



**THE DATASHEET OF
BZB784-C12**



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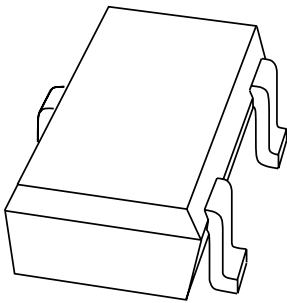
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Team Nexperia

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

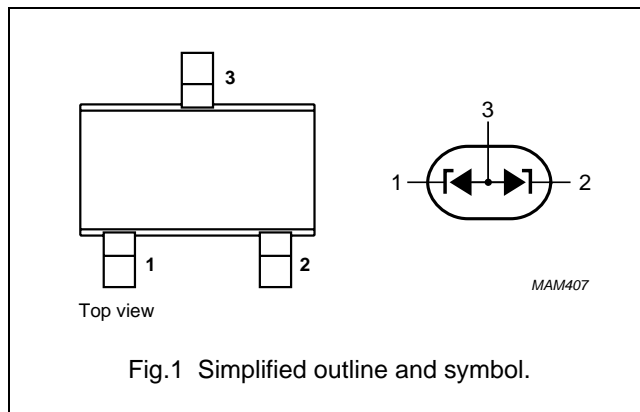
- General regulation functions
- ESD and surge protection.

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; $T_{amb} = 25 \text{ }^\circ C$; prior to surge | see Table 1 | | |
| P_{tot} | total power dissipation; note 1 | $T_{amb} = 25 \text{ }^\circ C$; 2 diodes loaded | – | 350 | mW |
| | | $T_{amb} = 25 \text{ }^\circ C$; 1 diode loaded | – | 180 | mW |
| P_{ZSM} | non-repetitive peak reverse dissipation | $t_p = 100 \mu s$; square wave; $T_{amb} = 25 \text{ }^\circ C$; prior to surge | – | 40 | W |
| T_{stg} | storage temperature | | –65 | +150 | $^\circ C$ |
| T_j | junction temperature | | – | 150 | $^\circ C$ |

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

- Solder points on cathode tabs.
- 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 | |

