

Important notice

Dear Customer,

On 7 February 2017 the former NXP Standard Product business became a new company with the tradename **Nexperia**. Nexperia is an industry leading supplier of Discrete, Logic and PowerMOS semiconductors with its focus on the automotive, industrial, computing, consumer and wearable application markets

In data sheets and application notes which still contain NXP or Philips Semiconductors references, use the references to Nexperia, as shown below.

Instead of <http://www.nxp.com>, <http://www.philips.com/> or <http://www.semiconductors.philips.com/>, use <http://www.nexperia.com>

Instead of sales.addresses@www.nxp.com or sales.addresses@www.semiconductors.philips.com, use salesaddresses@nexperia.com (email)

Replace the copyright notice at the bottom of each page or elsewhere in the document, depending on the version, as shown below:

- © NXP N.V. (year). All rights reserved or © Koninklijke Philips Electronics N.V. (year). All rights reserved

Should be replaced with:

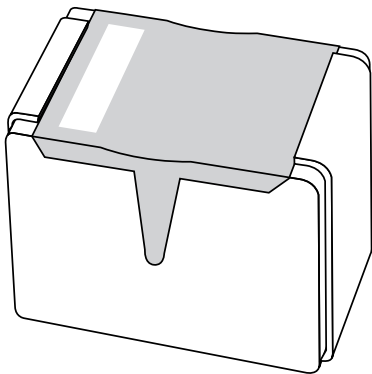
- © **Nexperia B.V. (year). All rights reserved.**

If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via salesaddresses@nexperia.com). Thank you for your cooperation and understanding,

Kind regards,

Team Nexperia

DATA SHEET



BZX284 series Voltage regulator diodes

Product data sheet
Supersedes data of 1999 Apr 19

2002 May 28

Voltage regulator diodes

BZX284 series

FEATURES

- Total power dissipation: max. 400 mW
- Two tolerance series: $\pm 2\%$ and $\pm 5\%$
- Working voltage range: nom. 2.4 to 75 V (E24 range).

DESCRIPTION

Low-power voltage regulator diodes in a SOD110 very small ceramic SMD package. The diodes are available in the normalized E24 $\pm 2\%$ (BZX284-B) and $\pm 5\%$ (BZX284-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.

APPLICATIONS

- General regulation functions.

