



# MJPE45H11

80 V, 8 A PNP high power bipolar transistor

22 April 2025

Product data sheet

## 1. General description

PNP high power bipolar transistor in a power SOT1289B (CFP15B) flat lead Surface-Mounted Device (SMD) plastic package.

NPN complement: MJPE44H11

## 2. Features and benefits

- High thermal power dissipation capability
- High energy efficiency due to less heat generation
- Electrically similar to popular MJD45H series
- Low collector emitter saturation voltage

## 3. Applications

- Power management
- Load switch
- Linear mode voltage regulator
- Constant current drive backlighting application
- Motor drive
- Relay replacement

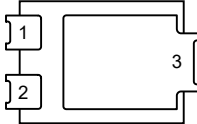
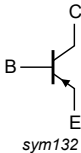
## 4. Quick reference data

Table 1. Quick reference data

| Symbol    | Parameter                 | Conditions                                                                                            | Min | Typ | Max | Unit |
|-----------|---------------------------|-------------------------------------------------------------------------------------------------------|-----|-----|-----|------|
| $V_{CEO}$ | collector-emitter voltage | open base                                                                                             | -   | -   | -80 | V    |
| $I_C$     | collector current         |                                                                                                       | -   | -   | -8  | A    |
| $I_{CM}$  | peak collector current    | single pulse; $t_p \leq 1$ ms                                                                         | -   | -   | -16 | A    |
| $h_{FE}$  | DC current gain           | $V_{CE} = -1$ V; $I_C = -2$ A; pulsed; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_{amb} = 25$ °C | 60  | -   | -   |      |

5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                                     | Graphic symbol                                                                                |
|-----|--------|-------------|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1   | E      | emitter     | <br>CFP15B (SOT1289B) | <br>sym132 |
| 2   | B      | base        |                                                                                                        |                                                                                               |
| 3   | C      | collector   |                                                                                                        |                                                                                               |

6. Ordering information

Table 3. Ordering information

| Type number               | Package |                                                                                                    |                          |
|---------------------------|---------|----------------------------------------------------------------------------------------------------|--------------------------|
|                           | Name    | Description                                                                                        | Version                  |
| <a href="#">MJPE45H11</a> | CFP15B  | plastic, thermal enhanced ultra thin SMD package; 3 leads; 2.13 mm pitch; 5.8 x 4.3 x 0.95 mm body | <a href="#">SOT1289B</a> |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| MJPE45H11   | JPE45H11     |

8. Limiting values

Table 5. Limiting values  
In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol           | Parameter                 | Conditions                          |     | Min | Max  | Unit |
|------------------|---------------------------|-------------------------------------|-----|-----|------|------|
| V <sub>CEO</sub> | collector-emitter voltage | open base                           |     | -   | -80  | V    |
| V <sub>EBO</sub> | emitter-base voltage      | open collector                      |     | -   | -6   | V    |
| I <sub>C</sub>   | collector current         |                                     |     | -   | -8   | A    |
| I <sub>CM</sub>  | peak collector current    | single pulse; t <sub>p</sub> ≤ 1 ms |     | -   | -16  | A    |
| P <sub>tot</sub> | total power dissipation   | T <sub>amb</sub> ≤ 25 °C            | [1] | -   | 1.65 | W    |
|                  |                           |                                     | [2] | -   | 2.25 | W    |
| T <sub>j</sub>   | junction temperature      |                                     |     | -   | 175  | °C   |
| T <sub>amb</sub> | ambient temperature       |                                     |     | -55 | 175  | °C   |
| T <sub>stg</sub> | storage temperature       |                                     |     | -65 | 175  | °C   |

- [1] Device mounted on an FR4 Printed-Circuit Board (PCB), 140 µm single-sided copper, standard footprint.  
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), 140 µm single-sided copper, mounting pad for collector 1 cm<sup>2</sup>.

