



# BZX884 series

## Voltage regulator diodes

Rev. 5 — 14 December 2020

Product data sheet

## 1. General description

General-purpose Zener diodes in an SOD882 (DFN1006-2) leadless ultra small Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Total power dissipation:  $P_{tot} \leq 250$  mW
- Wide working voltage range: nominal 2.4 V to 75 V (E24 range)
- Two tolerance series:  $\pm 2\%$  and  $\pm 5\%$
- Leadless ultra small plastic package suitable for surface-mounted design
- AEC-Q101 qualified

## 3. Applications

- General regulation functions
- ElectroStatic Discharge (ESD) ultra high-speed switching
- High-frequency applications

## 4. Quick reference data

Table 1. Quick reference data

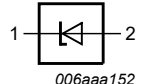
| Symbol    | Parameter               | Conditions           |     | Min | Typ | Max | Unit |
|-----------|-------------------------|----------------------|-----|-----|-----|-----|------|
| $V_F$     | forward voltage         | $I_F = 10$ mA        | [1] | -   | -   | 0.9 | V    |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C | [2] | -   | -   | 250 | mW   |

[1] Pulse test:  $t_p \leq 300$   $\mu$ s;  $\delta \leq 0.02$ .

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 5. Pinning information

Table 2. Pinning

| Pin | Symbol | Description | Simplified outline                                                                                               | Graphic symbol                                                                                         |
|-----|--------|-------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1   | K      | cathode[1]  |  <p>Transparent top view</p> |  <p>006aaa152</p> |
| 2   | A      | anode       |                                                                                                                  |                                                                                                        |

[1] The marking bar indicates the cathode.

## 6. Ordering information

Table 3. Ordering information

| Type number                              | Package   |                                                                            |         |
|------------------------------------------|-----------|----------------------------------------------------------------------------|---------|
|                                          | Name      | Description                                                                | Version |
| BZX884-B2V4 to BZX884-C75 <sup>[1]</sup> | DFN1006-2 | leadless ultra small plastic package; 2 terminals; body 1.0 x 0.6 x 0.5 mm | SOD882  |

[1] The series consists of 74 types with nominal working voltages from 2.4 V to 75 V.

## 7. Marking

Table 4. Marking Codes

| Type number | Mark. Code | Type number | Mark. Code | Type number | Mark. Code | Type number | Mark. Code |
|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| BZX884-B2V4 | A1         | BZX884-B15  | AL         | BZX884-C2V4 | B1         | BZX884-C15  | BL         |
| BZX884-B2V7 | A2         | BZX884-B16  | C1         | BZX884-C2V7 | B2         | BZX884-C16  | D1         |
| BZX884-B3V0 | A3         | BZX884-B18  | C2         | BZX884-C3V0 | B3         | BZX884-C18  | D2         |
| BZX884-B3V3 | A4         | BZX884-B20  | C3         | BZX884-C3V3 | B4         | BZX884-C20  | D3         |
| BZX884-B3V6 | A5         | BZX884-B22  | C4         | BZX884-C3V6 | B5         | BZX884-C22  | D4         |
| BZX884-B3V9 | A6         | BZX884-B24  | C5         | BZX884-C3V9 | B6         | BZX884-C24  | D5         |
| BZX884-B4V3 | A7         | BZX884-B27  | C6         | BZX884-C4V3 | B7         | BZX884-C27  | D6         |
| BZX884-B4V7 | A8         | BZX884-B30  | C7         | BZX884-C4V7 | B8         | BZX884-C30  | D7         |
| BZX884-B5V1 | A9         | BZX884-B33  | C8         | BZX884-C5V1 | B9         | BZX884-C33  | D8         |
| BZX884-B5V6 | AA         | BZX884-B36  | C9         | BZX884-C5V6 | BA         | BZX884-C36  | D9         |
| BZX884-B6V2 | AB         | BZX884-B39  | CA         | BZX884-C6V2 | BB         | BZX884-C39  | DA         |
| BZX884-B6V8 | AC         | BZX884-B43  | CB         | BZX884-C6V8 | BC         | BZX884-C43  | DB         |
| BZX884-B7V5 | AD         | BZX884-B47  | CC         | BZX884-C7V5 | BD         | BZX884-C47  | DC         |
| BZX884-B8V2 | AE         | BZX884-B51  | CD         | BZX884-C8V2 | BE         | BZX884-C51  | DD         |
| BZX884-B9V1 | AF         | BZX884-B56  | CE         | BZX884-C9V1 | BF         | BZX884-C56  | DE         |
| BZX884-B10  | AG         | BZX884-B62  | CF         | BZX884-C10  | BG         | BZX884-C62  | DF         |
| BZX884-B11  | AH         | BZX884-B68  | CG         | BZX884-C11  | BH         | BZX884-C68  | DG         |
| BZX884-B12  | AJ         | BZX884-B75  | CH         | BZX884-C12  | BJ         | BZX884-C75  | DH         |
| BZX884-B13  | AK         | -           | -          | BZX884-C13  | BK         | -           | -          |