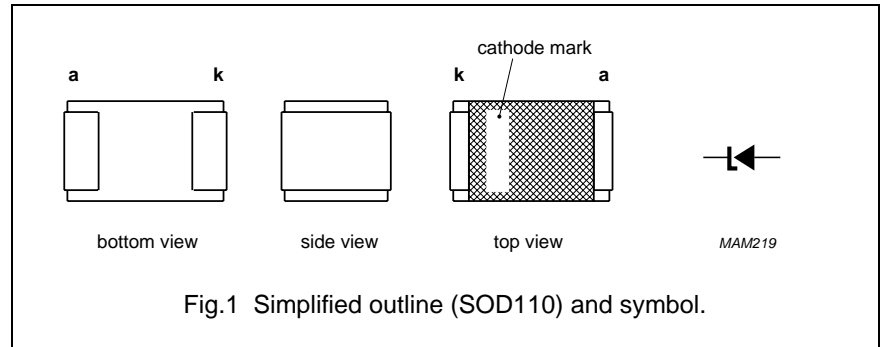


Fig.1 Simplified outline (SOD110) and symbol.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BZX284-B2V4	WO	BZX284-B15	XH	BZX284-C2V4	YO	BZX284-C15	ZH
BZX284-B2V7	WP	BZX284-B16	XI	BZX284-C2V7	YP	BZX284-C16	ZI
BZX284-B3V0	WQ	BZX284-B18	XJ	BZX284-C3V0	YQ	BZX284-C18	ZJ
BZX284-B3V3	WR	BZX284-B20	XK	BZX284-C3V3	YR	BZX284-C20	ZK
BZX284-B3V6	WS	BZX284-B22	XL	BZX284-C3V6	YS	BZX284-C22	ZL
BZX284-B3V9	WT	BZX284-B24	XM	BZX284-C3V9	YT	BZX284-C24	ZM
BZX284-B4V3	WU	BZX284-B27	XN	BZX284-C4V3	YU	BZX284-C27	ZN
BZX284-B4V7	WV	BZX284-B30	XO	BZX284-C4V7	YV	BZX284-C30	ZO
BZX284-B5V1	WW	BZX284-B33	XP	BZX284-C5V1	YW	BZX284-C33	ZP
BZX284-B5V6	WX	BZX284-B36	XQ	BZX284-C5V6	YX	BZX284-C36	ZQ
BZX284-B6V2	WY	BZX284-B39	XR	BZX284-C6V2	YY	BZX284-C39	ZR
BZX284-B6V8	WZ	BZX284-B43	XS	BZX284-C6V8	YZ	BZX284-C43	ZS
BZX284-B7V5	XA	BZX284-B47	XT	BZX284-C7V5	ZA	BZX284-C47	ZT
BZX284-B8V2	XB	BZX284-B51	XU	BZX284-C8V2	ZB	BZX284-C51	ZU
BZX284-B9V1	XC	BZX284-B56	XV	BZX284-C9V1	ZC	BZX284-C56	ZV
BZX284-B10	XD	BZX284-B62	XW	BZX284-C10	ZD	BZX284-C62	ZW
BZX284-B11	XE	BZX284-B68	XX	BZX284-C11	ZE	BZX284-C68	ZX
BZX284-B12	XF	BZX284-B75	XY	BZX284-C12	ZF	BZX284-C75	ZY
BZX284-B13	XG	—	—	BZX284-C13	ZG	—	—

Voltage regulator diodes

BZX284 series

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	250	mA
I_{ZSM}	non-repetitive peak reverse current	$t_p = 100 \mu\text{s}$; square wave; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ prior to surge	see Tables 1 and 2		
P_{tot}	total power dissipation	$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$; note 1	–	400	mW
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–	150	$^\circ\text{C}$

Note

1. Device mounted on a printed-circuit board: $11 \times 25 \times 1.6 \text{ mm}$.

ELECTRICAL CHARACTERISTICS**Total BZX284-B and BZX284-C series**

$T_j = 25 \text{ }^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	$I_F = 10 \text{ mA}$; see Fig.2	0.9	V
		$I_F = 100 \text{ mA}$; see Fig.2	1.1	V
I_R	reverse current			
	BZX284-B/C2V4	$V_R = 1 \text{ V}$	50	μA
	BZX284-B/C2V7	$V_R = 1 \text{ V}$	20	μA
	BZX284-B/C3V0	$V_R = 1 \text{ V}$	10	μA
	BZX284-B/C3V3	$V_R = 1 \text{ V}$	5	μA
	BZX284-B/C3V6	$V_R = 1 \text{ V}$	5	μA
	BZX284-B/C3V9	$V_R = 1 \text{ V}$	3	μA
	BZX284-B/C4V3	$V_R = 1 \text{ V}$	3	μA
	BZX284-B/C4V7	$V_R = 2 \text{ V}$	3	μA
	BZX284-B/C5V1	$V_R = 2 \text{ V}$	2	μA
	BZX284-B/C5V6	$V_R = 2 \text{ V}$	1	μA
	BZX284-B/C6V2	$V_R = 4 \text{ V}$	3	μA
	BZX284-B/C6V8	$V_R = 4 \text{ V}$	2	μA
	BZX284-B/C7V5	$V_R = 5 \text{ V}$	1	μA
	BZX284-B/C8V2	$V_R = 5 \text{ V}$	700	nA
	BZX284-B/C9V1	$V_R = 6 \text{ V}$	500	nA
	BZX284-B/C10	$V_R = 7 \text{ V}$	200	nA
	BZX284-B/C11	$V_R = 8 \text{ V}$	100	nA
BZX284-B/C12	$V_R = 8 \text{ V}$	100	nA	
BZX284-B/C13	$V_R = 8 \text{ V}$	100	nA	
BZX284-B/C15 to 75	$V_R = 0.7V_{Z\text{nom}}$	50	nA	

Voltage regulator diodes

BZX284 series

Table 1 Per type BZX284-B/C2V4 to B/C24 $T_j = 25\text{ °C}$ unless otherwise specified.

