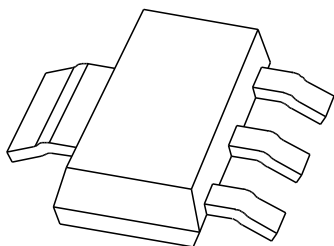


DATA SHEET



BZV90 series Voltage regulator diodes

Product specification
Supersedes data of November 1993
File under Discrete Semiconductors, SC01

1996 Apr 26

Voltage regulator diodes

BZV90 series

FEATURES

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

APPLICATIONS

- General regulation functions.

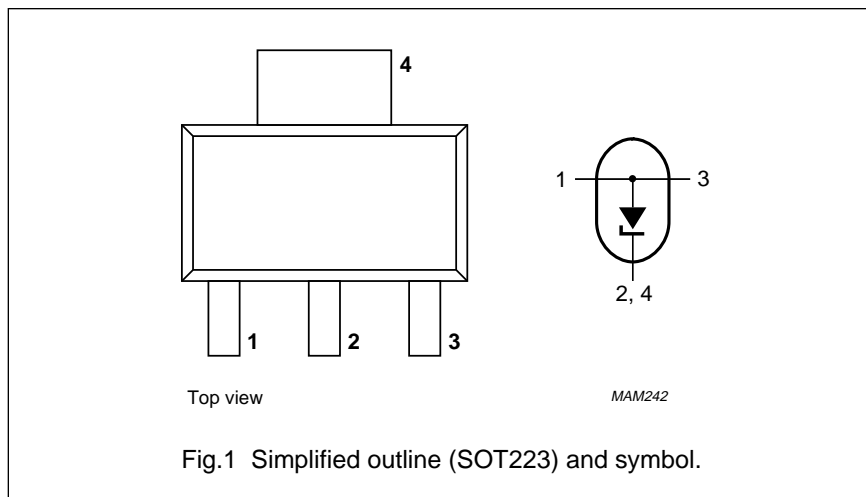
DESCRIPTION

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

The diodes are available in the normalized E24 $\pm 5\%$ 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	cathode
3	anode
4	cathode



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	$t_p = 100 \mu s$; 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	$t_p = 100 \mu s$; 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 cm².

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

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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} (Ω) 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 (μA)		V_R (V)
								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	180	3	2.0	6.0
5V1	4.8	5.4	40	60	-2.7	-0.8	1.2	5	160	2	2.0	6.0
5V6	5.2	6.0	15	40	-2.0	1.2	2.5	5	140	1	2.0	6.0
6V2	5.8	6.6	6	10	0.4	2.3	3.7	5	130	3	4.0	6.0
6V8	6.4	7.2	6	15	1.2	3.0	4.5	5	110	2	4.0	6.0
7V5	7.0	7.9	6	15	2.5	4.0	5.3	5	100	1	5.0	4.0
8V2	7.7	8.7	6	15	3.2	4.6	6.2	5	95	0.7	5.0	4.0
9V1	8.5	9.6	6	15	3.8	5.5	7.0	5	90	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_{dif} (Ω) 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 $t_p = 100 \mu s$; $T_{amb} = 25^\circ C$
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.			I_R (μA)	V_R (V)	
22	20.8	23.3	20	55	16.4	18.4	20.0	5	MAX.	0.05	15.4	MAX.
24	22.8	25.6	25	70	18.4	20.4	22.0	5	MAX.	0.05	16.8	MAX.
27	25.0	28.9	25	80	21.4	23.4	25.3	2	MAX.	0.05	18.9	MAX.
30	28.0	32.0	30	80	24.4	26.6	29.4	2	MAX.	0.05	21.0	MAX.
33	31.0	35.0	35	80	27.4	29.7	33.4	2	MAX.	0.05	23.1	MAX.
36	34.0	38.0	35	90	30.4	33.0	37.4	2	MAX.	0.05	25.2	MAX.
39	37.0	41.0	40	130	33.4	36.4	41.2	2	MAX.	0.05	27.3	MAX.
43	40.0	46.0	45	150	37.6	41.2	46.6	2	MAX.	0.05	30.1	MAX.
47	44.0	50.0	50	170	42.0	46.1	51.8	2	MAX.	0.05	32.9	MAX.
51	48.0	54.0	60	180	46.6	51.0	57.2	2	MAX.	0.05	35.7	MAX.
56	52.0	60.0	70	200	52.2	57.0	63.8	2	MAX.	0.05	39.2	MAX.
62	58.0	66.0	80	215	58.8	64.4	71.6	2	MAX.	0.05	43.4	MAX.
68	64.0	72.0	90	240	65.6	71.7	79.8	2	MAX.	0.05	47.6	MAX.
75	70.0	79.0	95	255	73.4	80.2	88.6	2	MAX.	0.05	52.5	MAX.

