Small Signal Zener Diodes

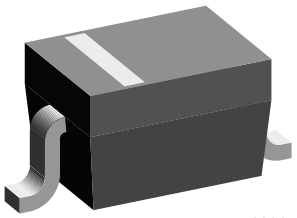
Features

- Silicon planar power Zener diodes
- The Zener voltages are graded according to the international E 24 standard
- Standard Zener voltage tolerance is ± 5 %; replace "C" with "B" for ± 2 % tolerance
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e3

RoHS COMPLIANT



20145

Mechanical Data

Case: SOD-323

Weight: approx. 4.3 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
Power dissipation		P_{tot}	200 [1]	mW

[1] Device on fiberglass substrate

Thermal Characteristics

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

Parameter	Test condition	Symbol	Value	Unit
Thermal resistance junction to ambient air		R_{thJA}	650 [1]	K/W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	- 65 to + 150	°C

[1] Valid that electrodes are kept at ambient temperature

Electrical Characteristics

Part number	Marking code	Zener voltage range		Dynamic resistance		Test current	Temperature coefficient of zener voltage		Test current	Reverse leakage current	
		V_Z at I_{ZT1}		r_{zj} at I_{ZT1}	r_{zj} at I_{ZT2}	I_{ZT1}	α_{VZ} at I_{ZT1}		at I_{ZT2}	I_R at V_R	
		V		Ω	Ω	mA	10^{-4}/°C		mA	µA	V
		min.	max.	typ.	typ.		min.	max.			
BZX384C2V4-V	W1	2.2	2.6	70 (≤ 100)	275	5	- 9	- 4	1	50	1
BZX384C2V7-V	W2	2.5	2.9	75 (≤ 100)	300 (≤ 600)	5	- 9	- 4	1	20	1
BZX384C3V0-V	W3	2.8	3.2	80 (≤ 95)	325 (≤ 600)	5	- 9	- 3	1	10	1
BZX384C3V3-V	W4	3.1	3.5	85 (≤ 95)	350 (≤ 600)	5	- 8	- 3	1	5	1
BZX384C3V6-V	W5	3.4	3.8	85 (≤ 90)	375 (≤ 600)	5	- 8	- 3	1	5	1
BZX384C3V9-V	W6	3.7	4.1	85 (≤ 90)	400 (≤ 600)	5	- 7	- 3	1	3	1
BZX384C4V3-V	W7	4	4.6	80 (≤ 90)	410 (≤ 600)	5	- 6	- 1	1	3	1
BZX384C4V7-V	W8	4.4	5	50 (≤ 80)	425 (≤ 500)	5	- 5	2	1	3	2
BZX384C5V1-V	W9	4.8	5.4	40 (≤ 60)	400 (≤ 480)	5	- 3	4	1	2	2
BZX384C5V6-V	WA	5.2	6	15 (≤ 40)	80 (≤ 400)	5	- 2	6	1	1	2
BZX384C6V2-V	WB	5.8	6.6	6 (≤ 10)	40 (≤ 150)	5	- 1	7	1	3	4
BZX384C6V8-V	WC	6.4	7.2	6 (≤ 15)	30 (≤ 80)	5	2	7	1	2	4
