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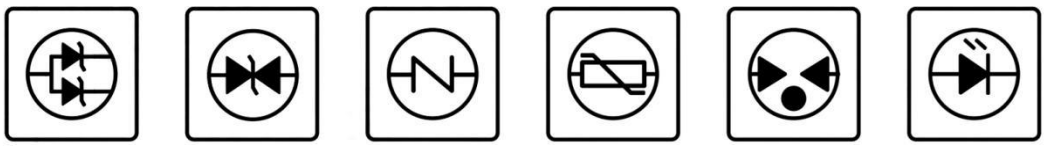
SEMICONDUCTOR



Product data sheet

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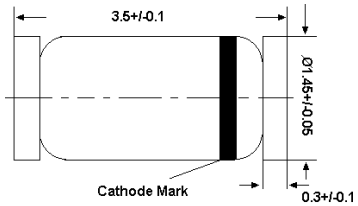
Silicon Epitaxial Planar Zener Diodes

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.



Glass case MiniMELF
Dimensions in mm

LL-34

REEL SPECIFICATION

P/N	PKG	QTY
ZMM2V0-MS THRU ZMM75-MS	LL34	2500

Absolute Maximum Ratings (T_a = 25 °C)

Parameter	Symbol	Value	Unit
Power Dissipation	P_{tot}	500 [1]	mW
Junction Temperature	T_j	175	°C
Storage Temperature Range	T_{stg}	- 55 to + 175	°C
[1] Valid provided that electrodes are kept at ambient temperature			

Characteristics at T_a = 25 °C

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Ambient Air	R_{thA}	0.3 [1]	K/mW
Forward Voltage at I_F = 100 mA	V_F	1	V
[1] Valid provided that electrodes are kept at ambient temperature			

