



### 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
- 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](http://www.vishay.com/doc?99912)



PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V <sub>Z</sub> range nom.	2.4 to 75	V
Test current I <sub>ZT</sub>	2; 5	mA
V <sub>Z</sub> 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 <sub>amb</sub> = 25 °C, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	Device on fiberglass substrate	P <sub>tot</sub>	200	mW
Thermal resistance junction to ambient air	Valid that electrodes are kept at ambient temperature	R <sub>thJA</sub>	650	K/W
Junction temperature		T <sub>j</sub>	150	°C
Storage temperature range		T <sub>stg</sub>	- 65 to + 150	°C
Operating temperature range		T <sub>stg</sub>	- 55 to + 150	°C



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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 $I_{ZT2}$	$\alpha_{VZ}$ at $I_{ZT1}$	
		V			mA		$\mu\text{A}$	V	$\Omega$		$10^{-4}/^{\circ}\text{C}$	
		MIN.	NOM.	MAX.			MAX.		TYP.	TYP.	MIN.	MAX.
BZX384C2V4-G	Y1	2.2	2.4	2.6	5	1	50	1	70 ( $\leq 100$ )	275	-9	-4
BZX384C2V7-G	Y2	2.5	2.7	2.9	5	1	20	1	75 ( $\leq 100$ )	300 ( $\leq 600$ )	-9	-4
BZX384C3V0-G	Y3	2.8	3.0	3.2	5	1	10	1	80 ( $\leq 95$ )	325 ( $\leq 600$ )	-9	-3
BZX384C3V3-G	Y4	3.1	3.3	3.5	5	1	5	1	85 ( $\leq 95$ )	350 ( $\leq 600$ )	-8	-3
BZX384C3V6-G	Y5	3.4	3.6	3.8	5	1	5	1	85 ( $\leq 90$ )	375 ( $\leq 600$ )	-8	-3
BZX384C3V9-G	Y6	3.7	3.9	4.1	5	1	3	1	85 ( $\leq 90$ )	400 ( $\leq 600$ )	-7	-3
BZX384C4V3-G	Y7	4	4.3	4.6	5	1	3	1	80 ( $\leq 90$ )	410 ( $\leq 600$ )	-6	-1
BZX384C4V7-G	Y8	4.4	4.7	5	5	1	3	2	50 ( $\leq 80$ )	425 ( $\leq 500$ )	-5	2
BZX384C5V1-G	Y9	4.8	5.1	5.4	5	1	2	2	40 ( $\leq 60$ )	400 ( $\leq 480$ )	-3	4
BZX384C5V6-G	YA	5.2	5.6	6	5	1	1	2	15 ( $\leq 40$ )	80 ( $\leq 400$ )	-2	6
BZX384C6V2-G	YB	5.8	6.2	6.6	5	1	3	4	6 ( $\leq 10$ )	40 ( $\leq 150$ )	-1	7
BZX384C6V8-G	YC	6.4	6.8	7.2	5	1	2	4	6 ( $\leq 15$ )	30 ( $\leq 80$ )	2	7
BZX384C7V5-G	YD	7	7.5	7.9	5	1	1	5	6 ( $\leq 15$ )	30 ( $\leq 80$ )	3	7
BZX384C8V2-G	YE	7.7	8.2	8.7	5	1	0.7	5	6 ( $\leq 15$ )	40 ( $\leq 80$ )	4	7
