

# **Small Signal Zener Diodes**



PRIMARY CHARACTERISTICS									
PARAMETER VALUE UNIT									
V <sub>Z</sub> range nom.	2.4 to 75	V							
Test current I <sub>ZT</sub>	2.5; 5	mA							
V <sub>Z</sub> specification	Pulse current								
Int. construction	Single								

#### **FEATURES**

- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- · Low noise
- AEC-Q101 qualified
- Material categorization:
   For definitions of compliance please see <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>





### COMPLIANT HALOGEN FREE

#### **APPLICATIONS**

· Voltage stabilization

ORDERING INFORMATION										
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY							
BZX55-series	BZX55-series-TR	10 000 per 13" reel	30 000/box							
BZX55-series	BZX55-series-TAP	10 000 per ammopack (52 mm tape)	30 000/box							

PACKAGE					
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS	
DO-35	125 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals	

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)										
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT						
Power dissipation	I = 4 mm, T <sub>L</sub> = 25 °C	P <sub>tot</sub>	500	mW						
Zener current		I <sub>Z</sub>	P <sub>tot</sub> /V <sub>Z</sub>	mA						
Junction to ambient air	I = 4 mm, T <sub>L</sub> = constant	R <sub>thJA</sub>	300	K/W						
Junction temperature		Tj	175	°C						
Storage temperature range		T <sub>stg</sub>	- 65 to + 175	°C						
Forward voltage (max.)	I <sub>F</sub> = 200 mA	V <sub>F</sub>	1.5	V						



