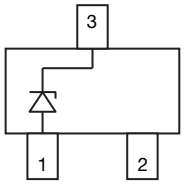
Small Signal Zener Diodes



20421

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
- 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 - RoHS-compliant, AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

Pb-free
e3
RoHS COMPLIANT

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V_Z range nom.	2.4 to 75	V
Test current I_{ZT}	2; 5	mA
V_Z specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZX84-series	BZX84C2V4-E3-08 to BZX84C75-E3-08	3000 (8 mm tape on 7" reel)	15 000
	BZX84B2V4-E3-08 to BZX84B75-E3-08		
	BZX84C2V4-HE3-08 to BZX84C75-HE3-08		
	BZX84B2V4-HE3-08 to BZX84B75-HE3-08		
	BZX84C2V4-E3-18 to BZX84C75-E3-18	10 000 (8 mm tape on 13" reel)	10 000
	BZX84B2V4-E3-18 to BZX84B75-E3-18		
	BZX84C2V4-HE3-18 to BZX84C75-HE3-18		
	BZX84B2V4-HE3-18 to BZX84B75-HE3-18		

PACKAGE				
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SOT-23	8.8 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	T_{amb} = 25 °C, device on fiberglass substrate, acc. layout on page 7	P_{tot}	300	mW
Thermal resistance junction to ambient air	T_{amb} = 25 °C, device on fiberglass substrate, acc. layout on page 7	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

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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.	MIN.	MAX.
BZX84C2V4	Z11	2.2	2.4	2.6	5	1	50	1	100	275	- 9	- 4
BZX84C2V7	Z12	2.5	2.7	2.9	5	1	20	1	100	600	- 9	- 4
BZX84C3V0	Z13	2.8	3.0	3.2	5	1	10	1	95	600	- 9	- 3
BZX84C3V3	Z14	3.1	3.3	3.5	5	1	5	1	95	600	- 8	- 3
BZX84C3V6	Z15	3.4	3.6	3.8	5	1	5	1	90	600	- 8	- 3
BZX84C3V9	Z16	3.7	3.9	4.1	5	1	3	1	90	600	- 7	- 3
BZX84C4V3	Z17	4.0	4.3	4.6	5	1	3	1	90	600	- 6	- 1
BZX84C4V7	Z1	4.4	4.7	5.0	5	1	3	2	80	500	- 5	2
BZX84C5V1	Z2	4.8	5.1	5.4	5	1	2	2	60	480	- 3	4
BZX84C5V6	Z3	5.2	5.6	6.0	5	1	1	2	40	400	- 2	6
BZX84C6V2	Z4	5.8	6.2	6.6	5	1	3	4	10	150	- 1	7
BZX84C6V8	Z5	6.4	6.8	7.2	5	1	2	4	15	80	2	7
BZX84C7V5	Z6	7.0	7.5	7.9	5	1	1	5	15	80	3	7
BZX84C8V2	Z7	7.7	8.2	8.7	5	1	0.7	5	15	80	4	7
BZX84C9V1	Z8	8.5	9.1	9.6	5	1	0.5	6	15	100	5	8
BZX84C10	Z9	9.4	10	10.6	5	1	0.2	7	20	150	5	8
BZX84C11	Y1	10.4	11	11.6	5	1	0.1	8	20	150	5	9
BZX84C12	Y2	11.4	12	12.7	5	1	0.1	8	25	150	6	9
BZX84C13	Y3	12.4	13	14.1	5	1	0.1	8	30	170	7	9
BZX84C15	Y4	13.8	15	15.6	5	1	0.05	10.5	30	200	7	9
BZX84C16	Y5	15.3	16	17.1	5	1	0.05	11.2	40	200	8	9.5
BZX84C18	Y6	16.8	18	19.1	5	1	0.05	12.6	45	225	8	9.5
BZX84C20	Y7	18.8	20	21.2	5	1	0.05	14.0	55	225	8	10
BZX84C22	Y8	20.8	22	23.3	5	1	0.05	15.4	55	250	8	10
BZX84C24	Y9	22.8	24	25.6	5	1	0.05	16.8	70	250	8	10
BZX84C27	Y10	25.1	27	28.9	2	0.5	0.05	18.9	80	300	8	10
BZX84C30	Y11	28	30	32	2	0.5	0.05	21.0	80	300	8	10
BZX84C33	Y12	31	33	35	2	0.5	0.05	23.1	80	325	8	10
BZX84C36	Y13	34	36	38	2	0.5	0.05	25.2	90	350	8	10
BZX84C39	Y14	37	39	41	2	0.5	0.05	27.3	130	350	10	12
BZX84C43	Y15	40	43	46	2	0.5	0.05	30.1	150	375	10	12
BZX84C47	Y16	44	47	50	2	0.5	0.05	32.9	170	375	10	12
BZX84C51	Y17	48	51	54	2	0.5	0.05	35.7	180	400	10	12
BZX84C56	Y18	52	56	60	2	0.5	0.05	39.2	200	425	9	11
BZX84C62	Y19	58	62	66	2	0.5	0.05	43.4	215	450	9	12
BZX84C68	Y20	64	68	72	2	0.5	0.05	47.6	240	475	10	12
BZX84C75	Y21	70	75	79	2	0.5	0.05	52.5	255	500	10	12

