



BZV85 series

Voltage regulator diodes

Rev. 03 — 10 November 2009

Product data sheet

1. Product profile

1.1 General description

Medium-power voltage regulator diodes in small hermetically sealed leaded SOD66 (DO-41) glass packages.

The diodes are available in the normalized E24 approximately $\pm 5\%$ tolerance range. The series consists of 33 types with nominal working voltages from 3.6 V to 75 V.

1.2 Features

- Total power dissipation: max. 1.3 W
- Working voltage range: nominal 3.3 V to 75 V (E24 range)
- Small hermetically sealed glass package
- Tolerance series: approximately $\pm 5\%$
- Non-repetitive peak reverse power dissipation: max. 60 W

1.3 Applications

- Stabilization purposes

1.4 Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|---|---|-----|-----|-----|------|
| V_F | forward voltage | $I_F = 50\text{ mA}$ | - | - | 1 | V |
| P_{tot} | total power dissipation | $T_{\text{amb}} = 25\text{ }^\circ\text{C};$ lead length 10 mm | [1] | - | 1 | W |
| | | | [2] | - | 1.3 | W |
| P_{ZSM} | non-repetitive peak reverse power dissipation | square wave; $t_p = 100\text{ }\mu\text{s}$ | [3] | - | 60 | W |

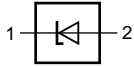

[1] Device mounted on a Printed-Circuit Board (PCB) with 1 cm² copper area per lead.

[2] If the leads are kept at $T_{\text{tp}} = 55\text{ }^\circ\text{C}$ at 4 mm from body.

[3] $T_j = 25\text{ }^\circ\text{C}$ prior to surge

2. Pinning information

Table 2. Pinning

| Pin | Description | Simplified outline | Graphic symbol |
|-----|-------------|--|---|
| 1 | cathode | [1] |  |
| 2 | anode |  | 006aaa152 |

[1] The marking band indicates the cathode.

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-----------------|---------|--|---------|
| | Name | Description | Version |
| BZV85 series[1] | - | hermetically sealed glass package; axial leaded; 2 leads | SOD66 |

[1] The series consists of 33 types with nominal working voltages from 3.3 V to 75 V.

4. Marking

Table 4. Marking codes

| Type number | Marking code |
|--------------|------------------------------|
| BZV85 series | The diodes are type branded. |

5. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|---|--|-------|--------------------------------|------------------|
| I_F | forward current | | - | 500 | mA |
| I_{ZSM} | non-repetitive peak reverse current | square wave; $t_p = 100 \mu\text{s}$ | [1] - | see Table 8 | |
| | | half sine wave; $t_p = 10 \text{ ms}$ | [1] - | see Table 8 | |
| P_{tot} | total power dissipation | $T_{amb} = 25 \text{ }^\circ\text{C}$; lead length 10 mm | [2] - | 1 | W |
| | | | [3] - | 1.3 | W |
| P_{ZSM} | non-repetitive peak reverse power dissipation | square wave; $t_p = 100 \mu\text{s}$ | [1] - | 60 | W |
| T_j | junction temperature | | - | 200 | $^\circ\text{C}$ |
| T_{stg} | storage temperature | | -65 | +200 | $^\circ\text{C}$ |

[1] $T_j = 25 \text{ }^\circ\text{C}$ prior to surge

[2] Device mounted on a PCB with 1 cm² copper area per lead.

