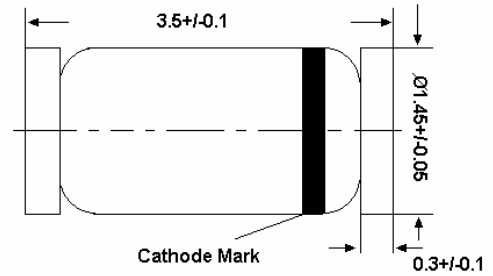


## SILICON PLANAR ZENER DIODES

in MiniMELF case especially for automatic insertion. The Zener voltages are graded according to the international E 24 standard. Smaller voltage tolerances and higher Zener voltages are upon request.



Glass case MiniMELF  
Dimensions in mm

LL-34

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

|  | Symbol           | Value             | Unit             |
|--|------------------|-------------------|------------------|
| Power Dissipation  | $P_{\text{tot}}$ | 500 <sup>1)</sup> | mW               |
| Junction Temperature   | $T_j$            | 175               | $^\circ\text{C}$ |
| Storage Temperature Range  | $T_s$            | -55 to +175       | $^\circ\text{C}$ |
| <sup>1)</sup> Valid provided that electrodes are kept at ambient temperature |                  |                   |                  |

### Characteristics at $T_{\text{amb}} = 25^\circ\text{C}$

|  | Symbol           | Min. | Typ. | Max.              | Unit |
|--|------------------|------|------|-------------------|------|
| Thermal Resistance<br>Junction to Ambient Air                                | $R_{\text{thA}}$ | -    | -    | 0.3 <sup>1)</sup> | K/mW |
| Forward Voltage<br>at $I_F = 100\text{mA}$                                   | $V_F$            | -    | -    | 1                 | V    |
| <sup>1)</sup> Valid provided that electrodes are kept at ambient temperature |                  |      |      |                   |      |

