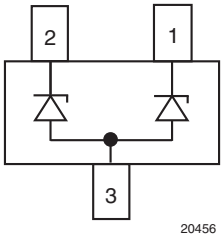
Small Signal Zener Diodes, Dual



FEATURES

AUTOMOTIVE GRADE Available

Pb-free

e3

RoHS COMPLIANT

- Dual silicon planar Zener diodes, common anode
- 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.
- The parameters are valid for both diodes in one case. ΔV_Z and ΔR_{zj} of the two diodes in one case is ≤ 5 %
- 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 - RoHS-compliant, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

PRIMARY CHARACTERISTICS

PARAMETER	VALUE	UNIT
V_Z range nom.	2.7 to 51	V
Test current I_{ZT}	5	mA
V_Z specification	Pulse current	
Int. construction	Dual common anode	

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
AZ23-series	AZ23C2V7-E3-08 to AZ23C51-E3-08	3000 (8 mm tape on 7" reel)	15 000
	AZ23B2V7-E3-08 to AZ23B51-E3-08		
	AZ23C2V7-HE3-08 to AZ23C51-HE3-08		
	AZ23B2V7-HE3-08 to AZ23B51-HE3-08		
	AZ23C2V7-E3-18 to AZ23C51-E3-18	10 000 (8 mm tape on 13" reel)	10 000
	AZ23B2V7-E3-18 to AZ23B51-E3-18		
	AZ23C2V7-HE3-18 to AZ23C51-HE3-18		
	AZ23B2V7-HE3-18 to AZ23B51-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 (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	Device on fiberglass substrate, see layout on page 6	P_{tot}	300	mW
Thermal resistance, junction to ambient air	Device on fiberglass substrate, see layout on page 6	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 (1)			TEST CURRENT		REVERSE VOLTAGE		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT OF ZENER VOLTAGE	
		V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	V_R at I_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	α_{VZ} at I_{ZT}	
		V			mA		V	nA	Ω		10^{-4}/°C	
		MIN.	NOM.	MAX.							MIN.	MAX.
AZ23C2V7	D1	2.5	2.7	2.9	5	1	-	-	75 (< 83)	< 500	-9	-4
