Small Signal Zener Diodes

FEATURES

- Silicon planar power Zener diodes
- The Zener voltages are graded according to the international E24 standard
- AEC-Q101 qualified
- ESD capability according to AEC-Q101:
  Human body model > 8 kV
  Machine model > 800 V
- Base P/N-G3 - green, commercial grade
- Material categorization:
  For definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

HALOGEN FREE GREEN (5-2008)

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V_Z range nom.	2.4 to 75	V
Test current I_{ZT}	2.5; 5	mA
V_Z specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZT52-G-series	BZT52C2V4-G3-08 to BZT52C75-G3-08	3000 (8 mm tape on 7" reel)	15 000/box
	BZT52B2V4-G3-08 to BZT52B75-G3-08		
	BZT52C2V4-G3-18 to BZT52C75-G3-18	10 000 (8 mm tape on 13" reel)	10 000/box
	BZT52B2V4-G3-18 to BZT52B75-G3-18		

PACKAGE				
PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SOD-123	9.4 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	Diode on ceramic substrate 0.7 mm; 5 mm^2 pad areas	P_{tot}	500	mW
	Diode on ceramic substrate 0.7 mm; 2.5 mm^2 pad areas	P_{tot}	410	mW
Zener current	See Table “Electrical Characteristics”			
Thermal resistance junction to ambient air	Valid provided that electrodes are kept at ambient temperature	R_{thJA}	300	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		TEMP. COEFFICIENT	ADMISSABLE ZENER CURRENT (4)	
		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}	I_Z at T_{amb} = 45 °C	I_Z at T_{amb} = 25 °C
		V			mA		V	nA	Ω		10^{-4}/°C	mA	
		MIN.	NOM.	MAX.									
BZT52C2V4-G	Y1	2.2	2.4	2.6	5	1	-	100	85	600	- 9 to - 4	-	-
BZT52C2V7-G	Y2	2.5	2.7	2.9	5	1	-	100	75 (< 83)	< 500	- 9 to - 4	113	134
BZT52C3V0-G	Y3	2.8	3.0	3.2	5	1	-	100	80 (< 95)	< 500	- 9 to - 3	98	118
BZT52C3V3-G	Y4	3.1	3.3	3.5	5	1	-	100	80 (< 95)	< 500	- 8 to - 3	92	109
BZT52C3V6-G	Y5	3.4	3.6	3.8	5	1	-	100	80 (< 95)	< 500	- 8 to - 3	85	100
BZT52C3V9-G	Y6	3.7	3.9	4.1	5	1	-	100	80 (< 95)	< 500	- 7 to - 3	77	92
BZT52C4V3-G	Y7	4	4.3	4.6	5	1	-	100	80 (< 95)	< 500	- 6 to - 1	71	84
BZT52C4V7-G	Y8	4.4	4.7	5	5	1	-	100	70 (< 78)	< 500	- 5 to + 2	64	76
