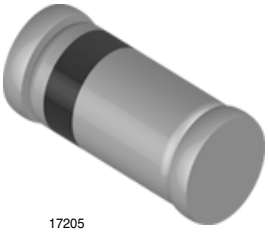
Small Signal Zener Diodes

Features

- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- High reliability
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC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Applications

- Voltage stabilization

Mechanical Data

Case: MiniMELF Glass case SOD80
Weight: approx. 31 mg
Packaging codes/ options:
GS18 / 10 k per 13" reel (8 mm tape), 10 k/box
GS08 / 2.5 k per 7" reel (8 mm tape), 12.5 k/box

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
Z-current		I_Z	P_{tot}/V_Z	mA
Junction temperature		T_j	175	°C
Storage temperature range		T_{stg}	- 65 to + 175	°C

Thermal Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Junction to ambient air	on PC board 50 mm x 50 mm x 1.6 mm	R_{thJA}	500	K/W

Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	I_F = 200 mA	V_F			1.5	V

Electrical Characteristics

Part-number-group	Part-number	Marking Code	Zener Voltage		Dynamic Resistance		Test Current		Reverse Leakage Current	
			V_Z at I_{ZT}		Z_Z at I_{ZT}	Z_{ZK} at I_{ZK}	I_{ZT}	I_{ZK}	I_R at V_R	
			V	V	Ω	Ω	mA	mA	µA	V
			min	max	max	max			max	
TLZ2V4	TLZ2V4A	2A4	2.33	2.52	100	2000	20	1	70	1
	TLZ2V4B	2B4	2.43	2.63	100	2000	20	1	70	1
TLZ2V7	TLZ2V7A	2A7	2.54	2.75	100	1000	20	1	50	1
	TLZ2V7B	2B7	2.69	2.91	100	1000	20	1	50	1
TLZ3V0	TLZ3V0A	3A0	2.85	3.07	80	1000	20	1	50	1
	TLZ3V0B	3B0	3.01	3.22	80	1000	20	1	10	1
TLZ3V3	TLZ3V3A	3A3	3.16	3.38	70	1000	20	1	10	1
	TLZ3V3B	3B3	3.32	3.53	70	1000	20	1	10	1
TLZ3V6	TLZ3V6A	3A6	3.455	3.695	60	1000	20	1	5	1
	TLZ3V6B	3B6	3.6	3.845	60	1000	20	1	5	1
TLZ3V9	TLZ3V9A	3A9	3.74	4.01	50	1000	20	1	3	1
	TLZ3V9B	3B9	3.89	4.16	50	1000	20	1	3	1
TLZ4V3	TLZ4V3A	4A3	4.04	4.29	40	1000	20	1	3	1
	TLZ4V3B	4B3	4.17	4.43	40	1000	20	1	3	1
	TLZ4V3C	4C3	4.3	4.57	40	1000	20	1	3	1
TLZ4V7	TLZ4V7A	4A7	4.44	4.68	25	900	20	1	10	2
	TLZ4V7B	4B7	4.55	4.8	25	900	20	1	6	2
	TLZ4V7C	4C7	4.68	4.93	25	900	20	1	3	2
TLZ5V1	TLZ5V1A	5A1	4.81	5.07	20	800	20	1	2	2
	TLZ5V1B	5B1	4.94	5.2	20	800	20	1	2	2
	TLZ5V1C	5C1	5.09	5.37	20	800	20	1	2	2
TLZ5V6	TLZ5V6A	5A6	5.28	5.55	13	500	20	1	1	2
	TLZ5V6B	5B6	5.45	5.73	13	500	20	1	1	2
	TLZ5V6C	5C6	5.61	5.91	13	500	20	1	1	2
TLZ6V2	TLZ6V2A	6A2	5.78	6.09	10	300	20	1	3	4
	TLZ6V2B	6B2	5.96	6.27	10	300	20	1	3	4
	TLZ6V2C	6C2	6.12	6.44	10	300	20	1	3	4
TLZ6V8	TLZ6V8A	6A8	6.29	6.63	8	150	20	0.5	2	4
	TLZ6V8B	6B8	6.49	6.83	8	150	20	0.5	2	4
	TLZ6V8C	6C8	6.66	7.01	8	150	20	0.5	2	4
TLZ7V5	TLZ7V5A	7A5	6.85	7.22	8	120	20	0.5	3	6.5
	TLZ7V5B	7B5	7.07	7.45	8	120	20	0.5	3	6.73
	TLZ7V5C	7C5	7.29	7.67	8	120	20	0.5	3	6.93
TLZ8V2	TLZ8V2A	8A2	7.53	7.92	8	120	20	0.5	7.5	7.15
	TLZ8V2B	8B2	7.78	8.19	8	120	20	0.5	7.5	7.39
	TLZ8V2C	8C2	8.03	8.45	8	120	20	0.5	7.5	7.63
TLZ9V1	TLZ9V1A	9A1	8.29	8.73	8	120	20	0.5	0.04	7.88
	TLZ9V1B	9B1	8.57	9.01	8	120	20	0.5	0.04	8.14
	TLZ9V1C	9C1	8.83	9.3	8	120	20	0.5	0.04	8.39
TLZ10	TLZ10A	10A	9.12	9.59	8	120	20	0.5	0.04	8.66
	TLZ10B	10B	9.41	9.9	8	120	20	0.5	0.04	8.94
	TLZ10C	10C	9.7	10.2	8	120	20	0.5	0.04	9.22
	TLZ10D	10D	9.94	10.44	8	120	20	0.5	0.04	9.44

