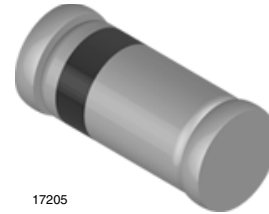
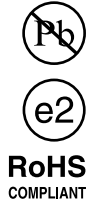


Small Signal Zener Diodes

Features

- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- TZMC - V_Z -tolerance $\pm 5\%$
- TZMB - V_Z -tolerance $\pm 2\%$
- Available with tighter tolerances
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC



17205

Applications

- Voltage stabilization

Mechanical Data

Case: MiniMELF SOD-80

Weight: approx. 31 mg

Cathode band color: black

Packaging codes/options:

GS08/2.5 k per 7" reel (8 mm tape), 12.5 k/box

GS18/10 k per 13" reel (8 mm tape), 10 k/box

Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Power dissipation	$R_{thJA} \leq 300\text{ K/W}$	P_{tot}	500	mW
Z-current		I_Z	P_{tot}/V_Z	mA

Thermal Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Thermal resistance junction to ambient air	On PC board 50 mm x 50 mm x 1.6 mm	R_{thJA}	500	K/W
Junction temperature		T_j	175	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 65 to + 175	$^{\circ}\text{C}$

Electrical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter	Test condition	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	$I_F = 200\text{ mA}$	V_F			1.5	V

Electrical Characteristics

Part number	Zener voltage range		Dynamic resistance		Test current		Reverse leakage current			Temperature coefficient of zener voltage	
	V_Z at I_{ZT}		r_{zT} at I_{ZT}	r_{zK} at I_{ZK}	I_{ZT}	I_{ZK}	I_R	$I_R^{1)}$	at V_R	TK_{VZ}	
	V	V	Ω	Ω	mA	mA	μA	μA	V	%/K	%/K
	min.	max.	typ.	typ.						min.	max.
TZMC2V4	2.28	2.56	< 85	< 600	5	1	< 50	< 100	1	- 0.09	- 0.06
TZMC2V7	2.5	2.9	< 85	< 600	5	1	< 10	< 50	1	- 0.09	- 0.06
TZMC3V0	2.8	3.2	< 90	< 600	5	1	< 4	< 40	1	- 0.08	- 0.05
TZMC3V3	3.1	3.5	< 90	< 600	5	1	< 2	< 40	1	- 0.08	- 0.05
TZMC3V6	3.4	3.8	< 90	< 600	5	1	< 2	< 40	1	- 0.08	- 0.05
TZMC3V9	3.7	4.1	< 90	< 600	5	1	< 2	< 40	1	- 0.08	- 0.05
TZMC4V3	4	4.6	< 90	< 600	5	1	< 1	< 20	1	- 0.06	- 0.03
TZMC4V7	4.4	5	< 80	< 600	5	1	< 0.5	< 10	1	- 0.05	0.02
TZMC5V1	4.8	5.4	< 60	< 550	5	1	< 0.1	< 2	1	- 0.02	0.02
TZMC5V6	5.2	6	< 40	< 450	5	1	< 0.1	< 2	1	- 0.05	0.05
TZMC6V2	5.8	6.6	< 10	< 200	5	1	< 0.1	< 2	2	0.03	0.06
TZMC6V8	6.4	7.2	< 8	< 150	5	1	< 0.1	< 2	3	0.03	0.07
TZMC7V5	7	7.9	< 7	< 50	5	1	< 0.1	< 2	5	0.03	0.07
TZMC8V2	7.7	8.7	< 7	< 50	5	1	< 0.1	< 2	6.2	0.03	0.08
TZMC9V1	8.5	9.6	< 10	< 50	5	1	< 0.1	< 2	6.8	0.03	0.09
TZMC10	9.4	10.6	< 15	< 70	5	1	< 0.1	< 2	7.5	0.03	0.1
TZMC11	10.4	11.6	< 20	< 70	5	1	< 0.1	< 2	8.2	0.03	0.11
TZMC12	11.4	12.7	< 20	< 90	5	1	< 0.1	< 2	9.1	0.03	0.11
TZMC13	12.4	14.1	< 26	< 110	5	1	< 0.1	< 2	10	0.03	0.11
TZMC15	13.8	15.6	< 30	< 110	5	1	< 0.1	< 2	11	0.03	0.11
TZMC16	15.3	17.1	< 40	< 170	5	1	< 0.1	< 2	12	0.03	0.11
TZMC18	16.8	19.1	< 50	< 170	5	1	< 0.1	< 2	13	0.03	0.11
TZMC20	18.8	21.2	< 55	< 220	5	1	< 0.1	< 2	15	0.03	0.11
TZMC22	20.8	23.3	< 55	< 220	5	1	< 0.1	< 2	16	0.04	0.12
TZMC24	22.8	25.6	< 80	< 220	5	1	< 0.1	< 2	18	0.04	0.12
TZMC27	25.1	28.9	< 80	< 220	5	1	< 0.1	< 2	20	0.04	0.12
TZMC30	28	32	< 80	< 220	5	1	< 0.1	< 2	22	0.04	0.12
TZMC33	31	35	< 80	< 220	5	1	< 0.1	< 2	24	0.04	0.12
TZMC36	34	38	< 80	< 220	5	1	< 0.1	< 2	27	0.04	0.12
TZMC39	37	41	< 90	< 500	2.5	0.5	< 0.1	< 5	30	0.04	0.12
TZMC43	40	46	< 90	< 600	2.5	0.5	< 0.1	< 5	33	0.04	0.12
TZMC47	44	50	< 110	< 700	2.5	0.5	< 0.1	< 5	36	0.04	0.12
TZMC51	48	54	< 125	< 700	2.5	0.5	< 0.1	< 10	39	0.04	0.12
TZMC56	52	60	< 135	< 1000	2.5	0.5	< 0.1	< 10	43	0.04	0.12
TZMC62	58	66	< 150	< 1000	2.5	0.5	< 0.1	< 10	47	0.04	0.12
TZMC68	64	72	< 200	< 1000	2.5	0.5	< 0.1	< 10	51	0.04	0.12
TZMC75	70	79	< 250	< 1500	2.5	0.5	< 0.1	< 10	56	0.04	0.12

