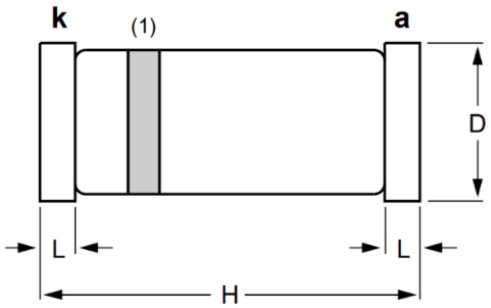
Silicon SMD Voltage Regulator Zener Diodes

Primary characteristics		
Parameter	**Value**	**Unit**
V_Z range nom.	0.75 to 75	V
Power rating	500	mW

Features

- Common cylindrical glass **MiniMELF (SOD-80C, DO-213AA, LL-34)** case for easy automatic insertion.
- Pb-Free and **RoHS** Compliant
- Smaller voltage tolerances and higher Zener voltages are available upon request

Case dimensions



[1)]The marking band indicates the cathode

LL-34 (MiniMELF)

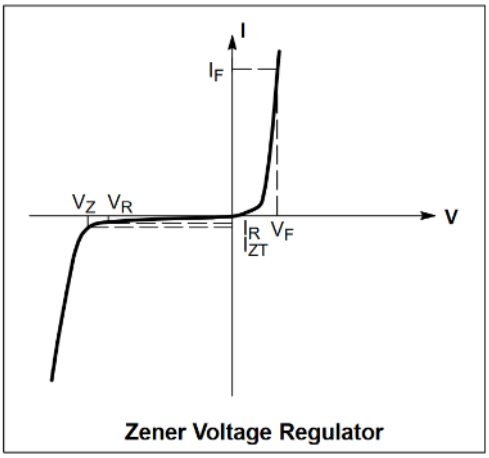
Unit	D	H	L
mm	1.45 ± 0.05	3.45 ± 0.15	0.29 ± 0.04

Part numbering system	
ZMM	**8V2**
↓	↓
Series code	Reverse Zener Voltage (see: Characteristics table)

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_s	-55 to +175	°C
[1)] Valid provided that electrodes are kept at ambient temperature			

Characteristics (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 = 100mA	V_F	1	V
[1)] Valid provided that electrodes are kept at ambient temperature			

Parameters list	
Symbol	**Parameter**
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Current
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F



Zener Voltage Regulator

Characteristics table (T_a = 25°C)