Voltage regulator diodes

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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

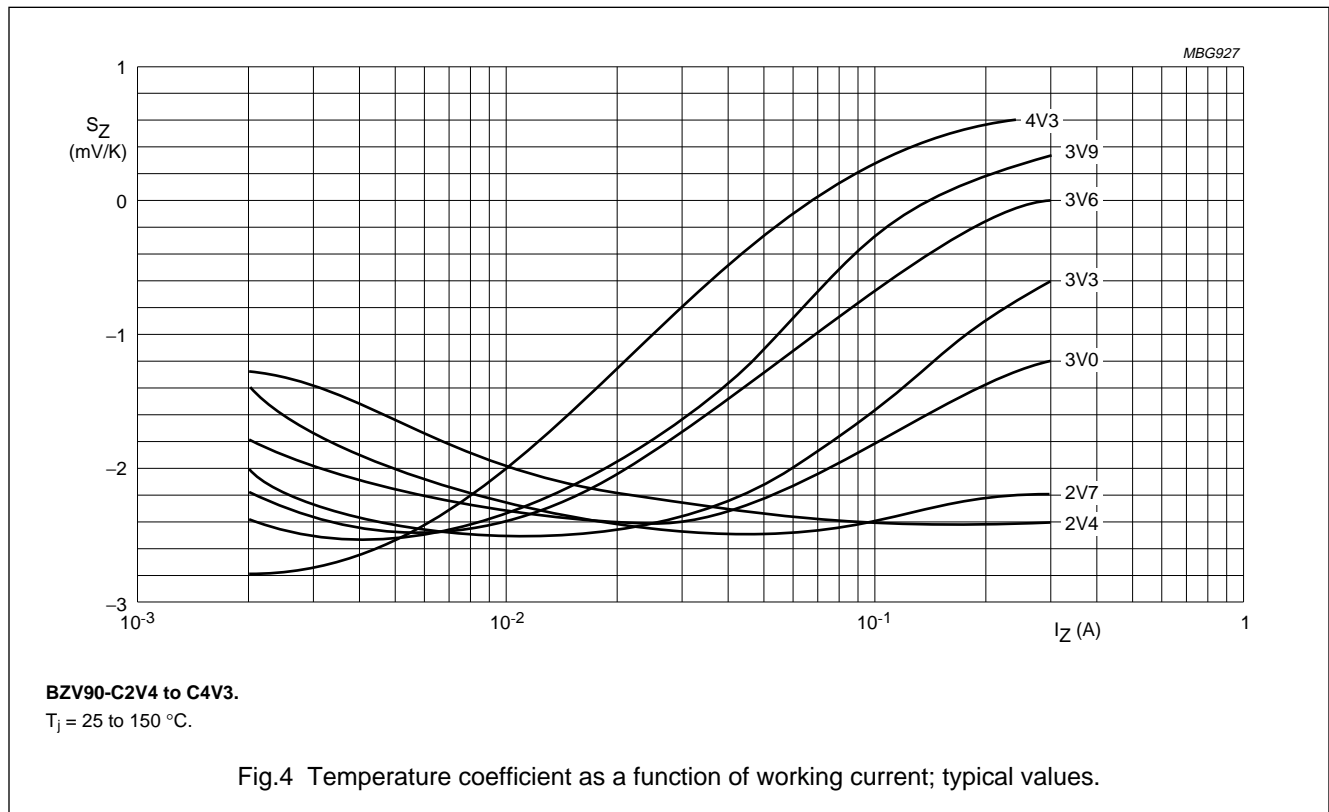
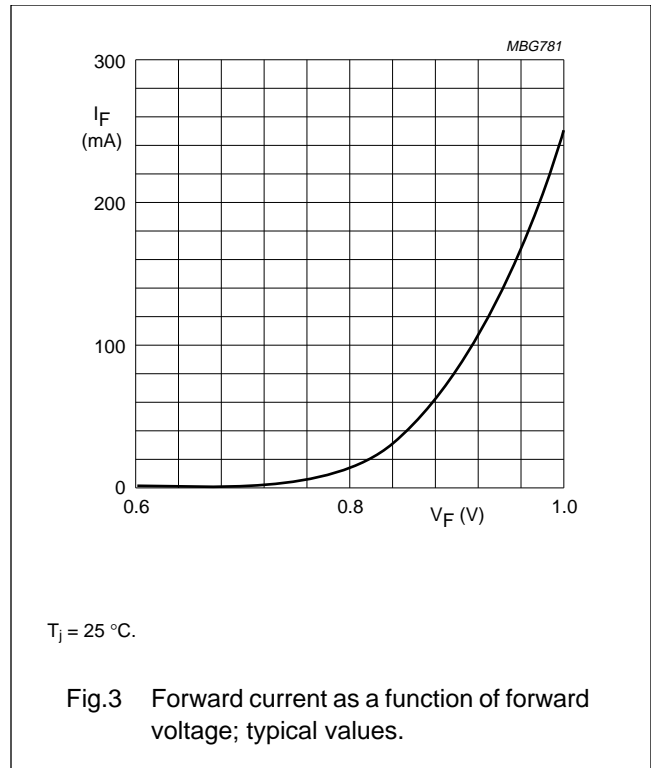
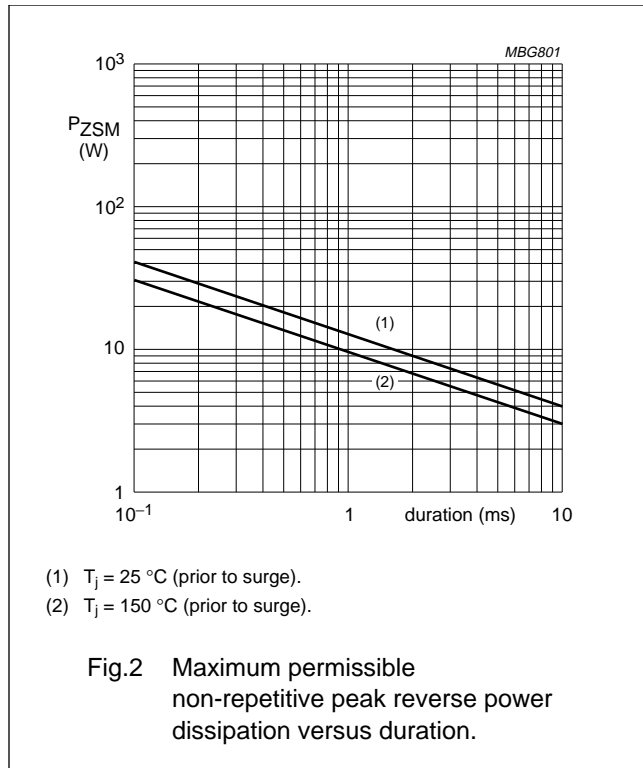
Note

