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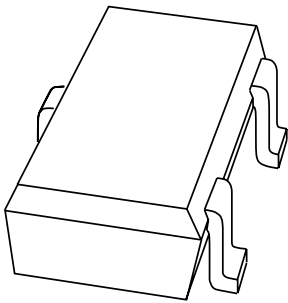
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Kind regards,

Team Nexperia

DATA SHEET



BZB784 series Voltage regulator double diodes

Product data sheet
Supersedes data of 2000 May 24

2001 Feb 27

Voltage regulator double diodes

BZB784 series

FEATURES

- Total power dissipation: max. 350 mW
- Approx. 5% V_Z tolerance
- Working voltage range: nom. 2.4 to 15 V (E24 range).

APPLICATIONS

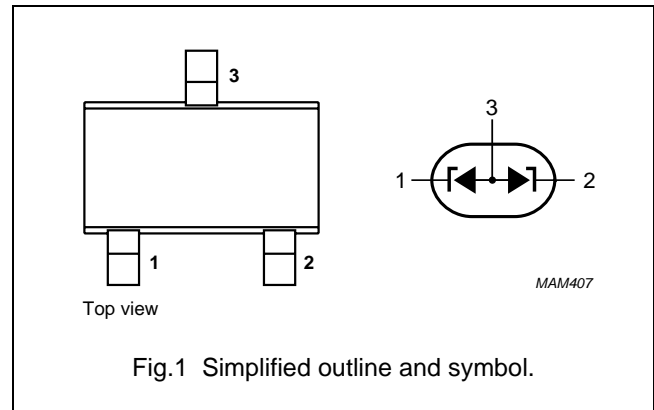
- General regulation functions
- ESD and surge protection.

DESCRIPTION

Low-power voltage regulator diodes in a small SOT323 (SC-70) package.

PINNING SOT323 (SC-70)

| PIN | DESCRIPTION |
|-----|--------------|
| 1 | cathode |
| 2 | cathode |
| 3 | common anode |



MARKING

| TYPE NUMBER | MARKING CODE | TYPE NUMBER | MARKING CODE | TYPE NUMBER | MARKING CODE | TYPE NUMBER | MARKING CODE |
|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|
| BZB784-C2V4 | 91 | BZB784-C3V9 | 96 | BZB784-C6V2 | 9B | BZB784-C10 | 9G |
| BZB784-C2V7 | 92 | BZB784-C4V3 | 97 | BZB784-C6V8 | 9C | BZB784-C11 | 9H |
| BZB784-C3V0 | 93 | BZB784-C4V7 | 98 | BZB784-C7V5 | 9D | BZB784-C12 | 9J |
| BZB784-C3V3 | 94 | BZB784-C5V1 | 99 | BZB784-C8V2 | 9E | BZB784-C13 | 9K |
| BZB784-C3V6 | 95 | BZB784-C5V6 | 9A | BZB784-C9V1 | 9F | BZB784-C15 | 9L |

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|---|--|-------------|------|------------------|
| I_F | continuous forward current | | – | 200 | mA |
| I_{ZSM} | non-repetitive peak reverse current | $t_p = 100 \mu s$; square wave; $T_{amb} = 25 \text{ }^\circ\text{C}$; prior to surge | see Table 1 | | |
| P_{tot} | total power dissipation; note 1 | $T_{amb} = 25 \text{ }^\circ\text{C}$; 2 diodes loaded | – | 350 | mW |
| | | $T_{amb} = 25 \text{ }^\circ\text{C}$; 1 diode loaded | – | 180 | mW |
| P_{ZSM} | non-repetitive peak reverse dissipation | $t_p = 100 \mu s$; square wave; $T_{amb} = 25 \text{ }^\circ\text{C}$; prior to surge | – | 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 printed-circuit board.

Voltage regulator double diodes

BZB784 series

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|---|-------------------------|-------|------|
| $R_{th\ j-s}$ | thermal resistance from junction to soldering point | 2 diodes loaded; note 1 | 140 | K/W |
| | | 1 diode loaded; note 1 | 265 | K/W |
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | 2 diodes loaded; note 2 | 355 | K/W |
| | | 1 diode loaded; note 2 | 680 | K/W |

