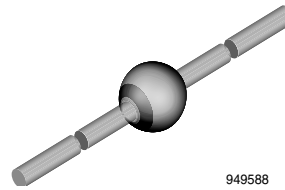


## Zener Diodes with Surge Current Specification

### Features

- Glass passivated junction
- Hermetically sealed package
- Clamping time in picoseconds
- Lead (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



949588

### Applications

Voltage regulators and transient suppression circuits

### Mechanical Data

**Case:** SOD-64 Sintered glass case

**Weight:** approx. 858 mg

**Packaging Codes/Options:**

TAP / 2.5 k Ammopack (52 mm tape), 12.5 k/box

TR / 2.5 k 10 " reel

### Absolute Maximum Ratings

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

Parameter	Test condition	Symbol	Value	Unit
Power dissipation	$I = 10\text{ mm}, T_L = 25\text{ }^{\circ}\text{C}$	$P_{diss}$	6.0	W
	$T_{amb} = 45\text{ }^{\circ}\text{C}$	$P_{diss}$	1.85	W
Repetitive peak reverse power dissipation		$P_{ZRM}$	20	W
Non repetitive peak surge power dissipation	$t_p = 100\text{ }\mu\text{s}, T_j = 25\text{ }^{\circ}\text{C}$	$P_{ZSM}$	1000	W
Junction temperature		$T_j$	175	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 65 to + 175	$^{\circ}\text{C}$

### Thermal Characteristics

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

Parameter	Test condition	Symbol	Value	Unit
Junction ambient	$I = 25\text{ mm}, T_L = \text{constant}$	$R_{thJA}$	30	K/W
	on PC board with spacing 37.5 mm	$R_{thJA}$	70	K/W

### Electrical Characteristics

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

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	$I_F = 1\text{ A}$	$V_F$			1.2	V

### Electrical Characteristics

BZW03C...

