Small Signal Zener Diodes

FEATURES

- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- High reliability
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

HALOGEN FREE

APPLICATIONS

- Voltage stabilization

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V_Z range nom.	2.4 to 56	V
Test current I_{ZT}	5 to 20	mA
V_Z specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
TLZ-series	TLZ-series-GS18	10 000 (8 mm tape on 13" reel)	10 000/box
TLZ-series	TLZ-series-GS08	2500 (8 mm tape on 7" reel)	12 500/box

PACKAGE				
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
MiniMELF SOD-80	31 mg	-	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	$R_{thJA} \leq 300$ K/W	P_{tot}	500	mW
Zener current		I_Z	P_{tot}/V_Z	mA
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	°C
Storage temperature range		T_{stg}	-65 to +175	°C
Forward voltage (max.)	I_F = 200 mA	V_F	1.5	V

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE		TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE	
		V_Z at I_{ZT1}		I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}
		V		mA		µA	V	Ω	
		MIN.	MAX.			MAX.		MAX.	MAX.
TLZ2V4A	2A4	2.33	2.52	20	1	70	1	100	2000
TLZ2V4B	2B4	2.43	2.63	20	1	70	1	100	2000
TLZ2V7A	2A7	2.54	2.75	20	1	50	1	100	1000
TLZ2V7B	2B7	2.69	2.91	20	1	50	1	100	1000
TLZ3V0A	3A0	2.85	3.07	20	1	50	1	80	1000
TLZ3V0B	3B0	3.01	3.22	20	1	10	1	80	1000
TLZ3V3A	3A3	3.16	3.38	20	1	10	1	70	1000
TLZ3V3B	3B3	3.32	3.53	20	1	10	1	70	1000
TLZ3V6A	3A6	3.455	3.695	20	1	5	1	60	1000
TLZ3V6B	3B6	3.6	3.845	20	1	5	1	60	1000
TLZ3V9A	3A9	3.74	4.01	20	1	3	1	50	1000
TLZ3V9B	3B9	3.89	4.16	20	1	3	1	50	1000
TLZ4V3A	4A3	4.04	4.29	20	1	3	1	40	1000
TLZ4V3B	4B3	4.17	4.43	20	1	3	1	40	1000
TLZ4V3C	4C3	4.3	4.57	20	1	3	1	40	1000
TLZ4V7A	4A7	4.44	4.68	20	1	5	1	25	900
TLZ4V7B	4B7	4.55	4.8	20	1	5	1	25	900
TLZ4V7C	4C7	4.68	4.93	20	1	5	1	25	900
TLZ5V1A	5A1	4.81	5.07	20	1	2	2	20	800
TLZ5V1B	5B1	4.94	5.2	20	1	2	2	20	800
TLZ5V1C	5C1	5.09	5.37	20	1	2	2	20	800
TLZ5V6A	5A6	5.28	5.55	20	1	1	2	13	500
TLZ5V6B	5B6	5.45	5.73	20	1	1	2	13	500
TLZ5V6C	5C6	5.61	5.91	20	1	1	2	13	500
TLZ6V2A	6A2	5.78	6.09	20	1	3	4	10	300
TLZ6V2B	6B2	5.96	6.27	20	1	3	4	10	300
TLZ6V2C	6C2	6.12	6.44	20	1	3	4	10	300
TLZ6V8A	6A8	6.29	6.63	20	0.5	2	4	8	150
TLZ6V8B	6B8	6.49	6.83	20	0.5	2	4	8	150
TLZ6V8C	6C8	6.66	7.01	20	0.5	2	4	8	150
TLZ7V5A	7A5	6.85	7.22	20	0.5	3	6.5	8	120
TLZ7V5B	7B5	7.07	7.45	20	0.5	3	6.73	8	120
TLZ7V5C	7C5	7.29	7.67	20	0.5	3	6.93	8	120
TLZ8V2A	8A2	7.53	7.92	20	0.5	7.5	7.15	8	120
TLZ8V2B	8B2	7.78	8.19	20	0.5	7.5	7.39	8	120
TLZ8V2C	8C2	8.03	8.45	20	0.5	7.5	7.63	8	120
TLZ9V1A	9A1	8.29	8.73	20	0.5	0.04	7.88	8	120
TLZ9V1B	9B1	8.57	9.01	20	0.5	0.04	8.14	8	120
TLZ9V1C	9C1	8.83	9.3	20	0.5	0.04	8.39	8	120
TLZ10A	10A	9.12	9.59	20	0.5	0.04	8.66	8	120
TLZ10B	10B	9.41	9.9	20	0.5	0.04	8.94	8	120
TLZ10C	10C	9.7	10.2	20	0.5	0.04	9.22	8	120
TLZ10D	10D	9.94	10.44	20	0.5	0.04	9.44	8	120

