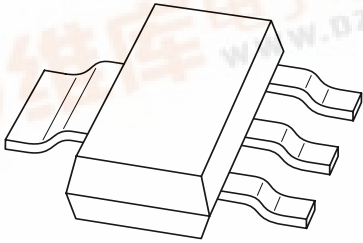


**DISCRETE SEMICONDUCTORS**

# DATA SHEET



## **BZV90 series** **Voltage regulator diodes**

Product specification  
Supersedes data of 1996 Oct 25

1999 May 17

## Voltage regulator diodes

## BZV90 series

## FEATURES

- Total power dissipation: max. 1500 mW
- Tolerance series: approx.  $\pm 5\%$
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

## APPLICATIONS

- General regulation functions.

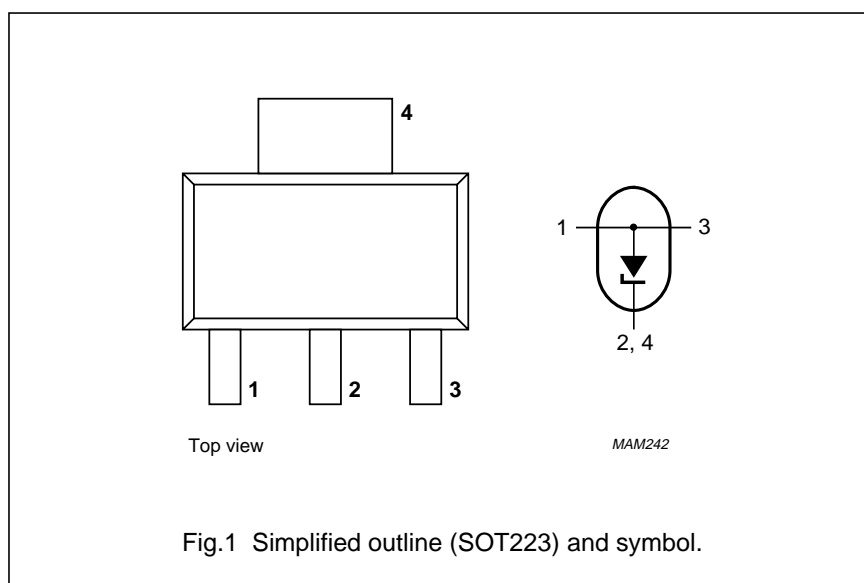
## DESCRIPTION

Medium-power voltage regulator diodes in SOT223 plastic SMD packages.

The diodes are available in the normalized E24 approx.  $\pm 5\%$  tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V (BZV90-C2V4 to C75).

## PINNING

PIN	DESCRIPTION
1	anode
2, 4	cathode
3	anode



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_F$	continuous forward current		–	400	mA
$I_{ZSM}$	non-repetitive peak reverse current	$t_p = 100 \mu\text{s}$ ; square wave; $T_j = 25 \text{ }^\circ\text{C}$ prior to surge	see Table “Per type”		
$P_{tot}$	total power dissipation	$T_{amb} = 25 \text{ }^\circ\text{C}$ ; note 1	–	1500	mW
$P_{ZSM}$	non-repetitive peak reverse power dissipation	$t_p = 100 \mu\text{s}$ ; square wave; $T_j = 25 \text{ }^\circ\text{C}$ prior to surge; see Fig.2	–	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 double-sided copper-clad printed circuit-board; copper area = 2 cm<sup>2</sup>.

## ELECTRICAL CHARACTERISTICS

## Total series

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_F$	forward voltage	$I_F = 50 \text{ mA}$ ; see Fig.3	–	1.0	V

