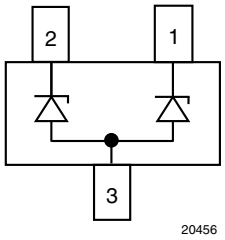
Small Signal Zener Diodes



FEATURES

- Silicon planar Zener diodes
- The Zener voltages are graded according to the international E24 standard. Standard Zener voltage tolerance is ± 5 %, indicated by the “C” in the ordering code. Replace “C” with “B” for ± 2 % tolerance.
- AEC-Q101 qualified available
- ESD capability acc. 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

AUTOMOTIVE GRADE Available

Pb-free

e3

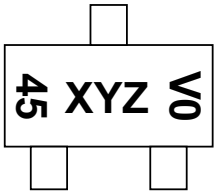
RoHS COMPLIANT

LINKS TO ADDITIONAL RESOURCES

3D Models

SPICE Models

MARKING (example only)



XYZ = type code
45 = working week
0 = year
V = Vishay

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
AZ23 series	AZ23C2V4-E3-08 to AZ23C75-E3-08	5 %	no	3000 (8 mm tape on 7" reel)	15 000
	AZ23B2V4-E3-08 to AZ23B75-E3-08	2 %	no		
	AZ23C2V4-HE3_A-08 to AZ23C75-HE3_A-08	5 %	yes		
	AZ23B2V4-HE3_A-08 to AZ23B75-HE3_A-08	2 %	yes		
	AZ23C2V4-E3-18 to AZ23C75-E3-18	5 %	no	10 000 (8 mm tape on 13" reel)	10 000
	AZ23B2V4-E3-18 to AZ23B75-E3-18	2 %	no		
	AZ23C2V4-HE3_A-18 to AZ23C75-HE3_A-18	5 %	yes		
	AZ23B2V4-HE3_A-18 to AZ23B75-HE3_A-18	2 %	yes		

PACKAGE

PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SOT-23	9.2 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	Peak temperature max. 260 °C

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	R_{thJL} = 250 K/W	P_{tot}	500	mW
	On FR-4 board with recommended soldering footprint	P_{tot}	300	mW
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_{amb} = 25 °C, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE f = 1 kHz		TEMPERATURE COEFFICIENT	
		V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	α_{VZ} at I_{ZT1}	
		V			mA		µA	V	Ω		10^{-4}/°C	
		MIN.	NOM.	MAX.			MAX.		MAX.	MAX.	MIN.	MAX.
AZ23C2V2	D77	2.09	2.2	2.31	5	1	100	1	120	600	-9	-4
AZ23C2V4	D78	2.28	2.4	2.52	5	1	50	1	100	600	-9	-4
AZ23C2V7	D41	2.57	2.7	2.84	5	1	20	1	83	500	-9	-4
AZ23C3V0	D42	2.85	3.0	3.15	5	1	10	1	95	500	-9	-3
AZ23C3V3	D43	3.14	3.3	3.47	5	1	5	1	95	500	-8	-3
AZ23C3V6	D44	3.42	3.6	3.78	5	1	5	1	90	500	-8	-3
AZ23C3V9	D45	3.71	3.9	4.10	5	1	3	1	90	500	-7	-3
AZ23C4V3	D46	4.09	4.3	4.52	5	1	3	1	90	500	-6	-1
AZ23C4V7	D47	4.47	4.7	4.94	5	1	3	2	78	500	-5	2
AZ23C5V1	D48	4.85	5.1	5.36	5	1	2	2	60	480	-3	4
							0.1	0.8				
AZ23C5V6	D49	5.32	5.6	5.88	5	1	1	2	40	400	-2	6
							0.1	1				
AZ23C6V2	D50	5.89	6.2	6.51	5	1	3	4	10	150	-1	7
							0.1	2				
AZ23C6V8	D51	6.46	6.8	7.14	5	1	2	4	8	80	2	7
							0.1	3				
AZ23C7V5	D52	7.13	7.5	7.88	5	1	0.1	5	7	50	3	7
AZ23C8V2	D53	7.79	8.2	8.61	5	1	0.1	6	7	50	4	7
AZ23C9V1	D54	8.65	9.1	9.56	5	1	0.1	7	10	50	5	8
AZ23C10	D55	9.50	10	10.50	5	1	0.1	7.5	15	70	5	8
AZ23C11	D56	10.45	11	11.55	5	1	0.1	8.5	20	70	5	9
AZ23C12	D57	11.40	12	12.60	5	1	0.1	9	20	90	6	9
AZ23C13	D58	12.40	13	13.65	5	1	0.1	10	25	110	7	9
AZ23C15	D59	14.25	15	15.60	5	1	0.05	11	30	110	7	9
AZ23C16	D60	15.30	16	16.80	5	1	0.05	12	40	170	8	9.5
AZ23C18	D61	17.10	18	18.90	5	1	0.05	14	45	170	8	9.5
AZ23C20	D62	19.00	20	21.00	5	1	0.05	15	50	220	8	10
AZ23C22	D63	20.90	22	23.10	5	1	0.05	17	55	220	8	10
AZ23C24	D64	22.80	24	25.20	5	1	0.05	18	70	220	8	10
AZ23C27	D65	25.65	27	28.35	2	0.5	0.05	20	80	250	8	10
AZ23C30	D66	28.50	30	31.50	2	0.5	0.05	22.5	80	250	8	10
AZ23C33	D67	31.35	33	34.65	2	0.5	0.05	25	80	250	8	10
AZ23C36	D68	34.20	36	37.80	2	0.5	0.05	27	87	250	8	10
AZ23C39	D69	37.05	39	40.95	2	0.5	0.05	29	87	300	10	12
AZ23C43	D70	40.85	43	45.15	2	0.5	0.05	32	97	375	10	12
AZ23C47	D71	44.65	47	49.35	2	0.5	0.05	35	97	375	10	12
AZ23C51	D72	48.45	51	53.55	2	0.5	0.05	38	100	400	10	12
AZ23C56	D73	53.20	56	58.80	2	0.5	0.05	42	135	425	9	11
AZ23C62	D74	58.90	62	65.10	2	0.5	0.05	46.5	150	450	9	12
AZ23C68	D75	64.60	68	71.40	2	0.5	0.05	51	200	475	10	12
AZ23C75	D76	71.25	75	78.75	2	0.5	0.05	56	250	500	10	12

