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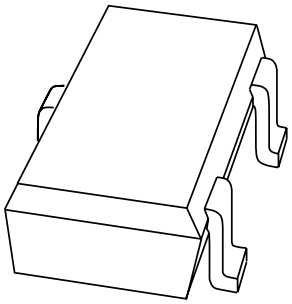
DATA SHEET



BZB784 series
Voltage regulator double diodes

Product data sheet
Supersedes data of 2000 May 24

2001 Feb 27

NXP founded by Philips

Voltage regulator double diodes BZB784 series

FEATURES

- Total power dissipation: max. 350 mW
- Approx. 5% V_Z tolerance
- Working voltage range: nom. 2.4 to 15 V (E24 range).

APPLICATIONS

- General regulation functions
- ESD and surge protection.

DESCRIPTION

Low-power voltage regulator diodes in a small SOT323 (SC-70) package.

PINNING SOT323 (SC-70)

PIN	DESCRIPTION
1	cathode
2	cathode
3	common anode

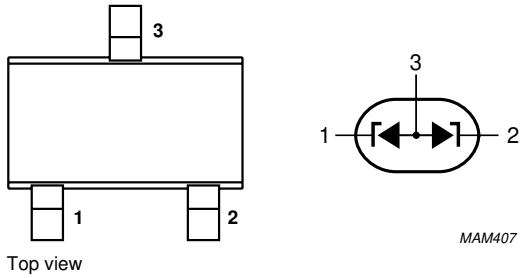


Fig.1 Simplified outline and symbol.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BZB784-C2V4	91	BZB784-C3V9	96	BZB784-C6V2	9B	BZB784-C10	9G
BZB784-C2V7	92	BZB784-C4V3	97	BZB784-C6V8	9C	BZB784-C11	9H
BZB784-C3V0	93	BZB784-C4V7	98	BZB784-C7V5	9D	BZB784-C12	9J
BZB784-C3V3	94	BZB784-C5V1	99	BZB784-C8V2	9E	BZB784-C13	9K
BZB784-C3V6	95	BZB784-C5V6	9A	BZB784-C9V1	9F	BZB784-C15	9L

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	200	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_{amb} = 25 °C; prior to surge	see Table 1		
P_{tot}	total power dissipation; note 1	T_{amb} = 25 °C; 2 diodes loaded	–	350	mW
		T_{amb} = 25 °C; 1 diode loaded	–	180	mW
P_{ZSM}	non-repetitive peak reverse dissipation	t_p = 100 μs; square wave; T_{amb} = 25 °C; prior to surge	–	40	W
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point	2 diodes loaded; note 1	140	K/W
		1 diode loaded; note 1	265	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	2 diodes loaded; note 2	355	K/W
		1 diode loaded; note 2	680	K/W

Notes

1. Solder points on cathode tabs.
2. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

Total BZB784-C series

T_j = 25 °C; unless otherwise specified.

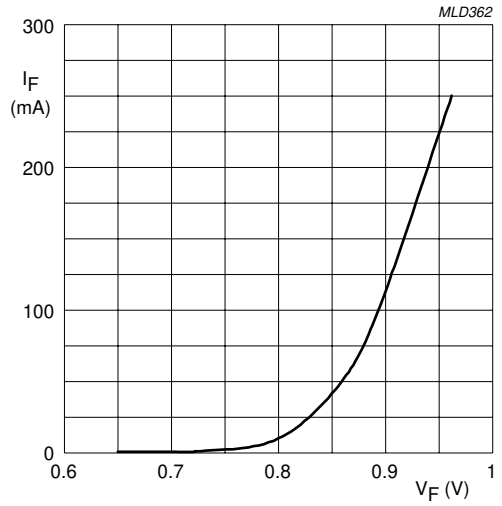
SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.2	0.9	V
I_R	reverse current			
	BZB784-C2V4	V_R = 1 V	50	μA
	BZB784-C2V7	V_R = 1 V	20	μA
	BZB784-C3V0	V_R = 1 V	10	μA
	BZB784-C3V3	V_R = 1 V	5	μA
	BZB784-C3V6	V_R = 1 V	5	μA
	BZB784-C3V9	V_R = 1 V	3	μA
	BZB784-C4V3	V_R = 1 V	3	μA
	BZB784-C4V7	V_R = 2 V	3	μA
	BZB784-C5V1	V_R = 2 V	2	μA
	BZB784-C5V6	V_R = 2 V	1	μA
	BZB784-C6V2	V_R = 4 V	3	μA
	BZB784-C6V8	V_R = 4 V	2	μA
	BZB784-C7V5	V_R = 5 V	1	μA
	BZB784-C8V2	V_R = 5 V	700	nA
	BZB784-C9V1	V_R = 6 V	500	nA
	BZB784-C10	V_R = 7 V	200	nA
	BZB784-C11	V_R = 8 V	100	nA
	BZB784-C12	V_R = 8 V	100	nA
	BZB784-C13	V_R = 8 V	100	nA
	BZB784-C15	V_R = 10.5V	50	nA

