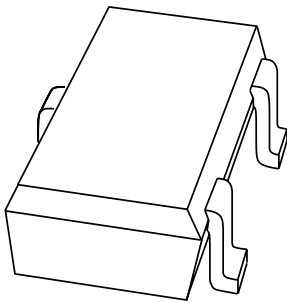


# DATA SHEET



## **BZB784 series** Voltage regulator double diodes

Product specification  
Supersedes data of 2000 May 24

2001 Feb 27

# 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

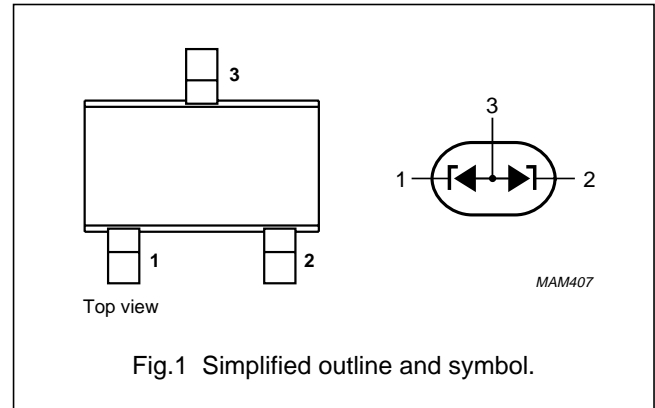
- General regulation functions
- ESD and surge protection.

### 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



### 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	$t_p = 100 \mu s$ ; square wave; $T_{amb} = 25 \text{ }^\circ\text{C}$ ; prior to surge	see Table 1		
$P_{tot}$	total power dissipation; note 1	$T_{amb} = 25 \text{ }^\circ\text{C}$ ; 2 diodes loaded	–	350	mW
		$T_{amb} = 25 \text{ }^\circ\text{C}$ ; 1 diode loaded	–	180	mW
$P_{ZSM}$	non-repetitive peak reverse dissipation	$t_p = 100 \mu s$ ; square wave; $T_{amb} = 25 \text{ }^\circ\text{C}$ ; prior to surge	–	40	W
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$
$T_j$	junction temperature		–	150	$^\circ\text{C}$

### Note

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

## Voltage regulator double diodes

## BZB784 series

## THERMAL CHARACTERISTICS

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

## Notes

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

## ELECTRICAL CHARACTERISTICS

## Total BZB784-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
$I_R$	reverse current			
	BZB784-C2V4	$V_R = 1\text{ V}$	50	$\mu\text{A}$
	BZB784-C2V7	$V_R = 1\text{ V}$	20	$\mu\text{A}$
	BZB784-C3V0	$V_R = 1\text{ V}$	10	$\mu\text{A}$
	BZB784-C3V3	$V_R = 1\text{ V}$	5	$\mu\text{A}$
	BZB784-C3V6	$V_R = 1\text{ V}$	5	$\mu\text{A}$
	BZB784-C3V9	$V_R = 1\text{ V}$	3	$\mu\text{A}$
	BZB784-C4V3	$V_R = 1\text{ V}$	3	$\mu\text{A}$
	BZB784-C4V7	$V_R = 2\text{ V}$	3	$\mu\text{A}$
	BZB784-C5V1	$V_R = 2\text{ V}$	2	$\mu\text{A}$
	BZB784-C5V6	$V_R = 2\text{ V}$	1	$\mu\text{A}$
	BZB784-C6V2	$V_R = 4\text{ V}$	3	$\mu\text{A}$
	BZB784-C6V8	$V_R = 4\text{ V}$	2	$\mu\text{A}$
	BZB784-C7V5	$V_R = 5\text{ V}$	1	$\mu\text{A}$
	BZB784-C8V2	$V_R = 5\text{ V}$	700	nA
	BZB784-C9V1	$V_R = 6\text{ V}$	500	nA
	BZB784-C10	$V_R = 7\text{ V}$	200	nA
	BZB784-C11	$V_R = 8\text{ V}$	100	nA
	BZB784-C12	$V_R = 8\text{ V}$	100	nA
	BZB784-C13	$V_R = 8\text{ V}$	100	nA
BZB784-C15	$V_R = 10.5\text{ V}$	50	nA	

