



# 0.5W, 50 $\mu$ A I<sub>ZT</sub> , Bare Die Zener Diode

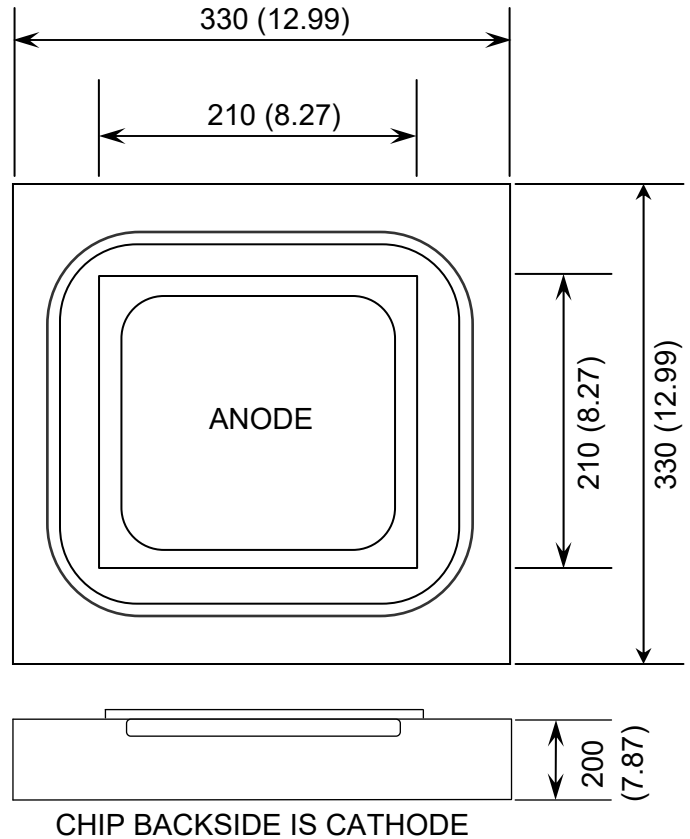
Rev 1.0  
27/1/21

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 $\mu$ m (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 | $\mu$ m<br>mils |
| Anode Pad Size         | 210 x 210<br>8.27 x 8.27   | $\mu$ m<br>mils |
| Die Thickness          | 200<br>7.87                | $\mu$ m<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         |     |      | MAXIMUM VOLTAGE REGULATION <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> |     |      | ΔV <sub>Z</sub>                         | I <sub>ZM</sub>          |
|        | V                                |      |       | μA              | μA                              | V   | V    | mA                                      |                          |
|        | Min.                             | Nom. | Max.  |                 |                                 |     |      |   |                          |
| 1N4678 | 1.71                             | 1.8  | 1.89  | 50              | 7.5                             | 1   | 0.70 | 120.0                                   |                          |
| 1N4679 | 1.9                              | 2    | 2.1   | 50              | 5.0                             | 1   | 0.70 | 110.0                                   |                          |
| 1N4680 | 2.09                             | 2.2  | 2.31  | 50              | 4.0                             | 1   | 0.75 | 100.0                                   |                          |
| 1N4681 | 2.28                             | 2.4  | 2.52  | 50              | 2.0                             | 1   | 0.80 | 95.0                                    |                          |
| 1N4682 | 2.565                            | 2.7  | 2.835 | 50              | 1.0                             | 1   | 0.80 | 90.0                                    |                          |
| 1N4683 | 2.85                             | 3    | 3.15  | 50              | 0.8                             | 1   | 0.90 | 85.0                                    |                          |
| 1N4684 | 3.135                            | 3.3  | 3.465 | 50              | 7.5                             | 1.5 | 0.95 | 80.0                                    |                          |
| 1N4685 | 3.42                             | 3.6  | 3.78  | 50              | 7.5                             | 2   | 0.95 | 75.0                                    |                          |
| 1N4686 | 3.705                            | 3.9  | 4.095 | 50              | 5.0                             | 2   | 0.97 | 70.0                                    |                          |
| 1N4687 | 4.085                            | 4.3  | 4.515 | 50              | 4.0                             | 2   | 0.99 | 65.0                                    |                          |
| 1N4688 | 4.465                            | 4.7  | 4.935 | 50              | 10                              | 3   | 0.99 | 60.0                                    |                          |
| 1N4689 | 4.845                            | 5.1  | 5.355 | 50              | 10                              | 3   | 0.97 | 55.0                                    |                          |
| 1N4690 | 5.32                             | 5.6  | 5.88  | 50              | 10                              | 4   | 0.96 | 50.0                                    |                          |
| 1N4691 | 5.89                             | 6.2  | 6.51  | 50              | 10                              | 5   | 0.95 | 45.0                                    |                          |
| 1N4692 | 6.46                             | 6.8  | 7.14  | 50              | 10                              | 5.1 | 0.90 | 35.0                                    |                          |
| 1N4693 | 7.125                            | 7.5  | 7.875 | 50              | 10                              | 5.7 | 0.75 | 31.8                                    |                          |
| 1N4694 | 7.79                             | 8.2  | 8.61  | 50              | 1.0                             | 6.2 | 0.50 | 29.0                                    |                          |
| 1N4695 | 8.265                            | 8.7  | 9.135 | 50              | 1.0                             | 6.6 | 0.10 | 27.4                                    |                          |
| 1N4696 | 8.645                            | 9.1  | 9.555 | 50              | 1.0                             | 6.9 | 0.08 | 26.2                                    |                          |
| 1N4697 | 9.5                              | 10   | 10.5  | 50              | 1.0                             | 7.6 | 0.10 | 24.8                                    |                          |
| 1N4698 | 10.45                            | 11   | 11.55 | 50              | 0.05                            | 8.4 | 0.11 | 21.6                                    |                          |
| 1N4699 | 11.4                             | 12   | 12.6  | 50              | 0.05                            | 9.1 | 0.12 | 20.4                                    |                          |
| 1N4700 | 12.35                            | 13   | 13.65 | 50              | 0.05                            | 9.8 | 0.13 | 19.0                                    |                          |