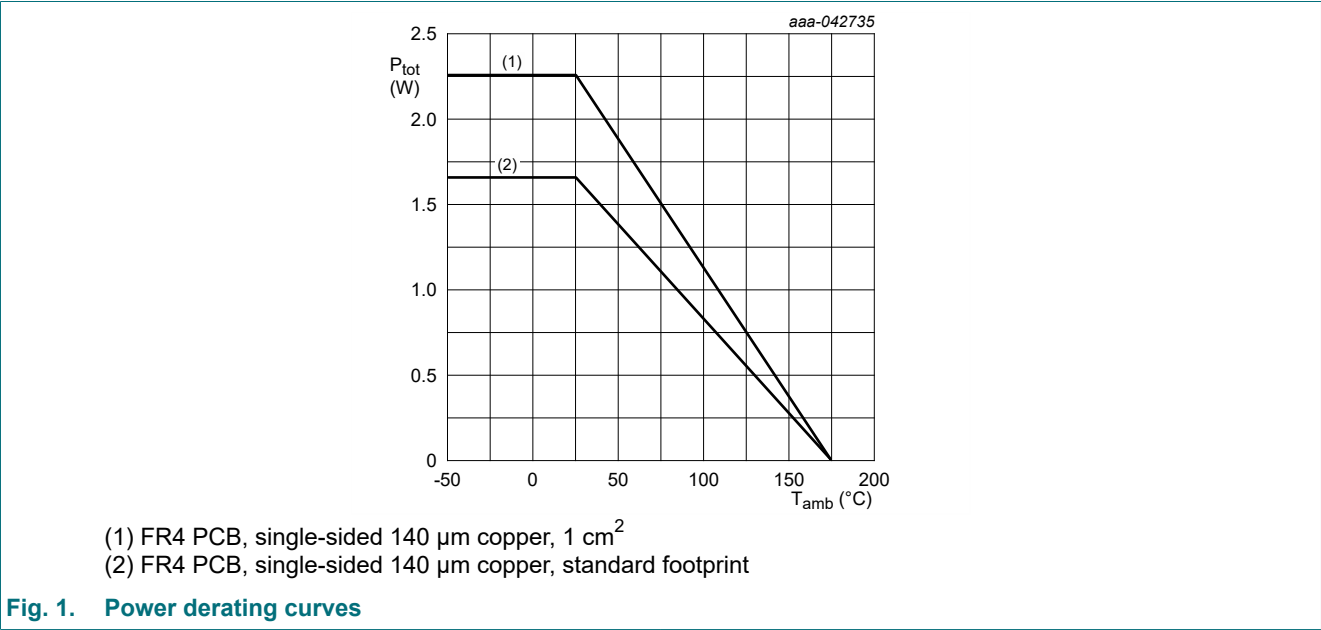


Fig. 1. Power derating curves

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] | -   | -   | 91  | K/W  |
|                |                                                  |             | [2] | -   | -   | 67  | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             |     | -   | -   | 3   | K/W  |

- [1] Device mounted on an FR4 Printed-Circuit Board (PCB), 140  $\mu\text{m}$  single-sided copper, standard footprint.  
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), 140  $\mu\text{m}$  single-sided copper, mounting pad for collector 1  $\text{cm}^2$ .