BZT52C5V1-G	Y9	4.8	5.1	5.4	5	1	> 0.8	100	30 (< 60)	< 480	- 3 to + 4	56	67
BZT52C5V6-G	YA	5.2	5.6	6	5	1	> 1	100	10 (< 40)	< 400	- 2 to + 6	50	59
BZT52C6V2-G	YB	5.8	6.2	6.6	5	1	> 2	100	4.8 (< 10)	< 200	- 1 to + 7	45	54
BZT52C6V8-G	YC	6.4	6.8	7.2	5	1	> 3	100	4.5 (< 8)	< 150	+ 2 to + 7	41	49
BZT52C7V5-G	YD	7	7.5	7.9	5	1	> 5	100	4 (< 7)	< 50	+ 3 to + 7	37	44
BZT52C8V2-G	YE	7.7	8.2	8.7	5	1	> 6	100	4.5 (< 7)	< 50	+ 4 to + 7	34	40
BZT52C9V1-G	YF	8.5	9.1	9.6	5	1	> 7	100	4.8 (< 10)	< 50	+ 5 to + 8	30	36
BZT52C10-G	YG	9.4	10	10.6	5	1	> 7.5	100	5.2 (< 15)	< 70	+ 5 to + 8	28	33
BZT52C11-G	YH	10.4	11	11.6	5	1	> 8.5	100	6 (< 20)	< 70	+ 5 to + 9	25	30
BZT52C12-G	YI	11.4	12	12.7	5	1	> 9	100	7 (< 20)	< 90	+ 6 to + 9	23	28
BZT52C13-G	YK	12.4	13	14.1	5	1	> 10	100	9 (< 25)	< 110	+ 7 to + 9	21	25
BZT52C15-G	YL	13.8	15	15.6	5	1	> 11	100	11 (< 30)	< 110	+ 7 to + 9	19	23
BZT52C16-G	YM	15.3	16	17.1	5	1	> 12	100	13 (< 40)	< 170	+ 8 to + 9.5	17	20
BZT52C18-G	YN	16.8	18	19.1	5	1	> 14	100	18 (< 50)	< 170	+ 8 to + 9.5	15	18
BZT52C20-G	YO	18.8	20	21.2	5	1	> 15	100	20 (< 50)	< 220	+ 8 to + 10	14	17
BZT52C22-G	YP	20.8	22	23.3	5	1	> 17	100	25 (< 55)	< 220	+ 8 to + 10	13	16
BZT52C24-G	YR	22.8	24	25.6	5	1	> 18	100	28 (< 80)	< 220	+ 8 to + 10	11	13
BZT52C27-G	YS	25.1	27	28.9	5	1	> 20	100	30 (< 80)	< 250	+ 8 to + 10	10	12
BZT52C30-G	YT	28	30	32	5	1	> 22.5	100	35 (< 80)	< 250	+ 8 to + 10	9	10
BZT52C33-G	YU	31	33	35	5	1	> 25	100	40 (< 80)	< 250	+ 8 to + 10	8	9
BZT52C36-G	YW	34	36	38	5	1	> 27	100	40 (< 90)	< 250	+ 8 to + 10	8	9
BZT52C39-G	YX	37	39	41	5	1	> 29	100	50 (< 90)	< 300	+ 10 to + 12	7	8
BZT52C43-G	YY	40	43	46	5	1	> 32	100	60 (< 100)	< 700	+ 10 to + 12	6	7
BZT52C47-G	YZ	44	47	50	5	1	> 35	100	70 (< 100)	< 750	+ 10 to + 12	5	6
BZT52C51-G	Z1	48	51	54	5	1	> 38	100	70 (< 100)	< 750	+ 10 to + 12	5	6
BZT52C56-G	Z2	52	56	60	2.5	1	-	100	< 135 (2)	< 1000 (3)	typ. + 10 (2)	-	-
BZT52C62-G	Z3	58	62	66	2.5	1	-	100	< 150 (2)	< 1000 (3)	typ. + 10 (2)	-	-
BZT52C68-G	Z4	64	68	72	2.5	1	-	100	< 200 (2)	< 1000 (3)	typ. + 10 (2)	-	-
BZT52C75-G	Z5	70	75	79	2.5	1	-	100	< 250 (2)	< 1000 (3)	typ. + 10 (2)	-	-