BZX284- Bxxx Cxxx	WORKING VOLTAGE V_Z (V) at $I_{Ztest} = 5\text{ mA}$				DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at $I_{Ztest} = 5\text{ mA}$ (see Figs 3 and 4)	DIODE CAP. C_d (pF) at $f = 1\text{ MHz}$; $V_R = 0\text{ V}$	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at $t_p = 100\text{ }\mu\text{s}$; $T_{amb} = 25\text{ °C}$
	Tol. $\pm 2\%$ (B)		Tol. $\pm 5\%$ (C)		at $I_{Ztest} = 1\text{ mA}$		at $I_{Ztest} = 5\text{ mA}$				
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	TYP.	MAX.	MAX.
2V4	2.35	2.45	2.2	2.6	275	400	70	100	-1.6	450	12.0
2V7	2.65	2.75	2.5	2.9	300	450	75	100	-2.0	440	12.0
3V0	2.94	3.06	2.8	3.2	325	500	80	95	-2.1	425	12.0
3V3	3.23	3.37	3.1	3.5	350	500	85	95	-2.4	410	12.0
3V6	3.53	3.67	3.4	3.8	375	500	85	90	-2.4	390	12.0
3V9	3.82	3.98	3.7	4.1	400	500	85	90	-2.5	370	12.0
4V3	4.21	4.39	4.0	4.6	410	600	80	90	-2.5	350	12.0
4V7	4.61	4.79	4.4	5.0	425	500	50	80	-1.4	325	12.0
5V1	5.00	5.20	4.8	5.4	400	480	40	60	-0.8	300	12.0
5V6	5.49	5.71	5.2	6.0	80	400	15	40	1.2	275	12.0
6V2	6.08	6.32	5.8	6.6	40	150	6	10	2.3	250	12.0
6V8	6.66	6.94	6.4	7.2	30	80	6	15	3.0	215	12.0
7V5	7.35	7.65	7.0	7.9	15	80	2	10	4.0	170	4.0
8V2	8.04	8.36	7.7	8.7	20	80	2	10	4.6	150	4.0
9V1	8.92	9.28	8.5	9.6	20	100	2	10	5.5	120	3.0
10	9.80	10.20	9.4	10.6	20	150	2	10	6.4	110	3.0
11	10.80	11.20	10.4	11.6	25	150	2	10	7.4	108	2.5
12	11.80	12.20	11.4	12.7	25	150	2	10	8.4	105	2.5
13	12.70	13.30	12.4	14.1	25	170	2	10	9.4	103	2.5
15	14.70	15.30	13.8	15.6	25	200	3	15	11.4	99	2.0
16	15.70	16.30	15.3	17.1	25	200	4	20	12.4	97	1.5
18	17.60	18.40	16.8	19.1	25	225	4	20	14.4	93	1.5
20	19.60	20.40	18.8	21.2	30	225	4	20	16.4	88	1.5
22	21.60	22.40	20.8	23.3	30	250	5	25	18.4	84	1.25
24	23.50	24.50	22.8	25.6	30	250	6	30	20.4	80	1.25

Voltage regulator diodes

BZX284 series

Table 2 Per type BZX284-B/C27 to B/C75 $T_j = 25\text{ °C}$ unless otherwise specified.

