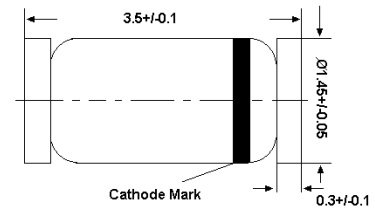


# ZMM1V0 THRU ZMM75

## 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.

LL-34



Glass case MiniMELF  
 Dimensions in mm

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

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

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

| Parameter  | Symbol           | Max.              | Unit |
|--|------------------|-------------------|------|
| Thermal Resistance 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 |                  |                   |      |

# ZMM1V0 THRU ZMM75

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

| Type   | Zener Voltage Range <sup>1)</sup> |             |             | Dynamic Resistance |                   |             | Reverse Leakage Current          |                                   |          | Temp. Coefficient of Zener Voltage |
|--------|-----------------------------------|-------------|-------------|--------------------|-------------------|-------------|----------------------------------|-----------------------------------|----------|------------------------------------|
|        | $V_{Znom}$                        | $V_{ZT}$    | at $I_{ZT}$ | $Z_{ZT}$           | $Z_{ZK}$          | at $I_{ZK}$ | $T_a = 25\text{ }^\circ\text{C}$ | $T_a = 125\text{ }^\circ\text{C}$ | at $V_R$ |                                    |
|        | (V)                               | (V)         | (mA)        | Max. ( $\Omega$ )  | Max. ( $\Omega$ ) | (mA)        | Max. ( $\mu\text{A}$ )           | Max. ( $\mu\text{A}$ )            | (V)      |                                    |
| ZMM1V0 | 0.75                              | 0.7...0.8   | 5           | 8                  | 50                | 1           | -                                | -                                 | -        | -0.26...-0.23                      |
| ZMM2V0 | 2                                 | 1.8...2.15  | 5           | 85                 | 600               | 1           | 100                              | 200                               | 1        | -0.09...-0.06                      |
| ZMM2V2 | 2.2                               | 2.08...2.33 | 5           | 85                 | 600               | 1           | 75                               | 160                               | 1        | -0.09...-0.06                      |
| ZMM2V4 | 2.4                               | 2.28...2.56 | 5           | 85                 | 600               | 1           | 50                               | 100                               | 1        | -0.09...-0.06                      |
| ZMM2V7 | 2.7                               | 2.5...2.9   | 5           | 85                 | 600               | 1           | 10                               | 50                                | 1        | -0.09...-0.06                      |
| ZMM3V0 | 3                                 | 2.8...3.2   | 5           | 85                 | 600               | 1           | 4                                | 40                                | 1        | -0.08...-0.05                      |
| ZMM3V3 | 3.3                               | 3.1...3.5   | 5           | 85                 | 600               | 1           | 2                                | 40                                | 1        | -0.08...-0.05                      |
| ZMM3V6 | 3.6                               | 3.4...3.8   | 5           | 85                 | 600               | 1           | 2                                | 40                                | 1        | -0.08...-0.05                      |
| ZMM3V9 | 3.9                               | 3.7...4.1   | 5           | 85                 | 600               | 1           | 2                                | 40                                | 1        | -0.08...-0.05                      |
| ZMM4V3 | 4.3                               | 4...4.6     | 5           | 75                 | 600               | 1           | 1                                | 20                                | 1        | -0.06...-0.03                      |
| ZMM4V7 | 4.7                               | 4.4...5     | 5           | 60                 | 600               | 1           | 0.5                              | 10                                | 1        | -0.05...+0.02                      |
| ZMM5V1 | 5.1                               | 4.8...5.4   | 5           | 35                 | 550               | 1           | 0.1                              | 2                                 | 1        | -0.02...+0.02                      |
| ZMM5V6 | 5.6                               | 5.2...6     | 5           | 25                 | 450               | 1           | 0.1                              | 2                                 | 1        | -0.05...+0.05                      |
| ZMM6V2 | 6.2                               | 5.8...6.6   | 5           | 10                 | 200               | 1           | 0.1                              | 2                                 | 2        | 0.03...0.06                        |
| ZMM6V8 | 6.8                               | 6.4...7.2   | 5           | 8                  | 150               | 1           | 0.1                              | 2                                 | 3        | 0.03...0.07                        |
| ZMM7V5 | 7.5                               | 7...7.9     | 5           | 7                  | 50                | 1           | 0.1                              | 2                                 | 5        | 0.03...0.07                        |
| ZMM8V2 | 8.2                               | 7.7...8.7   | 5           | 7                  | 50                | 1           | 0.1                              | 2                                 | 6.2      | 0.03...0.08                        |
