

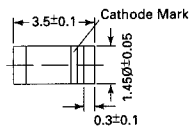
ZMM 1 ... ZMM 200

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 on request.

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

These diodes are delivered taped.
Details see "Taping".



Glass case MiniMELF

Weight approx. 0.05g
Dimensions in mm

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

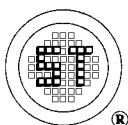
| | Symbol | Value | Unit |
|---------------------------------------------------|-----------|-------------------|------------------|
| Zener Current see Table "Characteristics" | | | |
| Power Dissipation at $T_{amb} = 25^\circ\text{C}$ | P_{tot} | 500 ¹⁾ | mW |
| Junction Temperature | T_j | 175 | $^\circ\text{C}$ |
| Storage Temperature Range | T_s | -55 to + 175 | $^\circ\text{C}$ |

¹⁾ Valid provided that electrodes are kept at ambient temperature.

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

| | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------------------------------|-----------|------|------|-------------------|------|
| Thermal Resistance Junction to Ambient Air | R_{thA} | - | - | 0.3 ¹⁾ | K/mW |

¹⁾ Valid provided that electrodes are kept at ambient temperature.



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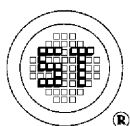
ZMM 1 ... ZMM 200

| Type | Zener Voltage range ¹⁾ | | | Dynamic resistance | | | Reverse leakage current | | | Temp. coefficient of Zener Voltage |
|--------------------|-----------------------------------|---------------------------------------------------|---------------|--------------------|------------------------------------|------|--------------------------------------------|------|----------------------------------|------------------------------------|
| | V _{Znom} V | I _{ZT} for V _{ZT} ²⁾ | | r _{zT} | r _{zK} at I _{ZK} | | T _a =25°C T _a =125°C | | I _R at V _R | TK _{VZ} |
| | | mA | V | Ω | Ω | mA | μA | μA | V | %/K |
| ZMM1 ³⁾ | 0.75 | 5 | 0.7 ... 0.8 | <8 | <50 | 1 | -- | -- | -- | -0.26 ... -0.23 |
| ZMM2.0 | 2.0 | 5 | 1.9 ... 2.1 | <85 | <600 | 1 | <100 | <200 | 1 | -0.09 ... -0.06 |
| ZMM2.2 | 2.2 | 5 | 2.08 ... 2.33 | <85 | <600 | 1 | <75 | <160 | 1 | -0.09 ... -0.06 |
| ZMM2.4 | 2.4 | 5 | 2.28 ... 2.56 | <85 | <600 | 1 | <50 | <100 | 1 | -0.09 ... -0.06 |
| ZMM2.7 | 2.7 | 5 | 2.5 ... 2.9 | <85 | <600 | 1 | <10 | <50 | 1 | -0.09 ... -0.06 |
| ZMM3.0 | 3.0 | 5 | 2.8 ... 3.2 | <85 | <600 | 1 | <4 | <40 | 1 | -0.08 ... -0.05 |
| ZMM3.3 | 3.3 | 5 | 3.1 ... 3.5 | <85 | <600 | 1 | <2 | <40 | 1 | -0.08 ... -0.05 |
| ZMM3.6 | 3.6 | 5 | 3.4 ... 3.8 | <85 | <600 | 1 | <2 | <40 | 1 | -0.08 ... -0.05 |
| ZMM3.9 | 3.9 | 5 | 3.7 ... 4.1 | <85 | <600 | 1 | <2 | <40 | 1 | -0.08 ... -0.05 |
| ZMM4.3 | 4.3 | 5 | 4.0 ... 4.6 | <75 | <600 | 1 | <1 | <20 | 1 | -0.06 ... -0.03 |
| ZMM4.7 | 4.7 | 5 | 4.4 ... 5.0 | <60 | <600 | 1 | <0.5 | <10 | 1 | -0.05 ... +0.02 |
| ZMM5.1 | 5.1 | 5 | 4.8 ... 5.4 | <35 | <550 | 1 | <0.1 | <2 | 1 | -0.02 ... +0.02 |
| ZMM5.6 | 5.6 | 5 | 5.2 ... 6.0 | <25 | <450 | 1 | <0.1 | <2 | 1 | -0.05 ... +0.05 |
| ZMM6.2 | 6.2 | 5 | 5.8 ... 6.6 | <10 | <200 | 1 | <0.1 | <2 | 2 | 0.03 ... 0.06 |
