Small Signal Zener Diodes

FEATURES

- Silicon planar Zener diodes
- The Zener voltages are graded according to the international E24 standard
- AEC-Q101 qualified available
- ESD capability according to AEC-Q101:
  Human body model > 8 kV
  Machine model > 800 V
- Base P/N-E3 - RoHS-compliant, commercial grade
- Base P/N-HE3 - RoHS-compliant, AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

Pb-free

e3

RoHS COMPLIANT

DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
V_Z range nom.	2.4 to 75	V
Test current I_{ZT}	2.5; 5	mA
V_Z specification	Pulse current	
Circuit configuration	Single	

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZT52-series	BZT52C2V4-E3-08 to BZT52C75-E3-08	3000 (8 mm tape on 7" reel)	15 000/box
	BZT52B2V4-E3-08 to BZT52B75-E3-08		
	BZT52C2V4-HE3-08 to BZT52C75-HE3-08		
	BZT52B2V4-HE3-08 to BZT52B75-HE3-08		
	BZT52C2V4-E3-18 to BZT52C75-E3-18	10 000 (8 mm tape on 13" reel)	10 000/box
	BZT52B2V4-E3-18 to BZT52B75-E3-18		
	BZT52C2V4-HE3-18 to BZT52C75-HE3-18		
	BZT52B2V4-HE3-18 to BZT52B75-HE3-18		

PACKAGE

PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
SOD-123	10.3 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

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

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	Diode on ceramic substrate 0.7 mm; 5 mm^2 pad areas	P_{tot}	500	mW
	Diode on ceramic substrate 0.7 mm; 2.5 mm^2 pad areas	P_{tot}	410	mW
Zener current	See table “Electrical Characteristics “			
Thermal resistance junction to ambient air	Valid provided that electrodes are kept at ambient temperature	R_{thJA}	300	K/W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	-65 to +150	°C
Operating temperature range		T_{op}	-55 to +150	°C

