



# BZX8850S-Q series

## Low-current voltage regulator diodes

Rev. 1 — 25 August 2021

Product data sheet

## 1. General description

Low-current voltage regulator diodes in an ultra small SOD882BD (DFN1006BD-2) leadless Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

## 2. Features and benefits

- Total power dissipation:  $\leq 365$  mW
- Tolerance series: approximately  $\pm 5\%$
- Working voltage range: nominal 1.8 V to 75 V
- Specified at a low test current (50  $\mu$ A), ideal for low bias and portable battery-powered applications
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Low-current general regulation functions

## 4. Quick reference data

Table 1. Quick reference data

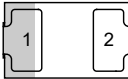
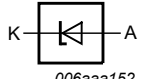
| Symbol    | Parameter               | Conditions               | Min | Typ | Max | Unit |
|-----------|-------------------------|--------------------------|-----|-----|-----|------|
| $V_F$     | forward voltage         | $I_F = 10$ mA [1]        | -   | -   | 0.9 | V    |
| $P_{tot}$ | total power dissipation | $T_{amb} \leq 25$ °C [2] | -   | -   | 365 | 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<br>[1] |  <p>Transparent top view</p> |  |
| 2   | A      | anode          |                                                                                                                  |                                                                                       |

[1] The marking bar indicates the cathode.

## 6. Ordering information

Table 3. Ordering information

| Type number       | Package     |                                                                                                                                |          |
|-------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------|----------|
|                   | Name        | Description                                                                                                                    | Version  |
| BZX8850S-Q series | DFN1006BD-2 | Leadless ultra small plastic package with side-wettable flanks (SWF): 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.47 mm body | SOD882BD |

## 7. Marking

Table 4. Marking Codes

| Type number     | Marking Code | Type number     | Marking Code | Type number    | Marking Code | Type number    | Marking Code |
|-----------------|--------------|-----------------|--------------|----------------|--------------|----------------|--------------|
| BZX8850S-C1V8-Q | 5N           | BZX8850S-C4V7-Q | 5Y           | BZX8850S-C12-Q | 7J           | BZX8850S-C33-Q | 7V           |
| BZX8850S-C2V0-Q | 5P           | BZX8850S-C5V1-Q | 5Z           | BZX8850S-C13-Q | 7K           | BZX8850S-C36-Q | 7W           |
| BZX8850S-C2V2-Q | 5Q           | BZX8850S-C5V6-Q | 7A           | BZX8850S-C15-Q | 7M           | BZX8850S-C39-Q | 7X           |
| BZX8850S-C2V4-Q | 5R           | BZX8850S-C6V2-Q | 7B           | BZX8850S-C16-Q | 7N           | BZX8850S-C43-Q | 7Y           |
| BZX8850S-C2V7-Q | 5S           | BZX8850S-C6V8-Q | 7C           | BZX8850S-C18-Q | 7P           | BZX8850S-C47-Q | 7Z           |
| BZX8850S-C3V0-Q | 5T           | BZX8850S-C7V5-Q | 7D           | BZX8850S-C20-Q | 7Q           | BZX8850S-C51-Q | 8A           |
| BZX8850S-C3V3-Q | 5U           | BZX8850S-C8V2-Q | 7E           | BZX8850S-C22-Q | 7R           | BZX8850S-C56-Q | 8B           |
| BZX8850S-C3V6-Q | 5V           | BZX8850S-C9V1-Q | 7F           | BZX8850S-C24-Q | 7S           | BZX8850S-C62-Q | 8C           |
| BZX8850S-C3V9-Q | 5W           | BZX8850S-C10-Q  | 7G           | BZX8850S-C27-Q | 7T           | BZX8850S-C68-Q | 8D           |
| BZX8850S-C4V3-Q | 5X           | BZX8850S-C11-Q  | 7H           | BZX8850S-C30-Q | 7U           | BZX8850S-C75-Q | 8E           |

## 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         |
| $P_{ZSM}$ | non-repetitive peak reverse power dissipation | $t_p = 100 \mu s$ ; square wave;<br>$T_j = 25^\circ C$ ; prior to surge |     | -   | 40   | W          |
| $P_{tot}$ | total power dissipation                       | $T_{amb} \leq 25^\circ C$                                               | [1] | -   | 365  | 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] Device mounted on an FR4 Printed-Circuit Board (PCB), single sided copper, tin-plated and standard footprint.

