



BAT54LS

Schottky barrier diode

25 January 2021

Product data sheet

1. General description

Planar Schottky barrier diode in a leadless ultra small DFN1006BD-2 (SOD882BD) Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

2. Features and benefits

- Low forward voltage
- Low capacitance
- Leadless ultra small SMD plastic package
- Low package height of 0.5 mm
- Suitable for Automatic Optical Inspection (AOI) of solder joint

3. Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits

4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|---|-----|-----|-----|---------------|
| V_R | reverse voltage | | - | - | 30 | V |
| V_F | forward voltage | $I_F = 100 \text{ mA}$; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$ | - | - | 800 | mV |
| I_R | reverse current | $V_R = 25 \text{ V}$; $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 2$; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$ | - | - | 2 | μA |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline | Graphic symbol |
|-----|--------|-------------|---|---------------------------|
| 1 | K | cathode | <p>Transparent top view</p> <p>DFN1006BD-2 (SOD882BD)</p> | <p>K A</p> <p>sym001</p> |
| 2 | A | anode | | |

6. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|-------------|--|----------|
| | Name | Description | Version |
| BAT54LS | 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 |
|-------------|--------------|
| BAT54LS | 8L |

8. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter | Conditions | | Min | Max | Unit |
|-----------|-------------------------------------|--|-----|-----|-----|------|
| V_R | reverse voltage | | | - | 30 | V |
| I_F | forward current | $T_{amb} \leq 25\text{ °C}$ | | - | 200 | mA |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1\text{ s}$; $\delta \leq 0.5$; $T_{amb} = 25\text{ °C}$ | | - | 300 | mA |
| I_{FSM} | non-repetitive peak forward current | square-wave pulse; $t_p \leq 10\text{ ms}$; $T_{j(\text{init})} = 25\text{ °C}$ | | - | 600 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | [1] | - | 345 | mW |
| | | | [2] | - | 640 | mW |
| T_j | junction temperature | | | - | 150 | °C |
| T_{amb} | ambient temperature | | | -55 | 150 | °C |
| T_{stg} | storage temperature | | | -65 | 150 | °C |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided 70 μm copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 μm single-sided copper, tin-plated; mounting pad for collector 1cm².

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] [2] | - | - | 360 | K/W |
| | | | [3] | - | - | 195 | K/W |

- [1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided 70 μm copper, tin-plated and standard footprint.
- [2] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses PR are a significant part of the total power losses.
- [3] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 μm single-sided copper, tin-plated; mounting pad for collector 1 cm^2 .