AZ23C3V0	D2	2.8	3.0	3.2	5	1	-	-	80 (< 95)	< 500	-9	-3
AZ23C3V3	D3	3.1	3.3	3.5	5	1	-	-	80 (< 95)	< 500	-8	-3
AZ23C3V6	D4	3.4	3.6	3.8	5	1	-	-	80 (< 95)	< 500	-8	-3
AZ23C3V9	D5	3.7	3.9	4.1	5	1	-	-	80 (< 95)	< 500	-7	-3
AZ23C4V3	D6	4	4.3	4.6	5	1	-	-	80 (< 95)	< 500	-6	-1
AZ23C4V7	D7	4.4	4.7	5	5	1	-	-	70 (< 78)	< 500	-5	2
AZ23C5V1	D8	4.8	5.1	5.4	5	1	> 0.8	100	30 (< 60)	< 480	-3	4
AZ23C5V6	D9	5.2	5.6	6	5	1	> 1	100	10 (< 40)	< 400	-2	6
AZ23C6V2	D10	5.8	6.2	6.6	5	1	> 2	100	4.8 (< 10)	< 200	-1	7
AZ23C6V8	D11	6.4	6.8	7.2	5	1	> 3	100	4.5 (< 8)	< 150	2	7
AZ23C7V5	D12	7	7.5	7.9	5	1	> 5	100	4 (< 7)	< 50	3	7
AZ23C8V2	D13	7.7	8.2	8.7	5	1	> 6	100	4.5 (< 7)	< 50	4	7
AZ23C9V1	D14	8.5	9.1	9.6	5	1	> 7	100	4.8 (< 10)	< 50	5	8
AZ23C10	D15	9.4	10	10.6	5	1	> 7.5	100	5.2 (< 15)	< 70	5	8
AZ23C11	D16	10.4	11	11.6	5	1	> 8.5	100	6 (< 20)	< 70	5	9
AZ23C12	D17	11.4	12	12.7	5	1	> 9	100	7 (< 20)	< 90	6	9
AZ23C13	D18	12.4	13	14.1	5	1	> 10	100	9 (< 25)	< 110	7	9
AZ23C15	D19	13.8	15	15.6	5	1	> 11	100	11 (< 30)	< 110	7	9
AZ23C16	D20	15.3	16	17.1	5	1	> 12	100	13 (< 40)	< 170	8	9.5
AZ23C18	D21	16.8	18	19.1	5	1	> 14	100	18 (< 50)	< 170	8	9.5
AZ23C20	D22	18.8	20	21.2	5	1	> 15	100	20 (< 50)	< 220	8	10
AZ23C22	D23	20.8	22	23.3	5	1	> 17	100	25 (< 55)	< 220	8	10
AZ23C24	D24	22.8	24	25.6	5	1	> 18	100	28 (< 80)	< 220	8	10
AZ23C27	D25	25.1	27	28.9	5	1	> 20	100	30 (< 80)	< 250	8	10
AZ23C30	D26	28	30	32	5	1	> 22.5	100	35 (< 80)	< 250	8	10
AZ23C33	D27	31	33	35	5	1	> 25	100	40 (< 80)	< 250	8	10
AZ23C36	D28	34	36	38	5	1	> 27	100	40 (< 90)	< 250	8	10
AZ23C39	D29	37	39	41	5	1	> 29	100	50 (< 90)	< 300	10	12
AZ23C43	D30	40	43	46	5	1	> 32	100	60 (< 100)	< 700	10	12
AZ23C47	D31	44	47	50	5	1	> 35	100	70 (< 100)	< 750	10	12
AZ23C51	D32	48	51	54	5	1	> 38	100	70 (< 100)	< 750	10	12

