

# Kingtronics®

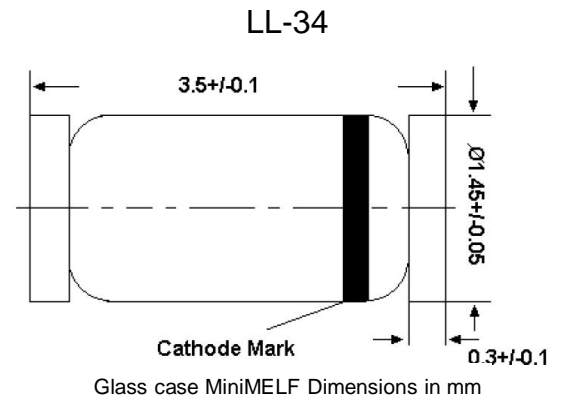
# ZMM1 THRU ZMM75

## 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.

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



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

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 $T_a = 25^\circ\text{C}$

Parameter	SYMBOL	Max.	UNIT
Thermal Resistance Junction to Ambient Air	$R_{\text{thA}}$	0.3 <sup>1)</sup>	K/mW
Forward Voltage at $I_F = 100 \text{ mA}$	$V_F$	1	V

<sup>1)</sup> Valid provided that electrodes are kept at ambient temperature

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**Kingtronics**®**ZMM1 THRU  
ZMM75****Characteristics at Ta = 25°C**

Type	Zener Voltage Range <sup>1)</sup>			Dynamic Resistance			Reverse Leakage Current			Temp.Coefficient
	VZno	VZT	at IZT	ZZT	ZZK	at IZK	Ta = 25 °C	Ta = 125 °C	at VR	
	(V)	(V)	(mA)	Max.(Ω)	Max.(Ω)	(mA)	Max. (μA)	Max. (μA)	(V)	TKvz (%/K)
ZMM1 <sub>2)</sub>	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

## Characteristics at Ta = 25°C

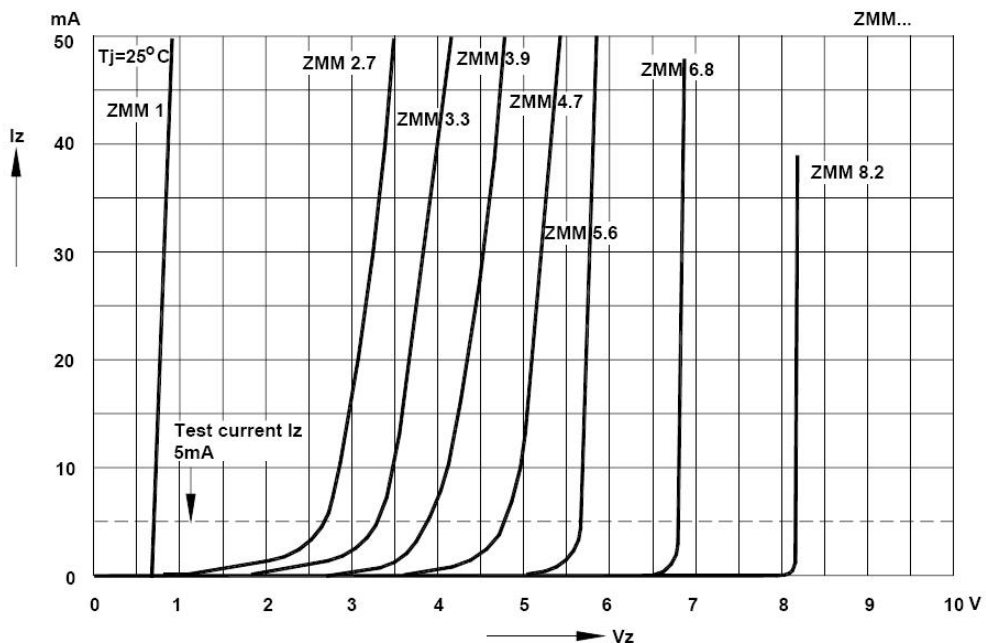
Type	Zener Voltage Range <sup>1)</sup>			Dynamic Resistance			Reverse Leakage Current			Temp. Coefficient Type of Zener Voltage TKvz (%/K)
	VZnom	VZT	at IZT	ZZT	ZZK	at IZK	Ta = 25 °C	Ta = 125 °C	at VR	
	(V)	(V)	(mA)	Max.(Ω)	Max.(Ω)	(mA)	Max. (μA)	Max. (μA)	(V)	
ZMM39	39	37...41	2.5	90	500	0.5	0.1	5	30	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...0.1

<sup>1)</sup> Tested with pulses  $t_p = 20$  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.