Characteristics at T_a = 25 °C

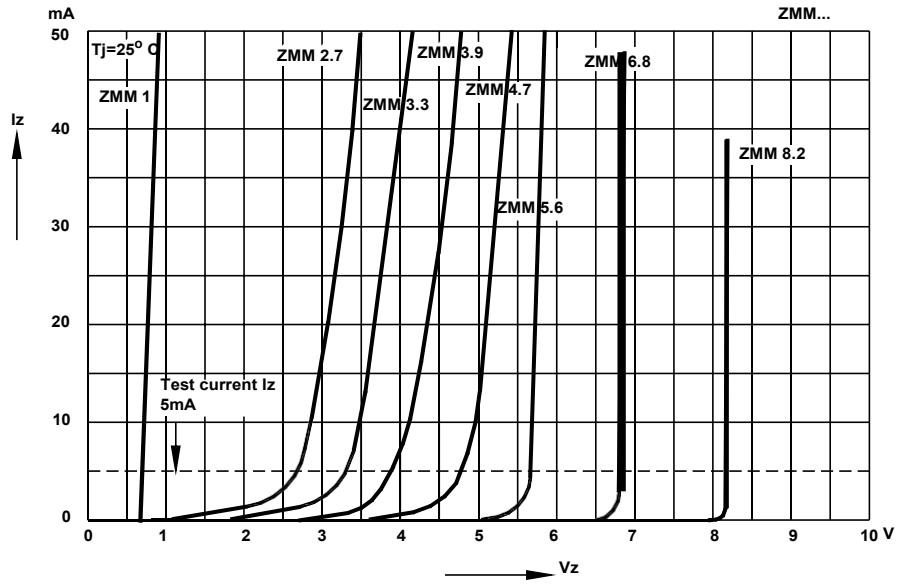
P/N	Zener Voltage Range [1]			Dynamic Resistance			Reverse Leakage Current			Temp. Coefficient of Zener Voltage
	V_{Znom}	V_{ZT}	at I_{ZT}	Z_{ZT}	Z_{ZK}	at I_{ZK}	T_a = 25 °C	T_a = 125 °C	at V_R	
	(V)	(V)	(mA)	Max. (Ω)	Max. (Ω)	(mA)	Max. (μA)	Max. (μA)	(V)	TKvz (%/K)
ZMM2V0-MS	2.0	1.8...2.15	5	85	600	1	100	200	1	-0.09...-0.06
ZMM2V2-MS	2.2	2.08...2.33	5	85	600	1	75	160	1	-0.09...-0.06
ZMM2V4-MS	2.4	2.28...2.56	5	85	600	1	50	100	1	-0.09...-0.06
ZMM2V7-MS	2.7	2.5...2.9	5	85	600	1	10	50	1	-0.09...-0.06
ZMM3V0-MS	3.0	2.8...3.2	5	85	600	1	4	40	1	-0.08...-0.05
ZMM3V3-MS	3.3	3.1...3.5	5	85	600	1	2	40	1	-0.08...-0.05
ZMM3V6-MS	3.6	3.4...3.8	5	85	600	1	2	40	1	-0.08...-0.05
ZMM3V9-MS	3.9	3.7...4.1	5	85	600	1	2	40	1	-0.08...-0.05
ZMM4V3-MS	4.3	4...4.6	5	75	600	1	1	20	1	-0.06...-0.03
ZMM4V7-MS	4.7	4.4...5	5	60	600	1	0.5	10	1	-0.05...+0.02
ZMM5V1-MS	5.1	4.8...5.4	5	35	550	1	0.1	2	1	-0.02...+0.02
ZMM5V6-MS	5.6	5.2...6	5	25	450	1	0.1	2	1	-0.05...+0.05
ZMM6V2-MS	6.2	5.8...6.6	5	10	200	1	0.1	2	2	0.03...0.06
ZMM6V8-MS	6.8	6.4...7.2	5	8	150	1	0.1	2	3	0.03...0.07
ZMM7V5-MS	7.5	7...7.9	5	7	50	1	0.1	2	5	0.03...0.07
ZMM8V2-MS	8.2	7.7...8.7	5	7	50	1	0.1	2	6.2	0.03...0.08
ZMM9V1-MS	9.1	8.5...9.6	5	10	50	1	0.1	2	6.8	0.03...0.09
ZMM10-MS	10	9.4...10.6	5	15	70	1	0.1	2	7.5	0.03...0.1
ZMM11-MS	11	10.4...11.6	5	20	70	1	0.1	2	8.2	0.03...0.11
ZMM12-MS	12	11.4...12.7	5	20	90	1	0.1	2	9.1	0.03...0.11
ZMM13-MS	13	12.4...14.1	5	26	110	1	0.1	2	10	0.03...0.11
ZMM15-MS	15	13.8...15.6	5	30	110	1	0.1	2	11	0.03...0.11
ZMM16-MS	16	15.3...17.1	5	40	170	1	0.1	2	12	0.03...0.11
ZMM18-MS	18	16.8...19.1	5	50	170	1	0.1	2	13	0.03...0.11
ZMM20-MS	20	18.8...21.2	5	55	220	1	0.1	2	15	0.03...0.11
ZMM22-MS	22	20.8...23.3	5	55	220	1	0.1	2	16	0.04...0.12
ZMM24-MS	24	22.8...25.6	5	80	220	1	0.1	2	18	0.04...0.12
ZMM27-MS	27	25.1...28.9	5	80	220	1	0.1	2	20	0.04...0.12
ZMM30-MS	30	28...32	5	80	220	1	0.1	2	22	0.04...0.12
ZMM33-MS	33	31...35	5	80	220	1	0.1	2	24	0.04...0.12
ZMM36-MS	36	34...38	5	80	220	1	0.1	2	27	0.04...0.12
ZMM39-MS	39	37...41	2.5	90	500	0.5	0.1	5	30	0.04...0.12
ZMM43-MS	43	40...46	2.5	90	500	0.5	0.1	5	33	0.04...0.12
ZMM47-MS	47	44...50	2.5	110	600	0.5	0.1	5	36	0.04...0.12
ZMM51-MS	51	48...54	2.5	125	700	0.5	0.1	10	39	0.04...0.12
ZMM56-MS	56	52...60	2.5	135	700	0.5	0.1	10	43	0.04...0.12
ZMM62-MS	62	58...66	2.5	150	1000	0.5	0.1	10	47	0.04...0.12
ZMM68-MS	68	64...72	2.5	200	1000	0.5	0.1	10	51	0.04...0.12
ZMM75-MS	75	70...79	2.5	250	1000	0.5	0.1	10	56	0.04...0.12

[1] Tested with pulses t_p = 20 ms.

[2] 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.