Note

(1) Tested with pulses t_δ = 5 ms

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

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE f = 1 kHz		TEMPERATURE COEFFICIENT	
		V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	I_R at V_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	α_{VZ} at I_{ZT1}	
		V			mA		µA	V	Ω		10^{-4}/°C	
		MIN.	NOM.	MAX.			MAX.		MAX.	MAX.	MIN.	MAX.
AZ23B2V2	DG8	2.16	2.2	2.24	5	1	100	1	120	600	-9	-4
AZ23B2V4	DG9	2.35	2.4	2.45	5	1	50	1	100	600	-9	-4
AZ23B2V7	DD1	2.65	2.7	2.75	5	1	20	1	83	500	-9	-4
AZ23B3V0	DD2	2.94	3.0	3.06	5	1	10	1	95	500	-9	-3
AZ23B3V3	DD3	3.23	3.3	3.37	5	1	5	1	95	500	-8	-3
AZ23B3V6	DD4	3.53	3.6	3.67	5	1	5	1	90	500	-8	-3
AZ23B3V9	DD5	3.82	3.9	3.98	5	1	3	1	90	500	-7	-3
AZ23B4V3	DD6	4.21	4.3	4.39	5	1	3	1	90	500	-6	-1
AZ23B4V7	DD7	4.61	4.7	4.79	5	1	3	2	78	500	-5	2
AZ23B5V1	DD8	5.00	5.1	5.20	5	1	2	2	60	480	-3	4
							0.1	0.8				
AZ23B5V6	DD9	5.49	5.6	5.71	5	1	1	2	40	400	-2	6
							0.1	1				
AZ23B6V2	DE0	6.08	6.2	6.32	5	1	3	4	10	150	-1	7
							0.1	2				
AZ23B6V8	DE1	6.66	6.8	6.94	5	1	2	4	8	80	2	7
							0.1	3				
AZ23B7V5	DE2	7.35	7.5	7.65	5	1	0.1	5	7	50	3	7
AZ23B8V2	DE3	8.04	8.2	8.36	5	1	0.1	6	7	50	4	7
AZ23B9V1	DE4	8.92	9.1	9.28	5	1	0.1	7	10	50	5	8
AZ23B10	DE5	9.80	10	10.20	5	1	0.1	7.5	15	70	5	8
AZ23B11	DE6	10.78	11	11.22	5	1	0.1	8.5	20	70	5	9
AZ23B12	DE7	11.76	12	12.24	5	1	0.1	9	20	90	6	9
AZ23B13	DE8	12.74	13	13.26	5	1	0.1	10	25	110	7	9
AZ23B15	DE9	14.70	15	15.30	5	1	0.05	11	30	110	7	9
AZ23B16	DF0	15.68	16	16.32	5	1	0.05	12	40	170	8	9.5
AZ23B18	DF1	17.64	18	18.36	5	1	0.05	14	45	170	8	9.5
AZ23B20	DF2	19.60	20	20.40	5	1	0.05	15	50	220	8	10
AZ23B22	DF3	21.56	22	22.44	5	1	0.05	17	55	220	8	10
AZ23B24	DF4	23.52	24	24.48	5	1	0.05	18	70	220	8	10
AZ23B27	DF5	26.46	27	27.54	2	0.5	0.05	20	80	250	8	10
AZ23B30	DF6	29.40	30	30.60	2	0.5	0.05	22.5	80	250	8	10
AZ23B33	DF7	32.34	33	33.66	2	0.5	0.05	25	80	250	8	10
AZ23B36	DF8	35.28	36	36.72	2	0.5	0.05	27	87	250	8	10
AZ23B39	DF9	38.22	39	39.78	2	0.5	0.05	29	87	300	10	12
AZ23B43	DG0	42.14	43	43.86	2	0.5	0.05	32	97	375	10	12
AZ23B47	DG1	46.06	47	47.94	2	0.5	0.05	35	97	375	10	12
AZ23B51	DG2	49.98	51	52.02	2	0.5	0.05	38	100	400	10	12
AZ23B56	DG3	54.88	56	57.12	2	0.5	0.05	42	135	425	9	11
AZ23B62	DG5	60.76	62	63.24	2	0.5	0.05	46.5	150	450	9	12
AZ23B68	DG6	66.64	68	69.36	2	0.5	0.05	51	200	475	10	12
AZ23B75	DG7	73.50	75	76.50	2	0.5	0.05	56	250	500	10	12