BZX384C9V1-G	YF	8.5	9.1	9.6	5	1	0.5	6	6 ( $\leq 15$ )	40 ( $\leq 100$ )	5	8
BZX384C10-G	YG	9.4	10	10.6	5	1	0.2	7	8 ( $\leq 20$ )	50 ( $\leq 150$ )	5	8
BZX384C11-G	YH	10.4	11	11.6	5	1	0.1	8	10 ( $\leq 20$ )	50 ( $\leq 150$ )	5	9
BZX384C12-G	YI	11.4	12	12.7	5	1	0.1	8	10 ( $\leq 25$ )	50 ( $\leq 150$ )	6	9
BZX384C13-G	YK	12.4	13	14.1	5	1	0.1	8	10 ( $\leq 30$ )	50 ( $\leq 170$ )	7	9
BZX384C15-G	YL	13.8	15	15.6	5	1	0.05	0.7 $V_{Znom.}$	10 ( $\leq 30$ )	50 ( $\leq 200$ )	7	9
BZX384C16-G	YM	15.3	16	17.1	5	1	0.05	0.7 $V_{Znom.}$	10 ( $\leq 40$ )	50 ( $\leq 200$ )	8	9.5
BZX384C18-G	YN	16.8	18	19.1	5	1	0.05	0.7 $V_{Znom.}$	10 ( $\leq 45$ )	50 ( $\leq 225$ )	8	9.5
BZX384C20-G	YO	18.8	20	21.2	5	1	0.05	0.7 $V_{Znom.}$	15 ( $\leq 55$ )	60 ( $\leq 225$ )	8	10
BZX384C22-G	YP	20.8	22	23.3	5	1	0.05	0.7 $V_{Znom.}$	20 ( $\leq 55$ )	60 ( $\leq 250$ )	8	10
BZX384C24-G	YR	22.8	24	25.6	5	0.5	0.05	0.7 $V_{Znom.}$	25 ( $\leq 70$ )	60 ( $\leq 250$ )	8	10
BZX384C27-G	YS	25.1	27	28.9	2	0.5	0.05	0.7 $V_{Znom.}$	25 ( $\leq 80$ )	65 ( $\leq 300$ )	8	10
BZX384C30-G	YT	28	30	32	2	0.5	0.05	0.7 $V_{Znom.}$	30 ( $\leq 80$ )	70 ( $\leq 300$ )	8	10
BZX384C33-G	YU	31	33	35	2	0.5	0.05	0.7 $V_{Znom.}$	35 ( $\leq 80$ )	75 ( $\leq 325$ )	8	10
BZX384C36-G	YW	34	36	38	2	0.5	0.05	0.7 $V_{Znom.}$	35 ( $\leq 90$ )	80 ( $\leq 350$ )	10	12
BZX384C39-G	YX	37	39	41	2	0.5	0.05	0.7 $V_{Znom.}$	40 ( $\leq 130$ )	80 ( $\leq 350$ )	10	12
BZX384C43-G	YY	40	43	46	2	0.5	0.05	0.7 $V_{Znom.}$	45 ( $\leq 150$ )	85 ( $\leq 375$ )	10	12
BZX384C47-G	YZ	44	47	50	2	0.5	0.05	0.7 $V_{Znom.}$	50 ( $\leq 170$ )	85 ( $\leq 375$ )	10	12
BZX384C51-G	Z1	48	51	54	2	0.5	0.05	0.7 $V_{Znom.}$	60 ( $\leq 180$ )	85 ( $\leq 400$ )	8	10
BZX384C56-G	Z2	52	56	60	2	0.5	0.05	0.7 $V_{Znom.}$	70 ( $\leq 200$ )	100 ( $\leq 425$ )	10	12
BZX384C62-G	Z3	58	62	66	2	0.5	0.05	0.7 $V_{Znom.}$	80 ( $\leq 215$ )	100 ( $\leq 450$ )	10	12
BZX384C68-G	Z4	64	68	72	2	0.5	0.05	0.7 $V_{Znom.}$	90 ( $\leq 240$ )	150 ( $\leq 475$ )	10	12
BZX384C75-G	Z5	70	75	79	2	1	0.05	0.7 $V_{Znom.}$	95 ( $\leq 255$ )	170 ( $\leq 500$ )	10	12



