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 ± 2 % tolerance
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

3D Models

APPLICATIONS

- Voltage stabilization

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V_Z range nom.	2.7 to 75	V
Test current I_{ZT}	4 to 80	mA
V_Z specification	Pulse current	
Circuit configuration	Single	

ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZX85-series	BZX85-series-TR	5000 (52 mm tape on 13" reel)	25 000/box
BZX85-series	BZX85-series-TAP	5000 per ammopack (52 mm tape)	25 000/box

PACKAGE				
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
DO-41 (DO-204AL)	310 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature	P_{tot}	1300	mW
Zener current	See Table “Electrical characteristics”			
Junction to ambient air	Valid provided that leads at a distance of 4 mm from case are kept at ambient temperature	R_{thJA}	110	K/W
Junction temperature		T_j	175	°C
Storage temperature range		T_{stg}	-55 to +175	°C

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

PART NUMBER	ZENER VOLTAGE RANGE (1)			TEST CURRENT		REVERSE LAEKAGE CURRENT		DYNAMIC RESISTANCE (3)		TEMPERATURE COEFFICIENT OF ZENER VOLTAGE		ADMISSIBLE ZENER CURRENT (2)
	V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	A_{VZ} at I_{ZT1}		I_Z
	V			mA		µA	V	Ω		%/°C		mA
	MIN.	NOM.	MAX.					MAX.	MAX.	MIN.	MAX.	
BZX85C2V7	2.5	2.7	2.9	80	1	< 150	1	< 20	< 400	- 0.08	- 0.05	360
BZX85C3V0	2.8	3.0	3.2	80	1	< 100	1	< 20	< 400	- 0.08	- 0.05	330
BZX85C3V3	3.1	3.3	3.5	80	1	< 40	1	< 20	< 400	- 0.08	- 0.05	300
BZX85C3V6	3.4	3.6	3.8	60	1	< 20	1	< 20	< 500	- 0.08	- 0.05	290
BZX85C3V9	3.7	3.9	4.1	60	1	< 10	1	< 15	< 500	- 0.07	- 0.02	280
BZX85C4V3	4	4.3	4.6	50	1	< 3	1	< 13	< 500	- 0.05	0.01	250
BZX85C4V7	4.4	4.7	5	45	1	< 3	1	< 13	< 600	- 0.03	0.04	215
BZX85C5V1	4.8	5.1	5.4	45	1	< 1	1.5	< 10	< 500	- 0.01	0.04	200
BZX85C5V6	5.2	5.6	6	45	1	< 1	2	< 7	< 400	0	0.045	190
BZX85C6V2	5.8	6.2	6.6	35	1	< 1	3	< 4	< 300	0.01	0.055	170
BZX85C6V8	6.4	6.8	7.2	35	1	< 1	4	< 3.5	< 300	0.015	0.06	155
BZX85C7V5	7	7.5	7.9	35	0.5	< 1	4.5	< 3	< 200	0.02	0.065	140
BZX85C8V2	7.7	8.2	8.7	25	0.5	< 1	6.2	< 5	< 200	0.03	0.07	130
BZX85C9V1	8.5	9.1	9.6	25	0.5	< 1	6.8	< 5	< 200	0.035	0.075	120
BZX85C10	9.4	10	10.6	25	0.5	< 0.5	7.5	< 7	< 200	0.04	0.08	105
BZX85C11	10.4	11	11.6	20	0.5	< 0.5	8.2	< 8	< 300	0.045	0.08	97
BZX85C12	11.4	12	12.7	20	0.5	< 0.5	9.1	< 9	< 350	0.045	0.085	88
BZX85C13	12.4	13	14.1	20	0.5	< 0.5	10	< 10	< 400	0.05	0.085	79
BZX85C15	13.8	15	15.6	15	0.5	< 0.5	11	< 15	< 500	0.055	0.09	71
BZX85C16	15.3	16	17.1	15	0.5	< 0.5	12	< 15	< 500	0.055	0.09	66
BZX85C18	16.8	18	19.1	15	0.5	< 0.5	13	< 20	< 500	0.06	0.09	62
BZX85C20	18.8	20	21.2	10	0.5	< 0.5	15	< 24	< 600	0.06	0.09	56
BZX85C22	20.8	22	23.3	10	0.5	< 0.5	16	< 25	< 600	0.06	0.095	52
BZX85C24	22.8	24	25.6	10	0.5	< 0.5	18	< 25	< 600	0.06	0.095	47
BZX85C27	25.1	27	28.9	8	0.25	< 0.5	20	< 30	< 750	0.06	0.095	41
BZX85C30	28	30	32	8	0.25	< 0.5	22	< 30	< 1000	0.06	0.095	36
BZX85C33	31	33	35	8	0.25	< 0.5	24	< 35	< 1000	0.06	0.095	33
BZX85C36	34	36	38	8	0.25	< 0.5	27	< 40	< 1000	0.06	0.095	30
BZX85C39	37	39	41	6	0.25	< 0.5	30	< 50	< 1000	0.06	0.095	28
BZX85C43	40	43	46	6	0.25	< 0.5	33	< 50	< 1000	0.06	0.095	26
BZX85C47	44	47	50	4	0.25	< 0.5	36	< 90	< 1500	0.06	0.095	23
BZX85C51	48	51	54	4	0.25	< 0.5	39	< 115	< 1500	0.06	0.095	21
BZX85C56	52	56	60	4	0.25	< 0.5	43	< 120	< 2000	0.06	0.095	19
BZX85C62	58	62	66	4	0.25	< 0.5	47	< 125	< 2000	0.06	0.095	16
BZX85C68	64	68	72	4	0.25	< 0.5	51	< 130	< 2000	0.055	0.095	15
BZX85C75	70	75	80	4	0.25	< 0.5	56	< 135	< 2000	0.055	0.095	14