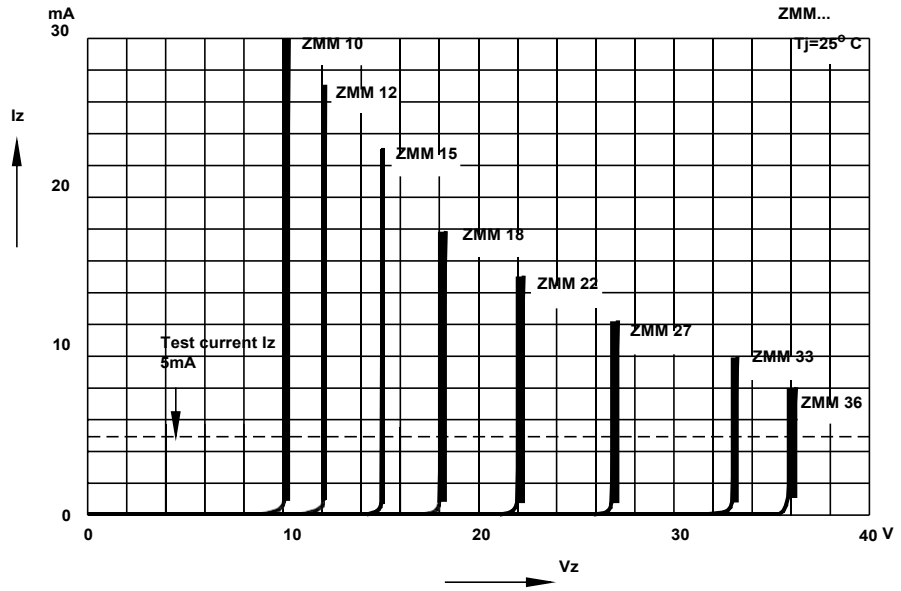
Breakdown characteristics

T_j = constant (pulsed)

