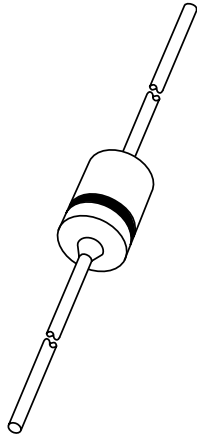


DATA SHEET



BZX79 series Voltage regulator diodes

Product data sheet
Supersedes data of 1999 May 25

2002 Feb 27

Voltage regulator diodes

BZX79 series

FEATURES

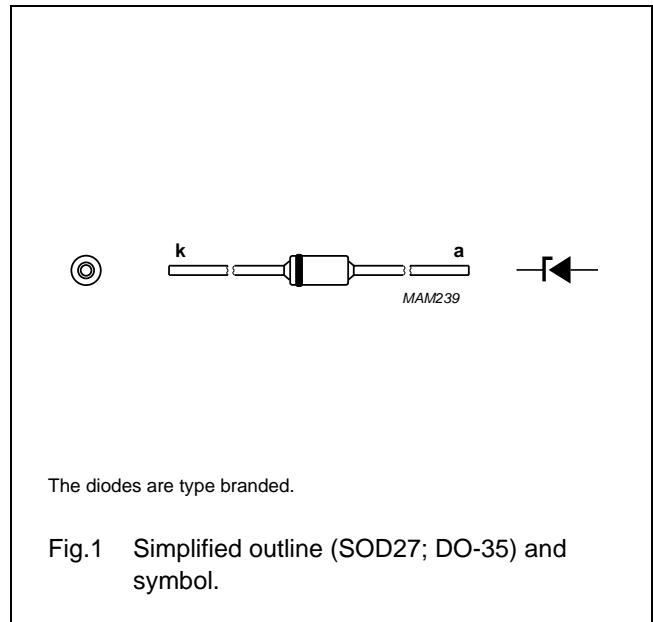
- Total power dissipation: max. 500 mW
- Two tolerance series: $\pm 2\%$, and approx. $\pm 5\%$
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- Low voltage stabilizers or voltage references.

DESCRIPTION

Low-power voltage regulator diodes in hermetically sealed leaded glass SOD27 (DO-35) packages. The diodes are available in the normalized E24 $\pm 2\%$ (BZX79-B) and approx. $\pm 5\%$ (BZX79-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.



LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|---|---|--------------------|------|------------------|
| I_F | continuous forward current | | – | 250 | 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 Tables 1 and 2 | | A |
| P_{tot} | total power dissipation | $T_{amb} = 50 \text{ }^\circ\text{C}$; note 1 | – | 400 | mW |
| | | $T_{amb} = 50 \text{ }^\circ\text{C}$; note 2 | – | 500 | 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.3 | – | 40 | W |
| T_{stg} | storage temperature | | –65 | +200 | $^\circ\text{C}$ |
| T_j | junction temperature | | –65 | +200 | $^\circ\text{C}$ |

Notes

1. Device mounted on a printed circuit-board without metallization pad; lead length max.
2. Tie-point temperature $\leq 50 \text{ }^\circ\text{C}$; max. lead length 8 mm.

ELECTRICAL CHARACTERISTICS

Total BZX79-B and BZX79-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.4 | 0.9 | V |

