

Small Signal Zener Diodes



FEATURES

- Silicon planar Zener diodes
- The Zener voltages are graded according to the international E24 standard
- Standard Zener voltage tolerance is $\pm 5\%$; replace "C" with "B" for $\pm 2\%$ tolerance
- AEC-Q101 qualified available (part number on request)
- 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



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	mA
V_Z specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZX384-G-series	BZX384C2V4-G3-08 to BZX384C75-G3-08	3000 (8 mm tape on 7" reel)	15 000/box
	BZX384B2V4-G3-08 to BZX384B75-G3-08		
	BZX384C2V4-G3-18 to BZX384C75-G3-18	10 000 (8 mm tape on 13" reel)	10 000/box
	BZX384B2V4-G3-18 to BZX384B75-G3-18		

PACKAGE

PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SOD-323	4 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ °C}$, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	Device on fiberglass substrate	P_{tot}	200	mW
Thermal resistance junction to ambient air	Valid that electrodes are kept at ambient temperature	R_{thJA}	650	K/W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Operating temperature range		T_{stg}	-55 to +150	°C

**ELECTRICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT OF ZENER VOLTAGE	
		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		$10^{-4}/^{\circ}\text{C}$	
		MIN.	NOM.	MAX.			MAX.		TYP.	TYP.	MIN.	MAX.
BZX384C2V4-G	Y1	2.2	2.4	2.6	5	1	50	1	70 (≤ 100)	275	- 9	- 4
BZX384C2V7-G	Y2	2.5	2.7	2.9	5	1	20	1	75 (≤ 100)	300 (≤ 600)	- 9	- 4
BZX384C3V0-G	Y3	2.8	3.0	3.2	5	1	10	1	80 (≤ 95)	325 (≤ 600)	- 9	- 3
BZX384C3V3-G	Y4	3.1	3.3	3.5	5	1	5	1	85 (≤ 95)	350 (≤ 600)	- 8	- 3
BZX384C3V6-G	Y5	3.4	3.6	3.8	5	1	5	1	85 (≤ 90)	375 (≤ 600)	- 8	- 3
BZX384C3V9-G	Y6	3.7	3.9	4.1	5	1	3	1	85 (≤ 90)	400 (≤ 600)	- 7	- 3
BZX384C4V3-G	Y7	4	4.3	4.6	5	1	3	1	80 (≤ 90)	410 (≤ 600)	- 6	- 1
BZX384C4V7-G	Y8	4.4	4.7	5	5	1	3	2	50 (≤ 80)	425 (≤ 500)	- 5	2
BZX384C5V1-G	Y9	4.8	5.1	5.4	5	1	2	2	40 (≤ 60)	400 (≤ 480)	- 3	4
BZX384C5V6-G	YA	5.2	5.6	6	5	1	1	2	15 (≤ 40)	80 (≤ 400)	- 2	6
