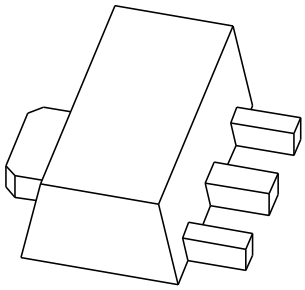
DATA SHEET



BZV49 series
Voltage regulator diodes

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

1996 Apr 26

Philips
Semiconductors

PHILIPS

Voltage regulator diodes BZV49 series

FEATURES

- Total power dissipation: max. 1000 mW
- Tolerance series: ±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 a plastic SMD SOT89 package.

The diodes are available in the normalized E24 ±5% tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V (BZV49-C2V4 to BZV49-C75).

PINNING

PIN	DESCRIPTION
1	anode
2	anode
3	cathode

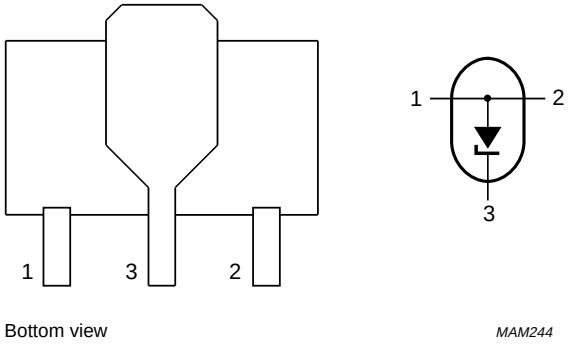


Fig.1 Simplified outline (SOT89) and symbol.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BZV49-C2V4	2Y4	BZV49-C6V2	6Y2	BZV49-C16	16Y	BZV49-C43	43Y
BZV49-C2V7	2Y7	BZV49-C6V8	6Y8	BZV49-C18	18Y	BZV49-C47	47Y
BZV49-C3V0	3Y0	BZV49-C7V5	7Y5	BZV49-C20	20Y	BZV49-C51	51Y
BZV49-C3Y3	3Y3	BZV49-C8V2	8Y2	BZV49-C22	22Y	BZV49-C56	56Y
BZV49-C3V6	3Y6	BZV49-C9V1	9Y1	BZV49-C24	24Y	BZV49-C62	62Y
BZV49-C3V9	3Y9	BZV49-C10	10Y	BZV49-C27	27Y	BZV49-C68	68Y
BZV49-C4V3	4Y3	BZV49-C11	11Y	BZV49-C30	30Y	BZV49-C75	75Y
BZV49-C4V7	4Y7	BZV49-C12	12Y	BZV49-C33	33Y	–	–
BZV49-C5V1	5Y1	BZV49-C13	13Y	BZV49-C36	36Y	–	–
BZV49-C5V6	5Y6	BZV49-C15	15Y	BZV49-C39	39Y	–	–

LIMITING VALUES

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

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_j = 25 °C prior to surge	see Table “Per type”		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	1000	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.2	–	40	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a ceramic substrate; area = 2.5 cm^2; thickness = 0.7 mm.

ELECTRICAL CHARACTERISTICS

Total series

T_j = 25 °C; unless otherwise specified.

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

Per type

T_j = 25 °C; unless otherwise specified.

BZV49-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 μs; T_{amb} = 25 °C
										I_R (μA)	V_R (V)	
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.		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	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

BZV49-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 μs; T_{amb} = 25 °C
	MIN.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.		MAX.	I_R (μA) MAX.	V_R (V)	MAX.
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	25.1	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

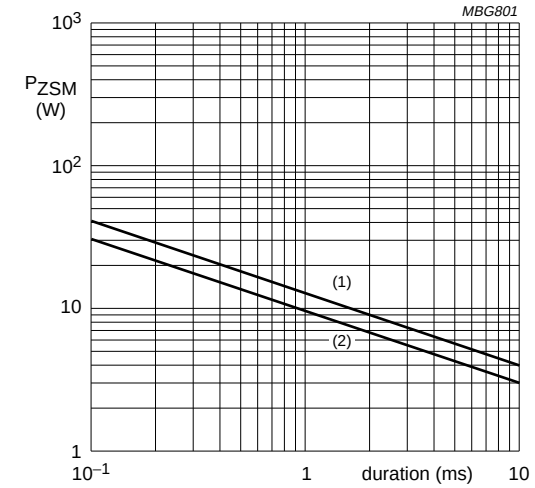
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		15	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	125	K/W

Note

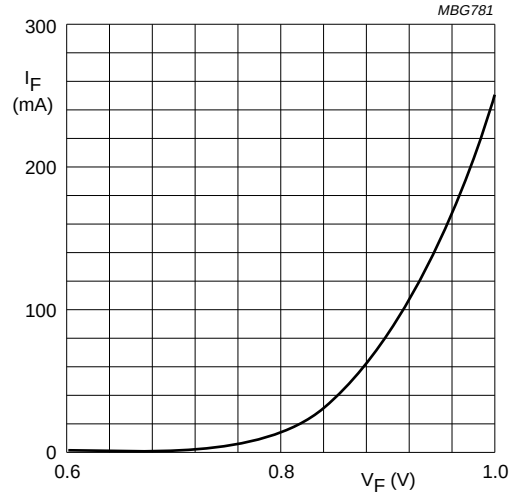
1. Device mounted on a ceramic substrate; area = 2.5 cm^2; thickness = 0.7 mm.

