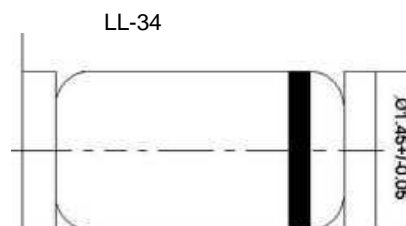




Silicon Epitaxial Planar Zener Diodes

in MiniMELF case especially for automatic insertion.
The Zener voltages are graded according to the international E24 standard. Smaller voltage tolerances and higher Zener voltages are upon request.

These diodes are also available in DO-35 case with the type designation BZX55C...



Cathode Mark

Glass case MiniMELF
Dimensions in mm

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

| Parameter | Symbol | Value | Unit |
|---------------------------|------------------|---------------|------------------|
| Power Dissipation | P_{tot} | 500 | mW |
| Junction Temperature | T_j | 175 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | - 55 to + 175 | $^\circ\text{C}$ |

Characteristics at $T_a = 25\text{ }^\circ\text{C}$ ($V_F = 1\text{ V Max. at } I_F = 100\text{ mA}$)

| Type | Zener Voltage ¹⁾ | | Reverse Leakage Current | | | Dynamic Resistance | |
|--------|-----------------------------|----------|-------------------------|------------------------|----------|--------------------|-------------|
| | V_Z | | at I_{ZT} | I_R | at V_R | Z_{ZT} | at I_{ZT} |
| | Min. (V) | Max. (V) | (mA) | Max. (μA) | (V) | Max. (Ω) | (mA) |
| ZMM2A1 | 1.6 | 1.8 | 5 | 25 | 0.5 | 100 | 5 |
| ZMM2A2 | 1.7 | 1.9 | 5 | 25 | 0.5 | 100 | 5 |
| ZMM2A3 | 1.8 | 2 | 5 | 25 | 0.5 | 100 | 5 |
| ZMM2B1 | 1.9 | 2.1 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM2B2 | 2 | 2.2 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM2B3 | 2.1 | 2.3 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM2C1 | 2.2 | 2.4 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM2C2 | 2.3 | 2.5 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM2C3 | 2.4 | 2.6 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3A1 | 2.5 | 2.7 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3A2 | 2.6 | 2.8 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3A3 | 2.7 | 2.9 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3B1 | 2.8 | 3 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3B2 | 2.9 | 3.1 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3B3 | 3 | 3.2 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3C1 | 3.1 | 3.3 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3C2 | 3.2 | 3.4 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM3C3 | 3.3 | 3.5 | 5 | 5 | 0.5 | 100 | 5 |
| ZMM4A1 | 3.4 | 3.6 | 5 | 5 | 1 | 100 | 5 |
| ZMM4A2 | 3.5 | 3.7 | 5 | 5 | 1 | 100 | 5 |
| ZMM4A3 | 3.6 | 3.8 | 5 | 5 | 1 | 100 | 5 |
| ZMM4B1 | 3.7 | 3.9 | 5 | 5 | 1 | 100 | 5 |
| ZMM4B2 | 3.8 | 4 | 5 | 5 | 1 | 100 | 5 |
| ZMM4B3 | 3.9 | 4.1 | 5 | 5 | 1 | 100 | 5 |
| ZMM4C1 | 4 | 4.2 | 5 | 5 | 1 | 100 | 5 |
| ZMM4C2 | 4.1 | 4.3 | 5 | 5 | 1 | 100 | 5 |



Characteristics at $T_a = 25\text{ }^\circ\text{C}$ ($V_F = 1\text{ V Max. at } I_F = 100\text{ mA}$)