Notes

(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

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

PART NUMBER	ZENER VOLTAGE RANGE (1)			TEST CURRENT		REVERSE LAEKAGE CURRENT		DYNAMIC RESISTANCE (3)		TEMPERATURE COEFFICIENT OF ZENER VOLTAGE		ADMISSIBLE ZENER CURRENT (2)
	V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	A_{VZ} at I_{ZT1}		I_Z
	V			mA		µA	V	Ω		%/°C		mA
	MIN.	NOM.	MAX.					MAX.	MAX.	MIN.	MAX.	
BZX85B2V7	2.64	2.7	2.76	80	1	< 150	1	< 20	< 400	- 0.08	- 0.05	360
BZX85B3V0	2.94	3	3.06	80	1	< 100	1	< 20	< 400	- 0.08	- 0.05	330
BZX85B3V3	2.24	3.3	3.36	80	1	< 40	1	< 20	< 400	- 0.08	- 0.05	300
BZX85B3V6	3.53	3.6	3.67	60	1	< 20	1	< 20	< 500	- 0.08	- 0.05	290
BZX85B3V9	3.82	3.9	3.98	60	1	< 10	1	< 15	< 500	- 0.07	- 0.02	280
BZX85B4V3	4.21	4.3	4.39	50	1	< 3	1	< 13	< 500	- 0.05	0.01	250
BZX85B4V7	4.61	4.7	4.79	45	1	< 3	1	< 13	< 600	- 0.03	0.04	215
BZX85B5V1	5	5.1	5.2	45	1	< 1	1.5	< 10	< 500	- 0.01	0.04	200
BZX85B5V6	5.49	5.6	5.71	45	1	< 1	2	< 7	< 400	0	0.045	190
BZX85B6V2	6.08	6.2	6.32	35	1	< 1	3	< 4	< 300	0.01	0.055	170
BZX85B6V8	6.66	6.8	6.94	35	1	< 1	4	< 3.5	< 300	0.015	0.06	155
BZX85B7V5	7.35	7.5	7.65	35	0.5	< 1	4.5	< 3	< 200	0.02	0.065	140
BZX85B8V2	8.04	8.2	8.36	25	0.5	< 1	6.2	< 5	< 200	0.03	0.07	130
BZX85B9V1	8.92	9.1	9.28	25	0.5	< 1	6.8	< 5	< 200	0.035	0.075	120
BZX85B10	9.8	10	10.2	25	0.5	< 0.5	7.5	< 7	< 200	0.04	0.08	105
BZX85B11	10.8	11	11.2	20	0.5	< 0.5	8.2	< 8	< 300	0.045	0.08	97
BZX85B12	11.8	12	12.2	20	0.5	< 0.5	9.1	< 9	< 350	0.045	0.085	88
BZX85B13	12.7	13	13.3	20	0.5	< 0.5	10	< 10	< 400	0.05	0.085	79
BZX85B15	14.7	15	15.3	15	0.5	< 0.5	11	< 15	< 500	0.055	0.09	71
BZX85B16	15.7	16	16.3	15	0.5	< 0.5	12	< 15	< 500	0.055	0.09	66
BZX85B18	17.6	18	18.4	15	0.5	< 0.5	13	< 20	< 500	0.06	0.09	62
BZX85B20	19.6	20	20.4	10	0.5	< 0.5	15	< 24	< 600	0.06	0.09	56
BZX85B22	21.6	22	22.4	10	0.5	< 0.5	16	< 25	< 600	0.06	0.095	52
BZX85B24	23.5	24	24.5	10	0.5	< 0.5	18	< 25	< 600	0.06	0.095	47
BZX85B27	26.5	27	27.5	8	0.25	< 0.5	20	< 30	< 750	0.06	0.095	41
BZX85B30	29.4	30	30.6	8	0.25	< 0.5	22	< 30	< 1000	0.06	0.095	36
BZX85B33	32.3	33	33.7	8	0.25	< 0.5	24	< 35	< 1000	0.06	0.095	33
BZX85B36	35.3	36	36.7	8	0.25	< 0.5	27	< 40	< 1000	0.06	0.095	30
BZX85B39	38.2	39	39.8	6	0.25	< 0.5	30	< 50	< 1000	0.06	0.095	28
BZX85B43	42.1	43	43.9	6	0.25	< 0.5	33	< 50	< 1000	0.06	0.095	26
BZX85B47	46.1	47	47.9	4	0.25	< 0.5	36	< 90	< 1500	0.06	0.095	23
BZX85B51	50	51	52	4	0.25	< 0.5	39	< 115	< 1500	0.06	0.095	21
BZX85B56	54.9	56	57.1	4	0.25	< 0.5	43	< 120	< 2000	0.06	0.095	19
BZX85B62	60.8	62	63.2	4	0.25	< 0.5	47	< 125	< 2000	0.06	0.095	16
BZX85B68	66.6	68	69.4	4	0.25	< 0.5	51	< 130	< 2000	0.055	0.095	15
BZX85B75	73.5	75	76.5	4	0.25	< 0.5	56	< 135	< 2000	0.055	0.095	14

