mA) |     | $Z_{ZK}$ ( $\Omega$ ) @ $I_{ZK}$ (mA) |      | $I_R$ ( $\mu\text{A}$ ) @ $V_R$ (V) |     | $T_C$<br>(%/°C) |
|---------|----------------------------------|------|-------|---------------------------------|-----|---------------------------------------|------|-------------------------------------|-----|-----------------|
|         | Min.                             | Typ. | Max.  |                                 |     |                                       |      |                                     |     |                 |
| 1N5221B | 2.28                             | 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          |
| 1N5224B | 2.66                             | 2.8  | 2.94  | 30                              | 20  | 1,400                                 | 0.25 | 75                                  | 1.0 | -0.080          |
| 1N5225B | 2.85                             | 3    | 3.15  | 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 | -0.07           |
| 1N5227B | 3.42                             | 3.6  | 3.78  | 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 | -0.06           |
| 1N5229B | 4.085                            | 4.3  | 4.515 | 22                              | 20  | 2,000                                 | 0.25 | 5.0                                 | 1.0 | +/-0.055        |
| 1N5230B | 4.465                            | 4.7  | 4.935 | 19                              | 20  | 1,900                                 | 0.25 | 2.0                                 | 1.0 | +/-0.03         |
| 1N5231B | 4.845                            | 5.1  | 5.355 | 17                              | 20  | 1,600                                 | 0.25 | 5.0                                 | 2.0 | +/-0.03         |
| 1N5232B | 5.32                             | 5.6  | 5.88  | 11                              | 20  | 1,600                                 | 0.25 | 5.0                                 | 3.0 | 0.038           |
| 1N5233B | 5.7                              | 6    | 6.3   | 7.0                             | 20  | 1,600                                 | 0.25 | 5.0                                 | 3.5 | 0.038           |
| 1N5234B | 5.89                             | 6.2  | 6.51  | 7.0                             | 20  | 1,000                                 | 0.25 | 5.0                                 | 4.0 | 0.045           |
| 1N5235B | 6.46                             | 6.8  | 7.14  | 5.0                             | 20  | 750                                   | 0.25 | 3.0                                 | 5.0 | 0.05            |
| 1N5236B | 7.125                            | 7.5  | 7.875 | 6.0                             | 20  | 500                                   | 0.25 | 3.0                                 | 6.0 | 0.058           |
| 1N5237B | 7.79                             | 8.2  | 8.61  | 8.0                             | 20  | 500                                   | 0.25 | 3.0                                 | 6.5 | 0.062           |
| 1N5238B | 8.265                            | 8.7  | 9.135 | 8.0                             | 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 | 9.5                              | 10   | 10.5  | 17                              | 20  | 600                                   | 0.25 | 3.0                                 | 8.0 | 0.075           |
| 1N5241B | 10.45                            | 11   | 11.55 | 22                              | 20  | 600                                   | 0.25 | 2.0                                 | 8.4 | 0.076           |
| 1N5242B | 11.4                             | 12   | 12.6  | 30                              | 20  | 600                                   | 0.25 | 1.0                                 | 9.1 | 0.077           |
| 1N5243B | 12.35                            | 13   | 13.65 | 13                              | 9.5 | 600                                   | 0.25 | 0.5                                 | 9.9 | 0.079           |