| ZMM6.8 | 6.8 | 5 | 6.4 ... 7.2 | <8 | <150 | 1 | <0.1 | <2 | 3 | 0.03 ... 0.07 |
| ZMM7.5 | 7.5 | 5 | 7.0 ... 7.9 | <7 | <50 | 1 | <0.1 | <2 | 5 | 0.03 ... 0.07 |
| ZMM8.2 | 8.2 | 5 | 7.7 ... 8.7 | <7 | <50 | 1 | <0.1 | <2 | 6.2 | 0.03 ... 0.08 |
| ZMM9.1 | 9.1 | 5 | 8.5 ... 9.6 | <10 | <50 | 1 | <0.1 | <2 | 6.8 | 0.03 ... 0.09 |
| ZMM10 | 10 | 5 | 9.4 ... 10.6 | <15 | <70 | 1 | <0.1 | <2 | 7.5 | 0.03 ... 0.1 |
| ZMM11 | 11 | 5 | 10.4 ... 11.6 | <20 | <70 | 1 | <0.1 | <2 | 8.2 | 0.03 ... 0.11 |
| ZMM12 | 12 | 5 | 11.4 ... 12.7 | <20 | <90 | 1 | <0.1 | <2 | 9.1 | 0.03 ... 0.11 |
| ZMM13 | 13 | 5 | 12.4 ... 14.1 | <26 | <110 | 1 | <0.1 | <2 | 10 | 0.03 ... 0.11 |
| ZMM15 | 15 | 5 | 13.8 ... 15.6 | <30 | <110 | 1 | <0.1 | <2 | 11 | 0.03 ... 0.11 |
| ZMM16 | 16 | 5 | 15.3 ... 17.1 | <40 | <170 | 1 | <0.1 | <2 | 12 | 0.03 ... 0.11 |
| ZMM18 | 18 | 5 | 16.8 ... 19.1 | <50 | <170 | 1 | <0.1 | <2 | 13 | 0.03 ... 0.11 |
| ZMM20 | 20 | 5 | 18.8 ... 21.2 | <55 | <220 | 1 | <0.1 | <2 | 15 | 0.03 ... 0.11 |
| ZMM22 | 22 | 5 | 20.8 ... 23.3 | <55 | <220 | 1 | <0.1 | <2 | 16 | 0.04 ... 0.12 |
| ZMM24 | 24 | 5 | 22.8 ... 25.6 | <80 | <220 | 1 | <0.1 | <2 | 18 | 0.04 ... 0.12 |
| ZMM27 | 27 | 5 | 25.1 ... 28.9 | <80 | <220 | 1 | <0.1 | <2 | 20 | 0.04 ... 0.12 |
| ZMM30 | 30 | 5 | 28 ... 32 | <80 | <220 | 1 | <0.1 | <2 | 22 | 0.04 ... 0.12 |
| ZMM33 | 33 | 5 | 31 ... 35 | <80 | <220 | 1 | <0.1 | <2 | 24 | 0.04 ... 0.12 |
| ZMM36 | 36 | 5 | 34 ... 38 | <80 | <220 | 1 | <0.1 | <2 | 27 | 0.04 ... 0.12 |
| ZMM39 | 39 | 2.5 | 37 ... 41 | <90 | <500 | 0.5 | <0.1 | <5 | 30 | 0.04 ... 0.12 |
| ZMM43 | 43 | 2.5 | 40 ... 46 | <90 | <500 | 0.5 | <0.1 | <5 | 33 | 0.04 ... 0.12 |
| ZMM47 | 47 | 2.5 | 44 ... 50 | <110 | <600 | 0.5 | <0.1 | <5 | 36 | 0.04 ... 0.12 |
| ZMM51 | 51 | 2.5 | 48 ... 54 | <125 | <700 | 0.5 | <0.1 | <10 | 39 | 0.04 ... 0.12 |
| ZMM56 | 56 | 2.5 | 52 ... 60 | <135 | <700 | 0.5 | <0.1 | <10 | 43 | 0.04 ... 0.12 |
| ZMM62 | 62 | 2.5 | 58 ... 66 | <150 | <1000 | 0.5 | <0.1 | <10 | 47 | 0.04 ... 0.12 |
| ZMM68 | 68 | 2.5 | 64 ... 72 | <200 | <1000 | 0.5 | <0.1 | <10 | 51 | 0.04 ... 0.12 |
| ZMM75 | 75 | 2.5 | 70 ... 79 | <250 | <1000 | 0.5 | <0.1 | <10 | 56 | 0.04 ... 0.12 |
| ZMM82 | 82 | 2.5 | 77 ... 87 | <300 | <1500 | 0.25 | <0.1 | <10 | 62 | 0.05 ... 0.12 |
| ZMM91 | 91 | 1 | 85 ... 96 | <450 | <2000 | 0.1 | <0.1 | <10 | 68 | 0.05 ... 0.12 |
| ZMM100 | 100 | 1 | 94 ... 106 | <450 | <5000 | 0.1 | <0.1 | <10 | 75 | 0.05 ... 0.12 |
| ZMM110 | 110 | 1 | 104 ... 116 | <600 | <5000 | 0.1 | <0.1 | <10 | 82 | 0.05 ... 0.12 |
| ZMM120 | 120 | 1 | 114 ... 127 | <800 | <5500 | 0.1 | <0.1 | <10 | 91 | 0.05 ... 0.12 |
| ZMM130 | 130 | 1 | 124 ... 141 | <950 | <6000 | 0.1 | <0.1 | <10 | 100 | 0.05 ... 0.12 |
| ZMM150 | 150 | 1 | 138 ... 156 | <1250 | <6500 | 0.1 | <0.1 | <10 | 110 | 0.05 ... 0.12 |
| ZMM160 | 160 | 1 | 153 ... 171 | <1400 | <7000 | 0.1 | <0.1 | <10 | 120 | 0.05 ... 0.12 |
| ZMM180 | 180 | 1 | 168 ... 191 | <1700 | <8500 | 0.1 | <0.1 | <10 | 130 | 0.05 ... 0.12 |
| ZMM200 | 200 | 1 | 188 ... 212 | <2000 | <10000 | 0.1 | <0.1 | <10 | 150 | 0.05 ... 0.12 |

