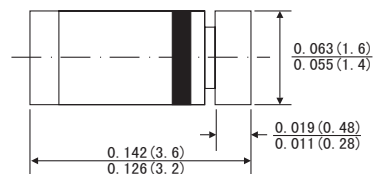


### FEATURES

- In MiniMELF case especially for automated insertion  
Standard Zener voltage tolerance is 5%. Add suffix "B" for 2% tolerance  
Other tolerance, non standard and higher zener voltages are upon request
- High temperature soldering guaranteed: 260°C/10 seconds at terminals
- Component in accordance to RoHS 2011/65/EU

### MiniMELF



### MECHANICAL DATA

- Case: MiniMELF(SOD-80) glass case
- Weight: Approx. 0.05 gram

Dimensions in inches and (millimeters)

### ABSOLUTE MAXIMUM RATINGS(LIMITING VALUES) (TA=25°C)

	Symbols	Value	Units
Zener current see table "Characteristics"			
Power dissipation at TA=25°C	P <sub>tot</sub>	500 <sup>1)</sup>	mW
Junction temperature	T <sub>J</sub>	175	°C
Storage temperature range	T <sub>STG</sub>	-55 to+175	°C

### ELECTRICAL CHARACTERISTICS (TA=25°C)

	Symbols	Min	Typ	Max	Units
Thermal resistance junction to ambient	R <sub>θJA</sub>			300 <sup>1)</sup>	K/W
Forward Voltage at I <sub>F</sub> = 100mA	V <sub>F</sub>			1	V

1) Valid provided that electrodes case is kept at ambient temperature

# ZMM1 THRU ZMM200 SILICON PLANAR ZENER DIODES

Type	Zener Voltage range <sup>1)</sup>		Maximum zener impedance <sup>1)</sup>			Maximum Reverse Leakage Current			Temp Coefficient of zener voltage	
	V <sub>ZNOM</sub>	I <sub>ZT</sub> <sup>2)</sup>		r <sub>ZT</sub> and r <sub>ZJK</sub> at I <sub>ZK</sub>			I <sub>R</sub> at V <sub>R</sub> (25°C)	I <sub>R</sub> at V <sub>R</sub> (125°C)	V <sub>R</sub>	TK <sub>VZ</sub>
	V	mA	V	Ω	Ω	mA	μA	μA	V	%/K
ZMM1 <sub>3)</sub>	0.75	5	0.7...0.8	<8	<50	1	--	--	1.0	-0.26...-0.23
ZMM2.0	2		1.9...2.1	<85	<600		<100	<200		-0.09...-0.06
ZMM2.4	2.4		2.28...2.56	<85	<600		<50	<100		-0.09...-0.06
ZMM2.7	2.7		2.5...2.9	<85	<600		<10	<50		-0.09...-0.06
ZMM3.0	3		2.8...3.2	<85	<600		<4	<40		-0.08...-0.05
ZMM3.3	3.3		3.1...3.5	<85	<600		<2	<40		-0.08...-0.05
ZMM3.6	3.6		3.4...3.8	<85	<600		<2	<40		-0.08...-0.05
ZMM3.9	3.9		3.7...4.1	<85	<600		<2	<40		-0.08...-0.05
ZMM4.3	4.3		4.0...4.6	<75	<600		<1	<20		-0.06...-0.03
ZMM4.7	4.7		4.4...5.0	<60	<600		<0.5	<10		-0.05...+0.02
ZMM5.1	5.1		4.8...5.4	<35	<550		0.1	<2	-0.02...+0.02	
ZMM5.6	5.6		5.2...6.0	<25	<450				-0.05...+0.05	
ZMM6.2	6.2		5.8...6.6	<10	<200				2	0.03...0.06
ZMM6.8	6.8		6.4...7.2	<8	<150				3	0.03...0.07
ZMM7.5	7.5		7.0...7.9	<7	<50				5	0.03...0.08
ZMM8.2	8.2		7.7...8.7	<7	<50				6.2	0.03...0.09
ZMM9.1	9.1		8.5...9.6	<10	<50				6.8	0.03...0.1
ZMM10	10		9.4...10.6	<15	<70				7.5	0.03...0.11
ZMM11	11		10.4...11.6	<20	<70				8.2	0.03...0.11
ZMM12	12		11.4...12.7	<20	<90				9.1	0.03...0.11
ZMM13	13	12.4...14.1	<26	<110	10	0.03...0.11				
ZMM15	15	13.8...15.6	<30	<110	11	0.03...0.11				
ZMM16	16	15.3...17.1	<40	<170	12	0.03...0.11				
ZMM18	18	16.8...19.1	<50	<170	13	0.03...0.11				
ZMM20	20	18.8...21.2	<55	<220	15	0.03...0.11				
ZMM22	22	20.8...23.3	<55	<220	16	0.04...0.12				
ZMM24	24	22.8...25.6	<80	<220	18	0.04...0.12				
ZMM27	27	25.1...28.9	<80	<220	20	0.04...0.12				
ZMM30	30	28...32	<80	<220	22	0.04...0.12				
ZMM33	33	31...35	<80	<220	24	0.04...0.12				
ZMM36	36	34...38	<80	<220	27	0.04...0.12				
ZMM39	39	37...41	<90	<500	0.1	<5	30	0.04...0.12		
ZMM43	43	40...46	<90	<500			33	0.04...0.12		
ZMM47	47	44...50	<110	<600			36	0.04...0.12		
ZMM51	51	48...54	<125	<700			39	0.04...0.12		
ZMM56	56	52...60	<135	<700			43	0.04...0.12		
ZMM62	62	58...66	<150	<1000			47	0.04...0.12		
ZMM68	68	64...72	<200	<1000			51	0.04...0.12		
ZMM75	75	70...79	<250	<1000			56	0.04...0.12		
ZMM82	82	77...87	<300	<1500			62	0.05...0.12		
ZMM91	91	85...96	<450	<2000			68	0.05...0.12		
ZMM100	100	94...106	<450	<5000	0.1	<10	75	0.05...0.12		
ZMM110	110	104...116	<600	<5000			82	0.05...0.12		
ZMM120	120	114...127	<800	<5500			91	0.05...0.12		
ZMM130	130	124...141	<950	<6000			100	0.05...0.12		
ZMM150	150	138...156	<1250	<6500			110	0.05...0.12		
ZMM160	160	153...171	<1400	<7000			120	0.05...0.12		
ZMM180	180	168...191	<1700	<8500			130	0.05...0.12		
ZMM200	200	188...212	<2000	<10000			150	0.05...0.12		

