

## Silicon Zener Diodes

### Features

- Silicon Planar Power Zener Diodes.
- Standard Zener voltage tolerance is  $\pm 5\%$  with a "B" suffix. Other tolerances are available upon request.
- These diodes are also available in MiniMELF case with the type designation TZM5221 ...TZM5267, SOT-23 case with the type designation MMBZ5225 ...MMBZ5267 and SOD-123 case with the types designation MMSZ5225 ... MMSZ5267



### Mechanical Data

**Case:** DO-35 Glass Case

**Weight:** approx. 130 mg

**Packaging codes/options:**

TAP / 10k per Ammopack (52 mm tape), 30k/box

TR / 10k per 13 " reel , 30k/box

### Applications

Voltage stabilization

### Absolute Maximum Ratings

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

Parameter	Test condition	Symbol	Value	Unit
Power dissipation	$T_L \leq 75\text{ }^{\circ}\text{C}$	$P_V$	500	mW
Z-current		$I_Z$	$P_V/V_Z$	mA
Junction temperature		$T_J$	200	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 65 to + 200	$^{\circ}\text{C}$

### Maximum Thermal Resistance

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

Parameter	Test condition	Symbol	Value	Unit
Junction ambient	$l = 9.5\text{ mm (3/8 " )}$ , $T_L = \text{constant}$	$R_{thJA}$	300	K/W

### Electrical Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	$I_F = 200\text{ mA}$	$V_F$			1.1	V

# 1N5221B to 1N5267B



Vishay Semiconductors

## Electrical Characteristics

1N5221B...1N5267B

Partnumber	Nominal Zener Voltage <sup>1)</sup> @ I <sub>ZT</sub> , V <sub>Z</sub>	Test Current I <sub>ZT</sub>	Maximum Dynamic Impedance <sup>1)</sup> Z <sub>ZT</sub> @ I <sub>ZT</sub>	Maximum Dynamic Impedance Z <sub>ZK</sub> @ I <sub>ZK</sub> = 0.25 mA	Typical Temperature of Coefficient α @ I <sub>ZT</sub>	Maximum Reverse Leakage Current	
						I <sub>R</sub>	V <sub>R</sub>
	V	mA	Ω	Ω	α (%/K)	μA	V
1N5221B	2.4	20	30	1200	-0.085	100	1
1N5222B	2.5	20	30	1250	-0.085	100	1
1N5223B	2.7	20	30	1300	-0.080	75	1
1N5224B	2.8	20	30	1400	-0.080	75	1
1N5225B	3	20	29	1600	-0.075	50	1
1N5226B	3.3	20	28	1600	-0.070	25	1
1N5227B	3.6	20	24	1700	-0.065	15	1
1N5228B	3.9	20	23	1900	-0.060	10	1
1N5229B	4.3	20	22	2000	+0.055	5	1
1N5230B	4.7	20	19	1900	+0.030	5	2
1N5231B	5.1	20	17	1600	+0.030	5	2
1N5232B	5.6	20	11	1600	+0.038	5	3
1N5233B	6	20	7	1600	+0.038	5	3.5
1N5234B	6.2	20	7	1000	+0.045	5	4
1N5235B	6.8	20	5	750	+0.050	3	5
1N5236B	7.5	20	6	500	+0.058	3	6
1N5237B	8.2	20	8	500	+0.062	3	6.5
1N5238B	8.7	20	8	600	+0.065	3	6.5
1N5239B	9.1	20	10	600	+0.068	3	7
1N5240B	10	20	17	600	+0.075	3	8
1N5241B	11	20	22	600	+0.076	2	8.4
1N5242B	12	20	30	600	+0.077	1	9.1
1N5243B	13	9.5	13	600	+0.079	0.5	9.9
1N5244B	14	9	15	600	+0.082	0.1	10
1N5245B	15	8.5	16	600	+0.082	0.1	11
1N5246B	16	7.8	17	600	+0.083	0.1	12
1N5247B	17	7.4	19	600	+0.084	0.1	13
1N5248B	18	7	21	600	+0.085	0.1	14
1N5249B	19	6.6	23	600	+0.086	0.1	14
1N5250B	20	6.2	25	600	+0.086	0.1	15
1N5251B	22	5.6	29	600	+0.087	0.1	17
1N5252B	24	5.2	33	600	+0.088	0.1	18
1N5253B	25	5	35	600	+0.089	0.1	19
1N5254B	27	4.6	41	600	+0.090	0.1	21
1N5255B	28	4.5	44	600	+0.091	0.1	21
1N5256B	30	4.2	49	600	+0.091	0.1	23
1N5257B	33	3.8	58	700	+0.092	0.1	25
1N5258B	36	3.4	70	700	+0.093	0.1	27
1N5259B	39	3.2	80	800	+0.094	0.1	30
1N5260B	43	3	93	900	+0.095	0.1	33
1N5261B	47	2.7	105	1000	+0.095	0.1	36
1N5262B	51	2.5	125	1100	+0.096	0.1	39
1N5263B	56	2.2	150	1300	+0.096	0.1	43
1N5264B	60	2.1	170	1400	+0.097	0.1	46