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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.	MIN.	MAX.
BZX84B2V4	Z50	2.35	2.4	2.45	5	1	50	1	100	275	- 9	- 4
BZX84B2V7	Z51	2.65	2.7	2.75	5	1	20	1	100	600	- 9	- 4
BZX84B3V0	Z52	2.94	3.0	3.06	5	1	10	1	95	600	- 9	- 3
BZX84B3V3	Z53	3.23	3.3	3.37	5	1	5	1	95	600	- 8	- 3
BZX84B3V6	Z54	3.53	3.6	3.67	5	1	5	1	90	600	- 8	- 3
BZX84B3V9	Z55	3.82	3.9	3.98	5	1	3	1	90	600	- 7	- 3
BZX84B4V3	Z56	4.21	4.3	4.39	5	1	3	1	90	600	- 6	- 1
BZX84B4V7	Z57	4.61	4.7	4.79	5	1	3	2	80	500	- 5	2
BZX84B5V1	Z58	5.0	5.1	5.2	5	1	2	2	60	480	- 3	4
BZX84B5V6	Z59	5.49	5.6	5.71	5	1	1	2	40	400	- 2	6
BZX84B6V2	Z60	6.08	6.2	6.32	5	1	3	4	10	150	- 1	7
BZX84B6V8	Z61	6.66	6.8	6.94	5	1	2	4	15	80	2	7
BZX84B7V5	Z62	7.35	7.5	7.65	5	1	1	5	15	80	3	7
BZX84B8V2	Z63	8.04	8.2	8.36	5	1	0.7	5	15	80	4	7
BZX84B9V1	Z64	8.92	9.1	9.28	5	1	0.5	6	15	100	5	8
BZX84B10	Z65	9.8	10	10.2	5	1	0.2	7	20	150	5	8
BZX84B11	Z66	10.8	11	11.2	5	1	0.1	8	20	150	5	9
BZX84B12	Z67	11.8	12	12.2	5	1	0.1	8	25	150	6	9
BZX84B13	Z68	12.7	13	13.3	5	1	0.1	8	30	170	7	9
BZX84B15	Z69	14.7	15	15.3	5	1	0.05	10.5	30	200	7	9
BZX84B16	Z70	15.7	16	16.3	5	1	0.05	11.2	40	200	8	9.5
BZX84B18	Z71	17.6	18	18.4	5	1	0.05	12.6	45	225	8	9.5
BZX84B20	Z72	19.6	20	20.4	5	1	0.05	14	55	225	8	10
BZX84B22	Z73	21.6	22	22.4	5	1	0.05	15.4	55	250	8	10
BZX84B24	Z74	23.5	24	24.5	5	1	0.05	16.8	70	250	8	10
BZX84B27	Z75	26.5	27	27.5	2	0.5	0.05	18.9	80	300	8	10
BZX84B30	Z76	29.4	30	30.6	2	0.5	0.05	21	80	300	8	10
BZX84B33	Z77	32.3	33	33.7	2	0.5	0.05	23.1	80	325	8	10
BZX84B36	Z78	35.3	36	36.7	2	0.5	0.05	25.2	90	350	8	10
BZX84B39	Z79	38.2	39	39.8	2	0.5	0.05	27.3	130	350	10	12
BZX84B43	Z80	42.1	43	43.9	2	0.5	0.05	30.1	150	375	10	12
BZX84B47	Z81	46.1	47	47.9	2	0.5	0.05	32.9	170	375	10	12
BZX84B51	Z82	50	51	52	2	0.5	0.05	35.7	180	400	10	12
BZX84B56	Z83	54.9	56	57.1	2	0.5	0.05	39.2	200	425	9	11
BZX84B62	Z84	60.8	62	63.2	2	0.5	0.05	43.4	215	450	9	12
BZX84B68	Z85	66.6	68	69.4	2	0.5	0.05	47.6	240	475	10	12
BZX84B75	Z86	73.5	75	76.5	2	0.5	0.05	52.5	255	500	10	12