### Breakdown characteristics

Tj=constant (pulsed)

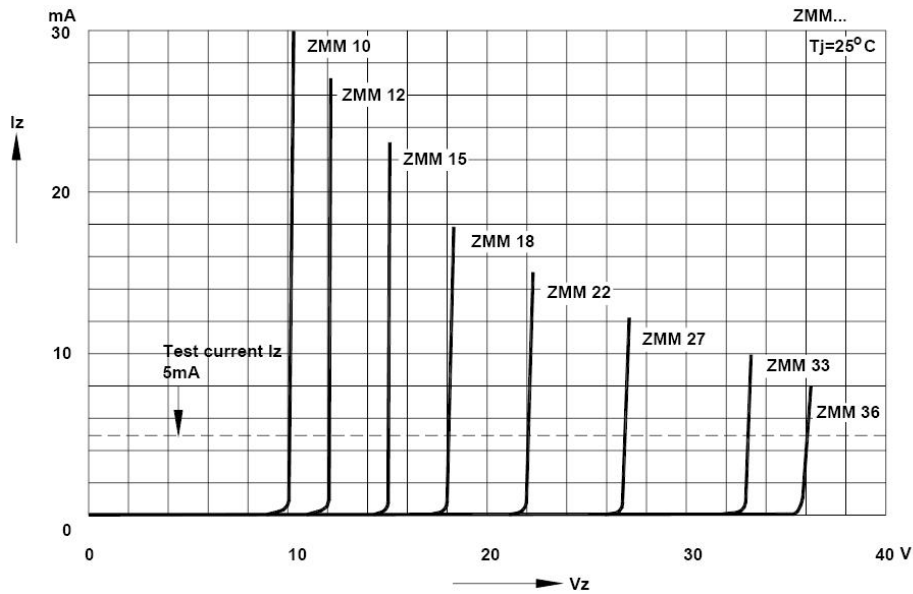


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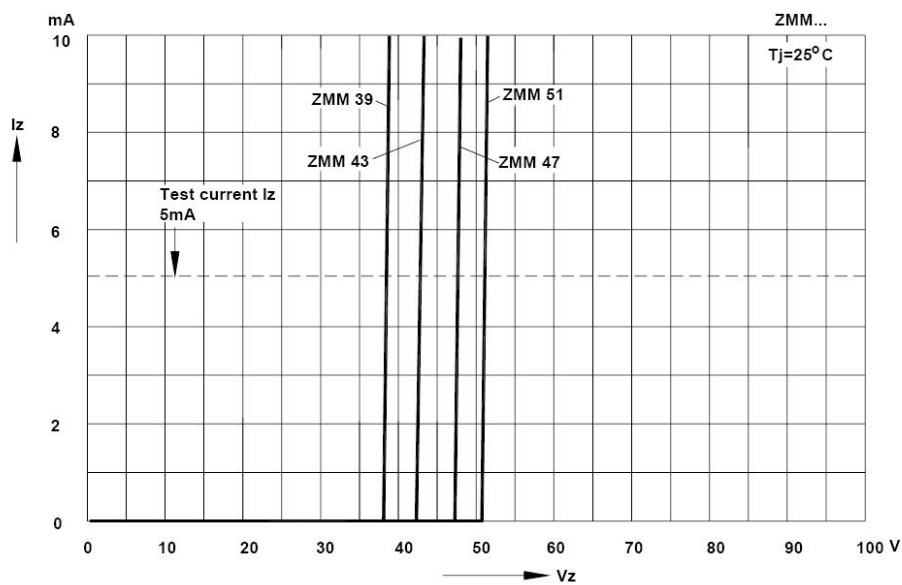
### Breakdown characteristics