Notes

- I_{ZT1} = 5 mA, I_{ZT2} = 1 mA

(1) Measured with pulses t_p = 5 ms

(2) I_{ZT1} = 2.5 mA

(3) I_{ZT2} = 0.5 mA

(4) Valid provided that electrodes are kept at ambient temperature

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

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE (1)			TEST CURRENT		REVERSE VOLTAGE		DYNAMIC RESISTANCE		TEMP. COEFFICIENT	ADMISSABLE ZENER CURRENT (4)	
		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}	I_Z at T_{amb} = 45 °C	I_Z at T_{amb} = 25 °C
		V			mA		V	nA	Ω		10^{-4}/°C	mA	
		MIN.	NOM.	MAX.									
BZT52B2V4-G	V1	2.35	2.4	2.45	5	1	-	100	85	600	- 9 to - 4	-	-
BZT52B2V7-G	V2	2.65	2.7	2.75	5	1	-	100	75 (< 83)	< 500	- 9 to - 4	113	134
BZT52B3V0-G	V3	2.94	3.0	3.06	5	1	-	100	80 (< 95)	< 500	- 9 to - 3	98	118
BZT52B3V3-G	V4	3.23	3.3	3.37	5	1	-	100	80 (< 95)	< 500	- 8 to - 3	92	109
BZT52B3V6-G	V5	3.53	3.6	3.67	5	1	-	100	80 (< 95)	< 500	- 8 to - 3	85	100
BZT52B3V9-G	V6	3.82	3.9	3.98	5	1	-	100	80 (< 95)	< 500	- 7 to - 3	77	92
BZT52B4V3-G	V7	4.21	4.3	4.39	5	1	-	100	80 (< 95)	< 500	- 6 to - 1	71	84
BZT52B4V7-G	V8	4.61	4.7	4.79	5	1	-	100	70 (< 78)	< 500	- 5 to + 2	64	76
BZT52B5V1-G	V9	5	5.1	5.2	5	1	> 0.8	100	30 (< 60)	< 480	- 3 to + 4	56	67
BZT52B5V6-G	VA	5.49	5.6	5.71	5	1	> 1	100	10 (< 40)	< 400	- 2 to + 6	50	59
BZT52B6V2-G	VB	6.08	6.2	6.32	5	1	> 2	100	4.8 (< 10)	< 200	- 1 to + 7	45	54
BZT52B6V8-G	VC	6.66	6.8	6.94	5	1	> 3	100	4.5 (< 8)	< 150	+ 2 to + 7	41	49
BZT52B7V5-G	VD	7.35	7.5	7.65	5	1	> 5	100	4 (< 7)	< 50	+ 3 to + 7	37	44
BZT52B8V2-G	VE	8.04	8.2	8.36	5	1	> 6	100	4.5 (< 7)	< 50	+ 4 to + 7	34	40
BZT52B9V1-G	VF	8.92	9.1	9.28	5	1	> 7	100	4.8 (< 10)	< 50	+ 5 to + 8	30	36
BZT52B10-G	VG	9.8	10	10.2	5	1	> 7.5	100	5.2 (< 15)	< 70	+ 5 to + 8	28	33
BZT52B11-G	VH	10.8	11	11.2	5	1	> 8.5	100	6 (< 20)	< 70	+ 5 to + 9	25	30
BZT52B12-G	VI	11.8	12	12.2	5	1	> 9	100	7 (< 20)	< 90	+ 6 to + 9	23	28
BZT52B13-G	VK	12.7	13	13.3	5	1	> 10	100	9 (< 25)	< 110	+ 7 to + 9	21	25
BZT52B15-G	VL	14.7	15	15.3	5	1	> 11	100	11 (< 30)	< 110	+ 7 to + 9	19	23
BZT52B16-G	VM	15.7	16	16.3	5	1	> 12	100	13 (< 40)	< 170	+ 8 to + 9.5	17	20
BZT52B18-G	VN	17.6	18	18.4	5	1	> 14	100	18 (< 50)	< 170	+ 8 to + 9.5	15	18
BZT52B20-G	VO	19.6	20	20.4	5	1	> 15	100	20 (< 50)	< 220	+ 8 to + 10	14	17
BZT52B22-G	VP	21.6	22	22.4	5	1	> 17	100	25 (< 55)	< 220	+ 8 to + 10	13	16
BZT52B24-G	VR	23.5	24	24.5	5	1	> 18	100	28 (< 80)	< 220	+ 8 to + 10	11	13
BZT52B27-G	VS	26.5	27	27.5	5	1	> 20	100	30 (< 80)	< 250	+ 8 to + 10	10	12
BZT52B30-G	VT	29.4	30	30.6	5	1	> 22.5	100	35 (< 80)	< 250	+ 8 to + 10	9	10
BZT52B33-G	VU	32.3	33	33.7	5	1	> 25	100	40 (< 80)	< 250	+ 8 to + 10	8	9
BZT52B36-G	VW	35.3	36	36.7	5	1	> 27	100	40 (< 90)	< 250	+ 8 to + 10	8	9
BZT52B39-G	VX	38.2	39	39.8	5	1	> 29	100	50 (< 90)	< 300	+ 10 to + 12	7	8
BZT52B43-G	VY	42.1	43	43.9	5	1	> 32	100	60 (< 100)	< 700	+ 10 to + 12	6	7
BZT52B47-G	VZ	46.1	47	47.9	5	1	> 35	100	70 (< 100)	< 750	+ 10 to + 12	5	6
BZT52B51-G	U1	50	51	52	5	1	> 38	100	70 (< 100)	< 750	+ 10 to + 12	5	6
BZT52B56-G	U2	54.9	56	57.1	2.5	1	-	100	< 135 (2)	< 1000 (3)	typ. + 10 (2)	-	-
BZT52B62-G	U3	60.8	62	63.2	2.5	1	-	100	< 150 (2)	< 1000 (3)	typ. + 10 (2)	-	-
BZT52B68-G	U4	66.6	68	69.4	2.5	1	-	100	< 200 (2)	< 1000 (3)	typ. + 10 (2)	-	-
BZT52B75-G	U5	73.5	75	76.5	2.5	1	-	100	< 250 (2))	< 1500 (3)	typ. + 10 (2)	-	-

