

Features

Silicon Planar Zener Diodes

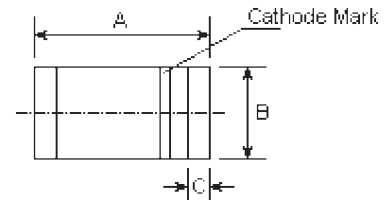
in MiniMELF case especially for automatic insertion. The Zener voltages are graded according to the international E 24 standard. Smaller voltage tolerances and higher Zener voltages on request.

These diodes are also available in DO-35 case with the type designation ZPD1 thru ZPD51.

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

Weight approx. : 0.05g

MiniMELF



DIMENSIONS					
DIM	inches		mm		Note
	Min.	Max.	Min.	Max.	
A	0.134	0.142	3.4	3.6	
B	0.055	0.059	1.40	1.50	φ
C	0.008	0.016	0.2	0.4	

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

	Symbols	Values	Units
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	$^{\circ}\text{C}$

Note:

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

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

	Symbols	Min.	Typ.	Max.	Units
Thermal resistance junction to ambient Air	R_{thA}	-	-	0.3 ¹⁾	K/mW

Note:

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

Type	Zener voltage range ¹⁾			Dynamic resistance			Reverse leakage current			Temp. coefficient of Zener Voltage TK _{Vz} %/K
	V _{znom}	I _{ZT} for V _{ZT} ²⁾		r _{zT} and r _{zjk} at I _{zK}			I _R and I _R ²⁾ at V _R			
	V	mA	V	Ω	Ω	mA	μ A	μ A	V	
ZMM 1 ³⁾	0.75	5	0.7 ... 0.8	<8	<50	1	-	-	-	-0.26 ... -0.23
ZMM 2.0	2.0	5	1.9 ... 2.1	<85	<600	1	<100	<200	1	-0.09 ... -0.06
ZMM 2.4	2.4	5	2.28 ... 2.56	<85	<600	1	<50	<100	1	-0.09 ... -0.06
ZMM 2.7	2.7	5	2.5 ... 2.9	<85	<600	1	<10	<50	1	-0.09 ... -0.06
ZMM 3.0	3.0	5	2.8 ... 3.2	<85	<600	1	<4	<40	1	-0.08 ... -0.05
ZMM 3.3	3.3	5	3.1 ... 3.5	<85	<600	1	<2	<40	1	-0.08 ... -0.05
ZMM 3.6	3.6	5	3.4 ... 3.8	<85	<600	1	<2	<40	1	-0.08 ... -0.05
ZMM 3.9	3.9	5	3.7 ... 4.1	<85	<600	1	<2	<40	1	-0.08 ... -0.05
ZMM 4.3	4.3	5	4.0 ... 4.6	<75	<600	1	<1	<20	1	-0.06 ... -0.03
ZMM 4.7	4.7	5	4.4 ... 5.0	<60	<600	1	<0.5	<10	1	-0.05 ... +0.02
ZMM 5.1	5.1	5	4.8 ... 5.4	<35	<550	1	<0.1	<2	1	-0.02 ... +0.02
ZMM 5.6	5.6	5	5.2 ... 6.0	<25	<450	1	<0.1	<2	1	-0.05 ... +0.05
ZMM 6.2	6.2	5	5.8 ... 6.6	<10	<200	1	<0.1	<2	2	0.03 ... 0.06
ZMM 6.8	6.8	5	6.4 ... 7.2	<8	<150	1	<0.1	<2	3	0.03 ... 0.07
ZMM 7.5	7.5	5	7.0 ... 7.9	<7	<50	1	<0.1	<2	5	0.03 ... 0.07
ZMM 8.2	8.2	5	7.7 ... 8.7	<7	<50	1	<0.1	<2	6.2	0.03 ... 0.08
ZMM 9.1	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

Notes:

(1) Tested with pulses tp=20ms.

