

500 mW DO-35 Hermetically Sealed Glass Zener Voltage Regulators



Maximum Ratings (Note 1)

| Rating | Symbol | Value | Units |
|--|-----------------------------------|-------------|-------|
| Maximum Steady State Power Dissipation @TL≤75°C, Lead Length = 3/8" | P _D | 500 | mW |
| Derate Above 75°C | | 4.0 | mW/°C |
| Operating and Storage Temperature Range | T _J , T _{stg} | -65 to +200 | °C |

Note 1: Some part number series have lower JEDEC registered ratings.

Specification Features:

- Zener Voltage Range = 2.4V to 200V
- ESD Rating of Class 3 (>6 KV) per Human Body Model
- DO-35 Package (DO-204AH)
- Double Slug Type Construction
- Metallurgical Bonded Construction
- RoHS Compliant
- Solder Hot Dip Tin (Sn) Lead Finish

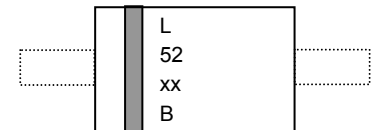
Specification Features:

Case : Double slug type, hermetically sealed glass

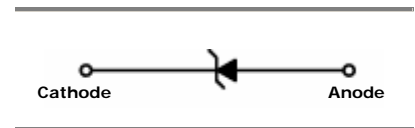
Finish : All external surfaces are corrosion resistant and leads are readily solderable