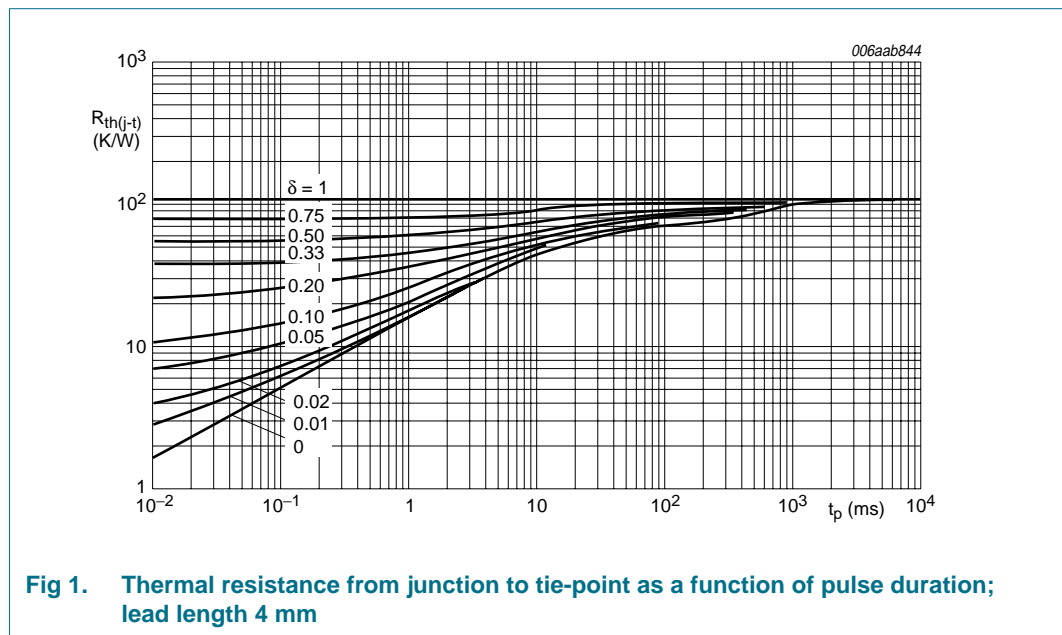
[3] If the leads are kept at $T_{ip} = 55 \text{ }^\circ\text{C}$ at 4 mm from body.

6. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|---|---------------------------------------|-----|-----|-----|------|
| $R_{th(j-t)}$ | thermal resistance from junction to tie-point | lead length 4 mm | - | - | 110 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | lead length 10 mm [1] | - | - | 175 | K/W |

[1] Device mounted on a PCB with 1 cm² copper area per lead.



7. Characteristics

Table 7. Characteristics

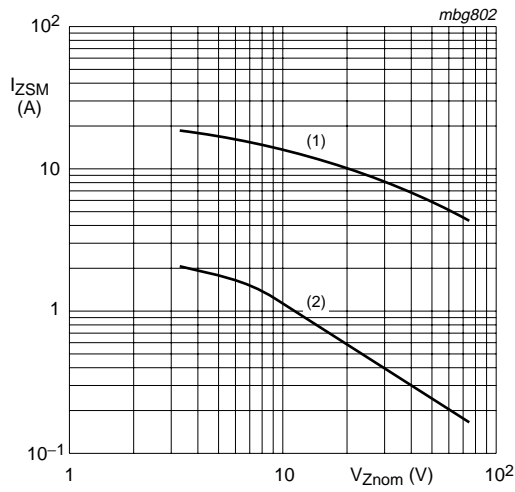
$T_j = 25\text{ °C}$ unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|----------------------|-----|-----|-----|------|
| V_F | forward voltage | $I_F = 50\text{ mA}$ | - | - | 1 | V |

Table 8. Characteristics per type

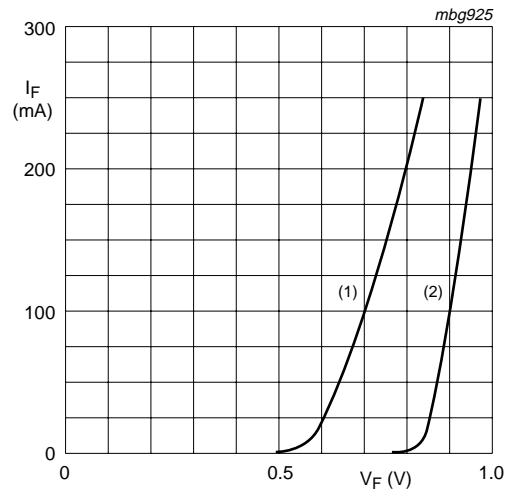
$T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified.