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

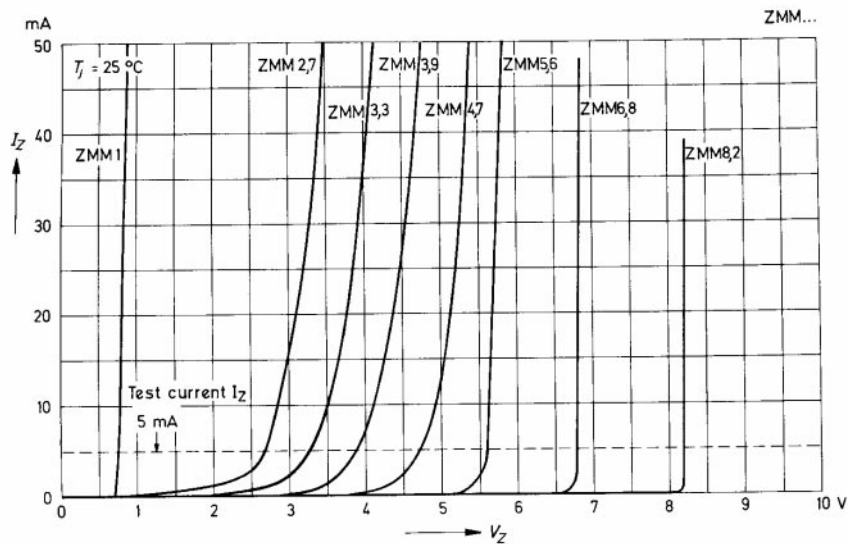
(3) The ZMM1 is a silicon diode with operation in forward direction. Hence, the index of all parameters should be "F" instead of "Z".

Connect the cathode electrode to the negative pole.

