



**THE DATASHEET OF
BZV90-C10,115**



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Team Nexperia

DATA SHEET



BZV90 series Voltage regulator diodes

Product data sheet
Supersedes data of 1996 Oct 25

1999 May 17

Voltage regulator diodes

BZV90 series

FEATURES

- Total power dissipation: max. 1500 mW
- Tolerance series: approx. ±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. ±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 |

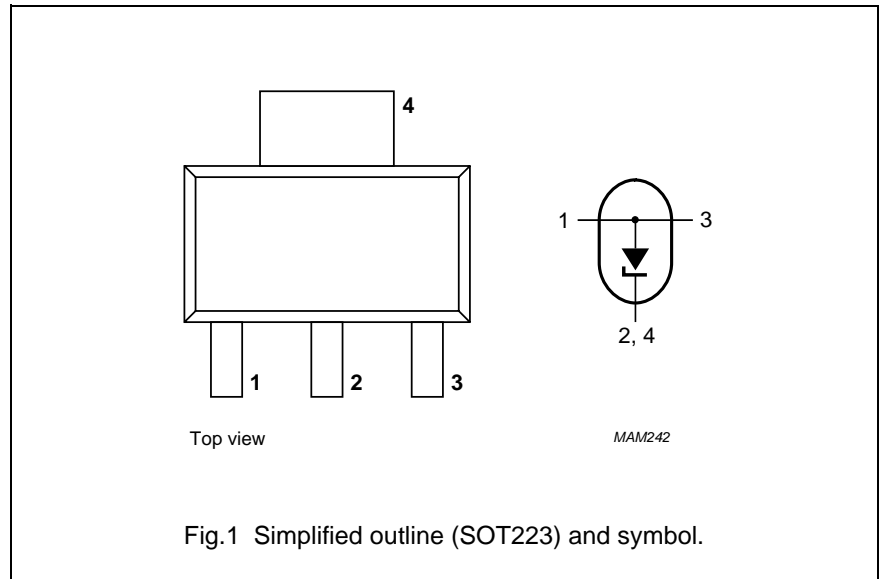


Fig.1 Simplified outline (SOT223) and symbol.

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 | $t_p = 100 \mu s$; 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 |

Per type

T_J = 25 °C unless otherwise specified.