Partnumber	Zener Voltage Range			Dynamic Resistance		Test Current	Temperature Coefficient of Zener Voltage		Reverse Leakage Current		Clamping		Stand off	
	$V_Z @ I_Z$			$r_{zi}$ and $TK_{VZ} @ I_Z$		$I_Z$	$TC_{VZ} @ I_{ZT}$		$I_R @ V_R$		$V_{(CL)R}^{1)} @ I_{RMS}$		$I_R @ V_R^{2)}$	
	V			$\Omega$		mA	%/K		$\mu A$	V	V	A	$\mu A$	V
	min	typ	max	typ	max		min	max	max		max		max	
BZW03C6V8	6.4	6.8	7.2	0.7	1.5	175	0	0.07	2000	5.1	10.3	48.5	4000	5.6
BZW03C7V5	7.0	7.5	7.9	0.7	1.5	175	0	0.07	1500	5.6	11.3	44.2	3000	6.2
BZW03C8V2	7.7	8.2	8.7	0.8	1.5	150	0.03	0.08	1200	6.2	12.3	40.6	2400	6.8
BZW03C9V1	8.5	9.1	9.6	0.9	2	150	0.03	0.08	40	6.8	13.3	37.6	100	7.5
BZW03C10	9.4	10	10.6	1	2	125	0.05	0.09	20	7.5	14.8	34	40	8.2
BZW03C11	10.4	11	11.6	1.1	2.5	125	0.05	0.1	15	8.2	15.7	31.8	30	9.1
BZW03C12	11.4	12	12.7	1.1	2.5	100	0.05	0.1	10	9.1	17.0	29.4	20	10
BZW03C13	12.4	14	14.1	1.2	2.5	100	0.05	0.1	4	10	18.9	26.4	10	11
BZW03C15	13.8	15	15.6	1.2	2.5	75	0.05	0.1	2	11	20.9	23.9	10	12
BZW03C16	15.3	16	17.1	1.3	2.5	75	0.06	0.11	2	12	22.9	21.8	10	13
BZW03C18	16.8	18	19.1	1.3	2.5	65	0.06	0.11	2	13	25.6	19.5	10	15
BZW03C20	18.8	20	21.2	1.5	3	65	0.06	0.11	2	15	28.4	17.6	10	16
BZW03C22	20.8	22	23.3	1.6	3.5	50	0.06	0.11	2	16	31.0	16.1	10	18
BZW03C24	22.8	24	25.6	1.8	3.5	50	0.06	0.11	2	18	33.8	14.8	10	20
BZW03C27	25.1	27	28.9	2.5	5	50	0.06	0.11	2	20	38.1	13.1	10	22
BZW03C30	28	30	32	4	8	40	0.06	0.11	2	22	42.2	11.8	10	24
BZW03C33	31	33	35	5	10	40	0.06	0.11	2	24	46.2	10.8	10	27
BZW03C36	34	36	38	6	11	30	0.06	0.11	2	27	50.1	10	10	30
BZW03C39	37	39	41	7	14	30	0.06	0.11	2	30	54.1	9.2	10	33
BZW03C43	40	43	46	10	20	30	0.07	0.12	2	33	60.7	8.2	10	36
BZW03C47	44	47	50	12	25	25	0.07	0.12	2	36	65.5	7.6	10	39
BZW03C51	48	51	54	14	27	25	0.07	0.12	2	39	70.8	7.0	10	43
BZW03C56	52	56	60	18	35	20	0.07	0.12	2	43	78.6	6.3	10	47
BZW03C62	58	62	66	20	42	20	0.08	0.13	2	47	86.5	5.8	10	51
BZW03C68	64	68	72	22	44	20	0.08	0.13	2	51	94.4	5.3	10	56
BZW03C75	70	75	79	25	45	20	0.08	0.13	2	56	103.5	4.8	10	62
BZW03C82	77	82	87	30	65	15	0.08	0.13	2	62	114	4.3	10	68
BZW03C91	85	91	96	40	75	15	0.09	0.13	2	68	126	3.9	10	75
BZW03C100	94	100	106	45	90	12	0.09	0.13	2	75	139	3.6	10	82
BZW03C110	104	110	116	65	125	12	0.09	0.13	2	82	152	3.3	10	91
BZW03C120	114	120	127	90	170	10	0.09	0.13	2	91	167	3.0	10	100
BZW03C130	124	130	141	100	190	10	0.09	0.13	2	100	185	2.7	10	110
BZW03C150	138	150	156	150	330	8	0.09	0.13	2	110	204	2.4	10	120
BZW03C160	153	160	171	180	350	8	0.09	0.13	2	120	224	2.2	10	130
BZW03C180	168	180	191	210	430	5	0.09	0.13	2	130	249	2.0	10	150
BZW03C200	188	200	212	250	500	5	0.09	0.13	2	150	276	1.8	10	160
BZW03C220	208	220	233	350	700	5	0.09	0.13	2	160	305	1.6	10	180
BZW03C240	228	240	256	450	900	5	0.09	0.13	2	180	336	1.5	10	200
BZW03C270	251	270	289	600	1200	5	0.09	0.13	2	200	380	1.3	10	220

<sup>1)</sup> Exp. falling pulse,  $t_p = 500 \mu s$  down to 37 %

<sup>2)</sup> Stand-off reverse voltage = recommended supply voltage



## Electrical Characteristics

BZW03D...