| ZMM9V1 | 9.1                               | 8.5...9.6   | 5           | 10                 | 50                | 1           | 0.1                              | 2                                 | 6.8      | 0.03...0.09                        |
| ZMM10  | 10                                | 9.4...10.6  | 5           | 15                 | 70                | 1           | 0.1                              | 2                                 | 7.5      | 0.03...0.1                         |
| ZMM11  | 11                                | 10.4...11.6 | 5           | 20                 | 70                | 1           | 0.1                              | 2                                 | 8.2      | 0.03...0.11                        |
| ZMM12  | 12                                | 11.4...12.7 | 5           | 20                 | 90                | 1           | 0.1                              | 2                                 | 9.1      | 0.03...0.11                        |
| ZMM13  | 13                                | 12.4...14.1 | 5           | 26                 | 110               | 1           | 0.1                              | 2                                 | 10       | 0.03...0.11                        |
| ZMM15  | 15                                | 13.8...15.6 | 5           | 30                 | 110               | 1           | 0.1                              | 2                                 | 11       | 0.03...0.11                        |
| ZMM16  | 16                                | 15.3...17.1 | 5           | 40                 | 170               | 1           | 0.1                              | 2                                 | 12       | 0.03...0.11                        |
| ZMM18  | 18                                | 16.8...19.1 | 5           | 50                 | 170               | 1           | 0.1                              | 2                                 | 13       | 0.03...0.11                        |
| ZMM20  | 20                                | 18.8...21.2 | 5           | 55                 | 220               | 1           | 0.1                              | 2                                 | 15       | 0.03...0.11                        |
| ZMM22  | 22                                | 20.8...23.3 | 5           | 55                 | 220               | 1           | 0.1                              | 2                                 | 16       | 0.04...0.12                        |
| ZMM24  | 24                                | 22.8...25.6 | 5           | 80                 | 220               | 1           | 0.1                              | 2                                 | 18       | 0.04...0.12                        |
| ZMM27  | 27                                | 25.1...28.9 | 5           | 80                 | 220               | 1           | 0.1                              | 2                                 | 20       | 0.04...0.12                        |
| ZMM30  | 30                                | 28...32     | 5           | 80                 | 220               | 1           | 0.1                              | 2                                 | 22       | 0.04...0.12                        |
| ZMM33  | 33                                | 31...35     | 5           | 80                 | 220               | 1           | 0.1                              | 2                                 | 24       | 0.04...0.12                        |
| ZMM36  | 36                                | 34...38     | 5           | 80                 | 220               | 1           | 0.1                              | 2                                 | 27       | 0.04...0.12                        |
| ZMM39  | 39                                | 37...41     | 2.5         | 90                 | 500               | 0.5         | 0.1                              | 5                                 | 30       | 0.04...0.12                        |
| ZMM43  | 43                                | 40...46     | 2.5         | 90                 | 500               | 0.5         | 0.1                              | 5                                 | 33       | 0.04...0.12                        |
| ZMM47  | 47                                | 44...50     | 2.5         | 110                | 600               | 0.5         | 0.1                              | 5                                 | 36       | 0.04...0.12                        |
| ZMM51  | 51                                | 48...54     | 2.5         | 125                | 700               | 0.5         | 0.1                              | 10                                | 39       | 0.04...0.12                        |
| ZMM56  | 56                                | 52...60     | 2.5         | 135                | 700               | 0.5         | 0.1                              | 10                                | 43       | 0.04...0.12                        |
| ZMM62  | 62                                | 58...66     | 2.5         | 150                | 1000              | 0.5         | 0.1                              | 10                                | 47       | 0.04...0.12                        |
| ZMM68  | 68                                | 64...72     | 2.5         | 200                | 1000              | 0.5         | 0.1                              | 10                                | 51       | 0.04...0.12                        |
| ZMM75  | 75                                | 70...79     | 2.5         | 250                | 1000              | 0.5         | 0.1                              | 10                                | 56       | 0.04...0.12                        |