Type	Zener Voltage Range[1]			Dynamic Resistance			Reverse Leakage Current			Temp coefficient of Zener Voltage
	V_Z nom. V	I_{ZT} mA	V_{ZT} V	r_{ZJT} Ω	r_{ZJK} Ω	I_{ZK} mA	T_a = 25°C µA	T_a = 125°C µA	I_R at V_R V	TKvz %/K
ZMM1[2]	0.75	5.0	0.7 ~ 0.8	<8	<50	1.0	-	-	-	-0.26 ~ -0.23
ZMM2V0	2.0	5.0	1.80 ~ 2.15	<85	<600	1.0	<100	<200	1.0	-0.09 ~ -0.06
ZMM2V2	2.2	5.0	2.08 ~ 2.33	<85	<600	1.0	<75	<160	1.0	-0.09 ~ -0.06
ZMM2V4	2.4	5.0	2.28 ~ 2.56	<85	<600	1.0	<50	<100	1.0	-0.09 ~ -0.06
ZMM2V7	2.7	5.0	2.5 ~ 2.9	<85	<600	1.0	<10	<50	1.0	-0.09 ~ -0.06
ZMM3V0	3.0	5.0	2.8 ~ 3.2	<85	<600	1.0	<4	<40	1.0	-0.08 ~ -0.05
ZMM3V3	3.3	5.0	3.1 ~ 3.5	<85	<600	1.0	<2	<40	1.0	-0.08 ~ -0.05
ZMM3V6	3.6	5.0	3.4 ~ 3.8	<85	<600	1.0	<2	<40	1.0	-0.08 ~ -0.05
ZMM3V9	3.9	5.0	3.7 ~ 4.1	<85	<600	1.0	<2	<40	1.0	-0.08 ~ -0.05
ZMM4V3	4.3	5.0	4.0 ~ 4.6	<75	<600	1.0	<1	<20	1.0	-0.06 ~ -0.03
ZMM4V7	4.7	5.0	4.4 ~ 5.0	<60	<600	1.0	<0.5	<10	1.0	-0.05 ~ 0.02
ZMM5V1	5.1	5.0	4.8 ~ 5.4	<35	<550	1.0	<0.1	<2	1.0	-0.02 ~ 0.02
ZMM5V6	5.6	5.0	5.2 ~ 6.0	<25	<450	1.0	<0.1	<2	1.0	-0.05 ~ 0.05
ZMM6V2	6.2	5.0	5.8 ~ 6.6	<10	<200	1.0	<0.1	<2	2.0	0.03 ~ 0.06
ZMM6V8	6.8	5.0	6.4 ~ 7.2	<8	<150	1.0	<0.1	<2	3.0	0.03 ~ 0.07
ZMM7V5	7.5	5.0	7.0 ~ 7.9	<7	<50	1.0	<0.1	<2	5.0	0.03 ~ 0.07
ZMM8V2	8.2	5.0	7.7 ~ 8.7	<7	<50	1.0	<0.1	<2	6.2	0.03 ~ 0.08
ZMM9V1	9.1	5.0	8.5 ~ 9.6	<10	<50	1.0	<0.1	<2	6.8	0.03 ~ 0.09
ZMM10	10	5.0	9.4 ~ 10.6	<15	<70	1.0	<0.1	<2	7.5	0.03 ~ 0.10
ZMM11	11	5.0	10.4 ~ 11.6	<20	<70	1.0	<0.1	<2	8.2	0.03 ~ 0.11
ZMM12	12	5.0	11.4 ~ 12.7	<20	<90	1.0	<0.1	<2	9.1	0.03 ~ 0.11
ZMM13	13	5.0	12.4 ~ 14.1	<26	<110	1.0	<0.1	<2	10	0.03 ~ 0.11
ZMM15	15	5.0	13.8 ~ 15.6	<30	<110	1.0	<0.1	<2	11	0.03 ~ 0.11
ZMM16	16	5.0	15.3 ~ 17.1	<40	<170	1.0	<0.1	<2	12	0.03 ~ 0.11
ZMM18	18	5.0	16.8 ~ 19.1	<50	<170	1.0	<0.1	<2	13	0.03 ~ 0.11
ZMM20	20	5.0	18.8 ~ 21.2	<55	<220	1.0	<0.1	<2	15	0.03 ~ 0.11
ZMM22	22	5.0	20.8 ~ 23.3	<55	<220	1.0	<0.1	<2	16	0.04 ~ 0.12
ZMM24	24	5.0	22.8 ~ 25.6	<80	<220	1.0	<0.1	<2	18	0.04 ~ 0.12
ZMM27	27	5.0	25.1 ~ 28.9	<80	<220	1.0	<0.1	<2	20	0.04 ~ 0.12
ZMM30	30	5.0	28 ~ 32	<80	<220	1.0	<0.1	<2	22	0.04 ~ 0.12
ZMM33	33	5.0	31 ~ 35	<80	<220	1.0	<0.1	<2	24	0.04 ~ 0.12
ZMM36	36	5.0	34 ~ 38	<80	<220	1.0	<0.1	<2	27	0.04 ~ 0.12