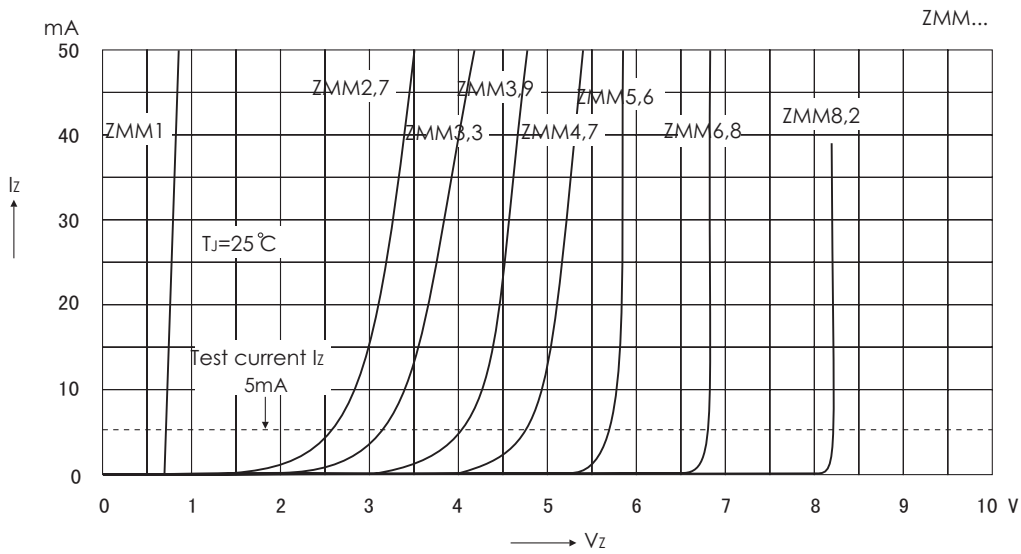
1) Tested with pulse tp=20ms

2) Valid provided that electrodes are kept at ambient temperature

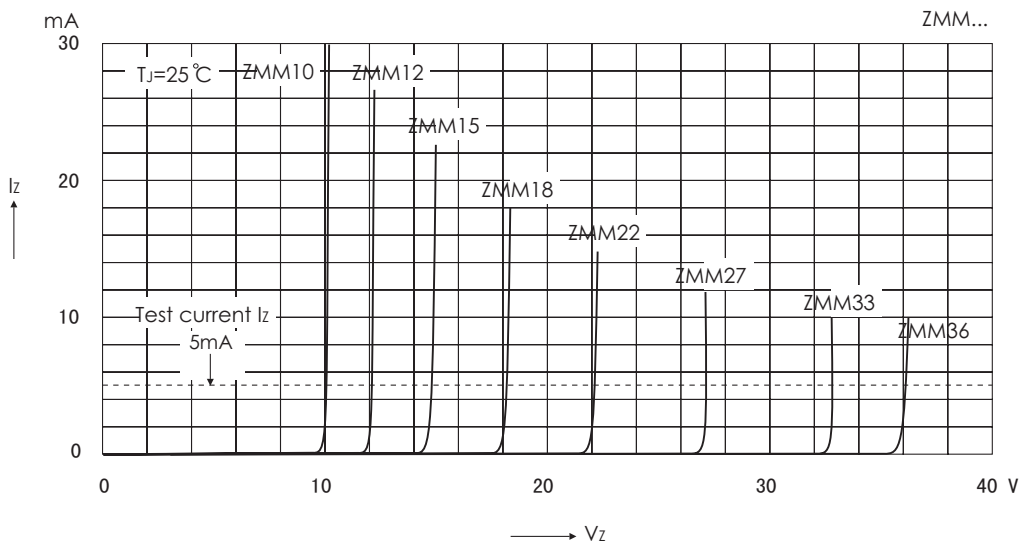
3) The ZMM1 is a silicon diode with operation in forward direction. Hence, the index of all parameters should be "F" instead of "Z", Connect the cathode to the negative pole.