Voltage regulator diodes

BZX79 series

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|----------------------------|---------------------|--------------------|-------------|---------------|
| I_R | reverse current | | | |
| | BZX79-B/C2V4 | $V_R = 1\text{ V}$ | 50 | μA |
| | BZX79-B/C2V7 | $V_R = 1\text{ V}$ | 20 | μA |
| | BZX79-B/C3V0 | $V_R = 1\text{ V}$ | 10 | μA |
| | BZX79-B/C3V3 | $V_R = 1\text{ V}$ | 5 | μA |
| | BZX79-B/C3V6 | $V_R = 1\text{ V}$ | 5 | μA |
| | BZX79-B/C3V9 | $V_R = 1\text{ V}$ | 3 | μA |
| | BZX79-B/C4V3 | $V_R = 1\text{ V}$ | 3 | μA |
| | BZX79-B/C4V7 | $V_R = 2\text{ V}$ | 3 | μA |
| | BZX79-B/C5V1 | $V_R = 2\text{ V}$ | 2 | μA |
| | BZX79-B/C5V6 | $V_R = 2\text{ V}$ | 1 | μA |
| | BZX79-B/C6V2 | $V_R = 4\text{ V}$ | 3 | μA |
| | BZX79-B/C6V8 | $V_R = 4\text{ V}$ | 2 | μA |
| | BZX79-B/C7V5 | $V_R = 5\text{ V}$ | 1 | μA |
| | BZX79-B/C8V2 | $V_R = 5\text{ V}$ | 700 | nA |
| | BZX79-B/C9V1 | $V_R = 6\text{ V}$ | 500 | nA |
| | BZX79-B/C10 | $V_R = 7\text{ V}$ | 200 | nA |
| | BZX79-B/C11 | $V_R = 8\text{ V}$ | 100 | nA |
| | BZX79-B/C12 | $V_R = 8\text{ V}$ | 100 | nA |
| | BZX79-B/C13 | $V_R = 8\text{ V}$ | 100 | nA |
| BZX79-B/C15 to BZX79-B/C75 | $V_R = 0.7V_{Znom}$ | 50 | nA | |

Voltage regulator diodes

BZX79 series

Table 1 Per type, BZX79-B/C2V4 to BZX79-B/C24 $T_j = 25\text{ °C}$ unless otherwise specified.