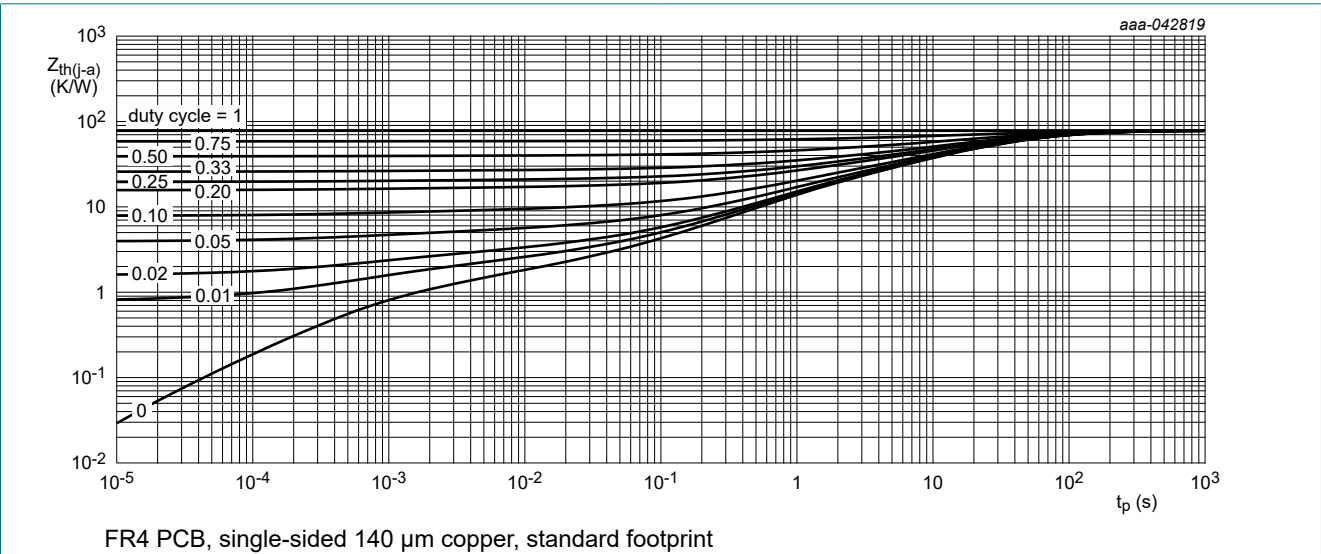


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

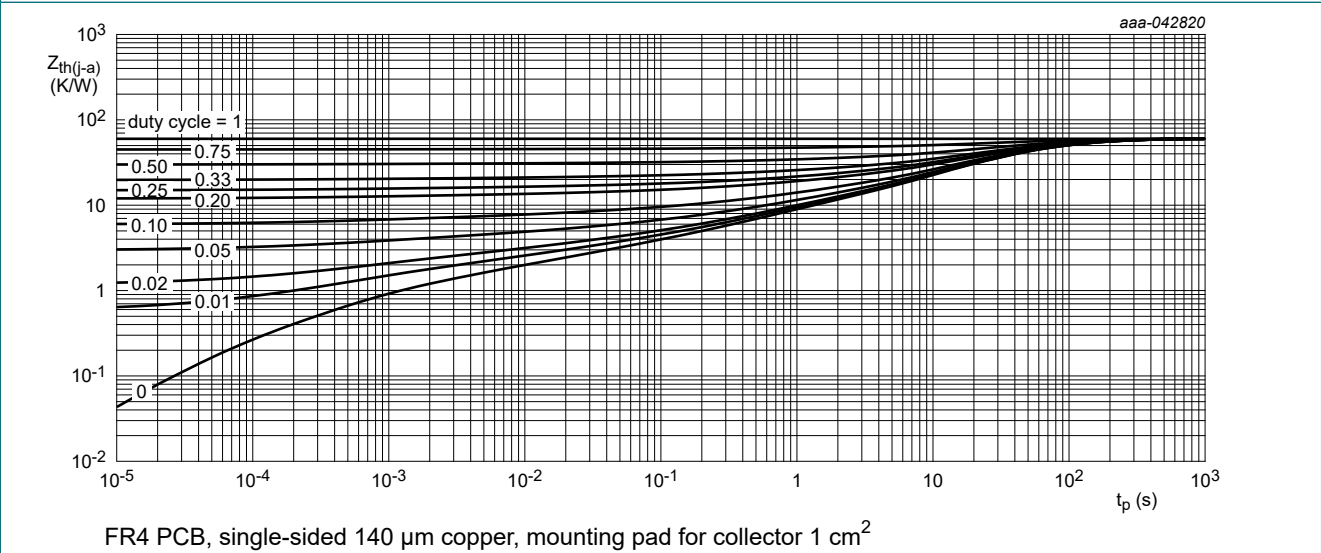


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

| Symbol        | Parameter                            | Conditions                                                                                                                                |  | Min | Typ | Max  | Unit          |
|---------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--|-----|-----|------|---------------|
| $V_{(BR)CEO}$ | collector-emitter breakdown voltage  | $I_C = -2\text{ mA}$ ; $I_B = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$                                                                      |  | -80 | -   | -    | V             |
| $V_{(BR)EBO}$ | emitter-base breakdown voltage       | $I_C = 0\text{ A}$ ; $I_E = -100\text{ }\mu\text{A}$ ; $T_{amb} = 25\text{ °C}$                                                           |  | -6  | -   | -    | V             |
| $I_{CBO}$     | collector-base cut-off current       | $V_{CB} = -64\text{ V}$ ; $I_E = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$                                                                   |  | -   | -   | -1   | $\mu\text{A}$ |
| $I_{CES}$     | collector-emitter cut-off current    | $V_{CE} = -64\text{ V}$ ; $V_{BE} = 0\text{ V}$ ; $T_{amb} = 25\text{ °C}$                                                                |  | -   | -   | -1   | $\mu\text{A}$ |
|               |                                      | $V_{CE} = -64\text{ V}$ ; $V_{BE} = 0\text{ V}$ ; $T_J = 150\text{ °C}$                                                                   |  | -   | -   | -50  | $\mu\text{A}$ |
| $I_{EBO}$     | emitter-base cut-off current         | $V_{EB} = -5\text{ V}$ ; $I_C = 0\text{ A}$ ; $T_{amb} = 25\text{ °C}$                                                                    |  | -   | -   | -1   | $\mu\text{A}$ |
| $h_{FE}$      | DC current gain                      | $V_{CE} = -1\text{ V}$ ; $I_C = -2\text{ A}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$  |  | 60  | -   | -    |               |