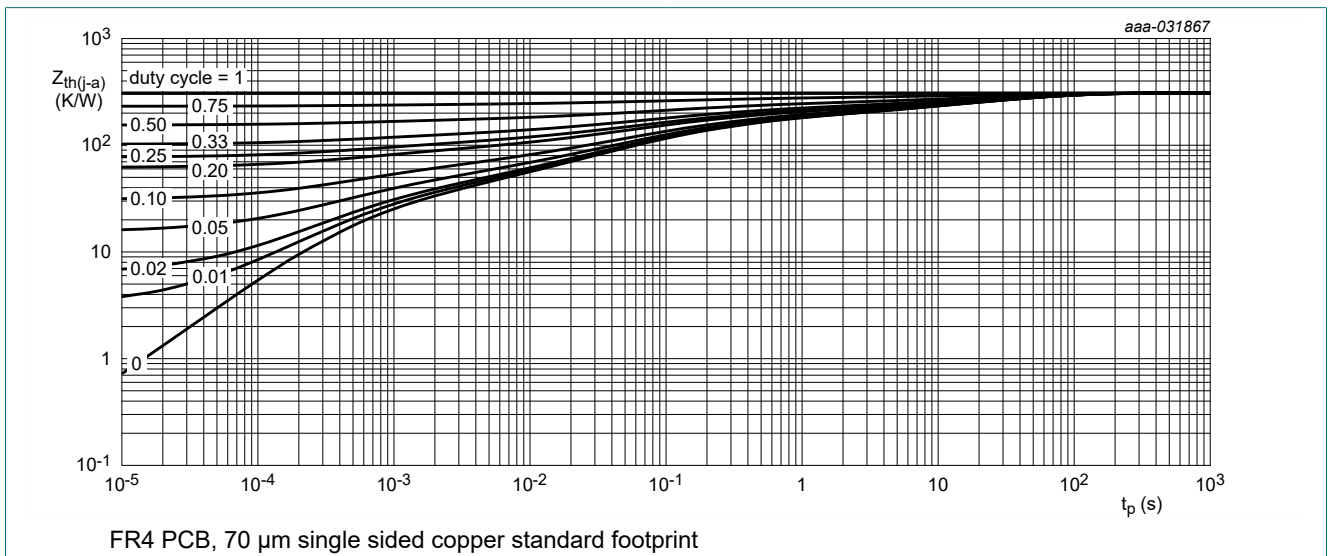


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