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com

THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE (1)			TEST CURRENT		REVERSE VOLTAGE		DYNAMIC RESISTANCE		TEMP. COEFFICIENT	ADMISSABLE ZENER CURRENT (4)	
		V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	V_R at I_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	α_{VZ}	I_Z at T_{amb} = 45 °C	I_Z at T_{amb} = 25 °C
		V			mA		V	nA	Ω		10^{-4}/°C	mA	
		MIN.	NOM.	MAX.									
BZT52C2V4	W1	2.2	2.4	2.6	5	1	-	-	85	600	-9 to -4	-	-
BZT52C2V7	W2	2.5	2.7	2.9	5	1	-	-	75 (< 83)	< 500	-9 to -4	113	134
BZT52C3V0	W3	2.8	3.0	3.2	5	1	-	-	80 (< 95)	< 500	-9 to -3	98	118
BZT52C3V3	W4	3.1	3.3	3.5	5	1	-	-	80 (< 95)	< 500	-8 to -3	92	109
BZT52C3V6	W5	3.4	3.6	3.8	5	1	-	-	80 (< 95)	< 500	-8 to -3	85	100
BZT52C3V9	W6	3.7	3.9	4.1	5	1	-	-	80 (< 95)	< 500	-7 to -3	77	92
BZT52C4V3	W7	4	4.3	4.6	5	1	-	-	80 (< 95)	< 500	-6 to -1	71	84
BZT52C4V7	W8	4.4	4.7	5	5	1	-	-	70 (< 78)	< 500	-5 to +2	64	76
BZT52C5V1	W9	4.8	5.1	5.4	5	1	> 0.8	100	30 (< 60)	< 480	-3 to +4	56	67
BZT52C5V6	WA	5.2	5.6	6	5	1	> 1	100	10 (< 40)	< 400	-2 to +6	50	59
BZT52C6V2	WB	5.8	6.2	6.6	5	1	> 2	100	4.8 (< 10)	< 200	-1 to +7	45	54
BZT52C6V8	WC	6.4	6.8	7.2	5	1	> 3	100	4.5 (< 8)	< 150	+2 to +7	41	49
BZT52C7V5	WD	7	7.5	7.9	5	1	> 5	100	4 (< 7)	< 50	+3 to +7	37	44
BZT52C8V2	WE	7.7	8.2	8.7	5	1	> 6	100	4.5 (< 7)	< 50	+4 to +7	34	40
BZT52C9V1	WF	8.5	9.1	9.6	5	1	> 7	100	4.8 (< 10)	< 50	+5 to +8	30	36
BZT52C10	WG	9.4	10	10.6	5	1	> 7.5	100	5.2 (< 15)	< 70	+5 to +8	28	33
BZT52C11	WH	10.4	11	11.6	5	1	> 8.5	100	6 (< 20)	< 70	+5 to +9	25	30
BZT52C12	WI	11.4	12	12.7	5	1	> 9	100	7 (< 20)	< 90	+6 to +9	23	28
BZT52C13	WK	12.4	13	14.1	5	1	> 10	100	9 (< 25)	< 110	+7 to +9	21	25
BZT52C15	WL	13.8	15	15.6	5	1	> 11	100	11 (< 30)	< 110	+7 to +9	19	23
BZT52C16	WM	15.3	16	17.1	5	1	> 12	100	13 (< 40)	< 170	+8 to +9.5	17	20
BZT52C18	WN	16.8	18	19.1	5	1	> 14	100	18 (< 50)	< 170	+8 to +9.5	15	18
BZT52C20	WO	18.8	20	21.2	5	1	> 15	100	20 (< 50)	< 220	+8 to +10	14	17
BZT52C22	WP	20.8	22	23.3	5	1	> 17	100	25 (< 55)	< 220	+8 to +10	13	16
BZT52C24	WR	22.8	24	25.6	5	1	> 18	100	28 (< 80)	< 220	+8 to +10	11	13
BZT52C27	WS	25.1	27	28.9	5	1	> 20	100	30 (< 80)	< 250	+8 to +10	10	12
BZT52C30	WT	28	30	32	5	1	> 22.5	100	35 (< 80)	< 250	+8 to +10	9	10
BZT52C33	WU	31	33	35	5	1	> 25	100	40 (< 80)	< 250	+8 to +10	8	9
BZT52C36	WW	34	36	38	5	1	> 27	100	40 (< 90)	< 250	+8 to +10	8	9
BZT52C39	WX	37	39	41	5	1	> 29	100	50 (< 90)	< 300	+10 to +12	7	8
BZT52C43	WY	40	43	46	5	1	> 32	100	60 (< 100)	< 700	+10 to +12	6	7
BZT52C47	WZ	44	47	50	5	1	> 35	100	70 (< 100)	< 750	+10 to +12	5	6
BZT52C51	X1	48	51	54	5	1	> 38	100	70 (< 100)	< 750	+10 to +12	5	6
BZT52C56	X2	52	56	60	2.5	0.5	-	-	< 135 (2)	< 1000 (3)	typ. +10 (2)	-	-
BZT52C62	X3	58	62	66	2.5	0.5	-	-	< 150 (2)	< 1000 (3)	typ. +10 (2)	-	-
BZT52C68	X4	64	68	72	2.5	0.5	-	-	< 200 (2)	< 1000 (3)	typ. +10 (2)	-	-
BZT52C75	X5	70	75	79	2.5	0.5	-	-	< 250 (2)	< 1500 (3)	typ. +10 (2)	-	-