1) Tested with pulses t_p = 20 ms.

2) Valid provided that electrodes are kept at ambient temperature.

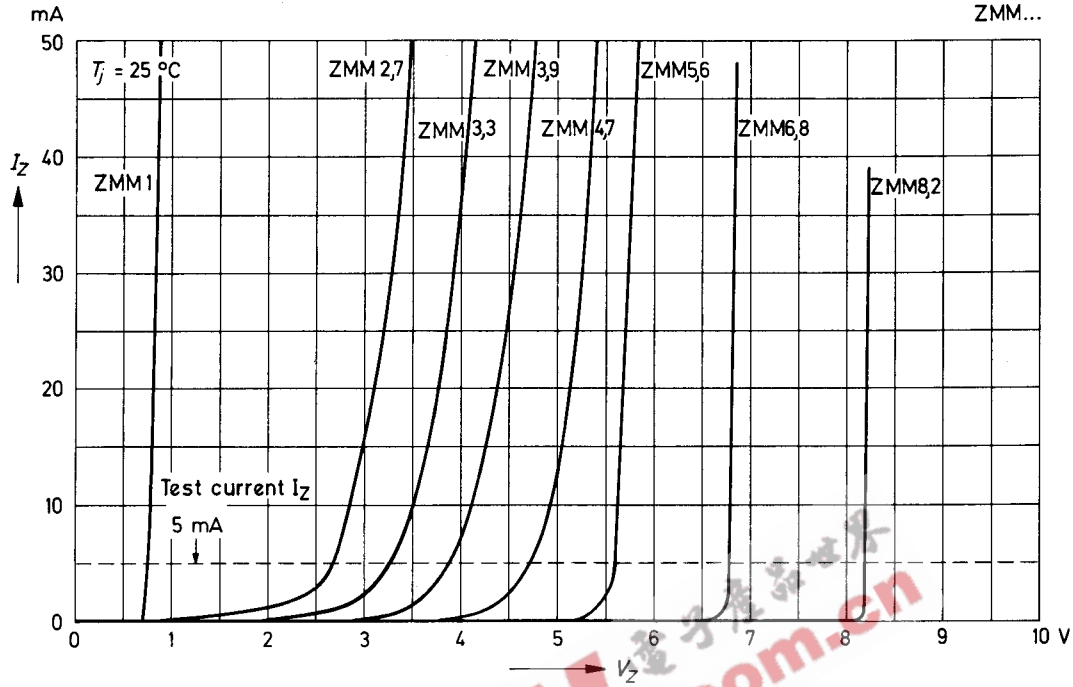
3) The ZMM1 is a silicon diode with operation in forward direction. Hence, the index of all parameters should be "F" instead of "Z". Connect the cathode electrode to the negative pole.