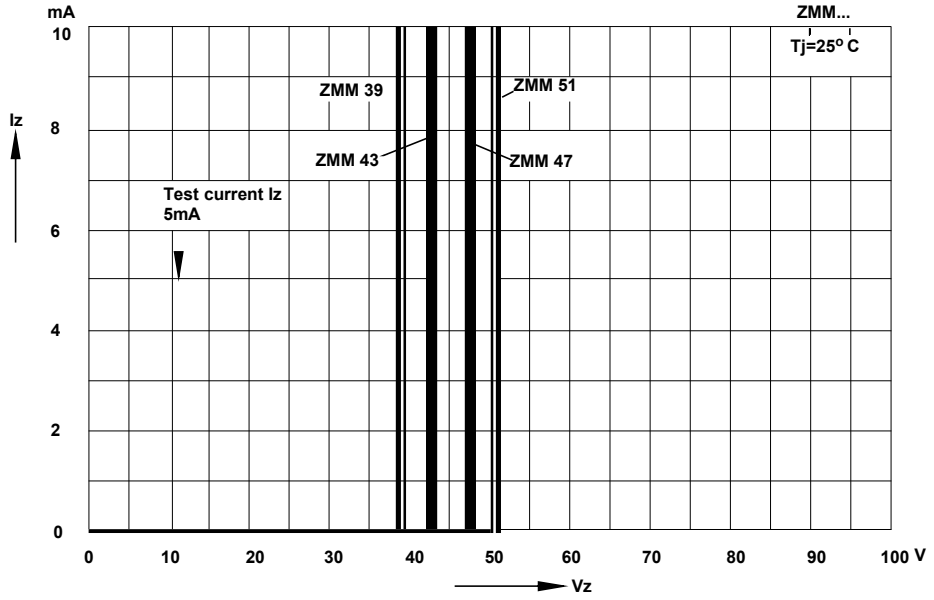


Breakdown characteristics

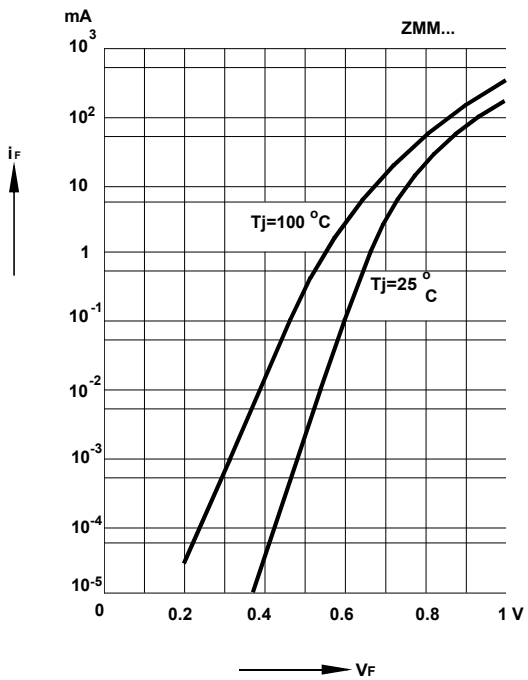
T_j = constant (pulsed)



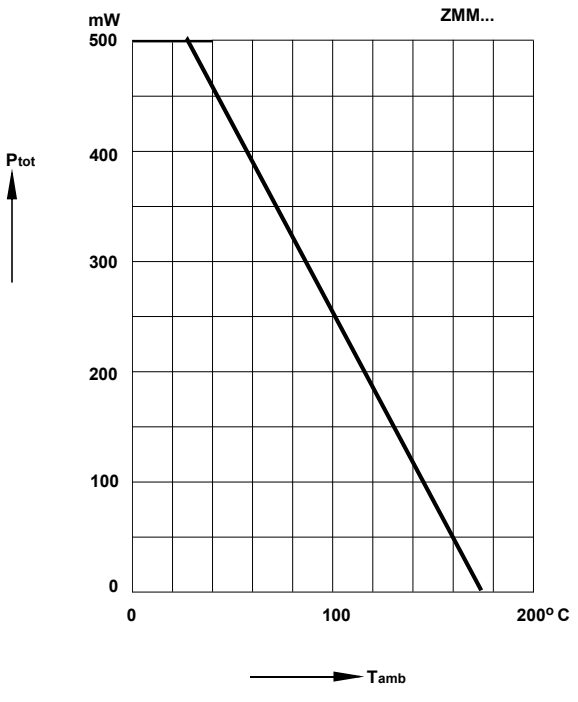
Breakdown characteristics
T_j = constant (pulsed)



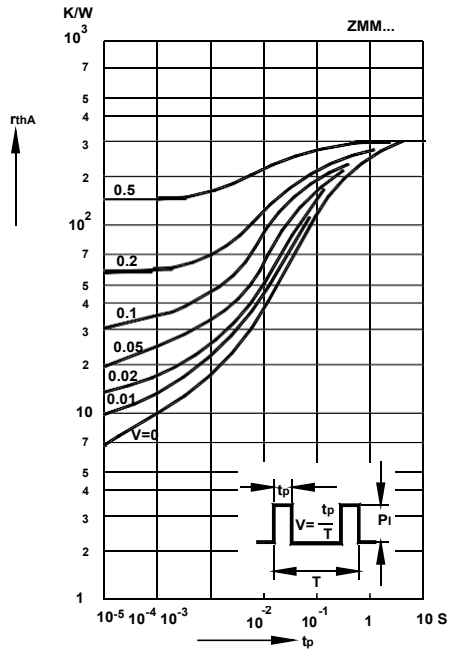
Forward characteristics



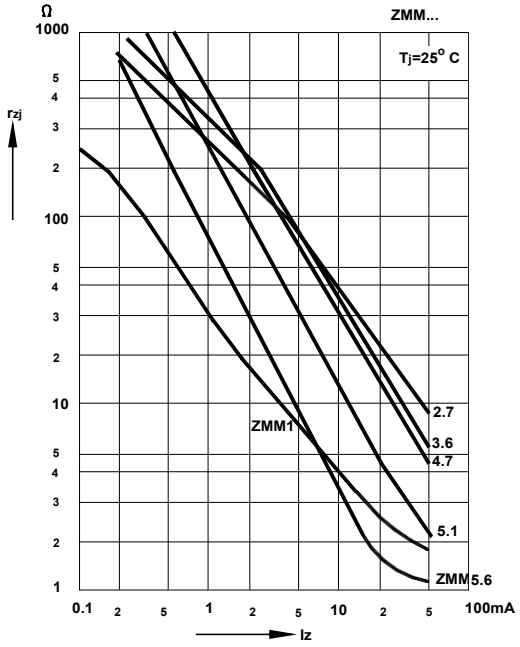
Admissible power dissipation versus ambient temperature
Valid provided that electrodes are kept at ambient temperature.