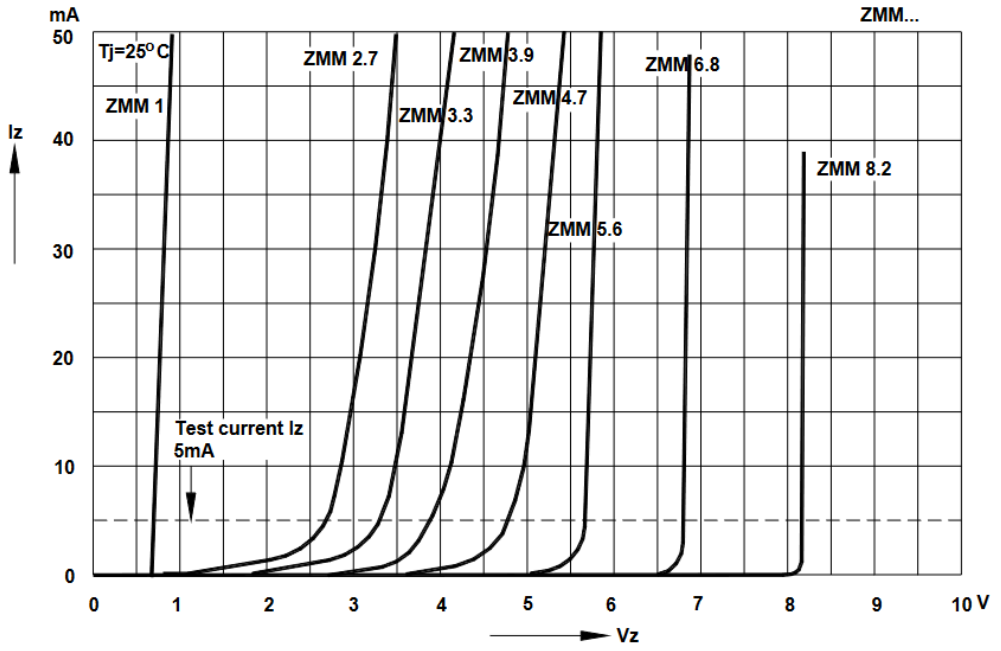
Characteristics table (T_a = 25°C)

Type	Zener Voltage Range[1]			Dynamic Resistance			Reverse Leakage Current			Temp coefficient of Zener Voltage
	V_Z nom. V	I_{ZT} mA	V_{ZT} V	r_{ZJT} Ω	r_{ZJK} Ω	I_{ZK} mA	T_a = 25°C µA	T_a = 125°C µA	I_R at V_R V	TKvz %/K
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	0.50	<0.1	<10	51	0.04 ~ 0.12
ZMM75	75	2.5	70 ~ 79	<250	<1000	0.50	<0.1	<10	56	0.04 ~ 0.12

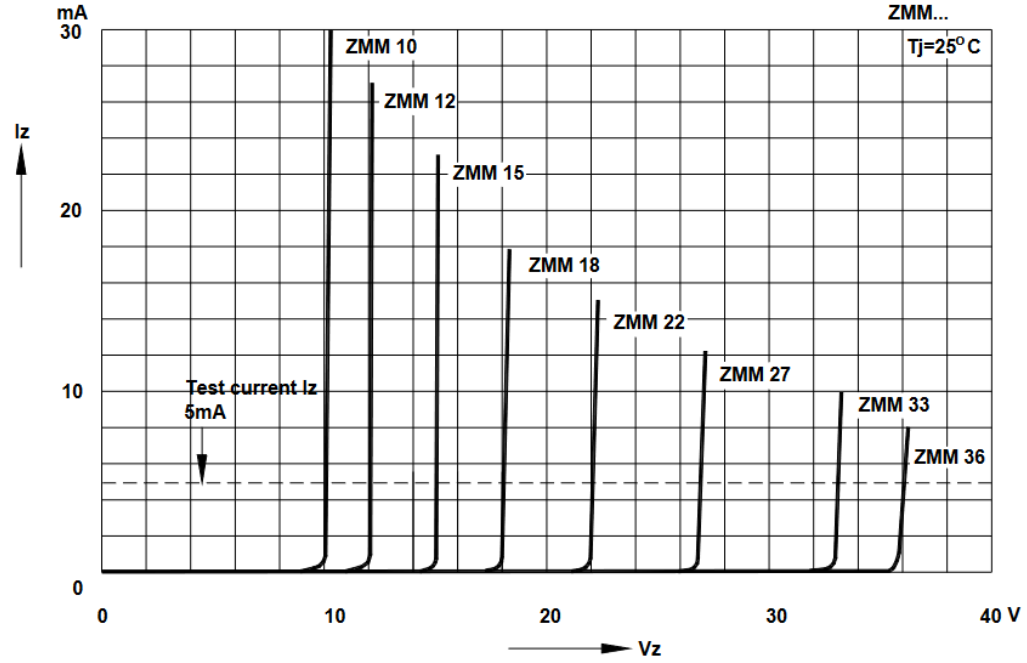
[1] Tested with pulses t_p = 20 ms
[2] The ZMM1 is a silicon diode with operation in forward direction. Hence, the index of all parameters should be "F" instead of "Z". Connect the cathode electrode to the negative pole.