ZMM 1 ... ZMM 200

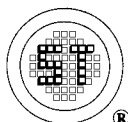
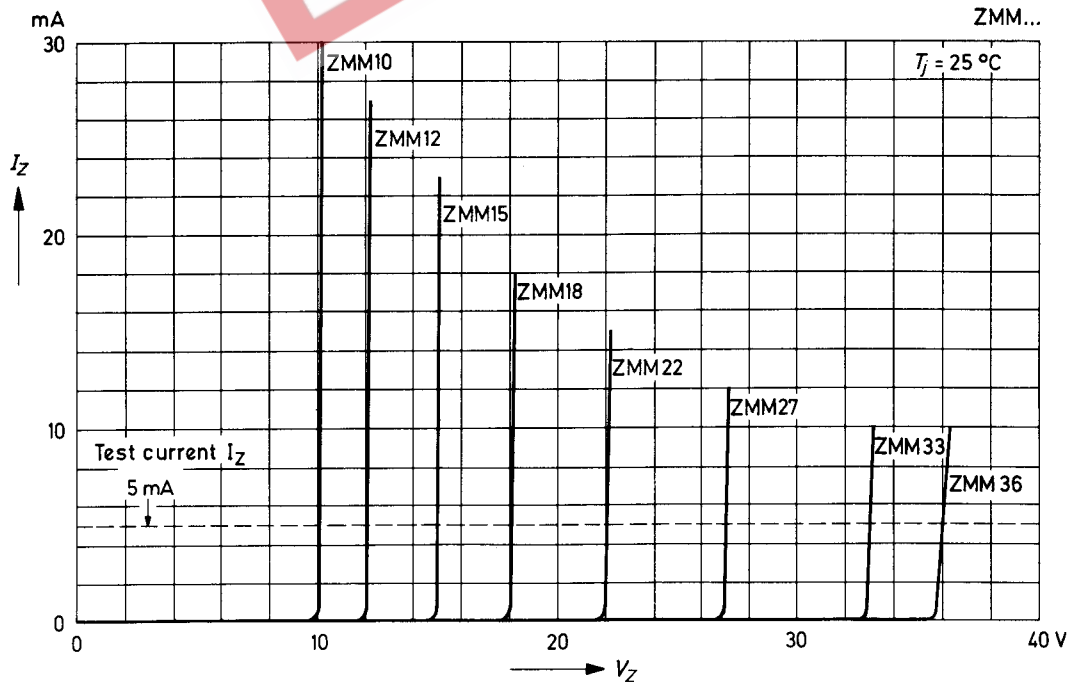
Breakdown characteristics

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



Breakdown characteristics

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



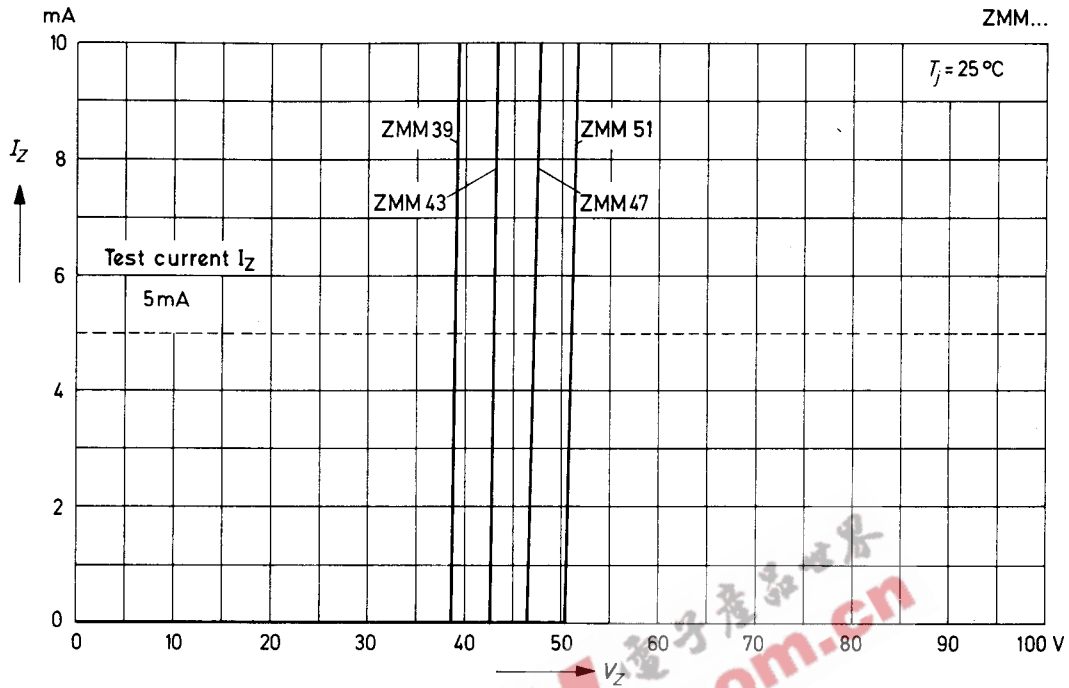
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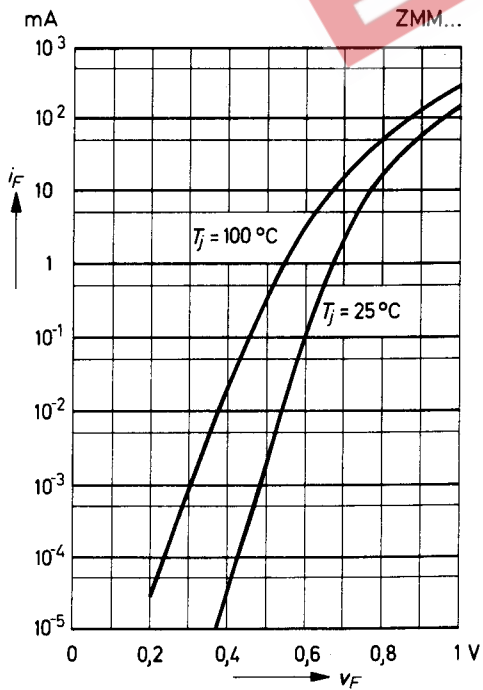
ZMM 1 ... ZMM 200