# ZMM1...ZMM200 SILICON PLANAR ZENER DIODES

## BREAKDOWN CHARACTERISTICS AT $T_J = \text{CONSTANT}$ (PULSED)

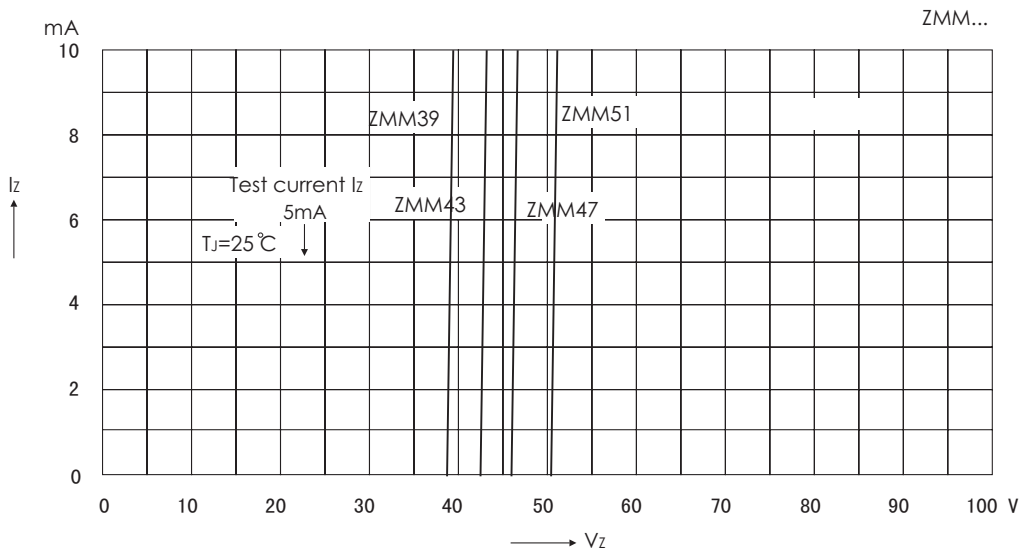


## BREAKDOWN CHARACTERISTICS AT $T_J = \text{CONSTANT}$ (PULSED)

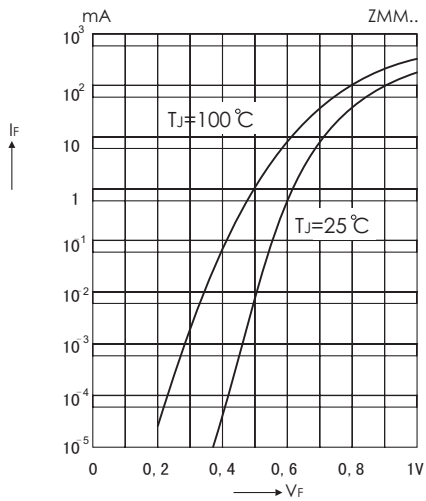


# ZMM1...ZMM200 SILICON PLANAR ZENER DIODES

## BREAKDOWN CHARACTERISTICS AT $T_J = \text{CONSTANT}$ (PULSED)

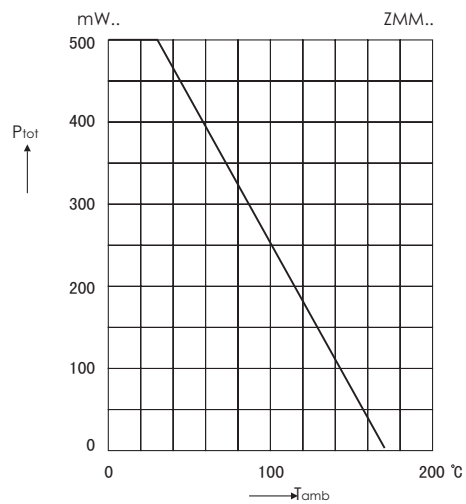