Notes

- I_{ZT1} = 5 mA, I_{ZT2} = 1 mA

(1) Measured with pulses t_p = 5 ms

(2) I_{ZT1} = 2.5 mA

(3) I_{ZT2} = 0.5 mA

(4) Valid provided that electrodes are kept at ambient temperature

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

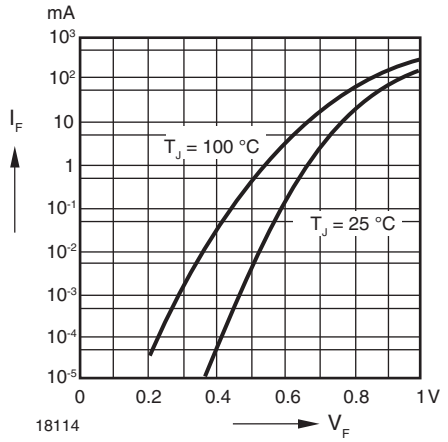


Fig. 1 - Forward Characteristics

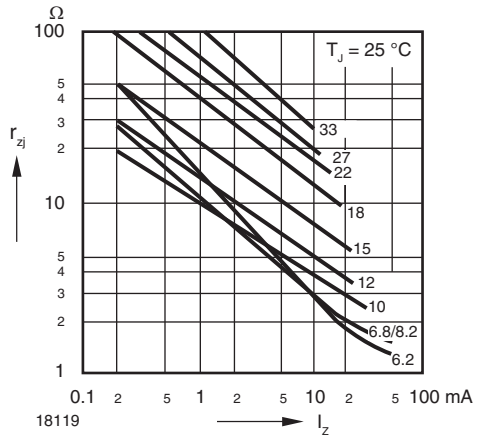


Fig. 4 - Dynamic Resistance vs. Zener Current

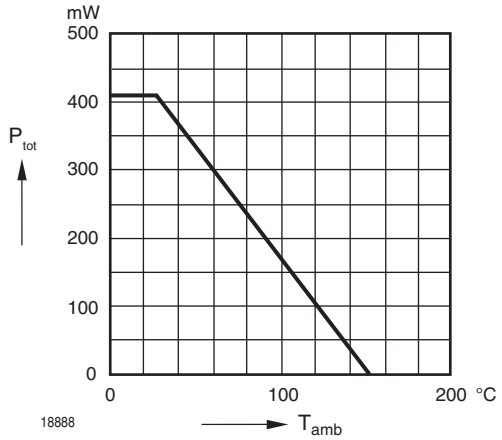


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