Notes

- 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

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

PART NUMBER	MARKING CODE	ZENER VOLTAGE RANGE (1)			TEST CURRENT		REVERSE VOLTAGE		DYNAMIC RESISTANCE		TEMP. COEFFICIENT	ADMISSABLE ZENER CURRENT (4)	
		V_Z at I_{ZT1}			I_{ZT1}	I_{ZT2}	V_R at I_R		Z_Z at I_{ZT1}	Z_{ZK} at I_{ZT2}	α_{VZ}	I_Z at T_{amb} = 45 °C	I_Z at T_{amb} = 25 °C
		V			mA		V	nA	Ω		10^{-4}/°C	mA	
		MIN.	NOM.	MAX.									
BZT52B2V4	W1	2.35	2.4	2.45	5	1	-	-	85	600	-9 to -4	-	-
BZT52B2V7	W2	2.65	2.7	2.75	5	1	-	-	75 (< 83)	< 500	-9 to -4	113	134
BZT52B3V0	W3	2.94	3.0	3.06	5	1	-	-	80 (< 95)	< 500	-9 to -3	98	118
BZT52B3V3	W4	3.23	3.3	3.37	5	1	-	-	80 (< 95)	< 500	-8 to -3	92	109
BZT52B3V6	W5	3.53	3.6	3.67	5	1	-	-	80 (< 95)	< 500	-8 to -3	85	100
BZT52B3V9	W6	3.82	3.9	3.98	5	1	-	-	80 (< 95)	< 500	-7 to -3	77	92
BZT52B4V3	W7	4.21	4.3	4.39	5	1	-	-	80 (< 95)	< 500	-6 to -1	71	84
BZT52B4V7	W8	4.61	4.7	4.79	5	1	-	-	70 (< 78)	< 500	-5 to +2	64	76
BZT52B5V1	W9	5	5.1	5.2	5	1	> 0.8	100	30 (< 60)	< 480	-3 to +4	56	67
BZT52B5V6	WA	5.49	5.6	5.71	5	1	> 1	100	10 (< 40)	< 400	-2 to +6	50	59
BZT52B6V2	WB	6.08	6.2	6.32	5	1	> 2	100	4.8 (< 10)	< 200	-1 to +7	45	54
BZT52B6V8	WC	6.66	6.8	6.94	5	1	> 3	100	4.5 (< 8)	< 150	+2 to +7	41	49
BZT52B7V5	WD	7.35	7.5	7.65	5	1	> 5	100	4 (< 7)	< 50	+3 to +7	37	44
BZT52B8V2	WE	8.04	8.2	8.36	5	1	> 6	100	4.5 (< 7)	< 50	+4 to +7	34	40
BZT52B9V1	WF	8.92	9.1	9.28	5	1	> 7	100	4.8 (< 10)	< 50	+5 to +8	30	36
BZT52B10	WG	9.8	10	10.2	5	1	> 7.5	100	5.2 (< 15)	< 70	+5 to +8	28	33
BZT52B11	WH	10.8	11	11.2	5	1	> 8.5	100	6 (< 20)	< 70	+5 to +9	25	30
BZT52B12	WI	11.8	12	12.2	5	1	> 9	100	7 (< 20)	< 90	+6 to +9	23	28
BZT52B13	WK	12.7	13	13.3	5	1	> 10	100	9 (< 25)	< 110	+7 to +9	21	25
BZT52B15	WL	14.7	15	15.3	5	1	> 11	100	11 (< 30)	< 110	+7 to +9	19	23
BZT52B16	WM	15.7	16	16.3	5	1	> 12	100	13 (< 40)	< 170	+8 to +9.5	17	20
BZT52B18	WN	17.6	18	18.4	5	1	> 14	100	18 (< 50)	< 170	+8 to +9.5	15	18
BZT52B20	WO	19.6	20	20.4	5	1	> 15	100	20 (< 50)	< 220	+8 to +10	14	17
BZT52B22	WP	21.6	22	22.4	5	1	> 17	100	25 (< 55)	< 220	+8 to +10	13	16
BZT52B24	WR	23.5	24	24.5	5	1	> 18	100	28 (< 80)	< 220	+8 to +10	11	13
BZT52B27	WS	26.5	27	27.5	5	1	> 20	100	30 (< 80)	< 250	+8 to +10	10	12
BZT52B30	WT	29.4	30	30.6	5	1	> 22.5	100	35 (< 80)	< 250	+8 to +10	9	10
BZT52B33	WU	32.3	33	33.7	5	1	> 25	100	40 (< 80)	< 250	+8 to +10	8	9
BZT52B36	WW	35.3	36	36.7	5	1	> 27	100	40 (< 90)	< 250	+8 to +10	8	9
BZT52B39	WX	38.2	39	39.8	5	1	> 29	100	50 (< 90)	< 300	+10 to +12	7	8
BZT52B43	WY	42.1	43	43.9	5	1	> 32	100	60 (< 100)	< 700	+10 to +12	6	7
BZT52B47	WZ	46.1	47	47.9	5	1	> 35	100	70 (< 100)	< 750	+10 to +12	5	6
BZT52B51	X1	50	51	52	5	1	> 38	100	70 (< 100)	< 750	+10 to +12	5	6
BZT52B56	X2	54.9	56	57.1	2.5	0.5	-	-	< 135 (2)	< 1000 (3)	typ. +10 (2)	-	-
BZT52B62	X3	60.8	62	63.2	2.5	0.5	-	-	< 150 (2)	< 1000 (3)	typ. +10 (2)	-	-
BZT52B68	X4	66.6	68	69.4	2.5	0.5	-	-	< 200 (2)	< 1000 (3)	typ. +10 (2)	-	-
BZT52B75	X5	73.5	75	76.5	2.5	0.5	-	-	< 250 (2)	< 1500 (3)	typ. +10 (2)	-	-