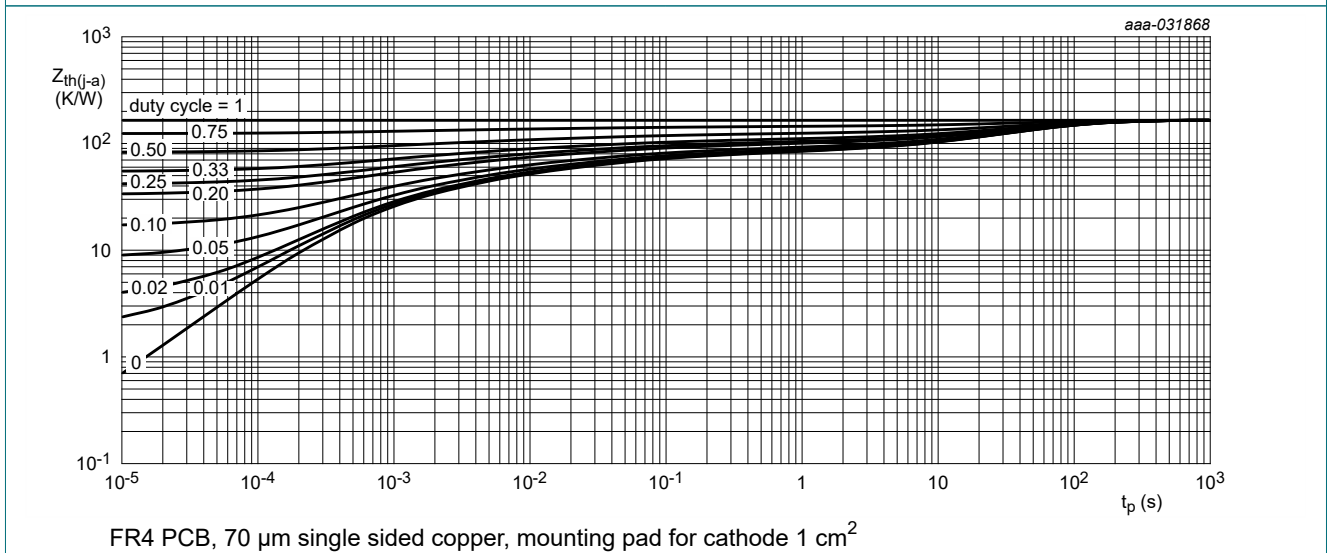
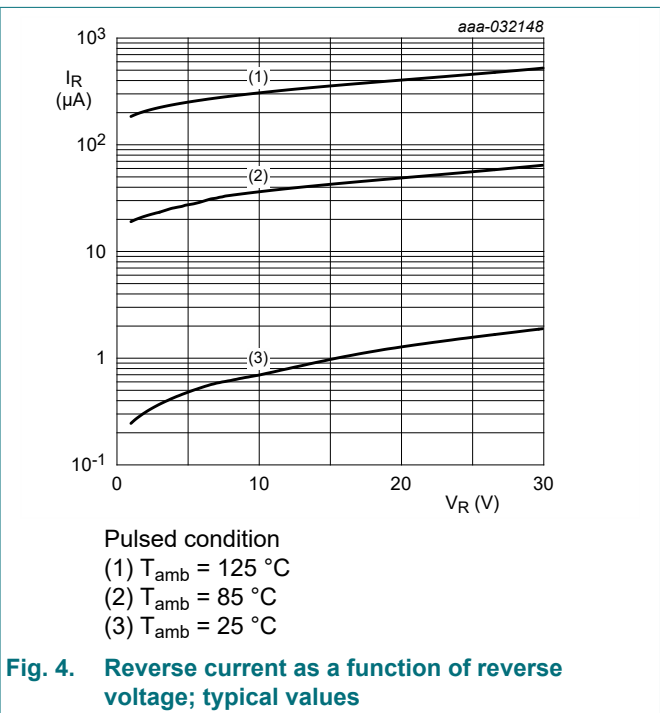
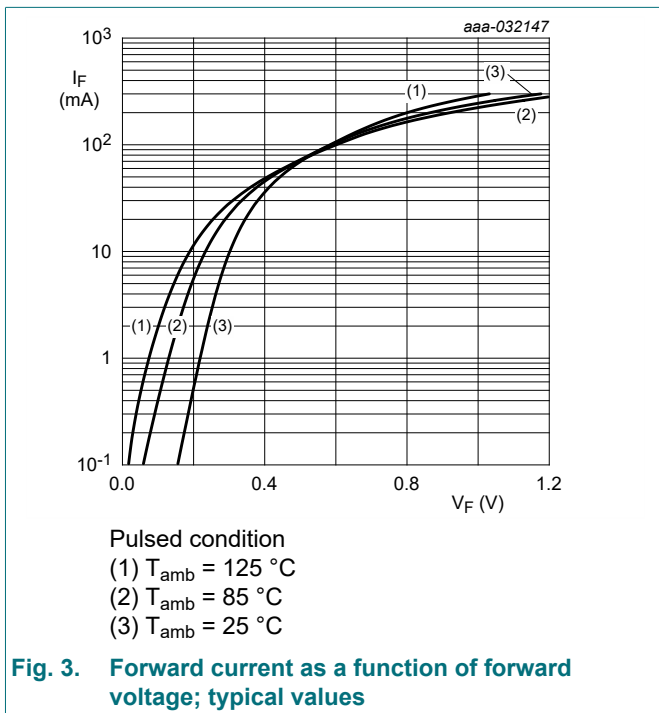


