Small Signal Zener Diodes

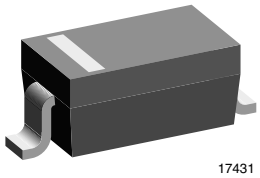
Features

- Silicon planar power zener diodes
- These diodes are also available in other case styles and other configurations including: the SOT-23 case with type designation BZX84 series, the dual zener diode common anode configuration in the SOT-23 case with type designation AZ23 series and the dual zener diode common cathode configuration in the SOT-23 case with type designation DZ23 series.
- The zener voltages are graded according to the international E 24 standard.
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e3

RoHS
COMPLIANT



17431

Mechanical Data

Case: SOD-123

Weight: approx. 10.3 mg

Packaging codes/options:

GS18/10 k per 13 " reel (8 mm tape), 10 k/box

GS08/3 k per 7 " reel (8 mm tape), 15 k/box

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Zener current see table " Characteristics "				
Power dissipation		P_{tot}	500 [2]	mW
Power dissipation		P_{tot}	410 [1]	mW

[1] Diode on ceramic substrate 0.7 mm; 2.5 mm^2 pad areas

[2] Diode on ceramic substrate 0.7 mm; 5 mm^2 pad areas

Thermal Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Thermal resistance junction to ambient air		R_{thJA}	300 [1]	°C/W
Junction temperature		T_J	150	°C
Storage temperature range		T_S	- 65 to + 150	°C

[1] Valid provided that electrodes are kept at ambient temperature

For technical questions within your region, please contact one of the following:
DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