Part-number-group	Part-number	Marking Code	Zener Voltage		Dynamic Resistance		Test Current		Reverse Leakage Current	
			V_Z at I_{ZT}		Z_Z at I_{ZT}	Z_{ZK} at I_{ZK}	I_{ZT}	I_{ZK}	I_R at V_R	
			V	V	Ω	Ω	mA	mA	µA	V
			min	max	max	max			max	
TLZ11	TLZ11A	11A	10.18	10.71	10	120	10	0.5	0.04	9.67
	TLZ11B	11B	10.5	11.05	10	120	10	0.5	0.04	9.98
	TLZ11C	11C	10.82	11.38	10	120	10	0.5	0.04	10.28
TLZ12	TLZ12A	12A	11.13	11.71	12	110	10	0.5	0.04	10.6
	TLZ12B	12B	11.44	12.03	12	110	10	0.5	0.04	10.9
	TLZ12C	12C	11.74	12.35	12	110	10	0.5	0.04	11.2
TLZ13	TLZ13A	13A	12.11	12.75	14	110	10	0.5	0.04	11.5
	TLZ13B	13B	12.55	13.21	14	110	10	0.5	0.04	11.9
	TLZ13C	13C	12.99	13.66	14	110	10	0.5	0.04	12.3
TLZ15	TLZ15A	15A	13.44	14.13	16	110	10	0.5	0.04	12.8
	TLZ15B	15B	13.89	14.62	16	110	10	0.5	0.04	13.2
	TLZ15C	15C	14.35	15.09	16	110	10	0.5	0.04	13.6
TLZ16	TLZ16A	16A	14.8	15.57	18	150	10	0.5	0.04	14.1
	TLZ16B	16B	15.25	16.04	18	150	10	0.5	0.04	14.5
	TLZ16C	16C	15.69	16.51	18	150	10	0.5	0.04	14.9
TLZ18	TLZ18A	18A	16.22	17.06	23	150	10	0.5	0.04	15.4
	TLZ18B	18B	16.82	17.7	23	150	10	0.5	0.04	16
	TLZ18C	18C	17.42	18.33	23	150	10	0.5	0.04	16.5
TLZ20	TLZ20A	20A	18.02	18.96	28	200	10	0.5	0.04	17.1
	TLZ20B	20B	18.63	19.59	28	200	10	0.5	0.04	17.7
	TLZ20C	20C	19.23	20.22	28	200	10	0.5	0.04	18.3
	TLZ20D	20D	19.72	20.72	28	200	10	0.5	0.04	18.7
TLZ22	TLZ22A	22A	20.15	21.2	30	200	5	0.5	0.04	19.1
	TLZ22B	22B	20.64	21.71	30	200	5	0.5	0.04	19.6
	TLZ22C	22C	21.08	22.17	30	200	5	0.5	0.04	20
	TLZ22D	22D	21.52	22.63	30	200	5	0.5	0.04	20.4
TLZ24	TLZ24A	24A	22.05	23.18	35	200	5	0.5	0.04	20.9
	TLZ24B	24B	22.61	23.77	35	200	5	0.5	0.04	21.5
	TLZ24C	24C	23.12	24.31	35	200	5	0.5	0.04	22
	TLZ24D	24D	23.63	24.85	35	200	5	0.5	0.04	22.4
TLZ27	TLZ27A	27A	24.26	25.52	45	250	5	0.5	0.04	23
	TLZ27B	27B	24.97	26.26	45	250	5	0.5	0.04	23.7
	TLZ27C	27C	25.63	26.95	45	250	5	0.5	0.04	24.3
	TLZ27D	27D	26.29	27.64	45	250	5	0.5	0.04	25
TLZ30	TLZ30A	30A	26.99	28.39	55	250	5	0.5	0.04	25.6
	TLZ30B	30B	27.7	29.13	55	250	5	0.5	0.04	26.3
	TLZ30C	30C	28.36	29.82	55	250	5	0.5	0.04	26.9
	TLZ30D	30D	29.02	30.51	55	250	5	0.5	0.04	27.6
TLZ33	TLZ33A	33A	29.68	31.22	65	250	5	0.5	0.04	28.2
	TLZ33B	33B	30.32	31.88	65	250	5	0.5	0.04	28.8
	TLZ33C	33C	30.9	32.5	65	250	5	0.5	0.04	29.4
	TLZ33D	33D	31.49	33.11	65	250	5	0.5	0.04	29.9
TLZ36	TLZ36A	36A	32.14	33.79	75	250	5	0.5	0.04	30.5
	TLZ36B	36B	32.79	34.49	75	250	5	0.5	0.04	31.2
	TLZ36C	36C	33.4	35.13	75	250	5	0.5	0.04	31.7
	TLZ36D	36D	34.01	35.77	75	250	5	0.5	0.04	32.3