Table 1 Per type BZB784-C2V4 to C15

T_j = 25 °C; unless otherwise specified.

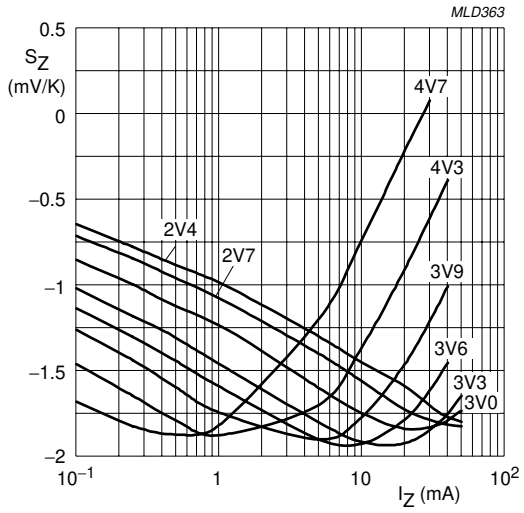
BZB784-C XXX	WORKING VOLTAGE V_Z (V) at I_Z = 5 mA		DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFFICIENT S_Z (mV/K) at I_{Ztest} = 5 mA (see Figs 3 and 4)	DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 μs; T_{amb} = 25 °C
	Tol. ≈5%		at I_Z = 1 mA		at I_Z = 5 mA				
	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	TYP.	MAX.	MAX.
2V4	2.2	2.6	275	600	70	100	−1.3	450	6.0
2V7	2.5	2.9	300	600	75	100	−1.4	450	6.0
3V0	2.8	3.2	325	600	80	95	−1.6	450	6.0
3V3	3.1	3.5	350	600	85	95	−1.8	450	6.0
3V6	3.4	3.8	375	600	85	90	−1.9	450	6.0
3V9	3.7	4.1	400	600	85	90	−1.9	450	6.0
4V3	4.0	4.6	410	600	80	90	−1.7	450	6.0
4V7	4.4	5.0	425	500	50	80	−1.2	300	6.0
5V1	4.8	5.4	400	480	40	60	−0.5	300	6.0
5V6	5.2	6.0	80	400	15	40	1.0	300	6.0
6V2	5.8	6.6	40	150	6	10	2.2	200	6.0
6V8	6.4	7.2	30	80	6	15	3.0	200	6.0
7V5	7.0	7.9	30	80	6	15	3.6	150	4.0
8V2	7.7	8.7	40	80	6	15	4.3	150	4.0
9V1	8.5	9.6	40	100	6	15	5.2	150	3.0
10	9.4	10.6	50	150	8	20	6.0	90	3.0
11	10.4	11.6	50	150	10	20	6.9	90	2.5
12	11.4	12.7	50	150	10	25	7.9	85	2.5
13	12.4	14.1	50	170	10	30	8.8	80	2.5
15	13.8	15.6	50	200	10	30	10.7	75	2.0