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE		TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE	
		V_Z at I_{ZT1}		I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}
		V		mA		µA	V	Ω	
		MIN.	MAX.			MAX.		MAX.	MAX.
TLZ11A	11A	10.18	10.71	10	0.5	0.04	9.67	10	120
TLZ11B	11B	10.5	11.05	10	0.5	0.04	9.98	10	120
TLZ11C	11C	10.82	11.38	10	0.5	0.04	10.28	10	120
TLZ12A	12A	11.13	11.71	10	0.5	0.04	10.6	12	110
TLZ12B	12B	11.44	12.03	10	0.5	0.04	10.9	12	110
TLZ12C	12C	11.74	12.35	10	0.5	0.04	11.2	12	110
TLZ13A	13A	12.11	12.75	10	0.5	0.04	11.5	14	110
TLZ13B	13B	12.55	13.21	10	0.5	0.04	11.9	14	110
TLZ13C	13C	12.99	13.66	10	0.5	0.04	12.3	14	110
TLZ15A	15A	13.44	14.13	10	0.5	0.04	12.8	16	110
TLZ15B	15B	13.89	14.62	10	0.5	0.04	13.2	16	110
TLZ15C	15C	14.35	15.09	10	0.5	0.04	13.6	16	110
TLZ16A	16A	14.8	15.57	10	0.5	0.04	14.1	18	150
TLZ16B	16B	15.25	16.04	10	0.5	0.04	14.5	18	150
TLZ16C	16C	15.69	16.51	10	0.5	0.04	14.9	18	150
TLZ18A	18A	16.22	17.06	10	0.5	0.04	15.4	23	150
TLZ18B	18B	16.82	17.7	10	0.5	0.04	16	23	150
TLZ18C	18C	17.42	18.33	10	0.5	0.04	16.5	23	150
TLZ20A	20A	18.02	18.96	10	0.5	0.04	17.1	28	200
TLZ20B	20B	18.63	19.59	10	0.5	0.04	17.7	28	200
TLZ20C	20C	19.23	20.22	10	0.5	0.04	18.3	28	200
TLZ20D	20D	19.72	20.72	10	0.5	0.04	18.7	28	200
TLZ22A	22A	20.15	21.2	5	0.5	0.04	19.1	30	200
TLZ22B	22B	20.64	21.71	5	0.5	0.04	19.6	30	200
TLZ22C	22C	21.08	22.17	5	0.5	0.04	20	30	200
TLZ22D	22D	21.52	22.63	5	0.5	0.04	20.4	30	200
TLZ24A	24A	22.05	23.18	5	0.5	0.04	20.9	35	200
TLZ24B	24B	22.61	23.77	5	0.5	0.04	21.5	35	200
TLZ24C	24C	23.12	24.31	5	0.5	0.04	22	35	200
TLZ24D	24D	23.63	24.85	5	0.5	0.04	22.4	35	200
TLZ27A	27A	24.26	25.52	5	0.5	0.04	23	45	250
TLZ27B	27B	24.97	26.26	5	0.5	0.04	23.7	45	250
TLZ27C	27C	25.63	26.95	5	0.5	0.04	24.3	45	250
TLZ27D	27D	26.29	27.64	5	0.5	0.04	25	45	250
TLZ30A	30A	26.99	28.39	5	0.5	0.04	25.6	55	250
TLZ30B	30B	27.7	29.13	5	0.5	0.04	26.3	55	250
TLZ30C	30C	28.36	29.82	5	0.5	0.04	26.9	55	250
TLZ30D	30D	29.02	30.51	5	0.5	0.04	27.6	55	250
TLZ33A	33A	29.68	31.22	5	0.5	0.04	28.2	65	250
TLZ33B	33B	30.32	31.88	5	0.5	0.04	28.8	65	250
TLZ33C	33C	30.9	32.5	5	0.5	0.04	29.4	65	250
TLZ33D	33D	31.49	33.11	5	0.5	0.04	29.9	65	250
TLZ36A	36A	32.14	33.79	5	0.5	0.04	30.5	75	250
TLZ36B	36B	32.79	34.49	5	0.5	0.04	31.2	75	250
TLZ36C	36C	33.4	35.13	5	0.5	0.04	31.7	75	250
TLZ36D	36D	34.01	35.77	5	0.5	0.04	32.3	75	250