## 8. 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                     |                                                                             |     | -           | 200  | mA         |
| $I_{ZSM}$ | non-repetitive peak reverse current | $t_p = 100 \mu s$ ; square wave;<br>$T_{amb} = 25^\circ C$ ; prior to surge |     | see Table 7 |      |            |
| $P_{tot}$ | total power dissipation             | $T_{amb} = 25^\circ C$                                                      | [1] | -           | 250  | mW         |
| $T_j$     | junction temperature                |                                                                             |     | -           | 150  | $^\circ C$ |
| $T_{amb}$ | ambient temperature                 |                                                                             |     | -55         | +150 | $^\circ C$ |
| $T_{stg}$ | storage temperature                 |                                                                             |     | -65         | +150 | $^\circ C$ |

[1] Refer to SOD882 standard mounting conditions (footprint), FR4 with 60  $\mu$  copper strip line.

## 9. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol        | Parameter                                   | Conditions      | Min | Typ | Max | Unit |
|---------------|---------------------------------------------|-----------------|-----|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air [1] | -   | -   | 500 | K/W  |

[1] Refer to SOD882 standard mounting conditions (footprint), FR4 with 60  $\mu m$  copper strip line.

## 10. Characteristics

**Table 7. Electrical characteristics**

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

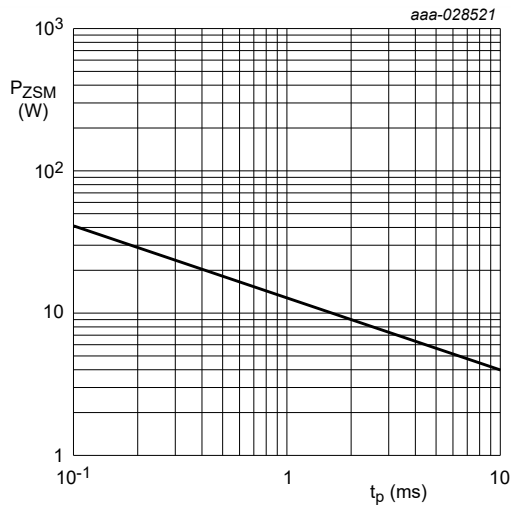
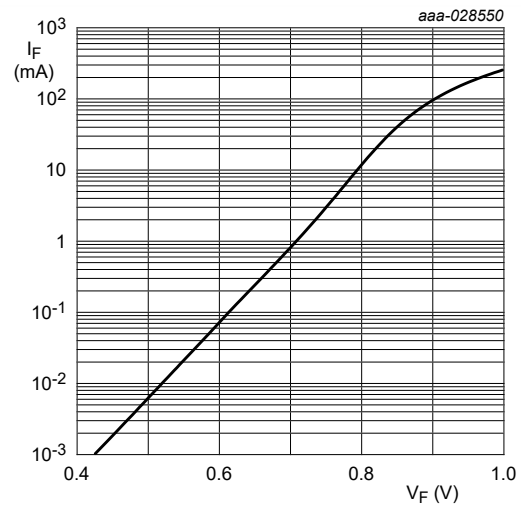
| Symbol | Parameter          | Conditions           | Max | Unit          |
|--------|--------------------|----------------------|-----|---------------|
| $V_F$  | forward voltage    | $I_F = 10\text{ mA}$ | 0.9 | V             |
| $I_R$  | reverse current    |                      |     |               |
|        | BZX884-B/C2V4      | $V_R = 1\text{ V}$   | 50  | $\mu\text{A}$ |
|        | BZX884-B/C2V7      | $V_R = 1\text{ V}$   | 20  | $\mu\text{A}$ |
|        | BZX884-B/C3V0      | $V_R = 1\text{ V}$   | 10  | $\mu\text{A}$ |
|        | BZX884-B/C3V3      | $V_R = 1\text{ V}$   | 5   | $\mu\text{A}$ |
|        | BZX884-B/C3V6      | $V_R = 1\text{ V}$   | 5   | $\mu\text{A}$ |
|        | BZX884-B/C3V9      | $V_R = 1\text{ V}$   | 3   | $\mu\text{A}$ |
|        | BZX884-B/C4V3      | $V_R = 1\text{ V}$   | 3   | $\mu\text{A}$ |
|        | BZX884-B/C4V7      | $V_R = 2\text{ V}$   | 3   | $\mu\text{A}$ |
|        | BZX884-B/C5V1      | $V_R = 2\text{ V}$   | 2   | $\mu\text{A}$ |
|        | BZX884-B/C5V6      | $V_R = 2\text{ V}$   | 1   | $\mu\text{A}$ |
|        | BZX884-B/C6V2      | $V_R = 4\text{ V}$   | 3   | $\mu\text{A}$ |
|        | BZX884-B/C6V8      | $V_R = 4\text{ V}$   | 2   | $\mu\text{A}$ |
|        | BZX884-B/C7V5      | $V_R = 5\text{ V}$   | 1   | $\mu\text{A}$ |
|        | BZX884-B/C8V2      | $V_R = 5\text{ V}$   | 700 | nA            |
|        | BZX884-B/C9V1      | $V_R = 6\text{ V}$   | 500 | nA            |
|        | BZX884-B/C10       | $V_R = 7\text{ V}$   | 200 | nA            |
|        | BZX884-B/C11       | $V_R = 8\text{ V}$   | 100 | nA            |
|        | BZX884-B/C12       | $V_R = 8\text{ V}$   | 100 | nA            |
|        | BZX884-B/C13       | $V_R = 8\text{ V}$   | 100 | nA            |
|        | BZX884-B/C15 to 75 | $V_R = 0.7 V_{Znom}$ | 50  | nA            |