Notes

(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

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

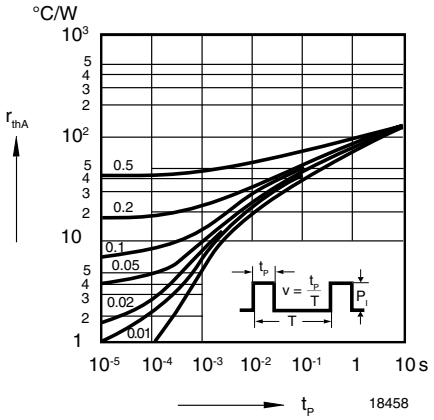

Fig. 1 - Pulse Thermal Resistance vs. Pulse Duration

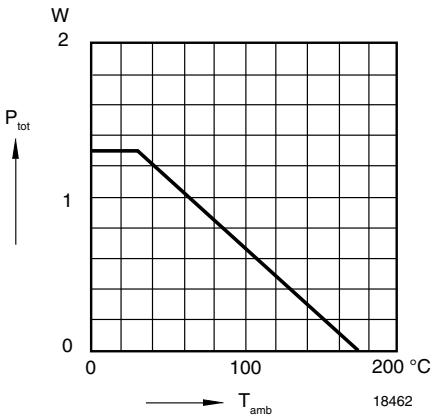

Fig. 4 - Admissible Power Dissipation vs. Ambient Temperature

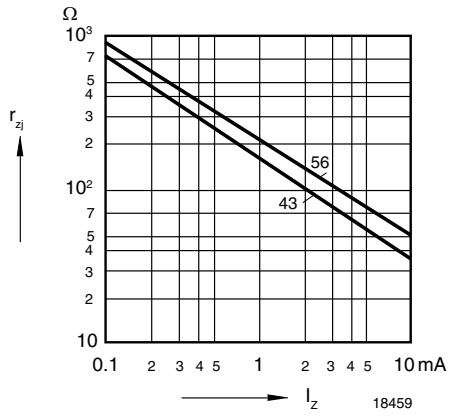

Fig. 2 - Dynamic Resistance vs. Zener Current

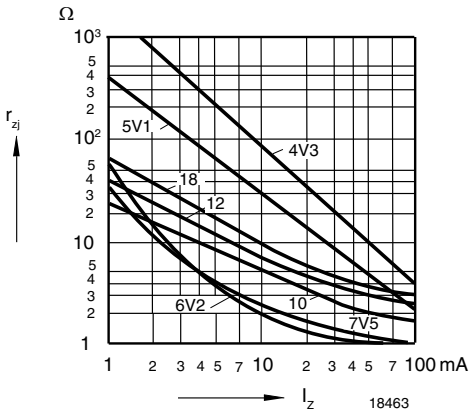

Fig. 5 - Dynamic Resistance vs. Zener Current

