



# 0.5W Zener Diode - 1N52\*B series

Rev 1.1  
05/04/19

Silicon Planar Zener diode in bare die form – 5% tolerance

## Features:

- Sharp Reverse Characteristics
- Low Reverse Current Levels
- High Reliability Gold Back Metal
- High Reliability tested grades.

## Die Dimensions in $\mu\text{m}$ (mils)



## Ordering Information

The following part suffixes apply:

- No suffix - Commercial grade die
- “H” – Hi-rel grade die + MIL-STD-38534 Class H LAT
- “K” – Hi-rel grade die + MIL-STD-38534 Class K LAT.

LAT = Lot acceptance Test.

For information on Hi-Rel LAT flows please see below.

[www.siliconsupplies.com/bare-die-lot-qualification](http://www.siliconsupplies.com/bare-die-lot-qualification)

## Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – By specific request
- Unsawn Wafer – By specific request
- With additional electrical selection – By specific request

## Mechanical Specification

|                        |                            |                       |
|------------------------|----------------------------|-----------------------|
| Die Size (Unsawn)      | 330 x 330<br>12.99 x 12.99 | $\mu\text{m}$<br>mils |
| Anode Pad Size         | 235 x 235<br>9.25 x 9.25   | $\mu\text{m}$<br>mils |
| Die Thickness          | 200<br>7.87                | $\mu\text{m}$<br>mils |
| Top Metal Composition  | Al                         |                       |
| Back Metal Composition | AuAs                       |                       |





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## Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise stated

| PARAMETER                              | SYMBOL    | VALUE       | UNIT             |
|--|-----------|-------------|------------------|
| Power Dissipation                      | $P_{TOT}$ | 500         | mW               |
| Junction Temperature                   | $T_J$     | 175         | $^\circ\text{C}$ |
| Storage Temperature Range              | $T_S$     | -65 to +200 | $^\circ\text{C}$ |
| Forward Voltage @ $I_F = 200\text{mA}$ | $V_F$     | 1.5         | V                |

## Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise stated

| DEVICE  | ZENER VOLTAGE RANGE |      |       | TEST CURRENT |           | REVERSE LEAKAGE CURRENT |     | DYNAMIC RESISTANCE |                    | TEMP. COEFFICIENT |
|---------|---------------------|------|-------|--------------|-----------|-------------------------|-----|--------------------|--------------------|-------------------|
|         | $V_Z @ I_{ZT1}$     |      |       | $I_{ZT2}$    | $I_{ZT2}$ | $I_R @ V_R$             |     | $Z_Z @ I_{ZT1}$    | $Z_{ZK} @ I_{ZT2}$ | $\alpha V_Z$      |
|         | V                   |      |       | mA           |           | $\mu\text{A}$           | V   | $\Omega$           |                    | %/K               |
|         | Min.                | Nom. | Max.  |              |           | Max.                    |     | Max.               | Max.               | Typ.              |
| 1N5221B | 2.28                | 2.4  | 2.52  | 20           | 0.25      | 100                     | 1   | 30                 | 1200               | -0.085            |
| 1N5222B | 2.38                | 2.5  | 2.63  | 20           | 0.25      | 100                     | 1   | 30                 | 1250               | -0.085            |
| 1N5223B | 2.57                | 2.7  | 2.84  | 20           | 0.25      | 75                      | 1   | 30                 | 1300               | -0.08             |
| 1N5224B | 2.66                | 2.8  | 2.94  | 20           | 0.25      | 75                      | 1   | 30                 | 1400               | -0.08             |
| 1N5225B | 2.85                | 3    | 3.15  | 20           | 0.25      | 50                      | 1   | 29                 | 1600               | -0.075            |
| 1N5226B | 3.14                | 3.3  | 3.47  | 20           | 0.25      | 25                      | 1   | 28                 | 1600               | -0.07             |
| 1N5227B | 3.42                | 3.6  | 3.78  | 20           | 0.25      | 15                      | 1   | 24                 | 1700               | -0.065            |
| 1N5228B | 3.71                | 3.9  | 4.10  | 20           | 0.25      | 10                      | 1   | 23                 | 1900               | -0.06             |
| 1N5229B | 4.09                | 4.3  | 4.52  | 20           | 0.25      | 5                       | 1   | 22                 | 2000               | 0.055             |
| 1N5230B | 4.47                | 4.7  | 4.94  | 20           | 0.25      | 5                       | 1   | 19                 | 1900               | 0.03              |
| 1N5231B | 4.85                | 5.1  | 5.36  | 20           | 0.25      | 5                       | 2   | 17                 | 1600               | 0.03              |
| 1N5232B | 5.32                | 5.6  | 5.88  | 20           | 0.25      | 5                       | 3   | 11                 | 1600               | 0.038             |
| 1N5233B | 5.70                | 6    | 6.30  | 20           | 0.25      | 5                       | 3.5 | 7                  | 1600               | 0.038             |
| 1N5234B | 5.89                | 6.2  | 6.51  | 20           | 0.25      | 5                       | 4.0 | 7                  | 1000               | 0.045             |
| 1N5235B | 6.46                | 6.8  | 7.14  | 20           | 0.25      | 3                       | 5.0 | 5                  | 750                | 0.05              |
| 1N5236B | 7.13                | 7.5  | 7.88  | 20           | 0.25      | 3                       | 6.0 | 6                  | 500                | 0.058             |
| 1N5237B | 7.79                | 8.2  | 8.61  | 20           | 0.25      | 3                       | 6.5 | 8                  | 500                | 0.062             |
| 1N5238B | 8.27                | 8.7  | 9.14  | 20           | 0.25      | 3                       | 6.5 | 8                  | 600                | 0.065             |
| 1N5239B | 8.65                | 9.1  | 9.56  | 20           | 0.25      | 3                       | 7.0 | 10                 | 600                | 0.068             |
| 1N5240B | 9.50                | 10   | 10.50 | 20           | 0.25      | 3                       | 8.0 | 17                 | 600                | 0.075             |
| 1N5241B | 10.45               | 11   | 11.55 | 20           | 0.25      | 2                       | 8.4 | 22                 | 600                | 0.076             |
| 1N5242B | 11.40               | 12   | 12.60 | 20           | 0.25      | 0.1                     | 9.1 | 30                 | 600                | 0.077             |
| 1N5243B | 12.35               | 13   | 13.65 | 9.5          | 0.25      | 0.1                     | 9.9 | 13                 | 600                | 0.079             |
| 1N5244B | 13.30               | 14   | 14.70 | 9.0          | 0.25      | 0.1                     | 10  | 15                 | 600                | 0.082             |