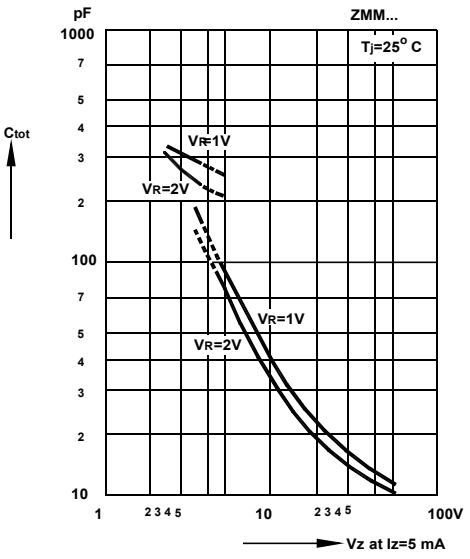
Pulse thermal resistance versus pulse duration
Valid provided that the electrodes are kept at ambient temperature.



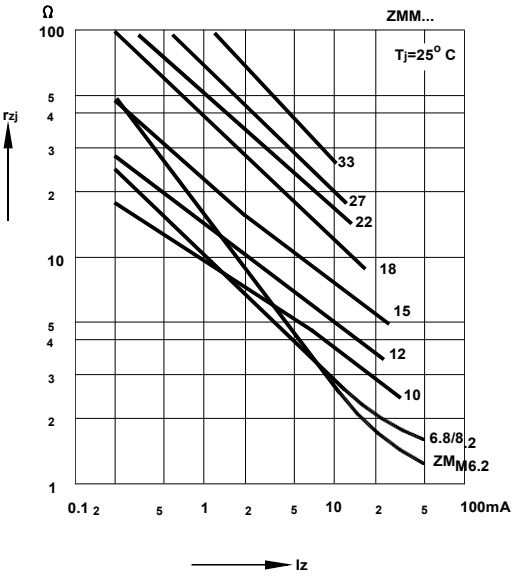
Dynamic resistance versus Zener current



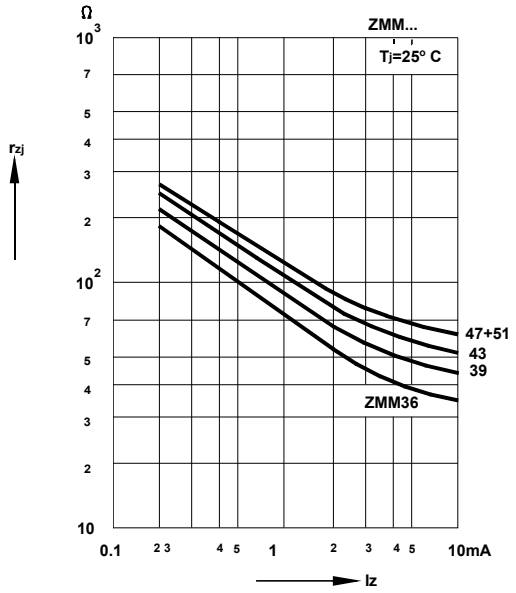
Capacitance versus Zener voltage



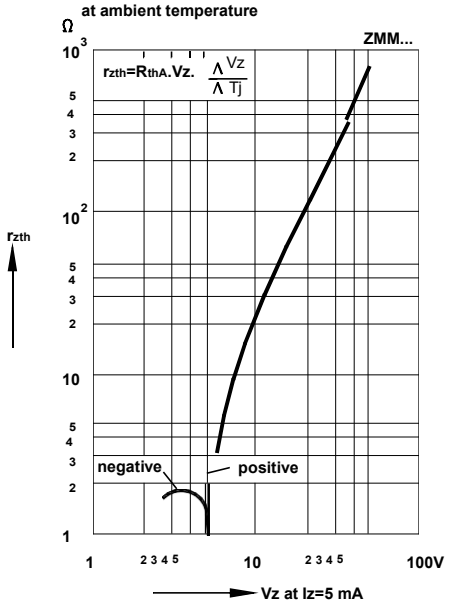
Dynamic resistance versus Zener current