Notes

- 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

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

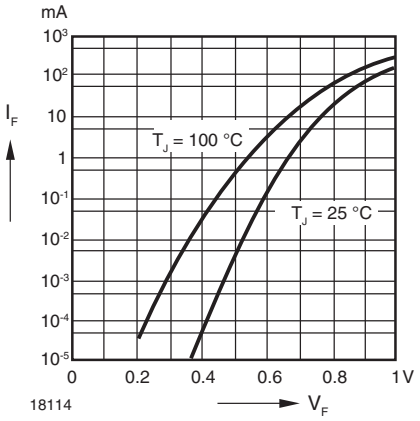


Fig. 1 - Forward characteristics

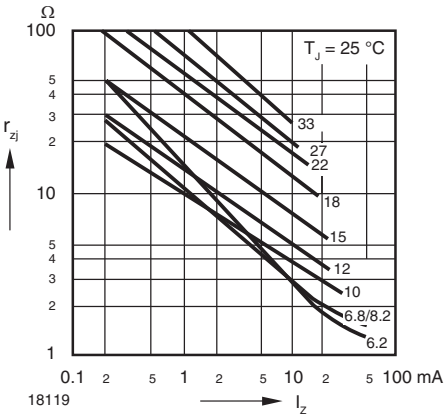


Fig. 4 - Dynamic Resistance vs. Zener Current

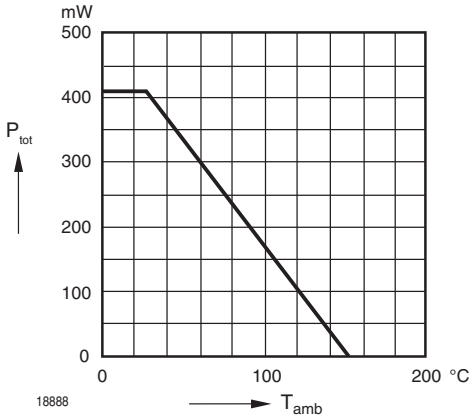


Fig. 2 - Admissible Power Dissipation vs. Ambient Temperature

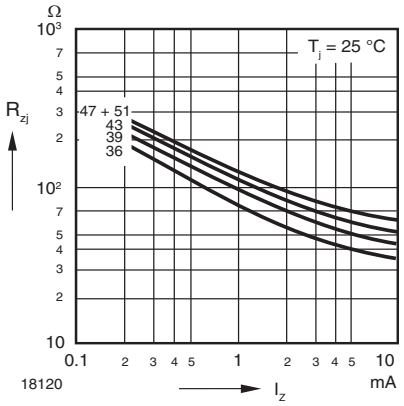


Fig. 5 - Dynamic Resistance vs. Zener Current

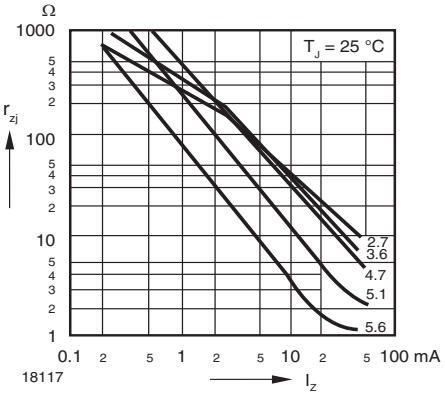