Electrical Characteristics

Part number	Marking code	Zener voltage range[1]		Dynamic resistance		Test current	Temp. coefficient	Reverse voltage	Admissible zener current[4]	
		V_Z at I_{ZT1}		r_{zj} at I_{ZT1}	r_{zj} at I_{ZT2}	I_{ZT1}	at I_{ZT1}	V_R at I_R = 100 nA,	I_Z at T_{amb} = 45 °C,	I_Z at T_{amb} = 25 °C,
		V		Ω		mA	α_{VZ} (10^{-4}/°C)	V	mA	
		min.	max.							
BZT52C2V4-V	W1	2.2	2.6	85	600	5	- 9 to - 4	-	-	-
BZT52C2V7-V	W2	2.5	2.9	75 (< 83)	< 500	5	- 9 to - 4	-	113	134
BZT52C3V0-V	W3	2.8	3.2	80 (< 95)	< 500	5	- 9 to - 3	-	98	118
BZT52C3V3-V	W4	3.1	3.5	80 (< 95)	< 500	5	- 8 to - 3	-	92	109
BZT52C3V6-V	W5	3.4	3.8	80 (< 95)	< 500	5	- 8 to - 3	-	85	100
BZT52C3V9-V	W6	3.7	4.1	80 (< 95)	< 500	5	- 7 to - 3	-	77	92
BZT52C4V3-V	W7	4	4.6	80 (< 95)	< 500	5	- 6 to - 1	-	71	84
BZT52C4V7-V	W8	4.4	5	70 (< 78)	< 500	5	- 5 to +2	-	64	76
BZT52C5V1-V	W9	4.8	5.4	30 (< 60)	< 480	5	- 3 to +4	> 0.8	56	67
BZT52C5V6-V	WA	5.2	6	10 (< 40)	< 400	5	- 2 to +6	> 1	50	59
BZT52C6V2-V	WB	5.8	6.6	4.8 (< 10)	< 200	5	- 1 to +7	> 2	45	54
BZT52C6V8-V	WC	6.4	7.2	4.5 (< 8)	< 150	5	+ 2 to +7	> 3	41	49
BZT52C7V5-V	WD	7	7.9	4 (< 7)	< 50	5	+ 3 to +7	> 5	37	44
BZT52C8V2-V	WE	7.7	8.7	4.5 (< 7)	< 50	5	+ 4 to +7	> 6	34	40
BZT52C9V1-V	WF	8.5	9.6	4.8 (< 10)	< 50	5	+ 5 to +8	> 7	30	36
BZT52C10-V	WG	9.4	10.6	5.2 (< 15)	< 70	5	+ 5 to +8	> 7.5	28	33
BZT52C11-V	WH	10.4	11.6	6 (< 20)	< 70	5	+ 5 to +9	> 8.5	25	30
BZT52C12-V	WI	11.4	12.7	7 (< 20)	< 90	5	+ 6 to +9	> 9	23	28
BZT52C13-V	WK	12.4	14.1	9 (< 25)	< 110	5	+ 7 to +9	> 10	21	25
BZT52C15-V	WL	13.8	15.6	11 (< 30)	< 110	5	+ 7 to +9	> 11	19	23
BZT52C16-V	WM	15.3	17.1	13 (< 40)	< 170	5	+ 8 to +9.5	> 12	17	20
BZT52C18-V	WN	16.8	19.1	18 (< 50)	< 170	5	+ 8 to +9.5	> 14	15	18
BZT52C20-V	WO	18.8	21.2	20 (< 50)	< 220	5	+ 8 to +10	> 15	14	17
BZT52C22-V	WP	20.8	23.3	25 (< 55)	< 220	5	+ 8 to +10	> 17	13	16
BZT52C24-V	WR	22.8	25.6	28 (< 80)	< 220	5	+ 8 to +10	> 18	11	13
BZT52C27-V	WS	25.1	28.9	30 (< 80)	< 250	5	+ 8 to +10	> 20	10	12
BZT52C30-V	WT	28	32	35 (< 80)	< 250	5	+ 8 to +10	> 22.5	9	10
BZT52C33-V	WU	31	35	40 (< 80)	< 250	5	+ 8 to +10	> 25	8	9
BZT52C36-V	WW	34	38	40 (< 90)	< 250	5	+ 8 to +10	> 27	8	9
BZT52C39-V	WX	37	41	50 (< 90)	< 300	5	+ 10 to +12	> 29	7	8
BZT52C43-V	WY	40	46	60 (< 100)	< 700	5	+ 10 to +12	> 32	6	7
BZT52C47-V	WZ	44	50	70 (< 100)	< 750	5	+ 10 to +12	> 35	5	6
BZT52C51-V	X1	48	54	70 (< 100)	< 750	5	+ 10 to +12	> 38	5	6
BZT52C56-V	X2	52	60	< 135[2]	< 1000[3]	2.5	typ. +10[2]	-	-	-
BZT52C62-V	X3	58	66	< 150[2]	< 1000[3]	2.5	typ. +10[2]	-	-	-
BZT52C68-V	X4	64	72	< 200[2]	< 1000[3]	2.5	typ. +10[2]	-	-	-
BZT52C75-V	X5	70	79	< 250[2]	< 1500[3]	2.5	typ. +10[2]	-	-	-