## Forward Characteristics



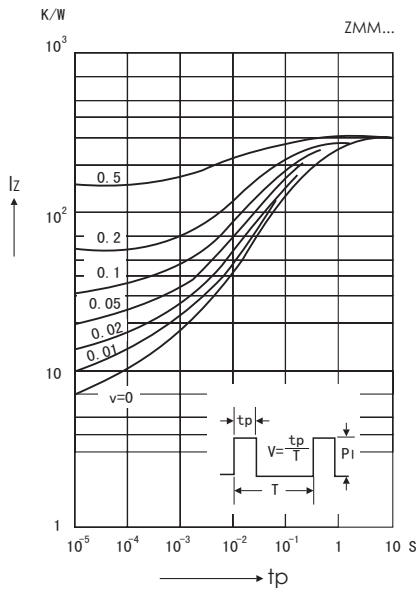
## Admissible power dissipation versus ambient temperature

valid provided that electrodes are kept at ambient temperature

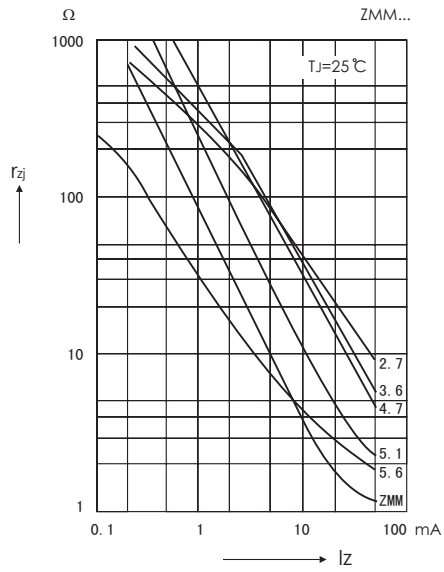


# ZMM1...ZMM200 SILICON PLANAR ZENER DIODES

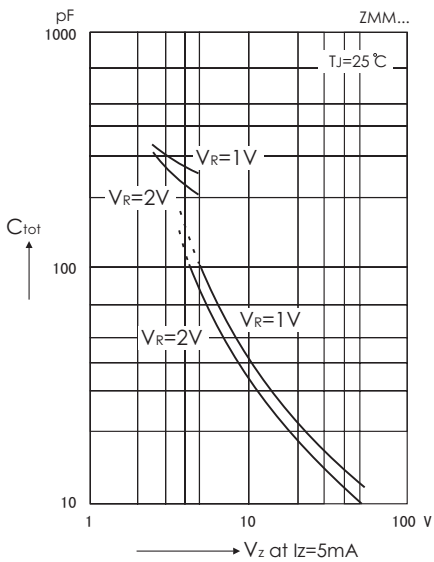
Pulse thermal resistance versus pulse duration