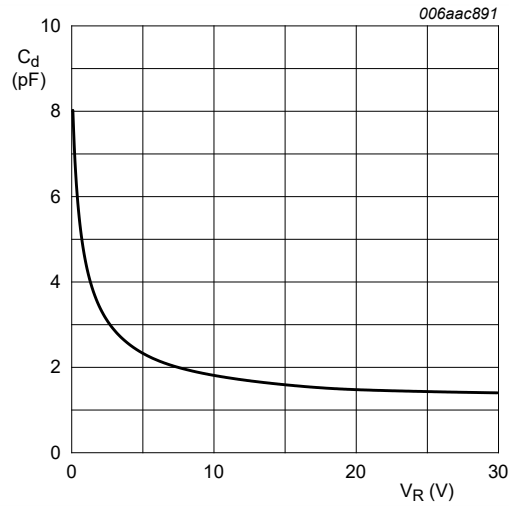
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------|-----------------------|---|-----|-----|-----|---------------|
| V_F | forward voltage | $I_F = 0.1 \text{ mA}$; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 240 | mV |
| | | $I_F = 1 \text{ mA}$; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 320 | mV |
| | | $I_F = 10 \text{ mA}$; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 400 | mV |
| | | $I_F = 30 \text{ mA}$; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 500 | mV |
| | | $I_F = 100 \text{ mA}$; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 0.02$; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 800 | mV |
| I_R | reverse current | $V_R = 25 \text{ V}$; $t_p \leq 300 \text{ }\mu\text{s}$; $\delta \leq 2$; pulsed; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 2 | μA |
| C_d | diode capacitance | $V_R = 1 \text{ V}$; $f = 1 \text{ MHz}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 10 | pF |
| t_{rr} | reverse recovery time | $I_F = 10 \text{ mA}$; $I_R = 10 \text{ mA}$; $R_L = 100 \text{ }\Omega$; $I_{R(\text{meas})} = 1 \text{ mA}$; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ | - | - | 5 | ns |