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



### Breakdown characteristics

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

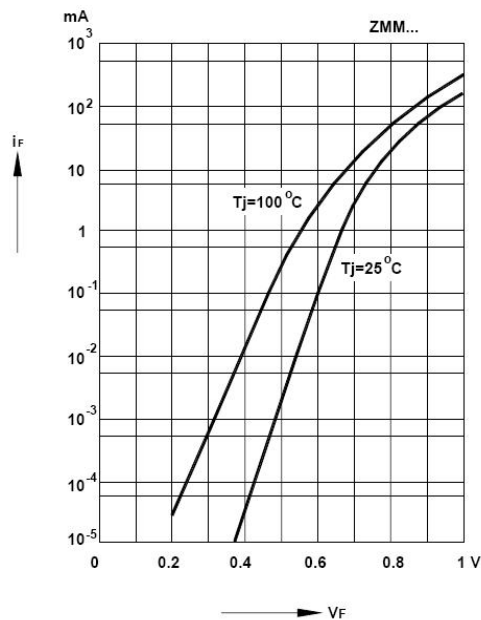


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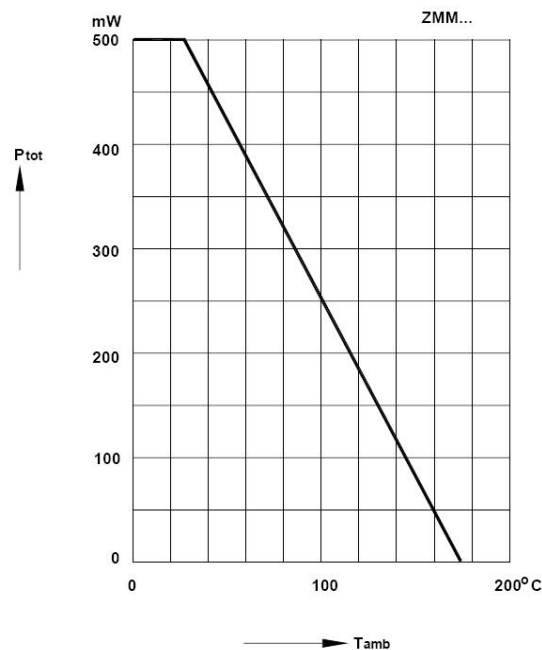
# ZMM1 THRU ZMM75

**Forward characteristics**



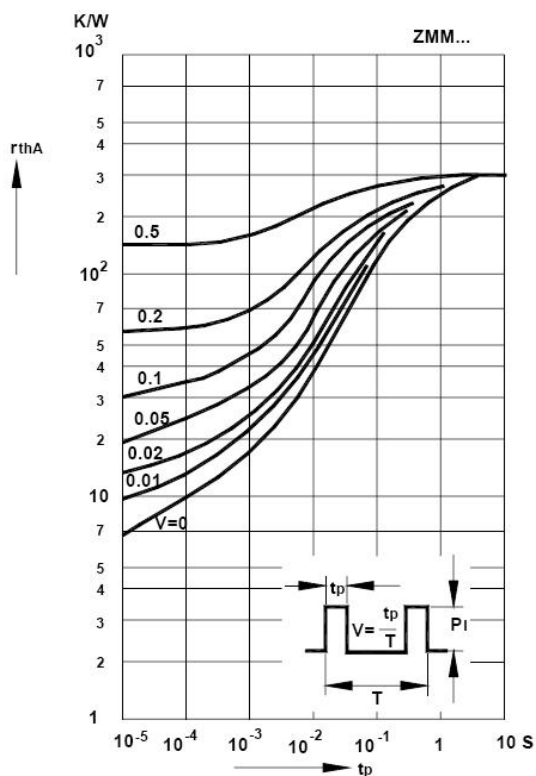
**Admissible power dissipation versus ambient temperature**