## 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] | -   | -   | 340 | K/W  |

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

## 10. Characteristics

**Table 7. Electrical characteristics**
 $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| Symbol | Parameter       | Conditions           |     | Max | Unit |
|--------|-----------------|----------------------|-----|-----|------|
| $V_F$  | forward voltage | $I_F = 10\text{ mA}$ | [1] | 0.9 | V    |

[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ 
**Table 8. Electrical characteristics per type: BZX8850S-C1V8-Q to BZX8850S-C24-Q**
 $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| BZX8850S-C | Working voltage<br>V <sub>Z</sub> (V) |       | Differential resistance<br>r <sub>diff</sub> (Ω) |                       | Reverse current<br>I <sub>R</sub> (μA) |                    | Temperature coefficient<br>S <sub>Z</sub> (mV/K) |      | Diode capacit.<br>C <sub>d</sub> (pF)[1] |
|------------|---------------------------------------|-------|--------------------------------------------------|-----------------------|----------------------------------------|--------------------|--------------------------------------------------|------|------------------------------------------|
|            | I <sub>Z</sub> = 50 μA                |       | I <sub>Z</sub> = 1 mA                            | I <sub>Z</sub> = 5 mA |                                        |                    | I <sub>Z</sub> = 5 mA                            |      |                                          |
|            | Min                                   | Max   | Max                                              | Max                   | Max                                    | V <sub>R</sub> (V) | Min                                              | Max  | Max                                      |
| 1V8-Q      | 1.71                                  | 1.89  | 600                                              | 100                   | 7.5                                    | 1.0                | -3.5                                             | 0    | 220                                      |
| 2V0-Q      | 1.88                                  | 2.12  | 600                                              | 100                   | 7                                      | 1.0                | -3.5                                             | 0    | 220                                      |
| 2V2-Q      | 2.09                                  | 2.31  | 600                                              | 100                   | 4                                      | 1.0                | -3.5                                             | 0    | 210                                      |
| 2V4-Q      | 2.28                                  | 2.52  | 600                                              | 100                   | 2                                      | 1.0                | -3.5                                             | 0    | 200                                      |
| 2V7-Q      | 2.565                                 | 2.835 | 600                                              | 100                   | 1                                      | 1.0                | -3.5                                             | 0    | 190                                      |
| 3V0-Q      | 2.85                                  | 3.15  | 600                                              | 100                   | 0.8                                    | 1.0                | -3.5                                             | 0.2  | 170                                      |
| 3V3-Q      | 3.13                                  | 3.47  | 600                                              | 100                   | 7.5                                    | 1.5                | -3.5                                             | 1.2  | 160                                      |
| 3V6-Q      | 3.42                                  | 3.78  | 600                                              | 95                    | 7.5                                    | 2.0                | -3.5                                             | 1.2  | 160                                      |
| 3V9-Q      | 3.70                                  | 4.10  | 600                                              | 95                    | 5.0                                    | 2.0                | -2.7                                             | 2.5  | 150                                      |
| 4V3-Q      | 4.09                                  | 4.52  | 600                                              | 95                    | 4.0                                    | 2.0                | -2.7                                             | 2.5  | 150                                      |
| 4V7-Q      | 4.47                                  | 4.94  | 600                                              | 80                    | 5.0                                    | 3.0                | -2.7                                             | 2.5  | 140                                      |