Breakdown characteristics

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

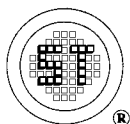
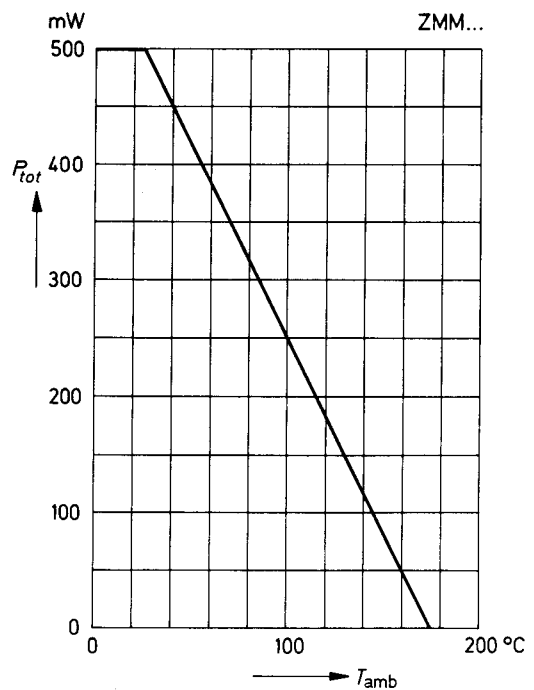


Forward characteristics



Admissible power dissipation versus ambient temperature

Valid provided that electrodes are kept at ambient temperature.

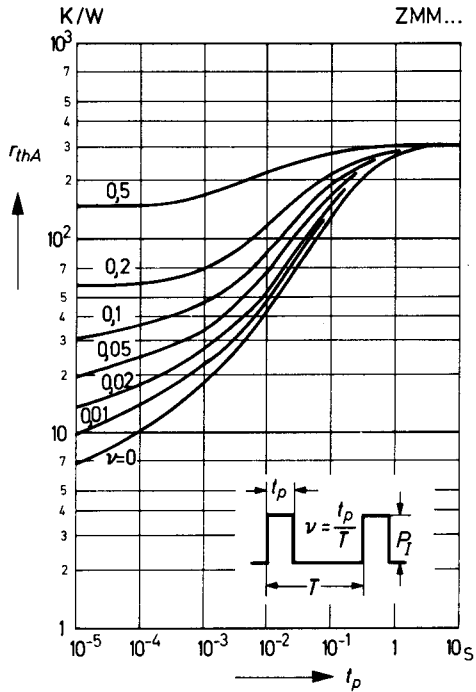


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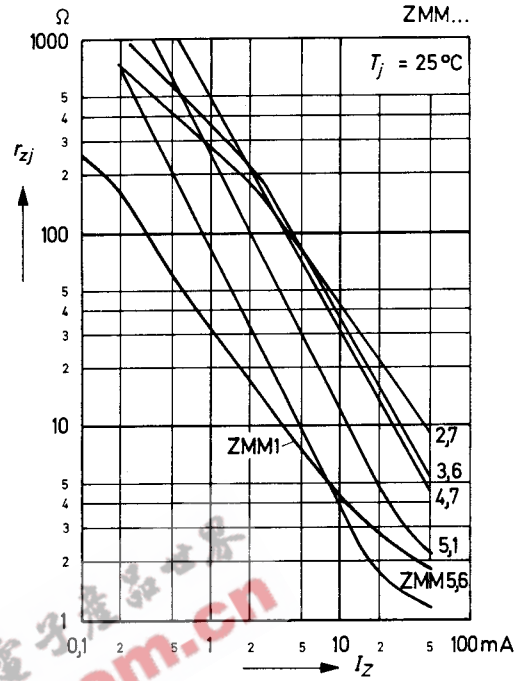