Valid provided that electrodes are kept at ambient

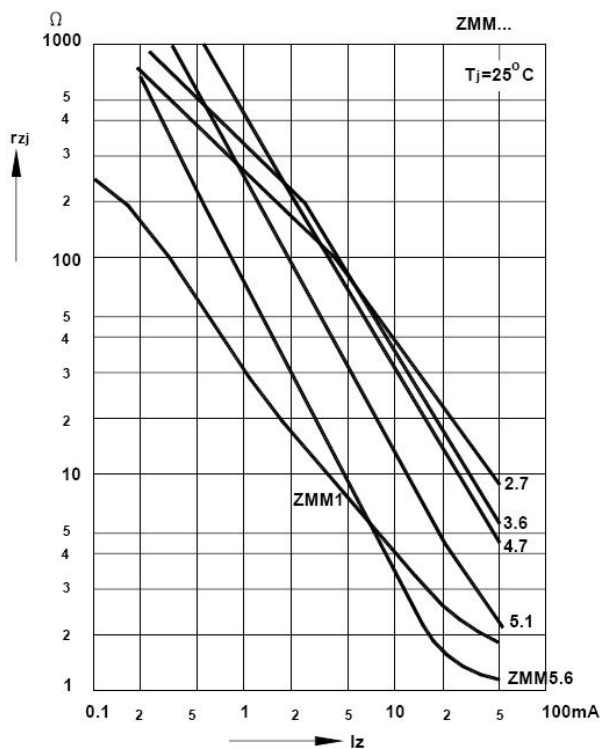


**Pulse thermal resistance versus pulse duration**

Valid provided that the electrodes are kept at ambient



**Dynamic resistance versus Zener**

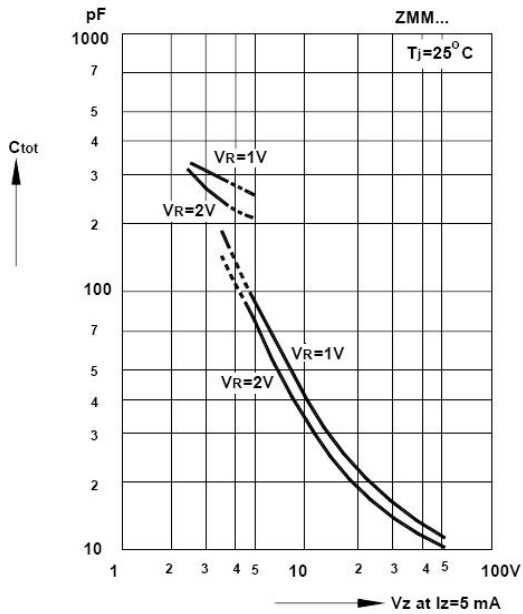


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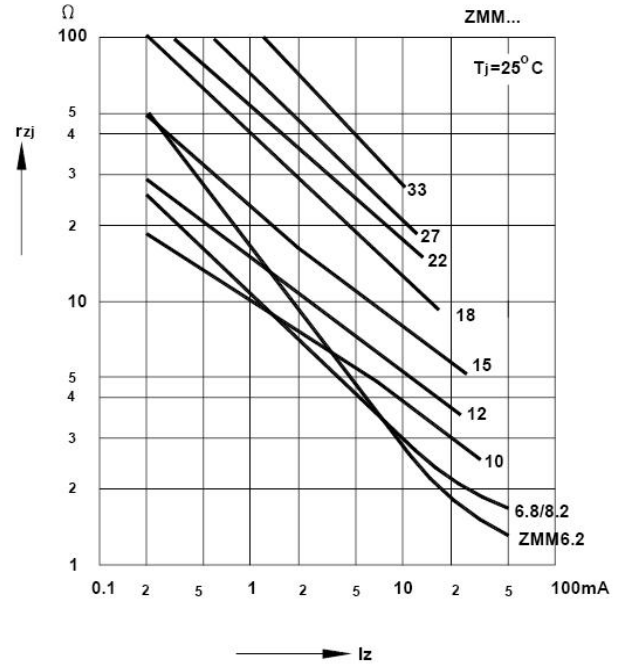
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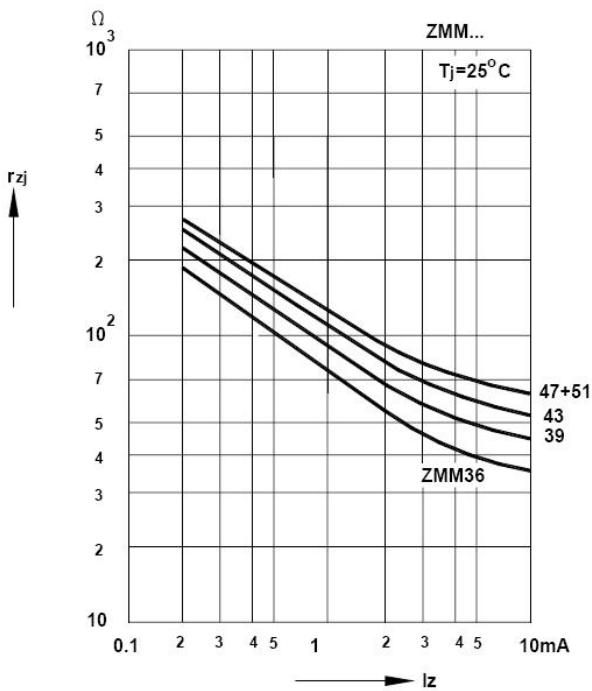
Capacitance versus Zener voltage