Fig. 3 - Dynamic Resistance vs. Zener Current

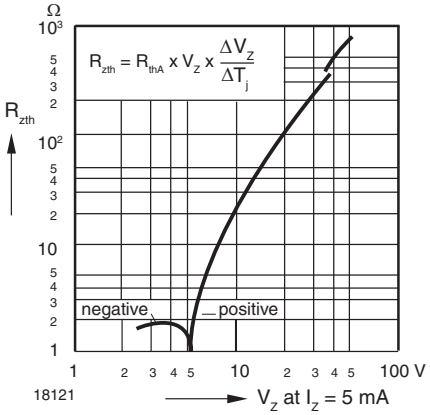


Fig. 6 - Thermal Differential Resistance vs. Zener Voltage

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

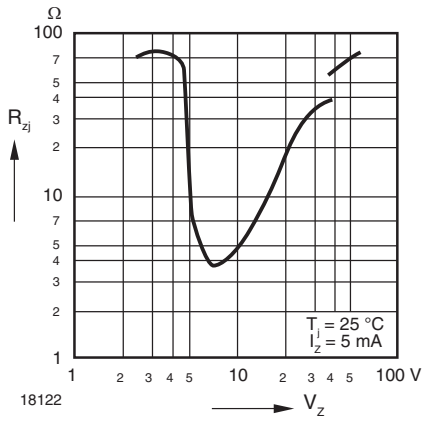


Fig. 7 - Dynamic Resistance vs. Zener Voltage

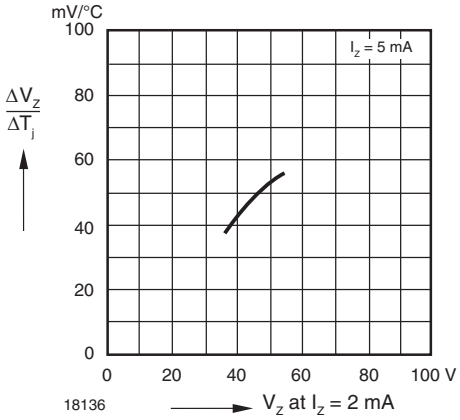


Fig. 10 - Temperature Dependence of Zener Voltage vs. Zener Voltage

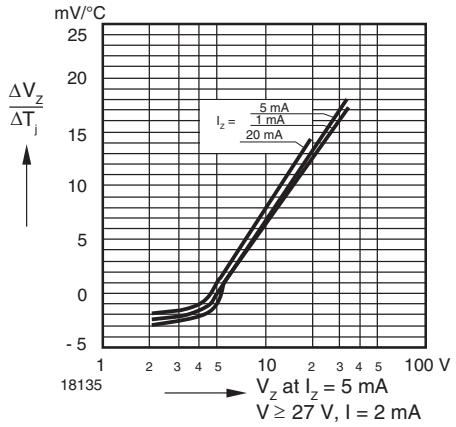


Fig. 8 - Temperature Dependence of Zener Voltage vs. Zener Voltage

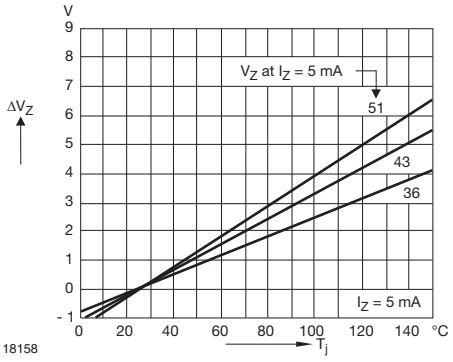