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)									
PART NUMBER	**MARKING CODE**	**ZENER VOLTAGE RANGE**		**TEST CURRENT**		**REVERSE LEAKAGE CURRENT**		**DYNAMIC RESISTANCE**	
		V_Z at I_{ZT1}		I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}
		V		mA		µA	V	Ω	
		MIN.	MAX.			MAX.		MAX.	MAX.
TLZ39A	39A	34.68	36.47	5	0.5	0.04	32.9	85	250
TLZ39B	39B	35.36	37.19	5	0.5	0.04	33.6	85	250
TLZ39C	39C	36	37.85	5	0.5	0.04	34.2	85	250
TLZ39D	39D	36.63	38.52	5	0.5	0.04	34.8	85	250
TLZ39E	39E	37.36	39.29	5	0.5	0.04	35.5	85	250
TLZ39F	39F	38.14	40.11	5	0.5	0.04	36.2	85	250
TLZ39G	39G	38.94	40.8	5	0.5	0.04	37	85	250
TLZ43	43	40	45	5	-	0.04	38	90	-
TLZ47	47	44	49	5	-	0.04	41.8	90	-
TLZ51	51	48	54	5	-	0.04	45.6	100	-
TLZ56	56	53	60	5	-	0.04	50.4	100	-

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

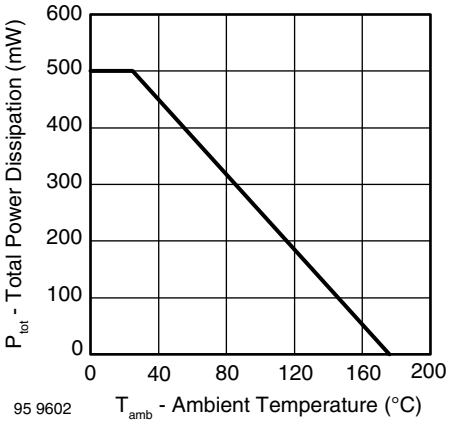


Fig. 1 - Total Power Dissipation vs. Ambient Temperature

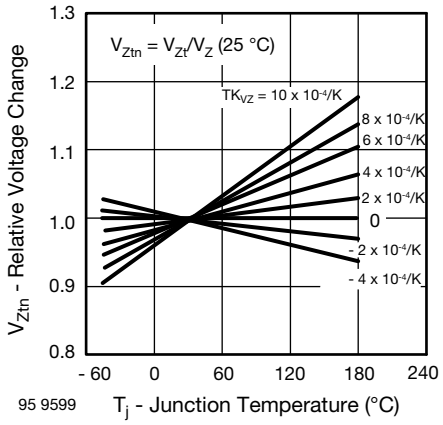


Fig. 3 - Typical Change of Working Voltage vs. Junction Temperature

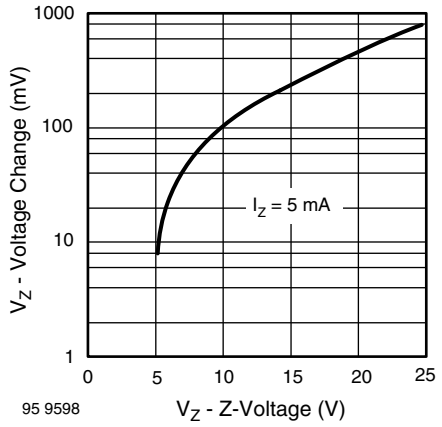


Fig. 2 - Typical Change of Working Voltage under Operating Conditions at T_{amb} = 25 °C