Notes

1. Solder points on cathode tabs.
2. Device mounted on a FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

Total BZB784-C series

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

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|------------|-----------------------|----------------------------------|------|---------------|
| V_F | forward voltage | $I_F = 10\text{ mA}$; see Fig.2 | 0.9 | V |
| I_R | reverse current | | | |
| | BZB784-C2V4 | $V_R = 1\text{ V}$ | 50 | μA |
| | BZB784-C2V7 | $V_R = 1\text{ V}$ | 20 | μA |
| | BZB784-C3V0 | $V_R = 1\text{ V}$ | 10 | μA |
| | BZB784-C3V3 | $V_R = 1\text{ V}$ | 5 | μA |
| | BZB784-C3V6 | $V_R = 1\text{ V}$ | 5 | μA |
| | BZB784-C3V9 | $V_R = 1\text{ V}$ | 3 | μA |
| | BZB784-C4V3 | $V_R = 1\text{ V}$ | 3 | μA |
| | BZB784-C4V7 | $V_R = 2\text{ V}$ | 3 | μA |
| | BZB784-C5V1 | $V_R = 2\text{ V}$ | 2 | μA |
| | BZB784-C5V6 | $V_R = 2\text{ V}$ | 1 | μA |
| | BZB784-C6V2 | $V_R = 4\text{ V}$ | 3 | μA |
| | BZB784-C6V8 | $V_R = 4\text{ V}$ | 2 | μA |
| | BZB784-C7V5 | $V_R = 5\text{ V}$ | 1 | μA |
| | BZB784-C8V2 | $V_R = 5\text{ V}$ | 700 | nA |
| | BZB784-C9V1 | $V_R = 6\text{ V}$ | 500 | nA |
| | BZB784-C10 | $V_R = 7\text{ V}$ | 200 | nA |
| | BZB784-C11 | $V_R = 8\text{ V}$ | 100 | nA |
| | BZB784-C12 | $V_R = 8\text{ V}$ | 100 | nA |
| | BZB784-C13 | $V_R = 8\text{ V}$ | 100 | nA |
| BZB784-C15 | $V_R = 10.5\text{ V}$ | 50 | nA | |

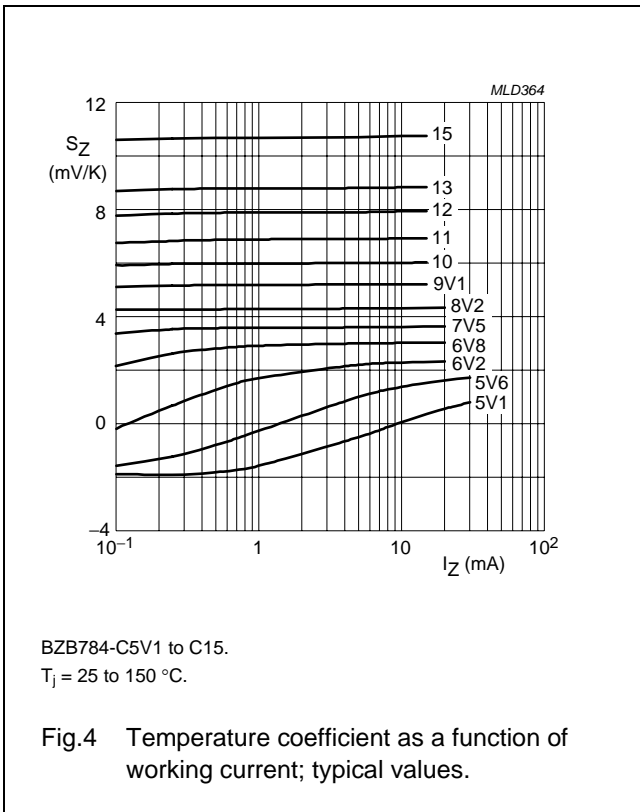
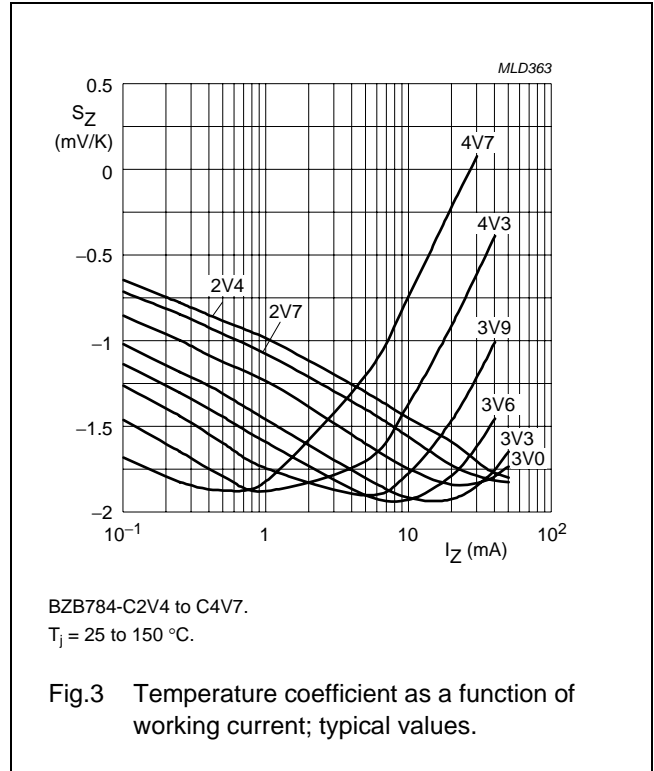
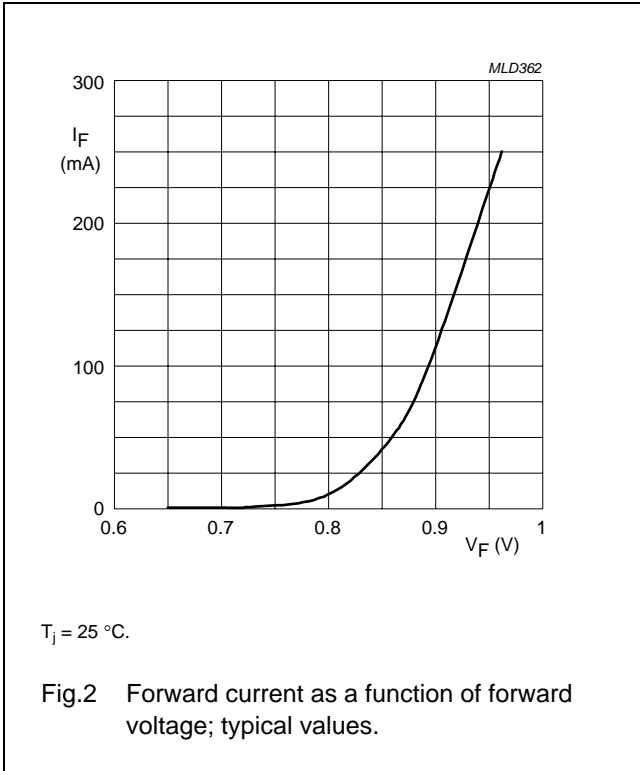
Table 1 Per type BZB784-C2V4 to C15 $T_j = 25\text{ }^\circ\text{C}$; unless otherwise specified.

