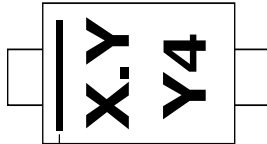


## Small Signal Zener Diodes



20278

**MARKING** (example only)

 X.Y = type code  
 Y4 = date code

23210

Cathode mark

**LINKS TO ADDITIONAL RESOURCES**


3D Models



SPICE Models

**FEATURES**

- Silicon planar Zener diodes
- The Zener voltages are graded according to the international E24 standard
- AEC-Q101 qualified available
- ESD capability according to AEC-Q101:  
Human body model > 8 kV  
Machine model > 800 V
- Base P/N-E3, RoHS-compliant, commercial grade
- Base P/N-HE3\_A, RoHS-compliant, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
 COMPLIANT

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
$V_Z$ range nom.	2.2 to 75	V
Test current $I_{ZT}$	2; 5	mA
$V_Z$ specification	Pulse current	
Circuit configuration	Single	

ORDERING INFORMATION					
DEVICE NAME	ORDERING CODE	ZENER VOLTAGE TOLERANCE	AEC-Q101 QUALIFIED	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZT52 series	BZT52C2V2-E3-08 to BZT52C75-E3-08	5%	no	3000 (8 mm tape on 7" reel)	15 000/box
	BZT52B2V2-E3-08 to BZT52B75-E3-08	2%	no		
	BZT52C2V2-HE3_A-08 to BZT52C75-HE3_A-08	5%	yes		
	BZT52B2V2-HE3_A-08 to BZT52B75-HE3_A-08	2%	yes		
	BZT52C2V2-E3-18 to BZT52C75-E3-18	5%	no	10 000 (8 mm tape on 13" reel)	10 000/box
	BZT52B2V2-E3-18 to BZT52B75-E3-18	2%	no		
	BZT52C2V2-HE3_A-18 to BZT52C75-HE3_A-18	5%	yes		
	BZT52B2V2-HE3_A-18 to BZT52B75-HE3_A-18	2%	yes		

PACKAGE				
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SOD-123	10.6 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	$R_{thJL} = 250\text{ K/W}$	$P_{tot}$	500	mW
	On FR-4 board with recommended soldering footprint	$P_{tot}$	300	mW
Zener current	See table "Electrical Characteristics"			
Thermal resistance junction to lead		$R_{thJL}$	250	K/W
Thermal resistance junction to ambient	According to JEDEC® 51-3 on FR-4 board with recommended soldering footprint	$R_{thJA}$	420	K/W
Junction temperature		$T_j$	150	°C
Storage temperature range		$T_{stg}$	-65 to +150	°C
Operating temperature range		$T_{op}$	-55 to +150	°C



ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)													
PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE <sup>(1)</sup>			TEST CURRENT		REVERSE VOLTAGE		DYNAMIC RESISTANCE		TEMP. COEFFICIENT	ADMISSABLE ZENER CURRENT <sup>(2)</sup>	
		V <sub>Z</sub> at I <sub>ZT1</sub>			I <sub>ZT1</sub>	I <sub>ZT2</sub>	V <sub>R</sub> at I <sub>R</sub>		Z <sub>Z</sub> at I <sub>ZT1</sub>	Z <sub>ZK</sub> at I <sub>ZT2</sub>	α <sub>VZ</sub>	I <sub>Z</sub> at T <sub>amb</sub> = 45 °C	I <sub>Z</sub> at T <sub>amb</sub> = 25 °C
		V			mA		V	nA	Ω		10 <sup>-4</sup> /°C	mA	
		MIN.	NOM.	MAX.									
BZT52C2V2	Z9	2.09	2.2	2.31	5	1	> 1	100 000	120	600	-9 to -4	130	154
BZT52C2V4	Y1	2.28	2.4	2.52	5	1	> 1	50 000	100	600	-9 to -4	124	146
BZT52C2V7	Y2	2.57	2.7	2.84	5	1	> 1	20 000	83	500	-9 to -4	111	131
BZT52C3V0	Y3	2.85	3.0	3.15	5	1	> 1	10 000	95	500	-9 to -3	106	123
BZT52C3V3	Y4	3.14	3.3	3.47	5	1	> 1	5000	95	500	-8 to -3	103	118
BZT52C3V6	Y5	3.42	3.6	3.78	5	1	> 1	5000	95	500	-8 to -3	100	114
BZT52C3V9	Y6	3.71	3.9	4.10	5	1	> 1	2000	95	500	-7 to -3	94	107
BZT52C4V3	Y7	4.09	4.3	4.52	5	1	> 1	1000	95	500	-6 to -1	91	103
BZT52C4V7	Y8	4.47	4.7	4.94	5	1	> 1	500	78	500	-5 to +2	87	99
BZT52C5V1	Y9	4.85	5.1	5.36	5	1	> 0.8	100	60	480	-3 to +4	84	101
BZT52C5V6	YA	5.32	5.6	5.88	5	1	> 1	100	40	400	-2 to +6	75	91
BZT52C6V2	YB	5.89	6.2	6.51	5	1	> 2	100	10	150	-1 to +7	67	80
BZT52C6V8	YC	6.46	6.8	7.14	5	1	> 3	100	8	80	+2 to +7	60	72
BZT52C7V5	YD	7.13	7.5	7.88	5	1	> 5	100	7	50	+3 to +7	54	64
BZT52C8V2	YE	7.79	8.2	8.61	5	1	> 6	100	7	50	+4 to +7	48	57
BZT52C9V1	YF	8.65	9.1	9.56	5	1	> 7	100	10	50	+5 to +8	42	50
BZT52C10	YG	9.50	10	10.50	5	1	> 7.5	100	15	70	+5 to +8	38	45
BZT52C11	YH	10.45	11	11.55	5	1	> 8.5	100	20	70	+5 to +9	35	41
BZT52C12	YI	11.40	12	12.60	5	1	> 9	100	20	90	+6 to +9	32	37
BZT52C13	YK	12.40	13	13.65	5	1	> 10	100	25	110	+7 to +9	29	34
BZT52C15	YL	14.25	15	15.60	5	1	> 11	100	30	110	+7 to +9	25	29
BZT52C16	YM	15.30	16	16.80	5	1	> 12	100	40	170	+8 to +9.5	23	27
BZT52C18	YN	17.10	18	18.90	5	1	> 14	100	45	170	+8 to +9.5	21	24
BZT52C20	YO	19.00	20	21.00	5	1	> 15	100	50	220	+8 to +10	18	22
BZT52C22	YP	20.90	22	23.10	5	1	> 17	100	55	220	+8 to +10	17	20
BZT52C24	YR	22.80	24	25.20	5	1	> 18	100	70	220	+8 to +10	15	18
BZT52C27	YS	25.65	27	28.35	2	0.5	> 20	100	80	250	+8 to +10	14	16
BZT52C30	YT	28.50	30	31.50	2	0.5	> 22.5	100	80	250	+8 to +10	12	14
BZT52C33	YU	31.35	33	34.65	2	0.5	> 25	100	80	250	+8 to +10	11	13
BZT52C36	YW	34.20	36	37.80	2	0.5	> 27	100	87	250	+8 to +10	10	12
BZT52C39	YX	37.05	39	40.95	2	0.5	> 29	100	87	300	+8 to +12	9	11
BZT52C43	YY	40.85	43	45.15	2	0.5	> 32	100	97	375	+8 to +12	9	10
BZT52C47	YZ	44.65	47	49.35	2	0.5	> 35	100	97	375	+8 to +12	8	9
BZT52C51	Z1	48.45	51	53.55	2	0.5	> 38	100	100	400	+8 to +12	7	8
BZT52C56	Z2	53.20	56	58.80	2	0.5	> 42	100	135	425	+8 to +12	7	8
BZT52C62	Z3	58.90	62	65.10	2	0.5	> 46	100	150	450	+8 to +12	6	7
BZT52C68	Z4	64.60	68	71.40	2	0.5	> 51	100	200	475	+8 to +12	5	6
BZT52C75	Z5	71.25	75	78.75	2	0.5	> 56	100	250	500	+8 to +12	5	6