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

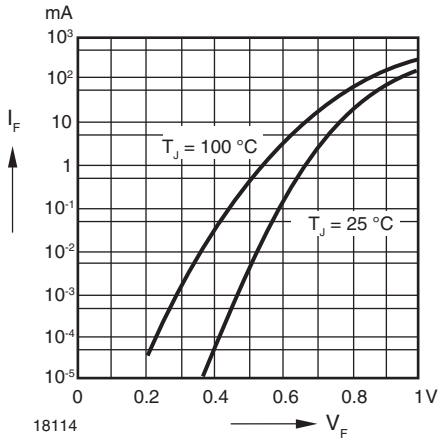

Fig. 1 - Forward Characteristics

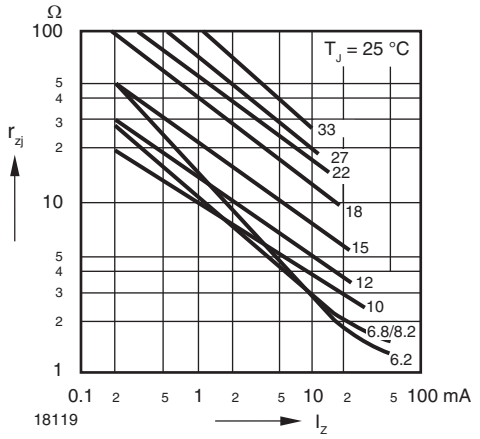

Fig. 4 - Dynamic Resistance vs. Zener Current

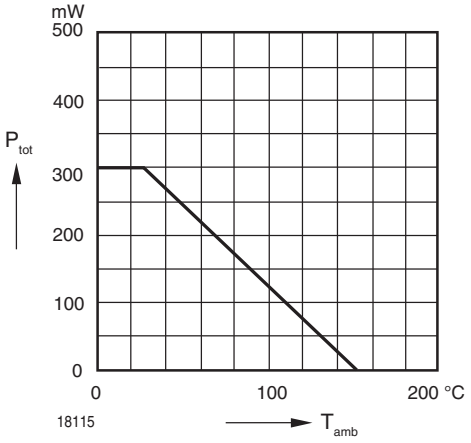

Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

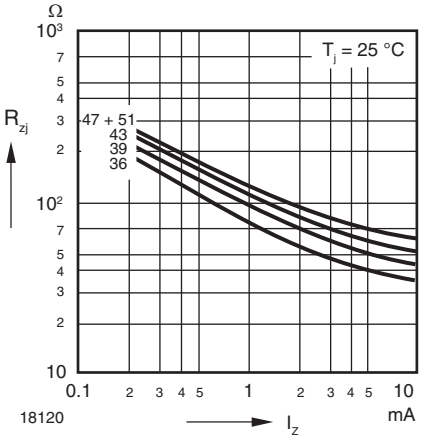

Fig. 5 - Dynamic Resistance vs. Zener Current

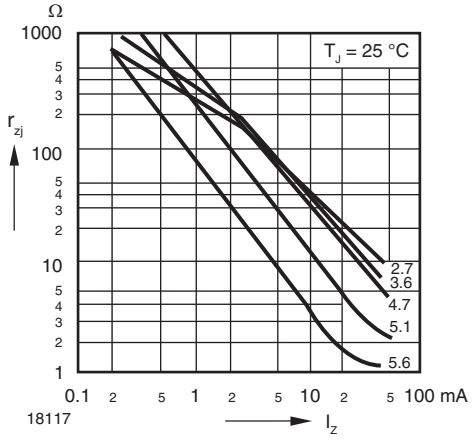

Fig. 3 - Dynamic Resistance vs. Zener Current

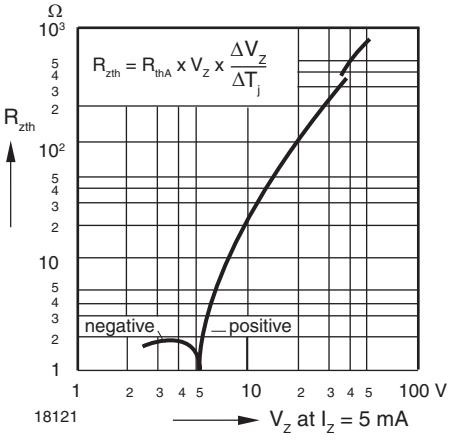

Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

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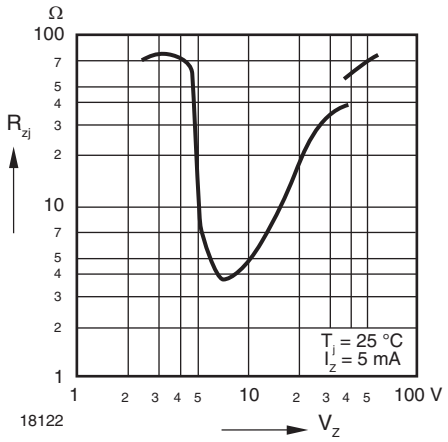