## Voltage regulator double diodes

## BZB784 series

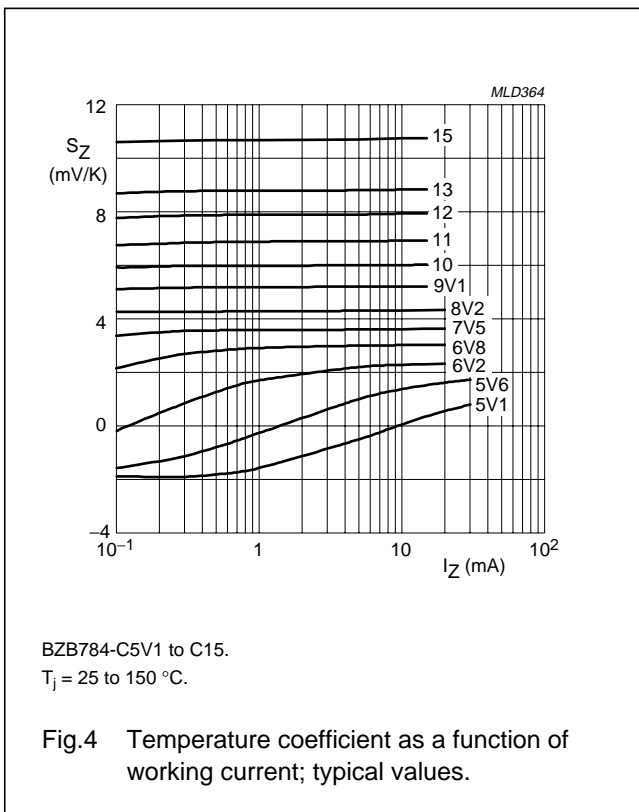
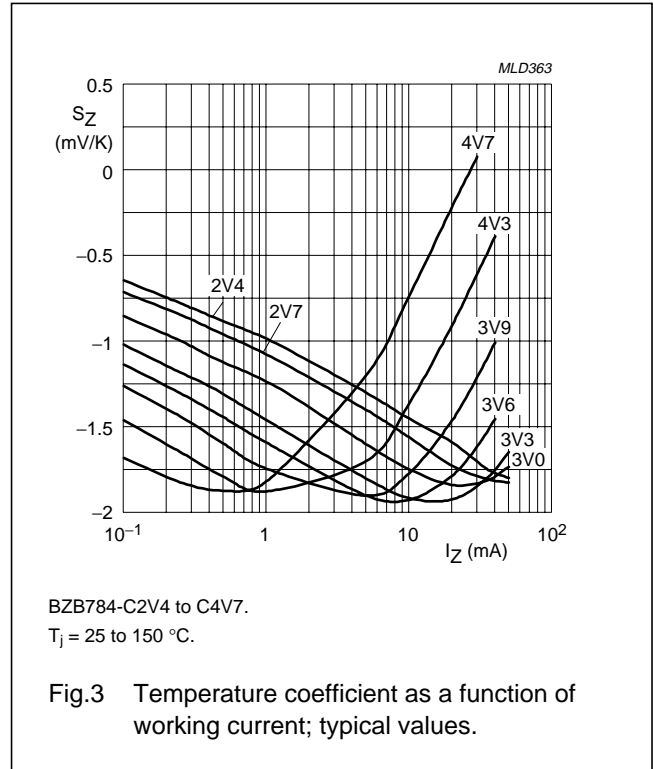
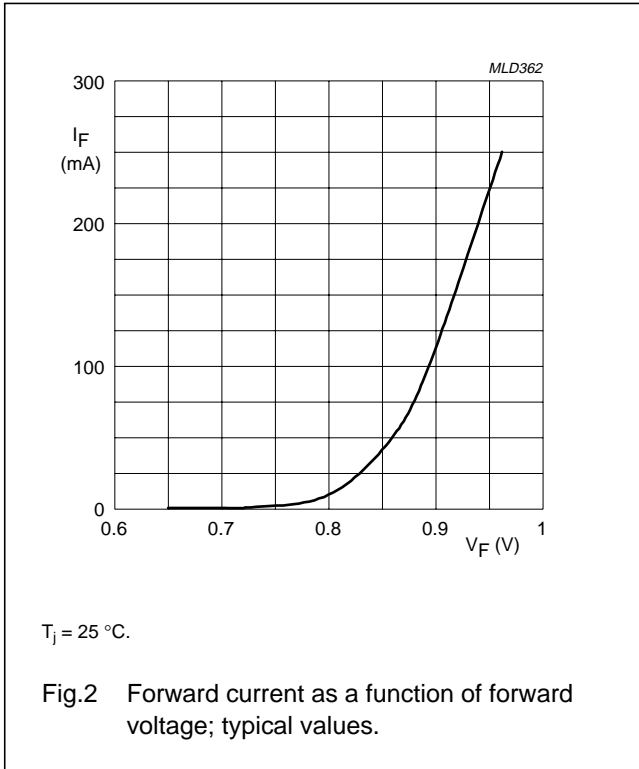
**Table 1** Per type BZB784-C2V4 to C15  
 $T_j = 25\text{ °C}$ ; unless otherwise specified.

