

## Small Signal Zener Diodes



### LINKS TO ADDITIONAL RESOURCES



### 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
- ESD capability according to AEC-Q101: Human body model > 8 kV Machine model > 800 V
- Base P/N-G3 - green, commercial grade
- Base P/N-HG3 - green, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
$V_Z$ range nom.	2.4 to 75	V
Test current $I_{ZT}$	2; 5	mA
$V_Z$ specification	Pulse current	
Circuit configuration	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-HG3-08 to BZX384C75-HG3-08		
	BZX384B2V4-HG3-08 to BZX384B75-HG3-08		
	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		
	BZX384C2V4-HG3-18 to BZX384C75-HG3-18		
	BZX384B2V4-HG3-18 to BZX384B75-HG3-18		

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 <sub>amb</sub> = 25 °C, unless otherwise specified)												
PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE LEAKAGE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT OF ZENER VOLTAGE	
		V <sub>Z</sub> at I <sub>ZT1</sub>			I <sub>ZT1</sub>	I <sub>ZT2</sub>	I <sub>R</sub> at V <sub>R</sub>		Z <sub>Z</sub> at I <sub>ZT1</sub>	Z <sub>ZK</sub> at I <sub>ZT2</sub>	α <sub>VZ</sub> at I <sub>ZT1</sub>	
		V			mA		μA	V	Ω		10 <sup>-4</sup> /°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 <sub>Znom.</sub>	10 (≤ 30)	50 (≤ 200)	7	9
BZX384C16-G	YM	15.3	16	17.1	5	1	0.05	0.7 V <sub>Znom.</sub>	10 (≤ 40)	50 (≤ 200)	8	9.5
BZX384C18-G	YN	16.8	18	19.1	5	1	0.05	0.7 V <sub>Znom.</sub>	10 (≤ 45)	50 (≤ 225)	8	9.5
BZX384C20-G	YO	18.8	20	21.2	5	1	0.05	0.7 V <sub>Znom.</sub>	15 (≤ 55)	60 (≤ 225)	8	10
BZX384C22-G	YP	20.8	22	23.3	5	1	0.05	0.7 V <sub>Znom.</sub>	20 (≤ 55)	60 (≤ 250)	8	10
BZX384C24-G	YR	22.8	24	25.6	5	1	0.05	0.7 V <sub>Znom.</sub>	25 (≤ 70)	60 (≤ 250)	8	10
BZX384C27-G	YS	25.1	27	28.9	2	0.5	0.05	0.7 V <sub>Znom.</sub>	25 (≤ 80)	65 (≤ 300)	8	10
BZX384C30-G	YT	28	30	32	2	0.5	0.05	0.7 V <sub>Znom.</sub>	30 (≤ 80)	70 (≤ 300)	8	10
BZX384C33-G	YU	31	33	35	2	0.5	0.05	0.7 V <sub>Znom.</sub>	35 (≤ 80)	75 (≤ 325)	8	10
BZX384C36-G	YW	34	36	38	2	0.5	0.05	0.7 V <sub>Znom.</sub>	35 (≤ 90)	80 (≤ 350)	10	12
BZX384C39-G	YX	37	39	41	2	0.5	0.05	0.7 V <sub>Znom.</sub>	40 (≤ 130)	80 (≤ 350)	10	12
BZX384C43-G	YY	40	43	46	2	0.5	0.05	0.7 V <sub>Znom.</sub>	45 (≤ 150)	85 (≤ 375)	10	12
BZX384C47-G	YZ	44	47	50	2	0.5	0.05	0.7 V <sub>Znom.</sub>	50 (≤ 170)	85 (≤ 375)	10	12
BZX384C51-G	Z1	48	51	54	2	0.5	0.05	0.7 V <sub>Znom.</sub>	60 (≤ 180)	85 (≤ 400)	8	10
BZX384C56-G	Z2	52	56	60	2	0.5	0.05	0.7 V <sub>Znom.</sub>	70 (≤ 200)	100 (≤ 425)	10	12
BZX384C62-G	Z3	58	62	66	2	0.5	0.05	0.7 V <sub>Znom.</sub>	80 (≤ 215)	100 (≤ 450)	10	12
BZX384C68-G	Z4	64	68	72	2	0.5	0.05	0.7 V <sub>Znom.</sub>	90 (≤ 240)	150 (≤ 475)	10	12
BZX384C75-G	Z5	70	75	79	2	0.5	0.05	0.7 V <sub>Znom.</sub>	95 (≤ 255)	170 (≤ 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)