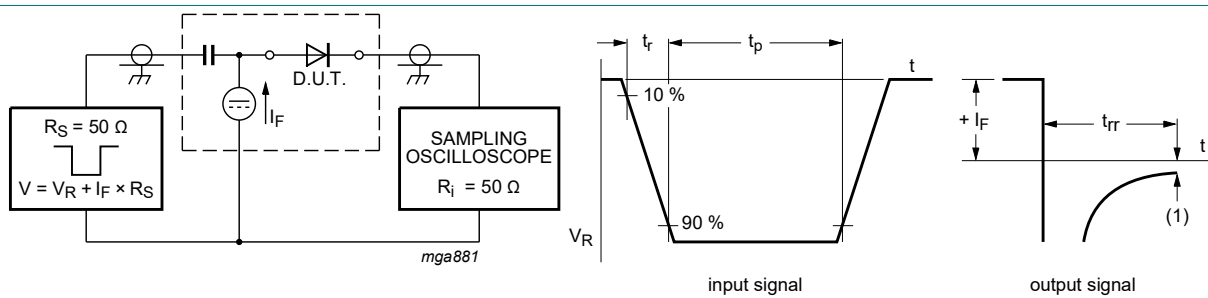




$T_{amb} = 25\text{ }^\circ\text{C}; f = 1\text{ MHz}$

Fig. 5. Diode capacitance as a function of reverse voltage; typical values

11. Test information



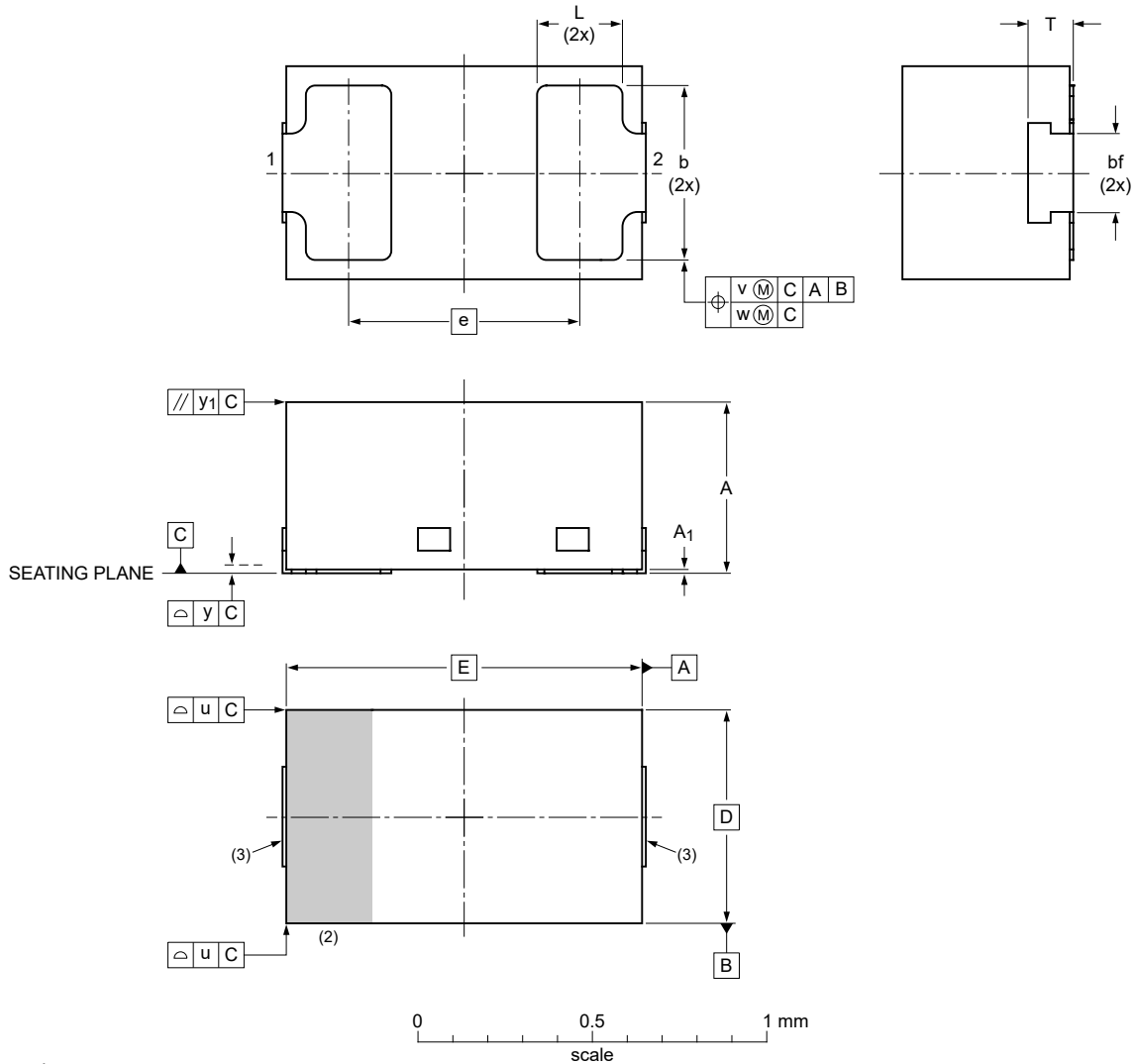
(1) $I_R = 1\text{ mA}$

Fig. 6. Reverse recovery time test circuit and waveforms

12. Package outline

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



Dimensions

| Unit | A ⁽¹⁾ | A ₁ | bf ⁽¹⁾ | b | D | E | e | L | T ⁽¹⁾ | u | v | w | y | y ₁ |
|------|------------------|----------------|-------------------|------|------|------|------|------|------------------|------|------|------|------|----------------|
| max | 0.50 | 0.04 | | 0.55 | | | | 0.30 | 0.22 | | | | | |
| nom | 0.47 | | | 0.50 | 0.60 | 1.00 | 0.65 | 0.25 | 0.16 | 0.05 | 0.10 | 0.05 | 0.05 | 0.05 |
| min | 0.44 | | 0.20 | 0.45 | | | | 0.22 | 0.10 | | | | | |

Note

1. Dimension including plating thickness.
2. The marking bar indicates the cathode.
3. Solderable lead end, protrusion max. 0.02 mm.

sod882bd_po

| Outline version | References | | | | European projection | Issue date |
|-----------------|------------|----------|-------|--|---------------------|----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOD882BD | | MO-343AA | | | | 20-06-22 20-06-23 |

Fig. 7. Package outline DFN1006BD-2 (SOD882BD)