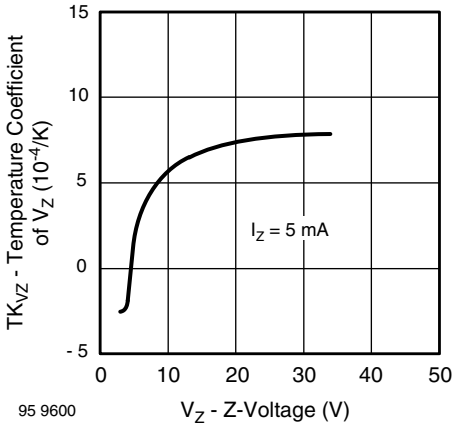


Fig. 4 - Temperature Coefficient of V_Z vs. Z-Voltage

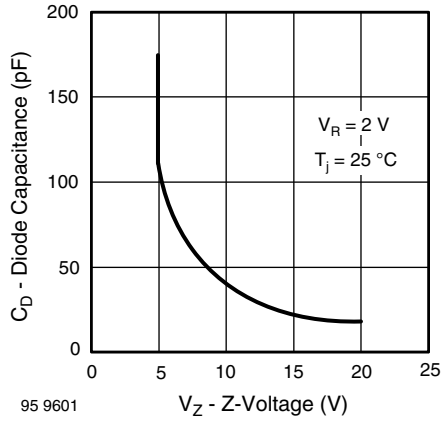


Fig. 5 - Diode Capacitance vs. Z-Voltage

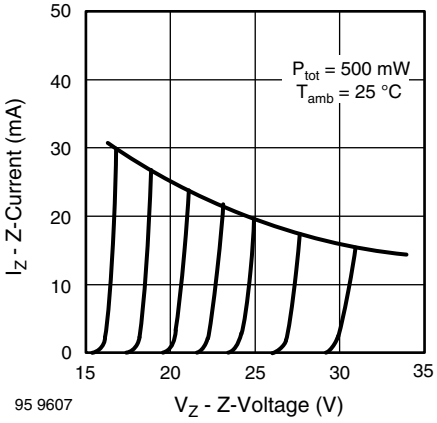


Fig. 8 - Z-Current vs. Z-Voltage

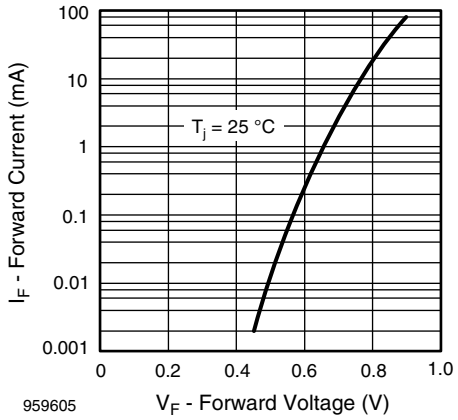


Fig. 6 - Forward Current vs. Forward Voltage

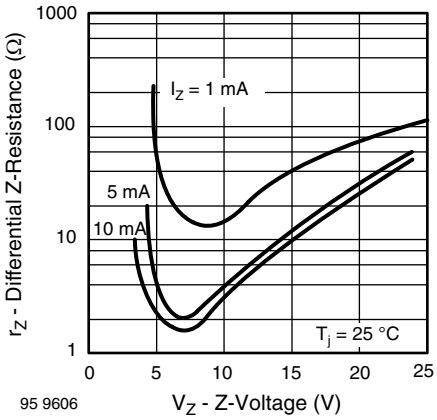


Fig. 9 - Differential Z-Resistance vs. Z-Voltage

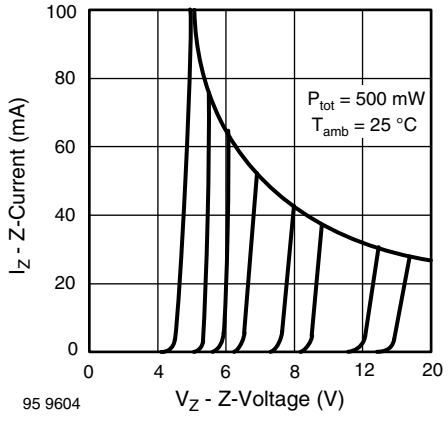


Fig. 7 - Z-Current vs. Z-Voltage

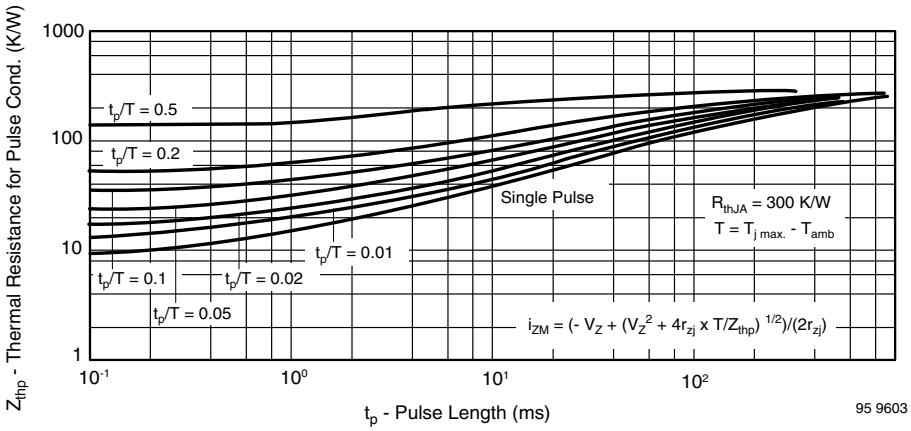