Partnumber	Nominal Zener Voltage <sup>1)</sup> @ $I_{ZT}$ , $V_Z$	Test Current $I_{ZT}$	Maximum Dynamic Impedance <sup>1)</sup> $Z_{ZT}$ @ $I_{ZT}$	Maximum Dynamic Impedance $Z_{ZK}$ @ $I_{ZK} = 0.25$ mA	Typical Temperature of Coefficient @ $I_{ZT}$	Maximum Reverse Leakage Current	
						$I_R$	$V_R$
	V	mA	$\Omega$	$\Omega$	$\alpha$ (%/K)	$\mu$ A	V
1N5265B	62	2	185	1400	+0.097	0.1	47
1N5266B	68	1.8	230	1600	+0.097	0.1	52
1N5267B	75	1.7	270	1700	+0.098	0.1	56

<sup>1)</sup> Based on dc-measurement at thermal equilibrium; lead length = 9.5 (3/8 "); thermal resistance of heat sink = 30 K/W

## Typical Characteristics ( $T_{amb} = 25^\circ\text{C}$ unless otherwise specified)

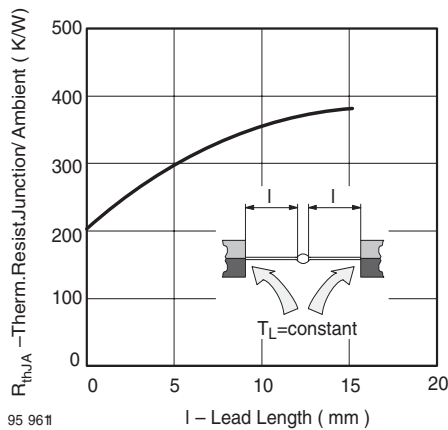


Figure 1. Thermal Resistance vs. Lead Length

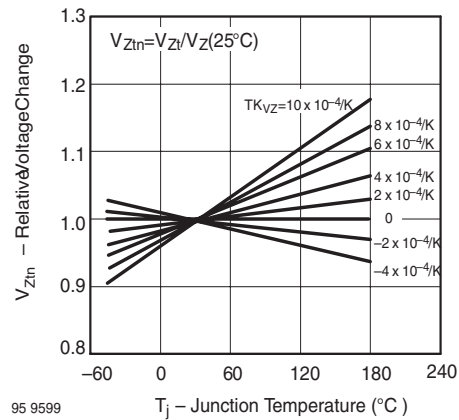


Figure 3. Typical Change of Working Voltage vs. Junction Temperature

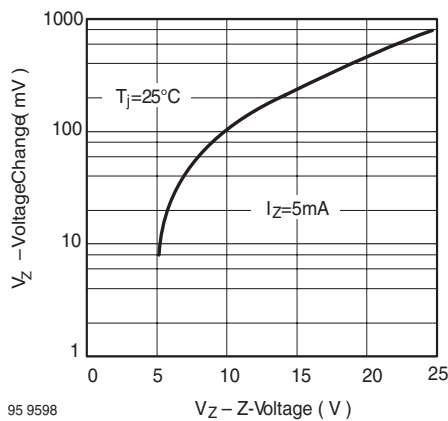


Figure 2. Typical Change of Working Voltage under Operating Conditions at  $T_{amb}=25^\circ\text{C}$

