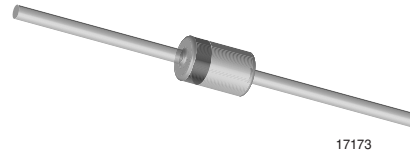


Zener Diodes

Features

- Silicon Planar Power Zener Diodes.
- For use in stabilizing and clipping circuits with high power rating.
- The Zener voltages are graded according to the international E 24 standard. Replace suffix "C" with "B" for $\pm 2\%$ tolerance. Other voltage tolerances and other Zener voltages are available upon request.



Applications

Voltage stabilization

Mechanical Data

Case: DO-41 Glass Case

Weight: approx. 350 mg

Packaging Codes/Options:

TR / 5 k per 13" reel (52 mm tape), 25 k/box

TAP / 5 k per ammo pack (52 mm tape), 25 k/box

Absolute Maximum Ratings

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

Parameter	Test condition	Symbol	Value	Unit
Zener current (see Table "Electrical Characteristics")				
Power dissipation		P_{tot}	1.3 ¹⁾	W

¹⁾ Valid provided that leads at a distance of 10 mm from case are kept at ambient temperature

Thermal Characteristics

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

Parameter	Test condition	Symbol	Value	Unit
Thermal resistance junction to ambient air		$R_{\theta JA}$	130 ¹⁾	$^{\circ}\text{C/W}$
Junction temperature		T_j	175	$^{\circ}\text{C}$
Storage temperature		T_s	- 55 to + 175	$^{\circ}\text{C}$

¹⁾ Valid provided that leads at a distance of 10 mm from case are kept at ambient temperature