Breakdown characteristics

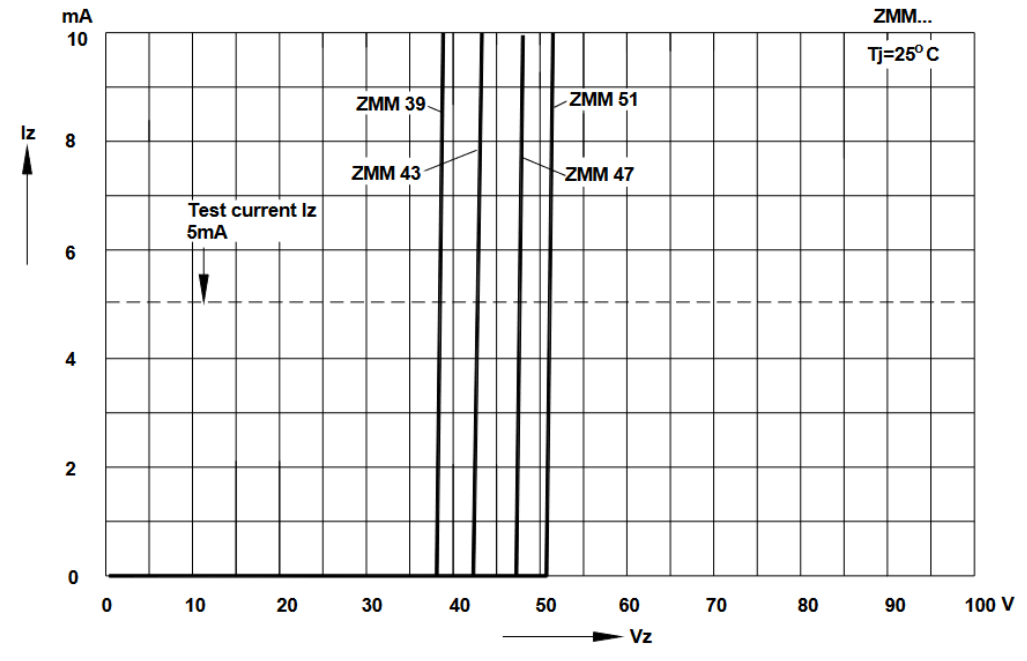
T_j = constant (pulsed)