| BZX79- Bxxx Cxxx | WORKING VOLTAGE V_z (V) at $I_{ztest} = 5\text{ mA}$ | | | | DIFFERENTIAL RESISTANCE r_{dif} (Ω) | | | | TEMP. COEFF. S_z (mV/K) at $I_{ztest} = 5\text{ mA}$ (see Figs 5 and 6) | | | DIODE CAP. C_d (pF) at $f = 1\text{ MHz}$; $V_R = 0\text{ V}$ | NON-REPETITIVE PEAK REVERSE CURRENT I_{zSM} (A) at $t_p = 100\text{ }\mu\text{s}$; $T_{amb} = 25\text{ °C}$ |
|------------------------|--|-------|-------------------------------|------|---|------|------------------------------|------|--|------|------|---|---|
| | Tol. $\pm 2\%$ (B) | | Tol. approx. $\pm 5\%$ (C) | | at $I_{ztest} = 1\text{ mA}$ | | at $I_{ztest} = 5\text{ mA}$ | | MIN. | TYP. | MAX. | MAX. | MAX. |
| | MIN. | MAX. | MIN. | MAX. | TYP. | MAX. | TYP. | MAX. | | | | | |
| 2V4 | 2.35 | 2.45 | 2.2 | 2.6 | 275 | 600 | 70 | 100 | -3.5 | -1.6 | 0 | 450 | 6.0 |
| 2V7 | 2.65 | 2.75 | 2.5 | 2.9 | 300 | 600 | 75 | 100 | -3.5 | -2.0 | 0 | 450 | 6.0 |
| 3V0 | 2.94 | 3.06 | 2.8 | 3.2 | 325 | 600 | 80 | 95 | -3.5 | -2.1 | 0 | 450 | 6.0 |
| 3V3 | 3.23 | 3.37 | 3.1 | 3.5 | 350 | 600 | 85 | 95 | -3.5 | -2.4 | 0 | 450 | 6.0 |
| 3V6 | 3.53 | 3.67 | 3.4 | 3.8 | 375 | 600 | 85 | 90 | -3.5 | -2.4 | 0 | 450 | 6.0 |
| 3V9 | 3.82 | 3.98 | 3.7 | 4.1 | 400 | 600 | 85 | 90 | -3.5 | -2.5 | 0 | 450 | 6.0 |
| 4V3 | 4.21 | 4.39 | 4.0 | 4.6 | 410 | 600 | 80 | 90 | -3.5 | -2.5 | 0 | 450 | 6.0 |
| 4V7 | 4.61 | 4.79 | 4.4 | 5.0 | 425 | 500 | 50 | 80 | -3.5 | -1.4 | 0.2 | 300 | 6.0 |
| 5V1 | 5.00 | 5.20 | 4.8 | 5.4 | 400 | 480 | 40 | 60 | -2.7 | -0.8 | 1.2 | 300 | 6.0 |
| 5V6 | 5.49 | 5.71 | 5.2 | 6.0 | 80 | 400 | 15 | 40 | -2.0 | 1.2 | 2.5 | 300 | 6.0 |
| 6V2 | 6.08 | 6.32 | 5.8 | 6.6 | 40 | 150 | 6 | 10 | 0.4 | 2.3 | 3.7 | 200 | 6.0 |
| 6V8 | 6.66 | 6.94 | 6.4 | 7.2 | 30 | 80 | 6 | 15 | 1.2 | 3.0 | 4.5 | 200 | 6.0 |
| 7V5 | 7.35 | 7.65 | 7.0 | 7.9 | 30 | 80 | 6 | 15 | 2.5 | 4.0 | 5.3 | 150 | 4.0 |
| 8V2 | 8.04 | 8.36 | 7.7 | 8.7 | 40 | 80 | 6 | 15 | 3.2 | 4.6 | 6.2 | 150 | 4.0 |
| 9V1 | 8.92 | 9.28 | 8.5 | 9.6 | 40 | 100 | 6 | 15 | 3.8 | 5.5 | 7.0 | 150 | 3.0 |
| 10 | 9.80 | 10.20 | 9.4 | 10.6 | 50 | 150 | 8 | 20 | 4.5 | 6.4 | 8.0 | 90 | 3.0 |
| 11 | 10.80 | 11.20 | 10.4 | 11.6 | 50 | 150 | 10 | 20 | 5.4 | 7.4 | 9.0 | 85 | 2.5 |
| 12 | 11.80 | 12.20 | 11.4 | 12.7 | 50 | 150 | 10 | 25 | 6.0 | 8.4 | 10.0 | 85 | 2.5 |
| 13 | 12.70 | 13.30 | 12.4 | 14.1 | 50 | 170 | 10 | 30 | 7.0 | 9.4 | 11.0 | 80 | 2.5 |
| 15 | 14.70 | 15.30 | 13.8 | 15.6 | 50 | 200 | 10 | 30 | 9.2 | 11.4 | 13.0 | 75 | 2.0 |
| 16 | 15.70 | 16.30 | 15.3 | 17.1 | 50 | 200 | 10 | 40 | 10.4 | 12.4 | 14.0 | 75 | 1.5 |
| 18 | 17.60 | 18.40 | 16.8 | 19.1 | 50 | 225 | 10 | 45 | 12.4 | 14.4 | 16.0 | 70 | 1.5 |
| 20 | 19.60 | 20.40 | 18.8 | 21.2 | 60 | 225 | 15 | 55 | 12.3 | 15.6 | 18.0 | 60 | 1.5 |
| 22 | 21.60 | 22.40 | 20.8 | 23.3 | 60 | 250 | 20 | 55 | 14.1 | 17.6 | 20.0 | 60 | 1.25 |
| 24 | 23.50 | 24.50 | 22.8 | 25.6 | 60 | 250 | 25 | 70 | 15.9 | 19.6 | 22.0 | 55 | 1.25 |

Voltage regulator diodes

BZX79 series

Table 2 Per type, BZX79-B/C27 to BZX79-B/C75 $T_j = 25\text{ °C}$ unless otherwise specified.