Electrical Characteristics

Partnumber	Zener Voltage Range ¹⁾		Dynamic Resistance				Temperature Coefficient of Zener Voltage		Reverse Leakage Current		Admissible Zener current ²⁾	
	$V_Z @ I_{ZT}$		$r_{ZT}^{3)}$	@ I_{ZT}	$r_{ZK}^{3)}$	@ I_{ZK}	$\alpha_{VZ} @ I_Z = I_{ZT}$		@ I_R	@ V_R	I_Z	$I_{ZMS} @ t_p = 10 \text{ ms}$
	V		Ω	mA	Ω	mA	%/°C		μA	V	mA	mA
	min	max					min	max				
BZX85C2V7	2.5	2.9	< 20	80	< 400	1	-0.08	-0.05	< 150	1	360	3100
BZX85C3V0	2.8	3.2	< 20	80	< 400	1	-0.08	-0.05	< 100	1	330	2900
BZX85C3V3	3.1	3.5	< 20	80	< 400	1	-0.08	-0.05	< 40	1	300	2700
BZX85C3V6	3.4	3.8	< 20	60	< 500	1	-0.08	-0.05	< 20	1	290	2660
BZX85C3V9	3.7	4.1	< 15	60	< 500	1	-0.07	-0.02	< 10	1	280	2540
BZX85C4V3	4	4.6	< 13	50	< 500	1	-0.05	0.01	< 3	1	250	2440
BZX85C4V7	4.4	5	< 13	45	< 600	1	-0.03	0.04	< 3	1	215	2320
BZX85C5V1	4.8	5.4	< 10	45	< 500	1	-0.01	0.04	< 1	1.5	200	2200
BZX85C5V6	5.2	6	< 7	45	< 400	1	0	0.045	< 1	2	190	2080
BZX85C6V2	5.8	6.6	< 4	35	< 300	1	0.01	0.055	< 1	3	170	1960
BZX85C6V8	6.4	7.2	< 3.5	35	< 300	1	0.015	0.06	< 1	4	155	1800
BZX85C7V5	7	7.9	< 3	35	< 200	0.5	0.02	0.065	< 1	4.5	140	1620
BZX85C8V2	7.7	8.7	< 5	25	< 200	0.5	0.03	0.07	< 1	6.2	130	1520
BZX85C9V1	8.5	9.6	< 5	25	< 200	0.5	0.035	0.075	< 1	6.8	120	1340
BZX85C10	9.4	10.6	< 7	25	< 200	0.5	0.04	0.08	< 0.5	7.5	105	1200
BZX85C11	10.4	11.6	< 8	20	< 300	0.5	0.045	0.08	< 0.5	8.2	97	1100
BZX85C12	11.4	12.7	< 9	20	< 350	0.5	0.045	0.085	< 0.5	9.1	88	1000
BZX85C13	12.4	14.1	< 10	20	< 400	0.5	0.05	0.085	< 0.5	10	79	900
BZX85C15	13.8	15.6	< 10	15	< 500	0.5	0.055	0.09	< 0.5	11	71	760
BZX85C16	15.3	17.1	< 15	15	< 500	0.5	0.055	0.09	< 0.5	12	66	700
BZX85C18	16.8	19.1	< 20	15	< 500	0.5	0.06	0.09	< 0.5	13	62	600
BZX85C20	18.8	21.2	< 24	10	< 600	0.5	0.06	0.09	< 0.5	15	56	540
BZX85C22	20.8	23.3	< 25	10	< 600	0.5	0.06	0.095	< 0.5	16	52	500
BZX85C24	22.8	25.6	< 25	10	< 600	0.5	0.06	0.095	< 0.5	18	47	450