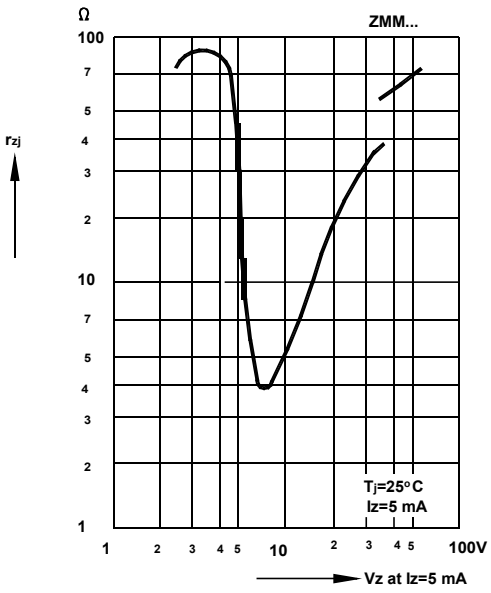
Dynamic resistance versus Zener current



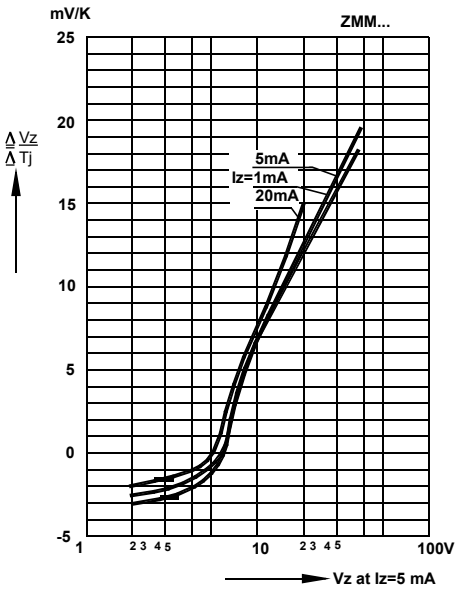
Thermal differential resistance versus Zener voltage
Valid provided that electrodes are kept at ambient temperature



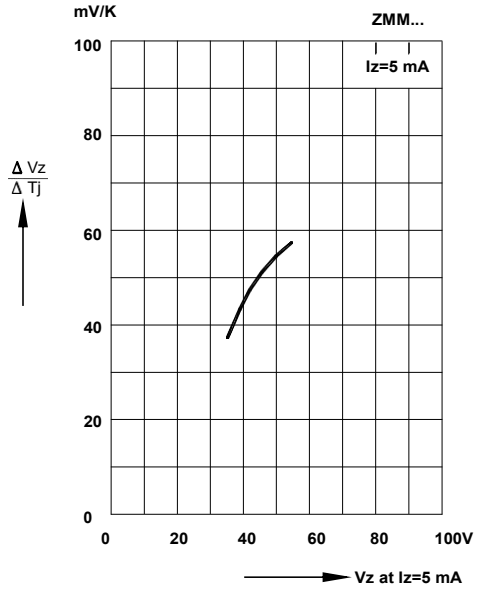
Dynamic resistance versus Zener voltage



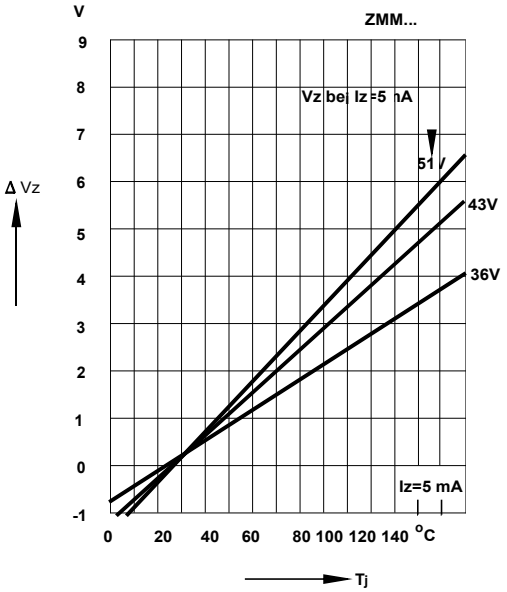
Temperature dependence of Zener voltage versus Zener voltage