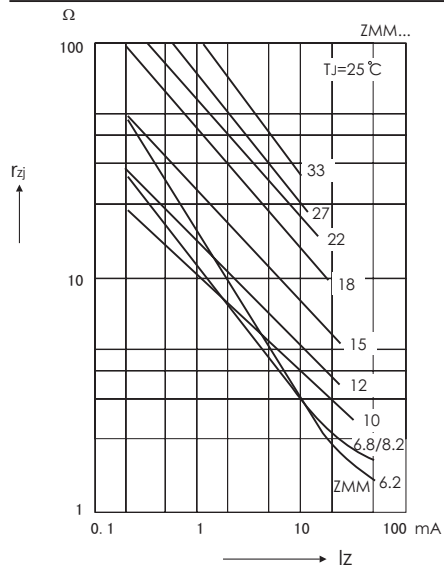
Dynamic resistance versus Zener current



Capacitance versus Zener voltage

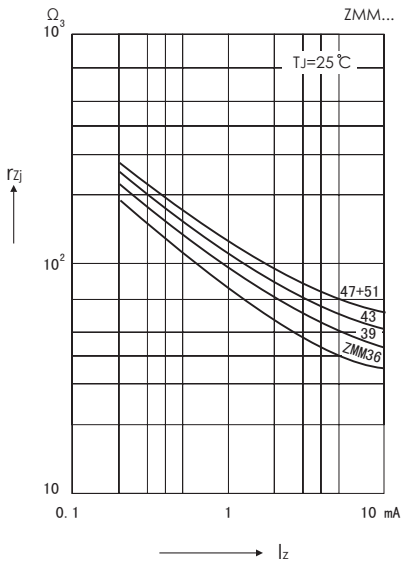


Dynamic resistance versus Zener current

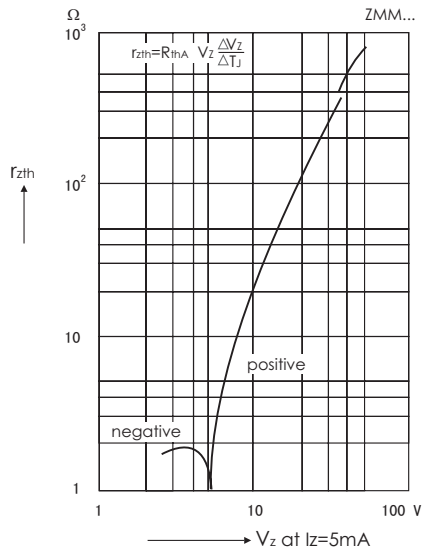


# ZMM1...ZMM200 SILICON PLANAR ZENER DIODES

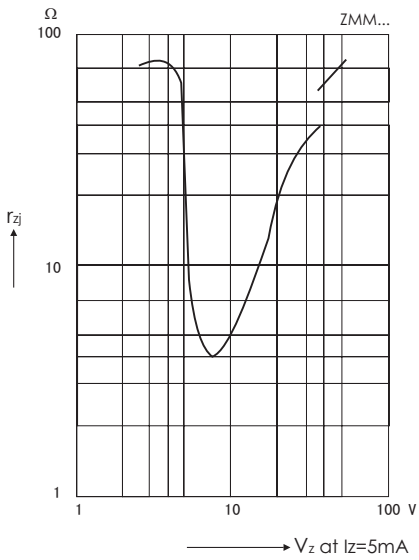
Dynamic resistance versus Zener current



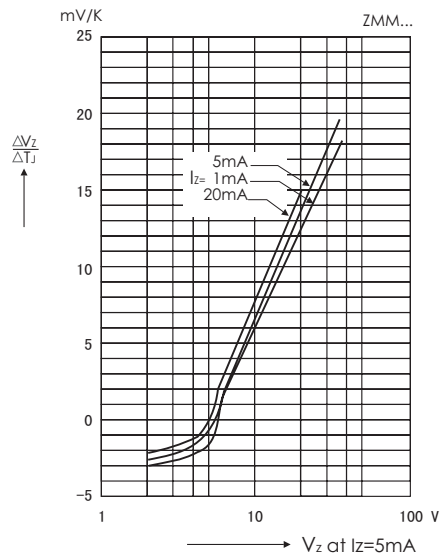
Thermal differential resistance versus Zener voltage