| BZX79- Bxxx Cxxx | WORKING VOLTAGE V_z (V) at $I_{z\text{test}} = 2\text{ mA}$ | | | | DIFFERENTIAL RESISTANCE r_{dif} (Ω) | | | | TEMP. COEFF. S_z (mV/K) at $I_{z\text{test}} = 2\text{ mA}$ (see Figs 5 and 6) | | | DIODE CAP. C_d (pF) at $f = 1\text{ MHz}$; $V_R = 0\text{ V}$ | NON-REPETITIVE PEAK REVERSE CURRENT $I_{z\text{SM}}$ (A) at $t_p = 100\text{ }\mu\text{s}$; $T_{\text{amb}} = 25\text{ °C}$ |
|------------------------|---|-------|-------------------------------|------|--|------|-------------------------------------|------|---|------|------|---|---|
| | Tol. $\pm 2\%$ (B) | | Tol. approx. $\pm 5\%$ (C) | | at $I_{z\text{test}} = 0.5\text{ mA}$ | | at $I_{z\text{test}} = 2\text{ mA}$ | | MIN. | TYP. | MAX. | MAX. | MAX. |
| | MIN. | MAX. | MIN. | MAX. | TYP. | MAX. | TYP. | MAX. | | | | | |
| 27 | 26.50 | 27.50 | 25.1 | 28.9 | 65 | 300 | 25 | 80 | 18.0 | 22.7 | 25.3 | 50 | 1.0 |
| 30 | 29.40 | 30.60 | 28.0 | 32.0 | 70 | 300 | 30 | 80 | 20.6 | 25.7 | 29.4 | 50 | 1.0 |
| 33 | 32.30 | 33.70 | 31.0 | 35.0 | 75 | 325 | 35 | 80 | 23.3 | 28.7 | 33.4 | 45 | 0.9 |
| 36 | 35.30 | 36.70 | 34.0 | 38.0 | 80 | 350 | 35 | 90 | 26.0 | 31.8 | 37.4 | 45 | 0.8 |
| 39 | 38.20 | 39.80 | 37.0 | 41.0 | 80 | 350 | 40 | 130 | 28.7 | 34.8 | 41.2 | 45 | 0.7 |
| 43 | 42.10 | 43.90 | 40.0 | 46.0 | 85 | 375 | 45 | 150 | 31.4 | 38.8 | 46.6 | 40 | 0.6 |
| 47 | 46.10 | 47.90 | 44.0 | 50.0 | 85 | 375 | 50 | 170 | 35.0 | 42.9 | 51.8 | 40 | 0.5 |
| 51 | 50.00 | 52.00 | 48.0 | 54.0 | 90 | 400 | 60 | 180 | 38.6 | 46.9 | 57.2 | 40 | 0.4 |
| 56 | 54.90 | 57.10 | 52.0 | 60.0 | 100 | 425 | 70 | 200 | 42.2 | 52.0 | 63.8 | 40 | 0.3 |
| 62 | 60.80 | 63.20 | 58.0 | 66.0 | 120 | 450 | 80 | 215 | 58.8 | 64.4 | 71.6 | 35 | 0.3 |
| 68 | 66.60 | 69.40 | 64.0 | 72.0 | 150 | 475 | 90 | 240 | 65.6 | 71.7 | 79.8 | 35 | 0.25 |
| 75 | 73.50 | 76.50 | 70.0 | 79.0 | 170 | 500 | 95 | 255 | 73.4 | 80.2 | 88.6 | 35 | 0.2 |