RATINGS AND CHARACTERISTIC CURVES

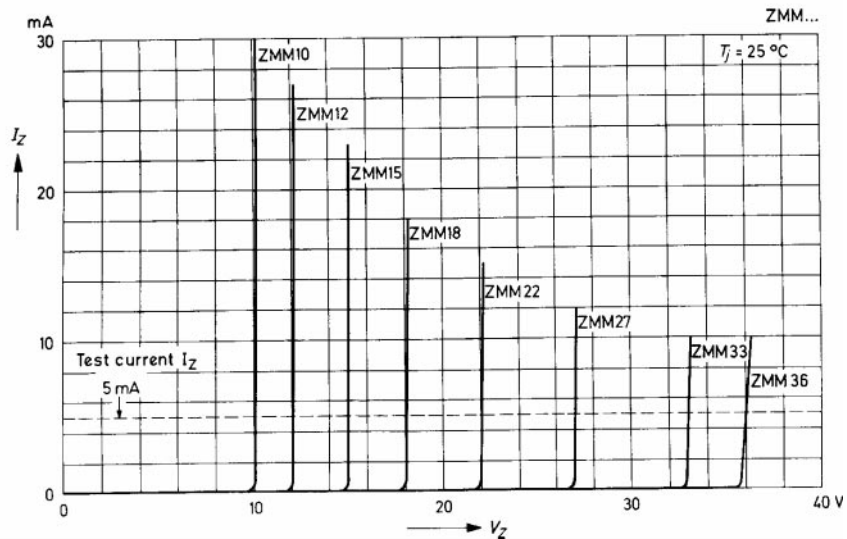
Breakdown characteristics

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



Breakdown characteristics

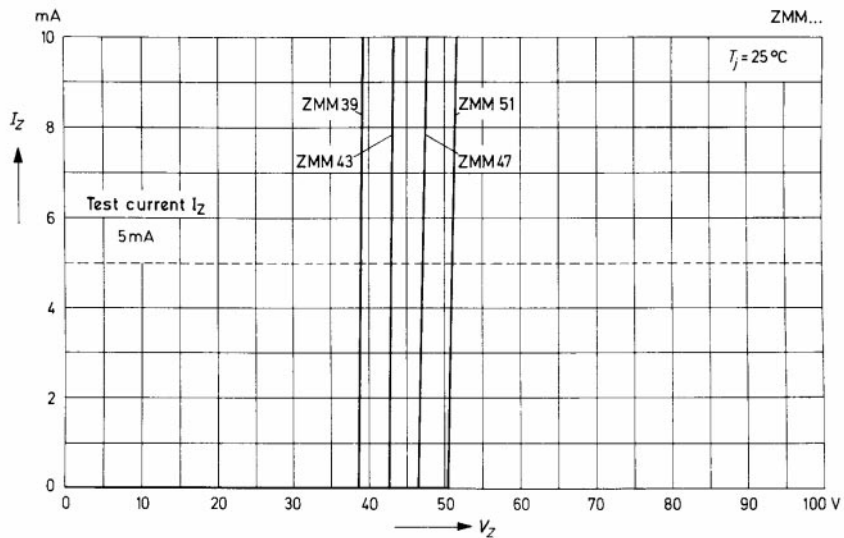
$T_j = \text{constant (pulsed)}$



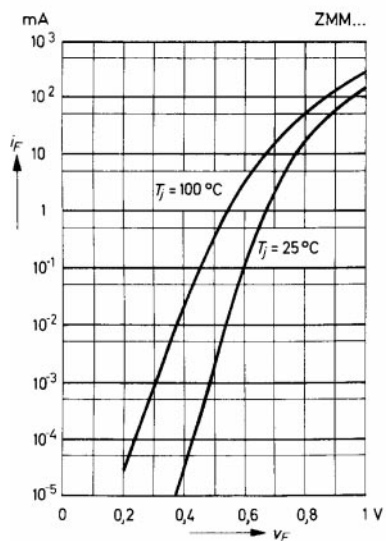
RATINGS AND CHARACTERISTIC CURVES

Breakdown characteristics

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

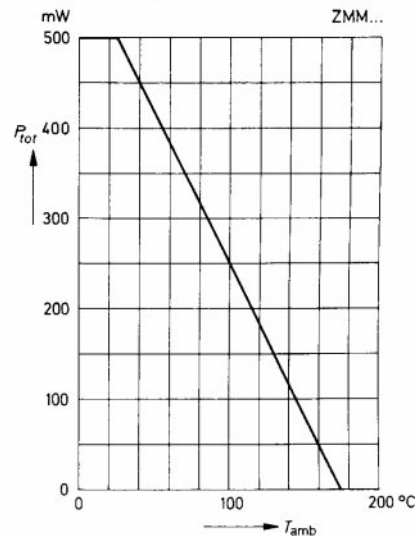


Forward characteristics



Admissible power dissipation versus ambient temperature

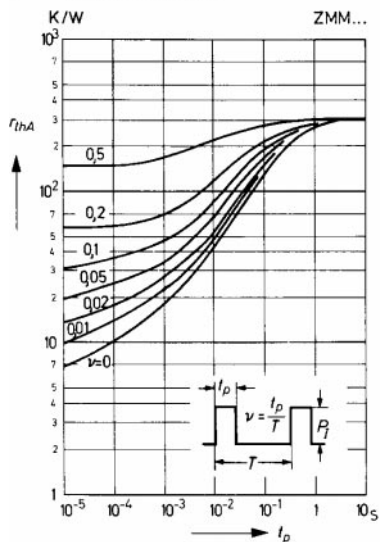
Valid provided that electrodes are kept at ambient temperature.