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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 $I_{ZT2}$	$\alpha_{VZ}$ at $I_{ZT1}$	
		V			mA		$\mu\text{A}$	V	$\Omega$		$10^{-4}/^{\circ}\text{C}$	
		MIN.	NOM.	MAX.			MAX.		TYP.	TYP.	MIN.	MAX.
BZX384B2V4-G	C1	2.35	2.4	2.45	5	1	50	1	70 ( $\leq 100$ )	275	-9	-4
BZX384B2V7-G	C2	2.65	2.7	2.75	5	1	20	1	75 ( $\leq 100$ )	300 ( $\leq 600$ )	-9	-4
BZX384B3V0-G	C3	2.94	3.0	3.06	5	1	10	1	80 ( $\leq 95$ )	325 ( $\leq 600$ )	-9	-3
BZX384B3V3-G	C4	3.23	3.3	3.37	5	1	5	1	85 ( $\leq 95$ )	350 ( $\leq 600$ )	-8	-3
BZX384B3V6-G	C5	3.53	3.6	3.67	5	1	5	1	85 ( $\leq 90$ )	375 ( $\leq 600$ )	-8	-3
BZX384B3V9-G	C6	3.82	3.9	3.98	5	1	3	1	85 ( $\leq 90$ )	400 ( $\leq 600$ )	-7	-3
BZX384B4V3-G	C7	4.21	4.3	4.39	5	1	3	1	80 ( $\leq 90$ )	410 ( $\leq 600$ )	-6	-1
BZX384B4V7-G	C8	4.61	4.7	4.79	5	1	3	2	50 ( $\leq 80$ )	425 ( $\leq 500$ )	-5	2
BZX384B5V1-G	C9	5	5.1	5.2	5	1	2	2	40 ( $\leq 60$ )	400 ( $\leq 480$ )	-3	4
BZX384B5V6-G	CA	5.49	5.6	5.71	5	1	1	2	15 ( $\leq 40$ )	80 ( $\leq 400$ )	-2	6
BZX384B6V2-G	CB	6.08	6.2	6.32	5	1	3	4	6 ( $\leq 10$ )	40 ( $\leq 150$ )	-1	7
BZX384B6V8-G	CC	6.66	6.8	6.94	5	1	2	4	6 ( $\leq 15$ )	30 ( $\leq 80$ )	2	7
BZX384B7V5-G	CD	7.35	7.5	7.65	5	1	1	5	6 ( $\leq 15$ )	30 ( $\leq 80$ )	3	7
BZX384B8V2-G	CE	8.04	8.2	8.36	5	1	0.7	5	6 ( $\leq 15$ )	40 ( $\leq 80$ )	4	7
BZX384B9V1-G	CF	8.92	9.1	9.28	5	1	0.5	6	6 ( $\leq 15$ )	40 ( $\leq 100$ )	5	8
BZX384B10-G	CG	9.8	10	10.2	5	1	0.2	7	8 ( $\leq 20$ )	50 ( $\leq 150$ )	5	8
BZX384B11-G	CH	10.8	11	11.2	5	1	0.1	8	10 ( $\leq 20$ )	50 ( $\leq 150$ )	5	9
BZX384B12-G	CI	11.8	12	12.2	5	1	0.1	8	10 ( $\leq 25$ )	50 ( $\leq 150$ )	6	9
BZX384B13-G	CK	12.7	13	13.3	5	1	0.1	8	10 ( $\leq 30$ )	50 ( $\leq 170$ )	7	9