| 5V1-Q      | 4.85                                  | 5.36  | 500                                              | 60                    | 5.0                                    | 3.0                | -2.0                                             | 3.7  | 130                                      |
| 5V6-Q      | 5.32                                  | 5.88  | 400                                              | 40                    | 2.0                                    | 4.0                | -2.0                                             | 3.7  | 120                                      |
| 6V2-Q      | 5.89                                  | 6.51  | 160                                              | 10                    | 1.0                                    | 5.0                | 0.4                                              | 4.5  | 110                                      |
| 6V8-Q      | 6.46                                  | 7.14  | 80                                               | 15                    | 0.1                                    | 5.1                | 1.2                                              | 4.5  | 100                                      |
| 7V5-Q      | 7.13                                  | 7.88  | 80                                               | 15                    | 0.1                                    | 5.7                | 2.5                                              | 5.3  | 150                                      |
| 8V2-Q      | 7.79                                  | 8.61  | 80                                               | 15                    | 0.1                                    | 6.2                | 3.2                                              | 6.2  | 150                                      |
| 9V1-Q      | 8.65                                  | 9.56  | 100                                              | 15                    | 0.1                                    | 6.9                | 3.8                                              | 7.0  | 150                                      |
| 10-Q       | 9.50                                  | 10.50 | 150                                              | 20                    | 0.1                                    | 7.6                | 4.5                                              | 8.0  | 90                                       |
| 11-Q       | 10.45                                 | 11.55 | 150                                              | 20                    | 0.05                                   | 8.4                | 5.4                                              | 9.0  | 85                                       |
| 12-Q       | 11.40                                 | 12.60 | 150                                              | 25                    | 0.05                                   | 9.1                | 6.0                                              | 10.0 | 85                                       |
| 13-Q       | 12.35                                 | 13.65 | 170                                              | 30                    | 0.05                                   | 9.8                | 7.0                                              | 11.0 | 80                                       |
| 15-Q       | 14.25                                 | 15.75 | 200                                              | 30                    | 0.05                                   | 11.4               | 9.2                                              | 13.0 | 75                                       |
| 16-Q       | 15.20                                 | 16.80 | 200                                              | 40                    | 0.05                                   | 12.1               | 10.4                                             | 14.0 | 75                                       |
| 18-Q       | 17.10                                 | 18.90 | 225                                              | 45                    | 0.05                                   | 13.6               | 12.4                                             | 16.0 | 70                                       |
| 20-Q       | 19.00                                 | 21.00 | 225                                              | 55                    | 0.05                                   | 15.2               | 14.4                                             | 18.0 | 60                                       |
| 22-Q       | 20.90                                 | 23.10 | 250                                              | 55                    | 0.05                                   | 16.7               | 16.4                                             | 20.0 | 60                                       |
| 24-Q       | 22.80                                 | 25.20 | 250                                              | 70                    | 0.05                                   | 18.2               | 18.4                                             | 22.0 | 55                                       |