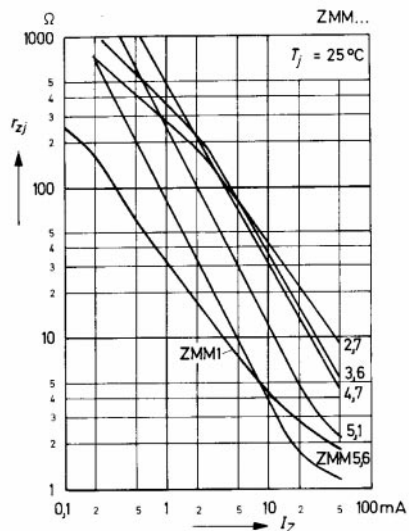
RATINGS AND CHARACTERISTIC CURVES

Pulse thermal resistance versus pulse duration

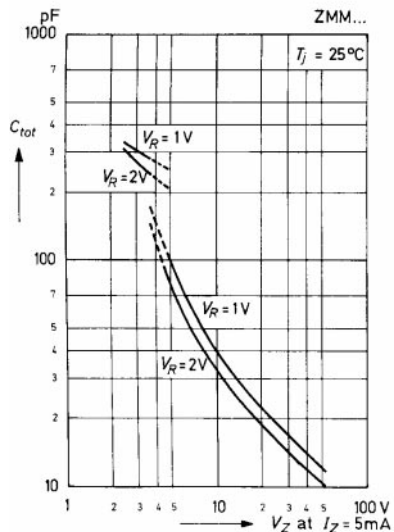
Valid provided that the electrodes are kept
at ambient temperature.