Voltage regulator diodes

BZX79 series

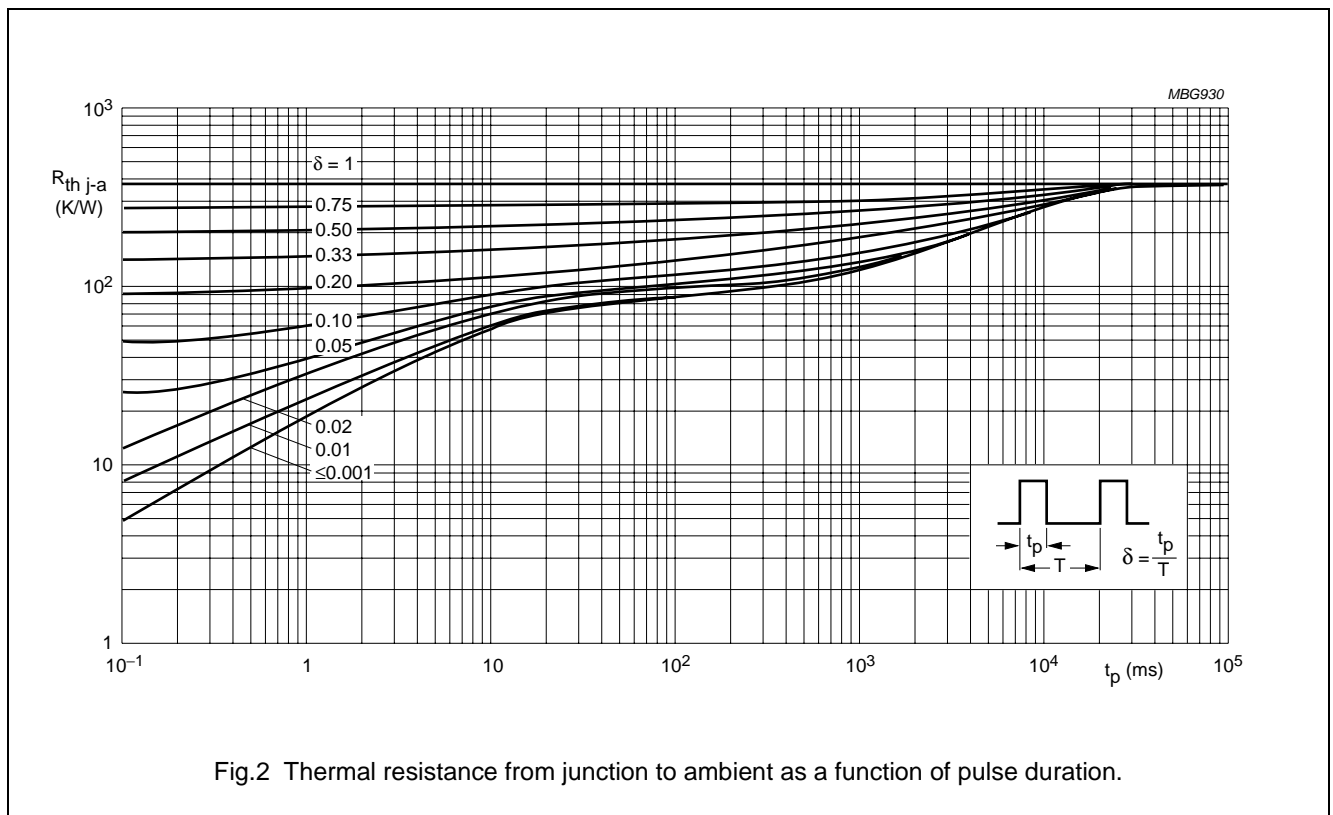
THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|----------------|---|--|-------|------|
| $R_{th\ j-tp}$ | thermal resistance from junction to tie-point | lead length 8 mm. | 300 | K/W |
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | lead length max.; see Fig.2 and note 1 | 380 | K/W |