| Type | Zener Voltage ¹⁾ | | | Reverse Leakage Current | | Dynamic Resistance | |
|---------|-----------------------------|----------|-------------|-------------------------|----------|--------------------|-------------|
| | V_Z | | at I_{ZT} | I_R | at V_R | Z_{ZT} | at I_{ZT} |
| | Min. (V) | Max. (V) | (mA) | Max. (μA) | (V) | Max. (Ω) | (mA) |
| ZMM4C3 | 4.2 | 4.4 | 5 | 5 | 1 | 100 | 5 |
| ZMM5A1 | 4.3 | 4.5 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5A2 | 4.4 | 4.6 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5A3 | 4.5 | 4.7 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5B1 | 4.6 | 4.8 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5B2 | 4.7 | 4.9 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5B3 | 4.8 | 5 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5C1 | 4.9 | 5.1 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5C2 | 5 | 5.2 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM5C3 | 5.1 | 5.3 | 5 | 5 | 1.5 | 100 | 5 |
| ZMM6A1 | 5.2 | 5.5 | 5 | 5 | 2 | 40 | 5 |
| ZMM6A2 | 5.3 | 5.6 | 5 | 5 | 2 | 40 | 5 |
| ZMM6A3 | 5.4 | 5.7 | 5 | 5 | 2 | 40 | 5 |
| ZMM6B1 | 5.5 | 5.8 | 5 | 5 | 2 | 40 | 5 |
| ZMM6B2 | 5.6 | 5.9 | 5 | 5 | 2 | 40 | 5 |
| ZMM6B3 | 5.7 | 6 | 5 | 5 | 2 | 40 | 5 |
| ZMM6C1 | 5.8 | 6.1 | 5 | 5 | 2 | 40 | 5 |
| ZMM6C2 | 6 | 6.3 | 5 | 5 | 2 | 40 | 5 |
| ZMM6C3 | 6.1 | 6.4 | 5 | 5 | 2 | 40 | 5 |
| ZMM7A1 | 6.3 | 6.6 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7A2 | 6.4 | 6.7 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7A3 | 6.6 | 6.9 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7B1 | 6.7 | 7 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7B2 | 6.9 | 7.2 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7B3 | 7 | 7.3 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7C1 | 7.2 | 7.6 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7C2 | 7.3 | 7.7 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM7C3 | 7.5 | 7.9 | 5 | 1 | 3.5 | 15 | 5 |
| ZMM9A1 | 7.7 | 8.1 | 5 | 1 | 5 | 20 | 5 |
| ZMM9A2 | 7.9 | 8.3 | 5 | 1 | 5 | 20 | 5 |
| ZMM9A3 | 8.1 | 8.5 | 5 | 1 | 5 | 20 | 5 |
| ZMM9B1 | 8.3 | 8.7 | 5 | 1 | 5 | 20 | 5 |
| ZMM9B2 | 8.5 | 8.9 | 5 | 1 | 5 | 20 | 5 |
| ZMM9B3 | 8.7 | 9.1 | 5 | 1 | 5 | 20 | 5 |
| ZMM9C1 | 8.9 | 9.3 | 5 | 1 | 5 | 20 | 5 |
| ZMM9C2 | 9.1 | 9.5 | 5 | 1 | 5 | 20 | 5 |
| ZMM9C3 | 9.3 | 9.7 | 5 | 1 | 5 | 20 | 5 |
| ZMM11A1 | 9.5 | 9.9 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11A2 | 9.7 | 10.1 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11A3 | 9.9 | 10.3 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11B1 | 10.2 | 10.6 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11B2 | 10.4 | 10.8 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11B3 | 10.7 | 11.1 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11C1 | 10.9 | 11.3 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11C2 | 11.1 | 11.6 | 5 | 1 | 7.5 | 25 | 5 |
| ZMM11C3 | 11.4 | 11.9 | 5 | 1 | 7.5 | 25 | 5 |

Characteristics at $T_a = 25\text{ }^\circ\text{C}$ ($V_F = 1\text{ V Max. at } I_F = 100\text{ mA}$)