Polarity : Cathode indicated by polarity band

Mounting: Any



L = Logo
52xxB = 1N52xxB Device Code



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

| Device (Note 2.) | Device Marking | Zener Voltage (Note 3.) | | | | Zener Impedance (Note 4.) | | | Leakage Current | | θ_{VZ} (Note 5.) |
|---------------------|-------------------|-------------------------|-----|--------|-----------|---------------------------|---------------------|------|----------------------|---------|----------------------------|
| | | V_Z (Volts) | | | $@I_{ZT}$ | Z_{ZT} @ I_{ZT} | Z_{ZK} @ I_{ZK} | | I_R @ V_R | | |
| | | Min | Nom | Max | (mA) | (Ω) | (Ω) | (mA) | (μA Max) | (Volts) | (%/°C) |
| 1N5221B | 1N5221B | 2.280 | 2.4 | 2.520 | 20 | 30 | 1200 | 0.25 | 100 | 1 | -0.085 |
| 1N5222B | 1N5222B | 2.375 | 2.5 | 2.625 | 20 | 30 | 1250 | 0.25 | 100 | 1 | -0.085 |
| 1N5223B | 1N5223B | 2.565 | 2.7 | 2.835 | 20 | 30 | 1300 | 0.25 | 75 | 1 | -0.080 |
| 1N5224B | 1N5224B | 2.660 | 2.8 | 2.940 | 20 | 30 | 1400 | 0.25 | 75 | 1 | -0.080 |
| 1N5225B | 1N5225B | 2.850 | 3.0 | 3.150 | 20 | 29 | 1600 | 0.25 | 50 | 1 | -0.075 |
| 1N5226B | 1N5226B | 3.135 | 3.3 | 3.465 | 20 | 28 | 1600 | 0.25 | 25 | 1 | -0.070 |
| 1N5227B | 1N5227B | 3.420 | 3.6 | 3.780 | 20 | 24 | 1700 | 0.25 | 15 | 1 | -0.065 |
| 1N5228B | 1N5228B | 3.705 | 3.9 | 4.095 | 20 | 23 | 1900 | 0.25 | 10 | 1 | -0.060 |
| 1N5229B | 1N5229B | 4.085 | 4.3 | 4.515 | 20 | 22 | 2000 | 0.25 | 5 | 1 | ± 0.055 |
| 1N5230B | 1N5230B | 4.465 | 4.7 | 4.935 | 20 | 19 | 1900 | 0.25 | 5 | 2 | ± 0.030 |
| 1N5231B | 1N5231B | 4.845 | 5.1 | 5.355 | 20 | 17 | 1600 | 0.25 | 5 | 2 | ± 0.030 |
| 1N5232B | 1N5232B | 5.320 | 5.6 | 5.880 | 20 | 11 | 1600 | 0.25 | 5 | 3 | +0.038 |
| 1N5233B | 1N5233B | 5.700 | 6.0 | 6.300 | 20 | 7 | 1600 | 0.25 | 5 | 3.5 | +0.038 |
| 1N5234B | 1N5234B | 5.890 | 6.2 | 6.510 | 20 | 7 | 1000 | 0.25 | 5 | 4 | +0.045 |
| 1N5235B | 1N5235B | 6.460 | 6.8 | 7.140 | 20 | 5 | 750 | 0.25 | 3 | 5 | +0.050 |
| 1N5236B | 1N5236B | 7.125 | 7.5 | 7.875 | 20 | 6 | 500 | 0.25 | 3 | 6 | +0.058 |
| 1N5237B | 1N5237B | 7.790 | 8.2 | 8.610 | 20 | 8 | 500 | 0.25 | 3 | 6.5 | +0.062 |
| 1N5238B | 1N5238B | 8.265 | 8.7 | 9.135 | 20 | 8 | 600 | 0.25 | 3 | 6.5 | +0.065 |
| 1N5239B | 1N5239B | 8.645 | 9.1 | 9.555 | 20 | 10 | 600 | 0.25 | 3 | 7 | +0.068 |
| 1N5240B | 1N5240B | 9.500 | 10 | 10.500 | 20 | 17 | 600 | 0.25 | 3 | 8 | +0.075 |
| 1N5241B | 1N5241B | 10.45 | 11 | 11.55 | 20 | 22 | 600 | 0.25 | 2 | 8.4 | +0.076 |
| 1N5242B | 1N5242B | 11.40 | 12 | 12.60 | 20 | 30 | 600 | 0.25 | 1 | 9.1 | +0.077 |
| 1N5243B | 1N5243B | 12.35 | 13 | 13.65 | 9.5 | 13 | 600 | 0.25 | 0.5 | 9.9 | +0.079 |
| 1N5244B | 1N5244B | 13.30 | 14 | 14.70 | 9 | 15 | 600 | 0.25 | 0.1 | 10 | +0.082 |
| 1N5245B | 1N5245B | 14.25 | 15 | 15.75 | 8.5 | 16 | 600 | 0.25 | 0.1 | 11 | +0.082 |
| 1N5246B | 1N5246B | 15.20 | 16 | 16.80 | 7.8 | 17 | 600 | 0.25 | 0.1 | 12 | +0.083 |
| 1N5247B | 1N5247B | 16.15 | 17 | 17.85 | 7.4 | 19 | 600 | 0.25 | 0.1 | 13 | +0.084 |
| 1N5248B | 1N5248B | 17.10 | 18 | 18.90 | 7 | 21 | 600 | 0.25 | 0.1 | 14 | +0.085 |
| 1N5249B | 1N5249B | 18.05 | 19 | 19.95 | 6.6 | 23 | 600 | 0.25 | 0.1 | 14 | +0.086 |
| 1N5250B | 1N5250B | 19.00 | 20 | 21.00 | 6.2 | 25 | 600 | 0.25 | 0.1 | 15 | +0.086 |
| 1N5251B | 1N5251B | 20.90 | 22 | 23.10 | 5.6 | 29 | 600 | 0.25 | 0.1 | 17 | +0.087 |
| 1N5252B | 1N5252B | 22.80 | 24 | 25.20 | 5.2 | 33 | 600 | 0.25 | 0.1 | 18 | +0.088 |
| 1N5253B | 1N5253B | 23.75 | 25 | 26.25 | 5 | 35 | 600 | 0.25 | 0.1 | 19 | +0.089 |
| 1N5254B | 1N5254B | 25.65 | 27 | 28.35 | 4.6 | 41 | 600 | 0.25 | 0.1 | 21 | +0.090 |
| 1N5255B | 1N5255B | 26.60 | 28 | 29.40 | 4.5 | 44 | 600 | 0.25 | 0.1 | 21 | +0.091 |
| 1N5256B | 1N5256B | 28.50 | 30 | 31.50 | 4.2 | 49 | 600 | 0.25 | 0.1 | 23 | +0.091 |
| 1N5257B | 1N5257B | 31.35 | 33 | 34.65 | 3.8 | 58 | 700 | 0.25 | 0.1 | 25 | +0.092 |
| 1N5258B | 1N5258B | 34.20 | 36 | 37.80 | 3.4 | 70 | 700 | 0.25 | 0.1 | 27 | +0.093 |
| 1N5259B | 1N5259B | 37.05 | 39 | 40.95 | 3.2 | 80 | 800 | 0.25 | 0.1 | 30 | +0.094 |
| 1N5260B | 1N5260B | 40.85 | 43 | 45.15 | 3.0 | 93 | 800 | 0.25 | 0.1 | 33 | +0.095 |