Partnumber	Zener Voltage Range			Dynamic Resistance		Test Current	Temperature Coefficient of Zener Voltage		Reverse Leakage Current		Clamping		Stand off		
	$V_Z @ I_Z$			$r_{zj}$ and $TK_{VZ}@I_Z$			$I_{ZT}$	@ $I_{ZT}, TC_{VZ}$		$I_R @ V_R$		$V_{(CL)R}^1 @ I_{RMS}$		$I_R @ V_R^2$	
	V			$\Omega$			mA	%K		$\mu A$	V	V	A	$\mu A$	V
	min	typ	max	typ	typ			min	max	max		max		max	
BZW03D6V8	6.1	6.8	7.5	0.7	1.5	175	0	0.07	2000	4.8	10.6	48.5	4000	5.3	
BZW03D7V5	6.75	7.5	8.25	0.7	1.5	175	0	0.07	1500	5.3	11.7	44.2	3000	5.8	
BZW03D8V2	7.4	8.2	9	0.8	1.5	150	0.03	0.08	1200	5.8	12.6	40.6	2400	6.5	
BZW03D9V1	8.2	9.1	10	0.9	2	150	0.03	0.08	40	6.5	13.6	37.6	100	7.1	
BZW03D10	9	10	11	1	2	125	0.05	0.09	20	7.1	15.2	34	40	7.9	
BZW03D11	9.9	11	12.1	1.1	2.5	125	0.05	0.1	15	7.9	16.2	31.8	30	8.6	
BZW03D12	10.8	12	13.2	1.1	2.5	100	0.05	0.1	10	8.6	17.5	29.4	20	9.3	
BZW03D13	11.7	13	14.3	1.2	2.5	100	0.05	0.1	4	9.3	19.1	26.4	10	10.6	
BZW03D15	13.5	15	16.5	1.2	2.5	75	0.05	0.1	2	10.6	21.8	23.9	10	11.6	
BZW03D16	14.4	16	17.6	1.3	2.5	75	0.06	0.11	2	11.6	23.4	21.8	10	12.6	
BZW03D18	16.2	18	19.8	1.3	2.5	65	0.06	0.11	2	12.6	26.3	19.5	10	14.4	
BZW03D20	18	20	22	1.5	3	65	0.06	0.11	2	14.4	29.2	17.6	10	15.8	
BZW03D22	20.8	22	24.2	1.6	3.5	50	0.06	0.11	2	15.8	32	16.1	10	17.2	
BZW03D24	21.6	24	26.4	1.8	3.5	50	0.06	0.11	2	17.2	34.6	14.8	10	19.4	
BZW03D27	24.3	27	29.7	2.5	5	50	0.06	0.11	2	19.4	39	13.1	10	21.5	
BZW03D30	27	30	33	4	8	40	0.06	0.11	2	21.5	43.2	11.8	10	23.5	
BZW03D33	29.7	33	36.3	5	10	40	0.06	0.11	2	23.5	47	10.8	10	25.8	
BZW03D36	32.4	36	39.6	6	11	30	0.06	0.11	2	25.8	51.7	10	10	28	
BZW03D39	25.1	39	42.9	7	14	30	0.06	0.11	2	28	56	9.2	10	31	
BZW03D43	38.7	43	47.3	10	20	30	0.07	0.12	2	31	62	8.2	10	33.5	
BZW03D47	42.3	47	51.7	12	25	25	0.07	0.12	2	33.5	66.7	7.6	10	36.5	
BZW03D51	45.9	51	56.1	14	27	25	0.07	0.12	2	36.5	73	7.0	10	40	
BZW03D56	50.4	56	61.6	18	35	20	0.07	0.12	2	40	80.2	6.3	10	44.5	
BZW03D62	55.8	62	68.2	20	42	20	0.08	0.13	2	44.5	88.7	5.8	10	49	
BZW03D68	61.2	68	74.8	22	44	20	0.08	0.13	2	49	97.2	5.3	10	54	
BZW03D75	67.5	75	82.5	25	45	20	0.08	0.13	2	54	107	4.8	10	59	
BZW03D82	73.8	82	90.2	30	65	15	0.08	0.13	2	59	117	4.3	10	65	
BZW03D91	81.9	91	100	40	75	15	0.09	0.13	2	65	130	3.9	10	71	
BZW03D100	90	100	110	45	90	12	0.09	0.13	2	71	143	3.6	10	79	
BZW03D110	99	110	121	65	125	12	0.09	0.13	2	79	157	3.3	10	86	
BZW03D120	108	120	132	90	170	10	0.09	0.13	2	86	172	3.0	10	93	
BZW03D130	117	130	143	100	190	10	0.09	0.13	2	93	187	2.7	10	106	
BZW03D150	135	150	165	150	330	8	0.09	0.13	2	106	213	2.4	10	116	
BZW03D160	144	160	176	180	350	8	0.09	0.13	2	116	229	2.2	10	126	
BZW03D180	162	180	198	210	430	5	0.09	0.13	2	126	256	2.0	10	144	
BZW03D200	180	200	220	250	500	5	0.09	0.13	2	144	284	1.8	10	158	
BZW03D220	198	220	242	350	700	5	0.09	0.13	2	158	314	1.6	10	172	
BZW03D240	216	240	264	450	900	5	0.09	0.13	2	172	344	1.5	10	194	
BZW03D270	243	270	297	600	1200	5	0.09	0.13	2	194	388	1.3	10	215	