Table 8. Electrical characteristics per type

| BZX884-B or C | Working voltage<br>V <sub>Z</sub> (V);<br>at I <sub>Z</sub> = 5 mA |       |               |       | Differential resistance<br>r <sub>diff</sub> (Ω); |     |                                 |     | Temperature<br>coefficient<br>S <sub>Z</sub> (mV/K);<br>I <sub>Ztest</sub> = 5 mA | Diode<br>capacit.<br>C <sub>d</sub> (pF)[1] | Non-<br>repetitive<br>peak reverse<br>current<br>I <sub>ZSM</sub> (A) at<br>t <sub>p</sub> = 100 μs;<br>T <sub>amb</sub> = 25°C |
|---------------|--------------------------------------------------------------------|-------|---------------|-------|---------------------------------------------------|-----|---------------------------------|-----|-----------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|               | Tol. ± 2% (B)                                                      |       | Tol. ± 5% (C) |       | at I <sub>Ztest</sub><br>= 1 mA                   |     | at I <sub>Ztest</sub><br>= 5 mA |     |                                                                                   |                                             |                                                                                                                                 |
|               | Min                                                                | Max   | Min           | Max   | Typ                                               | Max | Typ                             | Max | Typ                                                                               | Max                                         | Max                                                                                                                             |
| 2V4           | 2.35                                                               | 2.45  | 2.28          | 2.52  | 275                                               | 400 | 70                              | 100 | -1.3                                                                              | 450                                         | 6                                                                                                                               |
| 2V7           | 2.65                                                               | 2.75  | 2.57          | 2.84  | 300                                               | 450 | 75                              | 100 | -1.4                                                                              | 440                                         | 6                                                                                                                               |
| 3V0           | 2.94                                                               | 3.06  | 2.85          | 3.15  | 325                                               | 500 | 80                              | 95  | -1.6                                                                              | 425                                         | 6                                                                                                                               |
| 3V3           | 3.23                                                               | 3.37  | 3.14          | 3.47  | 350                                               | 500 | 85                              | 95  | -1.8                                                                              | 410                                         | 6                                                                                                                               |
| 3V6           | 3.53                                                               | 3.67  | 3.42          | 3.78  | 375                                               | 500 | 85                              | 90  | -1.9                                                                              | 390                                         | 6                                                                                                                               |
| 3V9           | 3.82                                                               | 3.98  | 3.71          | 4.10  | 400                                               | 500 | 85                              | 90  | -1.9                                                                              | 370                                         | 6                                                                                                                               |
| 4V3           | 4.21                                                               | 4.39  | 4.09          | 4.52  | 410                                               | 600 | 80                              | 90  | -1.7                                                                              | 350                                         | 6                                                                                                                               |
| 4V7           | 4.61                                                               | 4.79  | 4.47          | 4.94  | 425                                               | 500 | 50                              | 80  | -1.2                                                                              | 320                                         | 6                                                                                                                               |
| 5V1           | 5.00                                                               | 5.20  | 4.85          | 5.36  | 400                                               | 480 | 40                              | 60  | -0.5                                                                              | 300                                         | 6                                                                                                                               |
| 5V6           | 5.49                                                               | 5.71  | 5.32          | 5.88  | 80                                                | 400 | 15                              | 40  | 1.0                                                                               | 275                                         | 6                                                                                                                               |
| 6V2           | 6.08                                                               | 6.32  | 5.89          | 6.51  | 40                                                | 150 | 6                               | 10  | 2.2                                                                               | 250                                         | 6                                                                                                                               |
| 6V8           | 6.66                                                               | 6.94  | 6.46          | 7.14  | 30                                                | 80  | 6                               | 15  | 3.0                                                                               | 215                                         | 6                                                                                                                               |
| 7V5           | 7.35                                                               | 7.65  | 7.13          | 7.88  | 15                                                | 80  | 2                               | 10  | 3.6                                                                               | 170                                         | 4                                                                                                                               |
| 8V2           | 8.04                                                               | 8.36  | 7.79          | 8.61  | 20                                                | 80  | 2                               | 10  | 4.3                                                                               | 150                                         | 4                                                                                                                               |
| 9V1           | 8.92                                                               | 9.28  | 8.65          | 9.56  | 20                                                | 100 | 2                               | 10  | 5.2                                                                               | 120                                         | 3                                                                                                                               |
| 10            | 9.80                                                               | 10.20 | 9.50          | 10.50 | 20                                                | 150 | 2                               | 10  | 6.0                                                                               | 110                                         | 3                                                                                                                               |
| 11            | 10.78                                                              | 11.22 | 10.45         | 11.55 | 25                                                | 150 | 2                               | 10  | 6.9                                                                               | 110                                         | 2.5                                                                                                                             |
| 12            | 11.76                                                              | 12.24 | 11.40         | 12.60 | 25                                                | 150 | 2                               | 10  | 7.9                                                                               | 105                                         | 2.5                                                                                                                             |
| 13            | 12.74                                                              | 13.26 | 12.35         | 13.65 | 25                                                | 170 | 2                               | 10  | 8.8                                                                               | 105                                         | 2.5                                                                                                                             |
| 15            | 14.70                                                              | 15.30 | 14.25         | 15.75 | 25                                                | 200 | 3                               | 15  | 10.7                                                                              | 100                                         | 2                                                                                                                               |
| 16            | 15.68                                                              | 16.32 | 15.20         | 16.80 | 50                                                | 200 | 10                              | 40  | 12.4                                                                              | 90                                          | 1.5                                                                                                                             |
| 18            | 17.64                                                              | 18.36 | 17.10         | 18.90 | 50                                                | 225 | 10                              | 45  | 14.4                                                                              | 80                                          | 1.5                                                                                                                             |
| 20            | 19.60                                                              | 20.40 | 19.00         | 21.00 | 60                                                | 225 | 15                              | 55  | 16.4                                                                              | 70                                          | 1.5                                                                                                                             |
| 22            | 21.56                                                              | 22.44 | 20.90         | 23.10 | 60                                                | 250 | 20                              | 55  | 18.4                                                                              | 60                                          | 1.25                                                                                                                            |
| 24            | 23.52                                                              | 24.48 | 22.80         | 25.20 | 60                                                | 250 | 25                              | 70  | 20.4                                                                              | 55                                          | 1.25                                                                                                                            |