Note

(1) Tested with pulses t_p = 5 ms

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

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE (1)			TEST CURRENT		REVERSE VOLTAGE		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT OF ZENER VOLTAGE	
		V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	V_R at I_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	α_{VZ} at I_{ZT}	
		V			mA		V	nA	Ω		10^{-4}/°C	
		MIN.	NOM.	MAX.							MIN.	MAX.
AZ23B2V7	D1	2.65	2.7	2.75	5	1	-	-	75 (< 83)	< 500	-9	-4
AZ23B3V0	D2	2.94	3.0	3.06	5	1	-	-	80 (< 95)	< 500	-9	-3
AZ23B3V3	D3	3.23	3.3	3.37	5	1	-	-	80 (< 95)	< 500	-8	-3
AZ23B3V6	D4	3.53	3.6	3.67	5	1	-	-	80 (< 95)	< 500	-8	-3
AZ23B3V9	D5	3.82	3.9	3.98	5	1	-	-	80 (< 95)	< 500	-7	-3
AZ23B4V3	D6	4.21	4.3	4.39	5	1	-	-	80 (< 95)	< 500	-6	-1
AZ23B4V7	D7	4.61	4.7	4.79	5	1	-	-	70 (< 78)	< 500	-5	2
AZ23B5V1	D8	5	5.1	5.2	5	1	> 0.8	100	30 (< 60)	< 480	-3	4
AZ23B5V6	D9	5.49	5.6	5.71	5	1	> 1	100	10 (< 40)	< 400	-2	6
AZ23B6V2	D10	6.08	6.2	6.32	5	1	> 2	100	4.8 (< 10)	< 200	-1	7
AZ23B6V8	D11	6.66	6.8	6.94	5	1	> 3	100	4.5 (< 8)	< 150	2	7
AZ23B7V5	D12	7.35	7.5	7.65	5	1	> 5	100	4 (< 7)	< 50	3	7
AZ23B8V2	D13	8.04	8.2	8.36	5	1	> 6	100	4.5 (< 7)	< 50	4	7
AZ23B9V1	D14	8.92	9.1	9.28	5	1	> 7	100	4.8 (< 10)	< 50	5	8
AZ23B10	D15	9.8	10	10.2	5	1	> 7.5	100	5.2 (< 15)	< 70	5	8
AZ23B11	D16	10.8	11	11.2	5	1	> 8.5	100	6 (< 20)	< 70	5	9
AZ23B12	D17	11.8	12	12.2	5	1	> 9	100	7 (< 20)	< 90	6	9
AZ23B13	D18	12.7	13	13.3	5	1	> 10	100	9 (< 25)	< 110	7	9
AZ23B15	D19	14.7	15	15.3	5	1	> 11	100	11 (< 30)	< 110	7	9
AZ23B16	D20	15.7	16	16.3	5	1	> 12	100	13 (< 40)	< 170	8	0.5
AZ23B18	D21	17.6	18	18.4	5	1	> 14	100	18 (< 50)	< 170	8	0.5
AZ23B20	D22	19.6	20	20.4	5	1	> 15	100	20 (< 50)	< 220	8	10
AZ23B22	D23	21.6	22	22.4	5	1	> 17	100	25 (< 55)	< 220	8	10
AZ23B24	D24	23.5	24	24.5	5	1	> 18	100	28 (< 80)	< 220	8	10
AZ23B27	D25	26.5	27	27.5	5	1	> 20	100	30 (< 80)	< 250	8	10
AZ23B30	D26	29.4	30	30.6	5	1	> 22.5	100	35 (< 80)	< 250	8	10
AZ23B33	D27	32.3	33	33.7	5	1	> 25	100	40 (< 80)	< 250	8	10
AZ23B36	D28	35.3	36	36.7	5	1	> 27	100	40 (< 90)	< 250	8	10
AZ23B39	D29	38.2	39	39.8	5	1	> 29	100	50 (< 90)	< 300	10	12
AZ23B43	D30	42.1	43	43.9	5	1	> 32	100	60 (< 100)	< 700	10	12
AZ23B47	D31	46.1	47	47.9	5	1	> 35	100	70 (< 100)	< 750	10	12
AZ23B51	D32	50	51	52	5	1	> 38	100	70 (< 100)	< 750	10	12