Note

(1) Tested with pulses t_δ = 5 ms

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

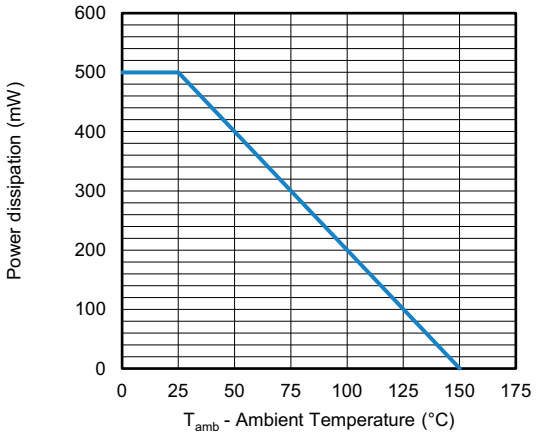


Fig. 1 - Admissible Power Dissipation vs. Ambient Temperature

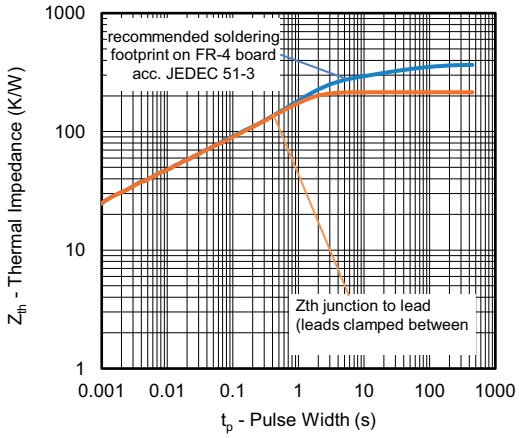
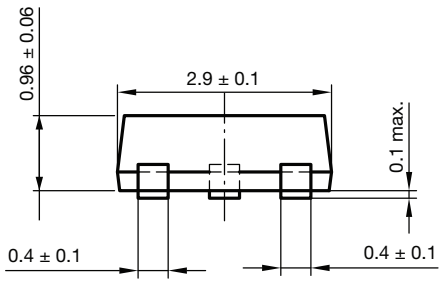
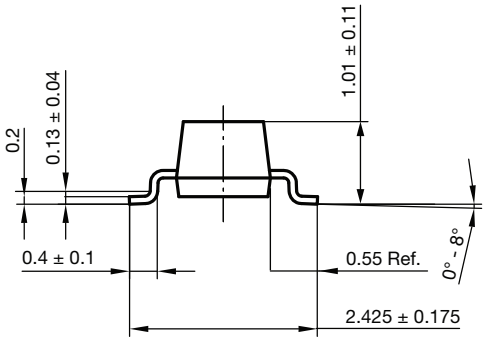
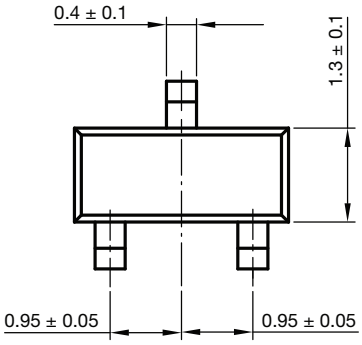