 $V_F = 1.1\text{V Max @}I_F = 200\text{mA}$ for 60V below types, $V_F = 1.4\text{V Max @}I_F = 200\text{mA}$ for 60V above types

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

| Device (Note 1.) | Device Marking | Zener Voltage (Note 2.) | | | | Zener Impedance (Note 3.) | | | Leakage Current | | θ_{V_Z} (Note 4.) |
|---------------------|-------------------|-------------------------|-----|-------|-----------|---------------------------|------------------|------|-----------------------|---------|-----------------------------|
| | | V_Z (Volts) | | | $@I_{ZT}$ | $Z_{ZT} @I_{ZT}$ | $Z_{ZK} @I_{ZK}$ | | $I_R @ V_R$ | | |
| | | Min | Nom | Max | (mA) | (Ω) | (Ω) | (mA) | ($\mu\text{A Max}$) | (Volts) | (mA) |
| 1N5261B | 1N5261B | 44.65 | 47 | 49.35 | 2.7 | 105 | 1000 | 0.25 | 0.1 | 36 | +0.095 |
| 1N5262B | 1N5262B | 48.45 | 51 | 53.55 | 2.5 | 125 | 1100 | 0.25 | 0.1 | 39 | +0.096 |
| 1N5263B | 1N5263B | 53.20 | 56 | 58.80 | 2.2 | 150 | 1300 | 0.25 | 0.1 | 43 | +0.096 |
| 1N5264B | 1N5264B | 57.00 | 60 | 63.00 | 2.1 | 170 | 1400 | 0.25 | 0.1 | 46 | +0.097 |
| 1N5265B | 1N5265B | 58.90 | 62 | 65.10 | 2.0 | 185 | 1400 | 0.25 | 0.1 | 47 | +0.097 |
| 1N5266B | 1N5266B | 64.60 | 68 | 71.40 | 1.8 | 230 | 1600 | 0.25 | 0.1 | 52 | +0.097 |
| 1N5267B | 1N5267B | 71.25 | 75 | 78.75 | 1.7 | 270 | 1700 | 0.25 | 0.1 | 56 | +0.098 |
| 1N5268B | 1N5268B | 77.90 | 82 | 86.10 | 1.5 | 330 | 2000 | 0.25 | 0.1 | 62 | +0.098 |
| 1N5269B | 1N5269B | 82.65 | 87 | 91.35 | 1.4 | 370 | 2200 | 0.25 | 0.1 | 68 | +0.099 |
| 1N5270B | 1N5270B | 86.45 | 91 | 95.55 | 1.4 | 400 | 2300 | 0.25 | 0.1 | 69 | +0.099 |
| 1N5271B | 1N5271B | 95.0 | 100 | 105.0 | 1.3 | 500 | 2600 | 0.25 | 0.1 | 76 | +0.11 |
| 1N5272B | 1N5272B | 104.5 | 110 | 115.5 | 1.1 | 750 | 3000 | 0.25 | 0.1 | 84 | +0.11 |
| 1N5273B | 1N5273B | 114.0 | 120 | 126.0 | 1.0 | 900 | 4000 | 0.25 | 0.1 | 91 | +0.11 |
| 1N5274B | 1N5274B | 123.5 | 130 | 136.5 | 0.95 | 1100 | 4500 | 0.25 | 0.1 | 99 | +0.11 |
| 1N5275B | 1N5275B | 133.0 | 140 | 147.0 | 0.9 | 1300 | 4500 | 0.25 | 0.1 | 106 | +0.11 |
| 1N5276B | 1N5276B | 142.5 | 150 | 157.5 | 0.85 | 1500 | 5000 | 0.25 | 0.1 | 114 | +0.11 |
| 1N5277B | 1N5277B | 152.0 | 160 | 168.0 | 0.8 | 1700 | 5500 | 0.25 | 0.1 | 122 | +0.11 |
| 1N5278B | 1N5278B | 161.5 | 170 | 178.5 | 0.74 | 1900 | 5500 | 0.25 | 0.1 | 129 | +0.11 |
| 1N5279B | 1N5279B | 171.0 | 180 | 189.0 | 0.68 | 2200 | 6000 | 0.25 | 0.1 | 137 | +0.11 |
| 1N5280B | 1N5280B | 180.5 | 190 | 199.5 | 0.66 | 2400 | 6500 | 0.25 | 0.1 | 144 | +0.11 |
| 1N5281B | 1N5281B | 190.0 | 200 | 210.0 | 0.65 | 2500 | 7000 | 0.25 | 0.1 | 152 | +0.11 |