BZX384C7V5-V	WD	7	7.9	6 (≤ 15)	30 (≤ 80)	5	3	7	1	1	5
BZX384C8V2-V	WE	7.7	8.7	6 (≤ 15)	40 (≤ 80)	5	4	7	1	0.7	5
BZX384C9V1-V	WF	8.5	9.6	6 (≤ 15)	40 (≤ 100)	5	5	8	1	0.5	6
BZX384C10-V	WG	9.4	10.6	8 (≤ 20)	50 (≤ 150)	5	5	8	1	0.2	7
BZX384C11-V	WH	10.4	11.6	10 (≤ 20)	50 (≤ 150)	5	5	9	1	0.1	8
BZX384C12-V	WI	11.4	12.7	10 (≤ 25)	50 (≤ 150)	5	6	9	1	0.1	8
BZX384C13-V	WK	12.4	14.1	10 (≤ 30)	50 (≤ 170)	5	7	9	1	0.1	8
BZX384C15-V	WL	13.8	15.6	10 (≤ 30)	50 (≤ 200)	5	7	9	1	0.05	0.7 $V_{Znom.}$
BZX384C16-V	WM	15.3	17.1	10 (≤ 40)	50 (≤ 200)	5	8	9.5	1	0.05	0.7 $V_{Znom.}$
BZX384C18-V	WN	16.8	19.1	10 (≤ 45)	50 (≤ 225)	5	8	9.5	1	0.05	0.7 $V_{Znom.}$
BZX384C20-V	WO	18.8	21.2	15 (≤ 55)	60 (≤ 225)	5	8	10	1	0.05	0.7 $V_{Znom.}$
BZX384C22-V	WP	20.8	23.3	20 (≤ 55)	60 (≤ 250)	5	8	10	1	0.05	0.7 $V_{Znom.}$
BZX384C24-V	WR	22.8	25.6	25 (≤ 70)	60 (≤ 250)	5	8	10	1	0.05	0.7 $V_{Znom.}$
BZX384C27-V	WS	25.1	28.9	25 (≤ 80)	65 (≤ 300)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384C30-V	WT	28	32	30 (≤ 80)	70 (≤ 300)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384C33-V	WU	31	35	35 (≤ 80)	75 (≤ 325)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384C36-V	WW	34	38	35 (≤ 90)	80 (≤ 350)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384C39-V	WX	37	41	40 (≤ 130)	80 (≤ 350)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384C43-V	WY	40	46	45 (≤ 150)	85 (≤ 375)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384C47-V	WZ	44	50	50 (≤ 170)	85 (≤ 375)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384C51-V	X1	48	54	60 (≤ 180)	85 (≤ 400)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384C56-V	X2	52	60	70 (≤ 200)	100 (≤ 425)	2	9	11	0.5	0.05	0.7 $V_{Znom.}$
BZX384C62-V	X3	58	66	80 (≤ 215)	100 (≤ 450)	2	9	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384C68-V	X4	64	72	90 (≤ 240)	150 (≤ 475)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384C75-V	X5	70	79	95 (≤ 255)	170 (≤ 500)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$