| BZB784-C XXX | WORKING VOLTAGE V_Z (V) at $I_Z = 5\text{ mA}$ | | DIFFERENTIAL RESISTANCE r_{dif} (Ω) | | | | TEMP. COEFFICIENT S_Z (mV/K) at $I_{Ztest} = 5\text{ mA}$ (see Figs 3 and 4) | DIODE CAP. C_d (pF) at $f = 1\text{ MHz}$; $V_R = 0\text{ V}$ |
|-----------------|---|------|---|------|------------------------|------|--|---|
| | Tol. $\approx 5\%$ | | at $I_Z = 1\text{ mA}$ | | at $I_Z = 5\text{ mA}$ | | | |
| | MIN. | MAX. | TYP. | MAX. | TYP. | MAX. | | |
| 2V4 | 2.2 | 2.6 | 275 | 600 | 70 | 100 | -1.3 | 450 |
| 2V7 | 2.5 | 2.9 | 300 | 600 | 75 | 100 | -1.4 | 450 |
| 3V0 | 2.8 | 3.2 | 325 | 600 | 80 | 95 | -1.6 | 450 |
| 3V3 | 3.1 | 3.5 | 350 | 600 | 85 | 95 | -1.8 | 450 |
| 3V6 | 3.4 | 3.8 | 375 | 600 | 85 | 90 | -1.9 | 450 |
| 3V9 | 3.7 | 4.1 | 400 | 600 | 85 | 90 | -1.9 | 450 |
| 4V3 | 4.0 | 4.6 | 410 | 600 | 80 | 90 | -1.7 | 450 |
| 4V7 | 4.4 | 5.0 | 425 | 500 | 50 | 80 | -1.2 | 300 |
| 5V1 | 4.8 | 5.4 | 400 | 480 | 40 | 60 | -0.5 | 300 |
| 5V6 | 5.2 | 6.0 | 80 | 400 | 15 | 40 | 1.0 | 300 |
| 6V2 | 5.8 | 6.6 | 40 | 150 | 6 | 10 | 2.2 | 200 |
| 6V8 | 6.4 | 7.2 | 30 | 80 | 6 | 15 | 3.0 | 200 |
| 7V5 | 7.0 | 7.9 | 30 | 80 | 6 | 15 | 3.6 | 150 |
| 8V2 | 7.7 | 8.7 | 40 | 80 | 6 | 15 | 4.3 | 150 |
| 9V1 | 8.5 | 9.6 | 40 | 100 | 6 | 15 | 5.2 | 150 |
| 10 | 9.4 | 10.6 | 50 | 150 | 8 | 20 | 6.0 | 90 |
| 11 | 10.4 | 11.6 | 50 | 150 | 10 | 20 | 6.9 | 90 |
| 12 | 11.4 | 12.7 | 50 | 150 | 10 | 25 | 7.9 | 85 |
| 13 | 12.4 | 14.1 | 50 | 170 | 10 | 30 | 8.8 | 80 |
| 15 | 13.8 | 15.6 | 50 | 200 | 10 | 30 | 10.7 | 75 |