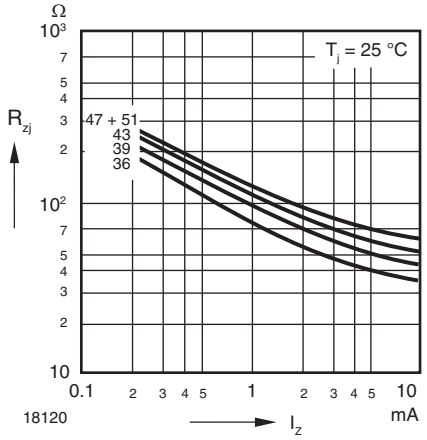


Fig. 5 - Dynamic Resistance vs. Zener Current

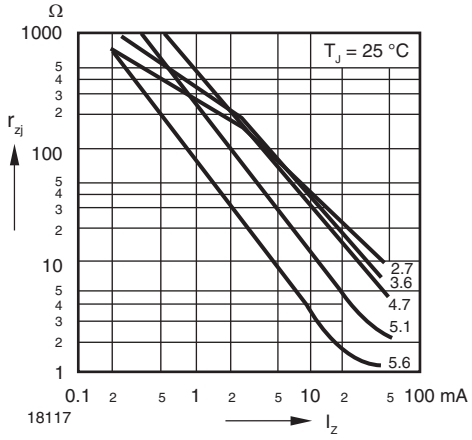


Fig. 3 - Dynamic Resistance vs. Zener Current

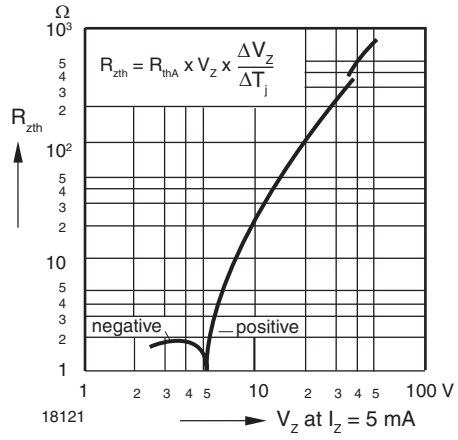


Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

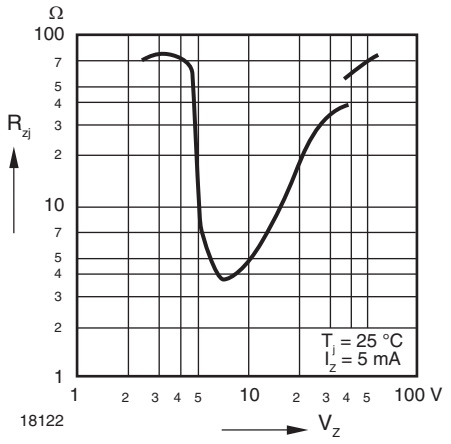


Fig. 7 - Dynamic Resistance vs. Zener Voltage

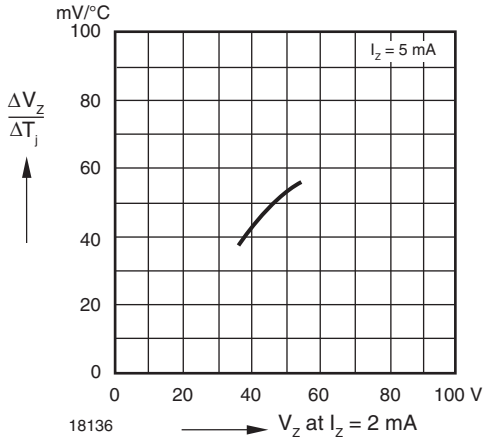


Fig. 10 - Temperature Dependence of Zener Voltage vs. Zener Voltage