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

Part number	Marking code	Zener voltage range[1]		Dynamic resistance		Test current	Temp. coefficient	Reverse voltage	Admissible zener current[4]	
		V_Z at I_{ZT1}		r_{zj} at I_{ZT1}	r_{zj} at I_{ZT2}	I_{ZT1}	at I_{ZT1}	V_R at I_R = 100 nA,	I_Z at T_{amb} = 45 °C,	I_Z at T_{amb} = 25 °C,
		V		Ω		mA	α_{VZ} (10^{-4}/°C)	V	mA	
		min.	max.							
BZT52B2V4-V	W1	2.35	2.45	85	600	5	- 9 to - 4	-	-	-
BZT52B2V7-V	W2	2.65	2.75	75 (< 83)	< 500	5	- 9 to - 4	-	113	134
BZT52B3V0-V	W3	2.94	3.06	80 (< 95)	< 500	5	- 9 to - 3	-	98	118
BZT52B3V3-V	W4	3.23	3.37	80 (< 95)	< 500	5	- 8 to - 3	-	92	109
BZT52B3V6-V	W5	3.53	3.67	80 (< 95)	< 500	5	- 8 to - 3	-	85	100
BZT52B3V9-V	W6	3.82	3.98	80 (< 95)	< 500	5	- 7 to - 3	-	77	92
BZT52B4V3-V	W7	4.21	4.39	80 (< 95)	< 500	5	- 6 to - 1	-	71	84
BZT52B4V7-V	W8	4.61	4.79	70 (< 78)	< 500	5	- 5 to + 2	-	64	76
BZT52B5V1-V	W9	5	5.2	30 (< 60)	< 480	5	- 3 to + 4	> 0.8	56	67
BZT52B5V6-V	WA	5.49	5.71	10 (< 40)	< 400	5	- 2 to + 6	> 1	50	59
BZT52B6V2-V	WB	6.08	6.32	4.8 (< 10)	< 200	5	- 1 to + 7	> 2	45	54
BZT52B6V8-V	WC	6.66	6.94	4.5 (< 8)	< 150	5	+ 2 to + 7	> 3	41	49
BZT52B7V5-V	WD	7.35	7.65	4 (< 7)	< 50	5	+ 3 to + 7	> 5	37	44
BZT52B8V2-V	WE	8.04	8.36	4.5 (< 7)	< 50	5	+ 4 to + 7	> 6	34	40
BZT52B9V1-V	WF	8.92	9.28	4.8 (< 10)	< 50	5	+ 5 to + 8	> 7	30	36
BZT52B10-V	WG	9.8	10.2	5.2 (< 15)	< 70	5	+ 5 to + 8	> 7.5	28	33
BZT52B11-V	WH	10.8	11.2	6 (< 20)	< 70	5	+ 5 to + 9	> 8.5	25	30
BZT52B12-V	WI	11.8	12.2	7 (< 20)	< 90	5	+ 6 to + 9	> 9	23	28
BZT52B13-V	WK	12.7	13.3	9 (< 25)	< 110	5	+ 7 to + 9	> 10	21	25
BZT52B15-V	WL	14.7	15.3	11 (< 30)	< 110	5	+ 7 to + 9	> 11	19	23
BZT52B16-V	WM	15.7	16.3	13 (< 40)	< 170	5	+ 8 to + 9.5	> 12	17	20
BZT52B18-V	WN	17.6	18.4	18 (< 50)	< 170	5	+ 8 to + 9.5	> 14	15	18
BZT52B20-V	WO	19.6	20.4	20 (< 50)	< 220	5	+ 8 to + 10	> 15	14	17
BZT52B22-V	WP	21.6	22.4	25 (< 55)	< 220	5	+ 8 to + 10	> 17	13	16
BZT52B24-V	WR	23.5	24.5	28 (< 80)	< 220	5	+ 8 to + 10	> 18	11	13
BZT52B27-V	WS	26.5	27.5	30 (< 80)	< 250	5	+ 8 to + 10	> 20	10	12
BZT52B30-V	WT	29.4	30.6	35 (< 80)	< 250	5	+ 8 to + 10	> 22.5	9	10
BZT52B33-V	WU	32.3	33.7	40 (< 80)	< 250	5	+ 8 to + 10	> 25	8	9
BZT52B36-V	WW	35.3	36.7	40 (< 90)	< 250	5	+ 8 to + 10	> 27	8	9
BZT52B39-V	WX	38.2	39.8	50 (< 90)	< 300	5	+ 10 to + 12	> 29	7	8
BZT52B43-V	WY	42.1	43.9	60 (< 100)	< 700	5	+ 10 to + 12	> 32	6	7
BZT52B47-V	WZ	46.1	47.9	70 (< 100)	< 750	5	+ 10 to + 12	> 35	5	6
BZT52B51-V	X1	50	52	70 (< 100)	< 750	5	+ 10 to + 12	> 38	5	6
BZT52B56-V	X2	54.9	57.1	< 135[2]	< 1000[3]	2.5	typ. + 10[2]	-	-	-
BZT52B62-V	X3	60.8	63.2	< 150[2]	< 1000[3]	2.5	typ. + 10[2]	-	-	-
BZT52B68-V	X4	66.6	69.4	< 200[2]	< 1000[3]	2.5	typ. + 10[2]	-	-	-
BZT52B75-V	X5	73.5	76.5	< 250[2]	< 1500[3]	2.5	typ. + 10[2]	-	-	-