| 1N5244B | 13.3                             | 14   | 14.7  | 15                              | 9.0 | 600                                   | 0.25 | 0.1                                 | 10  | 0.080           |
| 1N5245B | 14.25                            | 15   | 15.75 | 16                              | 8.5 | 600                                   | 0.25 | 0.1                                 | 11  | 0.082           |
| 1N5246B | 15.2                             | 16   | 16.8  | 17                              | 7.8 | 600                                   | 0.25 | 0.1                                 | 12  | 0.083           |
| 1N5247B | 16.15                            | 17   | 17.85 | 19                              | 7.4 | 600                                   | 0.25 | 0.1                                 | 13  | 0.084           |
| 1N5248B | 17.1                             | 18   | 18.9  | 21                              | 7.0 | 600                                   | 0.25 | 0.1                                 | 14  | 0.085           |
| 1N5249B | 18.05                            | 19   | 19.95 | 23                              | 6.6 | 600                                   | 0.25 | 0.1                                 | 14  | 0.085           |
| 1N5250B | 19                               | 20   | 21    | 25                              | 6.2 | 600                                   | 0.25 | 0.1                                 | 15  | 0.086           |
| 1N5251B | 20.9                             | 22   | 23.1  | 29                              | 5.6 | 600                                   | 0.25 | 0.1                                 | 17  | 0.087           |
| 1N5252B | 22.8                             | 24   | 25.2  | 33                              | 5.2 | 600                                   | 0.25 | 0.1                                 | 18  | 0.088           |
| 1N5253B | 23.75                            | 25   | 26.25 | 35                              | 5.0 | 600                                   | 0.25 | 0.1                                 | 19  | 0.088           |
| 1N5254B | 25.65                            | 27   | 28.35 | 41                              | 4.6 | 600                                   | 0.25 | 0.1                                 | 21  | 0.089           |
| 1N5255B | 26.6                             | 28   | 29.4  | 44                              | 4.5 | 600                                   | 0.25 | 0.1                                 | 21  | 0.090           |
| 1N5256B | 28.5                             | 30   | 31.5  | 49                              | 4.2 | 600                                   | 0.25 | 0.1                                 | 23  | 0.09            |
| 1N5257B | 31.35                            | 33   | 34.65 | 58                              | 3.8 | 700                                   | 0.25 | 0.1                                 | 25  | 0.092           |
| 1N5258B | 34.2                             | 36   | 37.8  | 70                              | 3.4 | 700                                   | 0.25 | 0.1                                 | 27  | 0.093           |
| 1N5259B | 37.05                            | 39   | 40.95 | 80                              | 3.2 | 800                                   | 0.25 | 0.1                                 | 30  | 0.094           |
| 1N5260B | 40.85                            | 43   | 45.15 | 93                              | 3.0 | 900                                   | 0.25 | 0.1                                 | 33  | 0.095           |
| 1N5261B | 44.65                            | 47   | 49.35 | 105                             | 2.7 | 1000                                  | 0.25 | 0.1                                 | 36  | 0.095           |
| 1N5262B | 48.45                            | 51   | 53.55 | 125                             | 2.5 | 1100                                  | 0.25 | 0.1                                 | 39  | 0.096           |
| 1N5263B | 53.2                             | 56   | 58.8  | 150                             | 2.2 | 1300                                  | 0.25 | 0.1                                 | 43  | 0.096           |