Voltage regulator double diodes

BZB784 series

GRAPHICAL DATA



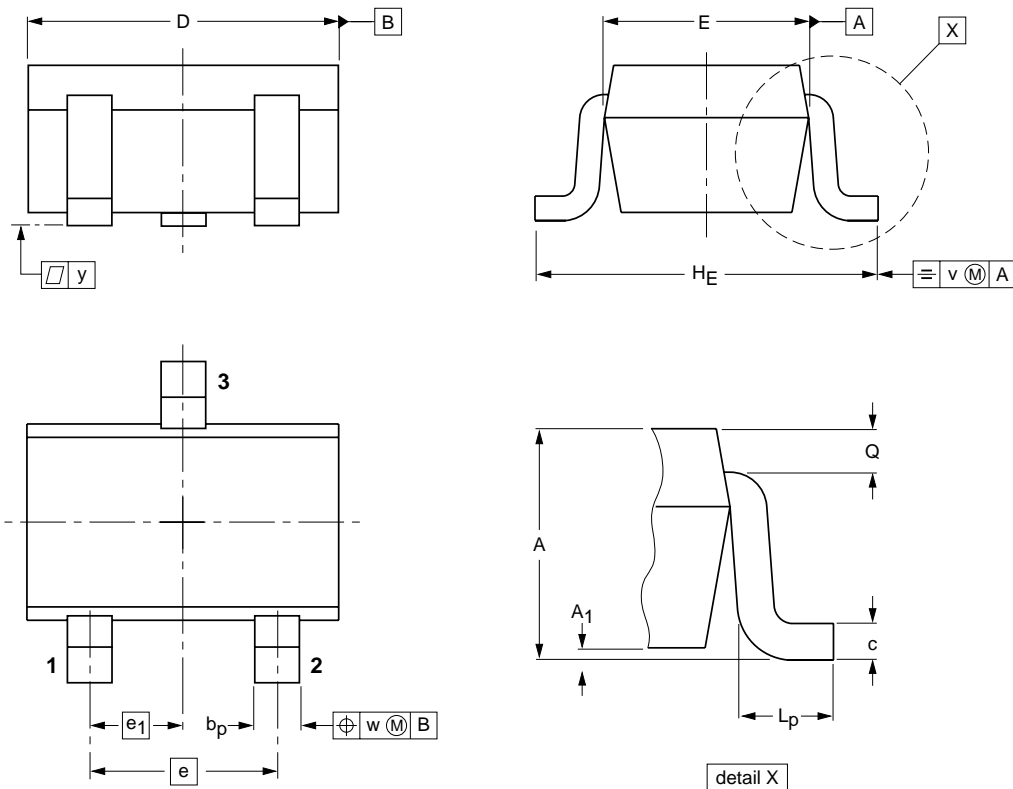
Voltage regulator double diodes

BZB784 series

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ max | b _p | c | D | E | e | e ₁ | H _E | L _p | Q | v | w |
|------|------------|-----------------------|----------------|--------------|------------|--------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm | 1.1 0.8 | 0.1 | 0.4 0.3 | 0.25 0.10 | 2.2 1.8 | 1.35 1.15 | 1.3 | 0.65 | 2.2 2.0 | 0.45 0.15 | 0.23 0.13 | 0.2 | 0.2 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|------------------------|------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT323 | | | SC-70 | | | 97-02-28 |

Voltage regulator double diodes

BZB784 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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Printed in The Netherlands

613514/02/pp8

Date of release: 2001 Feb 27

Document order number: 9397 750 08112



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