$V_F = 1.1\text{V Max @}I_F = 200\text{mA}$ for 60V below types, $V_F = 1.4\text{V Max @}I_F = 200\text{mA}$ for 60V above types

2. TOLERANCE AND TYPE NUMBER DESIGNATION (V_Z)

The type numbers listed have a standard tolerance on the nominal zener voltage of $\pm 5\%$.

3. ZENER VOLTAGE (V_Z) MEASUREMENT

The zener voltage (V_Z) is tested under pulse condition. The measured V_Z is guaranteed to be within specification with device junction in thermal equilibrium.

4. ZENER IMPEDANCE (Z_Z) DERIVATION

Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for $I_{Z(AC)} = 0.1 I_{Z(DC)}$ with AC frequency = 60Hz.

5. TEMPERATURE COEFFICIENT (θ_{V_Z})

Test conditions for temperature coefficient are as follows:

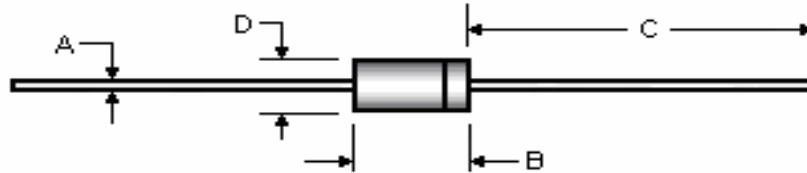
A. $I_{ZT} = 7.5\text{mA}$, $T_1 = 25^\circ\text{C}$, $T_2 = 125^\circ\text{C}$ (1N5221B through 1N5242B)

B. $I_{ZT} = \text{Rated } I_{ZT}$, $T_1 = 25^\circ\text{C}$, $T_2 = 125^\circ\text{C}$ (1N5243B through 1N5281B)

Device to be temperature stabilized with current applied prior to reading breakdown voltage at the specified ambient temperature.

Package Outline

Case Outline



| DIM | DO-35 | | | |
|-----|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min | Max | Min | Max |
| A | 0.46 | 0.56 | 0.018 | 0.022 |
| B | 3.05 | 5.08 | 0.120 | 0.200 |
| C | 25.40 | 38.10 | 1.000 | 1.500 |
| D | 1.52 | 2.29 | 0.060 | 0.090 |

Note: all dimensions are within JEDEC standard.

This datasheet presents technical data of Tak Cheong's Zener Diodes. Complete specifications for the individual devices are provided in the form of datasheets. A comprehensive Selector Guide is included to simplify the task of choosing the best set of components required for a specific application. For additional information, please visit our website <http://www.takcheong.com>.

Although information in this datasheet has been carefully checked, no responsibility for the inaccuracies can be assumed by Tak Cheong. Please consult your nearest Tak Cheong's sales office for further assistance.

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