## Voltage regulator diodes

## BZV90 series

Per type

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

BZV90- CXXX	WORKING VOLTAGE $V_Z$ (V) at $I_{Ztest}$		DIFFERENTIAL RESISTANCE $r_{dif}$ ( $\Omega$ ) at $I_{Ztest}$		TEMP. COEFF. $S_z$ (mV/K) at $I_{Ztest}$ see Figs 4 and 5			TEST CURRENT $I_{Ztest}$ (mA)	DIODE CAP. $C_d$ (pF) at $f = 1\text{ MHz}$ ; at $V_R = 0\text{ V}$	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT $I_{ZSM}$ (A) at $t_p = 100\text{ }\mu\text{s}$ ; $T_{amb} = 25\text{ }^\circ\text{C}$
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.			$I_R$ ( $\mu\text{A}$ )	$V_R$ (V)	
									MAX.		MAX.	MAX.
2V4	2.2	2.6	70	100	-3.5	-1.6	0	5	450	50	1.0	6.0
2V7	2.5	2.9	75	100	-3.5	-2.0	0	5	450	20	1.0	6.0
3V0	2.8	3.2	80	95	-3.5	-2.1	0	5	450	10	1.0	6.0
3V3	3.1	3.5	85	95	-3.5	-2.4	0	5	450	5	1.0	6.0
3V6	3.4	3.8	85	90	-3.5	-2.4	0	5	450	5	1.0	6.0
3V9	3.7	4.1	85	90	-3.5	-2.5	0	5	450	3	1.0	6.0
4V3	4.0	4.6	80	90	-3.5	-2.5	0	5	450	3	1.0	6.0
4V7	4.4	5.0	50	80	-3.5	-1.4	0.2	5	300	3	2.0	6.0
5V1	4.8	5.4	40	60	-2.7	-0.8	1.2	5	300	2	2.0	6.0
5V6	5.2	6.0	15	40	-2.0	1.2	2.5	5	300	1	2.0	6.0
6V2	5.8	6.6	6	10	0.4	2.3	3.7	5	200	3	4.0	6.0
6V8	6.4	7.2	6	15	1.2	3.0	4.5	5	200	2	4.0	6.0
7V5	7.0	7.9	6	15	2.5	4.0	5.3	5	150	1	5.0	4.0
8V2	7.7	8.7	6	15	3.2	4.6	6.2	5	150	0.7	5.0	4.0
9V1	8.5	9.6	6	15	3.8	5.5	7.0	5	150	0.5	6.0	3.0
10	9.4	10.6	8	20	4.5	6.4	8.0	5	90	0.2	7.0	3.0
11	10.4	11.6	10	20	5.4	7.4	9.0	5	85	0.1	8.0	2.5
12	11.4	12.7	10	25	6.0	8.4	10.0	5	85	0.1	8.0	2.5
13	12.4	14.1	10	30	7.0	9.4	11.0	5	80	0.1	8.0	2.5
15	13.8	15.6	10	30	9.2	11.4	13.0	5	75	0.05	10.5	2.0
16	15.3	17.1	10	40	10.4	12.4	14.0	5	75	0.05	11.2	1.5
18	16.8	19.1	10	45	12.4	14.4	16.0	5	70	0.05	12.6	1.5
20	18.8	21.2	15	55	14.4	16.4	18.0	5	60	0.05	14.0	1.5

## Voltage regulator diodes

## BZV90 series

BZV90- CXXX	WORKING VOLTAGE $V_Z$ (V) at $I_{Ztest}$		DIFFERENTIAL RESISTANCE $r_{diff}$ ( $\Omega$ ) at $I_{Ztest}$		TEMP. COEFF. $S_Z$ (mV/K) at $I_{Ztest}$ see Figs 4 and 5			TEST CURRENT $I_{Ztest}$ (mA)	DIODE CAP. $C_d$ (pF) at $f = 1$ MHz; at $V_R = 0$ V	REVERSE CURRENT at REVERSE VOLTAGE		NON-REPETITIVE PEAK REVERSE CURRENT $I_{ZSM}$ (A) at $t_p = 100$ $\mu$ s; $T_{amb} = 25$ °C
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.			$I_R$ ( $\mu$ A)	$V_R$ (V)	
22	20.8	23.3	20	55	16.4	18.4	20.0	5	60	0.05	15.4	1.25
24	22.8	25.6	25	70	18.4	20.4	22.0	5	55	0.05	16.8	1.25
27	25.0	28.9	25	80	21.4	23.4	25.3	2	50	0.05	18.9	1.0
30	28.0	32.0	30	80	24.4	26.6	29.4	2	50	0.05	21.0	1.0
33	31.0	35.0	35	80	27.4	29.7	33.4	2	45	0.05	23.1	0.9
36	34.0	38.0	35	90	30.4	33.0	37.4	2	45	0.05	25.2	0.8
39	37.0	41.0	40	130	33.4	36.4	41.2	2	45	0.05	27.3	0.7
43	40.0	46.0	45	150	37.6	41.2	46.6	2	40	0.05	30.1	0.6
47	44.0	50.0	50	170	42.0	46.1	51.8	2	40	0.05	32.9	0.5
51	48.0	54.0	60	180	46.6	51.0	57.2	2	40	0.05	35.7	0.4
56	52.0	60.0	70	200	52.2	57.0	63.8	2	40	0.05	39.2	0.3
62	58.0	66.0	80	215	58.8	64.4	71.6	2	35	0.05	43.4	0.3
68	64.0	72.0	90	240	65.6	71.7	79.8	2	35	0.05	47.6	0.25
75	70.0	79.0	95	255	73.4	80.2	88.6	2	35	0.05	52.5	0.2