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| DEVICE | ZENER VOLTAGE RANGE <sup>3</sup> |      |       | TEST CURRENT    | REVERSE LEAKAGE CURRENT         |      | MAXIMUM VOLTAGE REGULATION <sup>4</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> |      | $\Delta$ V <sub>Z</sub>                 | I <sub>ZM</sub>          |
|        | V                                |      |       | $\mu$ A         | $\mu$ A                         | V    | V                                       | mA                       |
|        | Min.                             | Nom. | Max.  |                 |                                 |      |   |                          |
| 1N4701 | 13.3                             | 14   | 14.7  | 50              | 0.05                            | 10.6 | 0.14                                    | 17.5                     |
| 1N4702 | 14.25                            | 15   | 15.75 | 50              | 0.05                            | 11.4 | 0.15                                    | 16.3                     |
| 1N4703 | 15.2                             | 16   | 16.8  | 50              | 0.05                            | 12.1 | 0.16                                    | 15.4                     |
| 1N4704 | 16.15                            | 17   | 17.85 | 50              | 0.05                            | 12.9 | 0.17                                    | 14.5                     |
| 1N4705 | 17.1                             | 18   | 18.9  | 50              | 0.05                            | 13.6 | 0.18                                    | 13.2                     |
| 1N4706 | 18.05                            | 19   | 19.95 | 50              | 0.05                            | 14.4 | 0.19                                    | 12.5                     |
| 1N4707 | 19                               | 20   | 21    | 50              | 0.01                            | 15.2 | 0.20                                    | 11.9                     |
| 1N4708 | 20.9                             | 22   | 23.1  | 50              | 0.01                            | 16.7 | 0.22                                    | 10.8                     |
| 1N4709 | 22.8                             | 24   | 25.2  | 50              | 0.01                            | 18.2 | 0.24                                    | 9.9                      |
| 1N4710 | 23.75                            | 25   | 26.25 | 50              | 0.01                            | 19.0 | 0.25                                    | 9.5                      |
| 1N4711 | 25.65                            | 27   | 28.35 | 50              | 0.01                            | 20.4 | 0.27                                    | 8.8                      |
| 1N4712 | 26.6                             | 28   | 29.4  | 50              | 0.01                            | 21.2 | 0.28                                    | 8.5                      |
| 1N4713 | 28.5                             | 30   | 31.5  | 50              | 0.01                            | 22.8 | 0.30                                    | 7.9                      |
| 1N4714 | 31.35                            | 33   | 34.65 | 50              | 0.01                            | 25.0 | 0.33                                    | 7.2                      |
| 1N4715 | 34.2                             | 36   | 37.8  | 50              | 0.01                            | 27.3 | 0.36                                    | 6.6                      |
| 1N4716 | 37.05                            | 39   | 40.95 | 50              | 0.01                            | 29.8 | 0.39                                    | 6.1                      |
| 1N4717 | 40.85                            | 43   | 45.15 | 50              | 0.01                            | 32.6 | 0.43                                    | 5.5                      |

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 voltage is read using a pulse measurement, 10 milliseconds maximum.

4. V<sub>Z</sub> @ 100 $\mu$ A minus V<sub>Z</sub> @ 10 $\mu$ A.

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