BZX85C27	25.1	28.9	< 30	8	< 750	0.25	0.06	0.095	< 0.5	20	41	400
BZX85C30	28	32	< 30	8	< 1000	0.25	0.06	0.095	< 0.5	22	36	380
BZX85C33	31	35	< 35	8	< 1000	0.25	0.06	0.095	< 0.5	24	33	350
BZX85C36	34	38	< 40	8	< 1000	0.25	0.06	0.095	< 0.5	27	30	320
BZX85C39	37	41	< 50	6	< 1000	0.25	0.06	0.095	< 0.5	30	28	296
BZX85C43	40	46	< 50	6	< 1000	0.25	0.06	0.095	< 0.5	33	26	270
BZX85C47	44	50	< 90	4	< 1500	0.25	0.06	0.095	< 0.5	36	23	246
BZX85C51	48	54	< 115	4	< 1500	0.25	0.06	0.095	< 0.5	39	21	226
BZX85C56	52	60	< 120	4	< 2000	0.25	0.06	0.095	< 0.5	43	19	208
BZX85C62	58	66	< 125	4	< 2000	0.25	0.06	0.095	< 0.5	47	16	186
BZX85C68	64	72	< 130	4	< 2000	0.25	0.055	0.095	< 0.5	51	15	171
BZX85C75	70	80	< 135	4	< 2000	0.25	0.055	0.095	< 0.5	56	14	161
BZX85C82	77	87	< 200	2.7	< 3000	0.25	0.055	0.095	< 0.5	62	12	141
BZX85C91	85	96	< 250	2.7	< 3000	0.25	0.055	0.095	< 0.5	68	10	127
BZX85C100	96	106	< 350	2.7	< 3000	0.25	0.055	0.095	< 0.5	75	9.4	116
BZX85C110	104	116	< 450	2.7	< 4000	0.25	0.055	0.095	< 0.5	82	8.6	105
BZX85C120	114	127	< 550	2	< 4500	0.25	0.055	0.095	< 0.5	91	7.8	96
BZX85C130	124	141	< 700	2	< 5000	0.25	0.055	0.095	< 0.5	100	7	89
BZX85C150	138	156	< 1000	2	< 6000	0.25	0.055	0.095	< 0.5	110	6.4	77



BZX85 Series

Vishay Semiconductors

Partnumber	Zener Voltage Range ¹⁾		Dynamic Resistance				Temperature Coefficient of Zener Voltage		Reverse Leakage Current		Admissible Zener current ²⁾	
	$V_Z @ I_{ZT}$		$r_{ZT}^{3)}$	@ I_{ZT}	$r_{ZK}^{3)}$	@ I_{ZK}	$\alpha_{VZ} @ I_Z = I_{ZT}$		@ I_R	@ V_R	I_Z	$I_{ZMS} @ t_p = 10 \text{ ms}$
	V		Ω	mA	Ω	mA	%/°C		μA	V	mA	mA
	min	max					min	max				
BZX85C160	153	171	< 1100	1.5	< 6500	0.25	0.055	0.095	< 0.5	120	5.8	72
BZX85C180	168	191	< 1200	1.5	< 7000	0.25	0.055	0.095	< 0.5	130	5.2	64
BZX85C200	188	212	< 1500	1.5	< 8000	0.25	0.055	0.095	< 0.5	150	4.7	58