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| DEVICE  | ZENER VOLTAGE RANGE |      |       | TEST CURRENT |           | REVERSE LEAKAGE CURRENT |    | DYNAMIC RESISTANCE |                    | TEMP. COEFFICIENT |
|---------|---------------------|------|-------|--------------|-----------|-------------------------|----|--------------------|--------------------|-------------------|
|         | $V_Z @ I_{ZT1}$     |      |       | $I_{ZT2}$    | $I_{ZT2}$ | $I_R @ V_R$             |    | $Z_Z @ I_{ZT1}$    | $Z_{ZK} @ I_{ZT2}$ | $\alpha V_Z$      |
|         | V                   |      |       | mA           |           | $\mu\text{A}$           | V  | $\Omega$           |                    | %/K               |
|         | Min.                | Nom. | Max.  |              |           | Max.                    |    | Max.               | Max.               | Typ.              |
| 1N5245B | 14.25               | 15   | 15.75 | 8.5          | 0.25      | 0.1                     | 11 | 19                 | 600                | 0.082             |
| 1N5246B | 15.20               | 16   | 16.80 | 7.8          | 0.25      | 0.1                     | 12 | 21                 | 600                | 0.083             |
| 1N5247B | 16.15               | 17   | 17.85 | 7.4          | 0.25      | 0.1                     | 13 | 23                 | 600                | 0.084             |
| 1N5248B | 17.1                | 18   | 18.90 | 7            | 0.25      | 0.1                     | 14 | 25                 | 600                | 0.085             |
| 1N5249B | 18.05               | 19   | 19.95 | 6.6          | 0.25      | 0.1                     | 14 | 29                 | 600                | 0.086             |
| 1N5250B | 19                  | 20   | 21.00 | 6.2          | 0.25      | 0.1                     | 15 | 33                 | 600                | 0.086             |
| 1N5251B | 20.9                | 22   | 23.10 | 5.6          | 0.25      | 0.1                     | 17 | 35                 | 600                | 0.087             |
| 1N5252B | 22.8                | 24   | 25.20 | 5.2          | 0.25      | 0.1                     | 18 | 41                 | 600                | 0.088             |
| 1N5253B | 23.75               | 25   | 26.25 | 5            | 0.25      | 0.1                     | 19 | 44                 | 600                | 0.089             |
| 1N5254B | 25.65               | 27   | 28.35 | 4.6          | 0.25      | 0.1                     | 21 | 49                 | 600                | 0.09              |
| 1N5255B | 26.6                | 28   | 29.40 | 4.5          | 0.25      | 0.1                     | 21 | 58                 | 600                | 0.091             |
| 1N5256B | 28.5                | 30   | 31.50 | 4.2          | 0.25      | 0.1                     | 23 | 70                 | 600                | 0.091             |
| 1N5257B | 31.35               | 33   | 34.65 | 3.8          | 0.25      | 0.1                     | 25 | 80                 | 700                | 0.092             |
| 1N5258B | 34.2                | 36   | 37.80 | 3.4          | 0.25      | 0.1                     | 27 | 93                 | 700                | 0.093             |
| 1N5259B | 37.05               | 39   | 40.95 | 3.2          | 0.25      | 0.1                     | 30 | 105                | 800                | 0.094             |
| 1N5260B | 40.85               | 43   | 45.15 | 3            | 0.25      | 0.1                     | 33 | 125                | 900                | 0.095             |
| 1N5261B | 44.65               | 47   | 49.35 | 2.7          | 0.25      | 0.1                     | 36 | 150                | 1000               | 0.095             |
| 1N5262B | 48.45               | 51   | 53.55 | 2.5          | 0.25      | 0.1                     | 39 | 170                | 1100               | 0.096             |
| 1N5263B | 53.2                | 56   | 58.80 | 2.2          | 0.25      | 0.1                     | 43 | 185                | 1300               | 0.096             |
| 1N5264B | 57                  | 60   | 63.00 | 2.1          | 0.25      | 0.1                     | 46 | 230                | 1400               | 0.097             |
| 1N5265B | 58.9                | 62   | 65.10 | 2            | 0.25      | 0.1                     | 47 | 270                | 1400               | 0.097             |
| 1N5266B | 64.6                | 68   | 71.40 | 1.8          | 0.25      | 0.1                     | 52 | 330                | 1600               | 0.097             |
| 1N5267B | 71.25               | 75   | 78.75 | 1.7          | 0.25      | 0.1                     | 56 | 370                | 1700               | 0.098             |