Dynamic resistance versus Zener current

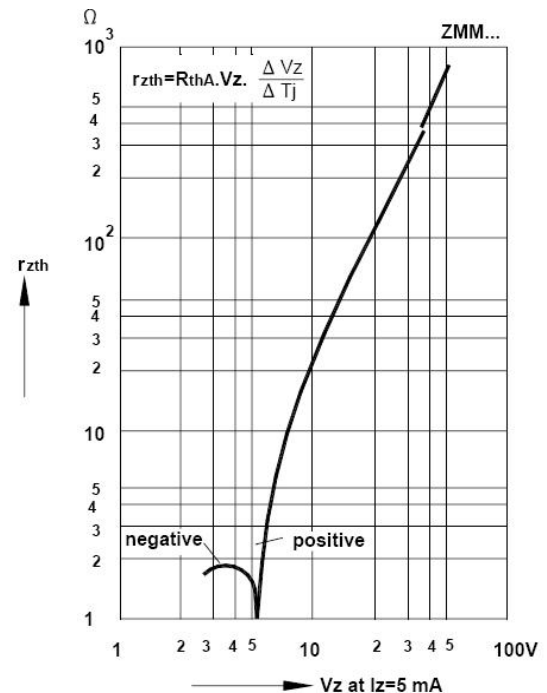


Dynamic resistance versus Zener current



Thermal differential resistance versus Zener voltage

Valid provided that electrodes are kept at ambient

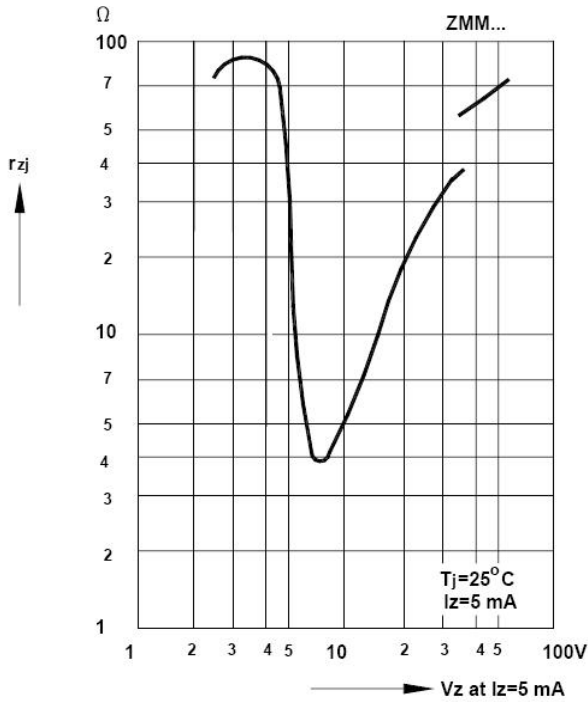