$V_F$  Forward Voltage = 1.2V Max. @  $I_F = 200\text{mA}$

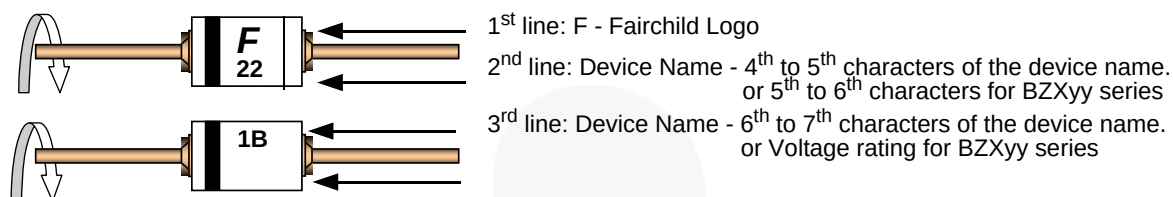
### Note:

#### 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.

## Top Mark Information

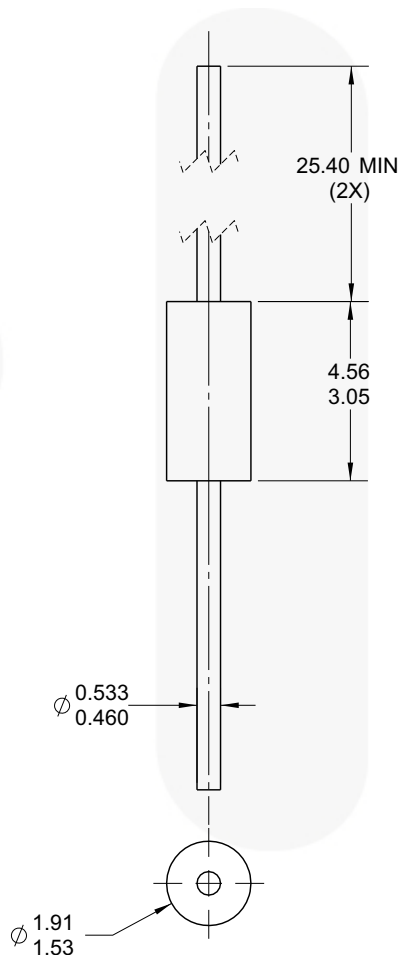
| Device  | Line 1 | Line 2 | Line 3 |
|---------|--------|--------|--------|
| 1N5221B | LOGO   | 22     | 1B     |
| 1N5222B | LOGO   | 22     | 2B     |
| 1N5223B | LOGO   | 22     | 3B     |
| 1N5224B | LOGO   | 22     | 4B     |
| 1N5225B | LOGO   | 22     | 5B     |
| 1N5226B | LOGO   | 22     | 6B     |
| 1N5227B | LOGO   | 22     | 7B     |
| 1N5228B | LOGO   | 22     | 8B     |
| 1N5229B | LOGO   | 22     | 9B     |
| 1N5230B | LOGO   | 23     | 0B     |
| 1N5231B | LOGO   | 23     | 1B     |
| 1N5232B | LOGO   | 23     | 2B     |
| 1N5233B | LOGO   | 23     | 3B     |
| 1N5234B | LOGO   | 23     | 4B     |
| 1N5235B | LOGO   | 23     | 5B     |
| 1N5236B | LOGO   | 23     | 6B     |
| 1N5237B | LOGO   | 23     | 7B     |
| 1N5238B | LOGO   | 23     | 8B     |
| 1N5239B | LOGO   | 23     | 9B     |
| 1N5240B | LOGO   | 24     | 0B     |
| 1N5241B | LOGO   | 24     | 1B     |
| 1N5242B | LOGO   | 24     | 2B     |
| 1N5243B | LOGO   | 24     | 3B     |
| 1N5244B | LOGO   | 24     | 4B     |
| 1N5245B | LOGO   | 24     | 5B     |
| 1N5246B | LOGO   | 24     | 6B     |
| 1N5247B | LOGO   | 24     | 7B     |
| 1N5248B | LOGO   | 24     | 8B     |
| 1N5249B | LOGO   | 24     | 9B     |
| 1N5250B | LOGO   | 25     | 0B     |
| 1N5251B | LOGO   | 25     | 1B     |
| 1N5252B | LOGO   | 25     | 2B     |
| 1N5253B | LOGO   | 25     | 3B     |
| 1N5254B | LOGO   | 25     | 4B     |
| 1N5255B | LOGO   | 25     | 5B     |
| 1N5256B | LOGO   | 25     | 6B     |
| 1N5257B | LOGO   | 25     | 7B     |
| 1N5258B | LOGO   | 25     | 8B     |
| 1N5259B | LOGO   | 25     | 9B     |
| 1N5260B | LOGO   | 26     | 0B     |
| 1N5261B | LOGO   | 26     | 1B     |
| 1N5262B | LOGO   | 26     | 2B     |
| 1N5263B | LOGO   | 26     | 3B     |