| BZV85-Cxxx | Working voltage V_Z (V) at I_{test} | | Differential resistance r_{dif} (Ω) at I_{test} | Temperature coefficient S_Z (mV/K) at I_{test} | | Test current I_{test} (mA) | Diode capacitance C_d (pF) at $f = 1\text{ MHz}$; $V_R = 0\text{ V}$ | Reverse current I_R (μA) | | Non-repetitive peak reverse current I_{ZSM} at $t_p = 100\ \mu\text{s}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$ | |
|------------|--|------|--|---|------|--|--|--|-----------|--|----------|
| | Min | Max | Max | Min | Max | | | Max | V_R (V) | Max (A) | Max (mA) |
| | | | | | | | | | | | |
| 3V6 | 3.4 | 3.8 | 15 | -3.5 | -1.0 | 60 | 450 | 50 | 1.0 | 8.0 | 2000 |
| 3V9 | 3.7 | 4.1 | 15 | -3.5 | -1.0 | 60 | 450 | 10 | 1.0 | 8.0 | 1950 |
| 4V3 | 4.0 | 4.6 | 13 | -2.7 | 0 | 50 | 450 | 5 | 1.0 | 8.0 | 1850 |
| 4V7 | 4.4 | 5.0 | 13 | -2.0 | 0.7 | 45 | 300 | 3 | 1.0 | 8.0 | 1800 |
| 5V1 | 4.8 | 5.4 | 10 | -0.5 | 2.2 | 45 | 300 | 3 | 2.0 | 8.0 | 1750 |
| 5V6 | 5.2 | 6.0 | 7 | 0 | 2.7 | 45 | 300 | 2 | 2.0 | 8.0 | 1700 |
| 6V2 | 5.8 | 6.6 | 4 | 0.6 | 3.6 | 35 | 200 | 2 | 3.0 | 7.0 | 1620 |
| 6V8 | 6.4 | 7.2 | 3.5 | 1.3 | 4.3 | 35 | 200 | 2 | 4.0 | 7.0 | 1550 |
| 7V5 | 7.0 | 7.9 | 3 | 2.5 | 5.5 | 35 | 150 | 1 | 4.5 | 5.0 | 1500 |
| 8V2 | 7.7 | 8.7 | 5 | 3.1 | 6.1 | 25 | 150 | 0.7 | 5.0 | 5.0 | 1400 |
| 9V1 | 8.5 | 9.6 | 5 | 3.8 | 7.2 | 25 | 150 | 0.7 | 6.5 | 4.0 | 1340 |
| 10 | 9.4 | 10.6 | 8 | 4.7 | 8.5 | 25 | 90 | 0.2 | 7.0 | 4.0 | 1200 |
| 11 | 10.4 | 11.6 | 10 | 5.3 | 9.3 | 20 | 85 | 0.2 | 7.7 | 3.0 | 1100 |
| 12 | 11.4 | 12.7 | 10 | 6.3 | 10.8 | 20 | 85 | 0.2 | 8.4 | 3.0 | 1000 |
| 13 | 12.4 | 14.1 | 10 | 7.4 | 12.0 | 20 | 80 | 0.2 | 9.1 | 3.0 | 900 |
| 15 | 13.8 | 15.6 | 15 | 8.9 | 13.6 | 15 | 75 | 0.05 | 10.5 | 2.5 | 760 |
| 16 | 15.3 | 17.1 | 15 | 10.7 | 15.4 | 15 | 75 | 0.05 | 11.0 | 1.75 | 700 |
| 18 | 16.8 | 19.1 | 20 | 11.8 | 17.1 | 15 | 70 | 0.05 | 12.5 | 1.75 | 600 |
| 20 | 18.8 | 21.2 | 24 | 13.6 | 19.1 | 10 | 60 | 0.05 | 14.0 | 1.75 | 540 |
| 22 | 20.8 | 23.3 | 25 | 16.6 | 22.1 | 10 | 60 | 0.05 | 15.5 | 1.5 | 500 |
| 24 | 22.8 | 25.6 | 30 | 18.3 | 24.3 | 10 | 55 | 0.05 | 17 | 1.5 | 450 |
| 27 | 25.1 | 28.9 | 40 | 20.1 | 27.5 | 8 | 50 | 0.05 | 19 | 1.2 | 400 |
| 30 | 28.0 | 32.0 | 45 | 22.4 | 32.0 | 8 | 50 | 0.05 | 21 | 1.2 | 380 |
| 33 | 31.0 | 35.0 | 45 | 24.8 | 35.0 | 8 | 45 | 0.05 | 23 | 1.0 | 350 |
| 36 | 34.0 | 38.0 | 50 | 27.2 | 39.9 | 8 | 45 | 0.05 | 25 | 0.9 | 320 |
| 39 | 37.0 | 41.0 | 60 | 29.6 | 43.0 | 6 | 45 | 0.05 | 27 | 0.8 | 296 |
| 43 | 40.0 | 46.0 | 75 | 34.0 | 48.3 | 6 | 40 | 0.05 | 30 | 0.7 | 270 |
| 47 | 44.0 | 50.0 | 100 | 37.4 | 52.5 | 4 | 40 | 0.05 | 33 | 0.6 | 246 |
| 51 | 48.0 | 54.0 | 125 | 40.8 | 56.5 | 4 | 40 | 0.05 | 36 | 0.5 | 226 |
| 56 | 52.0 | 60.0 | 150 | 46.8 | 63.0 | 4 | 40 | 0.05 | 39 | 0.4 | 208 |
| 62 | 58.0 | 66.0 | 175 | 52.2 | 72.5 | 4 | 35 | 0.05 | 43 | 0.4 | 186 |
| 68 | 64.0 | 72.0 | 200 | 60.5 | 81.0 | 4 | 35 | 0.05 | 48 | 0.35 | 171 |
| 75 | 70.0 | 80.0 | 225 | 66.5 | 88.0 | 4 | 35 | 0.05 | 53 | 0.3 | 161 |