[1]  $f = 1\text{ MHz}$ ;  $V_R = 0\text{ V}$

Table 9. Electrical characteristics per type: BZX8850S-C27-Q to BZX8850S-C75-Q

| BZX8850S-C | Working voltage<br>V <sub>Z</sub> (V) |       | Differential resistance<br>r <sub>diff</sub> (Ω) |                       | Reverse current<br>I <sub>R</sub> (μA) |                    | Temperature coefficient<br>S <sub>Z</sub> (mV/K) |      | Diode capacit.<br>C <sub>d</sub> (pF) <a href="#">[1]</a> |
|------------|---------------------------------------|-------|--------------------------------------------------|-----------------------|----------------------------------------|--------------------|--------------------------------------------------|------|-----------------------------------------------------------|
|            | I <sub>Z</sub> = 50 μA                |       | I <sub>Z</sub> = 0.5 mA                          | I <sub>Z</sub> = 2 mA |                                        |                    | I <sub>Z</sub> = 2 mA                            |      |                                                           |
|            | Min                                   | Max   | Max                                              | Max                   | Max                                    | V <sub>R</sub> (V) | Min                                              | Max  |                                                           |
| 27-Q       | 25.65                                 | 28.35 | 300                                              | 80                    | 0.05                                   | 20.4               | 21.4                                             | 25.3 | 50                                                        |
| 30-Q       | 28.50                                 | 31.50 | 300                                              | 80                    | 0.05                                   | 22.8               | 24.4                                             | 29.4 | 50                                                        |
| 33-Q       | 31.35                                 | 34.65 | 325                                              | 80                    | 0.05                                   | 25.0               | 27.4                                             | 33.4 | 45                                                        |
| 36-Q       | 34.20                                 | 37.80 | 350                                              | 90                    | 0.05                                   | 27.3               | 30.4                                             | 37.4 | 45                                                        |
| 39-Q       | 37.05                                 | 40.95 | 350                                              | 130                   | 0.05                                   | 29.6               | 33.4                                             | 41.2 | 45                                                        |
| 43-Q       | 40.85                                 | 45.15 | 375                                              | 150                   | 0.05                                   | 32.6               | 37.6                                             | 46.6 | 40                                                        |
| 47-Q       | 44.00                                 | 50.00 | 375                                              | 170                   | 0.05                                   | 32.9               | 42.0                                             | 51.8 | 40                                                        |
| 51-Q       | 48.00                                 | 54.00 | 400                                              | 180                   | 0.05                                   | 35.7               | 46.6                                             | 57.2 | 40                                                        |
| 56-Q       | 52.00                                 | 60.00 | 425                                              | 200                   | 0.05                                   | 39.2               | 52.2                                             | 63.8 | 40                                                        |
| 62-Q       | 58.00                                 | 66.00 | 450                                              | 215                   | 0.05                                   | 43.4               | 58.8                                             | 71.6 | 35                                                        |
| 68-Q       | 64.00                                 | 72.00 | 475                                              | 240                   | 0.05                                   | 47.6               | 65.6                                             | 79.8 | 35                                                        |
| 75-Q       | 70.00                                 | 79.00 | 500                                              | 255                   | 0.05                                   | 52.5               | 73.4                                             | 88.6 | 35                                                        |

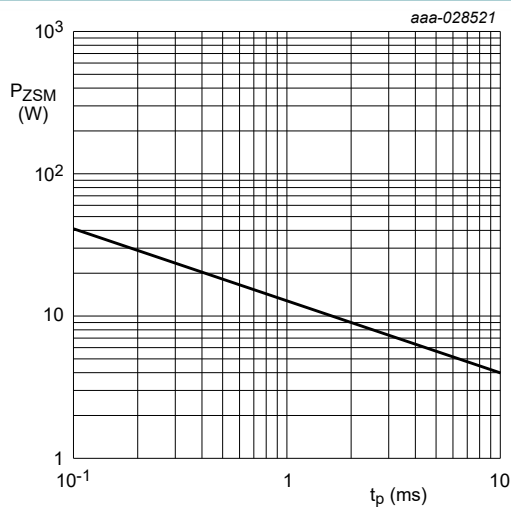
[1]  $f = 1 MHz$ ;  $V_R = 0 V$ (1)  $T_j = 25^\circ C$  (before surge)

Fig. 1. Non-repetitive peak reverse power dissipation as a function of pulse duration; maximum values

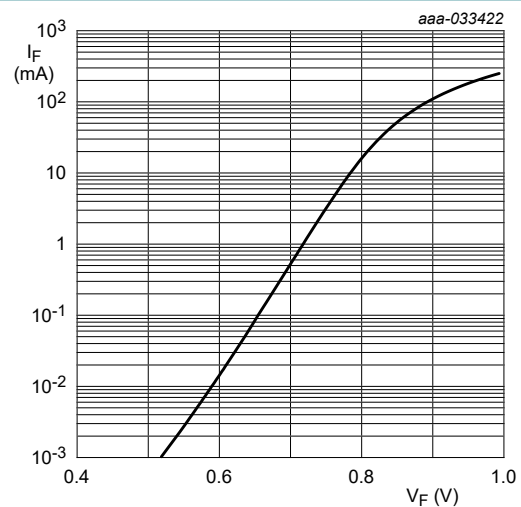
 $T_j = 25^\circ C$ 

Fig. 2. Forward current as a function of forward voltage; typical values (BZX8850S-C1V8-Q)