Note

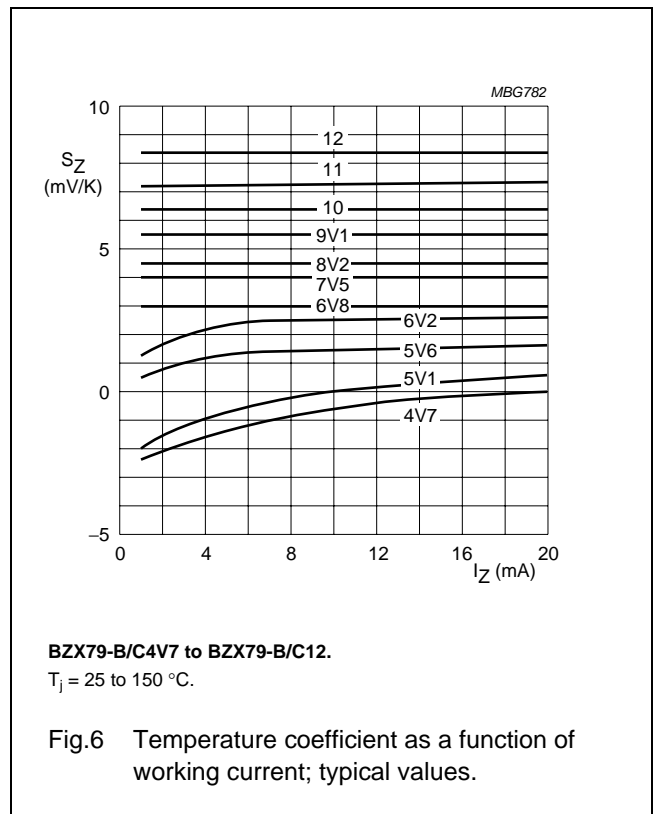
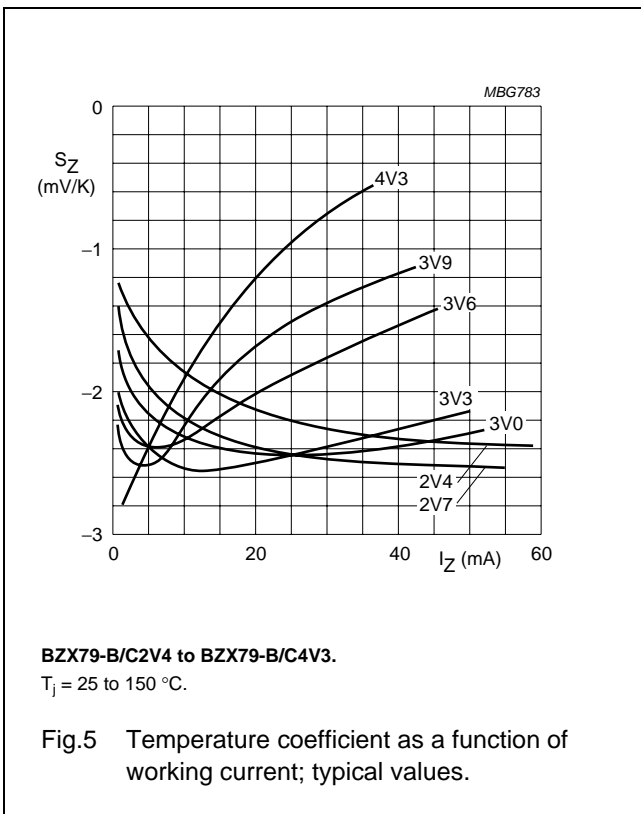
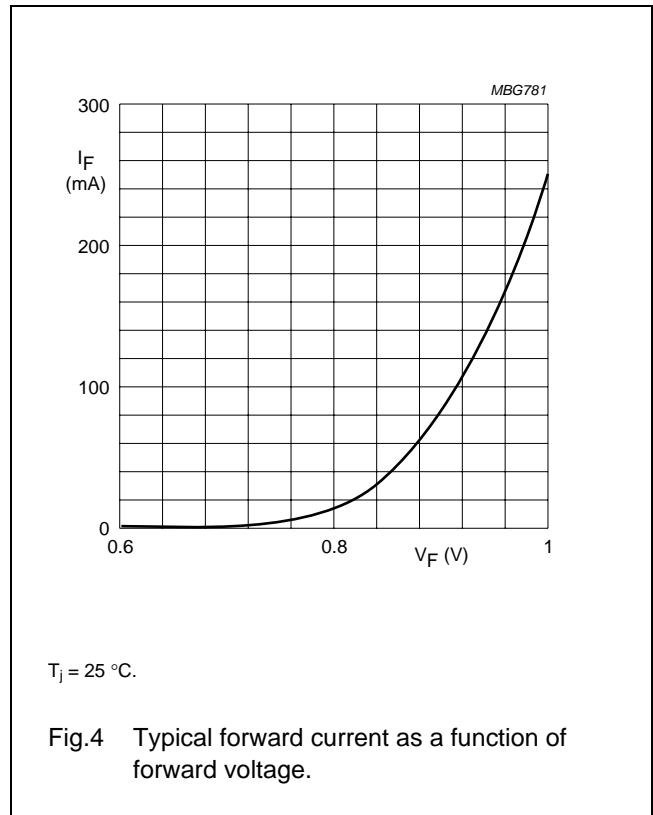
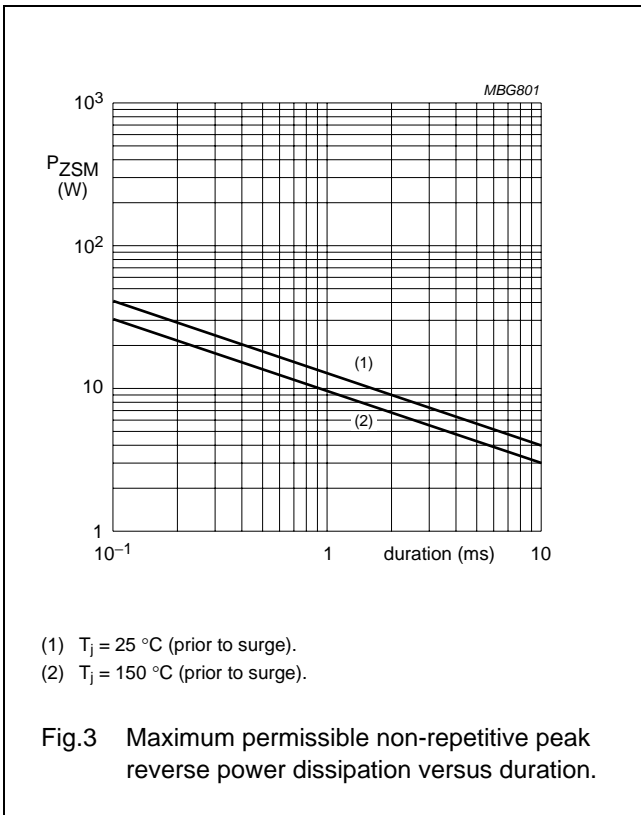
1. Device mounted on a printed circuit-board without metallization pad.