BZX384C6V2-G	YB	5.8	6.2	6.6	5	1	3	4	6 (≤ 10)	40 (≤ 150)	- 1	7
BZX384C6V8-G	YC	6.4	6.8	7.2	5	1	2	4	6 (≤ 15)	30 (≤ 80)	2	7
BZX384C7V5-G	YD	7	7.5	7.9	5	1	1	5	6 (≤ 15)	30 (≤ 80)	3	7
BZX384C8V2-G	YE	7.7	8.2	8.7	5	1	0.7	5	6 (≤ 15)	40 (≤ 80)	4	7
BZX384C9V1-G	YF	8.5	9.1	9.6	5	1	0.5	6	6 (≤ 15)	40 (≤ 100)	5	8
BZX384C10-G	YG	9.4	10	10.6	5	1	0.2	7	8 (≤ 20)	50 (≤ 150)	5	8
BZX384C11-G	YH	10.4	11	11.6	5	1	0.1	8	10 (≤ 20)	50 (≤ 150)	5	9
BZX384C12-G	YI	11.4	12	12.7	5	1	0.1	8	10 (≤ 25)	50 (≤ 150)	6	9
BZX384C13-G	YK	12.4	13	14.1	5	1	0.1	8	10 (≤ 30)	50 (≤ 170)	7	9
BZX384C15-G	YL	13.8	15	15.6	5	1	0.05	0.7 $V_{Znom.}$	10 (≤ 30)	50 (≤ 200)	7	9
BZX384C16-G	YM	15.3	16	17.1	5	1	0.05	0.7 $V_{Znom.}$	10 (≤ 40)	50 (≤ 200)	8	9.5
BZX384C18-G	YN	16.8	18	19.1	5	1	0.05	0.7 $V_{Znom.}$	10 (≤ 45)	50 (≤ 225)	8	9.5
BZX384C20-G	YO	18.8	20	21.2	5	1	0.05	0.7 $V_{Znom.}$	15 (≤ 55)	60 (≤ 225)	8	10
BZX384C22-G	YP	20.8	22	23.3	5	1	0.05	0.7 $V_{Znom.}$	20 (≤ 55)	60 (≤ 250)	8	10
BZX384C24-G	YR	22.8	24	25.6	5	1	0.05	0.7 $V_{Znom.}$	25 (≤ 70)	60 (≤ 250)	8	10
BZX384C27-G	YS	25.1	27	28.9	2	0.5	0.05	0.7 $V_{Znom.}$	25 (≤ 80)	65 (≤ 300)	8	10
BZX384C30-G	YT	28	30	32	2	0.5	0.05	0.7 $V_{Znom.}$	30 (≤ 80)	70 (≤ 300)	8	10
BZX384C33-G	YU	31	33	35	2	0.5	0.05	0.7 $V_{Znom.}$	35 (≤ 80)	75 (≤ 325)	8	10
BZX384C36-G	YW	34	36	38	2	0.5	0.05	0.7 $V_{Znom.}$	35 (≤ 90)	80 (≤ 350)	10	12
BZX384C39-G	YX	37	39	41	2	0.5	0.05	0.7 $V_{Znom.}$	40 (≤ 130)	80 (≤ 350)	10	12
BZX384C43-G	YY	40	43	46	2	0.5	0.05	0.7 $V_{Znom.}$	45 (≤ 150)	85 (≤ 375)	10	12
BZX384C47-G	YZ	44	47	50	2	0.5	0.05	0.7 $V_{Znom.}$	50 (≤ 170)	85 (≤ 375)	10	12
BZX384C51-G	Z1	48	51	54	2	0.5	0.05	0.7 $V_{Znom.}$	60 (≤ 180)	85 (≤ 400)	8	10
BZX384C56-G	Z2	52	56	60	2	0.5	0.05	0.7 $V_{Znom.}$	70 (≤ 200)	100 (≤ 425)	10	12
BZX384C62-G	Z3	58	62	66	2	0.5	0.05	0.7 $V_{Znom.}$	80 (≤ 215)	100 (≤ 450)	10	12
BZX384C68-G	Z4	64	68	72	2	0.5	0.05	0.7 $V_{Znom.}$	90 (≤ 240)	150 (≤ 475)	10	12
BZX384C75-G	Z5	70	75	79	2	0.5	0.05	0.7 $V_{Znom.}$	95 (≤ 255)	170 (≤ 500)	10	12