Part-number-group	Part-number	Marking Code	Zener Voltage		Dynamic Resistance		Test Current		Reverse Leakage Current	
			V_Z at I_{ZT}		Z_Z at I_{ZT}	Z_{ZK} at I_{ZK}	I_{ZT}	I_{ZK}	I_R at V_R	
			V	V	Ω	Ω	mA	mA	µA	V
			min	max	max	max			max	
TLZ39	TLZ39A	39A	34.68	36.47	85	250	5	0.5	0.04	32.9
	TLZ39B	39B	35.36	37.19	85	250	5	0.5	0.04	33.6
	TLZ39C	39C	36	37.85	85	250	5	0.5	0.04	34.2
	TLZ39D	39D	36.63	38.52	85	250	5	0.5	0.04	34.8
	TLZ39E	39E	37.36	39.29	85	250	5	0.5	0.04	35.5
	TLZ39F	39F	38.14	40.11	85	250	5	0.5	0.04	36.2
	TLZ39G	39G	38.94	40.8	85	250	5	0.5	0.04	37
TLZ43	TLZ43	43	40	45	90	-	5	-	0.04	38
TLZ47	TLZ47	47	44	49	90	-	5	-	0.04	41.8
TLZ51	TLZ51	51	48	54	100	-	5	-	0.04	45.6
TLZ56	TLZ56	56	53	60	100	-	5	-	0.04	50.4

Typical Characteristics

T_{amb} = 25 °C, unless otherwise specified

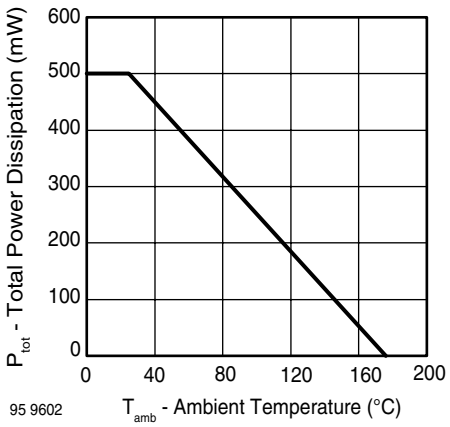


Figure 1. Total Power Dissipation vs. Ambient Temperature

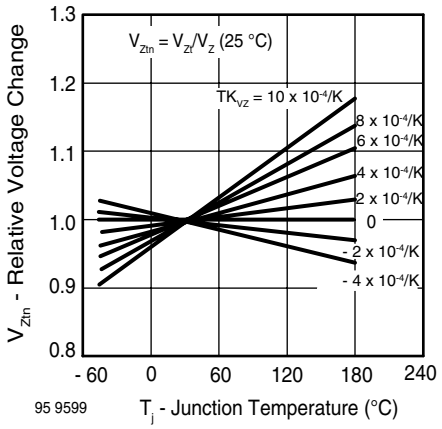


Figure 3. Typical Change of Working Voltage vs. Junction Temperature

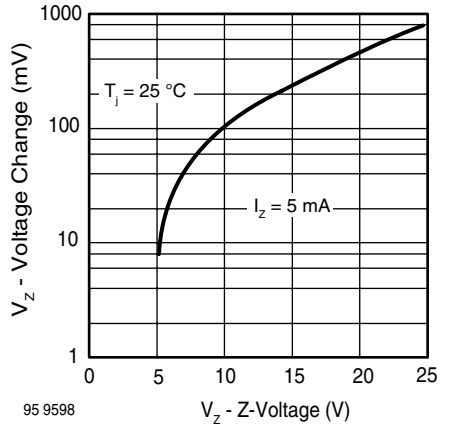


Figure 2. Typical Change of Working Voltage under Operating Conditions at T_{amb} = 25°C