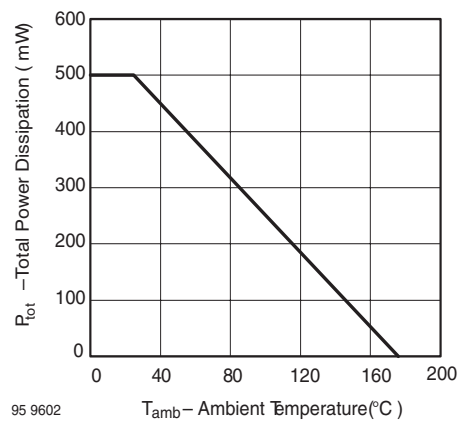


Figure 4. Total Power Dissipation vs. Ambient Temperature

# 1N5221B to 1N5267B



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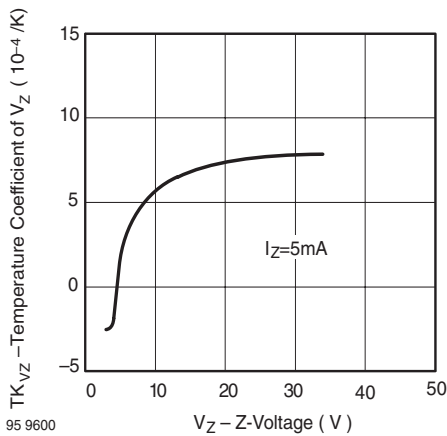