Note:

Additional measurement of voltage group TZMC9V1 to TZMC75, I_R at 95 % $V_{Zmin} \leq 35$ nA at $T_j = 25$ °C

¹⁾ at $T_j = 150$ °C

Electrical Characteristics

Part number	Zener voltage range		Dynamic resistance		Test current		Reverse leakage current			Temperature coefficient of zener voltage	
	V_Z at I_{ZT}		r_{zjT} at I_{ZT}	r_{zjK} at I_{ZK}	I_{ZT}	I_{ZK}	I_R	$I_R^{1)}$	at V_R	TK_{VZ}	
	V	V	Ω	Ω	mA	mA	μA	μA	V	%/K	%/K
	min.	max.	typ.	typ.						min.	max.
TZMB2V4	2.35	2.45	< 85	< 600	5	1	< 50	< 100	1	- 0.09	- 0.06
TZMB2V7	2.64	2.76	< 85	< 600	5	1	< 10	< 50	1	- 0.09	- 0.06
TZMB3V0	2.94	3.06	< 90	< 600	5	1	< 4	< 40	1	- 0.08	- 0.05
TZMB3V3	3.24	3.36	< 90	< 600	5	1	< 2	< 40	1	- 0.08	- 0.05
TZMB3V6	3.52	3.68	< 90	< 600	5	1	< 2	< 40	1	- 0.08	- 0.05
TZMB3V9	3.82	3.98	< 90	< 600	5	1	< 2	< 40	1	- 0.08	- 0.05
TZMB4V3	4.22	4.38	< 90	< 600	5	1	< 1	< 20	1	- 0.06	-0.03
TZMB4V7	4.6	4.8	< 80	< 600	5	1	< 0.5	< 10	1	- 0.05	0.02
TZMB5V1	5	5.2	< 60	< 550	5	1	< 0.1	< 2	1	- 0.02	0.02
TZMB5V6	5.48	5.72	< 40	< 450	5	1	< 0.1	< 2	1	- 0.05	0.05
TZMB6V2	6.08	6.32	< 10	< 200	5	1	< 0.1	< 2	2	0.03	0.06
TZMB6V8	6.66	6.94	< 8	< 150	5	1	< 0.1	< 2	3	0.03	0.07
TZMB7V5	7.35	7.65	< 7	< 50	5	1	< 0.1	< 2	5	0.03	0.07
TZMB8V2	8.04	8.36	< 7	< 50	5	1	< 0.1	< 2	6.2	0.03	0.08
TZMB9V1	8.92	9.28	< 10	< 50	5	1	< 0.1	< 2	6.8	0.03	0.09
TZMB10	9.8	10.2	< 15	< 70	5	1	< 0.1	< 2	7.5	0.03	0.1
TZMB11	10.78	11.22	< 20	< 70	5	1	< 0.1	< 2	8.2	0.03	0.11
TZMB12	11.76	12.24	< 20	< 90	5	1	< 0.1	< 2	9.1	0.03	0.11
TZMB13	12.74	13.26	< 26	< 110	5	1	< 0.1	< 2	10	0.03	0.11
TZMB15	14.7	15.3	< 30	< 110	5	1	< 0.1	< 2	11	0.03	0.11
TZMB16	15.7	16.3	< 40	< 170	5	1	< 0.1	< 2	12	0.03	0.11
TZMB18	17.64	18.36	< 50	< 170	5	1	< 0.1	< 2	13	0.03	0.11
TZMB20	19.6	20.4	< 55	< 220	5	1	< 0.1	< 2	15	0.03	0.11
TZMB22	21.55	22.45	< 55	< 220	5	1	< 0.1	< 2	16	0.04	0.12
TZMB24	23.5	24.5	< 80	< 220	5	1	< 0.1	< 2	18	0.04	0.12
TZMB27	26.4	27.6	< 80	< 220	5	1	< 0.1	< 2	20	0.04	0.12
TZMB30	29.4	30.6	< 80	< 220	5	1	< 0.1	< 2	22	0.04	0.12
TZMB33	32.4	33.6	< 80	< 220	5	1	< 0.1	< 2	24	0.04	0.12
TZMB36	35.3	36.7	< 80	< 220	5	1	< 0.1	< 2	27	0.04	0.12
TZMB39	38.2	39.8	< 90	< 500	2.5	1	< 0.1	< 5	30	0.04	0.12
TZMB43	42.1	43.9	< 90	< 600	2.5	0.5	< 0.1	< 5	33	0.04	0.12
TZMB47	46.1	47.9	< 110	< 700	2.5	0.5	< 0.1	< 5	36	0.04	0.12
TZMB51	50	52	< 125	< 700	2.5	0.5	< 0.1	< 10	39	0.04	0.12
TZMB56	54.9	57.1	< 135	< 1000	2.5	0.5	< 0.1	< 10	43	0.04	0.12
TZMB62	60.8	63.2	< 150	< 1000	2.5	0.5	< 0.1	< 10	47	0.04	0.12
TZMB68	66.6	69.4	< 200	< 1000	2.5	0.5	< 0.1	< 10	51	0.04	0.12
TZMB75	73.5	76.5	< 250	< 1500	2.5	0.5	< 0.1	< 10	56	0.04	0.12

Note:

Additional measurement of voltage group TZMB9V1 to TZMB75, I_R at 95 % $V_{Zmin} \leq 35$ nA at $T_j = 25$ °C