|               |                                      | $V_{CE} = -1\text{ V}$ ; $I_C = -4\text{ A}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$  |  | 40  | -   | -    |               |
| $V_{CEsat}$   | collector-emitter saturation voltage | $I_C = -8\text{ A}$ ; $I_B = -400\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$  |  | -   | -   | -1   | V             |
| $V_{BEsat}$   | base-emitter saturation voltage      | $I_C = -8\text{ A}$ ; $I_B = -800\text{ mA}$ ; pulsed; $t_p \leq 300\text{ }\mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{amb} = 25\text{ °C}$  |  | -   | -   | -1.5 | V             |
| $t_{on}$      | turn-on time                         | $I_C = -5\text{ A}$ ; $I_{B(on)} = -0.5\text{ A}$ ; $I_{B(off)} = 0.5\text{ A}$ ;<br>$V_{CC} = -12.5\text{ V}$ ; $T_{amb} = 25\text{ °C}$ |  | -   | 250 | -    | ns            |
| $t_s$         | storage time                         |                                                                                                                                           |  | -   | 245 | -    | ns            |
| $t_f$         | fall time                            |                                                                                                                                           |  | -   | 120 | -    | ns            |
| $t_{off}$     | turn-off time                        |                                                                                                                                           |  | -   | 370 | -    | ns            |
| $C_c$         | collector capacitance                | $V_{CB} = -10\text{ V}$ ; $I_E = 0\text{ A}$ ; $i_e = 0\text{ A}$ ;<br>$f = 1\text{ MHz}$ ; $T_{amb} = 25\text{ °C}$                      |  | -   | 85  | -    | pF            |
| $f_T$         | transition frequency                 | $V_{CE} = -10\text{ V}$ ; $I_C = -500\text{ mA}$ ; $f = 100\text{ MHz}$ ;<br>$T_{amb} = 25\text{ °C}$                                     |  | -   | 90  | -    | MHz           |