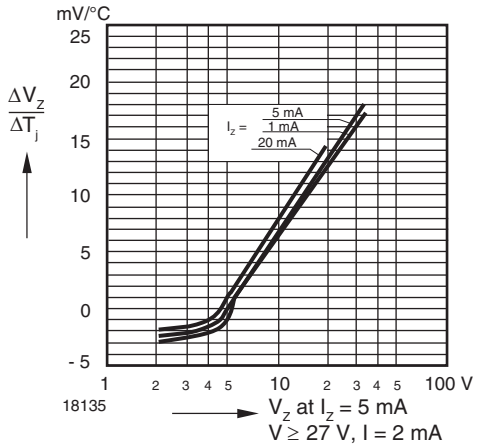


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

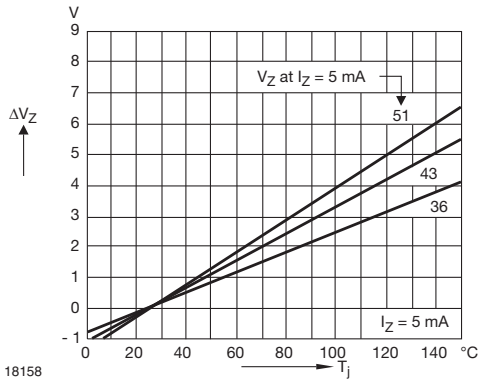


Fig. 11 - Change of Zener Voltage vs. Junction Temperature

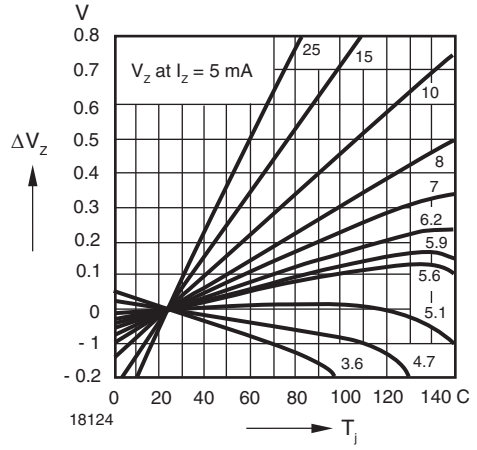


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

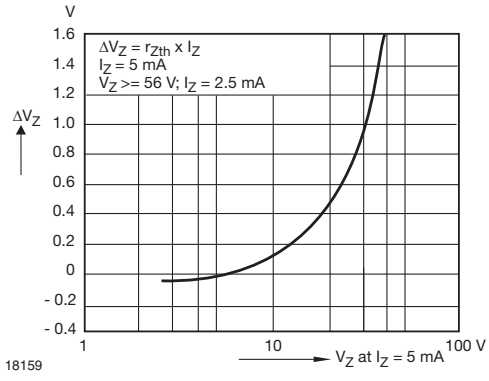


Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

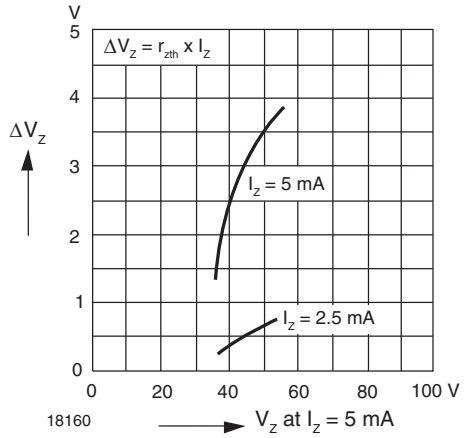


Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