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)

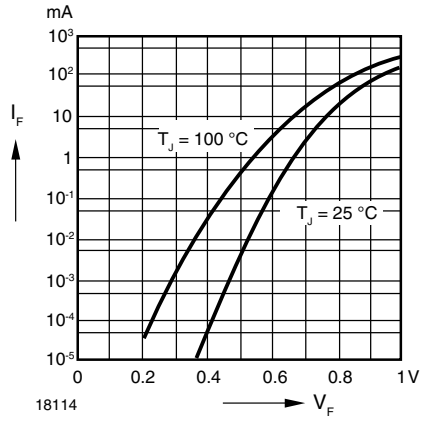


Figure 1. Forward characteristics

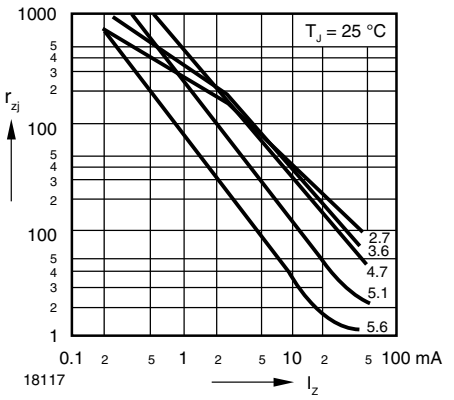


Figure 4. Dynamic Resistance vs. Zener Current

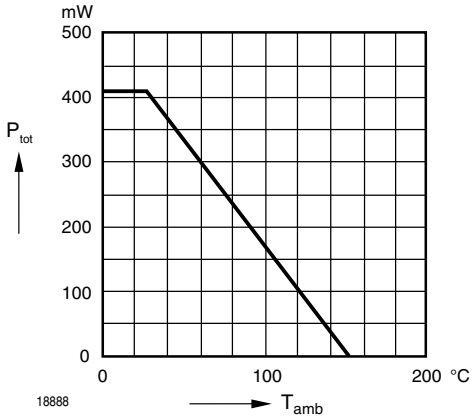


Figure 2. Admissible Power Dissipation vs. Ambient Temperature

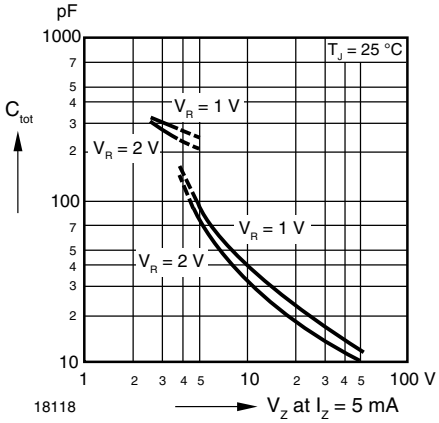


Figure 5. Capacitance vs. Zener Voltage

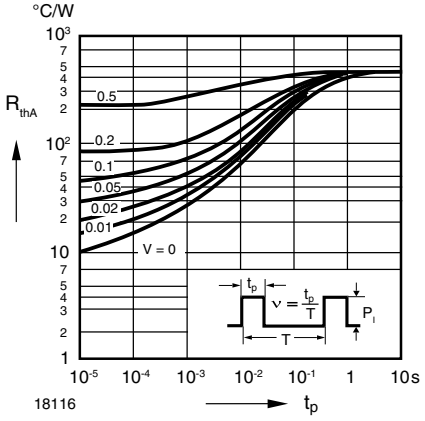


Figure 3. Pulse Thermal Resistance vs. Pulse Duration

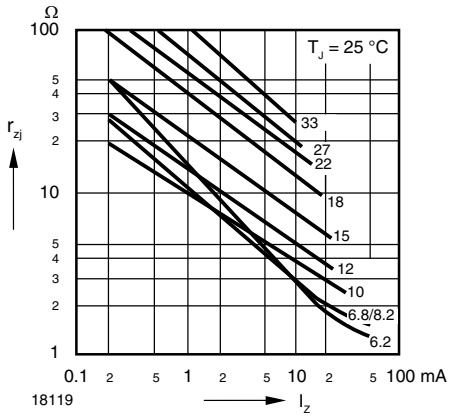


Figure 6. Dynamic Resistance vs. Zener Current