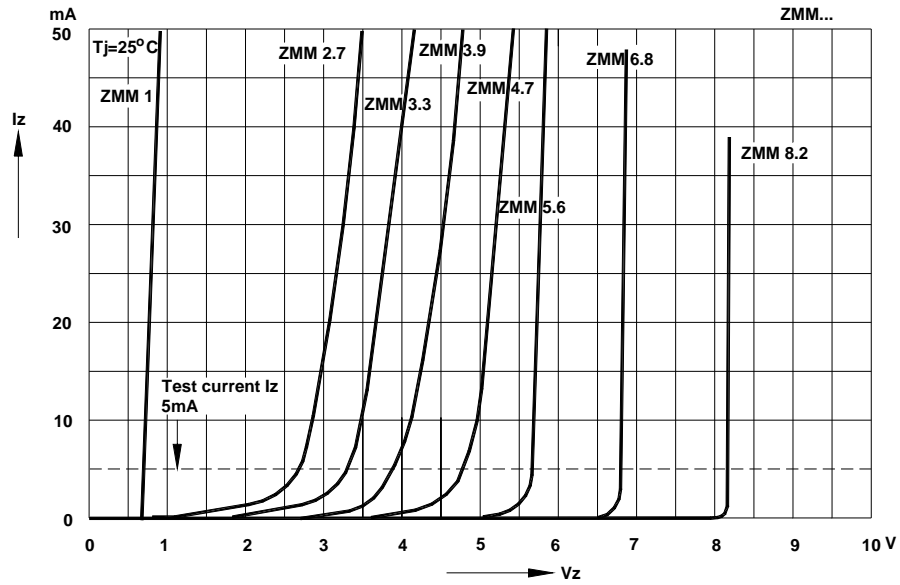
<sup>1)</sup> Tested with pulses  $t_p = 20\text{ ms}$ .