(1) Measured with pulses t_p = 5 ms

Electrical Characteristics

Part number	Marking code	Zener voltage range		Dynamic resistance		Test current	Temperature coefficient of zener voltage		Test current	Reverse leakage current	
		V_Z at I_{ZT1}		r_{zj} at I_{ZT1}	r_{zj} at I_{ZT2}	I_{ZT1}	α_{VZ} at I_{ZT1}		atI_{ZT2}	I_R at V_R	
		V		Ω	Ω	mA	10^{-4}/°C		mA	µA	V
		min.	max.	typ.	typ.		min.	max.			
BZX384B2V4-V	W1	2.35	2.45	70 (≤ 100)	275	5	- 9	- 4	1	50	1
BZX384B2V7-V	W2	2.65	2.75	75 (≤ 100)	300 (≤ 600)	5	- 9	- 4	1	20	1
BZX384B3V0-V	W3	2.94	3.06	80 (≤ 95)	325 (≤ 600)	5	- 9	- 3	1	10	1
BZX384B3V3-V	W4	3.23	3.37	85 (≤ 95)	350 (≤ 600)	5	- 8	- 3	1	5	1
BZX384B3V6-V	W5	3.53	3.67	85 (≤ 90)	375 (≤ 600)	5	- 8	- 3	1	5	1
BZX384B3V9-V	W6	3.82	3.98	85 (≤ 90)	400 (≤ 600)	5	- 7	- 3	1	3	1
BZX384B4V3-V	W7	4.21	4.39	80 (≤ 90)	410 (≤ 600)	5	- 6	- 1	1	3	1
BZX384B4V7-V	W8	4.61	4.79	50 (≤ 80)	425 (≤ 500)	5	- 5	2	1	3	2
BZX384B5V1-V	W9	5.00	5.20	40 (≤ 60)	400 (≤ 480)	5	- 3	4	1	2	2
BZX384B5V6-V	WA	5.49	5.71	15 (≤ 40)	80 (≤ 400)	5	- 2	6	1	1	2
BZX384B6V2-V	WB	6.08	6.32	6 (≤ 10)	40 (≤ 150)	5	- 1	7	1	3	4
BZX384B6V8-V	WC	6.66	6.94	6 (≤ 15)	30 (≤ 80)	5	2	7	1	2	4
BZX384B7V5-V	WD	7.35	7.65	6 (≤ 15)	30 (≤ 80)	5	3	7	1	1	5
BZX384B8V2-V	WE	8.04	8.36	6 (≤ 15)	40 (≤ 80)	5	4	7	1	0.7	5
BZX384B9V1-V	WF	8.92	9.28	6 (≤ 15)	40 (≤ 100)	5	5	8	1	0.5	6
BZX384B10-V	WG	9.80	10.2	8 (≤ 20)	50 (≤ 150)	5	5	8	1	0.2	7
BZX384B11-V	WH	10.8	11.2	10 (≤ 20)	50 (≤ 150)	5	5	9	1	0.1	8
BZX384B12-V	WI	11.8	12.2	10 (≤ 25)	50 (≤ 150)	5	6	9	1	0.1	8
BZX384B13-V	WK	12.7	13.3	10 (≤ 30)	50 (≤ 170)	5	7	9	1	0.1	8
BZX384B15-V	WL	14.7	15.3	10 (≤ 30)	50 (≤ 200)	5	7	9	1	0.05	0.7 $V_{Znom.}$
BZX384B16-V	WM	15.7	16.3	10 (≤ 40)	50 (≤ 200)	5	8	9.5	1	0.05	0.7 $V_{Znom.}$
BZX384B18-V	WN	17.6	18.4	10 (≤ 45)	50 (≤ 225)	5	8	9.5	1	0.05	0.7 $V_{Znom.}$
BZX384B20-V	WO	19.6	20.4	15 (≤ 55)	60 (≤ 225)	5	8	10	1	0.05	0.7 $V_{Znom.}$
BZX384B22-V	WP	21.6	22.4	20 (≤ 55)	60 (≤ 250)	5	8	10	1	0.05	0.7 $V_{Znom.}$
BZX384B24-V	WR	23.5	24.5	25 (≤ 70)	60 (≤ 250)	5	8	10	1	0.05	0.7 $V_{Znom.}$
BZX384B27-V	WS	26.5	27.5	25 (≤ 80)	65 (≤ 300)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384B30-V	WT	29.4	30.6	30 (≤ 80)	70 (≤ 300)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384B33-V	WU	32.3	33.7	35 (≤ 80)	75 (≤ 325)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384B36-V	WW	35.3	36.7	35 (≤ 90)	80 (≤ 350)	2	8	10	0.5	0.05	0.7 $V_{Znom.}$
BZX384B39-V	WX	38.2	39.8	40 (≤ 130)	80 (≤ 350)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384B43-V	WY	42.1	43.9	45 (≤ 150)	85 (≤ 375)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384B47-V	WZ	46.1	47.9	50 (≤ 170)	85 (≤ 375)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384B51-V	X1	50.0	52.0	60 (≤ 180)	85 (≤ 400)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384B56-V	X2	54.9	57.1	70 (≤ 200)	100 (≤ 425)	2	9	11	0.5	0.05	0.7 $V_{Znom.}$
BZX384B62-V	X3	60.8	63.2	80 (≤ 215)	100 (≤ 450)	2	9	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384B68-V	X4	66.6	69.4	90 (≤ 240)	150 (≤ 475)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$
BZX384B75-V	X5	73.5	76.5	95 (≤ 255)	170 (≤ 500)	2	10	12	0.5	0.05	0.7 $V_{Znom.}$

Typical Characteristics (T_{amb} = 25 °C, unless otherwise specified)