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	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE				AMIC	TEMPERATURE COEFFICIENT	
	KANGI			CUR	KENI	CURRENT I <sub>R</sub> at V <sub>R</sub>			RESISTANCE  Z <sub>Z</sub> at I <sub>ZT1</sub> Z <sub>ZK</sub> at I <sub>ZT2</sub>		COEFFICIENT	
PART NUMBER	,	V <sub>Z</sub> at I <sub>ZT1</sub>			I <sub>ZT1</sub> I <sub>ZT2</sub>		T <sub>amb</sub> = T <sub>amb</sub> = 25 °C 150 °C μΑ V		f = 1 kHz		TK <sub>VZ</sub>	
	V			mA					Ω			
	MIN.	NOM.	MAX.			<u> </u>			MAX.	MAX.	MIN.	MAX.
BZX55C2V4	2.28	2.4	2.56	5	1	< 50	< 100	1	< 85	< 600	- 0.09	- 0.06
BZX55C2V7	2.5	2.7	2.9	5	1	< 10	< 50	1	< 85	< 600	- 0.09	- 0.06
BZX55C3V0	2.8	3.0	3.2	5	1	< 4	< 40	1	< 85	< 600	- 0.08	- 0.05
BZX55C3V3	3.1	3.3	3.5	5	1	< 2	< 40	1	< 85	< 600	- 0.08	- 0.05
BZX55C3V6	3.4	3.6	3.8	5	1	< 2	< 40	1	< 85	< 600	- 0.08	- 0.05
BZX55C3V9	3.7	3.9	4.1	5	1	< 2	< 40	1	< 85	< 600	- 0.08	- 0.05
BZX55C4V3	4	4.3	4.6	5	1	< 1	< 20	1	< 75	< 600	- 0.06	- 0.03
BZX55C4V7	4.4	4.7	5	5	1	< 0.5	< 10	1	< 60	< 600	- 0.05	0.02
BZX55C5V1	4.8	5.1	5.4	5	1	< 0.1	< 2	1	< 35	< 550	- 0.02	0.02
BZX55C5V6	5.2	5.6	6	5	1	< 0.1	< 2	1	< 25	< 450	- 0.05	0.05
BZX55C6V2	5.8	6.2	6.6	5	1	< 0.1	< 2	2	< 10	< 200	0.03	0.06
BZX55C6V8	6.4	6.8	7.2	5	1	< 0.1	< 2	3	< 8	< 150	0.03	0.07
BZX55C7V5	7	7.5	7.9	5	1	< 0.1	< 2	5	< 7	< 50	0.03	0.07
BZX55C8V2	7.7	8.2	8.7	5	1	< 0.1	< 2	6.2	< 7	< 50	0.03	0.08
BZX55C9V1	8.5	9.1	9.6	5	1	< 0.1	< 2	6.8	< 10	< 50	0.03	0.09
BZX55C10	9.4	10	10.6	5	1	< 0.1	< 2	7.5	< 15	< 70	0.03	0.1
BZX55C11	10.4	11	11.6	5	1	< 0.1	< 2	8.2	< 20	< 70	0.03	0.11
BZX55C12	11.4	12	12.7	5	1	< 0.1	< 2	9.1	< 20	< 90	0.03	0.11
BZX55C13	12.4	13	14.1	5	1	< 0.1	< 2	10	< 26	< 110	0.03	0.11
BZX55C15	13.8	15	15.6	5	1	< 0.1	< 2	11	< 30	< 110	0.03	0.11
BZX55C16	15.3	16	17.1	5	1	< 0.1	< 2	12	< 40	< 170	0.03	0.11
BZX55C18	16.8	18	19.1	5	1	< 0.1	< 2	13	< 50	< 170	0.03	0.11
BZX55C20	18.8	20	21.2	5	1	< 0.1	< 2	15	< 55	< 220	0.03	0.11
BZX55C22	20.8	22	23.3	5	1	< 0.1	< 2	16	< 55	< 220	0.04	0.12
BZX55C24	22.8	24	25.6	5	1	< 0.1	< 2	18	< 80	< 220	0.04	0.12
BZX55C27	25.1	27	28.9	5	1	< 0.1	< 2	20	< 80	< 220	0.04	0.12
BZX55C30	28	30	32	5	1	< 0.1	< 2	22	< 80	< 220	0.04	0.12
BZX55C33	31	33	35	5	1	< 0.1	< 2	24	< 80	< 220	0.04	0.12
BZX55C36	34	36	38	5	1	< 0.1	< 2	27	< 80	< 220	0.04	0.12
BZX55C39	37	39	41	2.5	0.5	< 0.1	< 5	30	< 90	< 500	0.04	0.12
BZX55C43	40	43	46	2.5	0.5	< 0.1	< 5	33	< 90	< 600	0.04	0.12
BZX55C47	44	47	50	2.5	0.5	< 0.1	< 5	36	< 110	< 700	0.04	0.12
BZX55C51	48	51	54	2.5	0.5	< 0.1	< 10	39	< 125	< 700	0.04	0.12
BZX55C56	52	56	60	2.5	0.5	< 0.1	< 10	43	< 135	< 1000	0.04	0.12
BZX55C62	58	62	66	2.5	0.5	< 0.1	< 10	47	< 150	< 1000	0.04	0.12
BZX55C68	64	68	72	2.5	0.5	< 0.1	< 10	51	< 200	< 1000	0.04	0.12
BZX55C75	70	75	79	2.5	0.5	< 0.1	< 10	56	< 250	< 1500	0.04	0.12