Voltage regulator diodes

BZV90 series

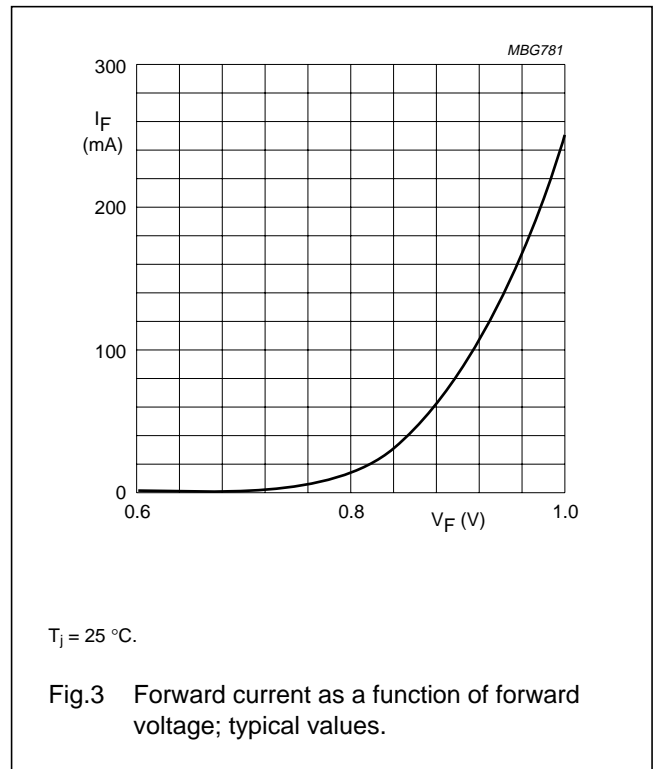
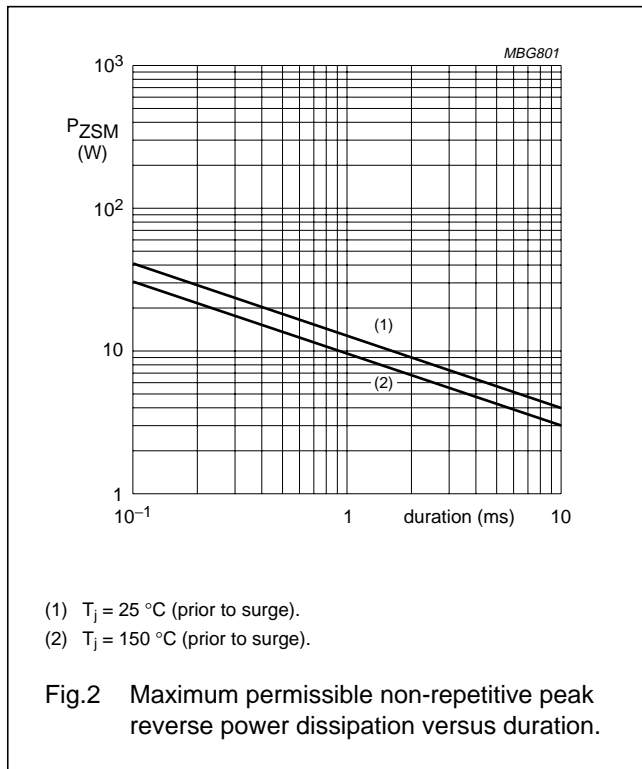
**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	lead length max.; note 1	83.3	K/W