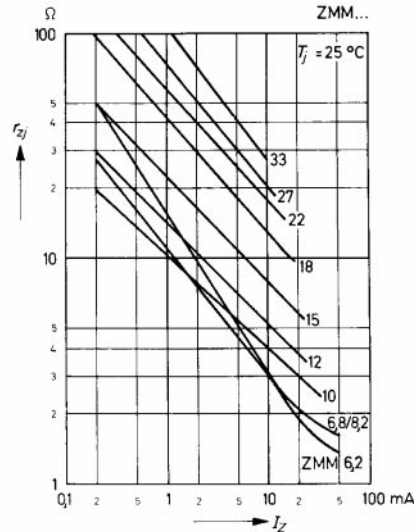
Dynamic resistance versus Zener current



Capacitance versus Zener voltage

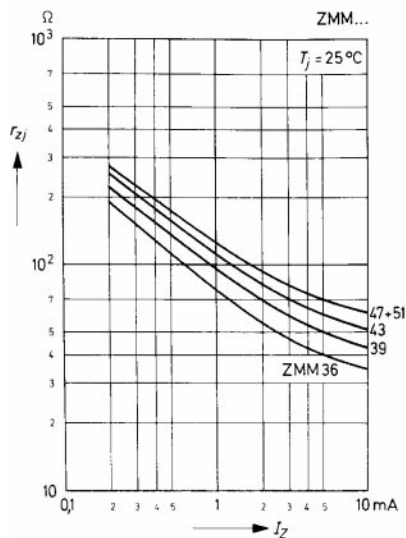


Dynamic resistance versus Zener current



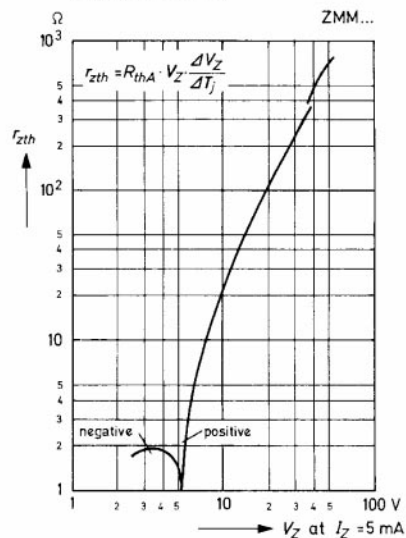
RATINGS AND CHARACTERISTIC CURVES

**Dynamic resistance
versus Zener current**

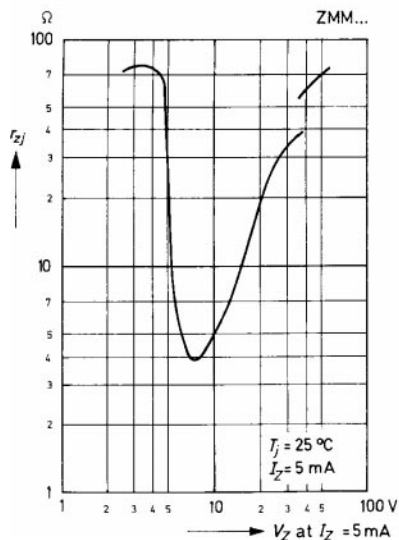


**Thermal differential resistance
versus Zener voltage**

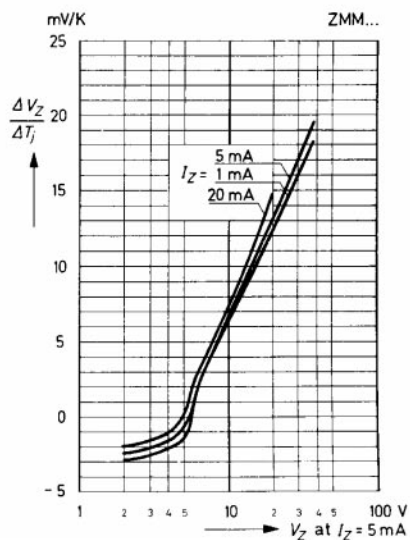
Valid provided that electrodes are kept at ambient temperature.



**Dynamic resistance
versus Zener voltage**

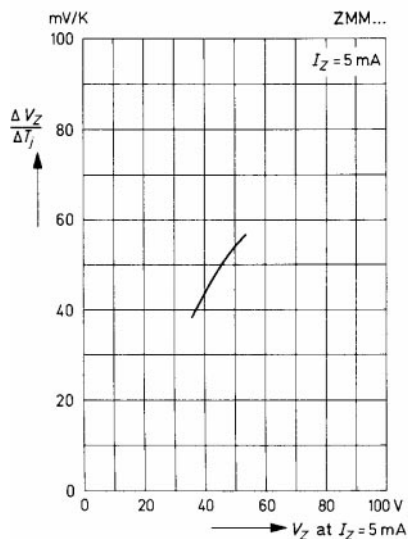


**Temperature dependence of Zener voltage
versus Zener voltage**

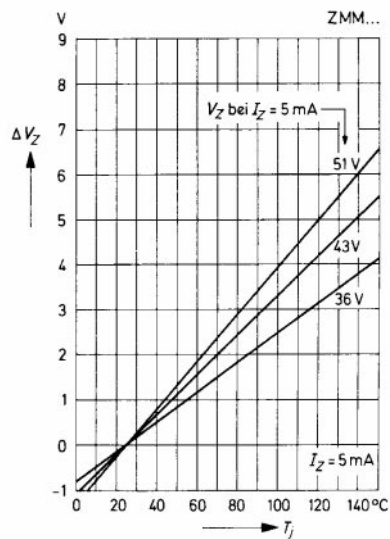


RATINGS AND CHARACTERISTIC CURVES

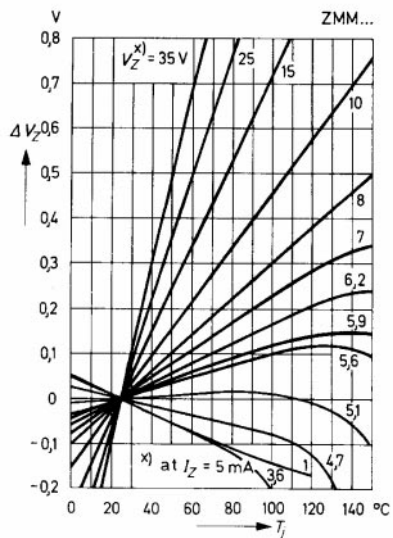
Temperature dependence of Zener voltage
versus Zener voltage



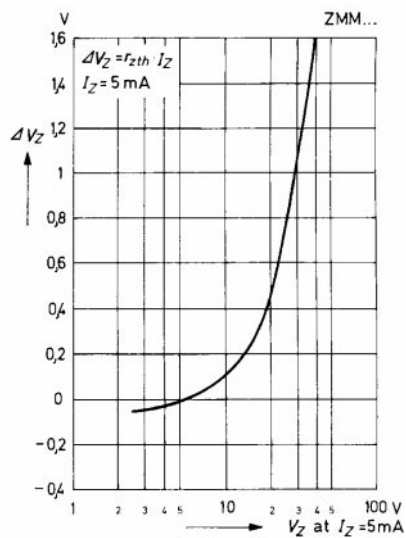
Change of Zener voltage
versus junction temperature



Change of Zener voltage
versus junction temperature



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



RATINGS AND CHARACTERISTIC CURVES

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