<sup>2)</sup> The ZMM1 is a silicon diode with operation in forward direction. Hence, the index of all parameters should be "F" instead of "Z". Connect the cathode electrode to the negative pole.

# ZMM1V0 THRU ZMM75

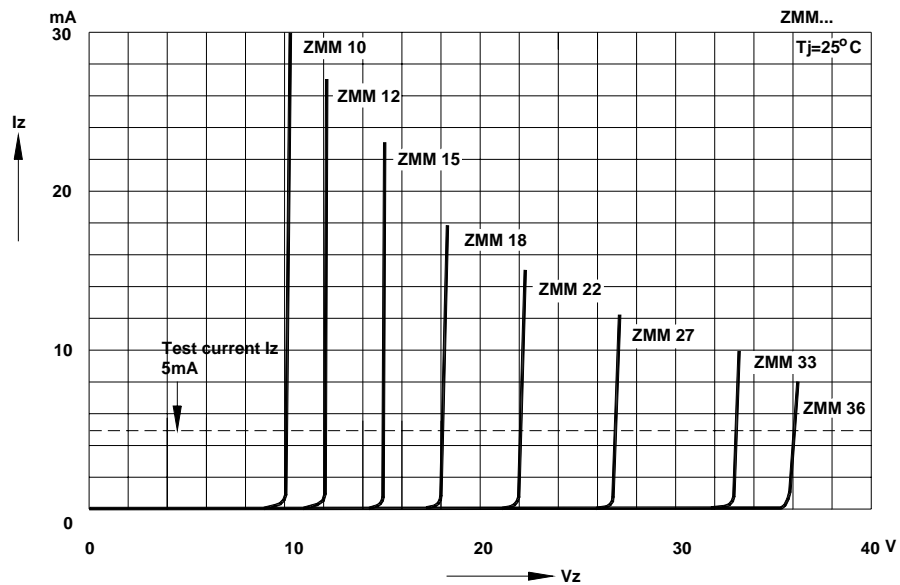
## Breakdown characteristics

$T_j = \text{constant (pulsed)}$



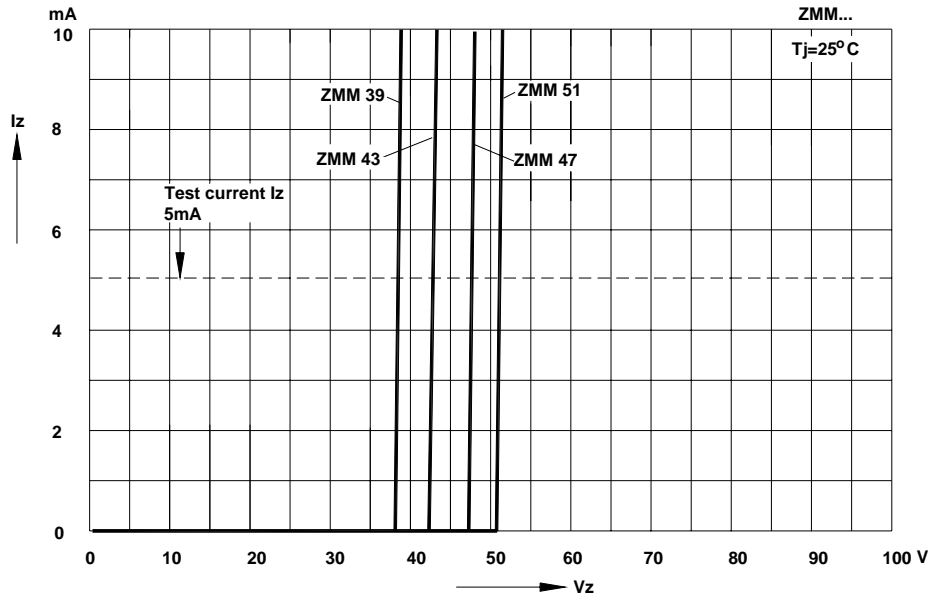
## Breakdown characteristics

$T_j = \text{constant (pulsed)}$

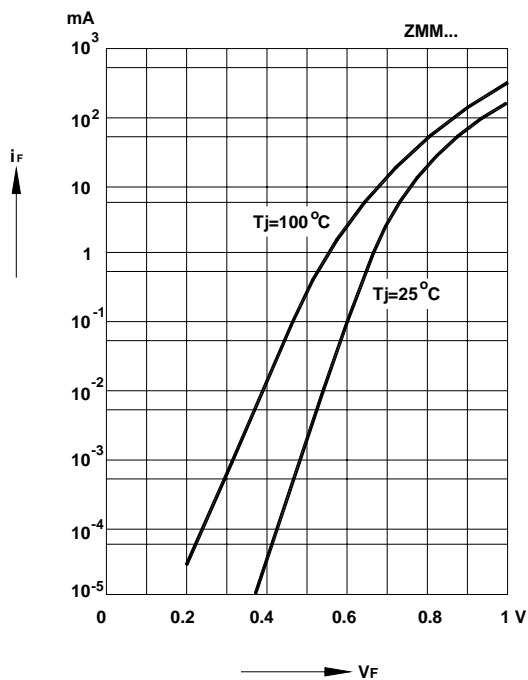


# ZMM1V0 THRU ZMM75

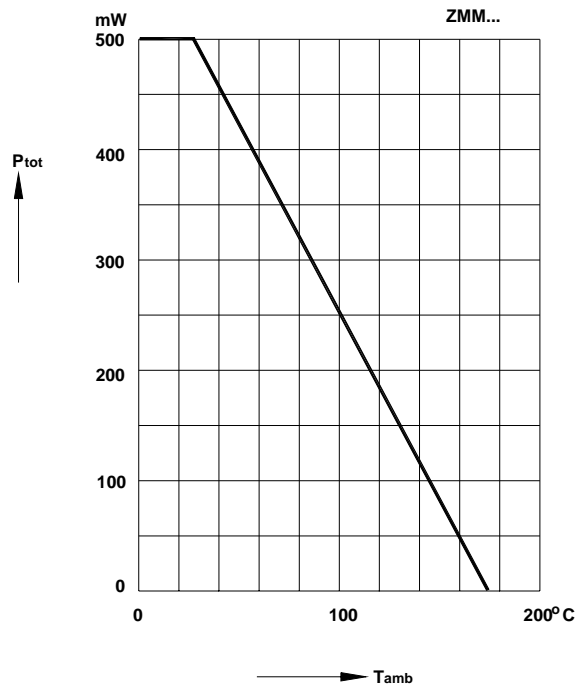
**Breakdown characteristics**  
 $T_j = \text{constant (pulsed)}$