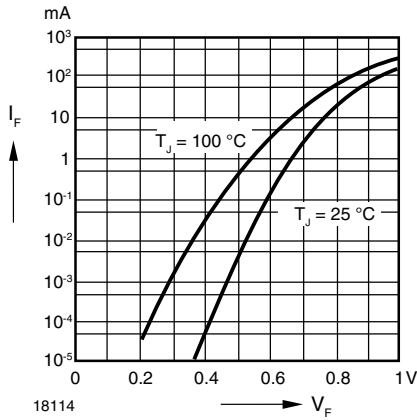


Fig. 1 - Forward Characteristics

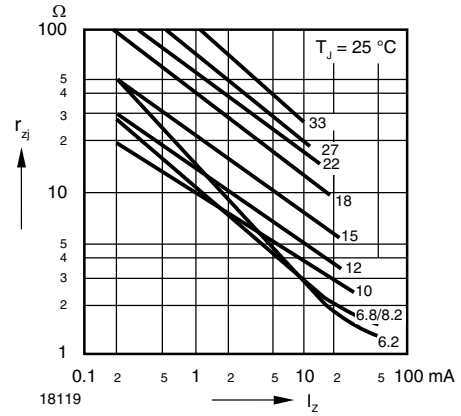


Fig. 4 - Dynamic Resistance vs. Zener Current

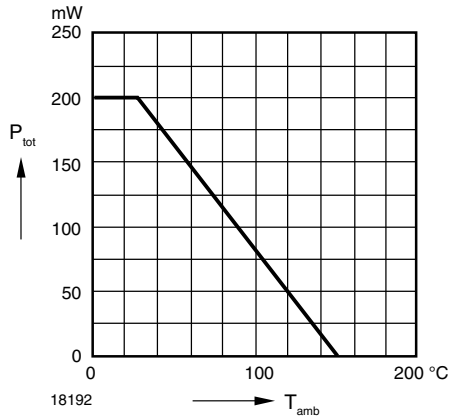


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

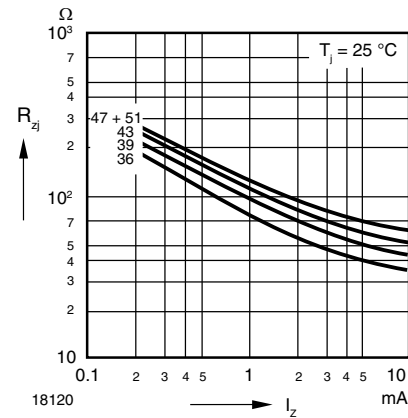


Fig. 5 - Dynamic Resistance vs. Zener Current

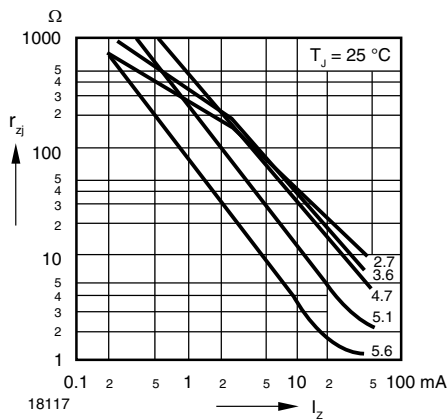


Fig. 3 - Dynamic Resistance vs. Zener Current

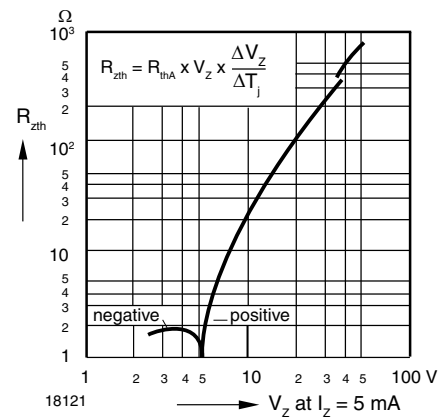


Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

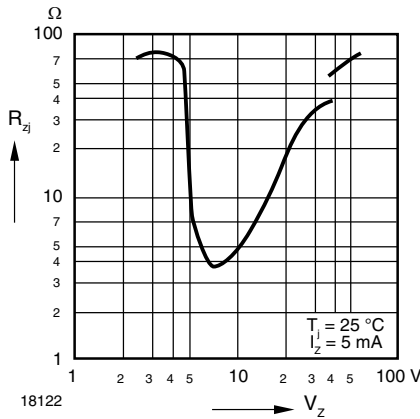