BZX384B15-G	CL	14.7	15	15.3	5	1	0.05	0.7 $V_{Znom.}$	10 ( $\leq 30$ )	50 ( $\leq 200$ )	7	9
BZX384B16-G	CM	15.7	16	16.3	5	1	0.05	0.7 $V_{Znom.}$	10 ( $\leq 40$ )	50 ( $\leq 200$ )	8	9.5
BZX384B18-G	CN	17.6	18	18.4	5	1	0.05	0.7 $V_{Znom.}$	10 ( $\leq 45$ )	50 ( $\leq 225$ )	8	9.5
BZX384B20-G	CO	19.6	20	20.4	5	1	0.05	0.7 $V_{Znom.}$	15 ( $\leq 55$ )	60 ( $\leq 225$ )	8	10
BZX384B22-G	CP	21.6	22	22.4	5	1	0.05	0.7 $V_{Znom.}$	20 ( $\leq 55$ )	60 ( $\leq 250$ )	8	10
BZX384B24-G	CR	23.5	24	24.5	5	1	0.05	0.7 $V_{Znom.}$	25 ( $\leq 70$ )	60 ( $\leq 250$ )	8	10
BZX384B27-G	CS	26.5	27	27.5	2	0.5	0.05	0.7 $V_{Znom.}$	25 ( $\leq 80$ )	65 ( $\leq 300$ )	8	10
BZX384B30-G	CT	29.4	30	30.6	2	0.5	0.05	0.7 $V_{Znom.}$	30 ( $\leq 80$ )	70 ( $\leq 300$ )	8	10
BZX384B33-G	CU	32.3	33	33.7	2	0.5	0.05	0.7 $V_{Znom.}$	35 ( $\leq 80$ )	75 ( $\leq 325$ )	8	10
BZX384B36-G	CW	35.3	36	36.7	2	0.5	0.05	0.7 $V_{Znom.}$	35 ( $\leq 90$ )	80 ( $\leq 350$ )	8	10
BZX384B39-G	CX	38.2	39	39.8	2	0.5	0.05	0.7 $V_{Znom.}$	40 ( $\leq 130$ )	80 ( $\leq 350$ )	10	12
BZX384B43-G	CY	42.1	43	43.9	2	0.5	0.05	0.7 $V_{Znom.}$	45 ( $\leq 150$ )	85 ( $\leq 375$ )	10	12
BZX384B47-G	CZ	46.1	47	47.9	2	0.5	0.05	0.7 $V_{Znom.}$	50 ( $\leq 170$ )	85 ( $\leq 375$ )	10	12
BZX384B51-G	D1	50	51	52	2	0.5	0.05	0.7 $V_{Znom.}$	60 ( $\leq 180$ )	85 ( $\leq 400$ )	10	12
BZX384B56-G	D2	54.9	56	57.1	2	0.5	0.05	0.7 $V_{Znom.}$	70 ( $\leq 200$ )	100 ( $\leq 425$ )	9	11
BZX384B62-G	D3	60.8	62	63.2	2	0.5	0.05	0.7 $V_{Znom.}$	80 ( $\leq 215$ )	100 ( $\leq 450$ )	9	12
BZX384B68-G	D4	66.6	68	69.4	2	0.5	0.05	0.7 $V_{Znom.}$	90 ( $\leq 240$ )	150 ( $\leq 475$ )	10	12
BZX384B75-G	D5	73.5	75	76.5	2	0.5	0.05	0.7 $V_{Znom.}$	95 ( $\leq 255$ )	170 ( $\leq 500$ )	10	12