**Note**

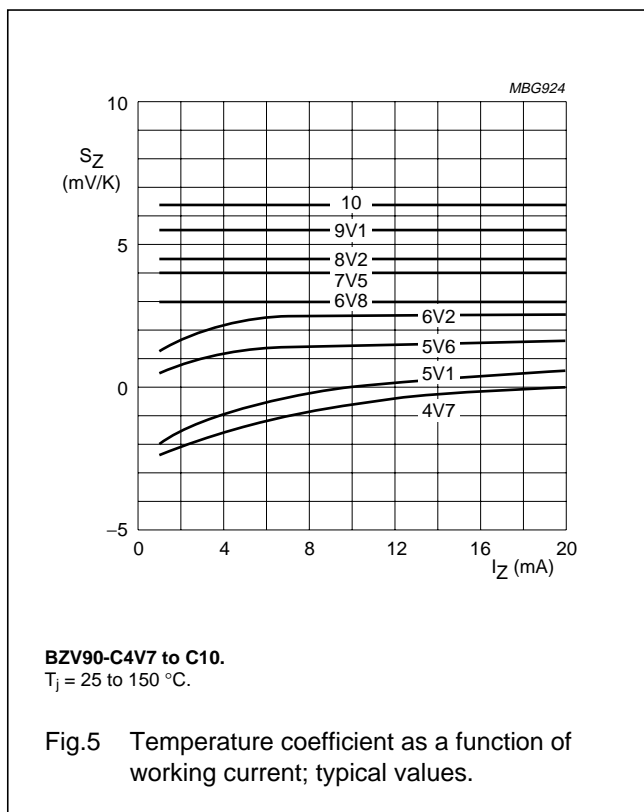
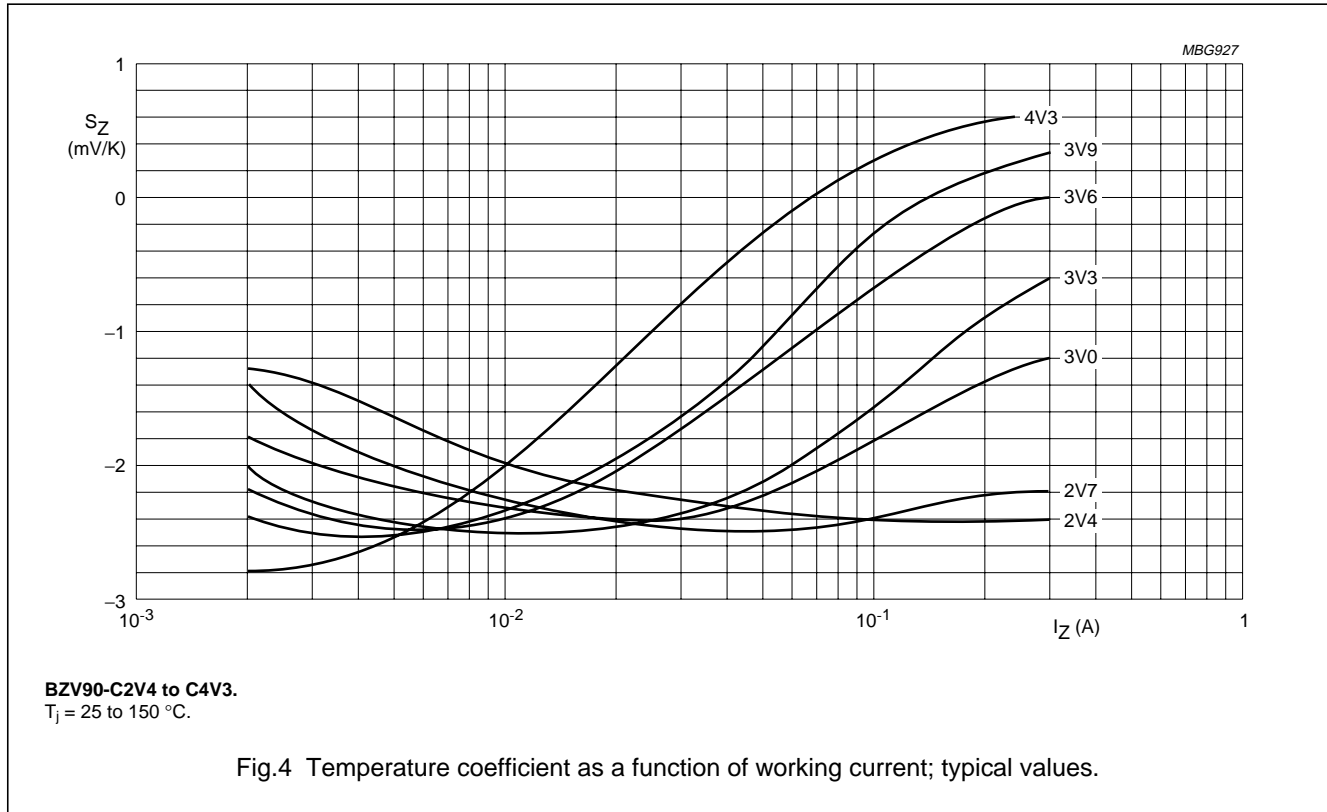
1. Device mounted on an FR4 double-sided copper-clad printed circuit-board; copper area = 2 cm<sup>2</sup>.