**ELECTRICAL CHARACTERISTICS** ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT OF ZENER VOLTAGE	
		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		$10^{-4}/^{\circ}\text{C}$	
		MIN.	NOM.	MAX.			MAX.		TYP.	TYP.	MIN.	MAX.
BZX384B2V4-G	C1	2.35	2.4	2.45	5	1	50	1	70 (≤ 100)	275	- 9	- 4
BZX384B2V7-G	C2	2.65	2.7	2.75	5	1	20	1	75 (≤ 100)	300 (≤ 600)	- 9	- 4
BZX384B3V0-G	C3	2.94	3.0	3.06	5	1	10	1	80 (≤ 95)	325 (≤ 600)	- 9	- 3
BZX384B3V3-G	C4	3.23	3.3	3.37	5	1	5	1	85 (≤ 95)	350 (≤ 600)	- 8	- 3
BZX384B3V6-G	C5	3.53	3.6	3.67	5	1	5	1	85 (≤ 90)	375 (≤ 600)	- 8	- 3
BZX384B3V9-G	C6	3.82	3.9	3.98	5	1	3	1	85 (≤ 90)	400 (≤ 600)	- 7	- 3
BZX384B4V3-G	C7	4.21	4.3	4.39	5	1	3	1	80 (≤ 90)	410 (≤ 600)	- 6	- 1
BZX384B4V7-G	C8	4.61	4.7	4.79	5	1	3	2	50 (≤ 80)	425 (≤ 500)	- 5	2
BZX384B5V1-G	C9	5	5.1	5.2	5	1	2	2	40 (≤ 60)	400 (≤ 480)	- 3	4
BZX384B5V6-G	CA	5.49	5.6	5.71	5	1	1	2	15 (≤ 40)	80 (≤ 400)	- 2	6
BZX384B6V2-G	CB	6.08	6.2	6.32	5	1	3	4	6 (≤ 10)	40 (≤ 150)	- 1	7
BZX384B6V8-G	CC	6.66	6.8	6.94	5	1	2	4	6 (≤ 15)	30 (≤ 80)	2	7
BZX384B7V5-G	CD	7.35	7.5	7.65	5	1	1	5	6 (≤ 15)	30 (≤ 80)	3	7
BZX384B8V2-G	CE	8.04	8.2	8.36	5	1	0.7	5	6 (≤ 15)	40 (≤ 80)	4	7
BZX384B9V1-G	CF	8.92	9.1	9.28	5	1	0.5	6	6 (≤ 15)	40 (≤ 100)	5	8
BZX384B10-G	CG	9.8	10	10.2	5	1	0.2	7	8 (≤ 20)	50 (≤ 150)	5	8
BZX384B11-G	CH	10.8	11	11.2	5	1	0.1	8	10 (≤ 20)	50 (≤ 150)	5	9
BZX384B12-G	CI	11.8	12	12.2	5	1	0.1	8	10 (≤ 25)	50 (≤ 150)	6	9
BZX384B13-G	CK	12.7	13	13.3	5	1	0.1	8	10 (≤ 30)	50 (≤ 170)	7	9
BZX384B15-G	CL	14.7	15	15.3	5	1	0.05	0.7 $V_{Znom.}$	10 (≤ 30)	50 (≤ 200)	7	9
BZX384B16-G	CM	15.7	16	16.3	5	1	0.05	0.7 $V_{Znom.}$	10 (≤ 40)	50 (≤ 200)	8	9.5
BZX384B18-G	CN	17.6	18	18.4	5	1	0.05	0.7 $V_{Znom.}$	10 (≤ 45)	50 (≤ 225)	8	9.5
BZX384B20-G	CO	19.6	20	20.4	5	1	0.05	0.7 $V_{Znom.}$	15 (≤ 55)	60 (≤ 225)	8	10
BZX384B22-G	CP	21.6	22	22.4	5	1	0.05	0.7 $V_{Znom.}$	20 (≤ 55)	60 (≤ 250)	8	10
BZX384B24-G	CR	23.5	24	24.5	5	1	0.05	0.7 $V_{Znom.}$	25 (≤ 70)	60 (≤ 250)	8	10
BZX384B27-G	CS	26.5	27	27.5	2	0.5	0.05	0.7 $V_{Znom.}$	25 (≤ 80)	65 (≤ 300)	8	10
BZX384B30-G	CT	29.4	30	30.6	2	0.5	0.05	0.7 $V_{Znom.}$	30 (≤ 80)	70 (≤ 300)	8	10
BZX384B33-G	CU	32.3	33	33.7	2	0.5	0.05	0.7 $V_{Znom.}$	35 (≤ 80)	75 (≤ 325)	8	10
BZX384B36-G	CW	35.3	36	36.7	2	0.5	0.05	0.7 $V_{Znom.}$	35 (≤ 90)	80 (≤ 350)	8	10
BZX384B39-G	CX	38.2	39	39.8	2	0.5	0.05	0.7 $V_{Znom.}$	40 (≤ 130)	80 (≤ 350)	10	12
BZX384B43-G	CY	42.1	43	43.9	2	0.5	0.05	0.7 $V_{Znom.}$	45 (≤ 150)	85 (≤ 375)	10	12
BZX384B47-G	CZ	46.1	47	47.9	2	0.5	0.05	0.7 $V_{Znom.}$	50 (≤ 170)	85 (≤ 375)	10	12
BZX384B51-G	D1	50	51	52	2	0.5	0.05	0.7 $V_{Znom.}$	60 (≤ 180)	85 (≤ 400)	10	12
BZX384B56-G	D2	54.9	56	57.1	2	0.5	0.05	0.7 $V_{Znom.}$	70 (≤ 200)	100 (≤ 425)	9	11
BZX384B62-G	D3	60.8	62	63.2	2	0.5	0.05	0.7 $V_{Znom.}$	80 (≤ 215)	100 (≤ 450)	9	12
BZX384B68-G	D4	66.6	68	69.4	2	0.5	0.05	0.7 $V_{Znom.}$	90 (≤ 240)	150 (≤ 475)	10	12
BZX384B75-G	D5	73.5	75	76.5	2	0.5	0.05	0.7 $V_{Znom.}$	95 (≤ 255)	170 (≤ 500)	10	12



TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

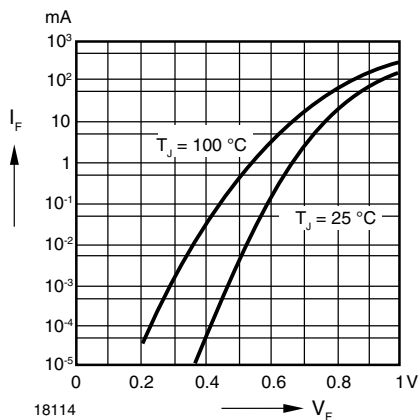


Fig. 1 - Forward Characteristics

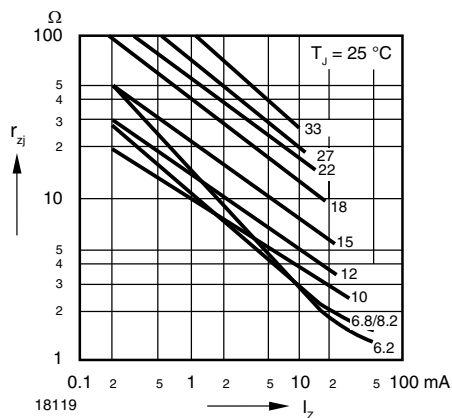


Fig. 4 - Dynamic Resistance vs. Zener Current

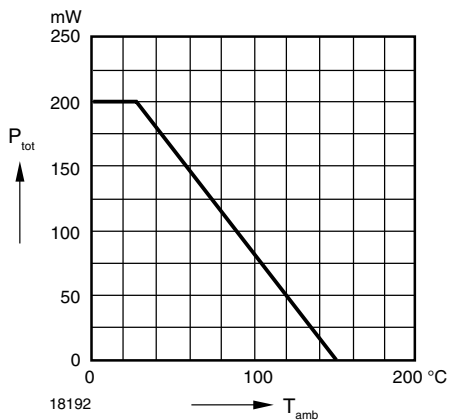


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

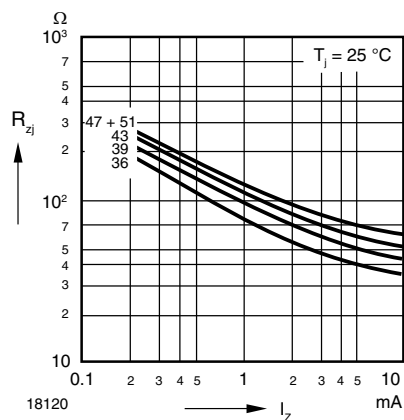


Fig. 5 - Dynamic Resistance vs. Zener Current

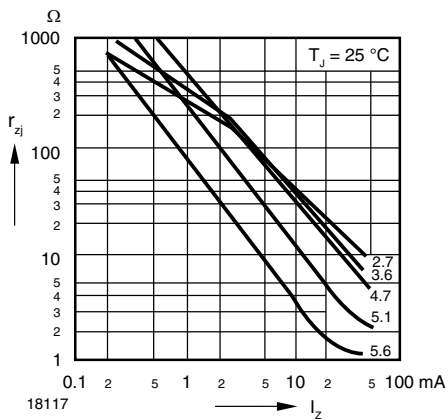


Fig. 3 - Dynamic Resistance vs. Zener Current

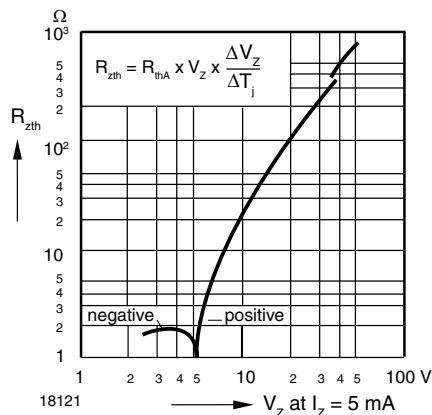


Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

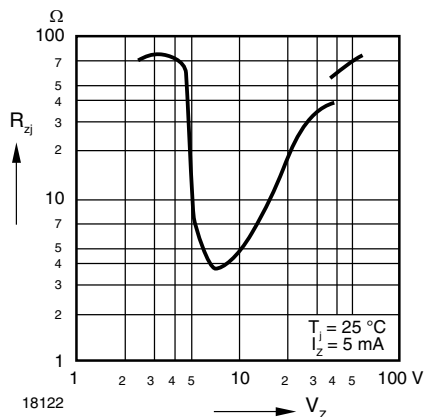


Fig. 7 - Dynamic Resistance vs. Zener Voltage