GRAPHICAL DATA



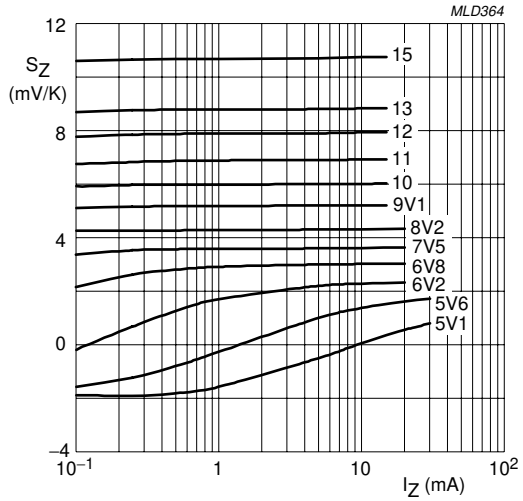
T_j = 25 °C.

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



BZB784-C2V4 to C4V7.
T_j = 25 to 150 °C.

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

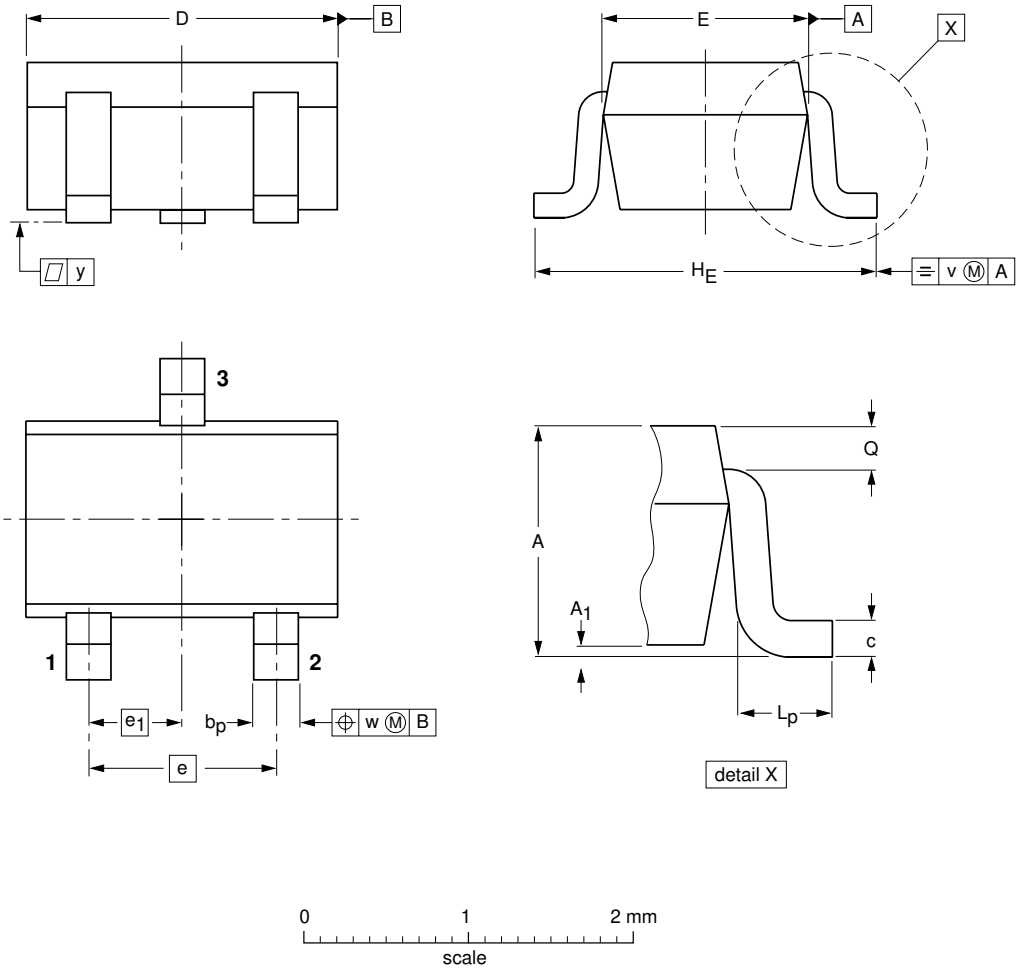


BZB784-C5V1 to C15.
T_j = 25 to 150 °C.

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

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT323**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

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.

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