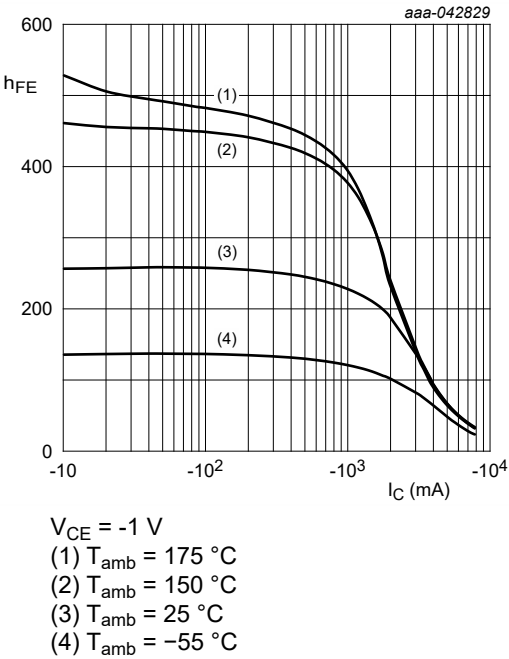


Fig. 4. DC current gain as a function of collector current; typical values

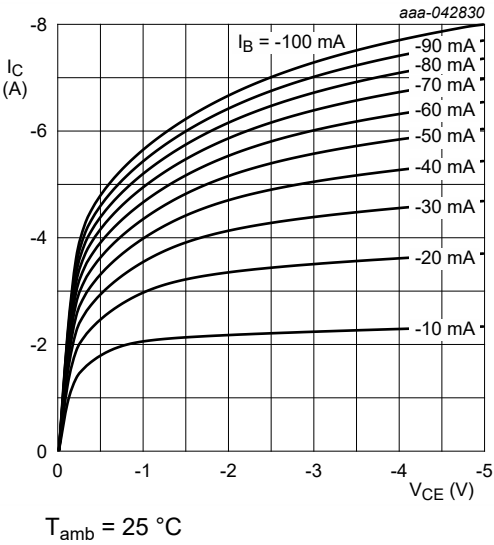


Fig. 5. Collector current as a function of collector-emitter voltage; typical values

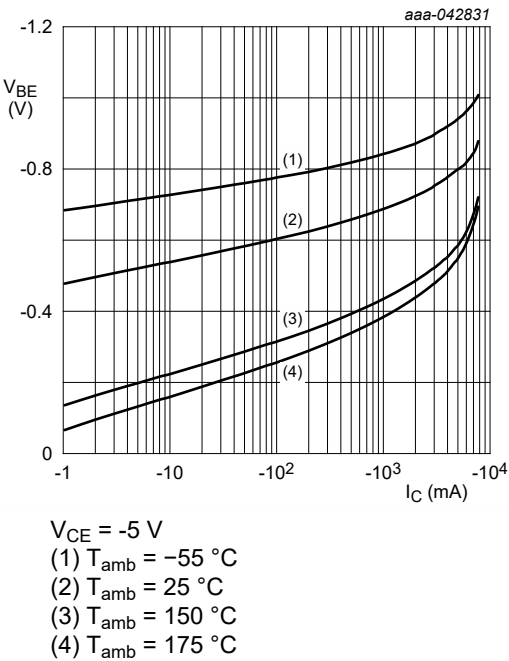


Fig. 6. Base-emitter voltage as a function of collector current; typical values

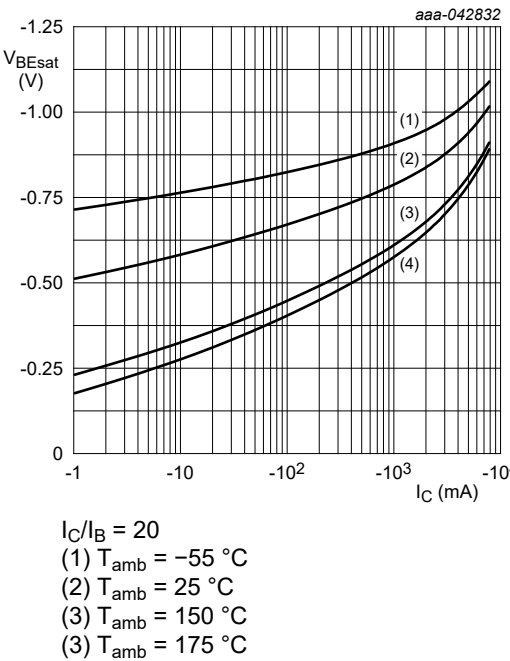


Fig. 7. Base-emitter saturation voltage as a function of collector current; typical values