Fig. 7 - Dynamic Resistance vs. Zener Voltage

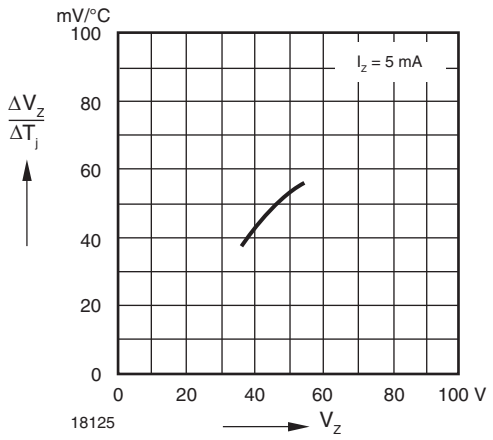

Fig. 10 - Temperature Dependence of Zener Voltage vs. Zener Voltage

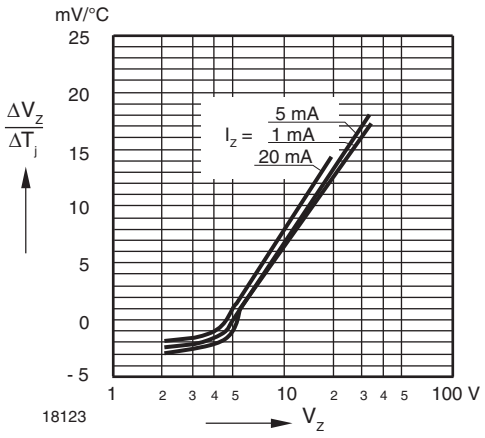

Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

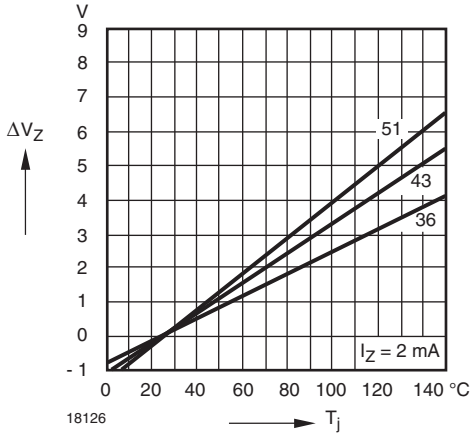

Fig. 11 - Change of Zener Voltage vs. Junction Temperature

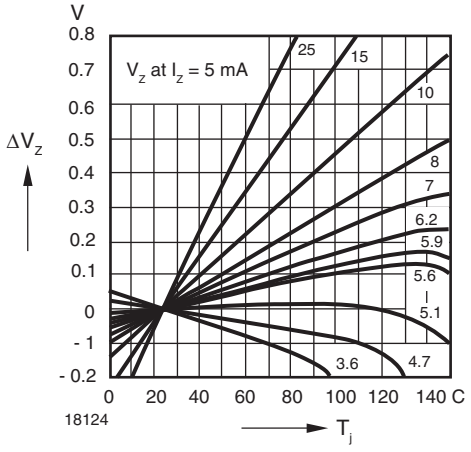

Fig. 9 - Change of Zener Voltage vs. Junction Temperature

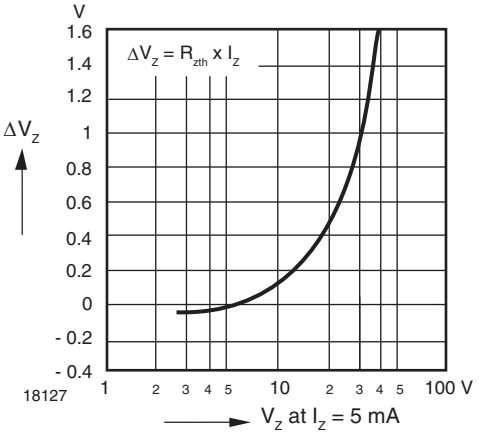

Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

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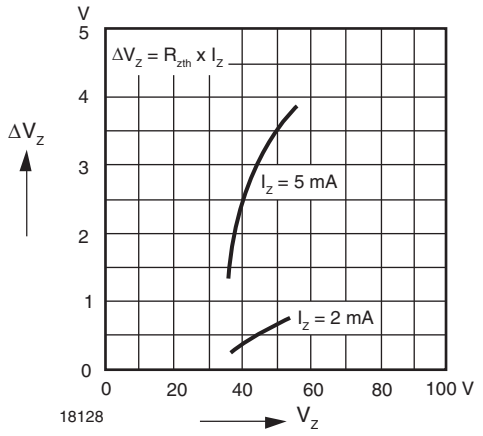

Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

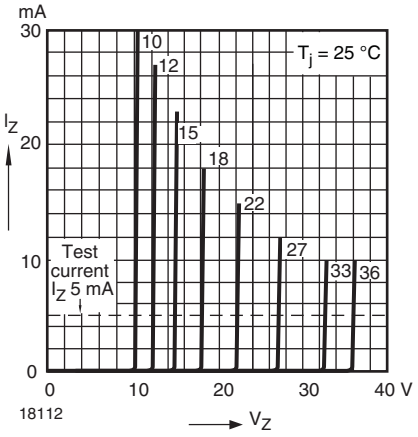

Fig. 15 - Breakdown Characteristics

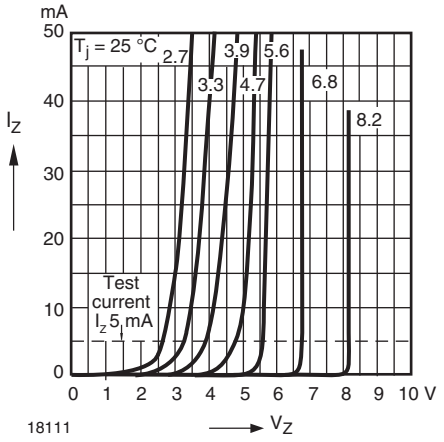

Fig. 14 - Breakdown Characteristics

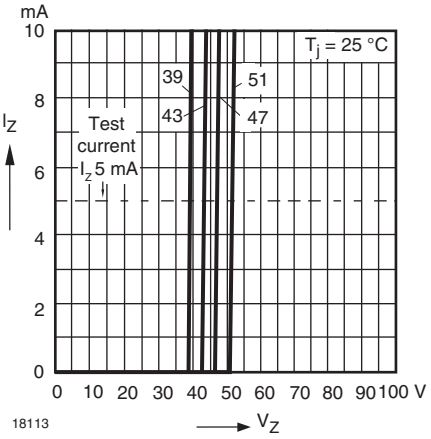

Fig. 16 - Breakdown Characteristics

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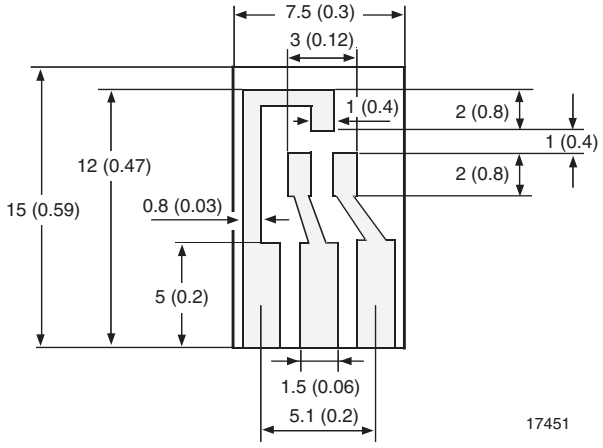