**GRAPHICAL DATA**



Voltage regulator diodes

BZV90 series



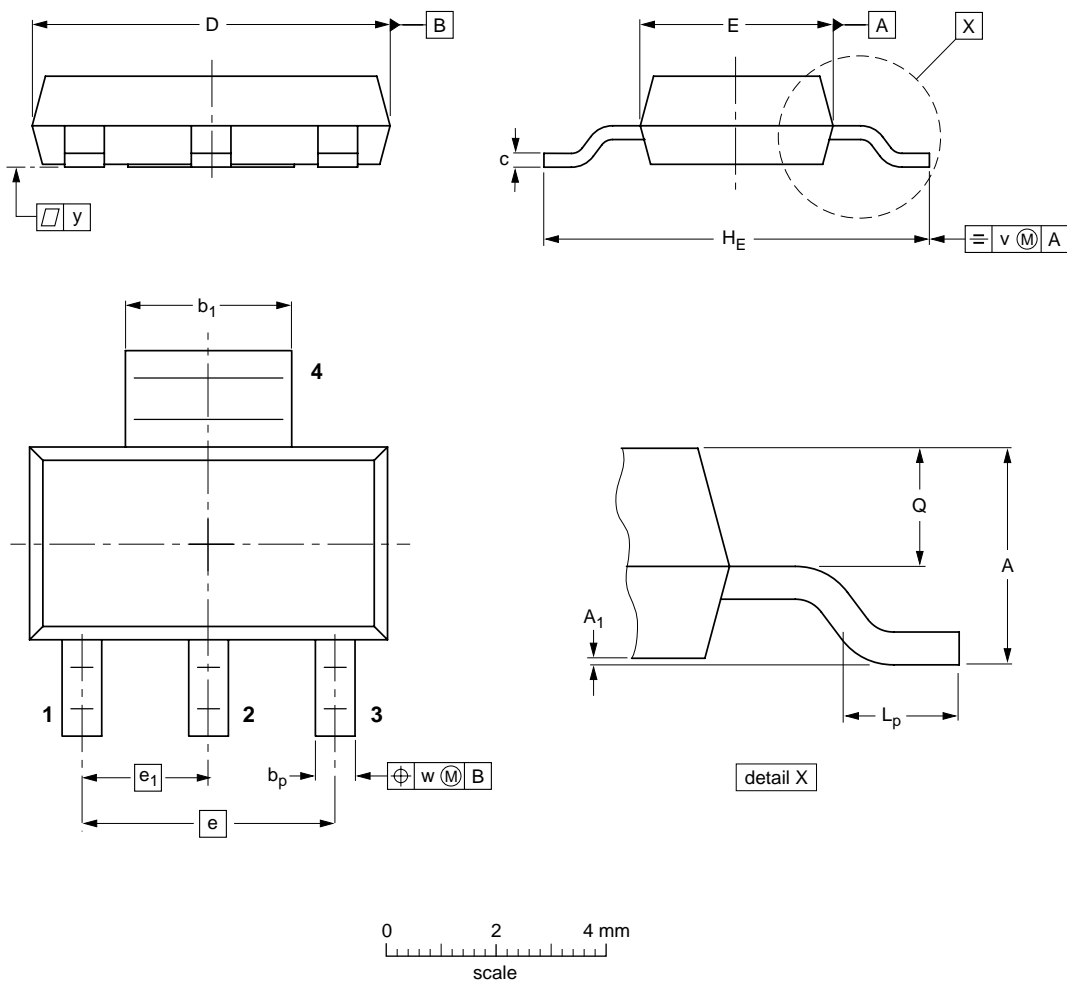
Voltage regulator diodes

BZV90 series

PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub>	b <sub>p</sub>	b <sub>1</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w	y
mm	1.8 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT223						96-11-11 97-02-28

## Voltage regulator diodes

## BZV90 series

**DEFINITIONS**

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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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Voltage regulator diodes

BZV90 series

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**NOTES**

Voltage regulator diodes

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**NOTES**

Voltage regulator diodes

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**NOTES**

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Printed in The Netherlands

115002/00/03/pp12

Date of release: 1999 May 17

Document order number: 9397 750 05928

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