<sup>1)</sup> Exp. falling pulse,  $t_p = 500 \mu s$  down to 37 %

<sup>2)</sup> Stand-off reverse voltage = recommended supply voltage

## Typical Characteristics (T<sub>amb</sub> = 25 °C unless otherwise specified)

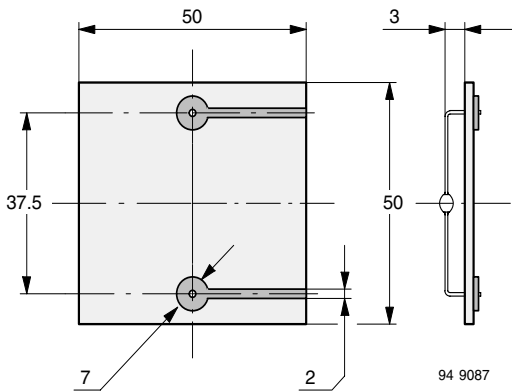


Figure 1. Epoxy Glass Hard Tissue, Board Thickness 1.5 mm,  $R_{thJA} \leq 70$  K/W

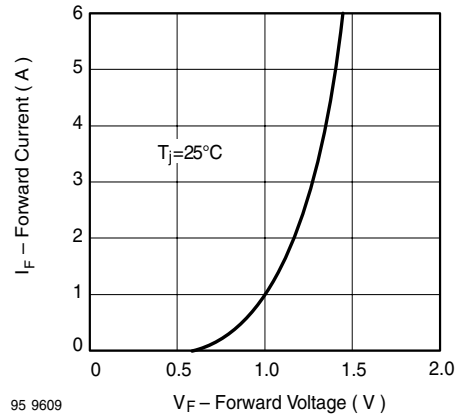


Figure 3. Forward Current vs. Forward Voltage

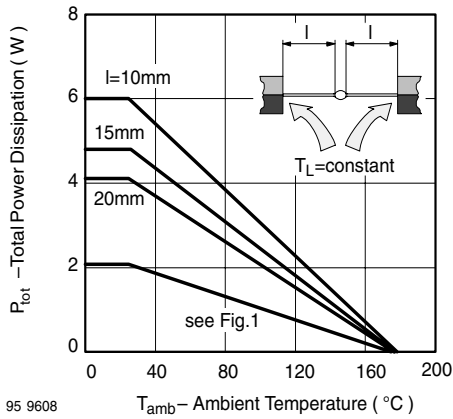


Figure 2. Total Power Dissipation vs. Ambient Temperature

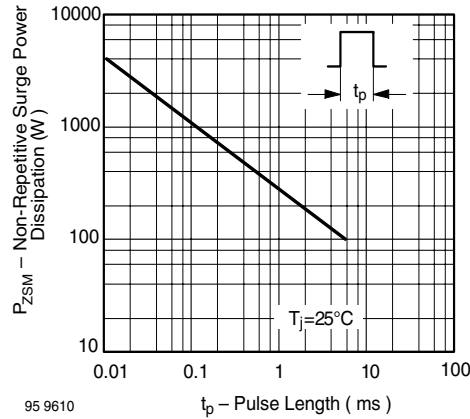
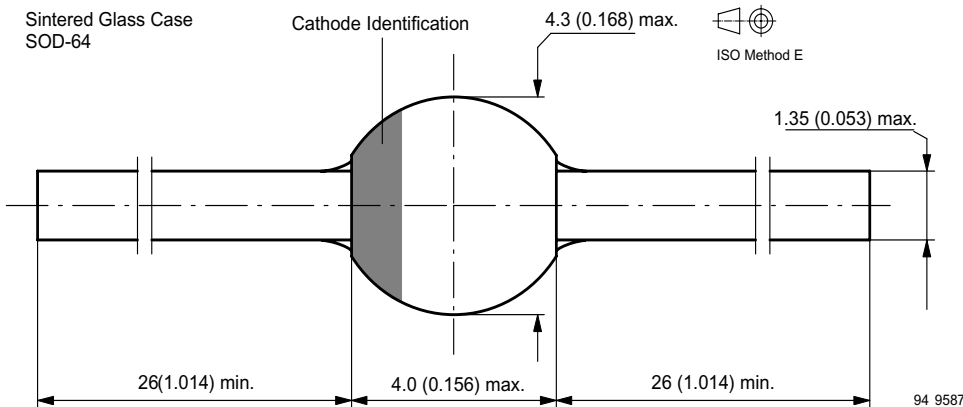


Figure 4. Non Repetitive Surge Power Dissipation vs. Pulse Length

## Package Dimensions in mm (Inches)





## 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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