GRAPHICAL DATA



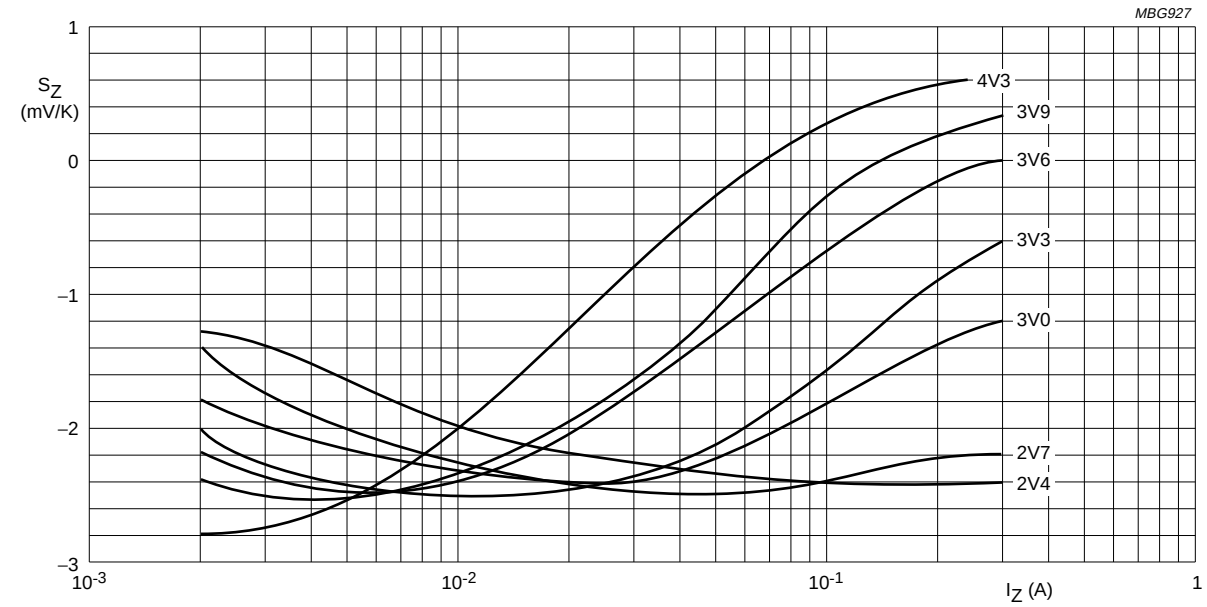
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.2 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



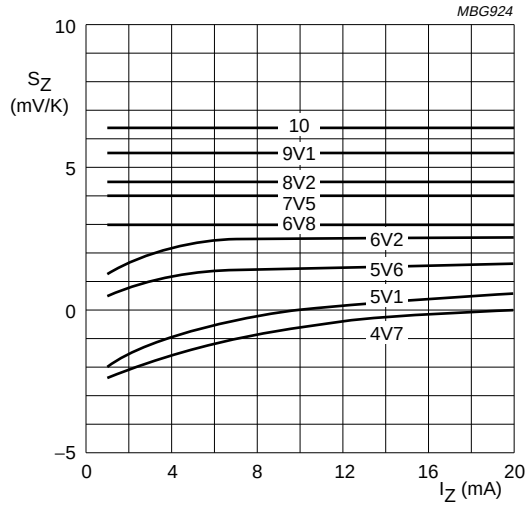
T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



BZV49-C2V4 to C4V3.
T_j = 25 to 150 °C.

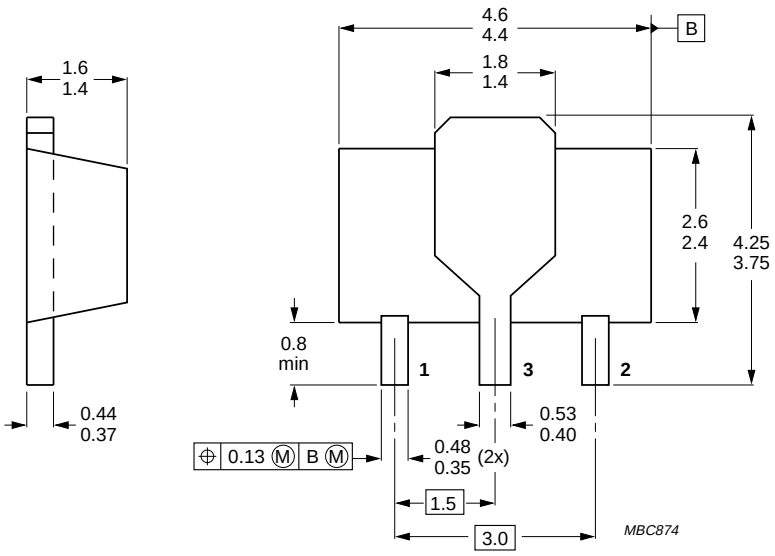
Fig.4 Temperature coefficient as a function of working current; typical values.



BZV49-C4V7 to C10.
T_j = 25 to 150 °C.

Fig.5 Temperature coefficient as a function of working current; typical values.

PACKAGE OUTLINE



Dimensions in mm.

Fig.6 SOT89.

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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