| Type | Zener Voltage ¹⁾ | | | Reverse Leakage Current | | Dynamic Resistance | |
|---------|-----------------------------|----------|-------------|-------------------------|----------|--------------------|-------------|
| | V_Z | | at I_{ZT} | I_R | at V_R | Z_{ZT} | at I_{ZT} |
| | Min. (V) | Max. (V) | (mA) | Max. (μA) | (V) | Max. (Ω) | (mA) |
| ZMM12A1 | 11.6 | 12.1 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12A2 | 11.9 | 12.4 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12A3 | 12.2 | 12.7 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12B1 | 12.4 | 12.9 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12B2 | 12.6 | 13.1 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12B3 | 12.9 | 13.4 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12C1 | 13.2 | 13.7 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12C2 | 13.5 | 14 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM12C3 | 13.8 | 14.3 | 5 | 1 | 9.5 | 35 | 5 |
| ZMM15-1 | 14.1 | 14.7 | 5 | 1 | 11 | 40 | 5 |
| ZMM15-2 | 14.5 | 15.1 | 5 | 1 | 11 | 40 | 5 |
| ZMM15-3 | 14.9 | 15.5 | 5 | 1 | 11 | 40 | 5 |
| ZMM16-1 | 15.3 | 15.9 | 5 | 1 | 12 | 45 | 5 |
| ZMM16-2 | 15.7 | 16.5 | 5 | 1 | 12 | 45 | 5 |
| ZMM16-3 | 16.3 | 17.1 | 5 | 1 | 12 | 45 | 5 |
| ZMM18-1 | 16.9 | 17.7 | 5 | 1 | 13 | 55 | 5 |
| ZMM18-2 | 17.5 | 18.3 | 5 | 1 | 13 | 55 | 5 |
| ZMM18-3 | 18.1 | 19 | 5 | 1 | 13 | 55 | 5 |
| ZMM20-1 | 18.8 | 19.7 | 2 | 1 | 15 | 60 | 2 |
| ZMM20-2 | 19.5 | 20.4 | 2 | 1 | 15 | 60 | 2 |
| ZMM20-3 | 20.2 | 21.1 | 2 | 1 | 15 | 60 | 2 |
| ZMM22-1 | 20.9 | 21.9 | 2 | 1 | 17 | 65 | 2 |
| ZMM22-2 | 21.6 | 22.6 | 2 | 1 | 17 | 65 | 2 |
| ZMM22-3 | 22.3 | 23.3 | 2 | 1 | 17 | 65 | 2 |
| ZMM24-1 | 22.9 | 24 | 2 | 1 | 19 | 70 | 2 |
| ZMM24-2 | 23.6 | 24.7 | 2 | 1 | 19 | 70 | 2 |
| ZMM24-3 | 24.3 | 25.5 | 2 | 1 | 19 | 70 | 2 |
| ZMM27-1 | 25.2 | 26.6 | 2 | 1 | 21 | 80 | 2 |
| ZMM27-2 | 26.2 | 27.6 | 2 | 1 | 21 | 80 | 2 |
| ZMM27-3 | 27.2 | 28.6 | 2 | 1 | 21 | 80 | 2 |
| ZMM30-1 | 28.2 | 29.6 | 2 | 1 | 23 | 100 | 2 |
| ZMM30-2 | 29.2 | 30.6 | 2 | 1 | 23 | 100 | 2 |
| ZMM30-3 | 30.2 | 31.6 | 2 | 1 | 23 | 100 | 2 |
| ZMM33-1 | 31.2 | 32.6 | 2 | 1 | 25 | 120 | 2 |
| ZMM33-2 | 32.2 | 33.6 | 2 | 1 | 25 | 120 | 2 |
| ZMM33-3 | 33.2 | 34.6 | 2 | 1 | 25 | 120 | 2 |
| ZMM36-1 | 34.2 | 35.7 | 2 | 1 | 27 | 140 | 2 |
| ZMM36-2 | 35.3 | 36.8 | 2 | 1 | 27 | 140 | 2 |
| ZMM36-3 | 36.4 | 38 | 2 | 1 | 27 | 140 | 2 |

¹⁾ Tested with pulses $t_p = 20\text{ ms}$.



Fig.1- Zener current versus zener voltage

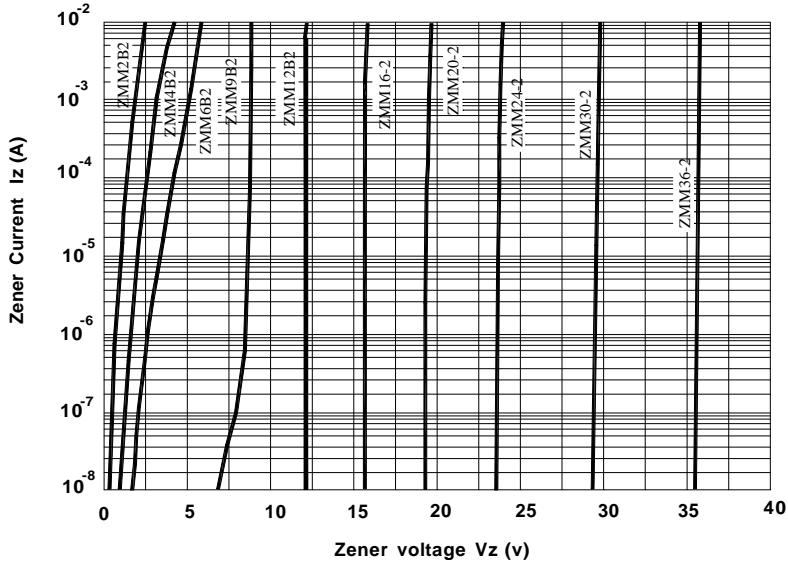
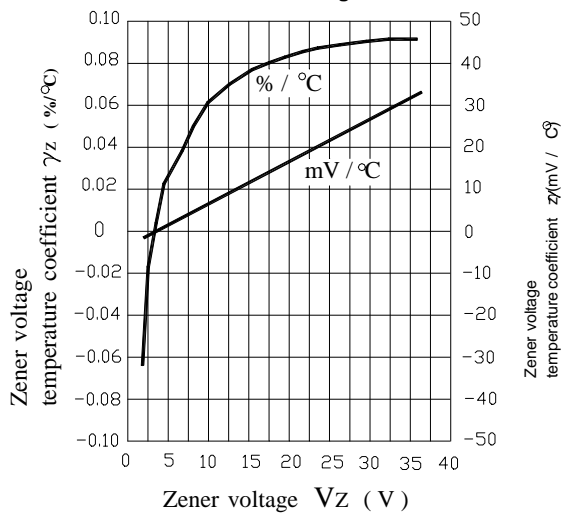


Fig.2 Temperature Coefficient Vs. Zener voltage



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