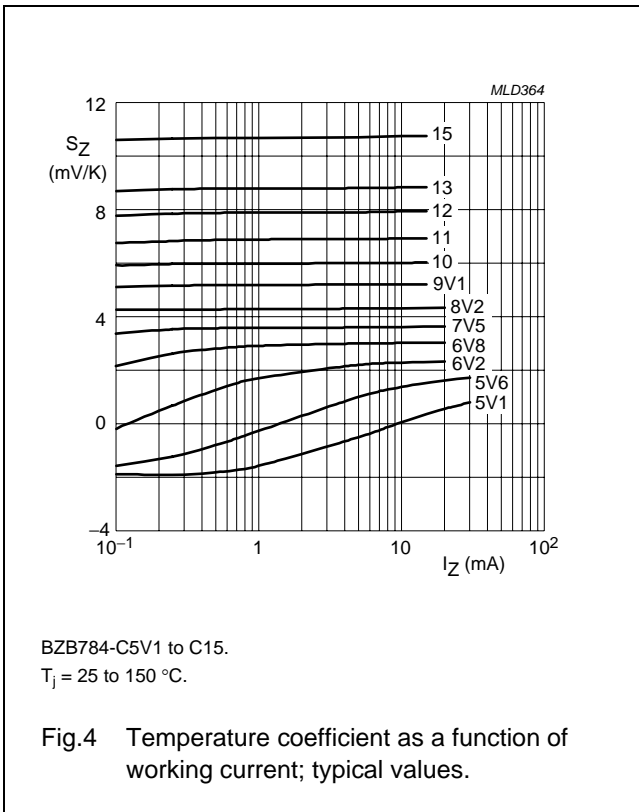
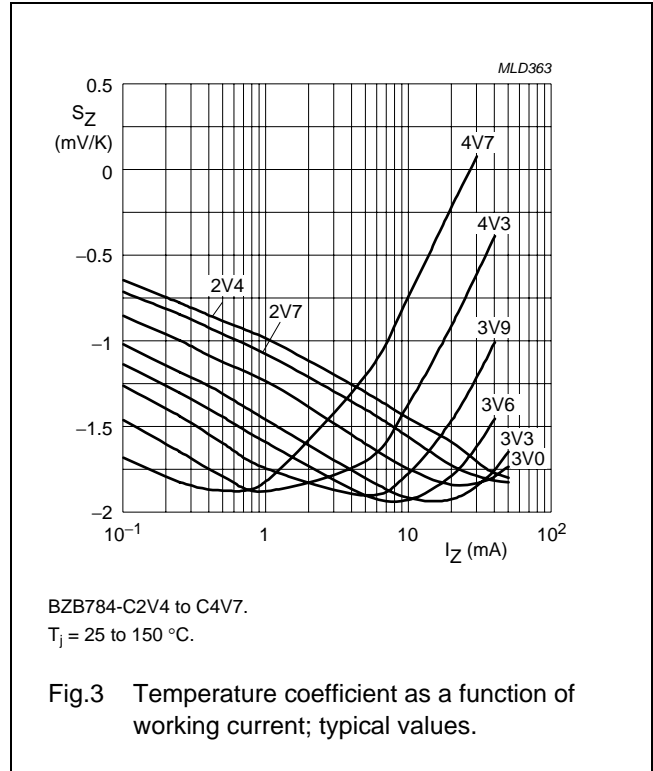
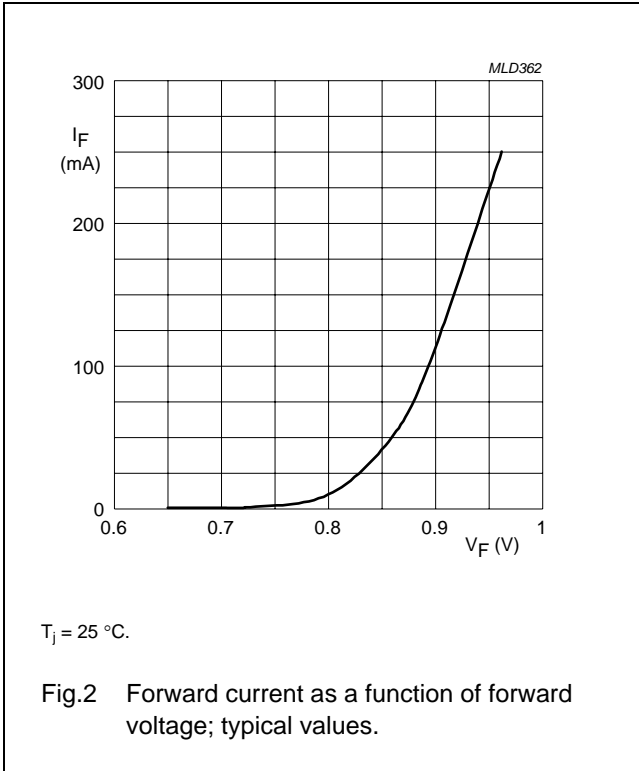
Table 1 Per type BZB784-C2V4 to C15
 $T_j = 25\text{ }^\circ\text{C}$; unless otherwise specified.