¹⁾ at $T_j = 150$ °C

Typical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

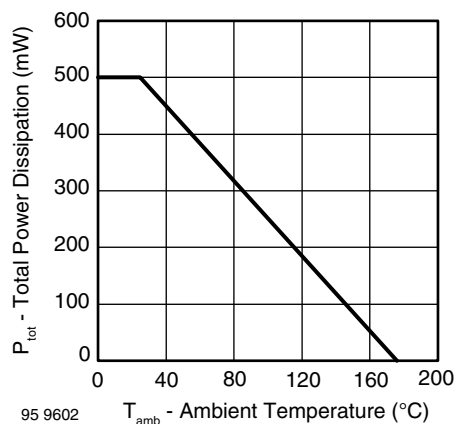


Figure 1. Total Power Dissipation vs. Ambient Temperature

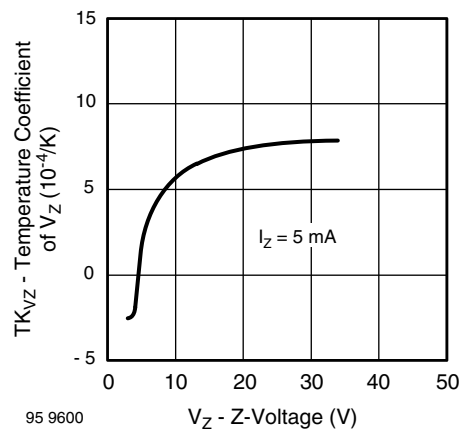


Figure 4. Temperature Coefficient of V_Z vs. Z-Voltage

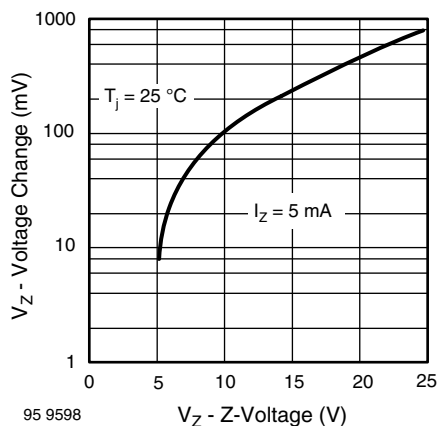


Figure 2. Typical Change of Working Voltage under Operating Conditions at $T_{amb} = 25\text{ }^{\circ}\text{C}$