Figure 5. Temperature Coefficient of Vz vs. Z-Voltage

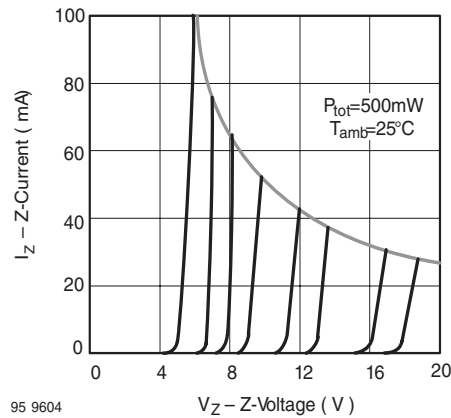


Figure 8. Z-Current vs. Z-Voltage

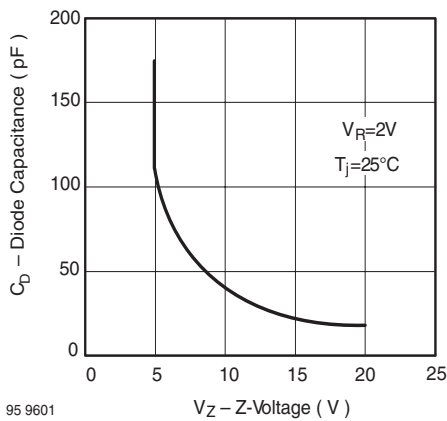


Figure 6. Diode Capacitance vs. Z-Voltage

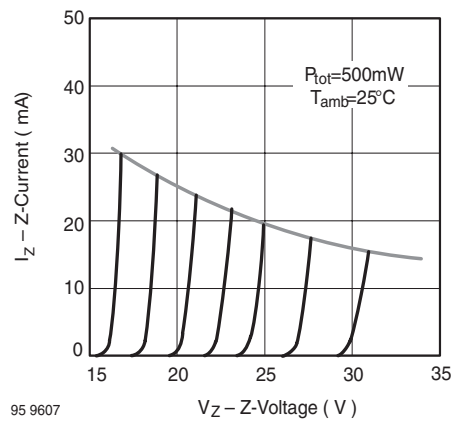


Figure 9. Z-Current vs. Z-Voltage

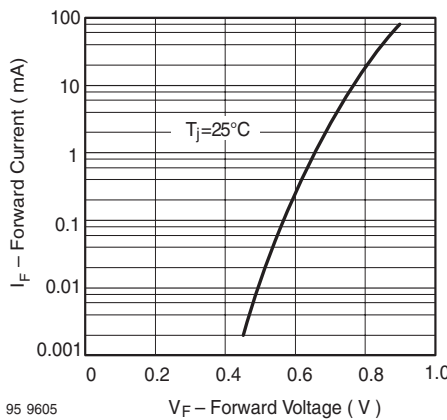


Figure 7. Forward Current vs. Forward Voltage

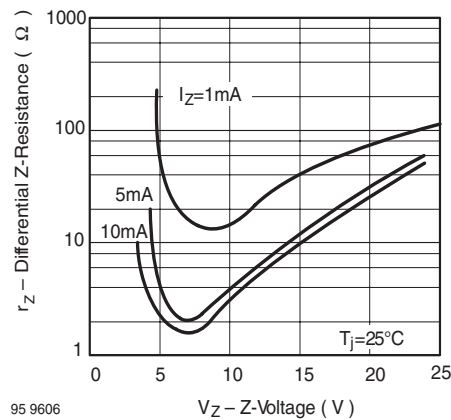


Figure 10. Differential Z-Resistance vs. Z-Voltage

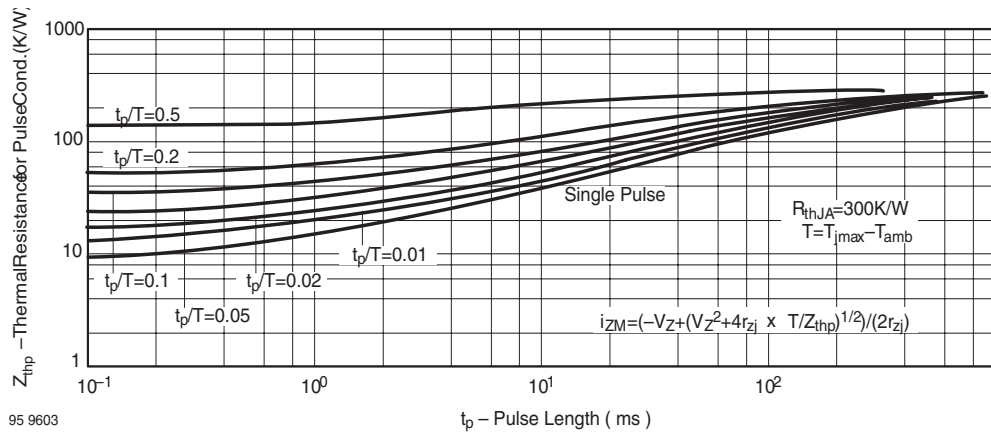
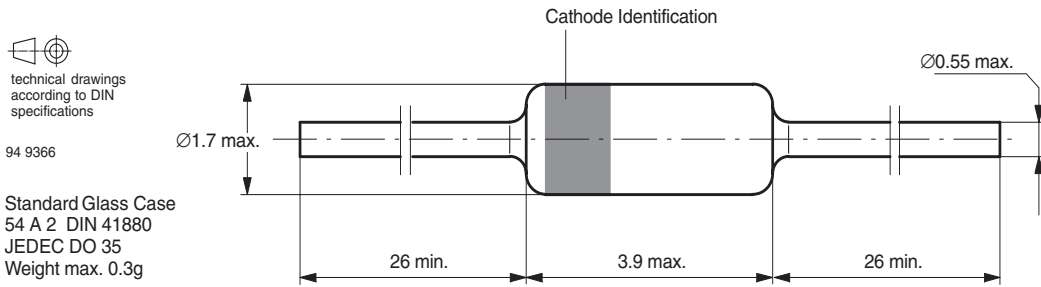


Figure 11. Thermal Response

## Package Dimensions in mm



## 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.

**We reserve the right to make changes to improve technical design  
and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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