[1]  $f = 1$  MHz;  $V_R = 0$  V

| BZX884-B or C | Working voltage<br>V <sub>Z</sub> (V);<br>at I <sub>Z</sub> = 2 mA |       |               |       | Differential resistance<br>r <sub>diff</sub> (Ω); |     |                                 |     | Temperature<br>coefficient<br>S <sub>Z</sub> (mV/K);<br>I <sub>Ztest</sub> = 2 mA | Diode<br>capacit.<br>C <sub>d</sub> (pF) <sup>[1]</sup> | Non-<br>repetitive<br>peak reverse<br>current<br>I <sub>ZSM</sub> (A) at<br>t <sub>p</sub> = 100 μs;<br>T <sub>amb</sub> = 25°C |
|---------------|--------------------------------------------------------------------|-------|---------------|-------|---------------------------------------------------|-----|---------------------------------|-----|-----------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
|               | Tol. ± 2% (B)                                                      |       | Tol. ± 5% (C) |       | at I <sub>Ztest</sub><br>= 0.5 mA                 |     | at I <sub>Ztest</sub><br>= 2 mA |     |                                                                                   |                                                         |                                                                                                                                 |
|               | Min                                                                | Max   | Min           | Max   | Typ                                               | Max | Typ                             | Max |                                                                                   |                                                         |                                                                                                                                 |
| 27            | 26.46                                                              | 27.57 | 25.65         | 28.35 | 65                                                | 300 | 25                              | 80  | 23.4                                                                              | 50                                                      | 1.0                                                                                                                             |
| 30            | 29.40                                                              | 30.60 | 28.50         | 31.50 | 70                                                | 300 | 30                              | 80  | 26.6                                                                              | 50                                                      | 1.0                                                                                                                             |
| 33            | 32.34                                                              | 33.66 | 31.35         | 34.65 | 75                                                | 325 | 35                              | 80  | 29.7                                                                              | 45                                                      | 0.9                                                                                                                             |
| 36            | 35.28                                                              | 36.72 | 34.20         | 37.80 | 80                                                | 350 | 35                              | 90  | 33.0                                                                              | 45                                                      | 0.8                                                                                                                             |
| 39            | 38.22                                                              | 39.78 | 37.05         | 40.95 | 80                                                | 350 | 40                              | 130 | 36.4                                                                              | 45                                                      | 0.7                                                                                                                             |
| 43            | 42.14                                                              | 43.86 | 40.85         | 45.15 | 85                                                | 375 | 45                              | 150 | 41.2                                                                              | 40                                                      | 0.6                                                                                                                             |
| 47            | 46.06                                                              | 47.94 | 44.65         | 49.35 | 85                                                | 375 | 50                              | 170 | 46.1                                                                              | 40                                                      | 0.5                                                                                                                             |
| 51            | 49.98                                                              | 52.02 | 48.45         | 53.55 | 90                                                | 400 | 60                              | 180 | 51                                                                                | 40                                                      | 0.4                                                                                                                             |
| 56            | 54.88                                                              | 57.12 | 53.20         | 58.80 | 100                                               | 425 | 70                              | 200 | 57.0                                                                              | 40                                                      | 0.3                                                                                                                             |
| 62            | 60.76                                                              | 63.24 | 58.90         | 65.10 | 120                                               | 450 | 80                              | 215 | 64.4                                                                              | 35                                                      | 0.3                                                                                                                             |
| 68            | 66.64                                                              | 69.36 | 64.60         | 71.40 | 150                                               | 475 | 90                              | 240 | 71.7                                                                              | 35                                                      | 0.25                                                                                                                            |
| 75            | 73.50                                                              | 76.50 | 71.25         | 78.75 | 170                                               | 500 | 95                              | 255 | 80.2                                                                              | 35                                                      | 0.2                                                                                                                             |

[1]  $f = 1$  MHz;  $V_R = 0$  V $T_j = 25^\circ\text{C}$  (before surge)**Fig. 1.** Non-repetitive peak reverse power dissipation as a function of pulse duration, maximum values $T_j = 25^\circ\text{C}$ **Fig. 2.** BZX884-B/C2V4: Forward current as a function of forward voltage; typical values

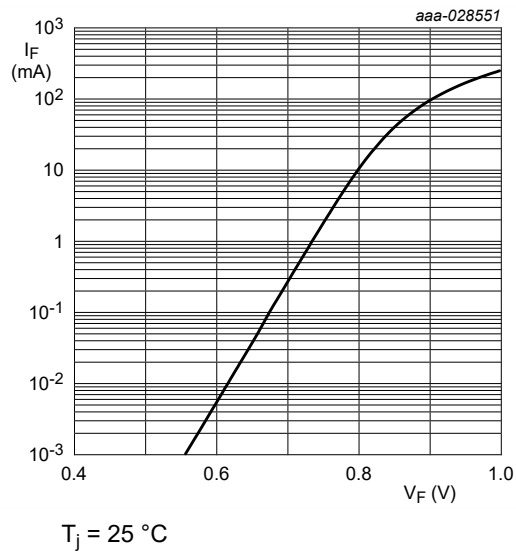


Fig. 3. BZX884-B/C6V8: Forward current as a function of forward voltage; typical values

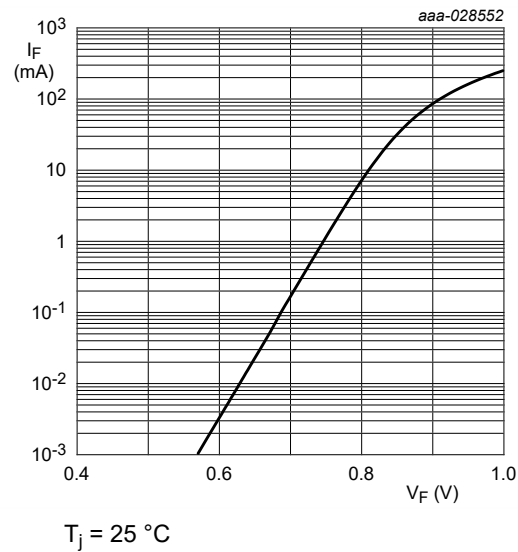


Fig. 4. BZX884-B/C7V5: Forward current as a function of forward voltage; typical values

