Voltage regulator diodes BZV90 series

FEATURES

- Total power dissipation: max. 1500 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 plastic SMD SOT223 packages.

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 (BZV90-C2V4 to C75).

PINNING

PIN	DESCRIPTION
1	anode
2	cathode
3	anode
4	cathode

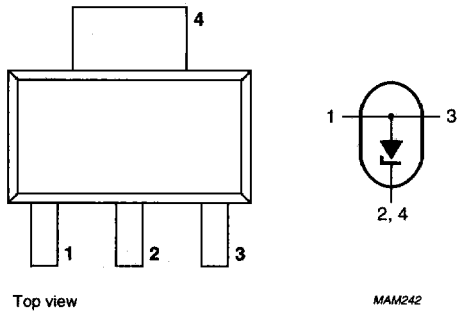


Fig.7 Simplified outline (SOT223) and symbol.

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 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	–	1500	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 µs; square wave; T_j = 25 °C prior to surge; see Fig.8	–	40	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

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

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.9	–	1.0	V

Per type

T_j = 25 °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 10 and 11			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	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

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 10 and 11			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	25.0	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

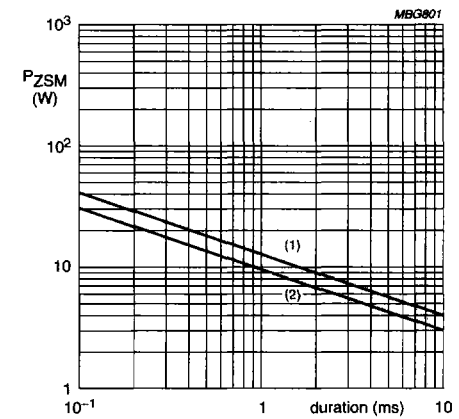
THERMAL CHARACTERISTICS

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

Note

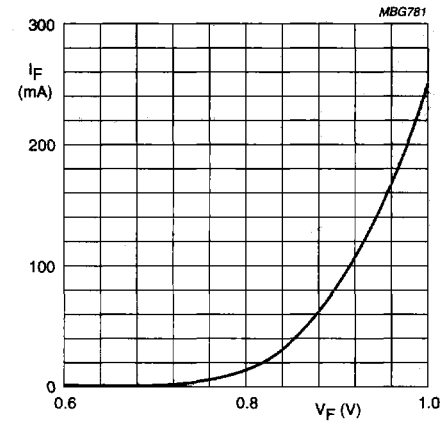
1. Device mounted on an FR4 double-sided copper-clad printed circuit-board; copper area = 2 cm^2.

GRAPHICAL DATA



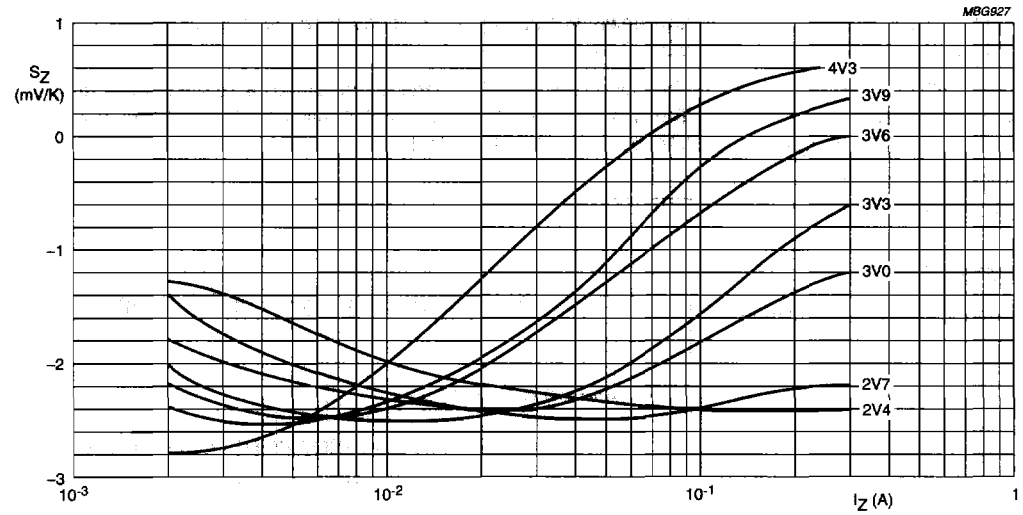
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.8 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



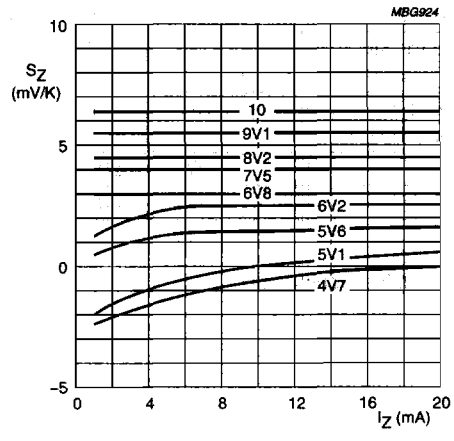
T_j = 25 °C.

Fig.9 Forward current as a function of forward voltage; typical values.



BZV90-C2V4 to C4V3.
T_j = 25 to 150 °C.

Fig.10 Temperature coefficient as a function of working current; typical values.



BZV90-C4V7 to C10.
T_j = 25 to 150 °C.

Fig.11 Temperature coefficient as a function of working current; typical values.