| BZV90- CXXX | WORKING VOLTAGE V _Z (V) at I _{Ztest} | | DIFFERENTIAL RESISTANCE r _{diff} (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 | |
|----------------|--|------|---|------|---|------|------|--------------------------------------|--|------------------------------------|--------------------|
| | MIN. | MAX. | TYP. | MAX. | MIN. | TYP. | MAX. | | | I _R (μA) | V _R (V) |
| | | | | | | | | | MAX. | MAX. | MAX. |
| 2V4 | 2.2 | 2.6 | 70 | 100 | -3.5 | -1.6 | 0 | 5 | 450 | 50 | 1.0 |
| 2V7 | 2.5 | 2.9 | 75 | 100 | -3.5 | -2.0 | 0 | 5 | 450 | 20 | 1.0 |
| 3V0 | 2.8 | 3.2 | 80 | 95 | -3.5 | -2.1 | 0 | 5 | 450 | 10 | 1.0 |
| 3V3 | 3.1 | 3.5 | 85 | 95 | -3.5 | -2.4 | 0 | 5 | 450 | 5 | 1.0 |
| 3V6 | 3.4 | 3.8 | 85 | 90 | -3.5 | -2.4 | 0 | 5 | 450 | 5 | 1.0 |
| 3V9 | 3.7 | 4.1 | 85 | 90 | -3.5 | -2.5 | 0 | 5 | 450 | 3 | 1.0 |
| 4V3 | 4.0 | 4.6 | 80 | 90 | -3.5 | -2.5 | 0 | 5 | 450 | 3 | 1.0 |
| 4V7 | 4.4 | 5.0 | 50 | 80 | -3.5 | -1.4 | 0.2 | 5 | 300 | 3 | 2.0 |
| 5V1 | 4.8 | 5.4 | 40 | 60 | -2.7 | -0.8 | 1.2 | 5 | 300 | 2 | 2.0 |
| 5V6 | 5.2 | 6.0 | 15 | 40 | -2.0 | 1.2 | 2.5 | 5 | 300 | 1 | 2.0 |
| 6V2 | 5.8 | 6.6 | 6 | 10 | 0.4 | 2.3 | 3.7 | 5 | 200 | 3 | 4.0 |
| 6V8 | 6.4 | 7.2 | 6 | 15 | 1.2 | 3.0 | 4.5 | 5 | 200 | 2 | 4.0 |
| 7V5 | 7.0 | 7.9 | 6 | 15 | 2.5 | 4.0 | 5.3 | 5 | 150 | 1 | 5.0 |
| 8V2 | 7.7 | 8.7 | 6 | 15 | 3.2 | 4.6 | 6.2 | 5 | 150 | 0.7 | 5.0 |
| 9V1 | 8.5 | 9.6 | 6 | 15 | 3.8 | 5.5 | 7.0 | 5 | 150 | 0.5 | 6.0 |
| 10 | 9.4 | 10.6 | 8 | 20 | 4.5 | 6.4 | 8.0 | 5 | 90 | 0.2 | 7.0 |
| 11 | 10.4 | 11.6 | 10 | 20 | 5.4 | 7.4 | 9.0 | 5 | 85 | 0.1 | 8.0 |
| 12 | 11.4 | 12.7 | 10 | 25 | 6.0 | 8.4 | 10.0 | 5 | 85 | 0.1 | 8.0 |
| 13 | 12.4 | 14.1 | 10 | 30 | 7.0 | 9.4 | 11.0 | 5 | 80 | 0.1 | 8.0 |
| 15 | 13.8 | 15.6 | 10 | 30 | 9.2 | 11.4 | 13.0 | 5 | 75 | 0.05 | 10.5 |
| 16 | 15.3 | 17.1 | 10 | 40 | 10.4 | 12.4 | 14.0 | 5 | 75 | 0.05 | 11.2 |
| 18 | 16.8 | 19.1 | 10 | 45 | 12.4 | 14.4 | 16.0 | 5 | 70 | 0.05 | 12.6 |
| 20 | 18.8 | 21.2 | 15 | 55 | 14.4 | 16.4 | 18.0 | 5 | 60 | 0.05 | 14.0 |

| BZV90- CXXX | WORKING VOLTAGE V_Z (V) at I_{Ztest} | | DIFFERENTIAL RESISTANCE r_{diff} (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 | |
|----------------|--|------|--|------|---|------|------|-------------------------------|--|------------------------------------|-----------|
| | MIN. | MAX. | TYP. | MAX. | MIN. | TYP. | MAX. | | | I_R (μ A) | V_R (V) |
| | | | | | | | | | MAX. | | MAX. |
| 22 | 20.8 | 23.3 | 20 | 55 | 16.4 | 18.4 | 20.0 | 5 | 60 | 0.05 | 15.4 |
| 24 | 22.8 | 25.6 | 25 | 70 | 18.4 | 20.4 | 22.0 | 5 | 55 | 0.05 | 16.8 |
| 27 | 25.0 | 28.9 | 25 | 80 | 21.4 | 23.4 | 25.3 | 2 | 50 | 0.05 | 18.9 |
| 30 | 28.0 | 32.0 | 30 | 80 | 24.4 | 26.6 | 29.4 | 2 | 50 | 0.05 | 21.0 |
| 33 | 31.0 | 35.0 | 35 | 80 | 27.4 | 29.7 | 33.4 | 2 | 45 | 0.05 | 23.1 |
| 36 | 34.0 | 38.0 | 35 | 90 | 30.4 | 33.0 | 37.4 | 2 | 45 | 0.05 | 25.2 |
| 39 | 37.0 | 41.0 | 40 | 130 | 33.4 | 36.4 | 41.2 | 2 | 45 | 0.05 | 27.3 |
| 43 | 40.0 | 46.0 | 45 | 150 | 37.6 | 41.2 | 46.6 | 2 | 40 | 0.05 | 30.1 |
| 47 | 44.0 | 50.0 | 50 | 170 | 42.0 | 46.1 | 51.8 | 2 | 40 | 0.05 | 32.9 |
| 51 | 48.0 | 54.0 | 60 | 180 | 46.6 | 51.0 | 57.2 | 2 | 40 | 0.05 | 35.7 |
| 56 | 52.0 | 60.0 | 70 | 200 | 52.2 | 57.0 | 63.8 | 2 | 40 | 0.05 | 39.2 |
| 62 | 58.0 | 66.0 | 80 | 215 | 58.8 | 64.4 | 71.6 | 2 | 35 | 0.05 | 43.4 |
| 68 | 64.0 | 72.0 | 90 | 240 | 65.6 | 71.7 | 79.8 | 2 | 35 | 0.05 | 47.6 |
| 75 | 70.0 | 79.0 | 95 | 255 | 73.4 | 80.2 | 88.6 | 2 | 35 | 0.05 | 52.5 |