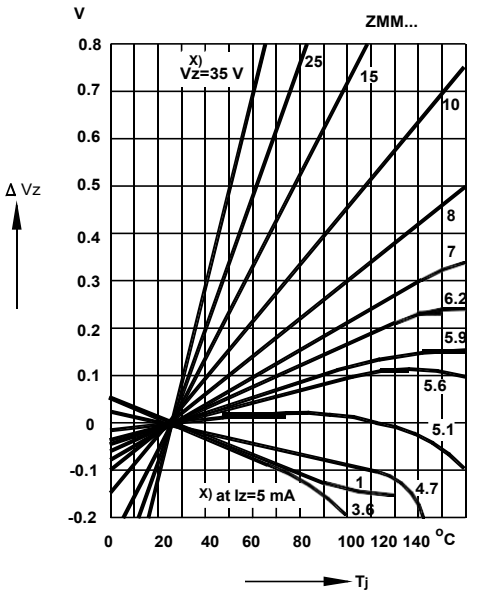
Temperature dependence of Zener voltage versus Zener voltage



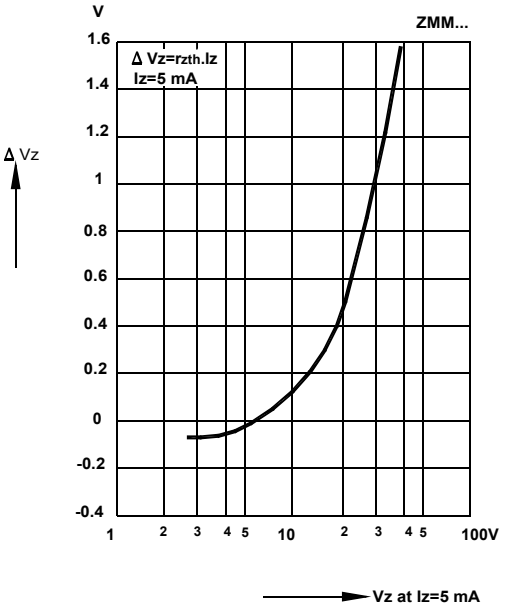
Change of Zener voltage versus junction temperature

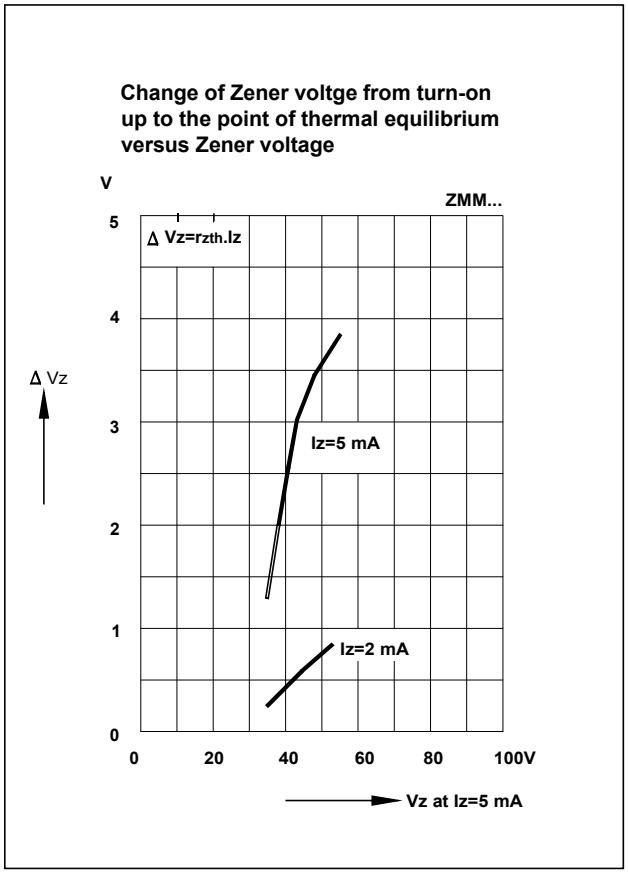


Change of Zener voltage versus junction temperature



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




Change of Zener voltge from turn-on up to the point of thermal equilibrium versus Zener voltage
V
ZMM...
Δ Vz=rzth.Iz
Δ Vz
Iz=5 mA
Iz=2 mA
0
1
2
3
4
5
0
20
40
60
80
100V
Vz at Iz=5 mA

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