BZX284- Bxxx Cxxx	WORKING VOLTAGE V_z (V) at $I_{Ztest} = 2\text{ mA}$				DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_z (mV/K) at $I_{Ztest} = 2\text{ mA}$	DIODE CAP. C_d (pF) at $f = 1\text{ MHz}$; $V_R = 0\text{ V}$	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at $t_p = 100\text{ }\mu\text{s}$; $T_{amb} = 25\text{ °C}$
	Tol. $\pm 2\%$ (B)		Tol. $\pm 5\%$ (C)		at $I_{Ztest} = 0.5\text{ mA}$		at $I_{Ztest} = 2\text{ mA}$				
	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.			
27	26.50	27.50	25.1	28.9	35	250	8	40	23.4	73	1.0
30	29.40	30.60	28.0	32.0	35	250	10	40	26.6	66	1.0
33	32.30	33.70	31.0	35.0	40	275	11	40	29.7	60	0.9
36	35.30	36.70	34.0	38.0	40	300	15	60	33.0	59	0.8
39	38.20	39.80	37.0	41.0	40	300	25	75	36.4	58	0.7
43	42.10	43.90	40.0	46.0	45	325	30	80	41.2	56	0.6
47	46.10	47.90	44.0	50.0	45	325	30	90	46.1	55	0.5
51	50.00	52.00	48.0	54.0	45	350	35	110	51.0	52	0.4
56	54.90	57.10	52.0	60.0	50	375	40	120	57.0	49	0.3
62	60.80	63.20	58.0	66.0	60	400	50	140	64.4	44	0.3
68	66.60	69.40	64.0	72.0	75	400	55	160	71.7	40	0.25
75	73.50	76.50	70.0	79.0	85	400	70	175	80.2	35	0.2

Voltage regulator diodes

BZX284 series

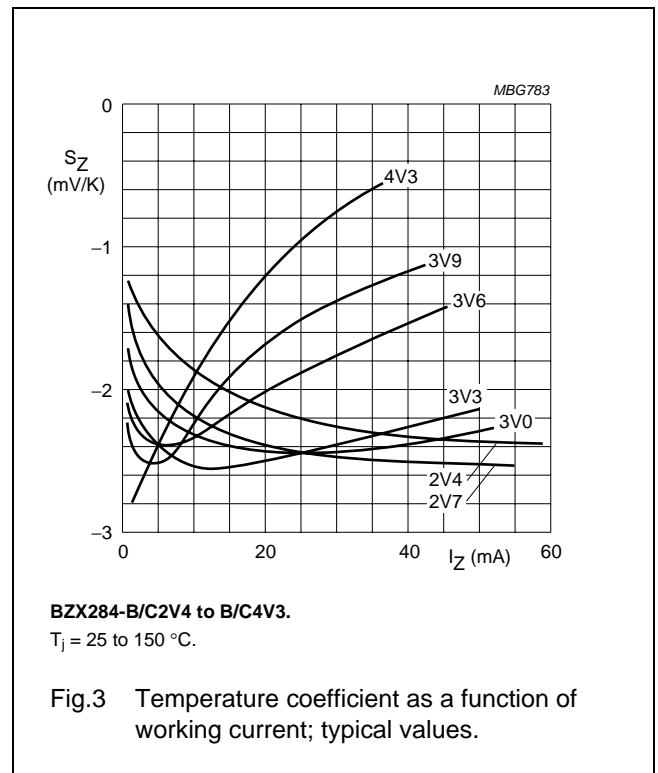
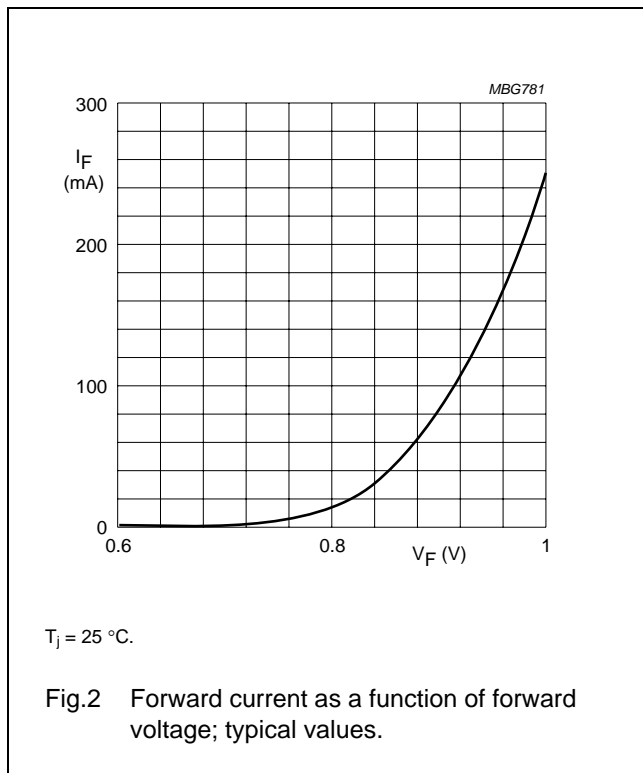
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	315	K/W