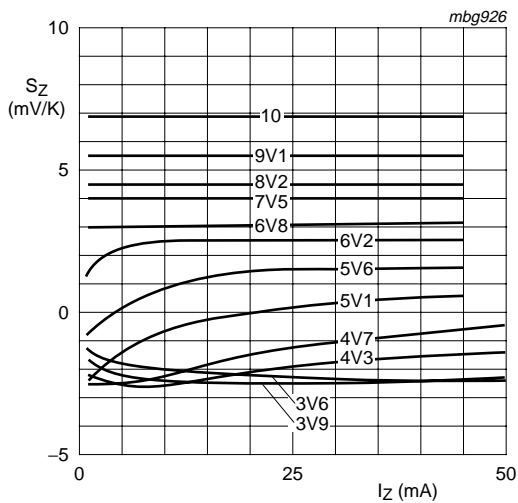
- (1) $t_p = 10 \mu s$; half sine wave; $T_{amb} = 25^\circ C$
- (2) $t_p = 10 ms$; half sine wave; $T_{amb} = 25^\circ C$

Fig 2. Non-repetitive peak reverse current as a function of the nominal working voltage



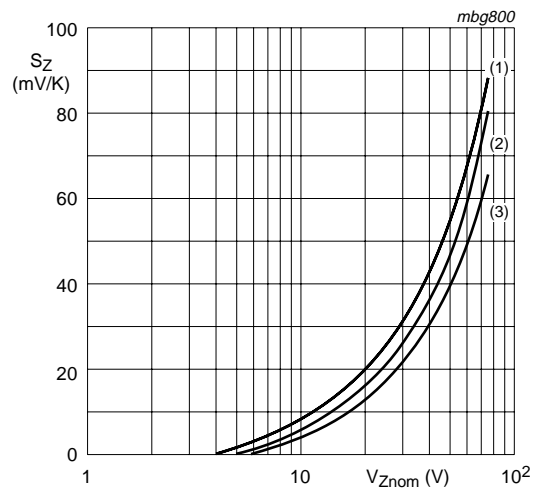
- (1) $T_j = 200^\circ C$
- (2) $T_j = 25^\circ C$

Fig 3. Forward current as a function of forward voltage; typical values



BZV85-C3V6 to BZV85-C10
 $T_j = 25^\circ C$ to $150^\circ C$
 For types above 7.5 V the temperature coefficient is independent of current; see [Table 8](#).