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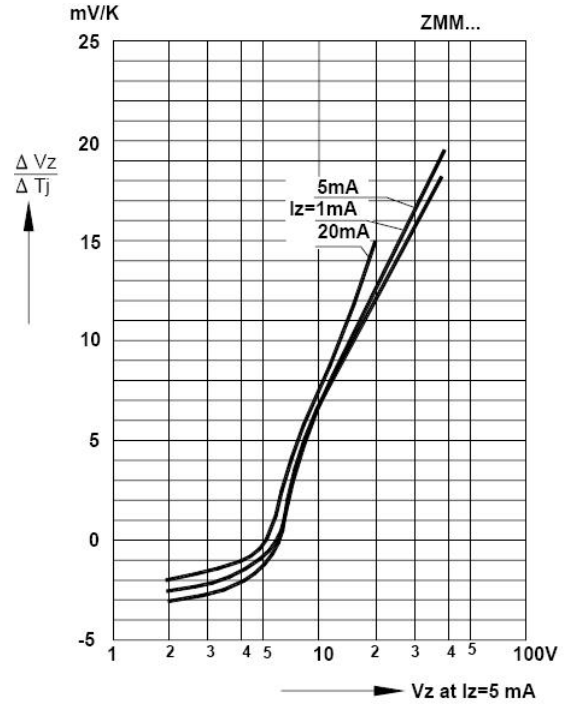
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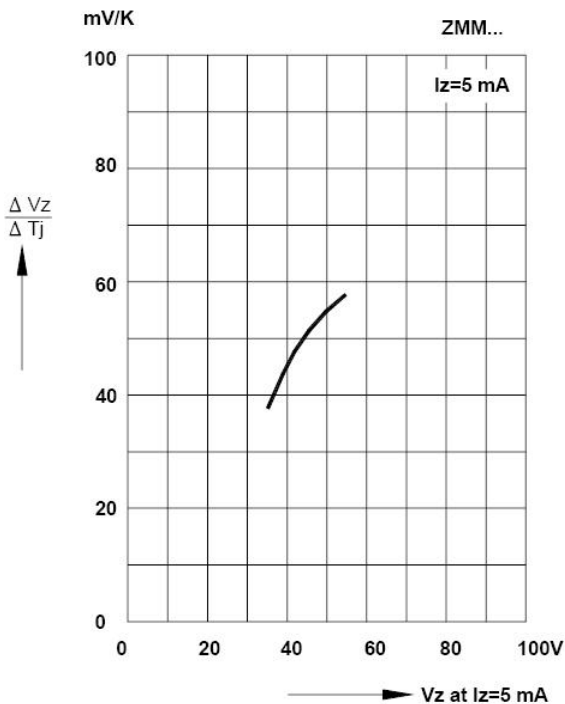
Dynamic resistance versus Zener voltage



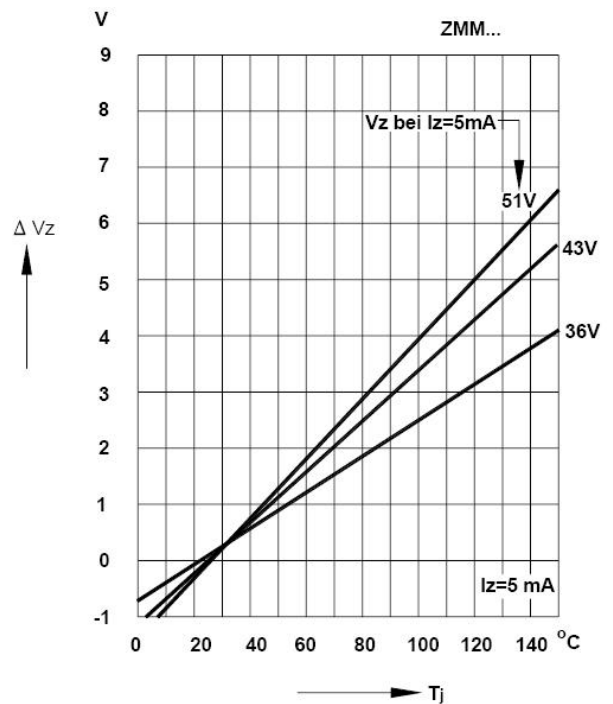
Temperature dependence of Zener voltage versus Zener voltage