Note

(1) Tested with pulses t_p = 5 ms

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

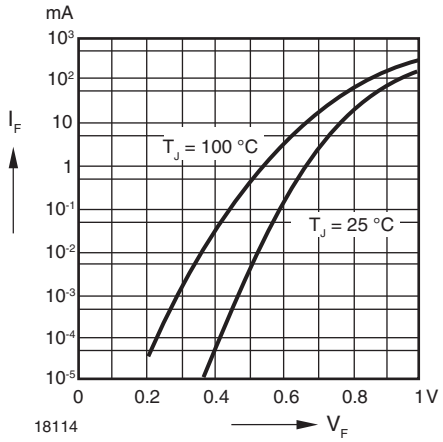


Fig. 1 - Forward Characteristics

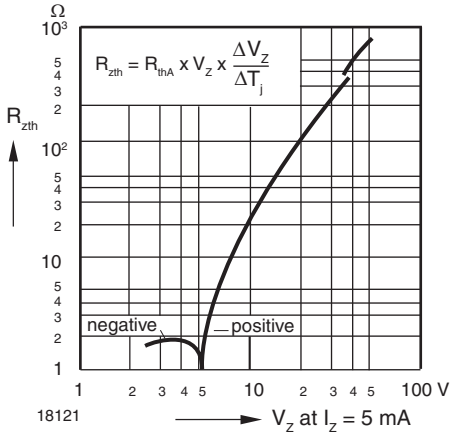


Fig. 4 - Thermal Differential Resistance vs. Zener Voltage

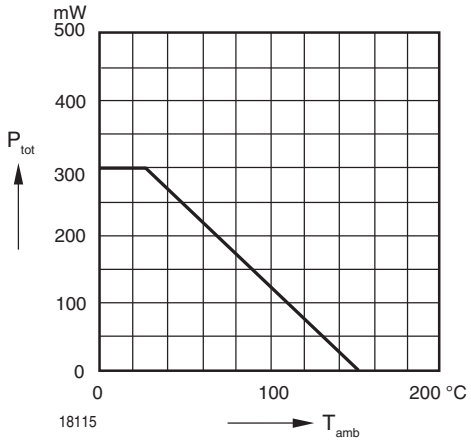


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

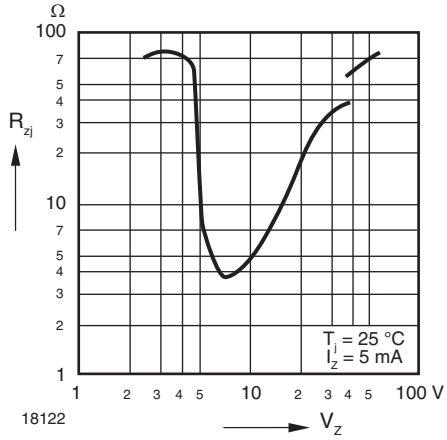


Fig. 5 - Dynamic Resistance vs. Zener Voltage

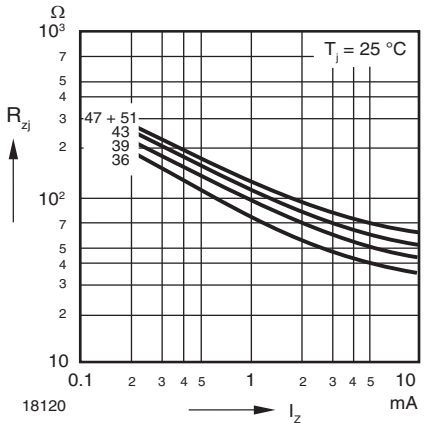


Fig. 3 - Dynamic Resistance vs. Zener Current

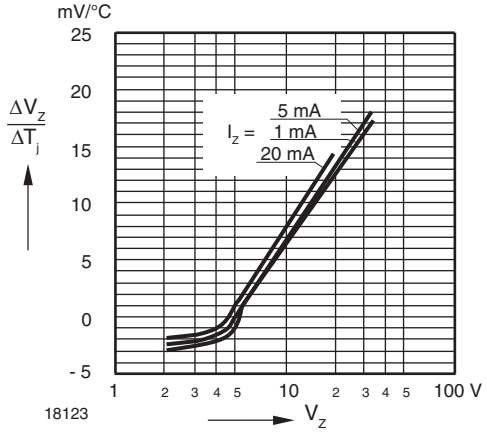


Fig. 6 - Temperature Dependence of Zener Voltage vs. Zener Voltage