Pulse thermal resistance versus pulse duration

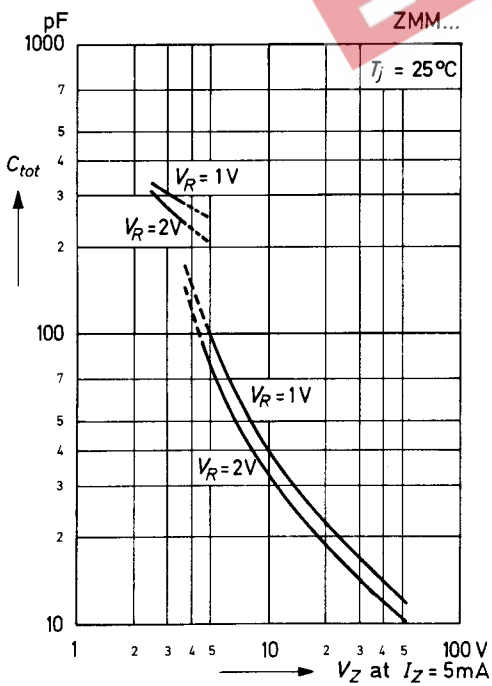
Valid provided that the electrodes are kept at ambient temperature.



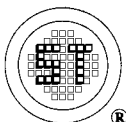
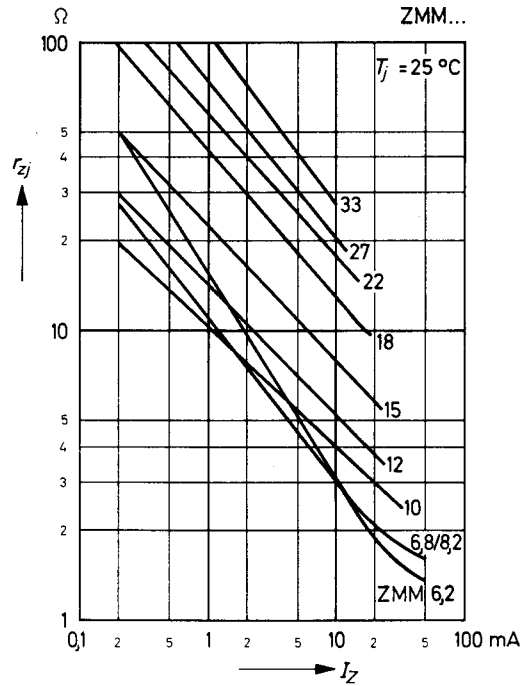
Dynamic resistance versus Zener current



Capacitance versus Zener voltage



Dynamic resistance versus Zener current

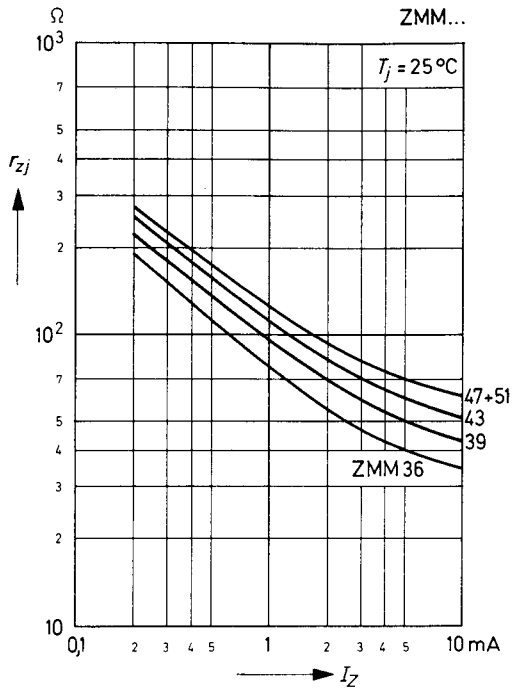


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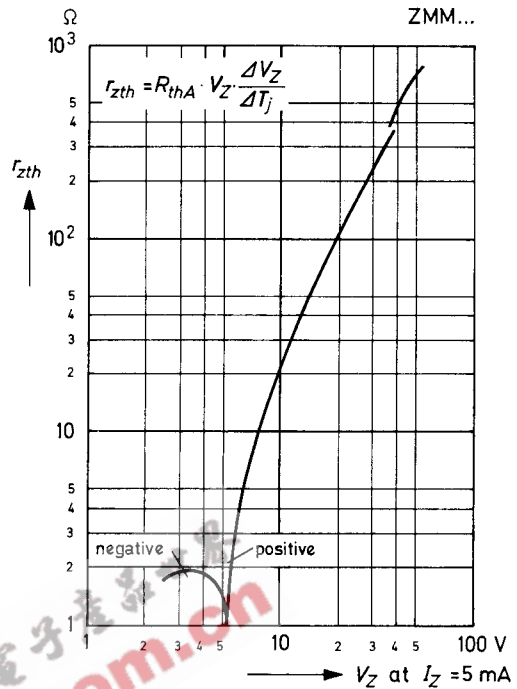