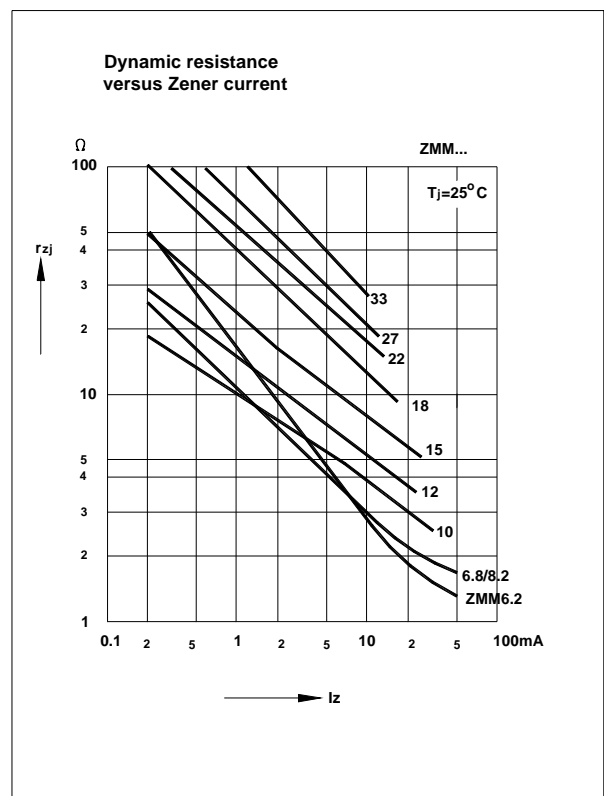
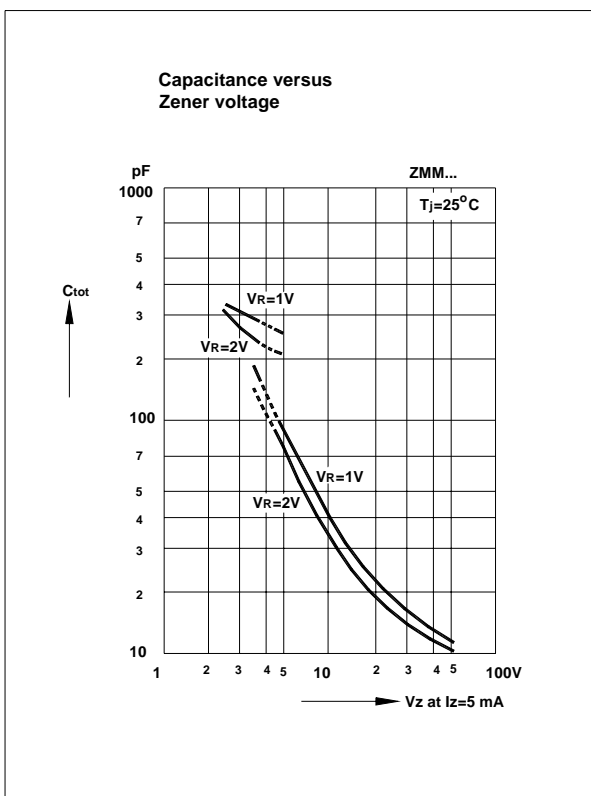
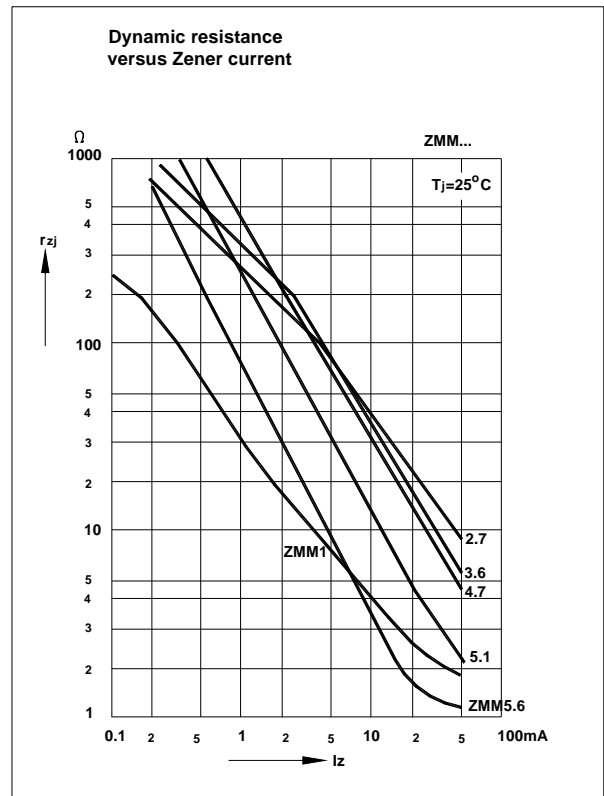
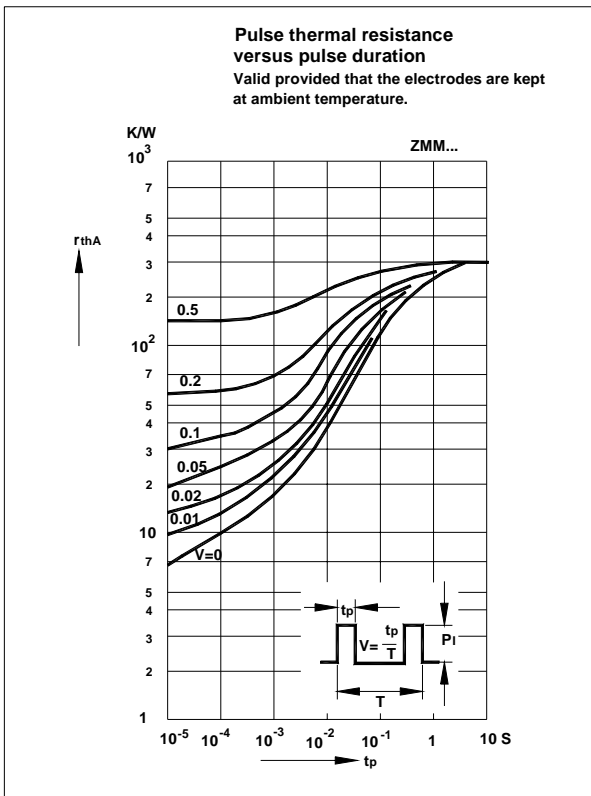
**Forward characteristics**