Fig 4. Temperature coefficient as a function of working current; typical values



$I_Z = I_{test}$
 $T_j = 25^\circ C$ to $150^\circ C$

- (1) Maximum values
- (2) Typical values
- (3) Minimum values

Fig 5. Temperature coefficient as a function of working current; typical values

8. Package outline

Hermetically sealed glass package; axial leaded; 2 leads

SOD66

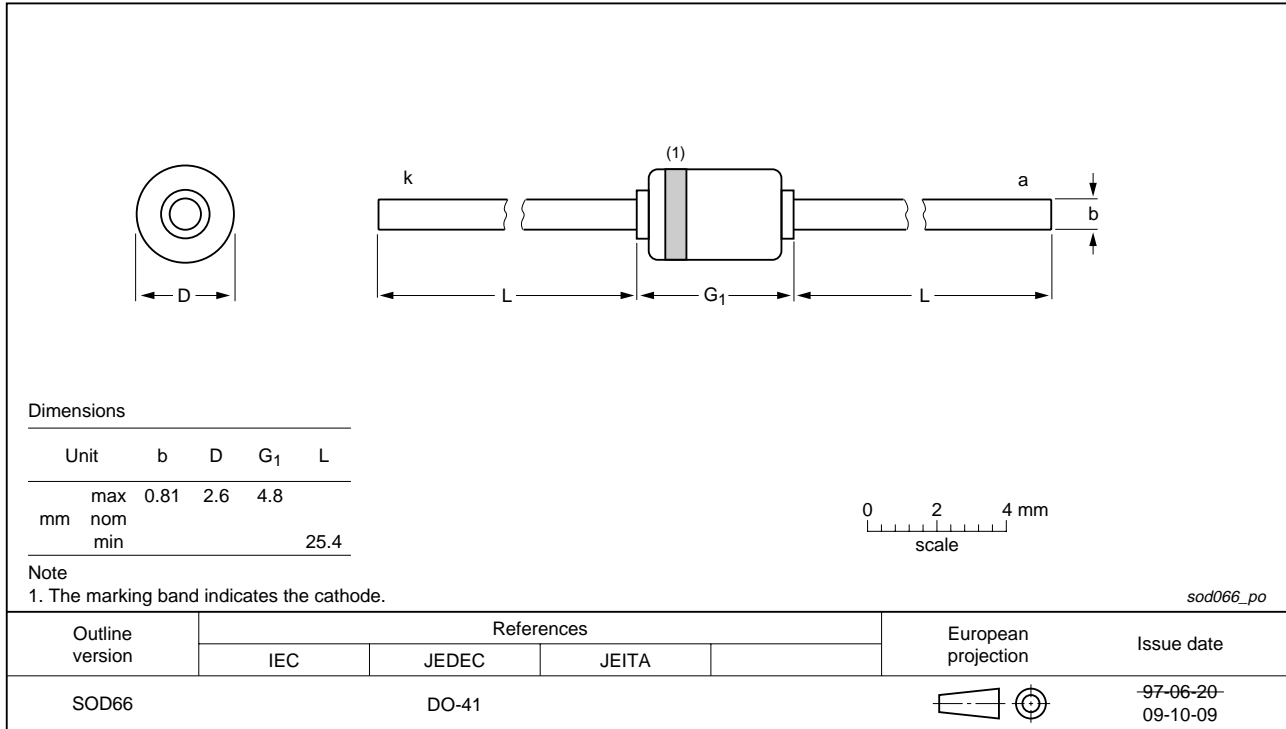


Fig 6. Package outline SOD66 (DO-41)

9. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.^[1]

| Type number | Package | Description | Packing quantity |
|-----------------------------|---------|----------------------------|------------------|
| | | | 10000 |
| BZV85 series ^[2] | SOD66 | 52 mm tape ammopack, axial | -133 |
| | | 52 mm reel pack, axial | -113 |

[1] For further information and the availability of packing methods, see [Section 11](#).

[2] The series consists of 33 types with nominal working voltages from 3.3 V to 75 V.

10. Revision history

Table 10. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--------------|---|---------------|------------|
| BZV85_SER_3 | 20091110 | Product data sheet | - | BZV85_2 |
| Modifications: | | <ul style="list-style-type: none"> • The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Table 6: $R_{th(j-tp)}$ redefined to $R_{th(j-t)}$ thermal resistance from junction to tie-point • Figure 1: $R_{th(j-tp)}$ redefined to $R_{th(j-t)}$ thermal resistance from junction to tie-point • Table 8 "Characteristics per type": I_{Ztest} redefined to I_{test} test current • Figure 6 "Package outline SOD66 (DO-41)": updated | | |
| BZV85_2 | 19990511 | Product specification | - | BZV85_1 |
| BZV85_1 | 19960426 | Product specification | - | - |

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| Document status ^{[1][2]} | Product status ^[3] | Definition |
|-----------------------------------|-------------------------------|---|
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| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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