



# 0.5W, 250µA I<sub>ZT</sub> , Bare Die Zener Diode

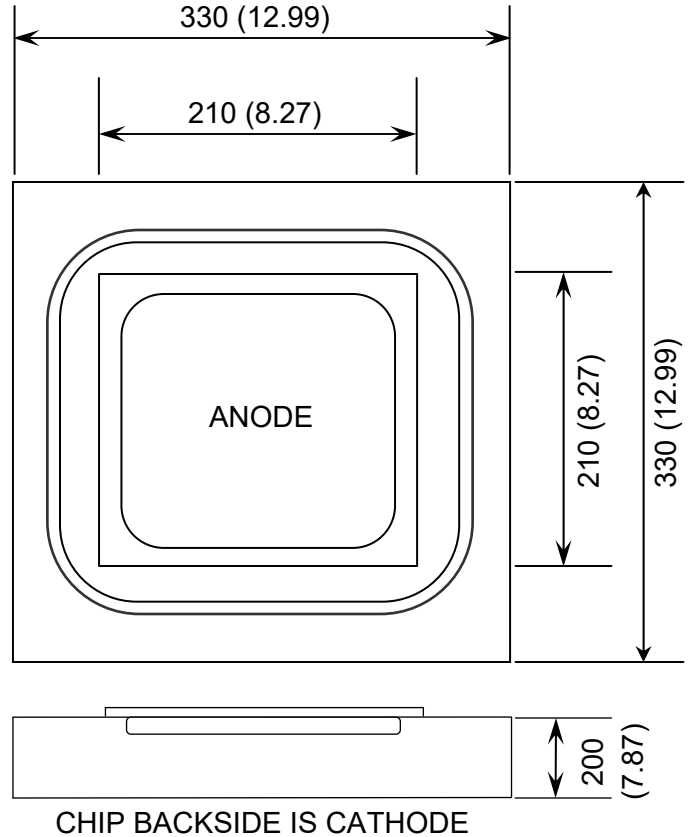
Rev 1.0  
07/07/17

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 µm (mils)



## Ordering Information

The following part suffixes apply:

- No suffix - MIL-STD-750 /2073 Visual Inspection
- “H” - MIL-STD-750 /2073 Visual Inspection + MIL-PRF-38534 Class H LAT
- “K” - MIL-STD-750 /2073 Visual Inspection + MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

[www.siliconsupplies.com/quality/bare-die-lot-qualification](http://www.siliconsupplies.com/quality/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
- Tighter V<sub>Z</sub> tolerances:  
2% - B grade, 1% - A grade – Specific request

## Mechanical Specification

|                        |                            |            |
|------------------------|----------------------------|------------|
| Die Size (Unsawn)      | 330 x 330<br>12.99 x 12.99 | µm<br>mils |
| Anode Pad Size         | 210 x 210<br>8.27 x 8.27   | µm<br>mils |
| Die Thickness          | 200<br>7.87                | µm<br>mils |
| Top Metal Composition  | Al                         |            |
| Back Metal Composition | Au                         |            |





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## Absolute Maximum Ratings<sup>1</sup> T<sub>A</sub> = 25°C unless otherwise stated

| PARAMETER                                | SYMBOL           | VALUE       | UNIT |
|--|------------------|-------------|------|
| Power Dissipation <sup>2</sup>           | P <sub>TOT</sub> | 500         | mW   |
| Junction Temperature                     | T <sub>J</sub>   | 175         | °C   |
| Storage Temperature Range                | T <sub>S</sub>   | -65 to +200 | °C   |
| Forward Voltage @ I <sub>F</sub> = 200mA | V <sub>F</sub>   | 1.5         | V    |