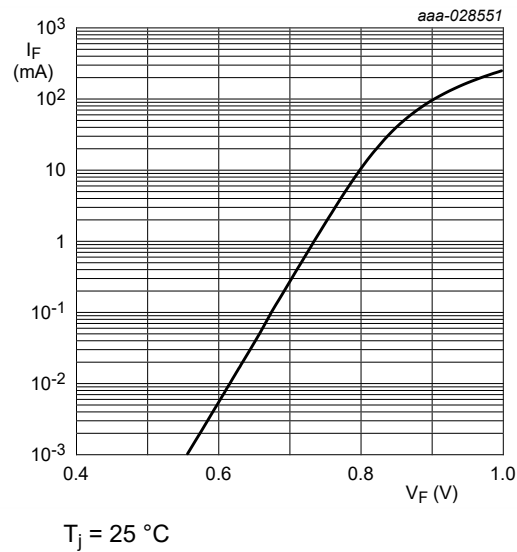


Fig. 3. Forward current as a function of forward voltage; typical values (BZX8850S-C6V8-Q)

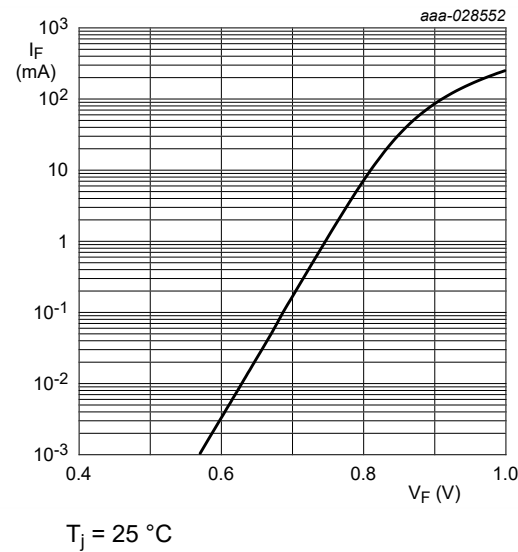


Fig. 4. Forward current as a function of forward voltage; typical values (BZX8850S-C7V5-Q)

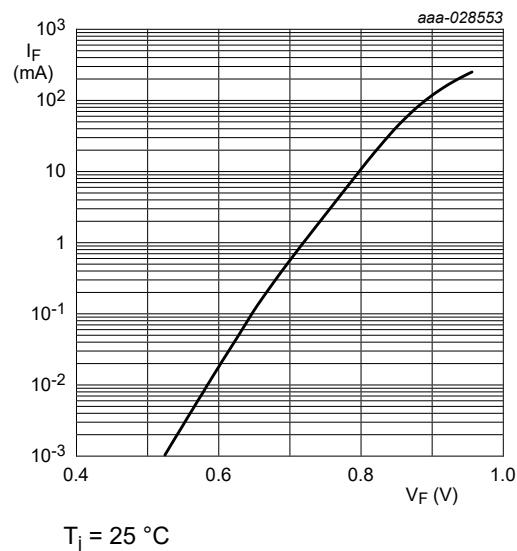


Fig. 5. Forward current as a function of forward voltage; typical values (BZX8850S-C75-Q)