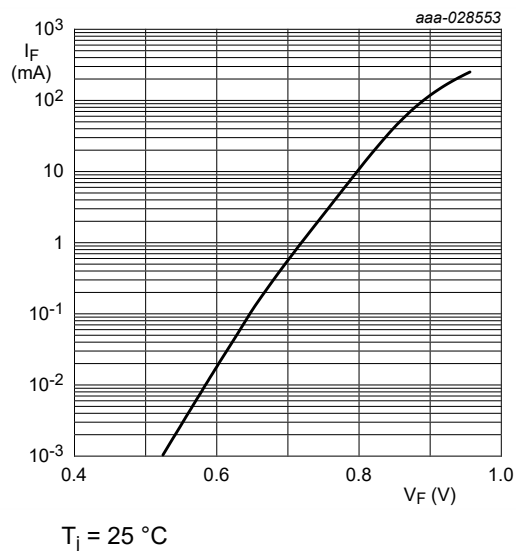


Fig. 5. BZX884-B/C75: Forward current as a function of forward voltage; typical values

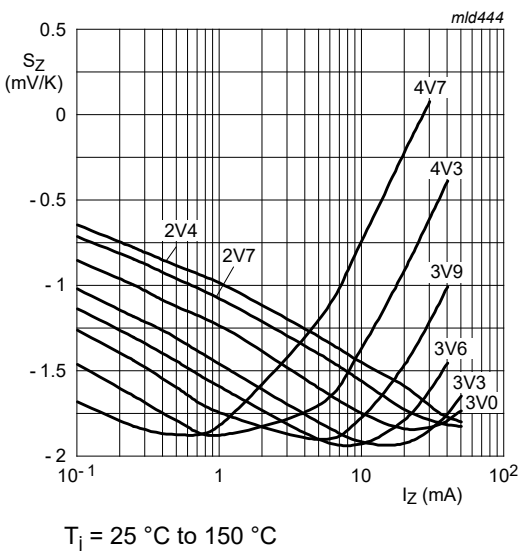


Fig. 6. BZX884-B/C2V4 to B/C4V7: Temperature coefficient as a function of working current; typical values

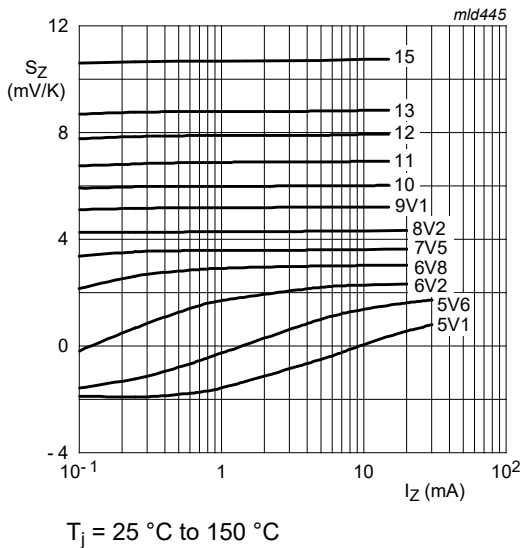


Fig. 7. BZX884-B/C5V1 to B/C15: Temperature coefficient as a function of working current; typical values

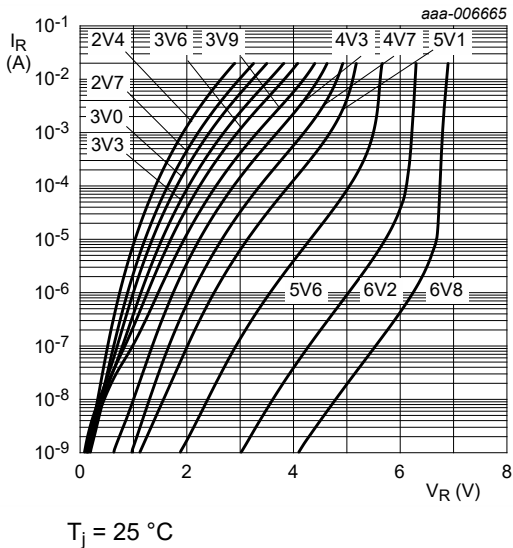


Fig. 8. BZX884-B/C2V4 to B/C6V8: Reverse current as a function of reverse voltage; typical values