Fig. 11 - Change of Zener Voltage vs. Junction Temperature

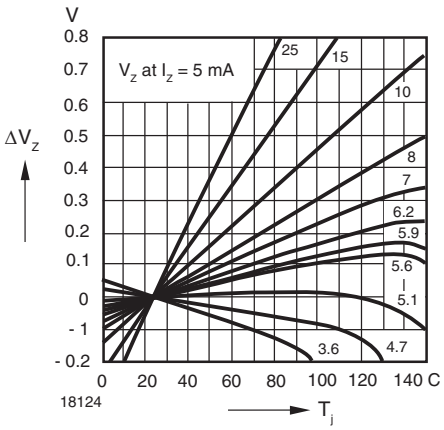


Fig. 9 - Change of Zener Voltage vs. Junction Temperature

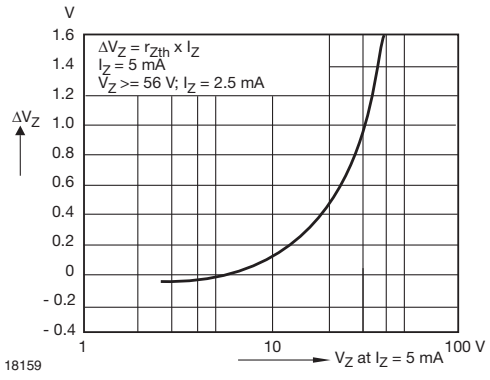


Fig. 12 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

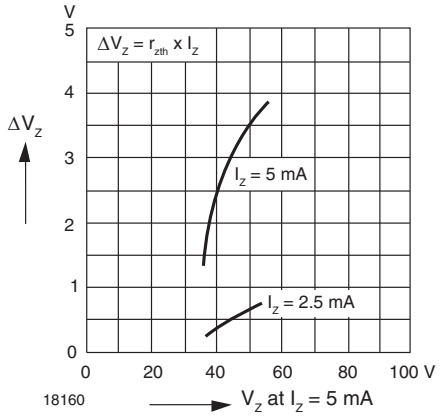


Fig. 13 - Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

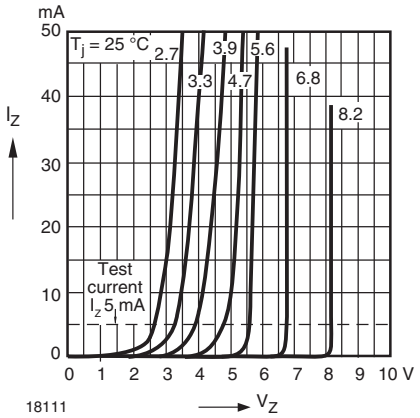


Fig. 14 - Breakdown Characteristics

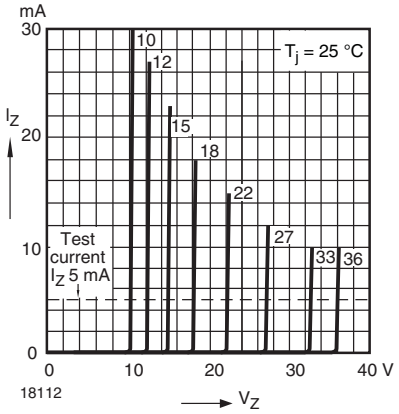


Fig. 15 - Breakdown Characteristics