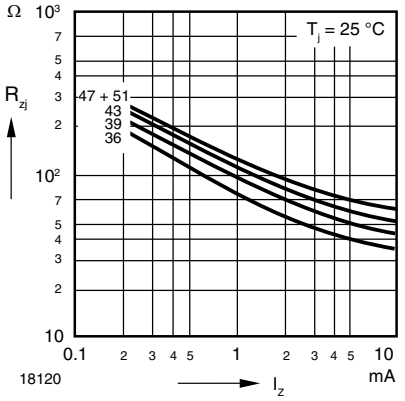


Figure 7. Dynamic Resistance vs. Zener Current

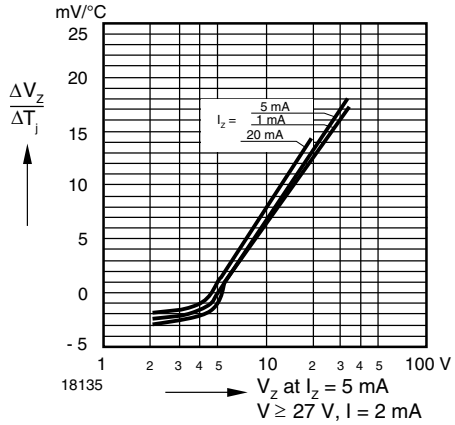


Figure 10. Temperature Dependence of Zener Voltage vs. Zener Voltage

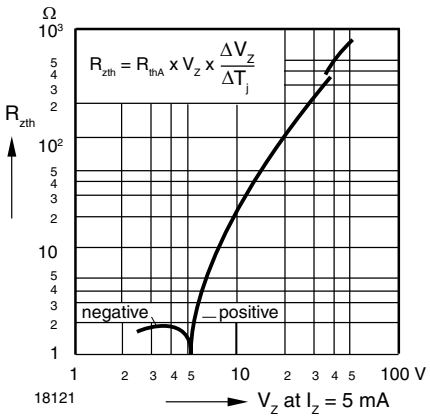


Figure 8. Thermal Differential Resistance vs. Zener Voltage

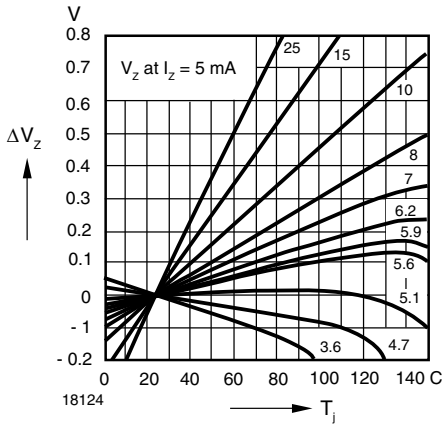


Figure 11. Change of Zener Voltage vs. Junction Temperature

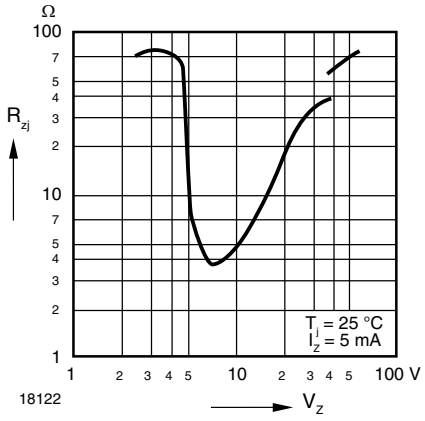


Figure 9. Dynamic Resistance vs. Zener Voltage

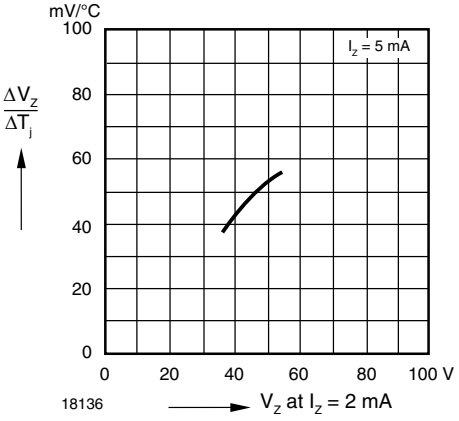


Figure 12. Temperature Dependence of Zener Voltage vs. Zener Voltage