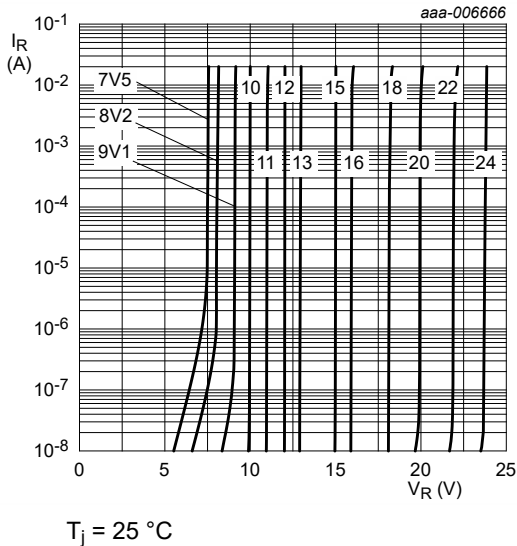


Fig. 9. BZX884-B/C7V5 to B/C24: Reverse current as a function of reverse voltage; typical values

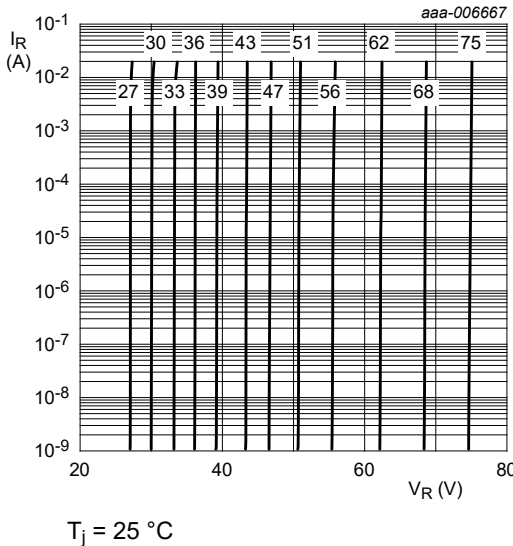


Fig. 10. BZX884-B/C27 to B/C75: Reverse current as a function of reverse voltage; typical values