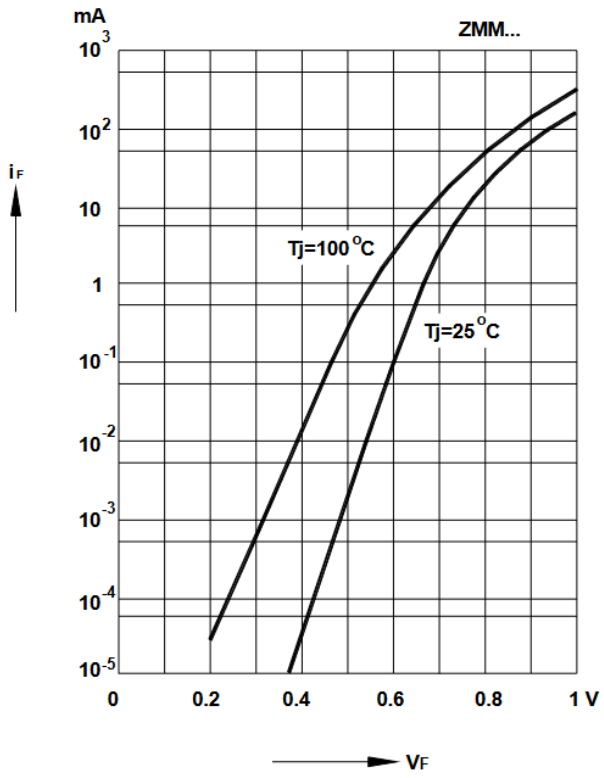
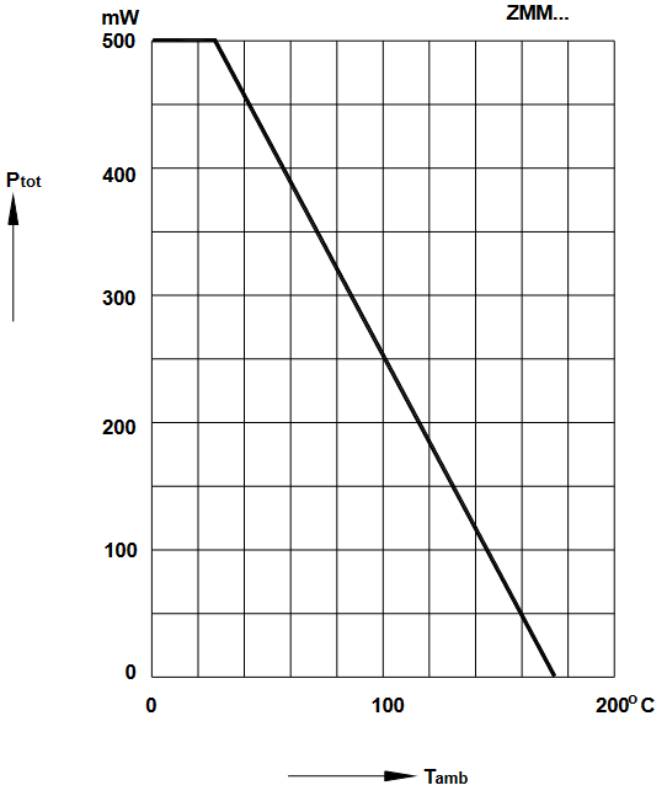


Breakdown characteristics
T_j = constant (pulsed)

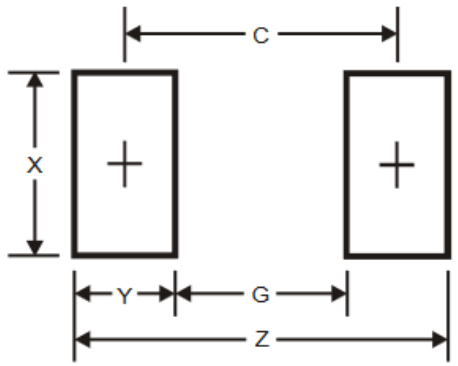


Breakdown characteristics
T_j = constant (pulsed)



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

Suggested soldering pad layout



LL-34 (MiniMELF)

Pad dimensions

Unit	Z	G	X	Y	C
mm	4.70	2.10	1.70	1.30	3.50

Ordering information

Part Number	Package	Shipping Quantity	Dimensions
ZMM1 ~ ZMM75	MiniMELF (SOD-80C, DO-213AA, LL-34)	**2500 pcs / reel**	---

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