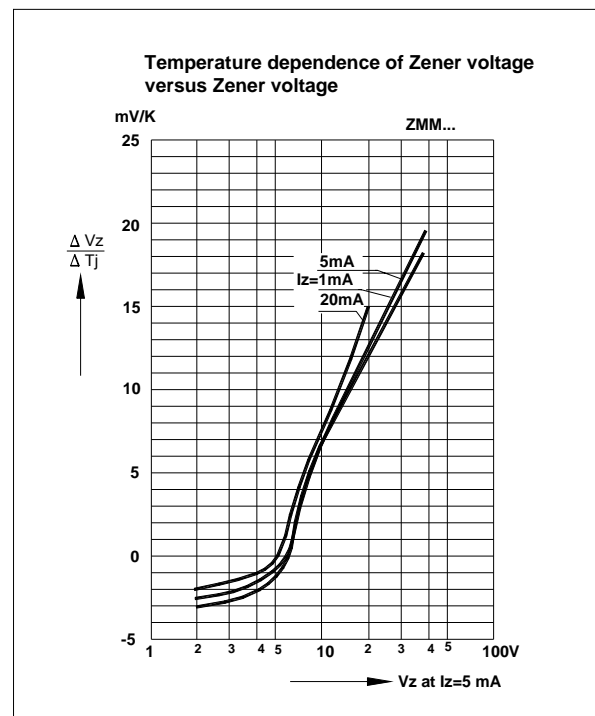
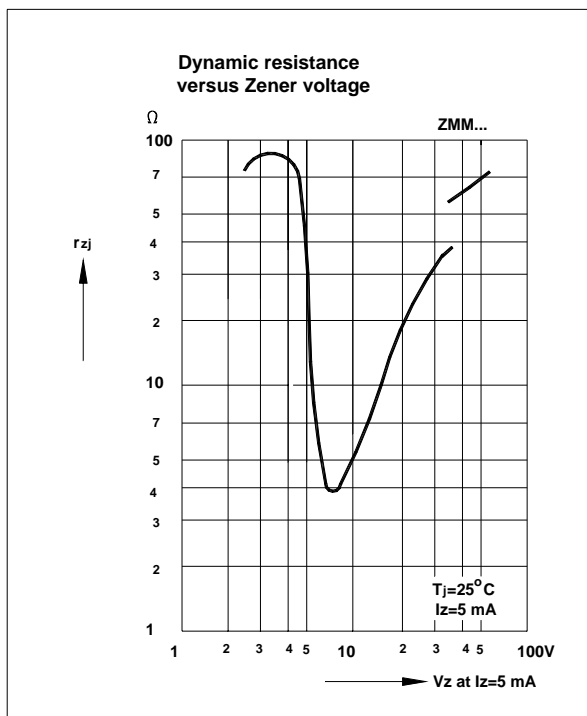
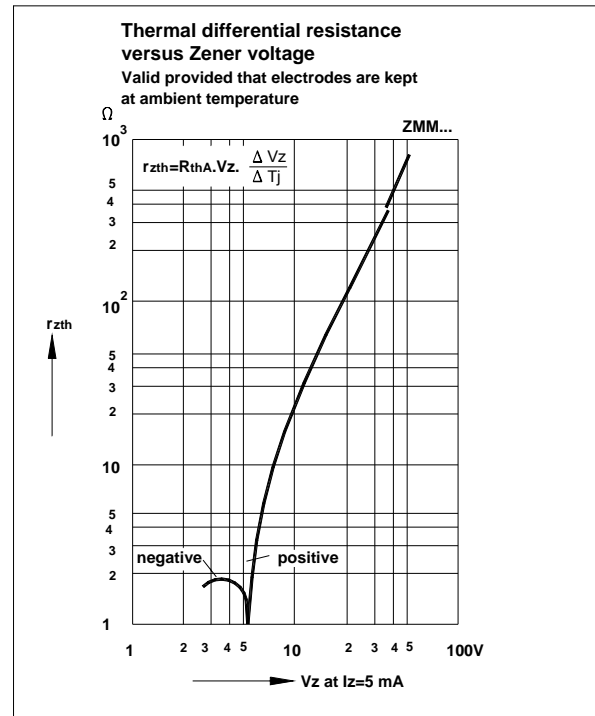
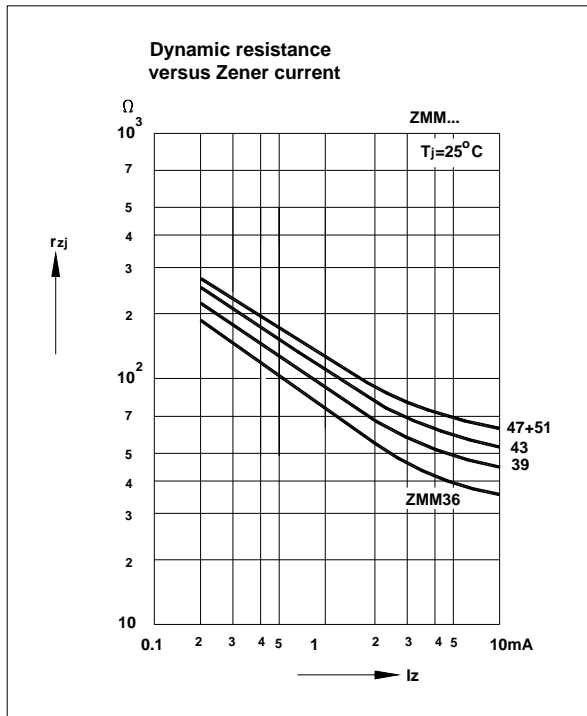
**Admissible power dissipation versus ambient temperature**  
 Valid provided that electrodes are kept at ambient temperature.