13. Soldering

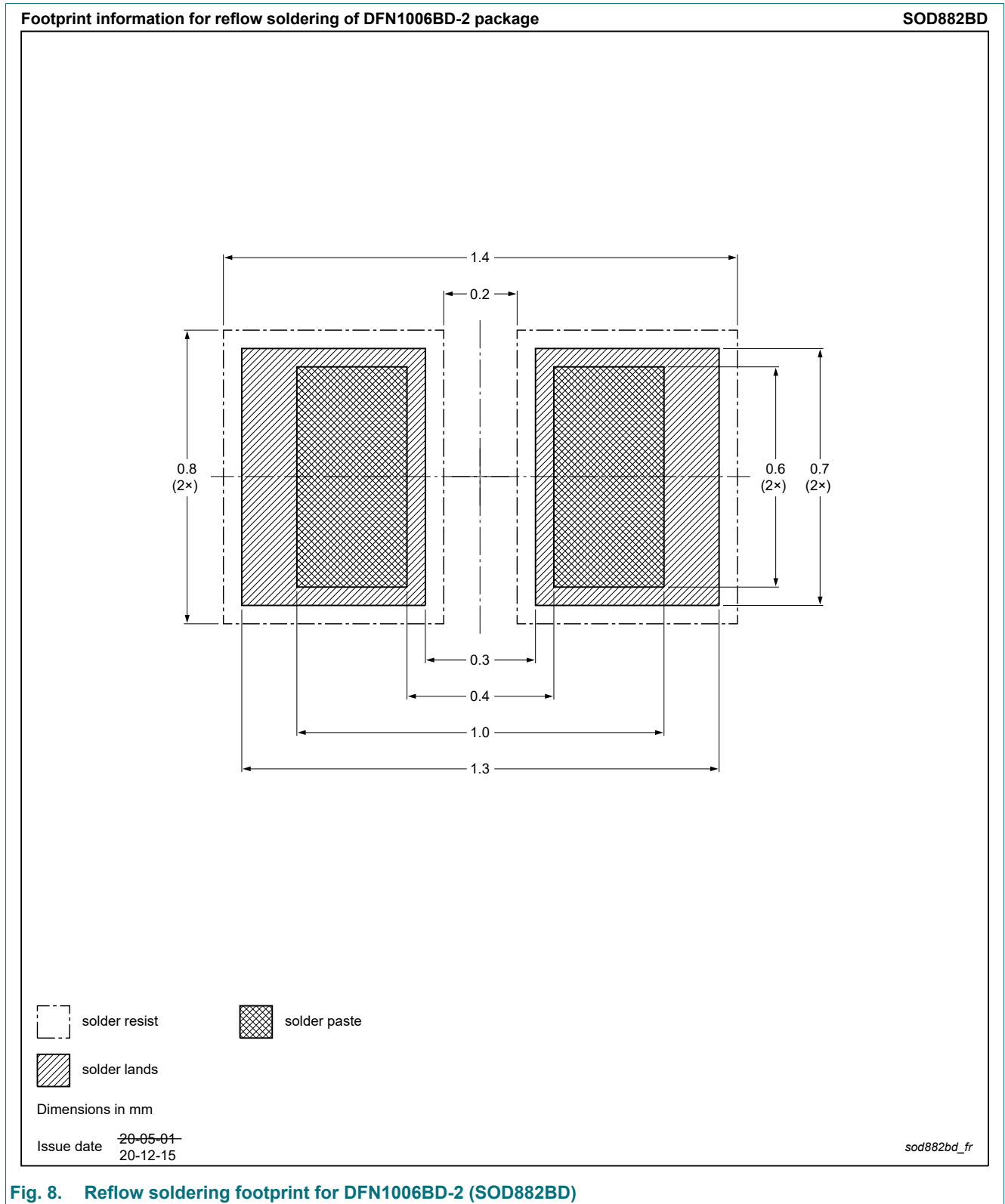


Fig. 8. Reflow soldering footprint for DFN1006BD-2 (SOD882BD)

14. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---------------|--------------|--------------------|---------------|------------|
| BAT54LS v.1 | 20210125 | Product data sheet | - | - |

15. Legal information

Data sheet status

| Document status [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. |

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