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PART NUMBER	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT			DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT	
						I <sub>R</sub> at V <sub>R</sub>			Z <sub>Z</sub> at I <sub>ZT1</sub>	Z <sub>ZK</sub> at I <sub>ZT2</sub>		
	'	V <sub>Z</sub> at I <sub>ZT1</sub>			I <sub>ZT1</sub> I <sub>ZT2</sub>		T <sub>amb</sub> =   T <sub>amb</sub> =   25 °C   150 °C		f = 1 kHz		TK <sub>VZ</sub>	
		٧		n	ıA	μ	A	V	2	Ω	%	/K
	MIN.	NOM.	MAX.						MAX.	MAX.	MIN.	MAX.
BZX55B2V4	2.35	2.4	2.45	5	1	< 50	< 100	1	< 85	< 600	- 0.09	- 0.06
BZX55B2V7	2.64	2.7	2.76	5	1	< 10	< 50	1	< 85	< 600	- 0.09	- 0.06
BZX55B3V0	2.94	3.0	3.06	5	1	< 4	< 40	1	< 90	< 600	- 0.08	- 0.05
BZX55B3V3	3.24	3.3	3.36	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZX55B3V6	3.52	3.6	3.68	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZX55B3V9	3.82	3.9	3.98	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZX55B4V3	4.22	4.3	4.38	5	1	< 1	< 20	1	< 90	< 600	- 0.06	- 0.03
BZX55B4V7	4.6	4.7	4.8	5	1	< 0.5	< 10	1	< 80	< 600	- 0.05	0.02
BZX55B5V1	5	5.1	5.2	5	1	< 0.1	< 2	1	< 60	< 550	- 0.02	0.02
BZX55B5V6	5.48	5.6	5.72	5	1	< 0.1	< 2	1	< 40	< 450	- 0.05	0.05
BZX55B6V2	6.08	6.2	6.32	5	1	< 0.1	< 2	2	< 10	< 200	0.03	0.06
BZX55B6V8	6.66	6.8	6.94	5	1	< 0.1	< 2	3	< 8	< 150	0.03	0.07
BZX55B7V5	7.35	7.5	7.65	5	1	< 0.1	< 2	5	< 7	< 50	0.03	0.07
BZX55B8V2	8.04	8.2	8.36	5	1	< 0.1	< 2	6.2	< 7	< 50	0.03	0.08
BZX55B9V1	8.92	9.1	9.28	5	1	< 0.1	< 2	6.8	< 10	< 50	0.03	0.09
BZX55B10	9.8	10	10.2	5	1	< 0.1	< 2	7.5	< 15	< 70	0.03	0.1
BZX55B11	10.78	11	11.22	5	1	< 0.1	< 2	8.2	< 20	< 70	0.03	0.11
BZX55B12	11.76	12	12.24	5	1	< 0.1	< 2	9.1	< 20	< 90	0.03	0.11
BZX55B13	12.74	13	13.26	5	1	< 0.1	< 2	10	< 26	< 110	0.03	0.11
BZX55B15	14.7	15	15.3	5	1	< 0.1	< 2	11	< 30	< 110	0.03	0.11
BZX55B16	15.7	16	16.3	5	1	< 0.1	< 2	12	< 40	< 170	0.03	0.11
BZX55B18	17.64	18	18.36	5	1	< 0.1	< 2	13	< 50	< 170	0.03	0.11
BZX55B20	19.6	20	20.4	5	1	< 0.1	< 2	15	< 55	< 220	0.03	0.11
BZX55B22	21.55	22	22.45	5	1	< 0.1	< 2	16	< 55	< 220	0.04	0.12
BZX55B24	23.5	24	24.5	5	1	< 0.1	< 2	18	< 80	< 220	0.04	0.12
BZX55B27	26.4	27	27.6	5	1	< 0.1	< 2	20	< 80	< 220	0.04	0.12
BZX55B30	29.4	30	30.6	5	1	< 0.1	< 2	22	< 80	< 220	0.04	0.12
BZX55B33	32.4	33	33.6	5	1	< 0.1	< 2	24	< 80	< 220	0.04	0.12
BZX55B36	35.3	36	36.7	5	1	< 0.1	< 2	27	< 80	< 220	0.04	0.12
BZX55B39	38.2	39	39.8	2.5	0.5	< 0.1	< 5	30	< 90	< 500	0.04	0.12
BZX55B43	42.1	43	43.9	2.5	0.5	< 0.1	< 5	33	< 90	< 600	0.04	0.12
BZX55B47	46.1	47	47.9	2.5	0.5	< 0.1	< 5	36	< 110	< 700	0.04	0.12
BZX55B51	50	51	52	2.5	0.5	< 0.1	< 10	39	< 125	< 700	0.04	0.12
BZX55B56	54.9	56	57.1	2.5	0.5	< 0.1	< 10	43	< 135	< 1000	0.04	0.12
BZX55B62	60.8	62	63.2	2.5	0.5	< 0.1	< 10	47	< 150	< 1000	0.04	0.12
BZX55B68	66.6	68	69.4	2.5	0.5	< 0.1	< 10	51	< 200	< 1000	0.04	0.12
BZX55B75	73	75	76.5	2.5	0.5	< 0.1	< 10	56	< 250	< 1500	0.04	0.12