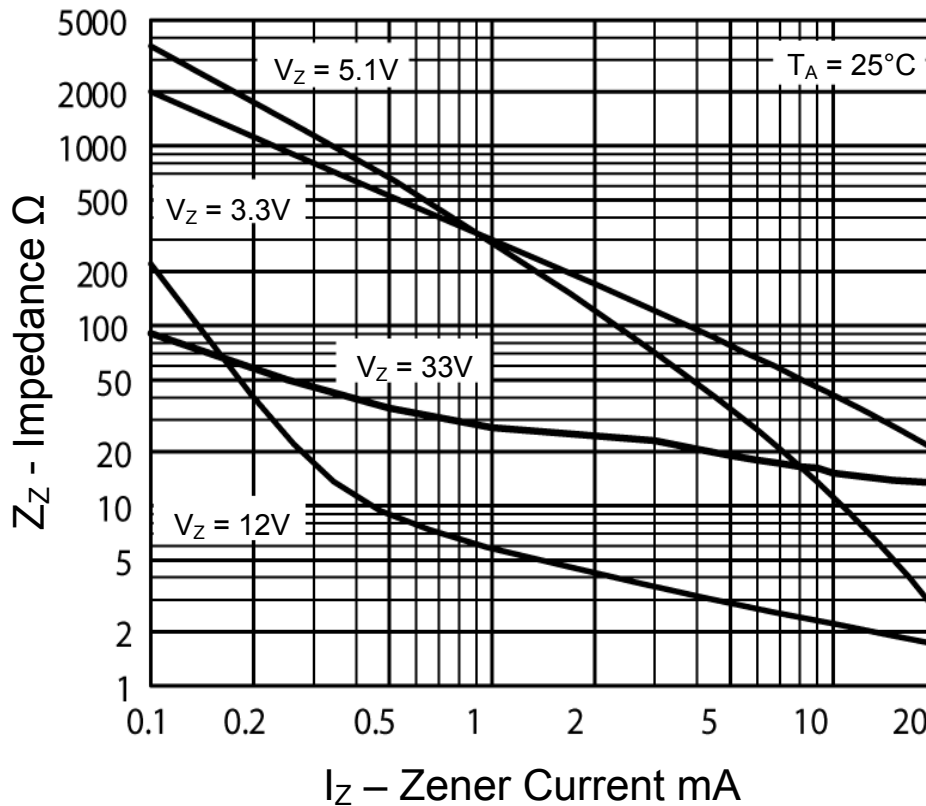
1. Operation above the absolute maximum rating may cause device failure. Operation at the absolute maximum ratings, for extended periods, may reduce device reliability.
2. Assembled in DO-35 package. Performance in die form subject to assembly heat sinking and die attach methods.





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Zener Impedance Versus Operating Current -  $Z_Z$  Versus  $I_Z$

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