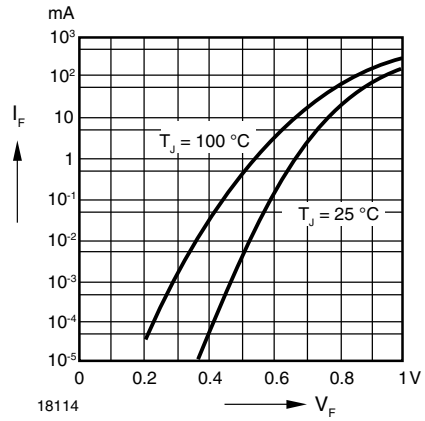


Figure 1. Forward characteristics

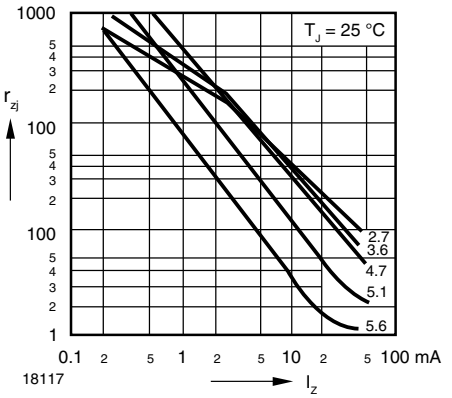


Figure 4. Dynamic Resistance vs. Zener Current

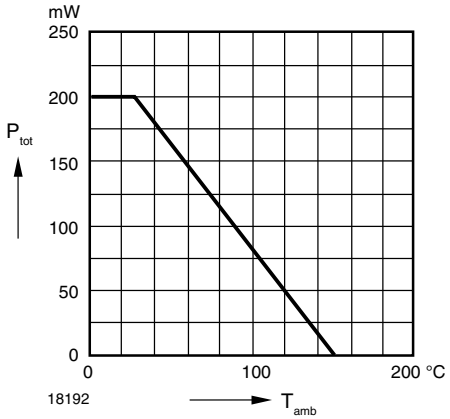


Figure 2. Admissible Power Dissipation vs. Ambient Temperature

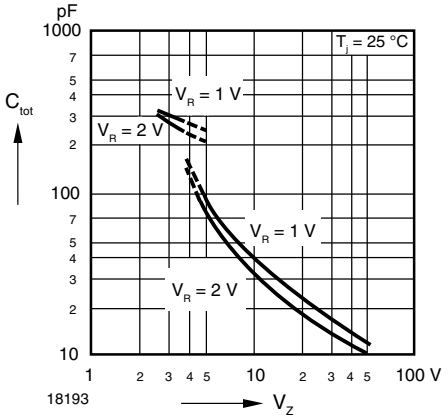


Figure 5. Capacitance vs. Zener Voltage

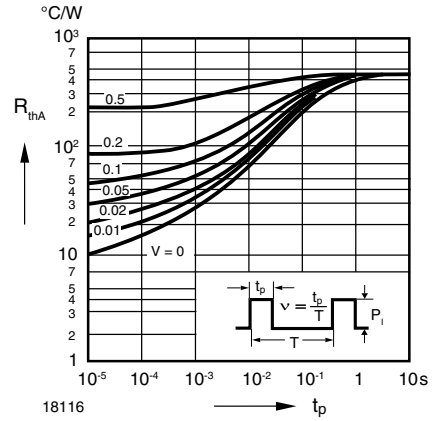


Figure 3. Pulse Thermal Resistance vs. Pulse Duration

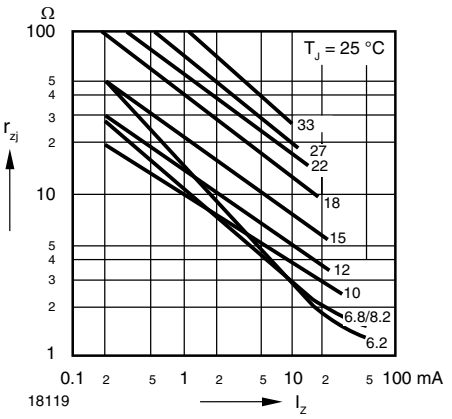


Figure 6. Dynamic Resistance vs. Zener Current

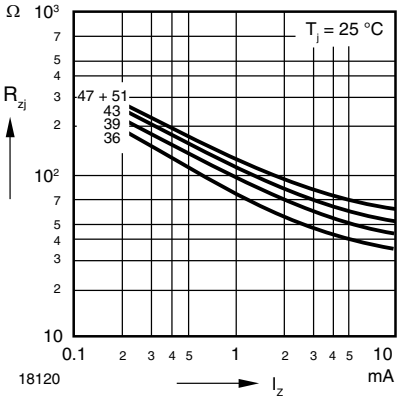


Figure 7. Dynamic Resistance vs. Zener Current

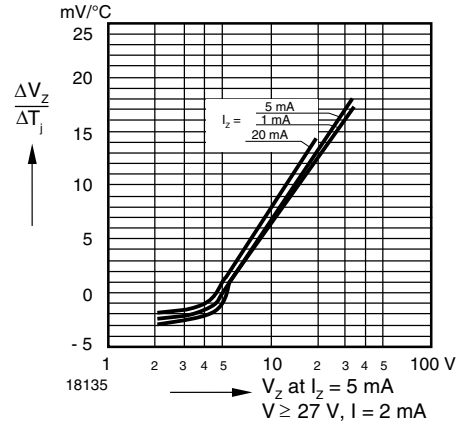


Figure 10. Temperature Dependence of Zener Voltage vs. Zener Voltage

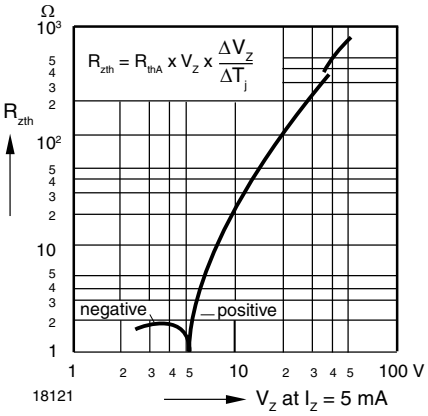