### **BASIC CHARACTERISTICS** (T<sub>amb</sub> = 25 °C, unless otherwise specified)

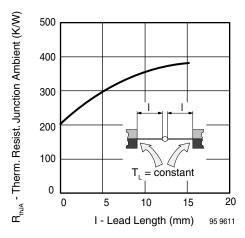


Fig. 1 - Thermal Resistance vs. Lead Length

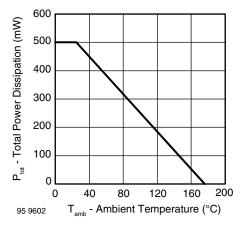


Fig. 2 - Total Power Dissipation vs. Ambient Temperature

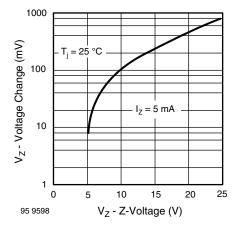


Fig. 3 - Typical Change of Working Voltage under Operating Conditions at  $T_{amb} = 25 \, ^{\circ}\text{C}$ 

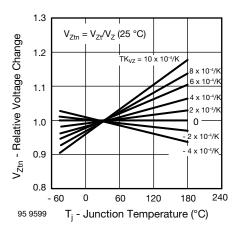


Fig. 4 - Typical Change of Working Voltage vs. Junction Temperature

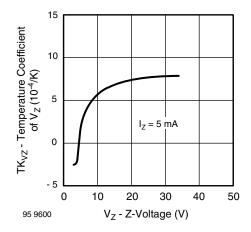


Fig. 5 - Temperature Coefficient of V<sub>Z</sub> vs. Z-Voltage

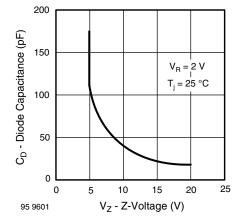


Fig. 6 - Diode Capacitance vs. Z-Voltage

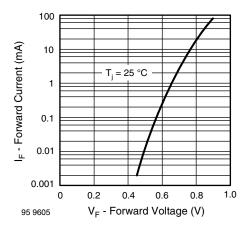


Fig. 7 - Forward Current vs. Forward Voltage

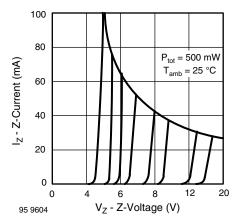


Fig. 8 - Z-Current vs. Z-Voltage

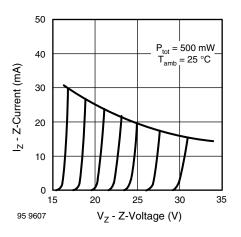


Fig. 9 - Z-Current vs. Z-Voltage

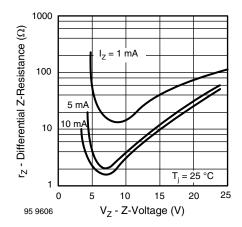


Fig. 10 - Differential Z-Resistance vs. Z-Voltage

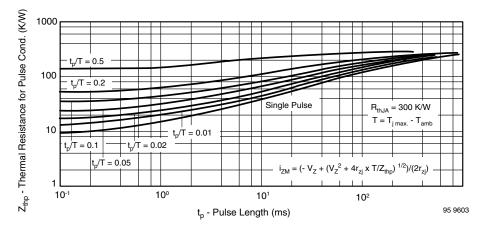
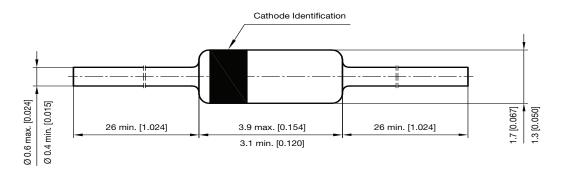


Fig. 11 - Thermal Response

### PACKAGE DIMENSIONS in millimeters (inches): DO-35



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### **Legal Disclaimer Notice**

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## **Material Category Policy**

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

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