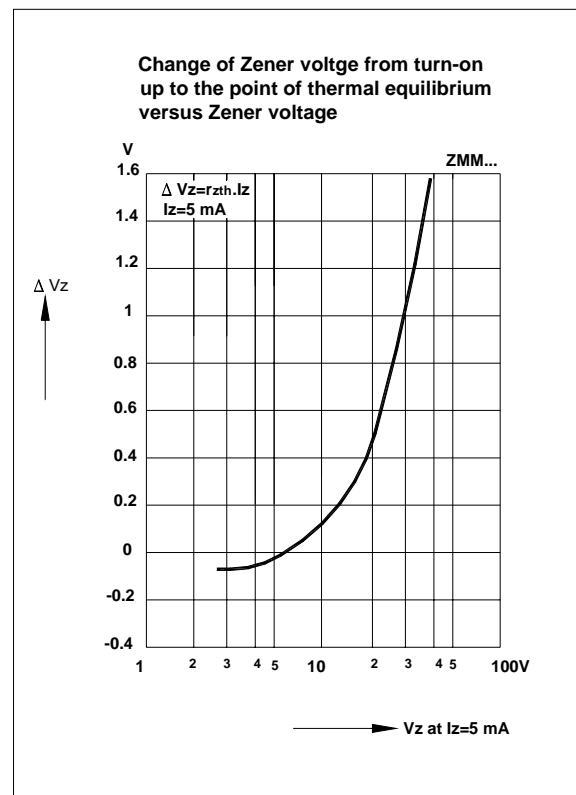
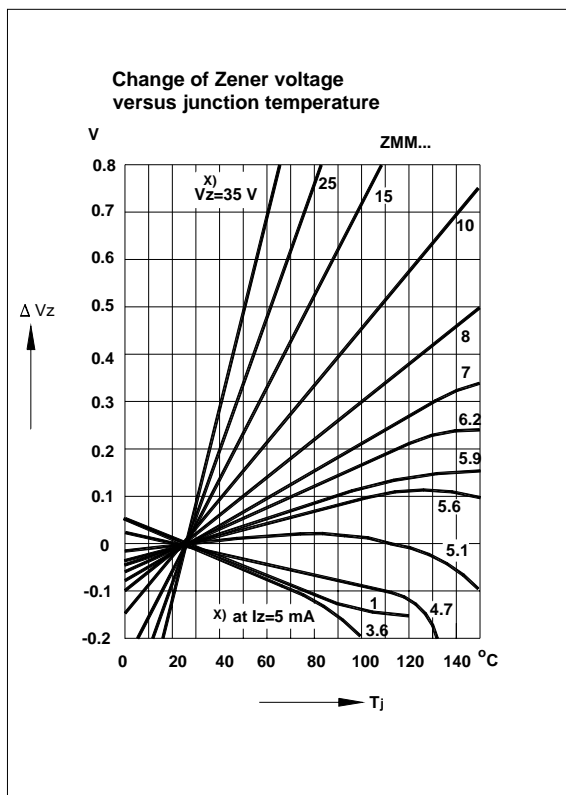
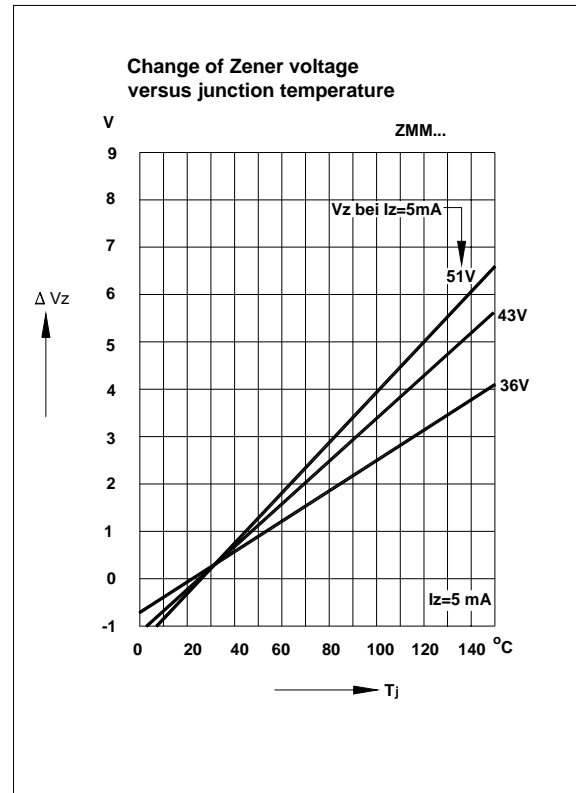
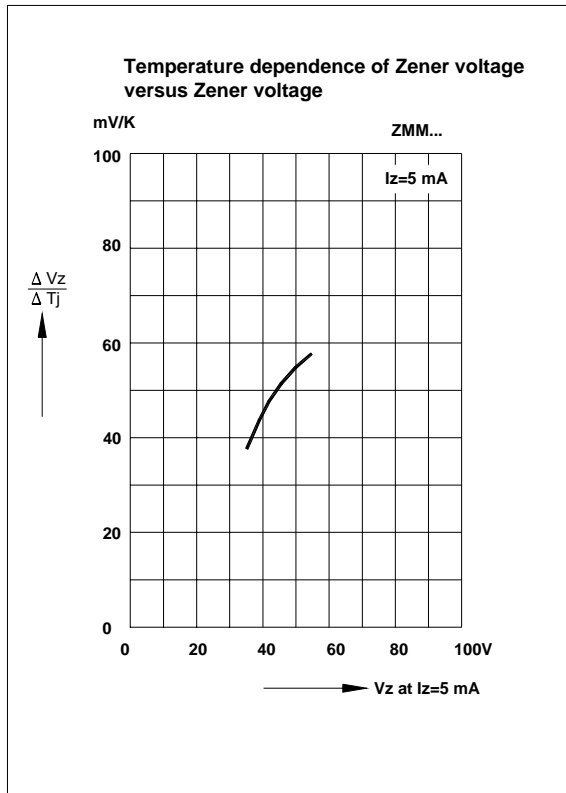
# ZMM1V0 THRU ZMM75