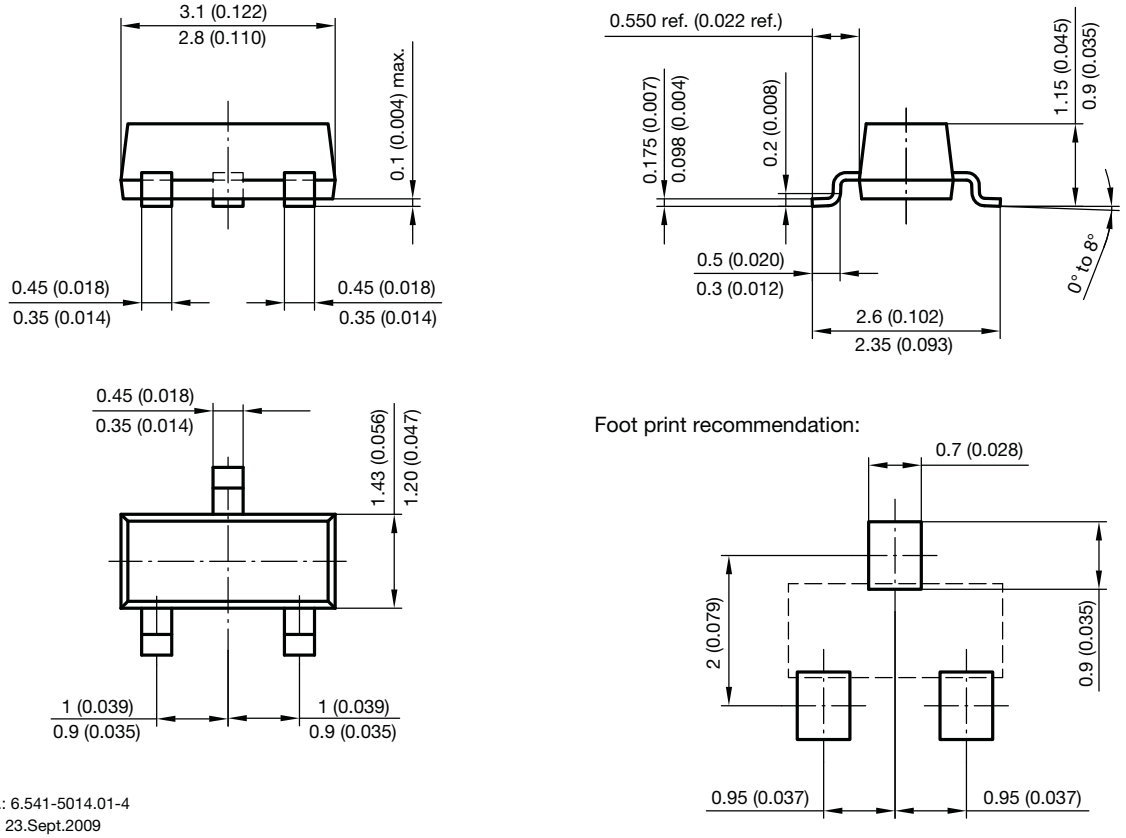
LAYOUT FOR R_{thJA} TEST

Thickness: fiberglass 0.059" (1.5 mm)
Copper leads 0.012" (0.3 mm)



PACKAGE DIMENSIONS in millimeters (inches): SOT-23



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Rev. 8 - Date: 23.Sept.2009
17418

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