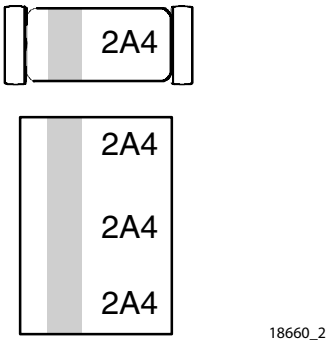


Fig. 10 - Thermal Response

MARKING VOLTAGE GROUP

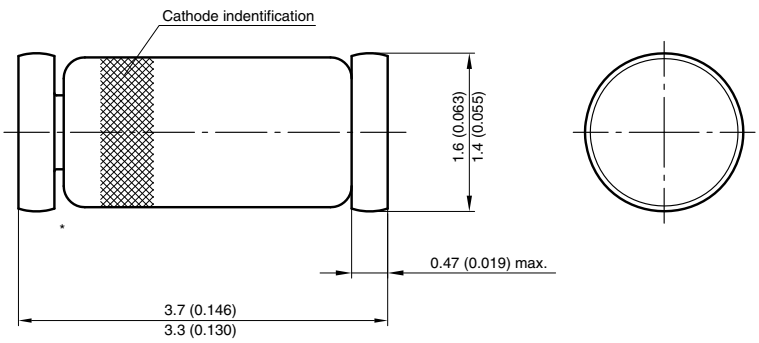
TLZ2V4A



Remark

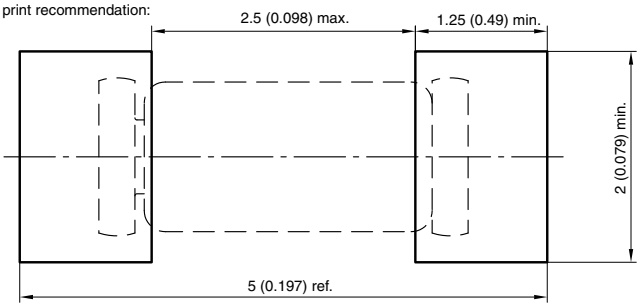
The Zener voltage group TLZ2V4A is printed with max 3 digits 3 times on the surface. The marking should be readable at minimum 2 times. The third print is allowed to be incomplete due to tolerances in diameter of the glass body.

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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