¹⁾ Measured with pulses $t_p = 5 \text{ ms}$

²⁾ Valid provided that leads are kept at ambient temperature at a distance of 10 mm from case

³⁾ Measured with $f = 1 \text{ kHz}$

Electrical Characteristics

Partnumber	Zener Voltage Range ¹⁾		Dynamic Resistance				Temperature Coefficient of Zener Voltage		Reverse Leakage Current		Admissible Zener current ²⁾	
	V _Z @ I _{ZT}		r _{ZT} ³⁾	@ I _{ZT}	r _{ZK} ³⁾	@ I _{ZK}	α _{VZ} @ I _Z = I _{ZT}		@ I _R	@ V _R	I _Z	I _{ZMS} @ t _p = 10 ms
	V		Ω	mA	Ω	mA	%/°C		μA	mA		mA
	min	max					min	max				
BZX85B2V7	2.64	2.76	< 20	80	< 400	1	-0.08	-0.05	< 150	1	360	3100
BZX85B3V0	2.94	3.06	< 20	80	< 400	1	-0.08	-0.05	< 100	1	330	2900
BZX85B3V3	2.94	3.36	< 20	80	< 400	1	-0.08	-0.05	< 40	1	300	2700
BZX85B3V6	3.53	3.67	< 15	60	< 500	1	-0.08	-0.05	< 20	1	290	2660
BZX85B3V9	3.82	3.98	< 15	60	< 500	1	-0.07	-0.02	< 10	1	280	2540
BZX85B4V3	4.21	4.39	< 13	50	< 500	1	-0.05	0.01	< 3	1	250	2440
BZX85B4V7	4.61	4.79	< 13	45	< 600	1	-0.03	0.04	< 3	1	215	2320
BZX85B5V1	5	5.2	< 10	45	< 500	1	-0.01	0.04	< 1	1.5	200	2200
BZX85B5V6	5.49	5.71	< 7	45	< 400	1	0	0.045	< 1	2	190	2080
BZX85B6V2	6.08	6.32	< 4	35	< 300	1	0.01	0.055	< 1	3	170	1960
BZX85B6V8	6.66	6.94	< 3.5	35	< 300	1	0.015	0.06	< 1	4	155	1800
BZX85B7V5	7.35	7.65	< 3	35	< 200	0.5	0.02	0.065	< 1	4.5	140	1620
BZX85B8V2	8.04	8.36	< 5	25	< 200	0.5	0.03	0.07	< 1	6.2	130	1520
BZX85B9V1	8.92	9.28	< 5	25	< 200	0.5	0.035	0.075	< 1	6.8	120	1340
BZX85B10	9.8	10.2	< 7	25	< 200	0.5	0.04	0.08	< 0.5	7.5	105	1200
BZX85B11	10.8	11.2	< 8	20	< 300	0.5	0.045	0.08	< 0.5	8.2	97	1100
BZX85B12	11.8	12.2	< 9	20	< 350	0.5	0.045	0.085	< 0.5	9.1	88	1000
BZX85B13	12.7	13.3	< 10	20	< 400	0.5	0.05	0.085	< 0.5	10	79	900
BZX85B15	14.7	15.3	< 10	15	< 500	0.5	0.055	0.09	< 0.5	11	71	760
BZX85B16	15.7	16.3	< 15	15	< 500	0.5	0.055	0.09	< 0.5	12	66	700
BZX85B18	17.6	18.4	< 20	15	< 500	0.5	0.06	0.09	< 0.5	13	62	600
BZX85B20	19.6	20.4	< 24	10	< 600	0.5	0.06	0.09	< 0.5	15	56	540
BZX85B22	21.6	22.4	< 25	10	< 600	0.5	0.06	0.095	< 0.5	16	52	500
BZX85B24	23.5	24.5	< 25	10	< 600	0.5	0.06	0.095	< 0.5	18	47	450
BZX85B27	26.5	27.5	< 30	8	< 750	0.25	0.06	0.095	< 0.5	20	41	400
BZX85B30	29.4	30.6	< 30	8	< 1000	0.25	0.06	0.095	< 0.5	22	36	380
BZX85B33	32.3	33.7	< 35	8	< 1000	0.25	0.06	0.095	< 0.5	24	33	350
BZX85B36	35.3	36.7	< 40	8	< 1000	0.25	0.06	0.095	< 0.5	27	30	320
BZX85B39	38.2	39.8	< 50	6	< 1000	0.25	0.06	0.095	< 0.5	30	28	296
BZX85B43	42.1	43.9	< 50	6	< 1000	0.25	0.06	0.095	< 0.5	33	26	270
BZX85B47	46.1	47.9	< 90	4	< 1500	0.25	0.06	0.095	< 0.5	36	23	246
BZX85B51	50	52	< 115	4	< 1500	0.25	0.06	0.095	< 0.5	39	21	226
BZX85B56	54.9	57.1	< 120	4	< 2000	0.25	0.06	0.095	< 0.5	43	19	208
BZX85B62	60.8	63.2	< 125	4	< 2000	0.25	0.06	0.095	< 0.5	47	16	186
BZX85B68	66.6	69.4	< 130	4	< 2000	0.25	0.055	0.095	< 0.5	51	15	171
BZX85B75	73.5	76.5	< 135	4	< 2000	0.25	0.055	0.095	< 0.5	56	14	161
BZX85B82	80.4	83.6	< 200	2.7	< 3000	0.25	0.055	0.095	< 0.5	62	12	141
BZX85B91	89.2	92.8	< 250	2.7	< 3000	0.25	0.055	0.095	< 0.5	68	10	127
BZX85B100	98	102	< 350	2.7	< 3000	0.25	0.055	0.095	< 0.5	75	9.4	116
BZX85B110	108	112	< 450	2.7	< 4000	0.25	0.055	0.095	< 0.5	82	8.6	105
BZX85B120	118	122	< 550	2	< 4500	0.25	0.055	0.095	< 0.5	91	7.8	96
BZX85B130	127	133	< 700	2	< 5000	0.25	0.055	0.095	< 0.5	100	7	89
BZX85B150	147	153	< 1000	2	< 6000	0.25	0.055	0.095	< 0.5	110	6.4	77