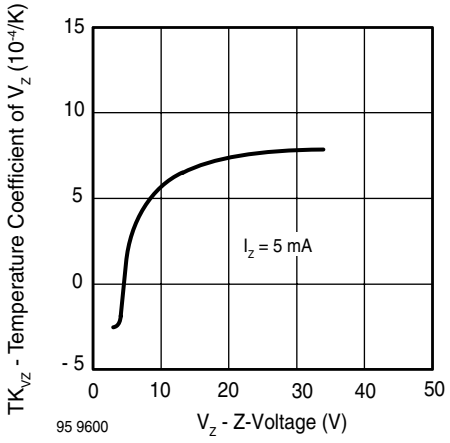


Figure 4. Temperature Coefficient of Vz vs. Z-Voltage

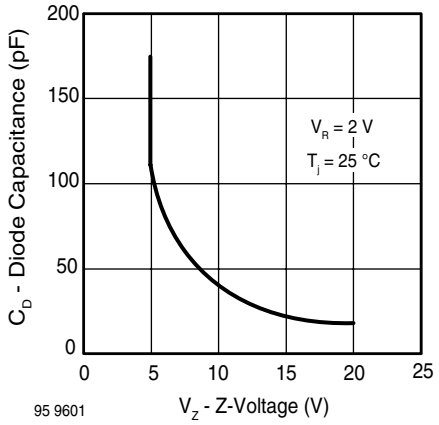


Figure 5. Diode Capacitance vs. Z-Voltage

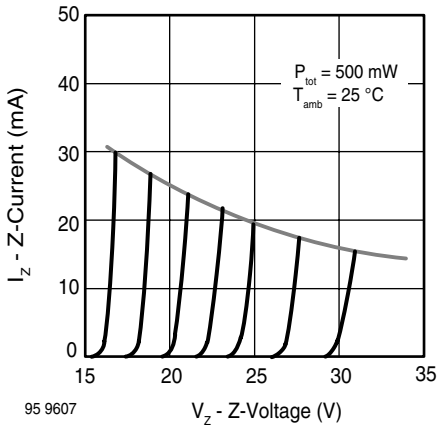


Figure 8. Z-Current vs. Z-Voltage

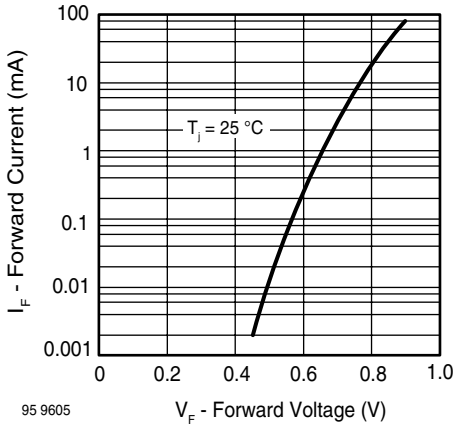


Figure 6. Forward Current vs. Forward Voltage

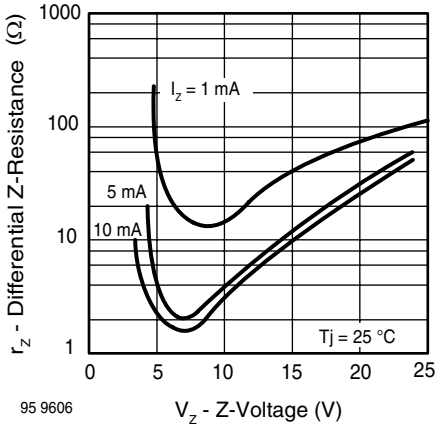


Figure 9. Differential Z-Resistance vs. Z-Voltage

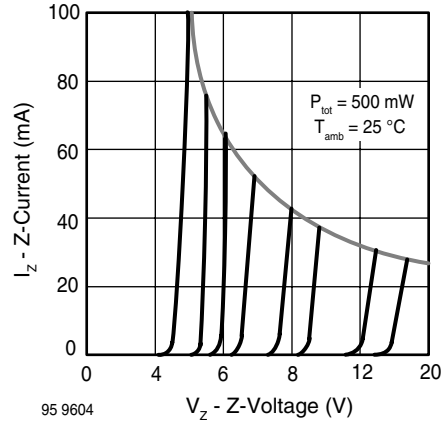


Figure 7. Z-Current vs. Z-Voltage

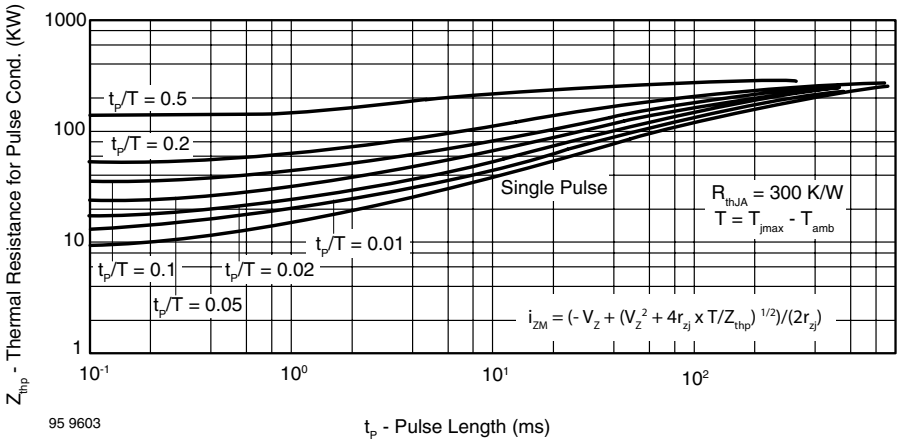