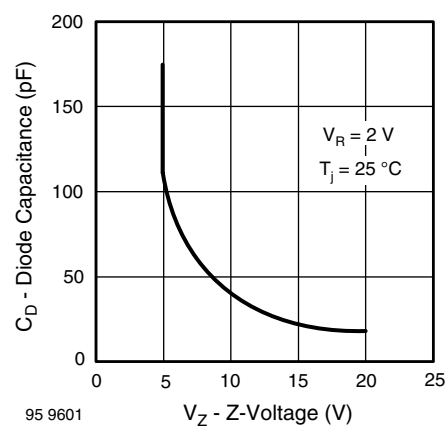


Figure 5. Diode Capacitance vs. Z-Voltage

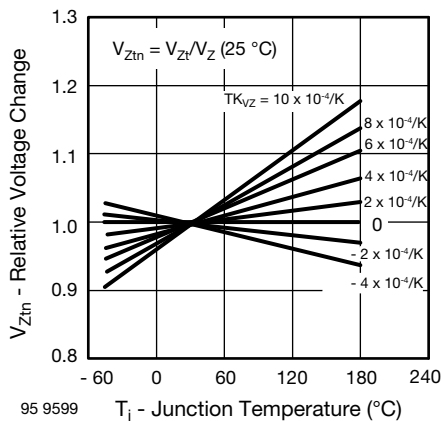


Figure 3. Typical Change of Working Voltage vs. Junction Temperature

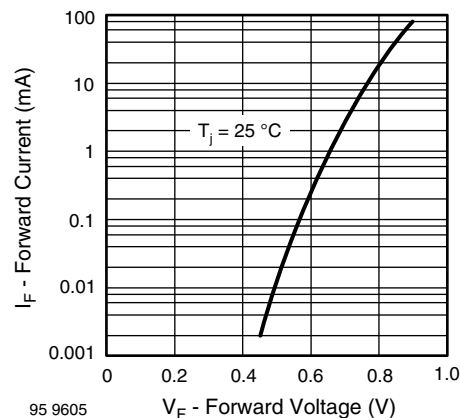


Figure 6. Forward Current vs. Forward Voltage

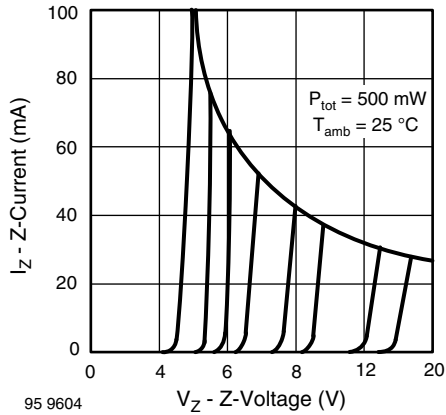


Figure 7. Z-Current vs. Z-Voltage

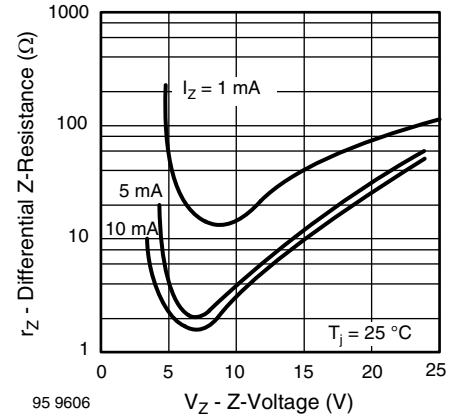


Figure 9. Differential Z-Resistance vs. Z-Voltage

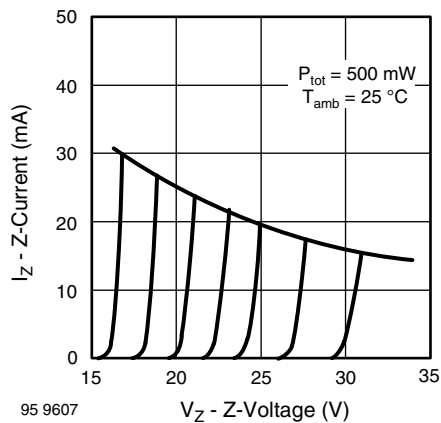