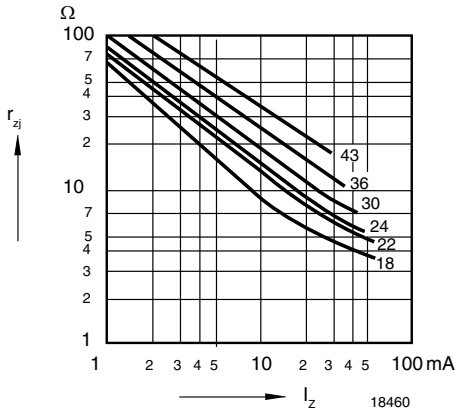

Fig. 3 - Dynamic Resistance vs. Zener Current

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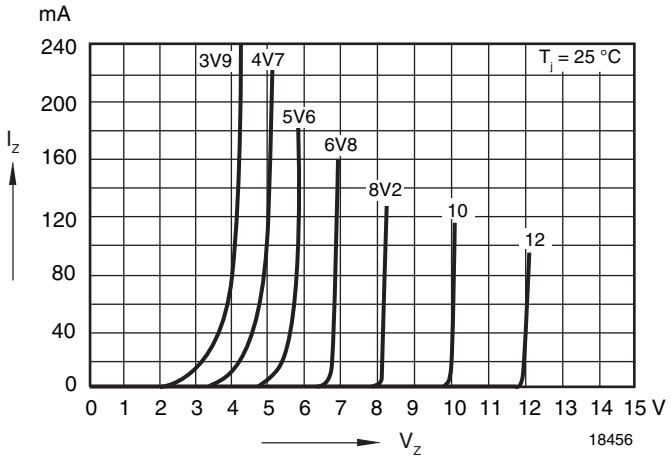


Fig. 6 - Breakdown Characteristics

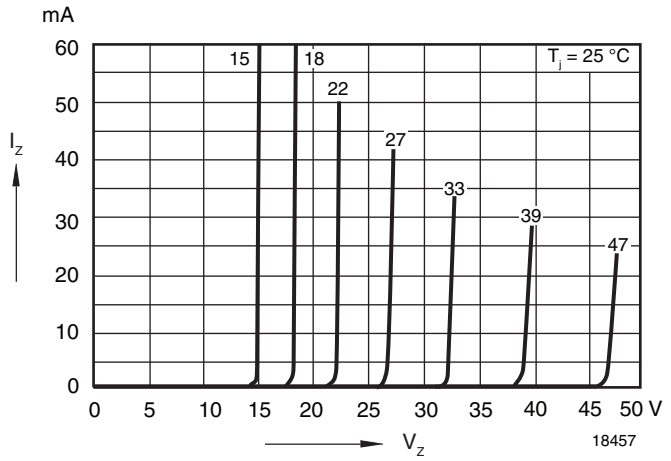
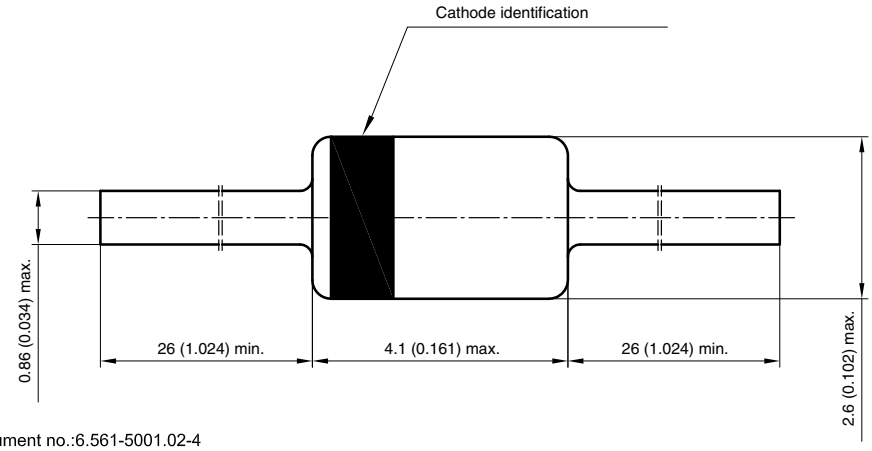


Fig. 7 - Breakdown Characteristics

PACKAGE DIMENSIONS in millimeters (inches): **DO-41 (DO-204AL)**



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