Notes

- I<sub>ZT1</sub> = 5 mA, I<sub>ZT2</sub> = 1 mA or 0.5 mA
- <sup>(1)</sup> Measured with pulses t<sub>p</sub> = 5 ms
- <sup>(2)</sup> Valid provided that electrodes are kept at ambient temperature



ELECTRICAL CHARACTERISTICS (T <sub>amb</sub> = 25 °C, unless otherwise specified)													
PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE <sup>(1)</sup>			TEST CURRENT		REVERSE VOLTAGE		DYNAMIC RESISTANCE		TEMP. COEFFICIENT	ADMISSABLE ZENER CURRENT <sup>(2)</sup>	
		V <sub>Z</sub> at I <sub>ZT1</sub>			I <sub>ZT1</sub>	I <sub>ZT2</sub>	V <sub>R</sub> at I <sub>R</sub>		Z <sub>Z</sub> at I <sub>ZT1</sub>	Z <sub>ZK</sub> at I <sub>ZT2</sub>	α <sub>VZ</sub>	I <sub>Z</sub> at T <sub>amb</sub> = 45 °C	I <sub>Z</sub> at T <sub>amb</sub> = 25 °C
		V			mA		V	nA	Ω		10 <sup>-4</sup> /°C	mA	
		MIN.	NOM.	MAX.									
BZT52B2V2	U6	2.16	2.2	2.24	5	1	> 1	100000	120	600	-9 to -4	130	154
BZT52B2V4	V1	2.35	2.4	2.45	5	1	> 1	50000	100	600	-9 to -4	124	146
BZT52B2V7	V2	2.65	2.7	2.75	5	1	> 1	20000	83	500	-9 to -4	111	131
BZT52B3V0	V3	2.94	3.0	3.06	5	1	> 1	10000	95	500	-9 to -3	106	123
BZT52B3V3	V4	3.23	3.3	3.37	5	1	> 1	5000	95	500	-8 to -3	103	118
BZT52B3V6	V5	3.53	3.6	3.67	5	1	> 1	5000	95	500	-8 to -3	100	114
BZT52B3V9	V6	3.82	3.9	3.98	5	1	> 1	2000	90	500	-7 to -3	94	107
BZT52B4V3	V7	4.21	4.3	4.39	5	1	> 1	1000	90	500	-6 to -1	91	103
BZT52B4V7	V8	4.61	4.7	4.79	5	1	> 1	500	78	500	-5 to +2	87	99
BZT52B5V1	V9	5.00	5.1	5.20	5	1	> 0.8	100	60	480	-3 to +4	84	101
BZT52B5V6	VA	5.49	5.6	5.71	5	1	> 1	100	40	400	-2 to +6	75	91
BZT52B6V2	VB	6.08	6.2	6.32	5	1	> 2	100	10	150	-1 to +7	67	80
BZT52B6V8	VC	6.66	6.8	6.94	5	1	> 3	100	8	80	+2 to +7	60	72
BZT52B7V5	VD	7.35	7.5	7.65	5	1	> 5	100	7	50	+3 to +7	54	64
BZT52B8V2	VE	8.04	8.2	8.36	5	1	> 6	100	7	50	+4 to +7	48	57
BZT52B9V1	VF	8.92	9.1	9.28	5	1	> 7	100	10	50	+5 to +8	42	50
BZT52B10	VG	9.80	10	10.20	5	1	> 7.5	100	15	70	+5 to +8	38	45
BZT52B11	VH	10.78	11	11.22	5	1	> 8.5	100	20	70	+5 to +9	35	41
BZT52B12	VI	11.76	12	12.24	5	1	> 9	100	20	90	+6 to +9	32	37
BZT52B13	VK	12.74	13	13.26	5	1	> 10	100	25	110	+7 to +9	29	34
BZT52B15	VL	14.70	15	15.30	5	1	> 11	100	30	110	+7 to +9	25	29
BZT52B16	VM	15.68	16	16.32	5	1	> 12	100	40	170	+8 to +9.5	23	27
BZT52B18	VN	17.64	18	18.36	5	1	> 14	100	45	170	+8 to +9.5	21	24
BZT52B20	VO	19.60	20	20.40	5	1	> 15	100	50	220	+8 to +10	18	22
BZT52B22	VP	21.56	22	22.44	5	1	> 17	100	55	220	+8 to +10	17	20
BZT52B24	VR	23.52	24	24.48	5	1	> 18	100	70	220	+8 to +10	15	18
BZT52B27	VS	26.46	27	27.54	2	0.5	> 20	100	80	250	+8 to +10	14	16
BZT52B30	VT	29.40	30	30.60	2	0.5	> 22.5	100	80	250	+8 to +10	12	14
BZT52B33	VU	32.34	33	33.66	2	0.5	> 25	100	80	250	+8 to +10	11	13
BZT52B36	VW	35.28	36	36.72	2	0.5	> 27	100	87	250	+8 to +10	10	12
BZT52B39	VX	38.22	39	39.78	2	0.5	> 29	100	87	300	+8 to +12	9	11
BZT52B43	VY	42.14	43	43.86	2	0.5	> 32	100	97	375	+8 to +12	9	10
BZT52B47	VZ	46.06	47	47.94	2	0.5	> 35	100	97	375	+8 to +12	8	9
BZT52B51	U1	49.98	51	52.02	2	0.5	> 38	100	100	400	+8 to +12	7	8
BZT52B56	U2	54.88	56	57.12	2	0.5	> 42	100	135	425	+8 to +12	7	8
BZT52B62	U3	60.76	62	63.24	2	0.5	> 46	100	150	450	+8 to +12	6	7
BZT52B68	U4	66.64	68	69.36	2	0.5	> 51	100	200	475	+8 to +12	5	6
BZT52B75	U5	73.50	75	76.50	2	0.5	> 56	100	250	500	+8 to +12	5	6