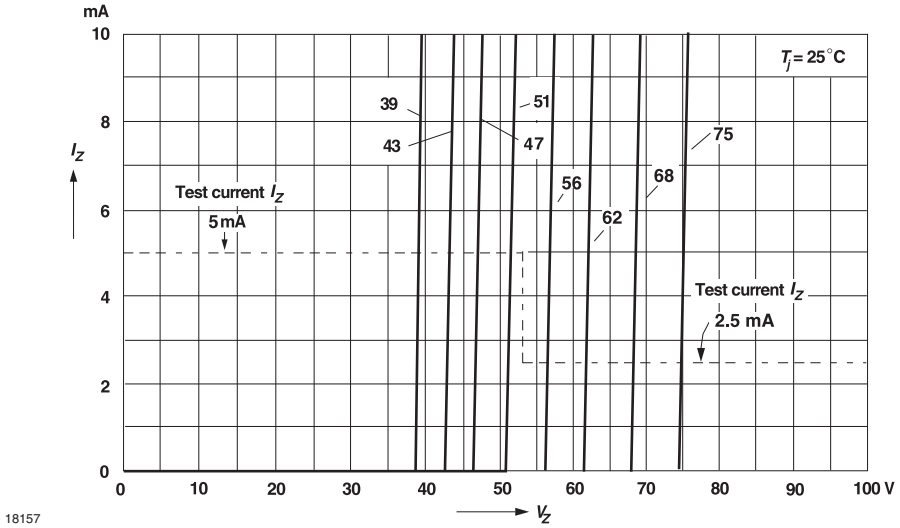
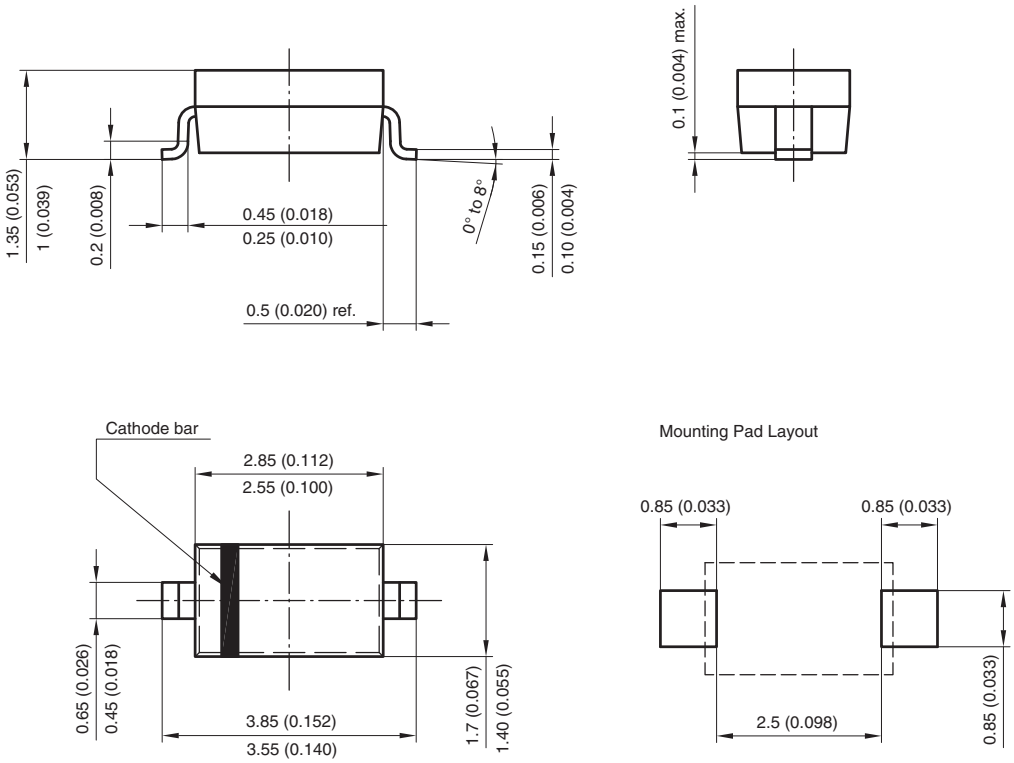


Fig. 16 - Breakdown Characteristics

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

PACKAGE DIMENSIONS in millimeters (inches): **SOD-123**



Rev. 4 - Date: 24. Sep. 2009
Document no.: S8-V-3910.01-001 (4)
17432

For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com
THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT ARE SUBJECT TO SPECIFIC DISCLAIMERS, SET FORTH AT www.vishay.com/doc?91000

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.