| Type    | Zener Voltage Range <sup>1)</sup> |                       |  | Dynamic Resistance    |  |                       | Reverse Leakage Current     |                              |                                       | Temp coefficient of Zener Voltage |
|---------|-----------------------------------|-----------------------|--|-----------------------|--|-----------------------|-----------------------------|------------------------------|---------------------------------------|-----------------------------------|
|         | V <sub>znom</sub><br>V            | I <sub>ZT</sub><br>mA | for V <sub>ZT</sub> <sup>2)</sup><br>V | r <sub>ZJT</sub><br>Ω | r <sub>ZJK</sub> at I <sub>ZK</sub><br>Ω | I <sub>ZK</sub><br>mA | T <sub>a</sub> = 25°C<br>μA | T <sub>a</sub> = 125°C<br>μA | I <sub>R</sub> at V <sub>R</sub><br>V | TKvz<br>%/K                       |
| ZMM 2V0 | 2.0                               | 5                     | 1.80...2.15                            | <85                   | <600                                     | 1                     | <100                        | <200                         | 1                                     | -0.09...-0.06                     |
| ZMM 2V2 | 2.2                               | 5                     | 2.08...2.33                            | <85                   | <600                                     | 1                     | <75                         | <160                         | 1                                     | -0.09...-0.06                     |
| ZMM 2V4 | 2.4                               | 5                     | 2.28...2.56                            | <85                   | <600                                     | 1                     | <50                         | <100                         | 1                                     | -0.09...-0.06                     |
| ZMM 2V7 | 2.7                               | 5                     | 2.5...2.9                              | <85                   | <600                                     | 1                     | <10                         | <50                          | 1                                     | -0.09...-0.06                     |
| ZMM 3V0 | 3.0                               | 5                     | 2.8...3.2                              | <85                   | <600                                     | 1                     | <4                          | <40                          | 1                                     | -0.08...-0.05                     |
| ZMM 3V3 | 3.3                               | 5                     | 3.1...3.5                              | <85                   | <600                                     | 1                     | <2                          | <40                          | 1                                     | -0.08...-0.05                     |
| ZMM 3V6 | 3.6                               | 5                     | 3.4...3.8                              | <85                   | <600                                     | 1                     | <2                          | <40                          | 1                                     | -0.08...-0.05                     |
| ZMM 3V9 | 3.9                               | 5                     | 3.7...4.1                              | <85                   | <600                                     | 1                     | <2                          | <40                          | 1                                     | -0.08...-0.05                     |
| ZMM 4V3 | 4.3                               | 5                     | 4.0...4.6                              | <75                   | <600                                     | 1                     | <1                          | <20                          | 1                                     | -0.06...-0.03                     |
| ZMM 4V7 | 4.7                               | 5                     | 4.4...5.0                              | <60                   | <600                                     | 1                     | <0.5                        | <10                          | 1                                     | -0.05...+0.02                     |
| ZMM 5V1 | 5.1                               | 5                     | 4.8...5.4                              | <35                   | <550                                     | 1                     | <0.1                        | <2                           | 1                                     | -0.02...+0.02                     |
| ZMM 5V6 | 5.6                               | 5                     | 5.2...6.0                              | <25                   | <450                                     | 1                     | <0.1                        | <2                           | 1                                     | -0.05...+0.05                     |
| ZMM 6V2 | 6.2                               | 5                     | 5.8...6.6                              | <10                   | <200                                     | 1                     | <0.1                        | <2                           | 2                                     | 0.03...0.06                       |
| ZMM 6V8 | 6.8                               | 5                     | 6.4...7.2                              | <8                    | <150                                     | 1                     | <0.1                        | <2                           | 3                                     | 0.03...0.07                       |
| ZMM 7V5 | 7.5                               | 5                     | 7.0...7.9                              | <7                    | <50                                      | 1                     | <0.1                        | <2                           | 5                                     | 0.03...0.07                       |
| ZMM 8V2 | 8.2                               | 5                     | 7.7...8.7                              | <7                    | <50                                      | 1                     | <0.1                        | <2                           | 6.2                                   | 0.03...0.08                       |
| ZMM 9V1 | 9.1                               | 5                     | 8.5...9.6                              | <10                   | <50                                      | 1                     | <0.1                        | <2                           | 6.8                                   | 0.03...0.09                       |
| ZMM 10  | 10                                | 5                     | 9.4...10.6                             | <15                   | <70                                      | 1                     | <0.1                        | <2                           | 7.5                                   | 0.03...0.1                        |
| ZMM 11  | 11                                | 5                     | 10.4...11.6                            | <20                   | <70                                      | 1                     | <0.1                        | <2                           | 8.2                                   | 0.03...0.11                       |
| ZMM 12  | 12                                | 5                     | 11.4...12.7                            | <20                   | <90                                      | 1                     | <0.1                        | <2                           | 9.1                                   | 0.03...0.11                       |
| ZMM 13  | 13                                | 5                     | 12.4...14.1                            | <26                   | <110                                     | 1                     | <0.1                        | <2                           | 10                                    | 0.03...0.11                       |
| ZMM 15  | 15                                | 5                     | 13.8...15.6                            | <30                   | <110                                     | 1                     | <0.1                        | <2                           | 11                                    | 0.03...0.11                       |
| ZMM 16  | 16                                | 5                     | 15.3...17.1                            | <40                   | <170                                     | 1                     | <0.1                        | <2                           | 12                                    | 0.03...0.11                       |