Figure 8. Thermal Differential Resistance vs. Zener Voltage

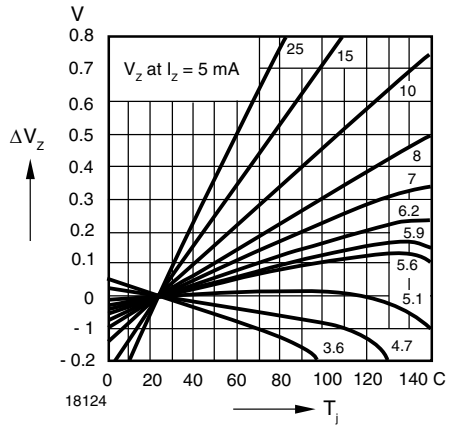


Figure 11. Change of Zener Voltage vs. Junction Temperature

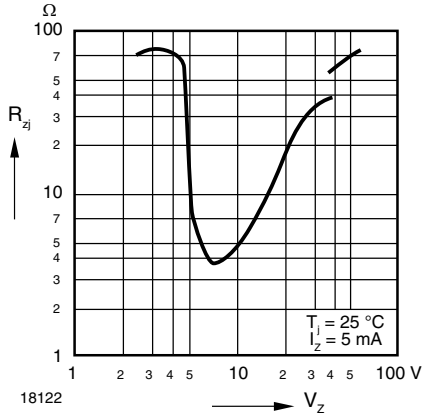


Figure 9. Dynamic Resistance vs. Zener Voltage

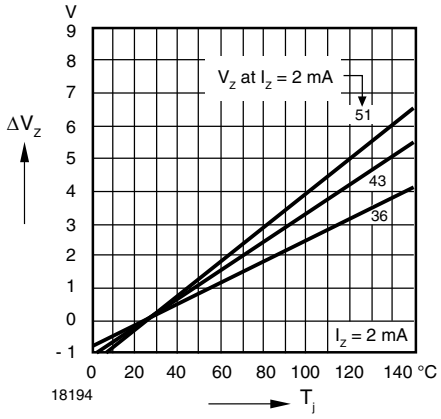


Figure 12. Change of Zener Voltage vs. Junction Temperature

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

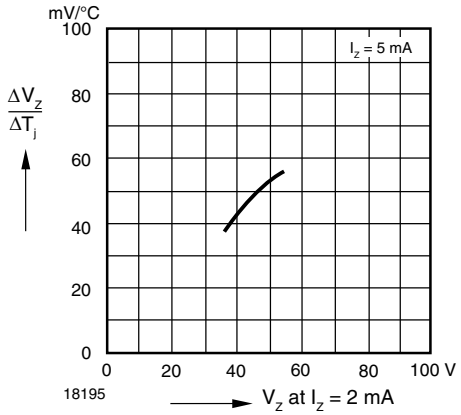


Figure 13. Temperature Dependence of Zener Voltage vs. Zener Voltage

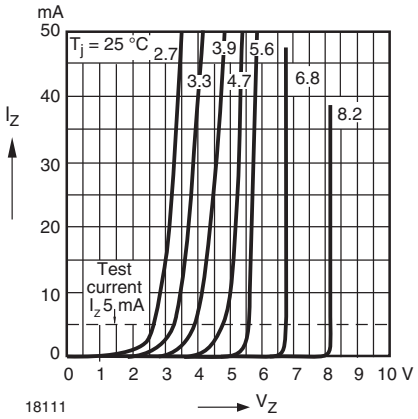


Figure 16. Breakdown Characteristics

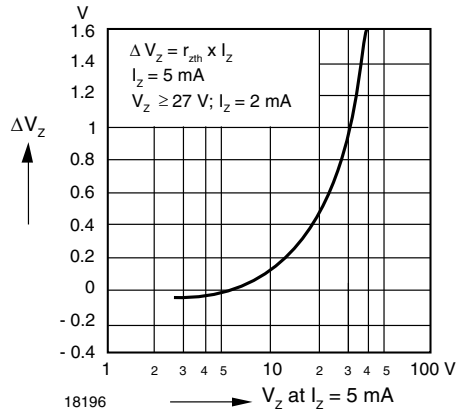


Figure 14. Change of Zener voltage from turn-on up to the point of thermal equilibrium vs. Zener voltage