1. Device mounted on an FR4 double-sided copper-clad printed circuit-board; copper area = 2 cm².

Voltage regulator diodes

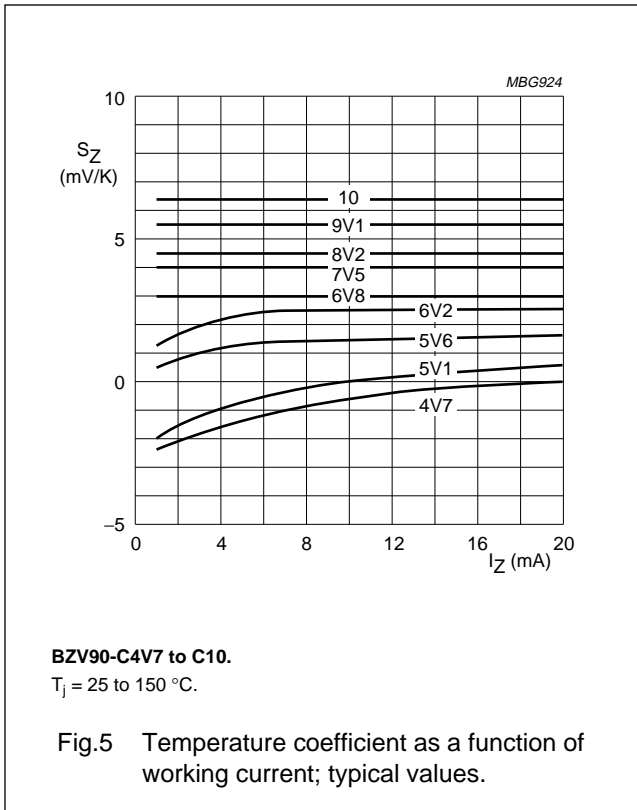
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GRAPHICAL DATA



Voltage regulator diodes

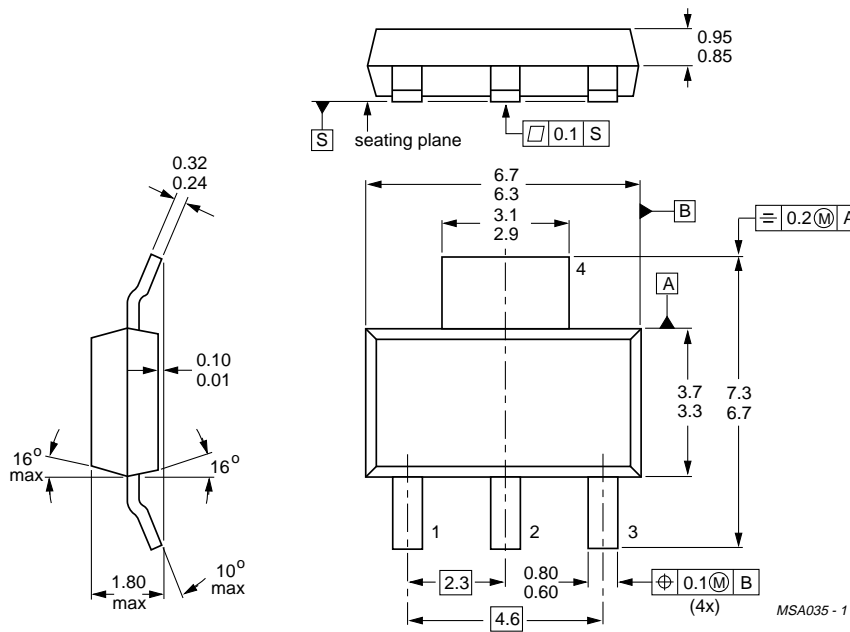
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Voltage regulator diodes

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PACKAGE OUTLINE



Dimensions in mm.

Fig.6 SOT223.

Voltage regulator diodes

BZV90 series

DEFINITIONS

Data sheet status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

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