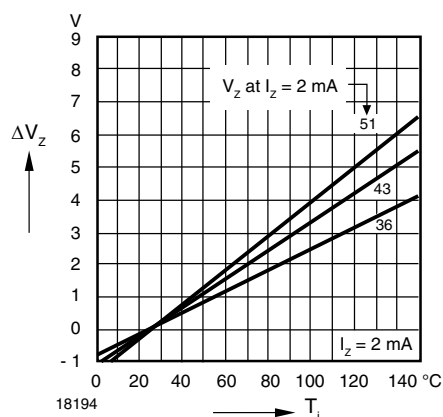


Fig. 10 - Change of Zener Voltage vs. Junction Temperature

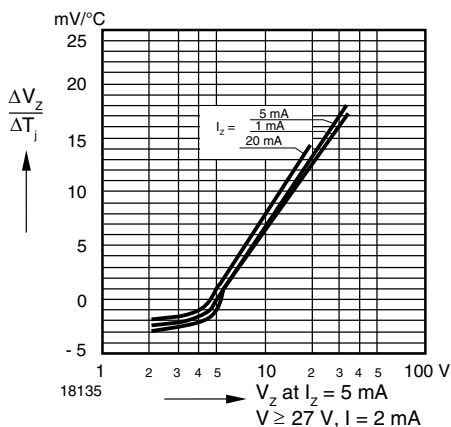


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

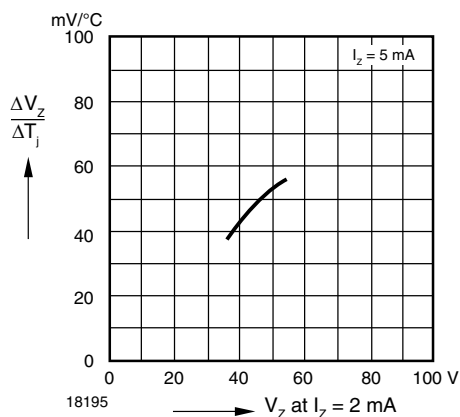


Fig. 11 - Temperature Dependence of Zener Voltage vs. Zener Voltage

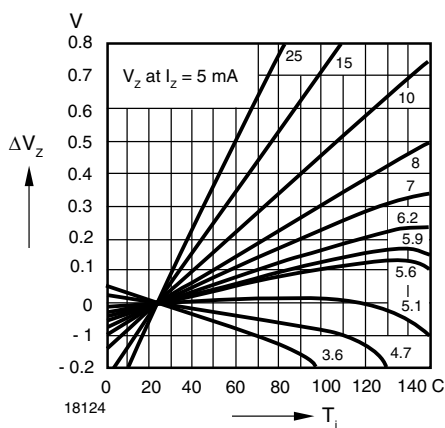


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

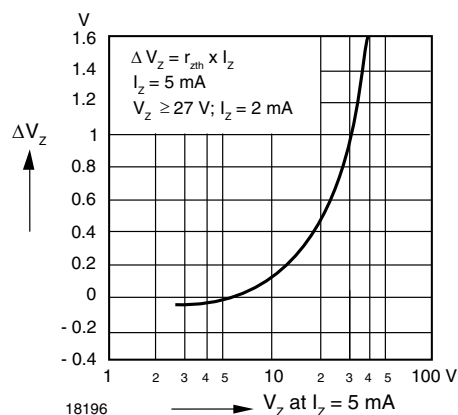


Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

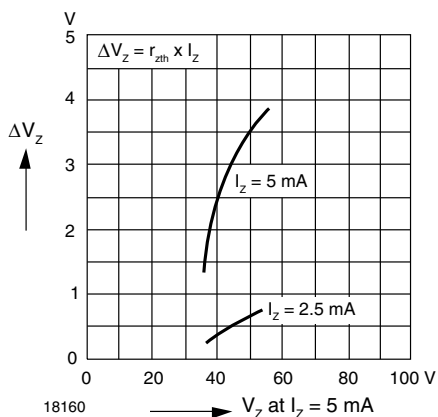


Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

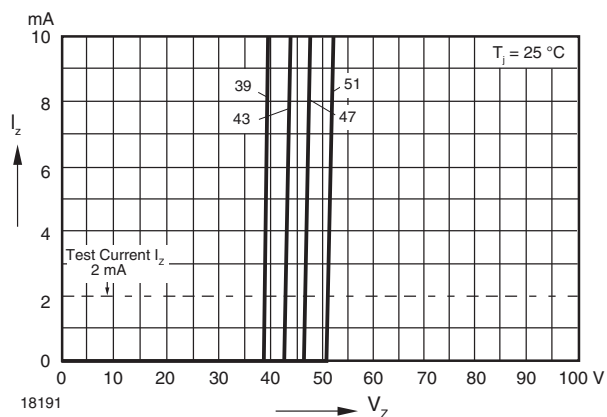