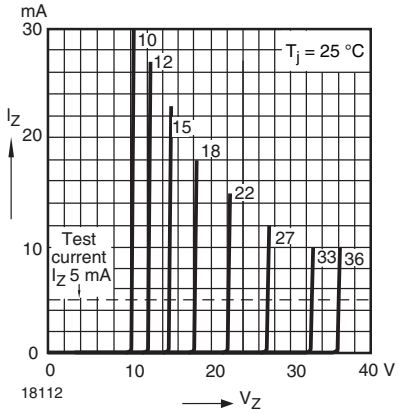


Figure 17. Breakdown Characteristics

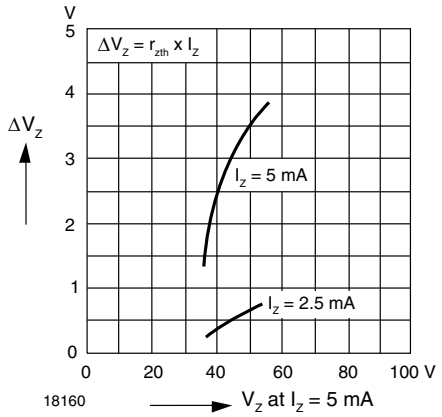


Figure 15. Change of Zener voltage from turn-on up to the point of thermal equilibrium vs. Zener voltage

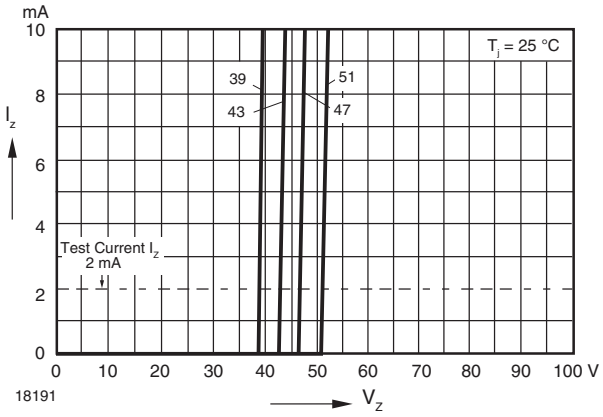
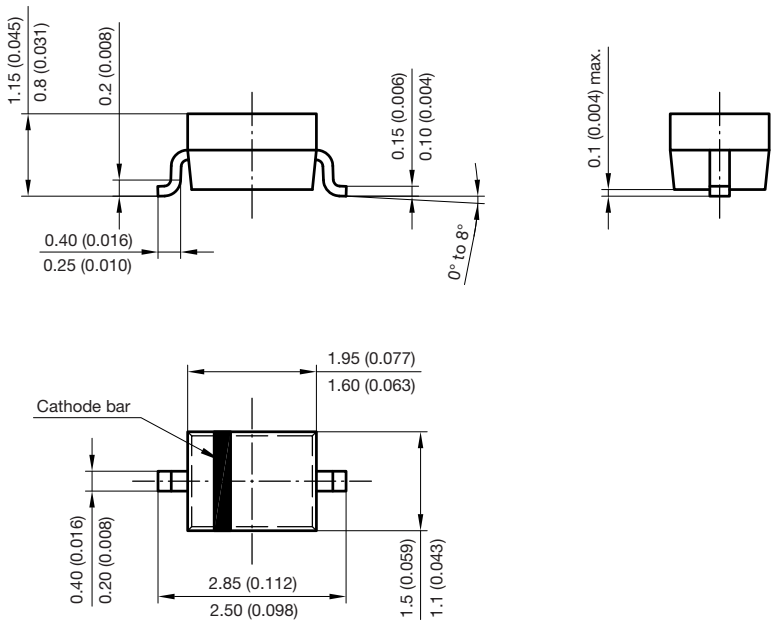
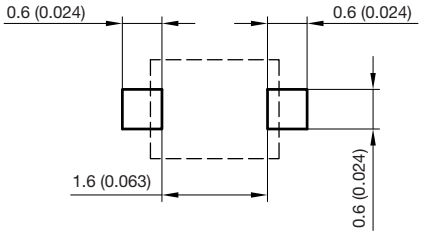


Figure 18. Breakdown Characteristics

Package Dimensions in millimeters (inches): **SOD-323**



Foot print recommendation:



Document no.:S8-V-3910.02-001 (4)
Created - Date: 24.August.2004
Rev. 5 - Date: 23.Sept.2009
17443

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.