| ZMM 18  | 18                                | 5                     | 16.8...19.1                            | <50                   | <170                                     | 1                     | <0.1                        | <2                           | 13                                    | 0.03...0.11                       |
| ZMM 20  | 20                                | 5                     | 18.8...21.2                            | <55                   | <220                                     | 1                     | <0.1                        | <2                           | 15                                    | 0.03...0.11                       |
| ZMM 22  | 22                                | 5                     | 20.8...23.3                            | <55                   | <220                                     | 1                     | <0.1                        | <2                           | 16                                    | 0.04...0.12                       |
| ZMM 24  | 24                                | 5                     | 22.8...25.6                            | <80                   | <220                                     | 1                     | <0.1                        | <2                           | 18                                    | 0.04...0.12                       |
| ZMM 27  | 27                                | 5                     | 25.1...28.9                            | <80                   | <220                                     | 1                     | <0.1                        | <2                           | 20                                    | 0.04...0.12                       |
| ZMM 30  | 30                                | 5                     | 28...32                                | <80                   | <220                                     | 1                     | <0.1                        | <2                           | 22                                    | 0.04...0.12                       |
| ZMM 33  | 33                                | 5                     | 31...35                                | <80                   | <220                                     | 1                     | <0.1                        | <2                           | 24                                    | 0.04...0.12                       |
| ZMM 36  | 36                                | 5                     | 34...38                                | <80                   | <220                                     | 1                     | <0.1                        | <2                           | 27                                    | 0.04...0.12                       |
| ZMM 39  | 39                                | 2.5                   | 37...41                                | <90                   | <500                                     | 0.5                   | <0.1                        | <5                           | 30                                    | 0.04...0.12                       |
| ZMM 43  | 43                                | 2.5                   | 40...46                                | <90                   | <500                                     | 0.5                   | <0.1                        | <5                           | 33                                    | 0.04...0.12                       |
| ZMM 47  | 47                                | 2.5                   | 44...50                                | <110                  | <600                                     | 0.5                   | <0.1                        | <5                           | 36                                    | 0.04...0.12                       |
| ZMM 51  | 51                                | 2.5                   | 48...54                                | <125                  | <700                                     | 0.5                   | <0.1                        | <10                          | 39                                    | 0.04...0.12                       |
| ZMM 56  | 56                                | 2.5                   | 52...60                                | <135                  | <700                                     | 0.5                   | <0.1                        | <10                          | 43                                    | 0.04...0.12                       |
| ZMM 62  | 62                                | 2.5                   | 58...66                                | <150                  | <1000                                    | 0.5                   | <0.1                        | <10                          | 47                                    | 0.04...0.12                       |
| ZMM 68  | 68                                | 2.5                   | 64...72                                | <200                  | <1000                                    | 0.5                   | <0.1                        | <10                          | 51                                    | 0.04...0.12                       |
| ZMM 75  | 75                                | 2.5                   | 70...79                                | <250                  | <1000                                    | 0.5                   | <0.1                        | <10                          | 56                                    | 0.04...0.12                       |
| ZMM 82  | 82                                | 2.5                   | 77...87                                | <300                  | <1500                                    | 0.25                  | <0.1                        | <10                          | 62                                    | 0.05...0.12                       |
| ZMM 91  | 91                                | 1                     | 85...96                                | <450                  | <2000                                    | 0.1                   | <0.1                        | <10                          | 68                                    | 0.05...0.12                       |
| ZMM 100 | 100                               | 1                     | 94...106                               | <450                  | <5000                                    | 0.1                   | <0.1                        | <10                          | 75                                    | 0.05...0.12                       |
| ZMM 110 | 110                               | 1                     | 104...116                              | <600                  | <5000                                    | 0.1                   | <0.1                        | <10                          | 82                                    | 0.05...0.12                       |
| ZMM 120 | 120                               | 1                     | 114...127                              | <800                  | <5500                                    | 0.1                   | <0.1                        | <10                          | 91                                    | 0.05...0.12                       |
| ZMM 130 | 130                               | 1                     | 124...141                              | <950                  | <6000                                    | 0.1                   | <0.1                        | <10                          | 100                                   | 0.05...0.12                       |
| ZMM 150 | 150                               | 1                     | 138...156                              | <1250                 | <6500                                    | 0.1                   | <0.1                        | <10                          | 110                                   | 0.05...0.12                       |
| ZMM 160 | 160                               | 1                     | 153...171                              | <1400                 | <7000                                    | 0.1                   | <0.1                        | <10                          | 120                                   | 0.05...0.12                       |
| ZMM 180 | 180                               | 1                     | 168...191                              | <1700                 | <8500                                    | 0.1                   | <0.1                        | <10                          | 130                                   | 0.05...0.12                       |
| ZMM 200 | 200                               | 1                     | 188...212                              | <2000                 | <10000                                   | 0.1                   | <0.1                        | <10                          | 150                                   | 0.05...0.12                       |

1) Tested with pulses t<sub>p</sub> = 20 ms.  
2) Valid provided that electrodes are kept at ambient temperature

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