BZB784-C XXX	WORKING VOLTAGE $V_Z$ (V) at $I_Z = 5\text{ mA}$		DIFFERENTIAL RESISTANCE $r_{dif}$ ( $\Omega$ )				TEMP. COEFFICIENT $S_Z$ (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. $\approx 5\%$		at $I_Z = 1\text{ mA}$		at $I_Z = 5\text{ mA}$				
	MIN.	MAX.	TYP.	MAX.	TYP.	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

Voltage regulator double diodes

BZB784 series

GRAPHICAL DATA



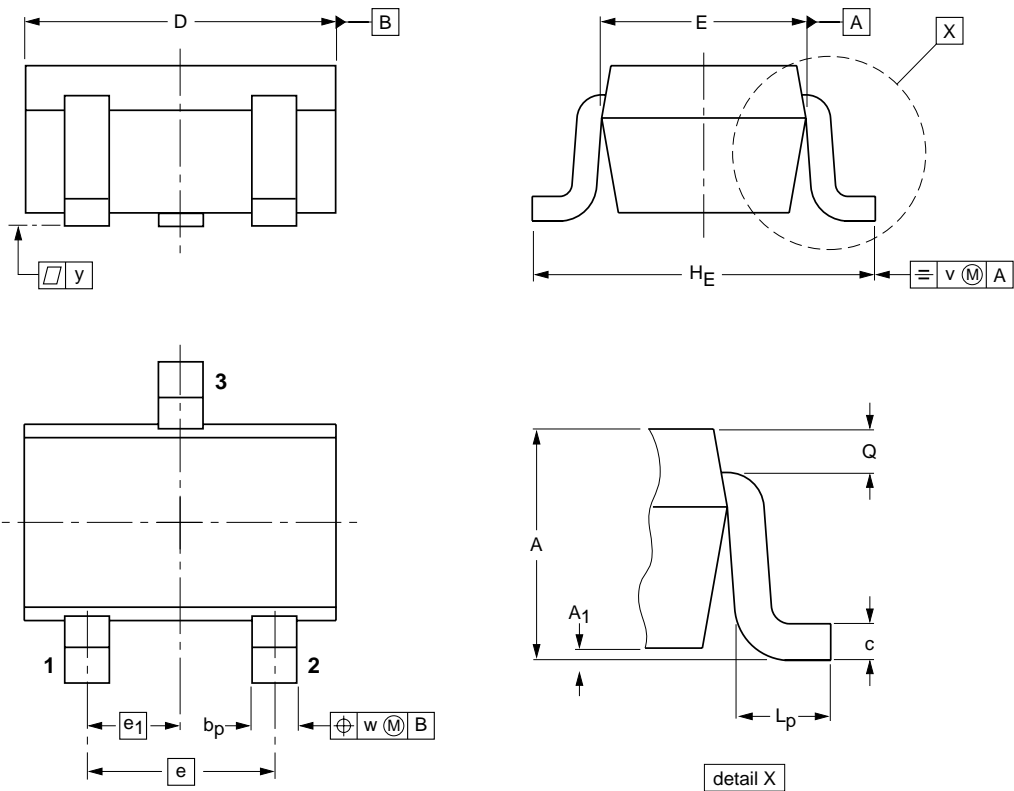
Voltage regulator double diodes

BZB784 series

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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

## Voltage regulator double diodes

## BZB784 series

## DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS <sup>(1)</sup>
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

## Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

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**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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