Fig. 7 - Dynamic Resistance vs. Zener Voltage

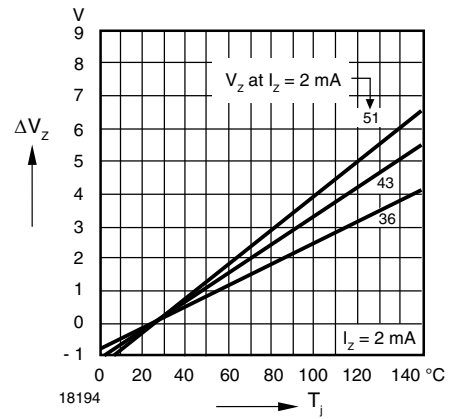


Fig. 10 - Change of Zener Voltage vs. Junction Temperature

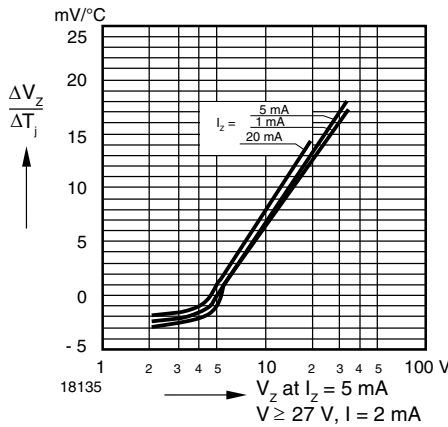


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

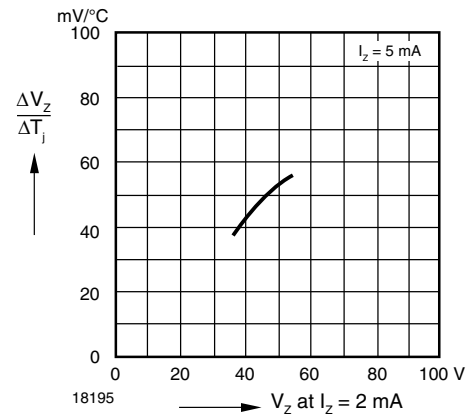


Fig. 11 - Temperature Dependence of Zener Voltage vs. Zener Voltage

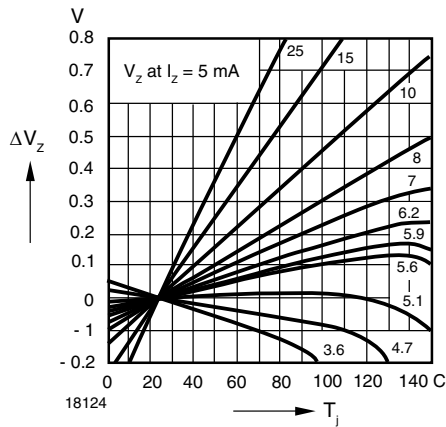


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

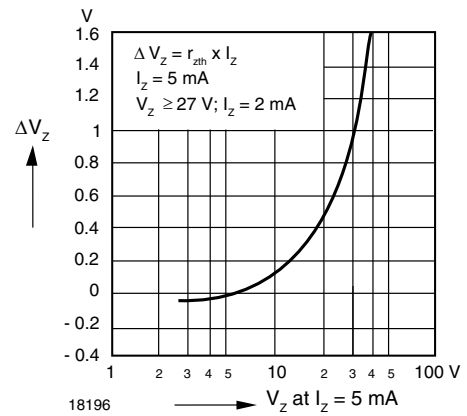


Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

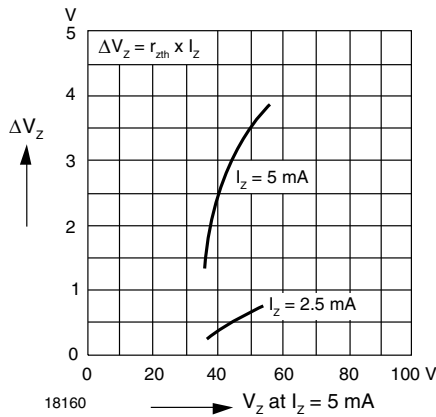


Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener voltage

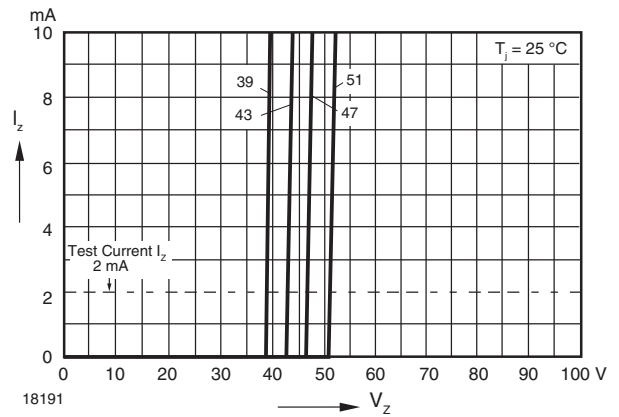


Fig. 16 - Breakdown Characteristics

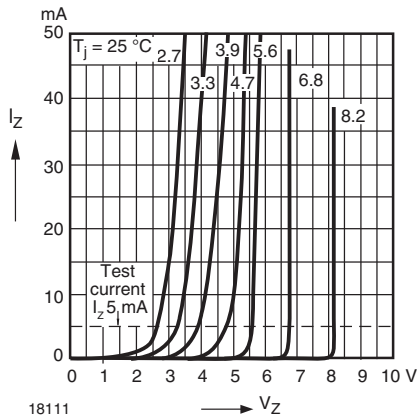


Fig. 14 - Breakdown Characteristics

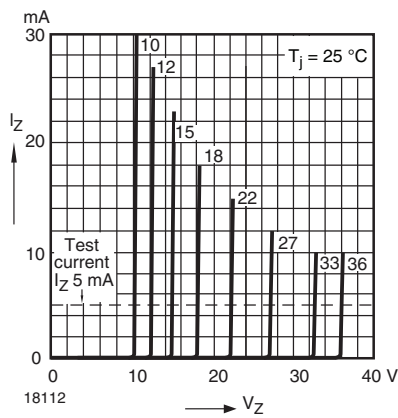
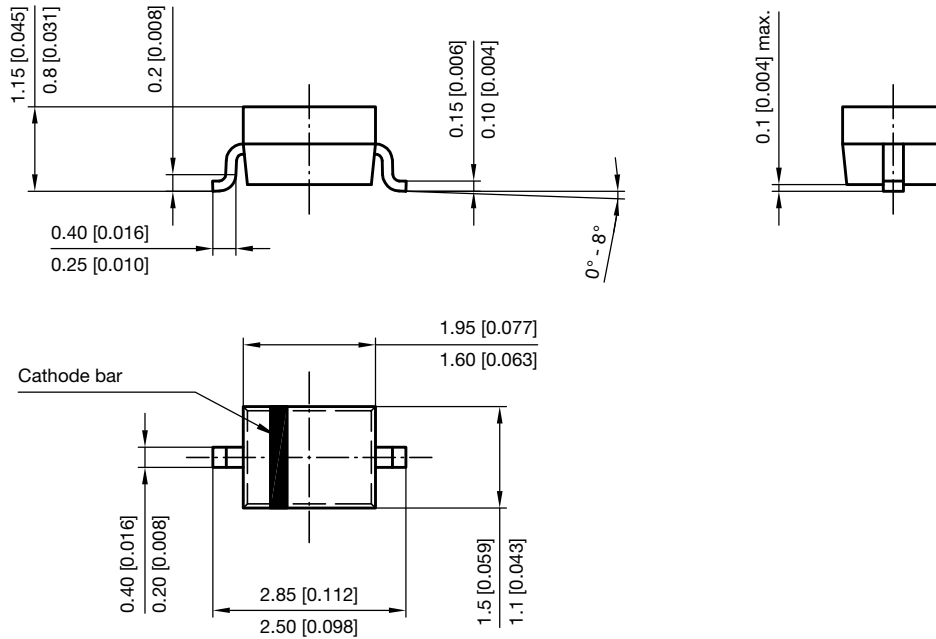


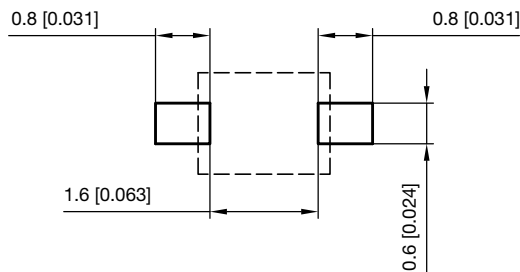
Fig. 15 - Breakdown Characteristics



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



Footprint recommendation:



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



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