Note

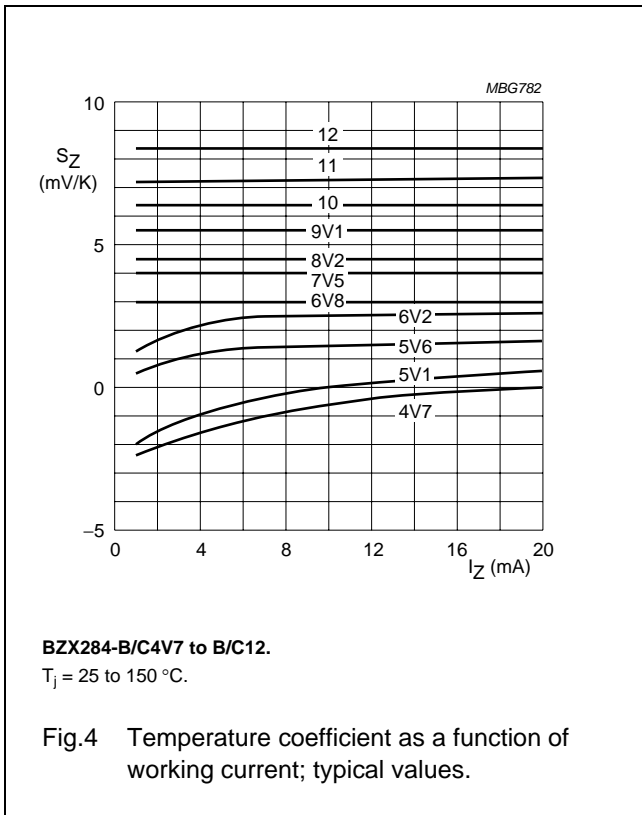
1. Device mounted on a printed-circuit board: 11 × 25 × 1.6 mm.

GRAPHICAL DATA



Voltage regulator diodes

BZX284 series



Voltage regulator diodes

BZX284 series

PACKAGE OUTLINE

Very small ceramic rectangular surface mounted package

SOD110

DIMENSIONS (mm are the original dimensions)

UNIT	A max.	D	E	y
mm	1.6	2.10 1.90	1.40 1.10	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOD110						97-04-14

Voltage regulator diodes

BZX284 series

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

Notes

1. Please consult the most recently issued document before initiating or completing a design.
2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

DISCLAIMERS

General — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions

above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

NXP Semiconductors

Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors. No changes were made to the content, except for the legal definitions and disclaimers.

Contact information

For additional information please visit: **<http://www.nxp.com>**

For sales offices addresses send e-mail to: **salesaddresses@nxp.com**

© NXP B.V. 2009

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Printed in The Netherlands

613514/04/pp10

Date of release: 2002 May 28

Document order number: 9397 750 09734