Figure 8. Z-Current vs. Z-Voltage

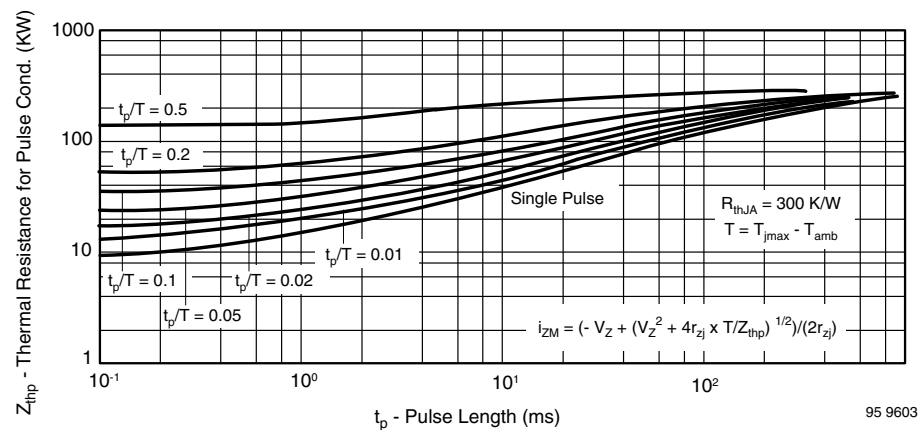
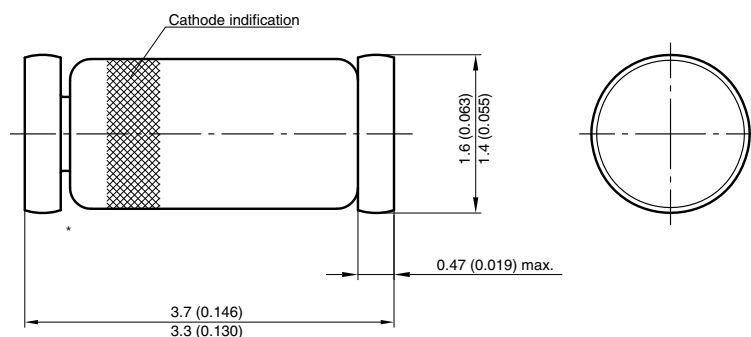


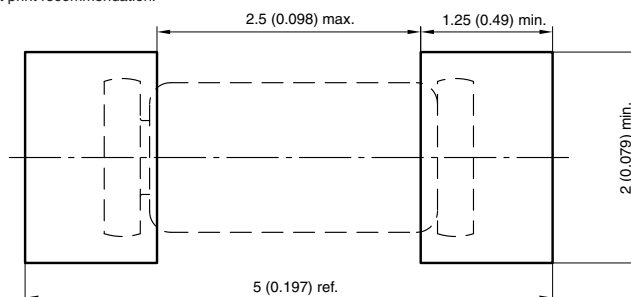
Figure 10. Thermal Response

Package Dimensions in millimeters (inches): MiniMELF SOD-80



* The gap between plug and glass can be either on cathode or anode side

Foot print recommendation:



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Rev. 8 - Date: 07.June.2006
96 12070



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