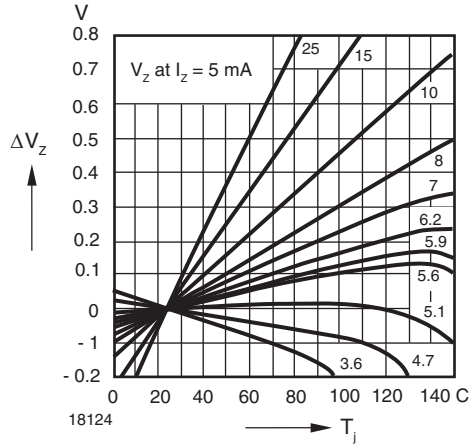


Fig. 7 - Change of Zener Voltage vs. Junction Temperature

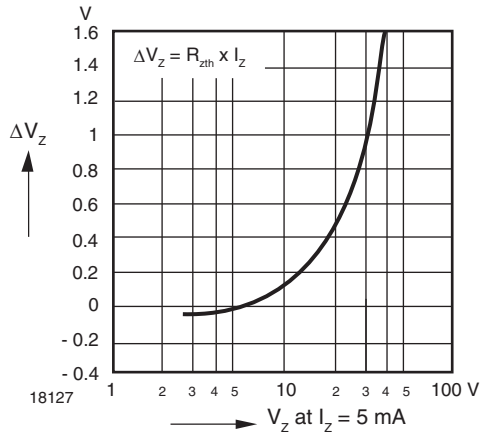


Fig. 10 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

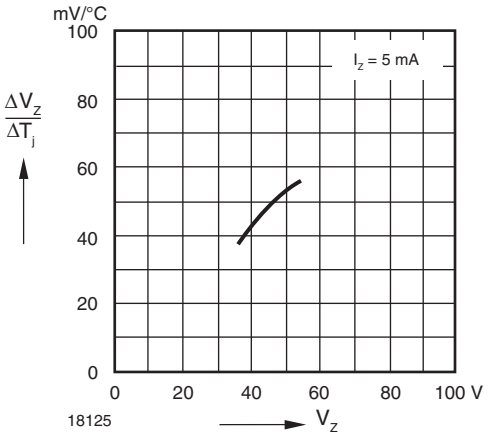


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

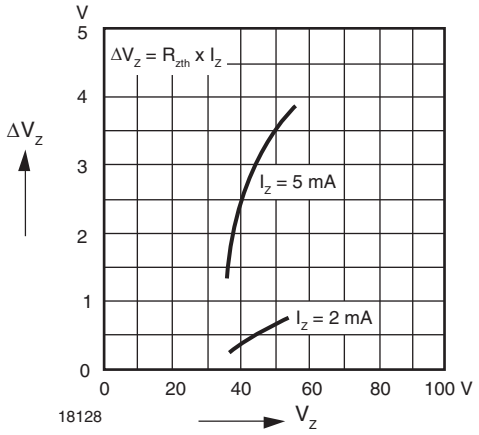


Fig. 11 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

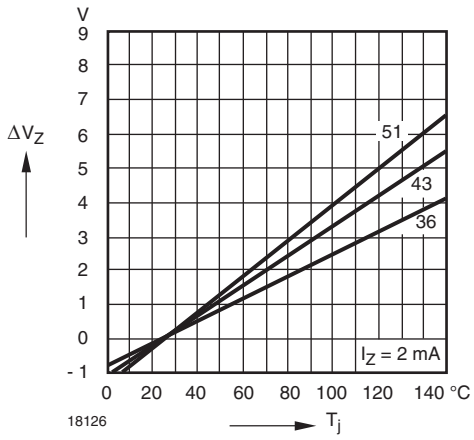


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

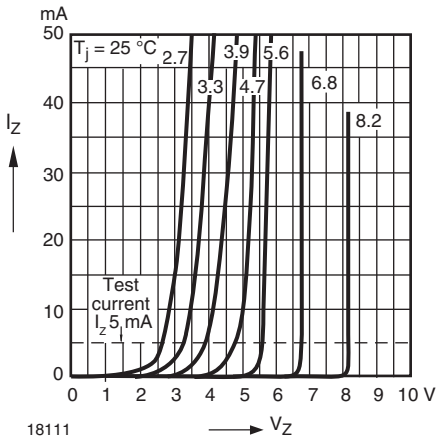


Fig. 12 - Breakdown Characteristics

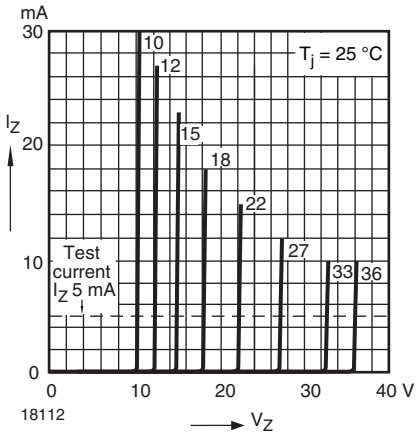


