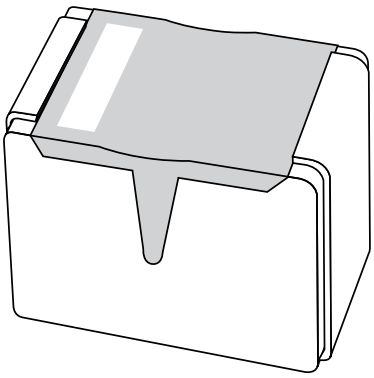
DATA SHEET



BZX284 series
Voltage regulator diodes

Product specification
Supersedes data of 1999 Apr 19

2002 May 28

Philips
Semiconductors

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Voltage regulator diodes BZX284 series

FEATURES

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

APPLICATIONS

- General regulation functions.

DESCRIPTION

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

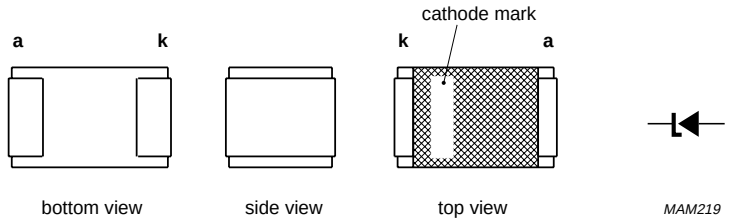


Fig.1 Simplified outline (SOD110) and symbol.

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	–	–

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 µs; square wave; T_{amb} = 25 °C prior to surge	see Tables 1 and 2		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	400	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

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

ELECTRICAL CHARACTERISTICS

Total BZX284-B and BZX284-C series

T_j = 25 °C unless otherwise specified.

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

–

Table 1 Per type BZX284-**B/C2V4** to **B/C24**
T_j = 25 °C unless otherwise specified.

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

Table 2 Per type BZX284-**B/C27** to **B/C75**

T_j = 25 °C unless otherwise specified.

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

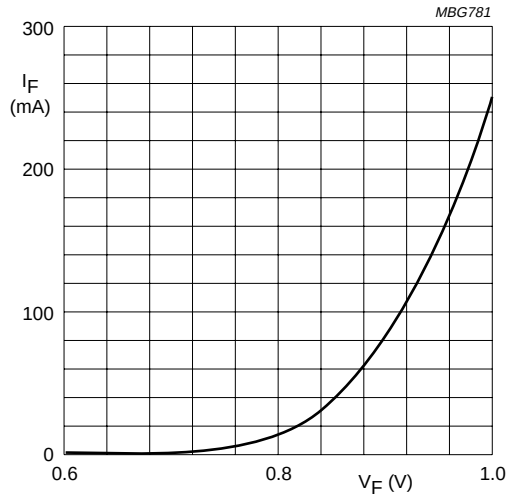
THERMAL CHARACTERISTICS

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

Note

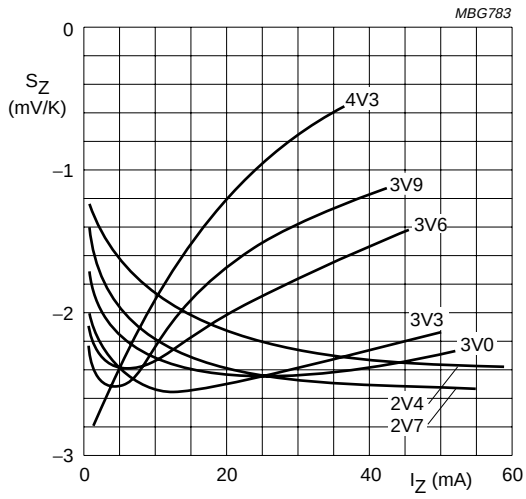
1. Device mounted on a printed-circuit board: $11 \times 25 \times 1.6$ mm.

GRAPHICAL DATA



T_j = 25 °C.

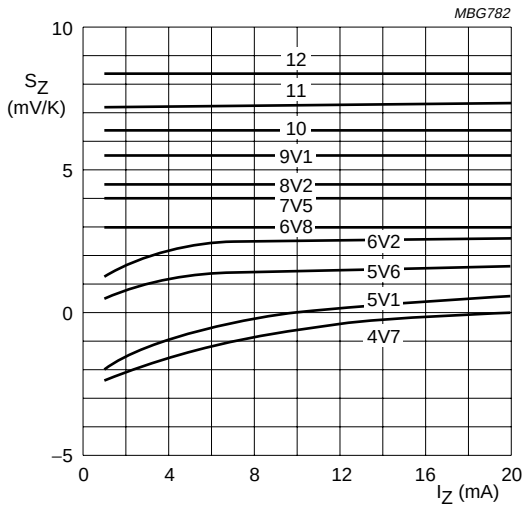
Fig.2 Forward current as a function of forward voltage; typical values.



BZX284-B/C2V4 to B/C4V3.

T_j = 25 to 150 °C.

Fig.3 Temperature coefficient as a function of working current; typical values.

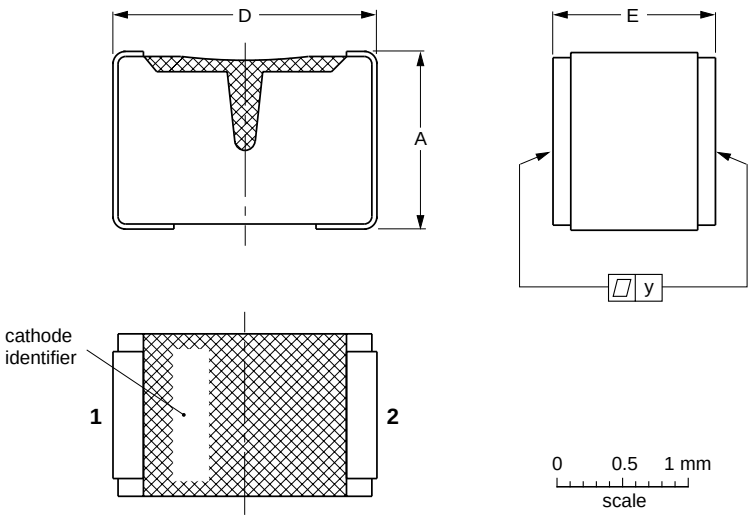


BZX284-B/C4V7 to B/C12.
T_j = 25 to 150 °C.

Fig.4 Temperature coefficient as a function of working current; typical values.

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

DATA SHEET STATUS

DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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