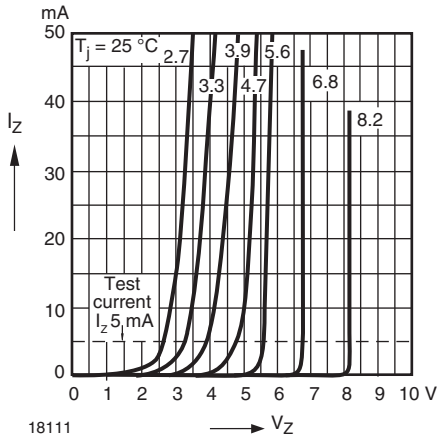


Fig. 14 - Breakdown Characteristics

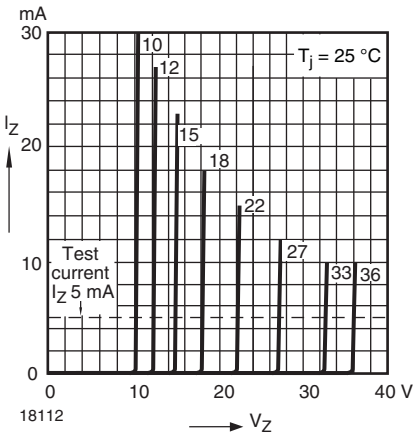


Fig. 15 - Breakdown Characteristics

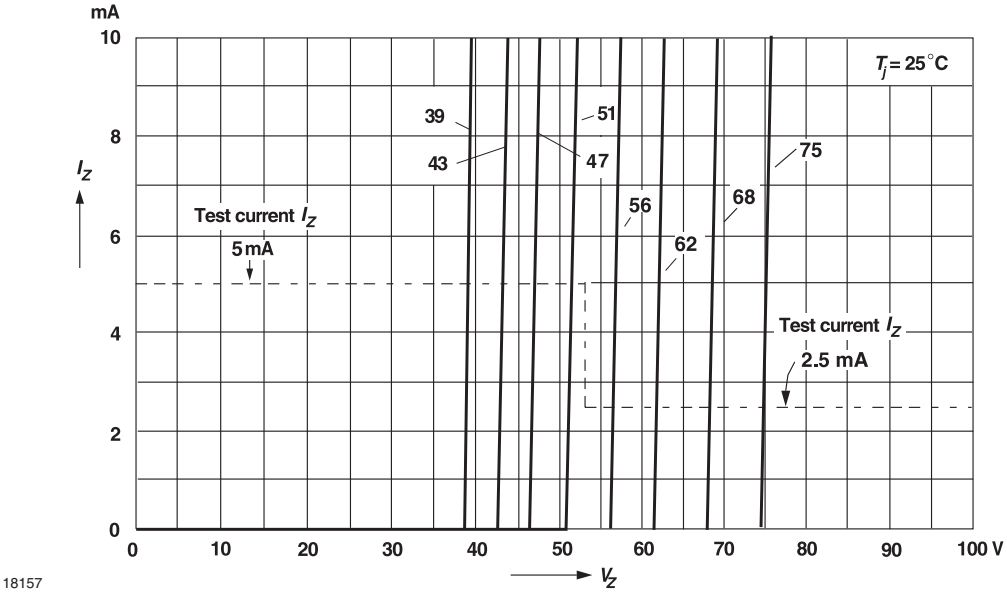
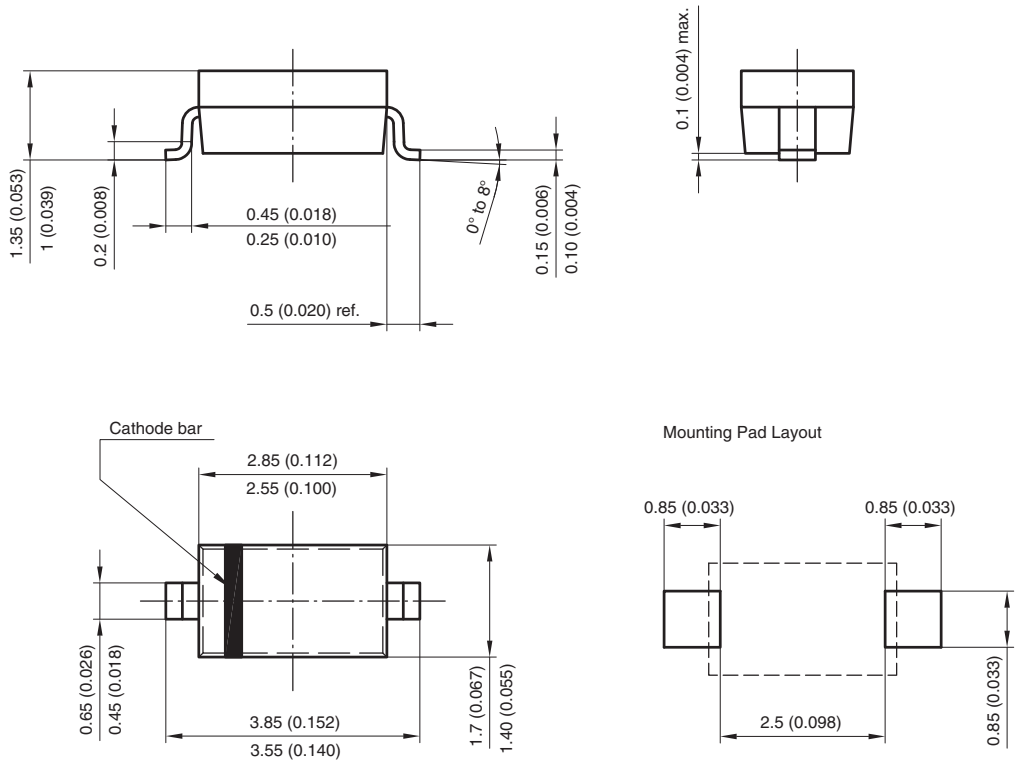


Fig. 16 - Breakdown Characteristics

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



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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.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.