## Electrical Characteristics T<sub>A</sub> = 25°C unless otherwise stated

| DEVICE | ZENER VOLTAGE RANGE              |      |       | TEST CURRENT    | REVERSE LEAKAGE CURRENT         |       |     | DYNAMIC RESISTANCE <sup>3</sup>  | MAXIMUM DC ZENER CURRENT |
|--------|----------------------------------|------|-------|-----------------|---------------------------------|-------|-----|----------------------------------|--------------------------|
|        | V <sub>Z</sub> @ I <sub>ZT</sub> |      |       | I <sub>ZT</sub> | I <sub>R</sub> @ V <sub>R</sub> |       |     | Z <sub>Z</sub> @ I <sub>ZT</sub> | I <sub>ZM</sub>          |
|        | V                                |      |       | μA              | μA                              | V     | Ω   | mA                               |                          |
|        | Min.                             | Nom. | Max.  |                 |                                 |       |     |                                  |                          |
| 1N4099 | 6.46                             | 6.8  | 7.14  | 250             | 10                              | 5.17  | 200 | 56.0                             |                          |
| 1N4100 | 7.13                             | 7.5  | 7.88  | 250             | 10                              | 5.70  | 200 | 51.0                             |                          |
| 1N4101 | 7.79                             | 8.2  | 8.61  | 250             | 1                               | 6.24  | 200 | 46.0                             |                          |
| 1N4102 | 8.27                             | 8.7  | 9.14  | 250             | 1                               | 6.61  | 200 | 44.0                             |                          |
| 1N4103 | 8.65                             | 9.1  | 9.56  | 250             | 1                               | 6.92  | 200 | 42.0                             |                          |
| 1N4104 | 9.50                             | 10   | 10.50 | 250             | 1                               | 7.60  | 200 | 38.0                             |                          |
| 1N4105 | 10.45                            | 11   | 11.55 | 250             | 0.05                            | 8.44  | 200 | 35.0                             |                          |
| 1N4106 | 11.40                            | 12   | 12.60 | 250             | 0.05                            | 9.12  | 200 | 32.0                             |                          |
| 1N4107 | 12.35                            | 13   | 13.65 | 250             | 0.05                            | 9.87  | 200 | 29.0                             |                          |
| 1N4108 | 13.30                            | 14   | 14.70 | 250             | 0.05                            | 10.65 | 200 | 27.0                             |                          |
| 1N4109 | 14.25                            | 15   | 15.75 | 250             | 0.05                            | 11.40 | 100 | 25.0                             |                          |
| 1N4110 | 15.20                            | 16   | 16.80 | 250             | 0.05                            | 12.15 | 100 | 24.0                             |                          |
| 1N4111 | 16.15                            | 17   | 17.85 | 250             | 0.05                            | 12.92 | 100 | 22.0                             |                          |
| 1N4112 | 17.10                            | 18   | 18.90 | 250             | 0.05                            | 13.67 | 100 | 21.0                             |                          |
| 1N4113 | 18.05                            | 19   | 19.95 | 250             | 0.05                            | 14.44 | 150 | 20.0                             |                          |
| 1N4114 | 19.00                            | 20   | 21.00 | 250             | 0.01                            | 15.20 | 150 | 19.0                             |                          |
| 1N4115 | 20.90                            | 22   | 23.10 | 250             | 0.01                            | 16.72 | 150 | 17.0                             |                          |
| 1N4116 | 22.80                            | 24   | 25.20 | 250             | 0.01                            | 18.25 | 150 | 16.0                             |                          |
| 1N4117 | 23.75                            | 25   | 26.25 | 250             | 0.01                            | 19.00 | 150 | 15.0                             |                          |
| 1N4118 | 25.65                            | 27   | 28.35 | 250             | 0.01                            | 20.46 | 150 | 14.0                             |                          |
| 1N4119 | 26.60                            | 28   | 29.40 | 250             | 0.01                            | 21.28 | 200 | 14.0                             |                          |
| 1N4120 | 28.50                            | 30   | 31.50 | 250             | 0.01                            | 22.80 | 200 | 13.0                             |                          |





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|--------|---------------------|------|-------|---------------|-------------------------|-------|----------|---------------------------------|--------------------------|
|        | $V_Z @ I_{ZT}$      |      |       | $I_{ZT}$      | $I_R @ V_R$             |       |          | $Z_Z @ I_{ZT}$                  | $I_{ZM}$                 |
|        | V                   |      |       | $\mu\text{A}$ | $\mu\text{A}$           | V     | $\Omega$ | mA                              |                          |
|        | Min.                | Nom. | Max.  |               |                         |       |          |                                 |                          |
| 1N4121 | 31.35               | 33   | 34.65 | 250           | 0.01                    | 25.08 | 200      | 12.0                            |                          |
| 1N4122 | 34.20               | 36   | 37.80 | 250           | 0.01                    | 27.38 | 200      | 11.0                            |                          |
| 1N4123 | 37.05               | 39   | 40.95 | 250           | 0.01                    | 29.65 | 200      | 9.8                             |                          |
| 1N4124 | 40.85               | 43   | 45.15 | 250           | 0.01                    | 32.65 | 250      | 8.9                             |                          |
| 1N4125 | 44.65               | 47   | 49.35 | 250           | 0.01                    | 35.75 | 250      | 8.1                             |                          |
| 1N4126 | 48.45               | 51   | 53.55 | 250           | 0.01                    | 38.76 | 300      | 7.5                             |                          |
| 1N4127 | 53.20               | 56   | 58.80 | 250           | 0.01                    | 42.6  | 300      | 6.7                             |                          |
| 1N4128 | 57.00               | 60   | 63.00 | 250           | 0.01                    | 45.6  | 400      | 6.4                             |                          |
| 1N4129 | 58.90               | 62   | 65.10 | 250           | 0.01                    | 47.1  | 500      | 6.1                             |                          |
| 1N4130 | 64.60               | 68   | 71.40 | 250           | 0.01                    | 51.68 | 700      | 5.6                             |                          |
| 1N4131 | 71.25               | 75   | 78.75 | 250           | 0.01                    | 57    | 700      | 5.1                             |                          |

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.
3. Zener impedance is derived by superimposing on  $I_{ZT}$  a 60Hz rms AC current equal to 10% of  $I_{ZT}$ .

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