GRAPHICAL DATA



Voltage regulator diodes

BZX79 series



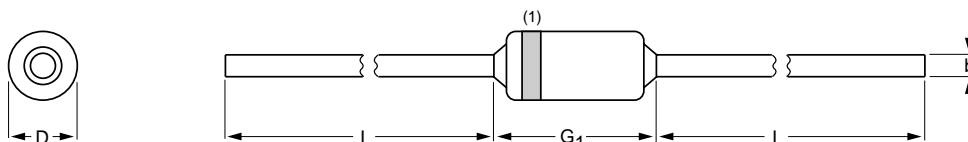
Voltage regulator diodes

BZX79 series

PACKAGE OUTLINE

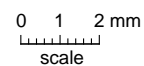
Hermetically sealed glass package; axial leaded; 2 leads

SOD27



DIMENSIONS (mm are the original dimensions)

| UNIT | b max. | D max. | G ₁ max. | L min. |
|------|-----------|-----------|------------------------|-----------|
| mm | 0.56 | 1.85 | 4.25 | 25.4 |



Note

1. The marking band indicates the cathode.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|------------------------|------------|
| | IEC | JEDEC | EIAJ | | | |
| SOD27 | A24 | DO-35 | SC-40 | | | 97-06-09 |

Voltage regulator diodes

BZX79 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. |
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