Fig. 13 - Breakdown Characteristics

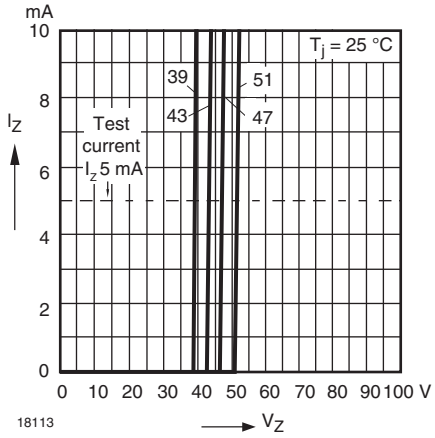
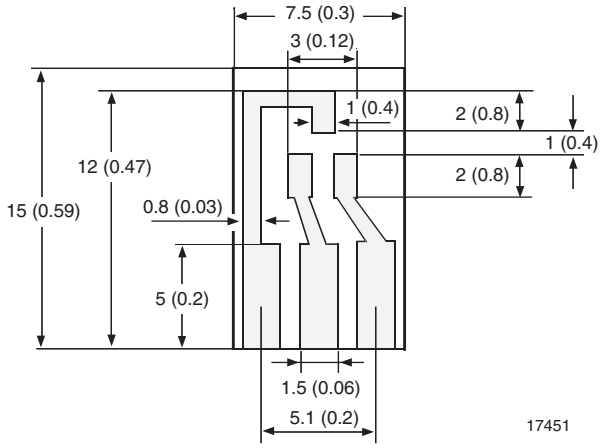


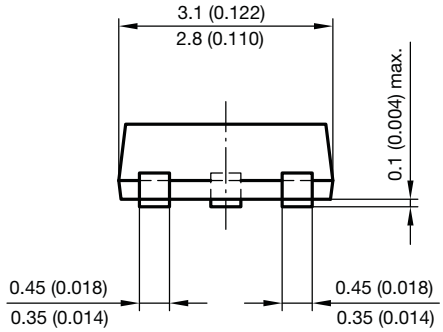
Fig. 14 - Breakdown Characteristics

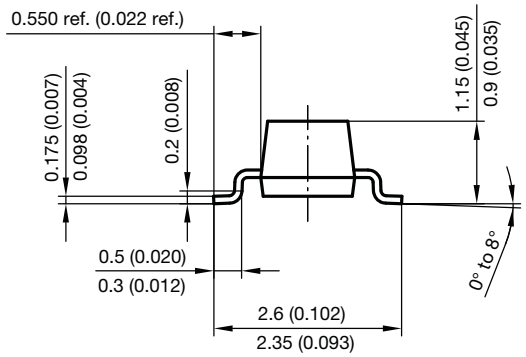
LAYOUT FOR R_{thJA} TEST

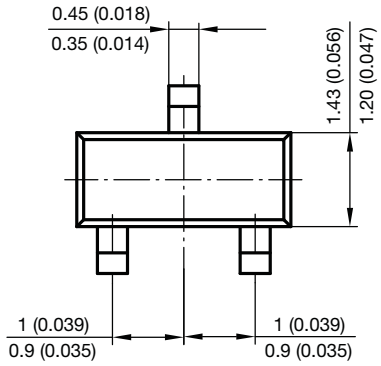
Thickness: fiberglass 0.059" (1.5 mm)
Copper leads 0.012" (0.3 mm)



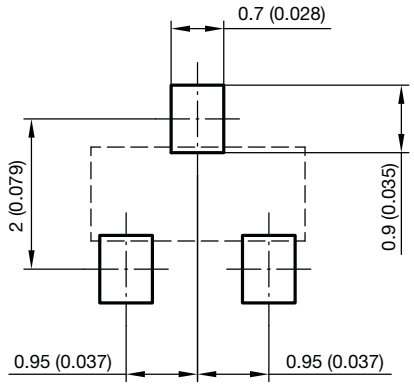
PACKAGE DIMENSIONS in millimeters (inches): **SOT-23**







Foot print recommendation:



Document no.: 6.541-5014.01-4
Rev. 8 - Date: 23.Sept.2009
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