Partnumber	Zener Voltage Range ¹⁾		Dynamic Resistance				Temperature Coefficient of Zener Voltage		Reverse Leakage Current		Admissible Zener current ²⁾	
			$r_{ZT}^{(3)}$	@ I_{ZT}	$r_{ZK}^{(3)}$	@ I_{ZK}						
	V		Ω	mA	Ω	mA	%/°C		μ A	mA	I_Z	I_{ZMS} @ $t_p = 10$ ms
	min	max					min	max				
BZX85B160	157	163	< 1100	1.5	< 6500	0.25	0.055	0.095	< 0.5	120	5.8	72
BZX85B180	176	184	< 1200	1.5	< 7000	0.25	0.055	0.095	< 0.5	130	5.2	64
BZX85B200	196	204	< 1500	1.5	< 8000	0.25	0.055	0.095	< 0.5	150	4.7	58

¹⁾ Measured with pulses $t_p = 5$ ms

²⁾ Valid provided that leads are kept at ambient temperature at a distance of 10 mm from case

³⁾ Measured with $f = 1$ kHz

Typical Characteristics ($T_{amb} = 25$ °C unless otherwise specified)

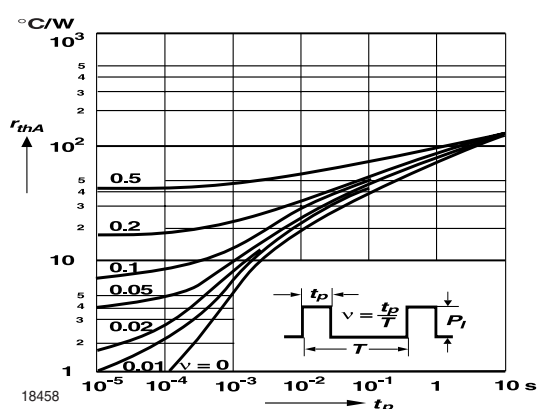


Figure 1. Pulse Thermal Resistance vs. Pulse Duration

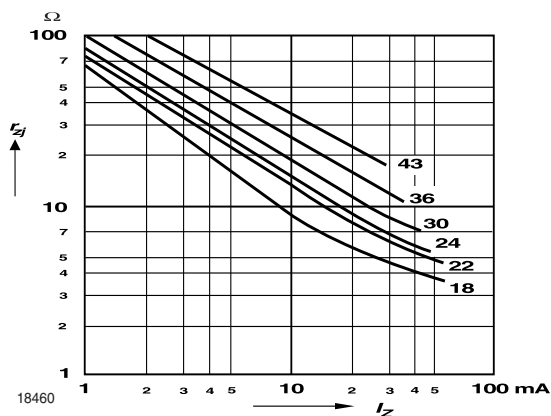


Figure 3. Dynamic Resistance vs. Zener Current

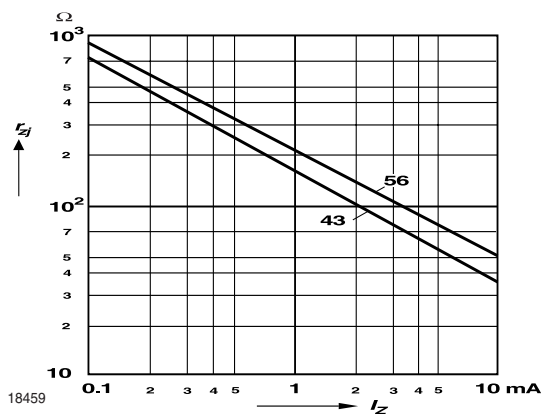


Figure 2. Dynamic Resistance vs. Zener Current

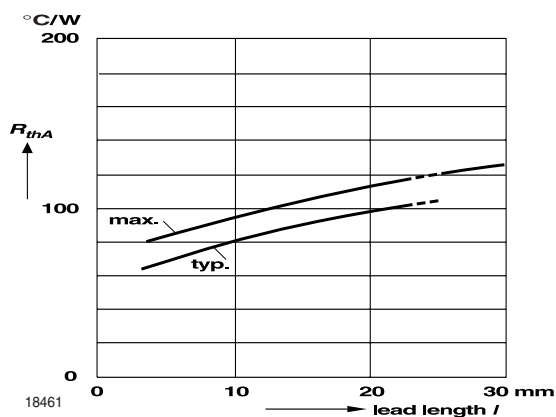


Figure 4.

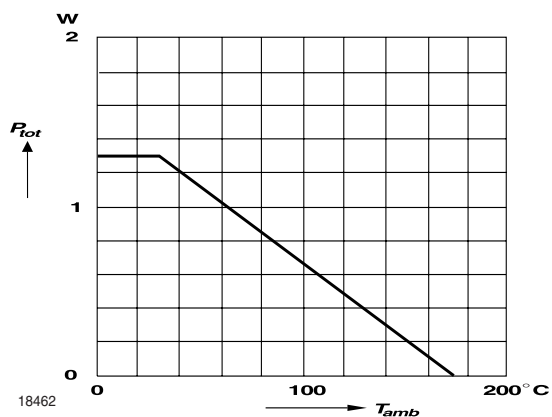


Figure 5.