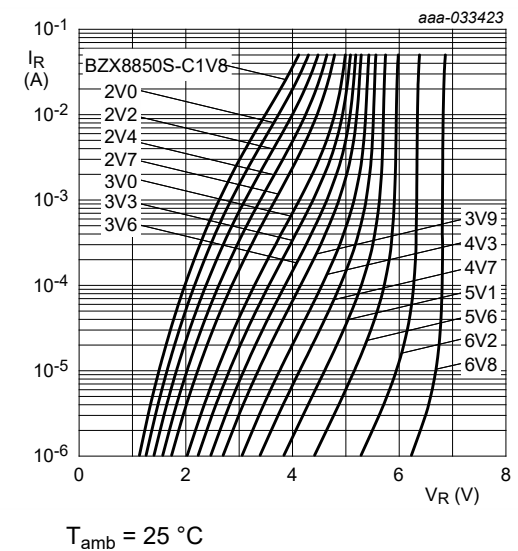


Fig. 6. Reverse current as a function of reverse voltage; typical values (BZX8850S-C1V8-Q to BZX8850S-C6V8-Q)

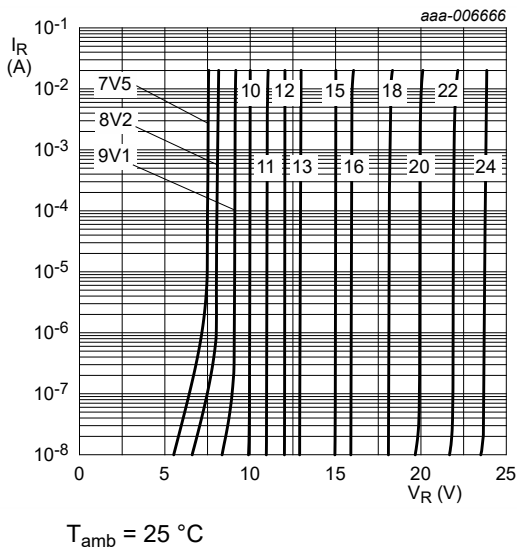


Fig. 7. Reverse current as a function of reverse voltage; typical values (BZX8850S-C7V5-Q to BZX8850S-C24-Q)

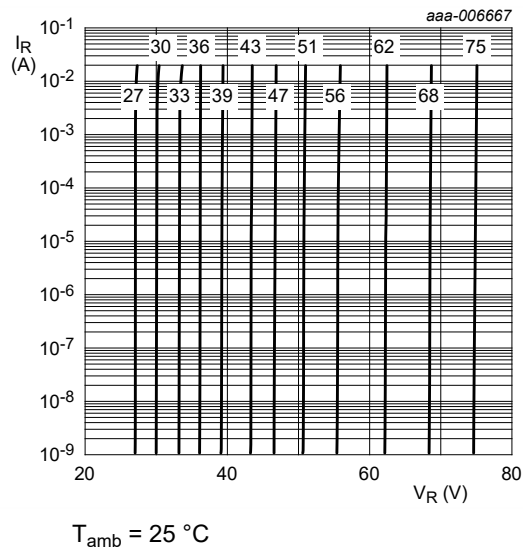


Fig. 8. Reverse current as a function of reverse voltage; typical values (BZX8850S-C27-Q to BZX8850S-C75-Q)