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

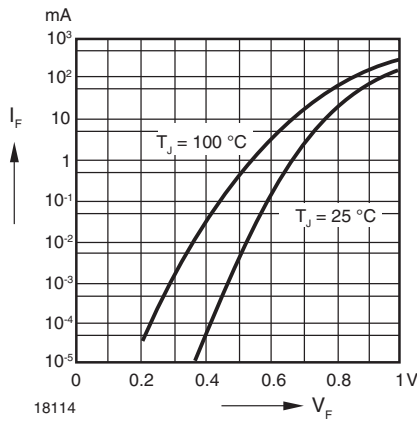


Fig. 1 - Forward Characteristics

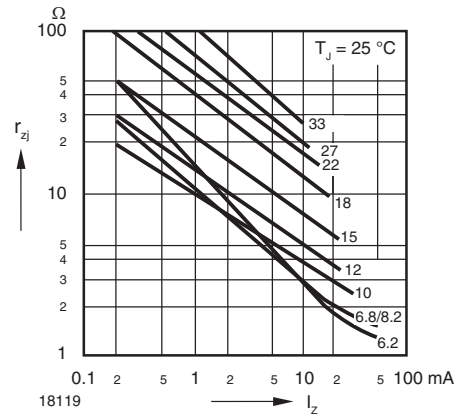


Fig. 4 - Dynamic Resistance vs. Zener Current

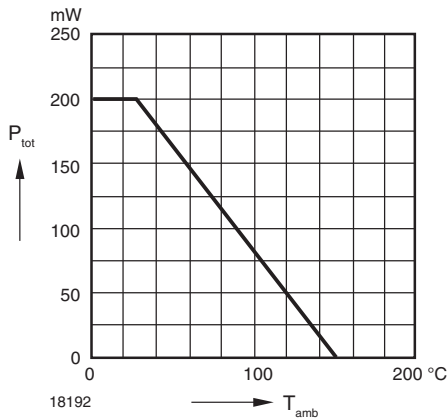


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

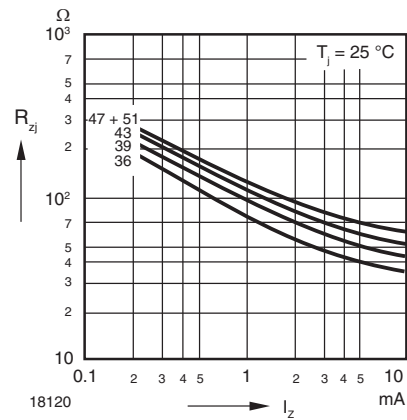


Fig. 5 - Dynamic Resistance vs. Zener Current

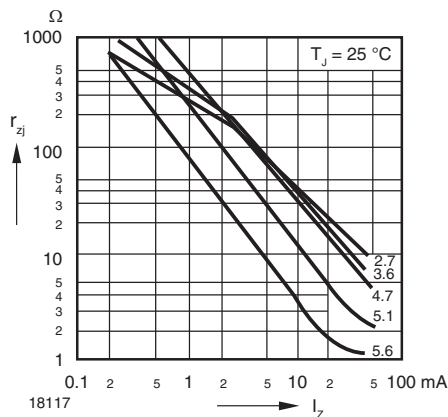


Fig. 3 - Dynamic Resistance vs. Zener Current

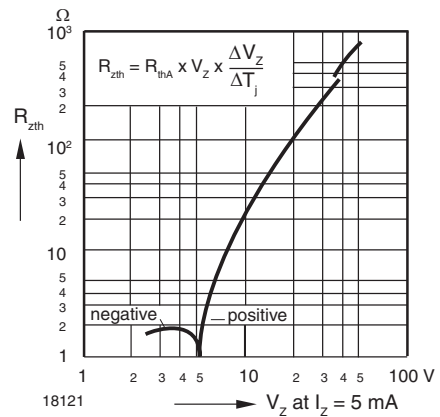


Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