Fig. 16 - Breakdown Characteristics

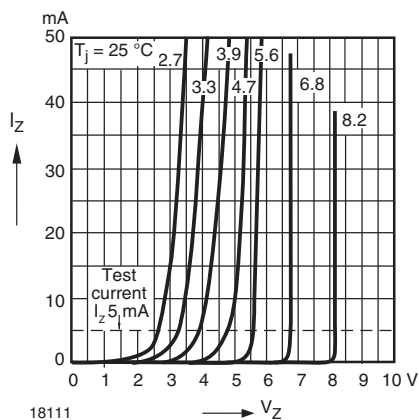


Fig. 14 - Breakdown Characteristics

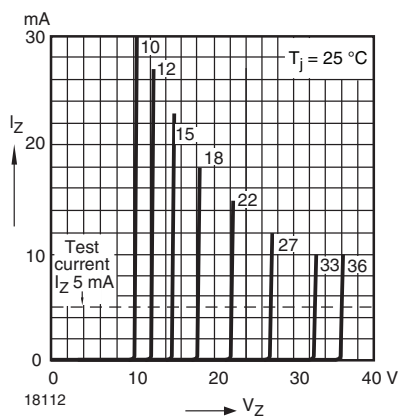
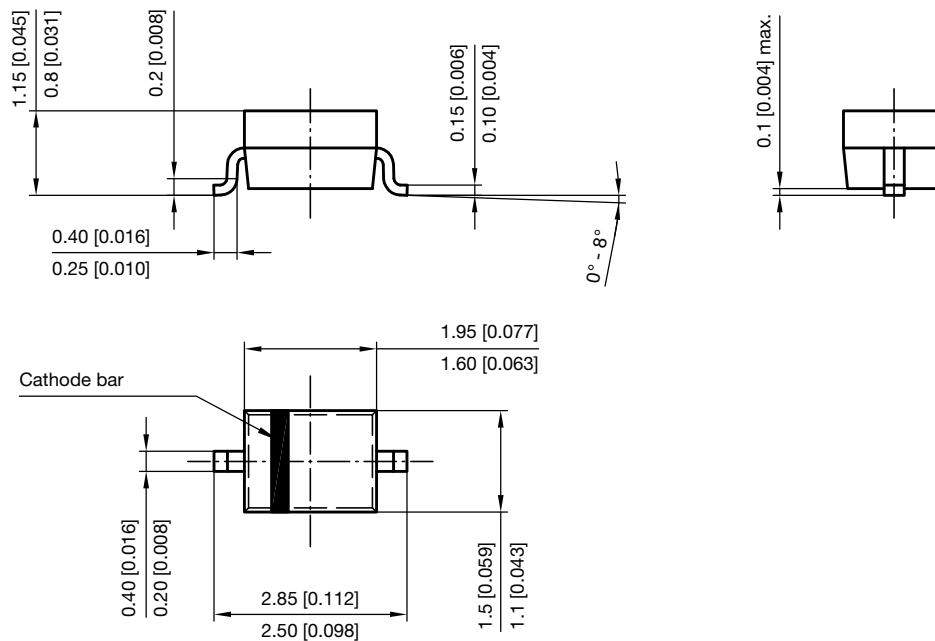


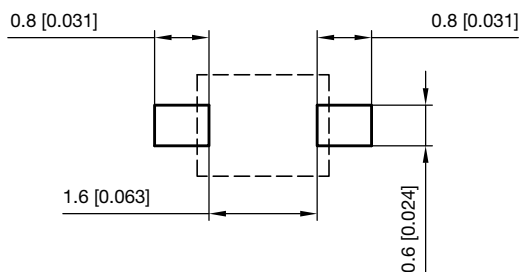
Fig. 15 - Breakdown Characteristics



PACKAGE DIMENSIONS in millimeters (inches): **SOD-323**



Footprint recommendation:



Document no.: S8-V-3910.02-001 (4)
Created - Date: 24.August.2004
Rev. 6 - Date: 23.Sept.2016
17443



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

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 in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

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