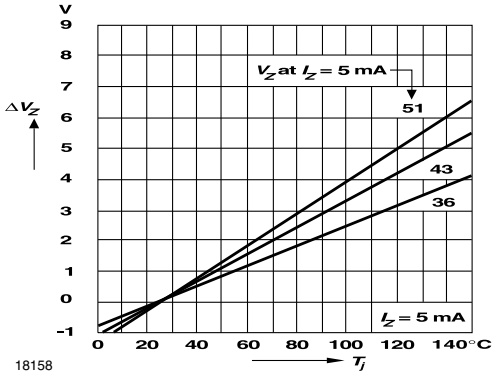


Figure 13. Change of Zener Voltage vs. Junction Temperature

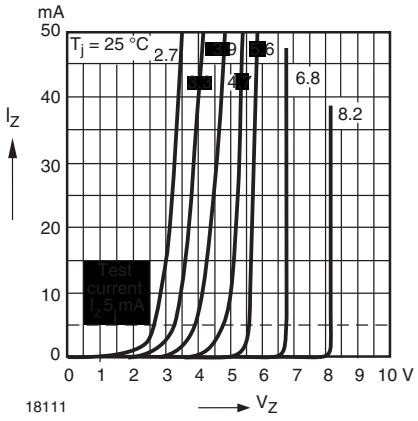


Figure 16. Breakdown Characteristics

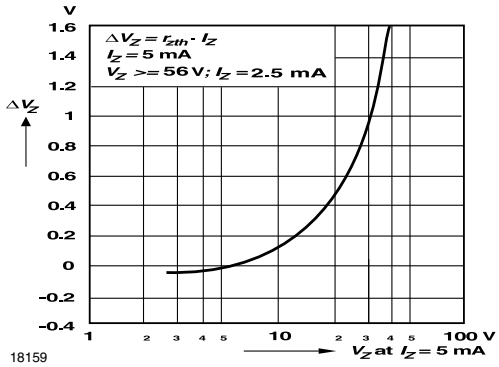


Figure 14. Change of Zener voltage from turn-on up to the point of thermal equilibrium vs. Zener voltage

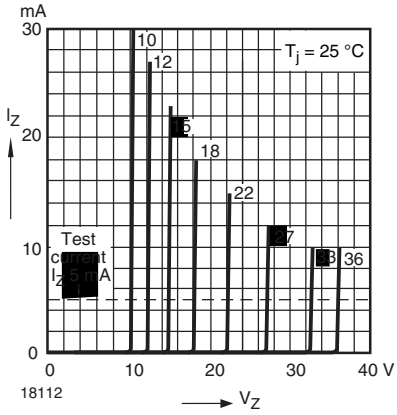


Figure 17. Breakdown Characteristics

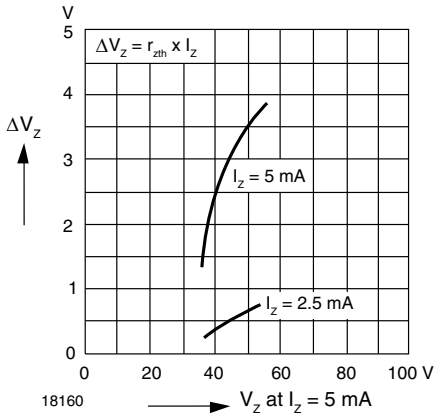


Figure 15. Change of Zener voltage from turn-on up to the point of thermal equilibrium vs. Zener voltage