Fig. 2 - Thermal Impedance vs. Time

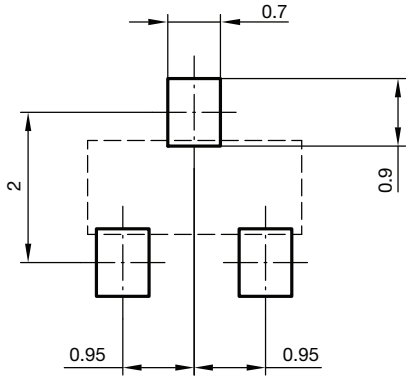
PACKAGE DIMENSIONS in millimeters (inches): SOT-23







Foot print recommendation:



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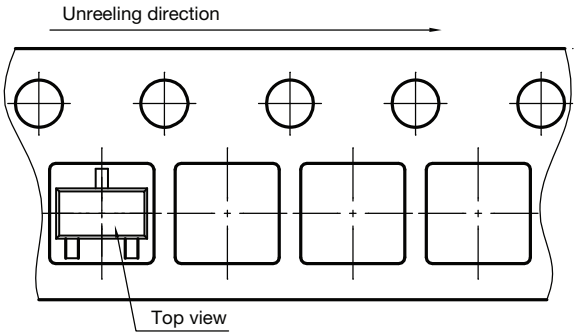
Created - Date: 18. Oct. 2021
Rev. 01 - Date: 18. Jan. 2022

ORIENTATION IN CARRIER TAPE



SOT-23

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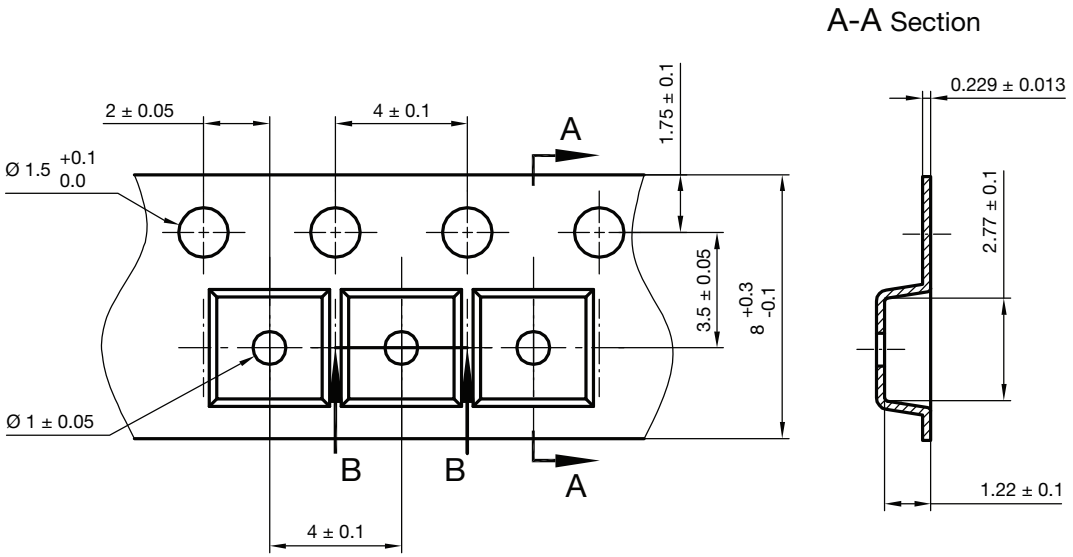
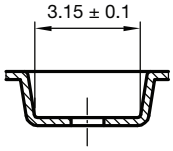
Created Date: 04.02.2010
Rev. 02 Date: 07.11.2022

CARRIER TAPE



B-B Section



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