| 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 $I_{Z\text{test}} = 5\text{ mA}$ (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 | | | MAX. | 450 |
| 2V7 | 2.5 | 2.9 | 300 | 600 | 75 | 100 | | | | 450 |
| 3V0 | 2.8 | 3.2 | 325 | 600 | 80 | 95 | | | | 450 |
| 3V3 | 3.1 | 3.5 | 350 | 600 | 85 | 95 | | | | 450 |
| 3V6 | 3.4 | 3.8 | 375 | 600 | 85 | 90 | | | | 450 |
| 3V9 | 3.7 | 4.1 | 400 | 600 | 85 | 90 | | | | 450 |
| 4V3 | 4.0 | 4.6 | 410 | 600 | 80 | 90 | | | | 450 |
| 4V7 | 4.4 | 5.0 | 425 | 500 | 50 | 80 | | | | 300 |
| 5V1 | 4.8 | 5.4 | 400 | 480 | 40 | 60 | | | | 300 |
| 5V6 | 5.2 | 6.0 | 80 | 400 | 15 | 40 | | | | 300 |
| 6V2 | 5.8 | 6.6 | 40 | 150 | 6 | 10 | | | | 200 |
| 6V8 | 6.4 | 7.2 | 30 | 80 | 6 | 15 | | | | 200 |
| 7V5 | 7.0 | 7.9 | 30 | 80 | 6 | 15 | | | | 150 |
| 8V2 | 7.7 | 8.7 | 40 | 80 | 6 | 15 | | | | 150 |
| 9V1 | 8.5 | 9.6 | 40 | 100 | 6 | 15 | | | | 150 |
| 10 | 9.4 | 10.6 | 50 | 150 | 8 | 20 | | | | 90 |
| 11 | 10.4 | 11.6 | 50 | 150 | 10 | 20 | | | | 90 |
| 12 | 11.4 | 12.7 | 50 | 150 | 10 | 25 | | | | 85 |
| 13 | 12.4 | 14.1 | 50 | 170 | 10 | 30 | | | | 80 |
| 15 | 13.8 | 15.6 | 50 | 200 | 10 | 30 | | | | 75 |

Voltage regulator double diodes

BZB784 series

GRAPHICAL DATA



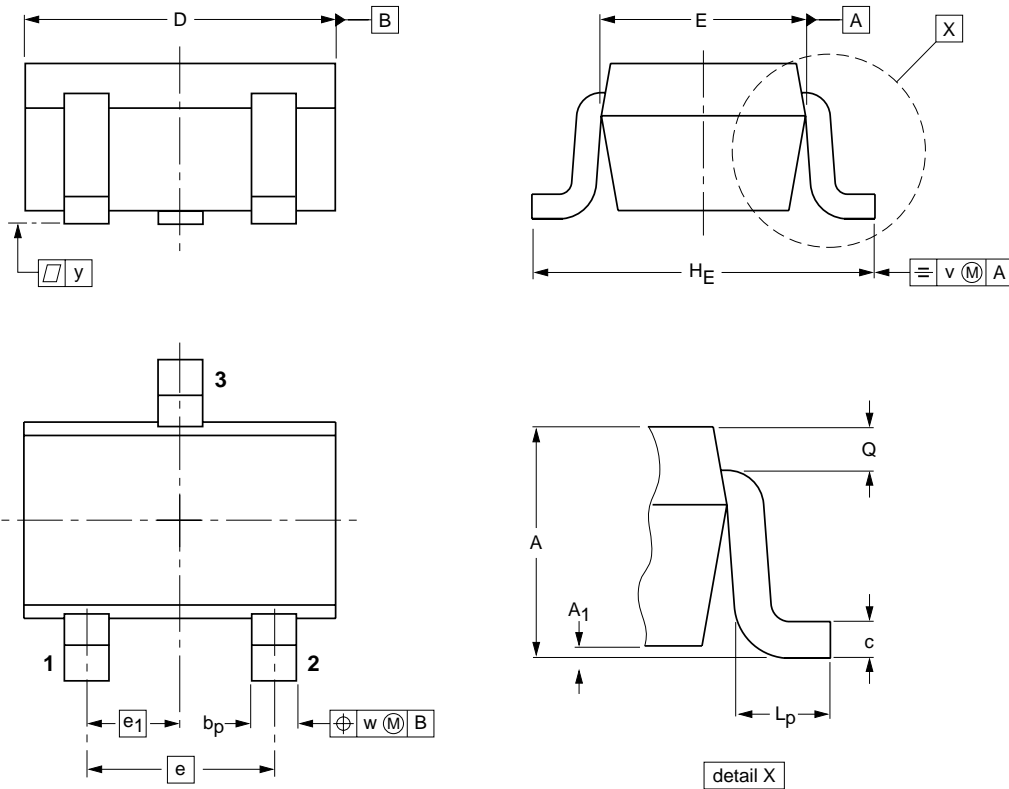
Voltage regulator double diodes

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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