11. Package outline

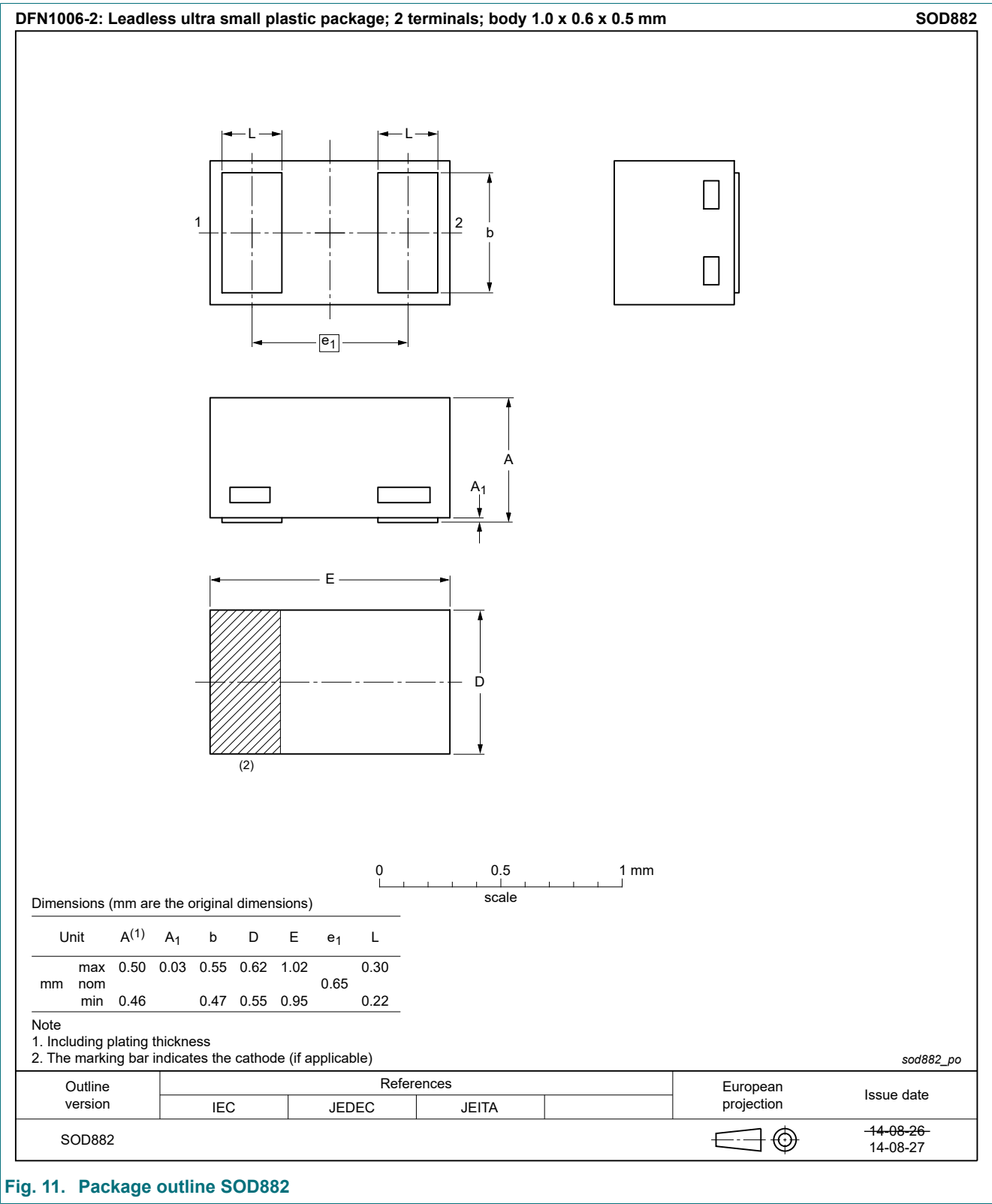
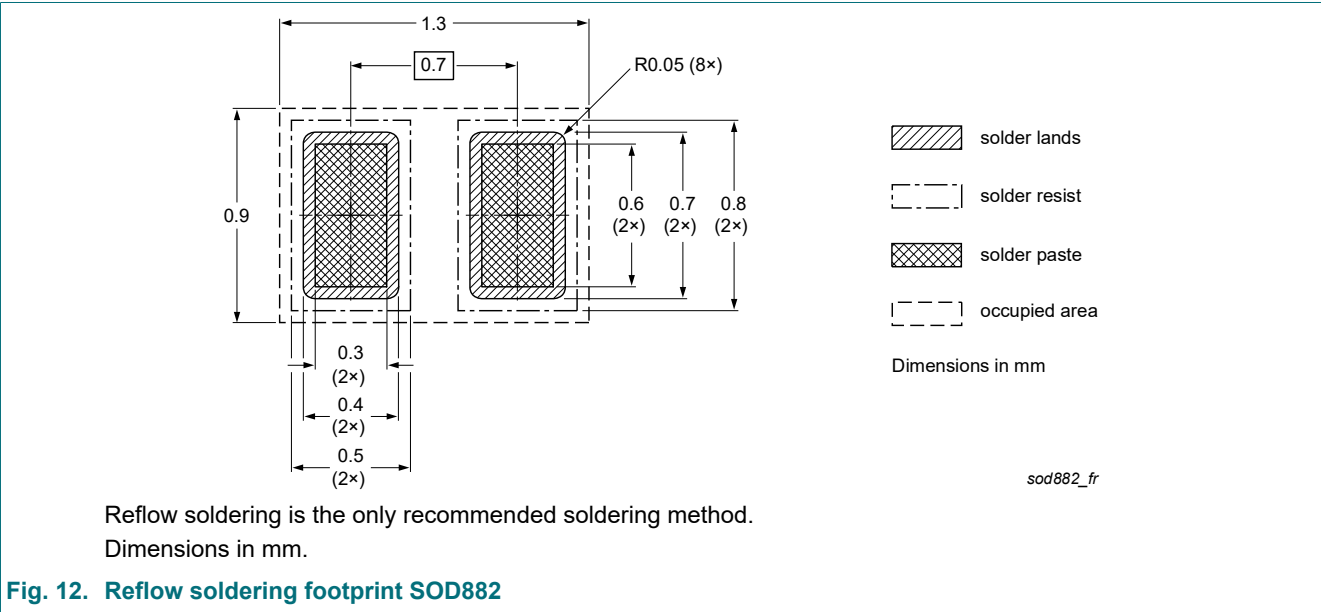


Fig. 11. Package outline SOD882

12. Soldering



## 13. Revision history

**Table 9. Revision history**

| Document ID       | Release date                                                                                                                                                                                                 | Data sheet status  | Change notice | Supersedes     |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|----------------|
| BZX884_BC_SER v.5 | 20201214                                                                                                                                                                                                     | Product data sheet | -             | BZX884_SER v.4 |
| Modifications:    | <ul style="list-style-type: none"><li>Characteristics: Working voltage min. value at tolerance <math>\pm 2\%</math> for BZX884B/C4V3 corrected</li><li>Characteristics: Graphs and figures aligned</li></ul> |                    |               |                |
| BZX884_SER v.4    | 20180323                                                                                                                                                                                                     | Product data sheet | -             | BZX884_SER v.3 |
| BZX884_SER v.3    | 20171114                                                                                                                                                                                                     | Product data sheet | -             | BZX884_SER v.2 |

## 14. Legal information

### Data sheet status

| Document status<br>[1][2]      | Product status [3] | Definition                                                                            |
|--------------------------------|--------------------|---------------------------------------------------------------------------------------|
| Objective [short] data sheet   | Development        | This document contains data from the objective specification for product development. |
| 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".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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