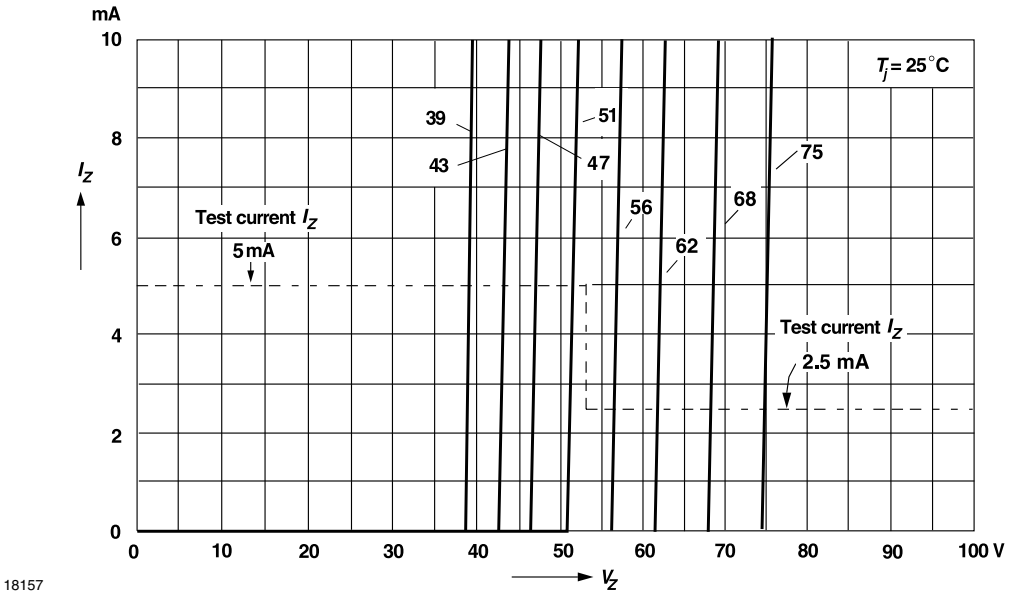
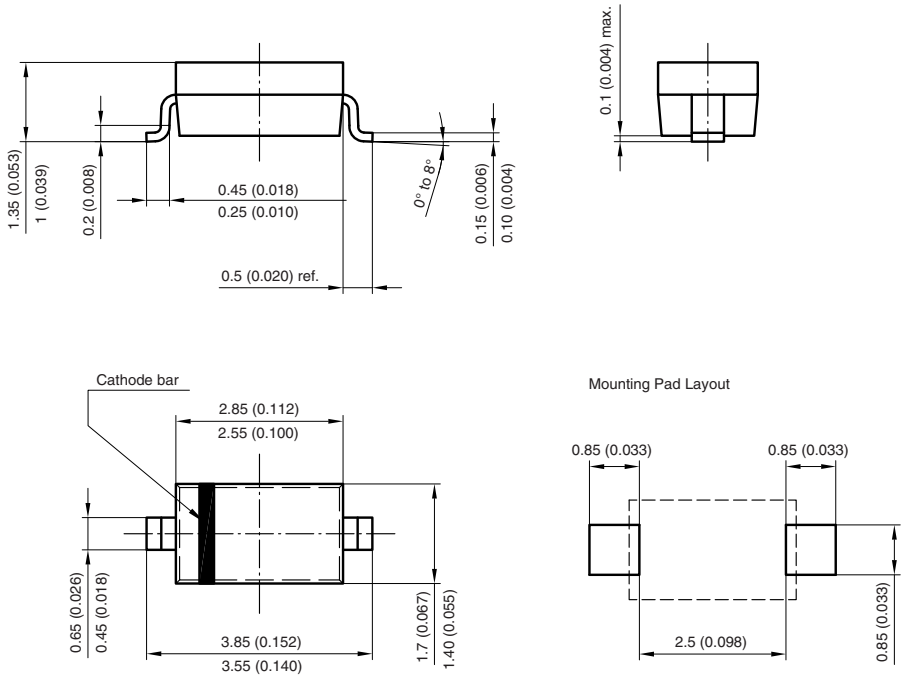


Figure 18. Breakdown Characteristics

Package Dimensions in millimeters (inches): **SOD-123**



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Document no.: S8-V-3910.01-001 (4)
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