Dynamic resistance versus Zener current

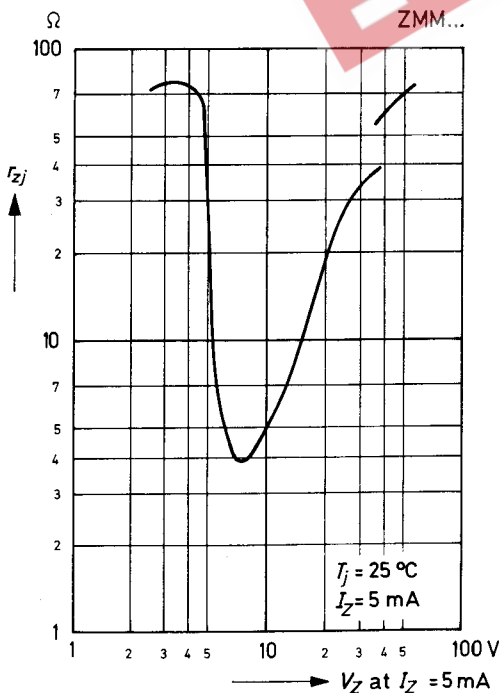


Thermal differential resistance versus Zener voltage

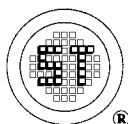
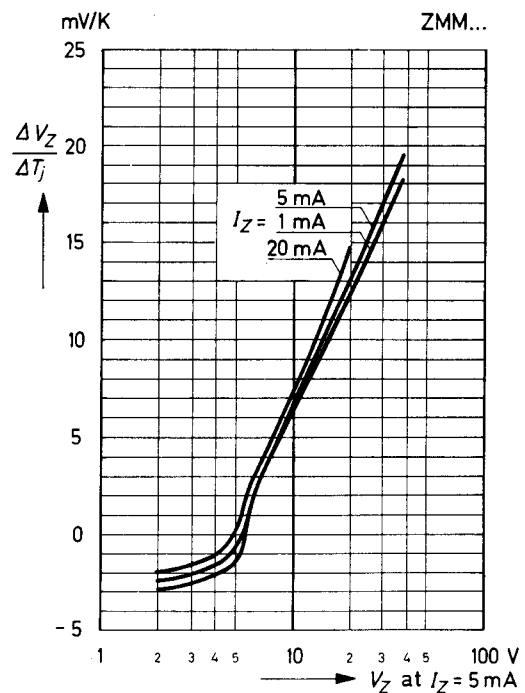
Valid provided that electrodes are kept at ambient temperature.