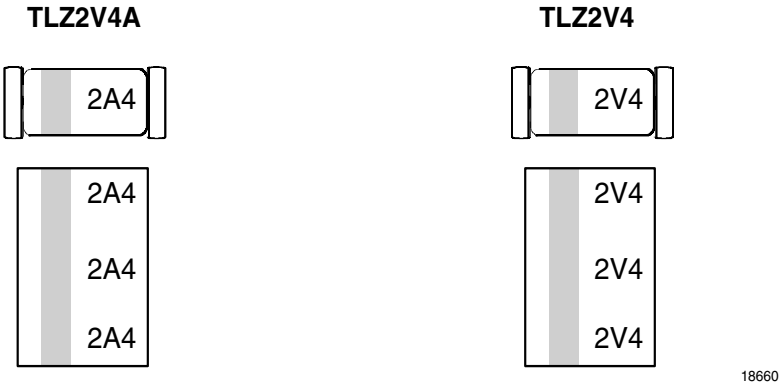


Figure 10. Thermal Response

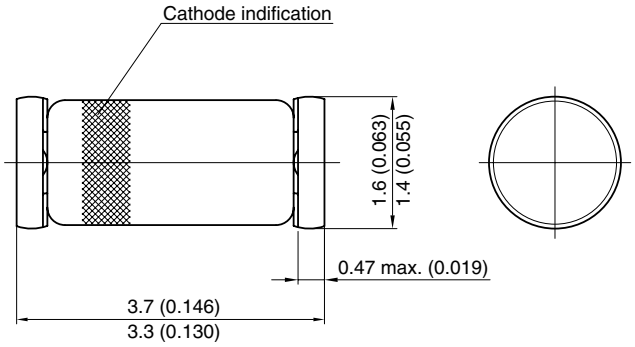
Marking Voltage Group

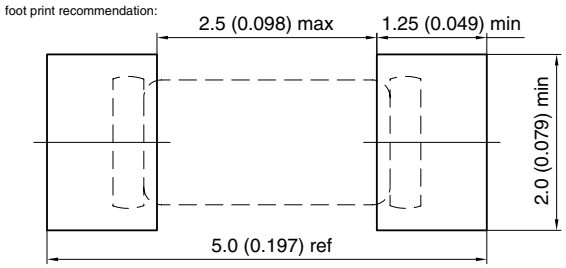


Remark:

The Zener voltage TLZ2V4 or Zener voltage group TLZ2V4A is printet 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 glassbody.

Package Dimensions in mm (Inches)





Document no.: 6.560-5005.01-4
Rev. 7 - Date: 07.February.2005
96 12070

Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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