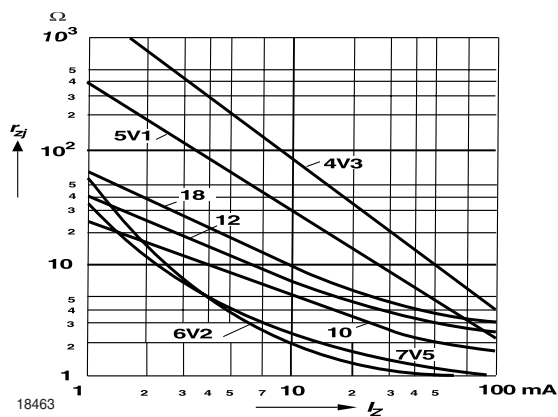


Figure 6. Dynamic Resistance vs. Zener Current

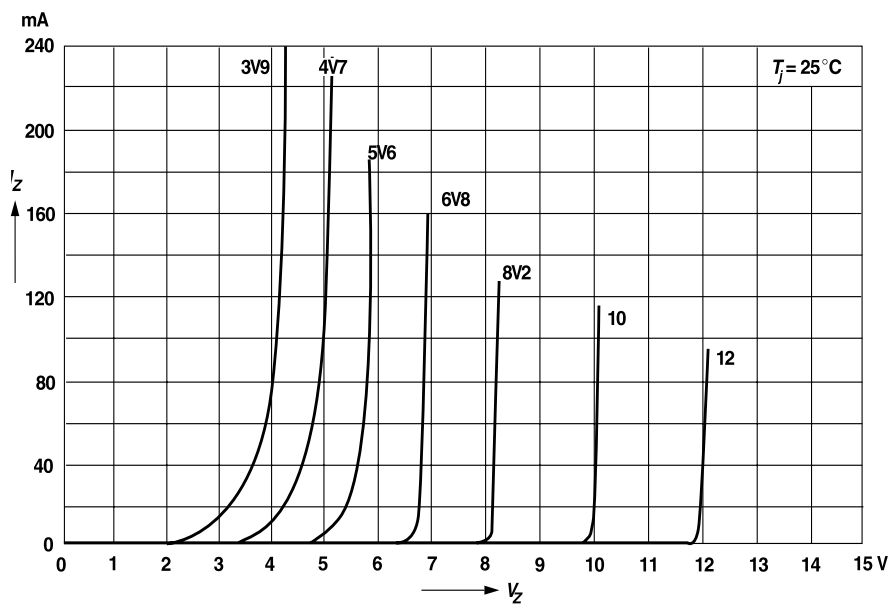


Figure 7. Breakdown Characteristics

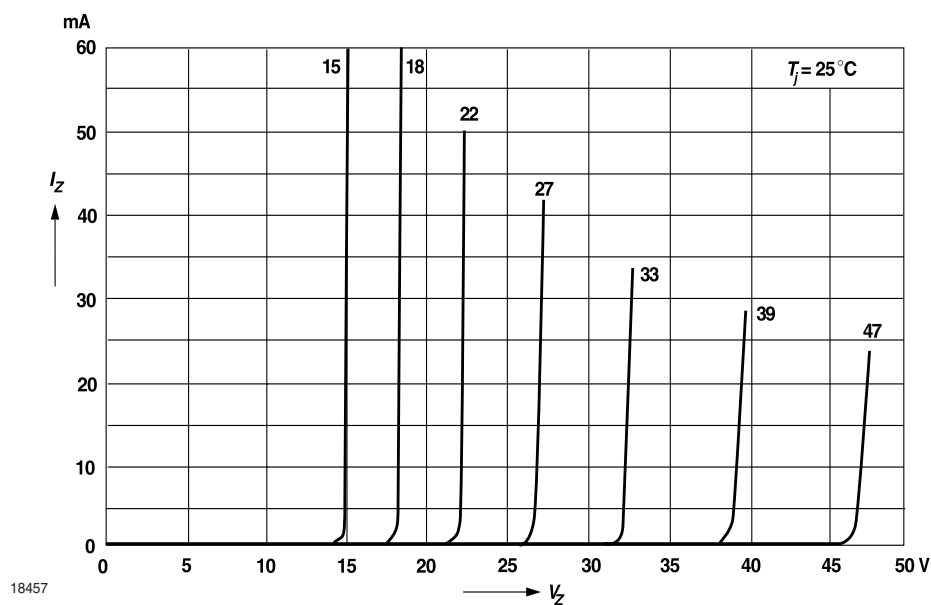
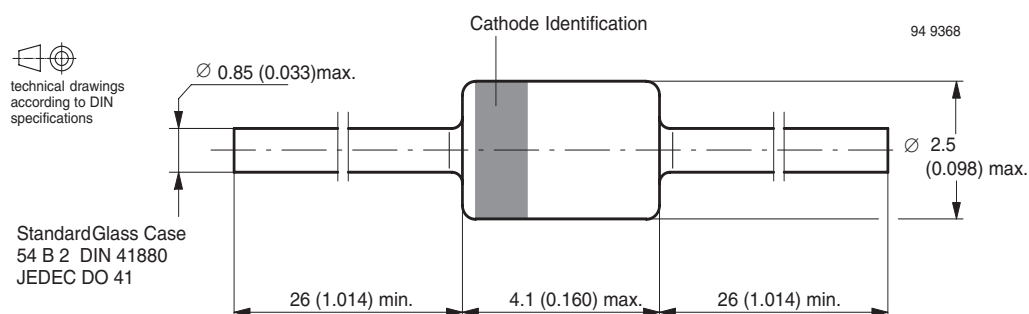


Figure 8. Breakdown Characteristics

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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