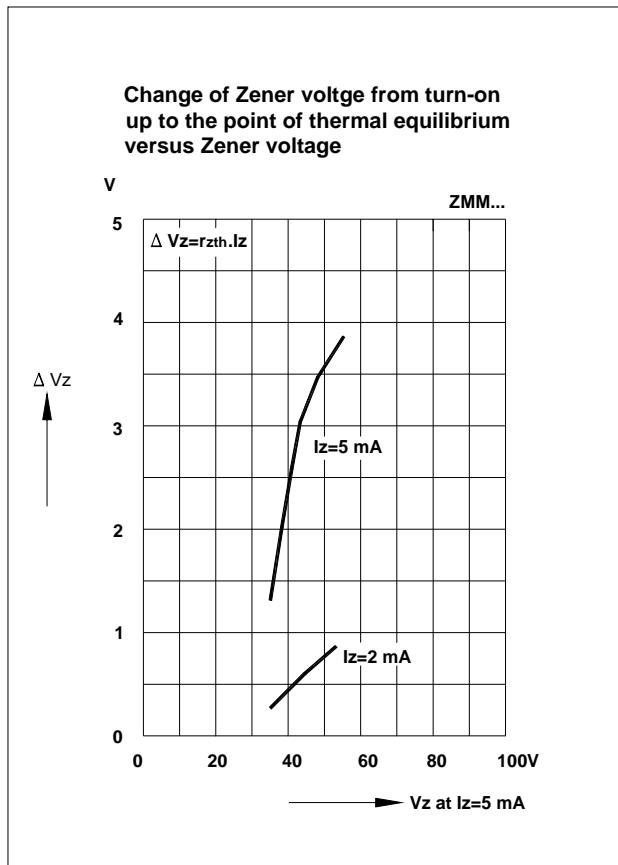
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