Voltage regulator diodes

BZV90 series

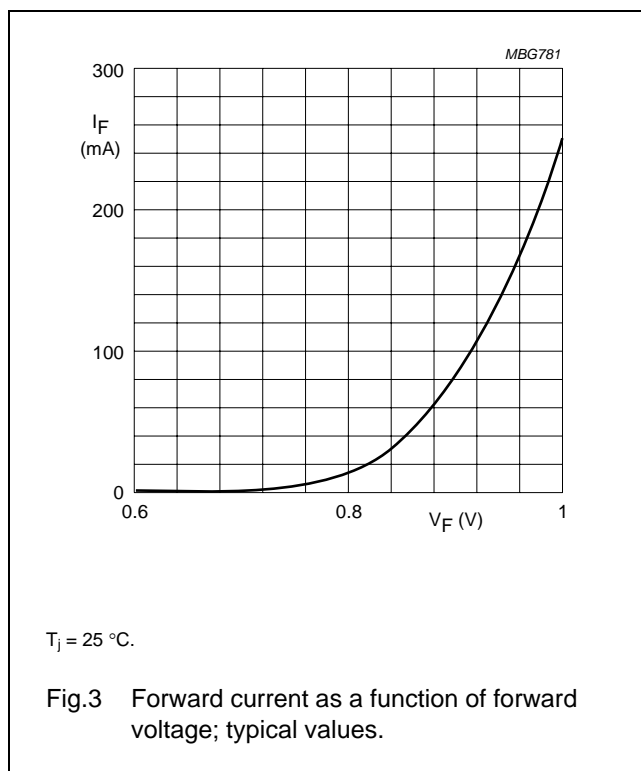
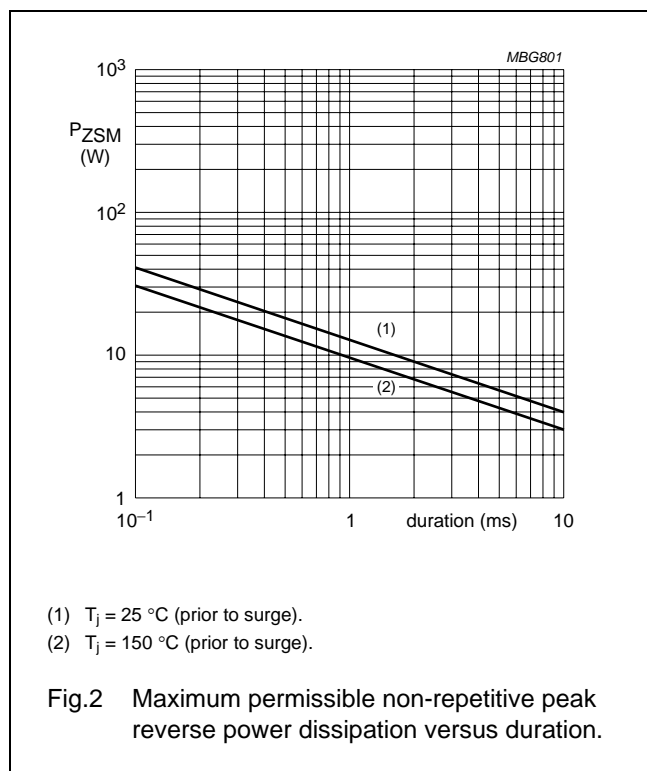
THERMAL CHARACTERISTICS

| 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 cm².