Temperature dependence of Zener voltage versus Zener voltage



Change of Zener voltage versus junction temperature

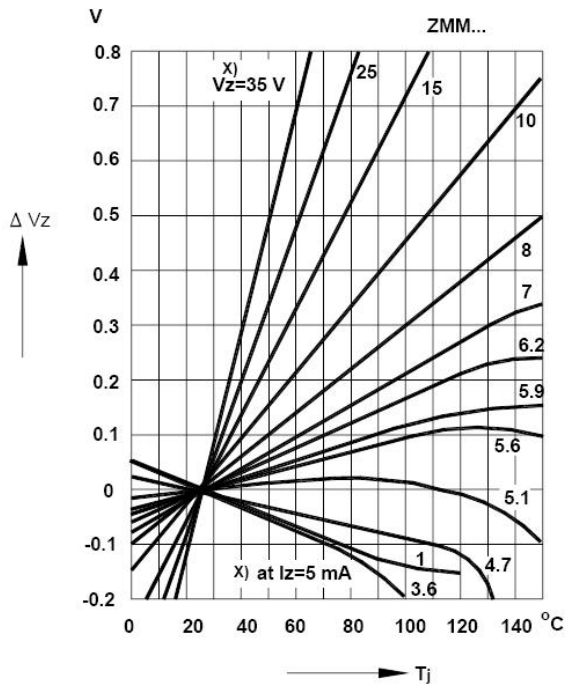


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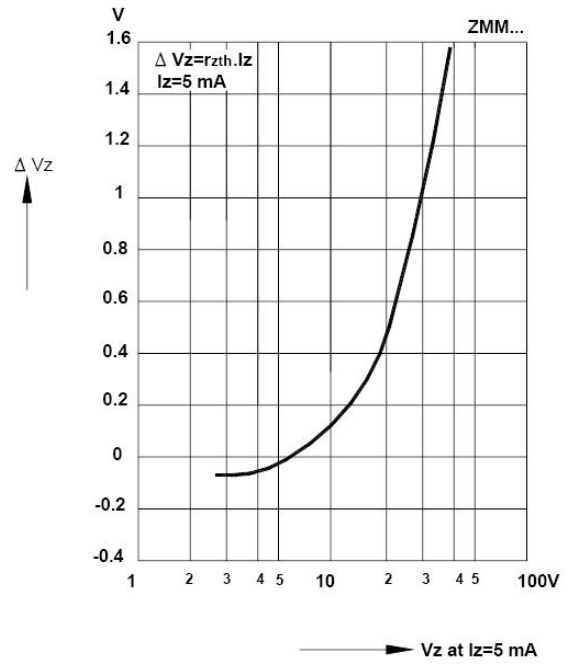
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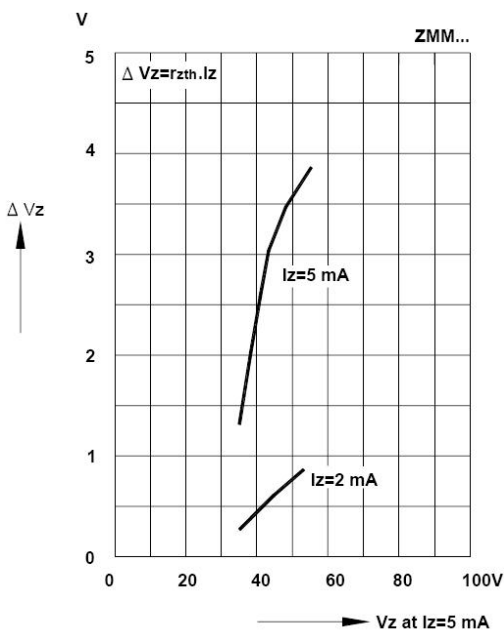
Change of Zener voltage versus junction temperature



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



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



Note: Specifications are subject to change without notice.

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