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

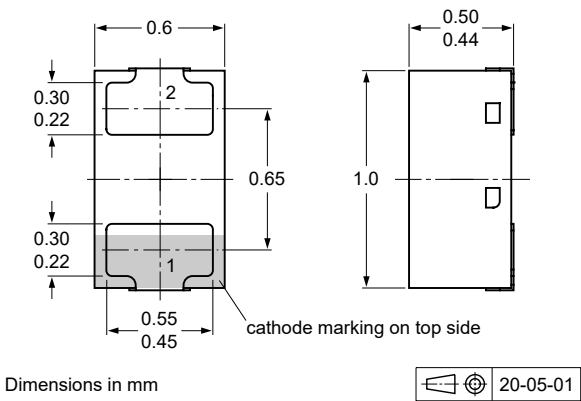
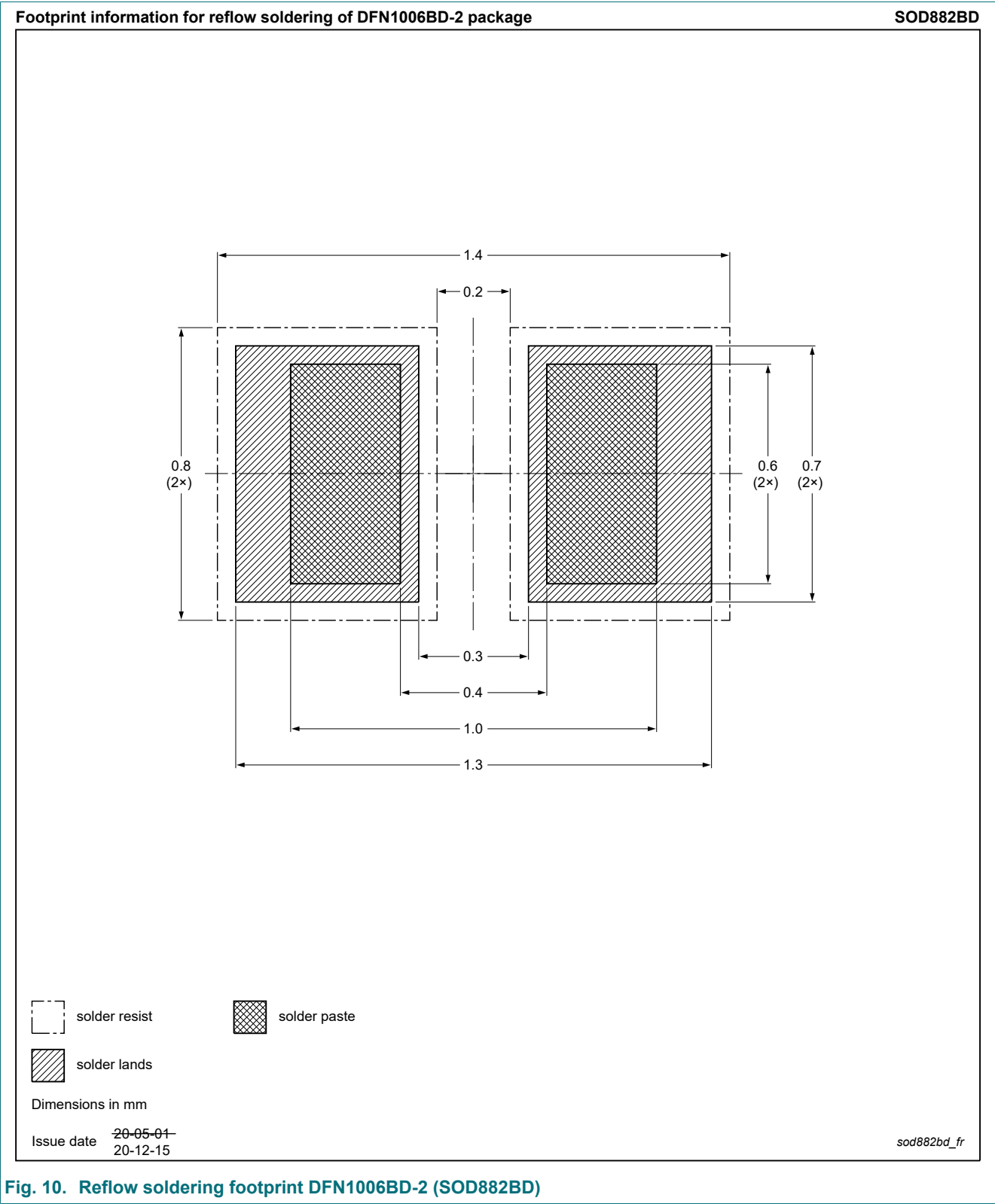


Fig. 9. Package outline DFN1006BD-2 (SOD882BD)

13. Soldering



14. Revision history

Table 10. Revision history

| Document ID        | Release date | Data sheet status  | Change notice | Supersedes |
|--------------------|--------------|--------------------|---------------|------------|
| BZX8850S-Q_SER v.1 | 20210825     | Product data sheet | -             | -          |

## 15. 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. |
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- [1] Please consult the most recently issued document before initiating or completing a design.
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