Dynamic resistance versus Zener voltage

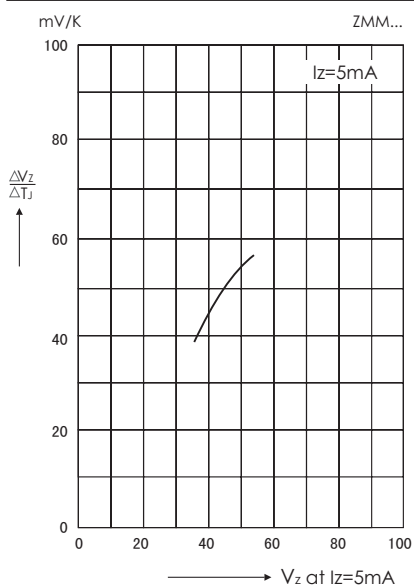


Temperature dependence of Zener voltage versus voltage

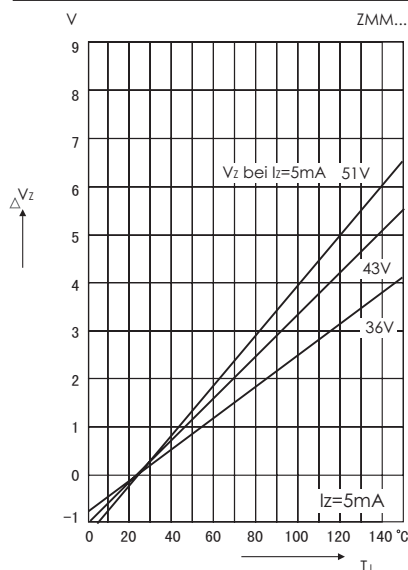


# ZMM1...ZMM200 SILICON PLANAR ZENER DIODES

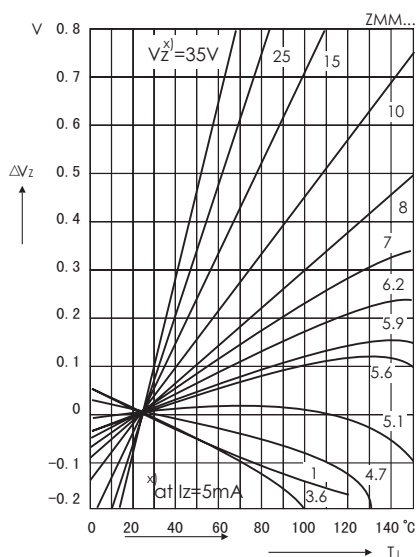
Temperature dependence of Zener voltage versus voltage



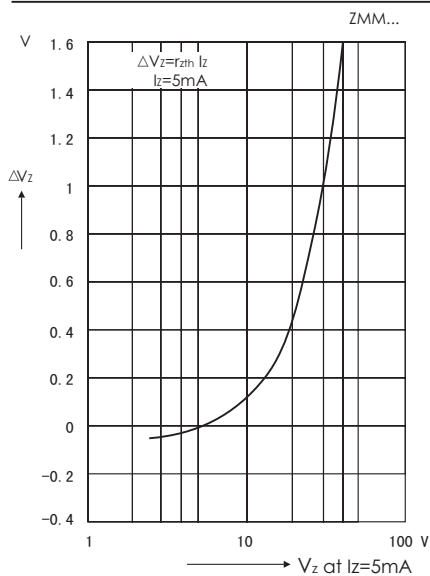
Change of Zener voltage versus junction temperature



Change of Zener voltage versus junction temperature



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



## ZMM1...ZMM200 SILICON PLANAR ZENER DIODES

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