GRAPHICAL DATA



Voltage regulator diodes

BZV90 series



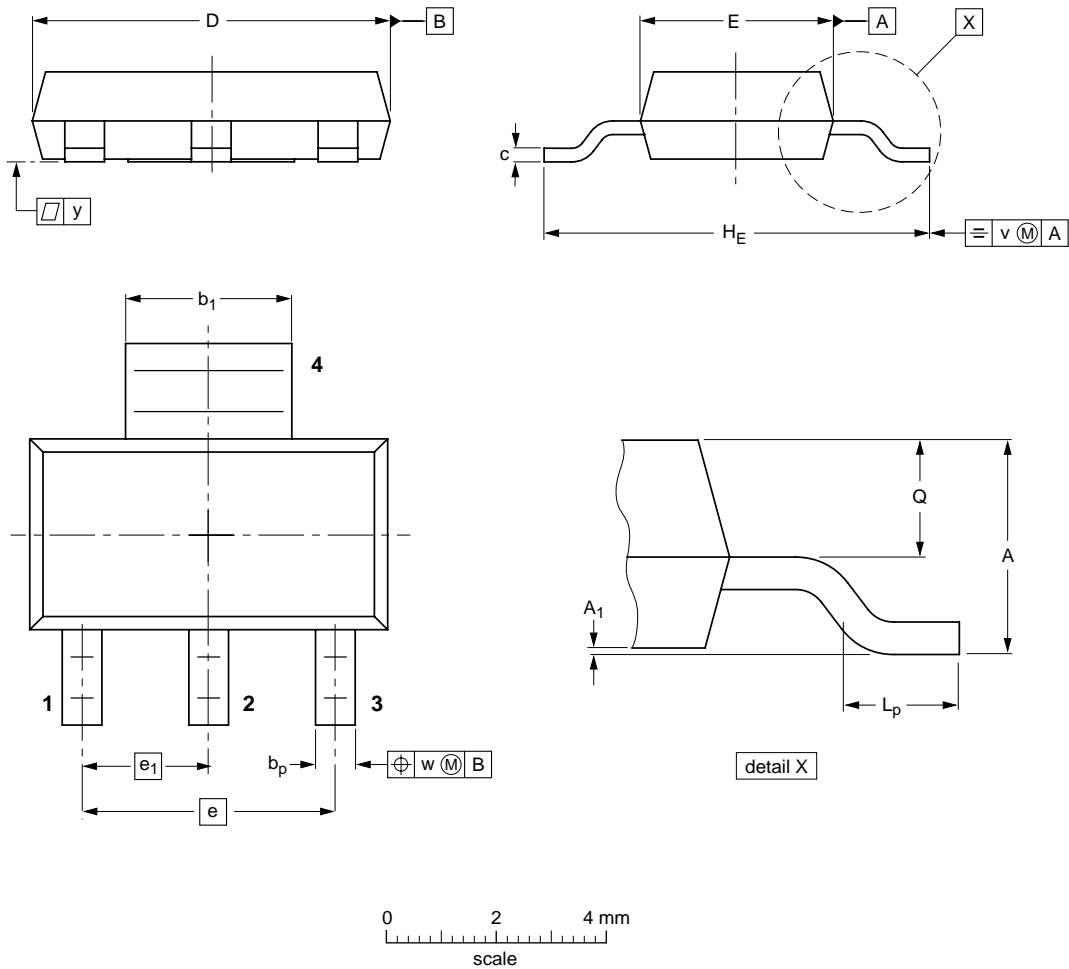
Voltage regulator diodes

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 ₁ | b _p | b ₁ | c | D | E | e | e ₁ | H _E | L _p | 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 | | | SC-73 | | | 97-02-28 99-09-13 |

Voltage regulator diodes

BZV90 series

DATA SHEET STATUS

| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITION |
|--------------------------------|-------------------------------|---|
| Objective data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary data sheet | Qualification | This document contains data from the preliminary specification. |
| Product data sheet | Production | This document contains the product specification. |

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NXP Semiconductors

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This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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