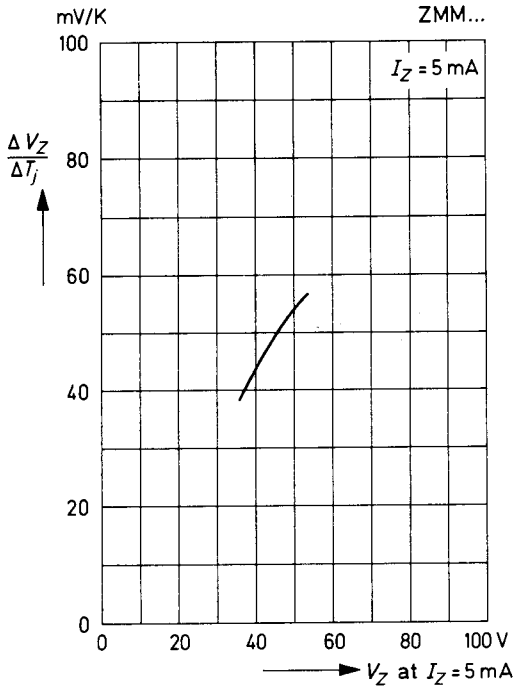
Dynamic resistance versus Zener voltage



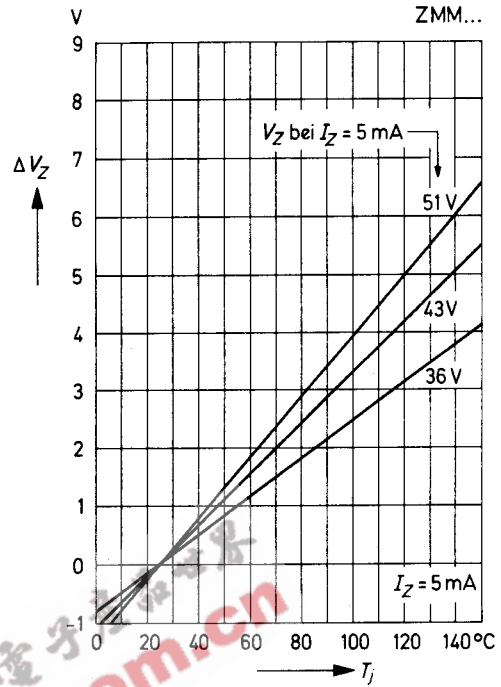
Temperature dependence of Zener voltage versus Zener voltage



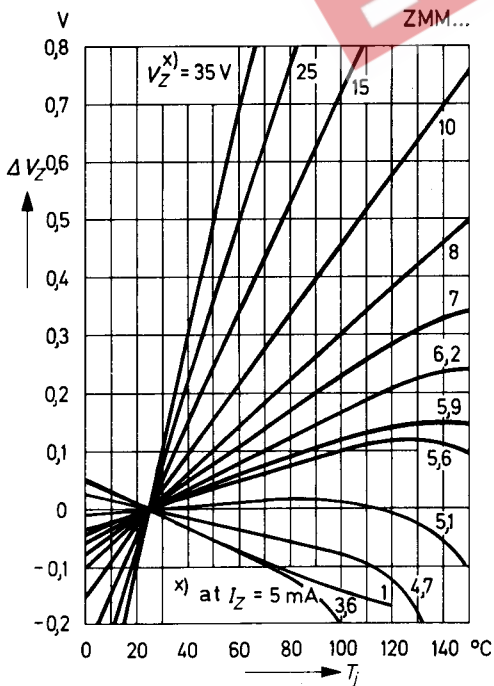
Temperature dependence of Zener voltage versus Zener voltage



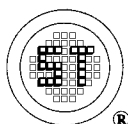
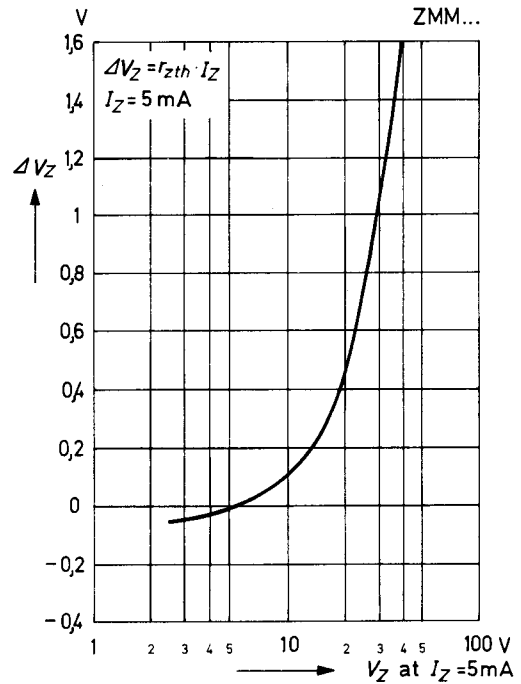
Change of Zener voltage versus junction temperature



Change of Zener voltage versus junction temperature

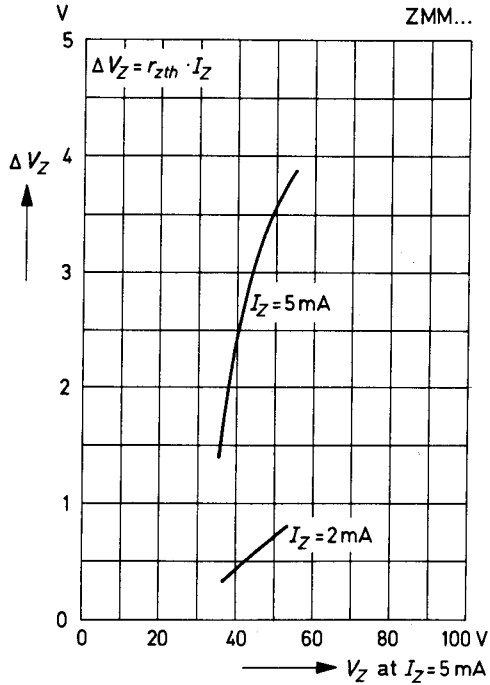


Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage

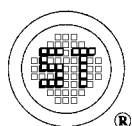


ZMM 1 ... ZMM 200

Change of Zener voltage from turn-on up to the point of thermal equilibrium versus Zener voltage



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