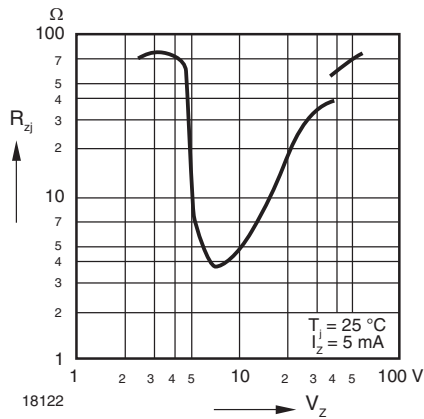


Fig. 7 - Dynamic Resistance vs. Zener Voltage

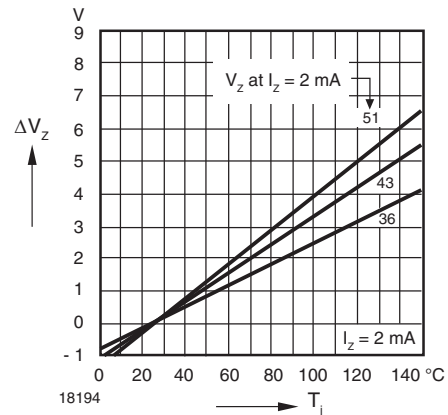


Fig. 10 - Change of Zener Voltage vs. Junction Temperature

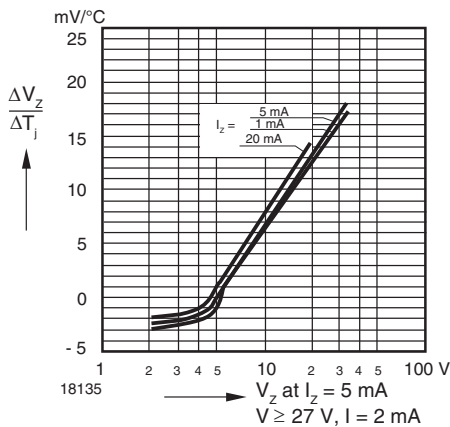


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

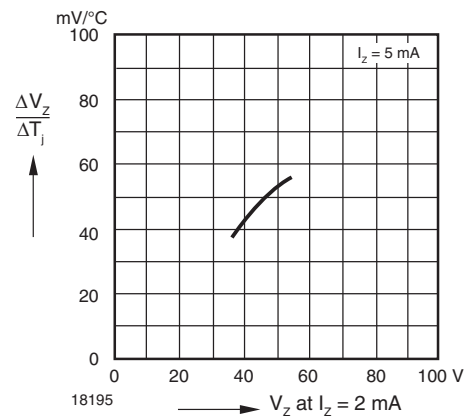


Fig. 11 - Temperature Dependence of Zener Voltage vs. Zener Voltage

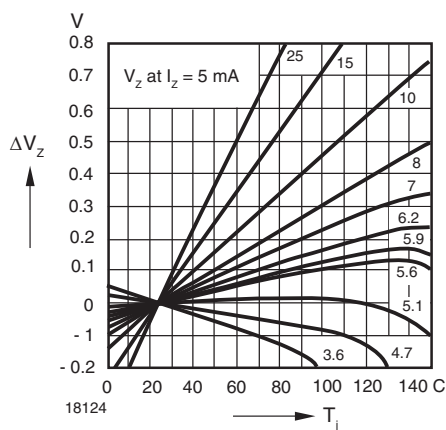


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

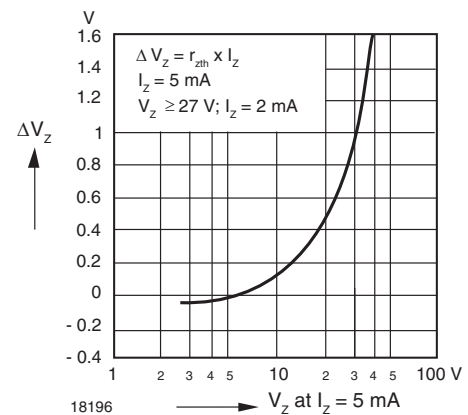


Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

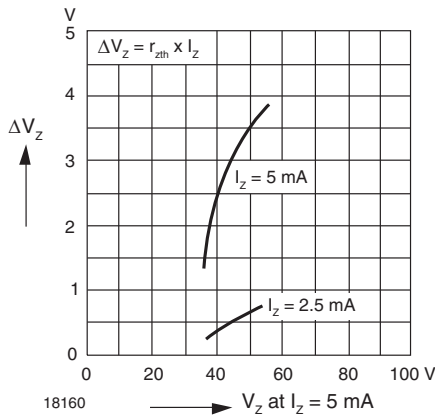


Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

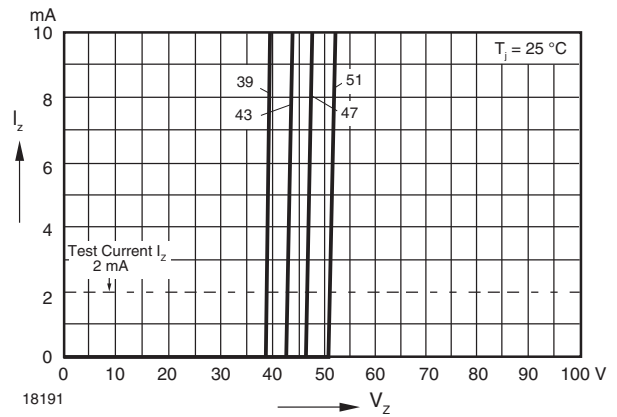


Fig. 16 - Breakdown Characteristics

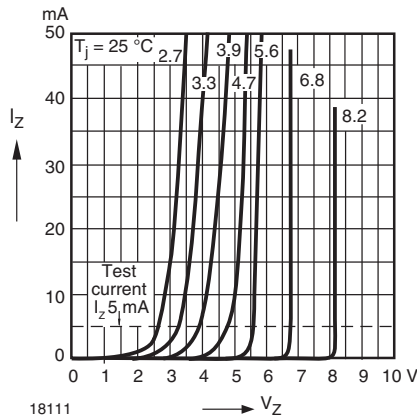


Fig. 14 - Breakdown Characteristics

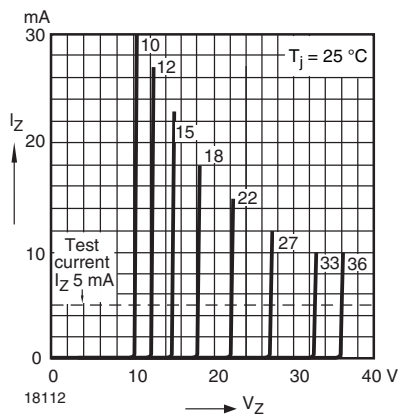
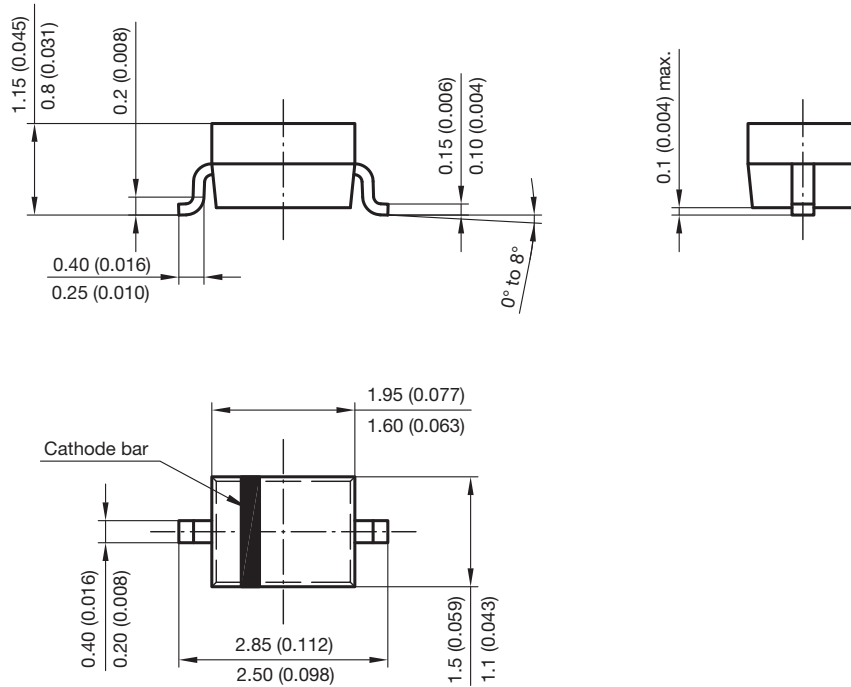


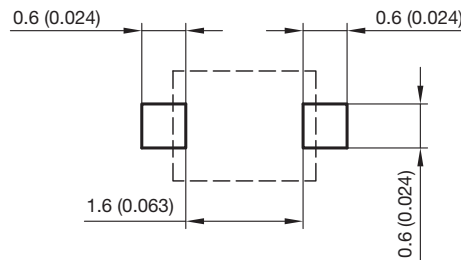
Fig. 15 - Breakdown Characteristics



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



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, 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.

## 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.**