© 2017 VISHAY INTERTECHNOLOGY, INC. ALL RIGHTS RESERVED

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Vishay:

BZT52C24-GS08 BZT52C8V2-V-GS08 BZT52C36-V-GS08 BZT52C12-V-GS08 BZT52C24-V-GS08 BZT52C9V1-V-GS08 BZT52C16-V-GS08 BZT52C13-V-GS08 BZT52C10-V-GS08 BZT52C22-V-GS08 BZT52C4V3-V-GS08 BZT52C27-V-GS08 BZT52C5V6-V-GS08 BZT52C3V9-V-GS08 BZT52C30-V-GS08 BZT52B10-V-GS08 BZT52B10-V-GS18 BZT52B11-V-GS08 BZT52B11-V-GS18 BZT52B12-V-GS08 BZT52B12-V-GS18 BZT52B13-V-GS08 BZT52B13-V-GS18 BZT52B15-V-GS08 BZT52B15-V-GS18 BZT52B16-V-GS08 BZT52B16-V-GS18 BZT52B18-V-GS08 BZT52B18-V-GS18 BZT52B2V4-V-GS08 BZT52B2V4-V-GS18 BZT52B2V7-V-GS08 BZT52B2V7-V-GS18 BZT52B20-V-GS08 BZT52B20-V-GS18 BZT52B22-V-GS08 BZT52B22-V-GS18 BZT52B24-V-GS08 BZT52B24-V-GS18 BZT52B27-V-GS08 BZT52B27-V-GS18 BZT52B3V0-V-GS08 BZT52B3V0-V-GS18 BZT52B3V3-V-GS08 BZT52B3V3-V-GS18 BZT52B3V6-V-GS08 BZT52B3V6-V-GS18 BZT52B3V9-V-GS08 BZT52B3V9-V-GS18 BZT52B30-V-GS08 BZT52B30-V-GS18 BZT52B33-V-GS08 BZT52B33-V-GS18 BZT52B36-V-GS08 BZT52B36-V-GS18 BZT52B39-V-GS08 BZT52B39-V-GS18 BZT52B4V3-V-GS08 BZT52B4V3-V-GS18 BZT52B4V7-V-GS08 BZT52B4V7-V-GS18 BZT52B43-V-GS08 BZT52B43-V-GS18 BZT52B47-V-GS08 BZT52B47-V-GS18 BZT52B5V1-V-GS08 BZT52B5V1-V-GS18 BZT52B5V6-V-GS08 BZT52B5V6-V-GS18 BZT52B51-V-GS08 BZT52B51-V-GS18 BZT52B56-V-GS08 BZT52B56-V-GS18 BZT52B6V2-V-GS08 BZT52B6V2-V-GS18 BZT52B6V8-V-GS08 BZT52B6V8-V-GS18 BZT52B62-V-GS08 BZT52B62-V-GS18 BZT52B68-V-GS08 BZT52B68-V-GS18 BZT52B7V5-V-GS08 BZT52B7V5-V-GS18 BZT52B75-V-GS08 BZT52B75-V-GS18 BZT52B8V2-V-GS08 BZT52B8V2-V-GS18 BZT52B9V1-V-GS08 BZT52B9V1-V-GS18 BZT52C10-V-GS18 BZT52C11-V-GS18 BZT52C12-V-GS18 BZT52C13-V-GS18 BZT52C16-V-GS18 BZT52C18-V-GS18 BZT52C2V4-V-GS18 BZT52C2V7-V-GS18 BZT52C20-V-GS18 BZT52C24-V-GS18 BZT52C27-V-GS18