**Top Mark Information** (Continued)**General Requirements:**

- 1.0 Cathode Band
- 2.0 First Line: F - Fairchild Logo
- 3.0 Second Line: Device name - For 1Nxx series: 4<sup>th</sup> to 5<sup>th</sup> characters of the device name.  
For BZxx series: 5<sup>th</sup> to 6<sup>th</sup> characters of the device name.
- 4.0 Third Line: Device name - For 1Nxx series: 6<sup>th</sup> to 7<sup>th</sup> characters of the device name.  
For BZXyy series: Voltage rating
- 5.0 Devices shall be marked as required in the device specification (PID or FSC Test Spec).
- 6.0 Maximum no. of marking lines: 3
- 7.0 Maximum no. of digits per line: 2
- 8.0 FSC logo must be 20 % taller than the alphanumeric marking and should occupy the 2 characters of the specified line.
- 9.0 Marking Font: Arial (Except FSC Logo)
- 10.0 First character of each marking line must be aligned vertically.
- 11.0 All device markings must be based on Fairchild device specification.

## Physical Dimensions

## DO-35



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.
- E) DRAWING FILE NAME: DO35AREV02

**Figure 1. AXIAL LEADED; GLASS; JEDEC DO204; VARIATION AH (ACTIVE)**

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/dwg/DO/DO35A.pdf>.

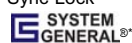
For current tape and reel specifications, visit Fairchild Semiconductor's online packaging area:

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|-----------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 2Cool™                                                                            | FPS™                                           |  | Sync-Lock™                                                                          |
| AccuPower™                                                                        | F-PFS™                                         | PowerTrench®                                                                      |  |
| AX-CAP®*                                                                          | FRFET®                                         | PowerXS™                                                                          | TinyBoost™                                                                          |
| BitSiC™                                                                           | Global Power Resource <sup>SM</sup>            | Programmable Active Droop™                                                        | TinyBuck™                                                                           |
| Build it Now™                                                                     | GreenBridge™                                   | QFET®                                                                             | TinyCalc™                                                                           |
| CorePLUS™                                                                         | Green FPS™                                     | QS™                                                                               | TinyLogic®                                                                          |
| CorePOWER™                                                                        | Green FPS™ e-Series™                           | Quiet Series™                                                                     | TINYOPTO™                                                                           |
| CROSSVOLT™                                                                        | Gmax™                                          | RapidConfigure™                                                                   | TinyPower™                                                                          |
| CTL™                                                                              | GTO™                                           |  | TinyPWM™                                                                            |
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| EcoSPARK®                                                                         | MegaBuck™                                      | SMART START™                                                                      | TRUECURRENT®*                                                                       |
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| ESBC™                                                                             | MicroFET™                                      | SPM®                                                                              |  |
|  | MicroPak™                                      | STEALTH™                                                                          | UHC®                                                                                |
| Fairchild®                                                                        | MicroPak2™                                     | SuperFET®                                                                         | Ultra FRFET™                                                                        |
| Fairchild Semiconductor®                                                          | MillerDrive™                                   | SuperSOT™-3                                                                       | UniFET™                                                                             |
| FACT Quiet Series™                                                                | MotionMax™                                     | SuperSOT™-6                                                                       | VCX™                                                                                |
| FACT®                                                                             | mWSaver™                                       | SuperSOT™-8                                                                       | VisualMax™                                                                          |
| FAST®                                                                             | OptoHiT™                                       | SupreMOS®                                                                         | VoltagePlus™                                                                        |
| FastvCore™                                                                        | OPTOLOGIC®                                     | SyncFET™                                                                          | XS™                                                                                 |
| FETBench™                                                                         | OPTOPLANAR®                                    |                                                                                   |                                                                                     |

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2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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### Definition of Terms

| Datasheet Identification | Product Status        | Definition                                                                                                                                                                                          |
|--------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advance Information      | Formative / In Design | Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.                                                                       |
| Preliminary              | First Production      | Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design. |
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