Notes

- I<sub>ZT1</sub> = 5 mA, I<sub>ZT2</sub> = 1 mA or 0.5 mA
- (1) Measured with pulses t<sub>p</sub> = 5 ms
- (2) Valid provided that electrodes are kept at ambient temperature



### TYPICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)



Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature

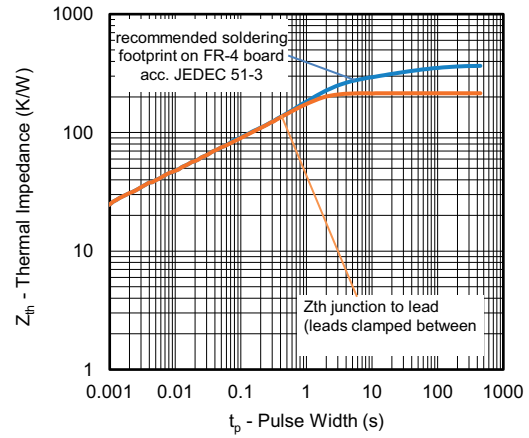
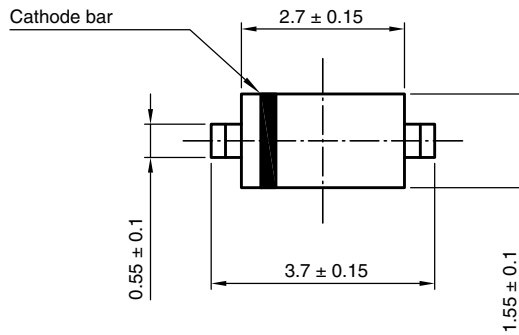
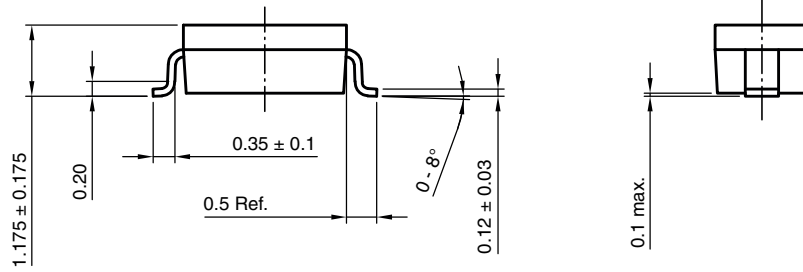


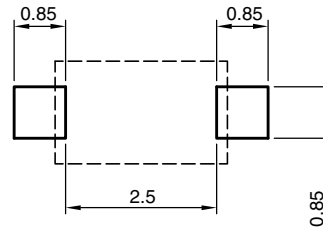
Fig. 2 - Thermal Impedance vs. Time



### PACKAGE DIMENSIONS in millimeters (inches): SOD-123



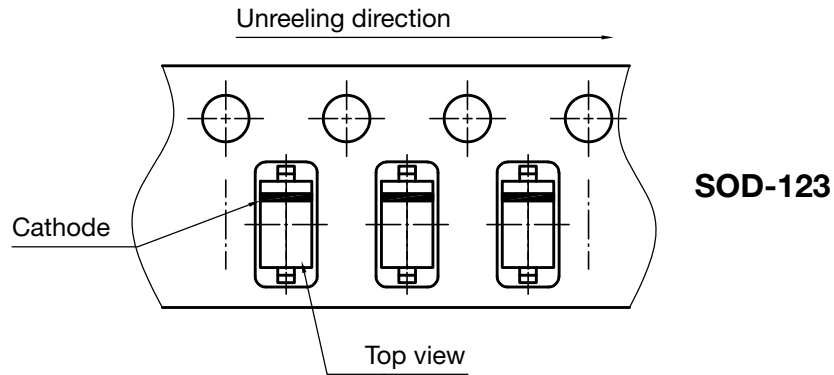
Footprint recommendation:



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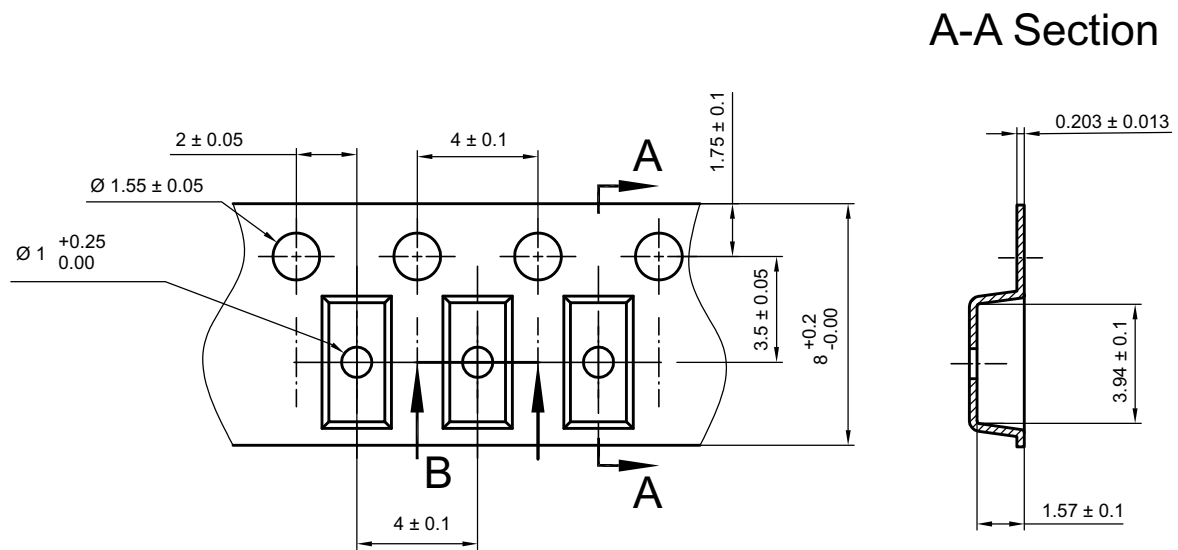


ORIENTATION IN CARRIER TAPE



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CARRIER TAPE



Created - Date: 07. Feb. 2013  
Rev. 01 - Date: 01. Mar. 2014  
Document no.: S8-V-3717.10-003 (4)



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