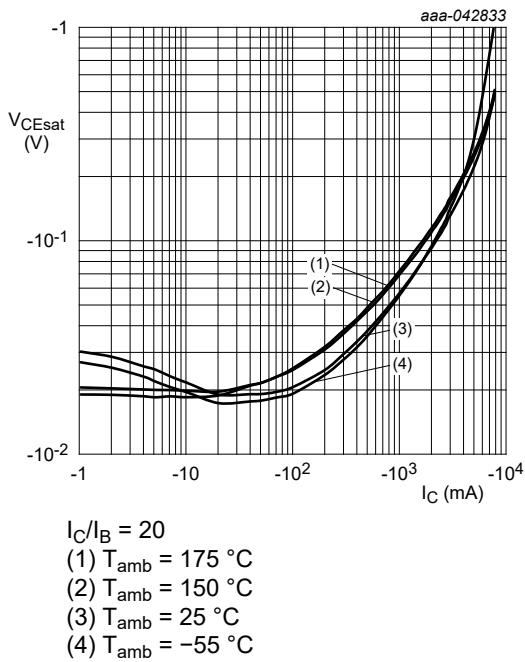


Fig. 8. Collector-emitter saturation voltage as a function of collector current; typical values

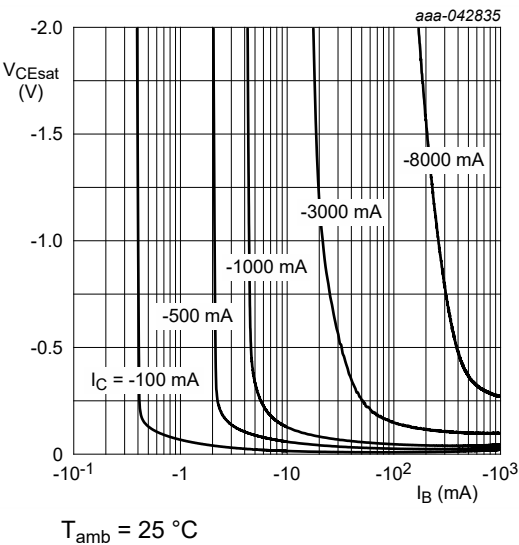


Fig. 9. Collector-emitter saturation region as a function of base current; typical values

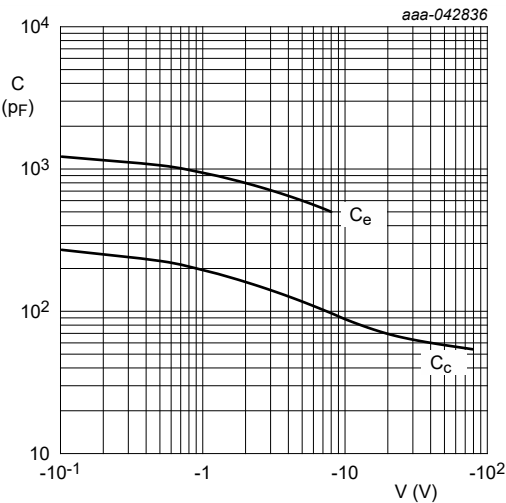
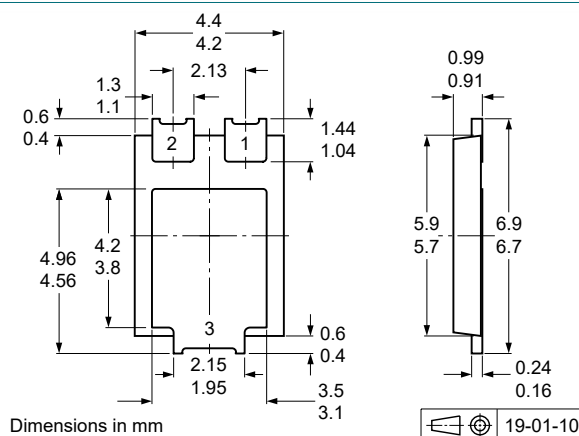


Fig. 10. Input/output capacitance as a function of input/output voltage

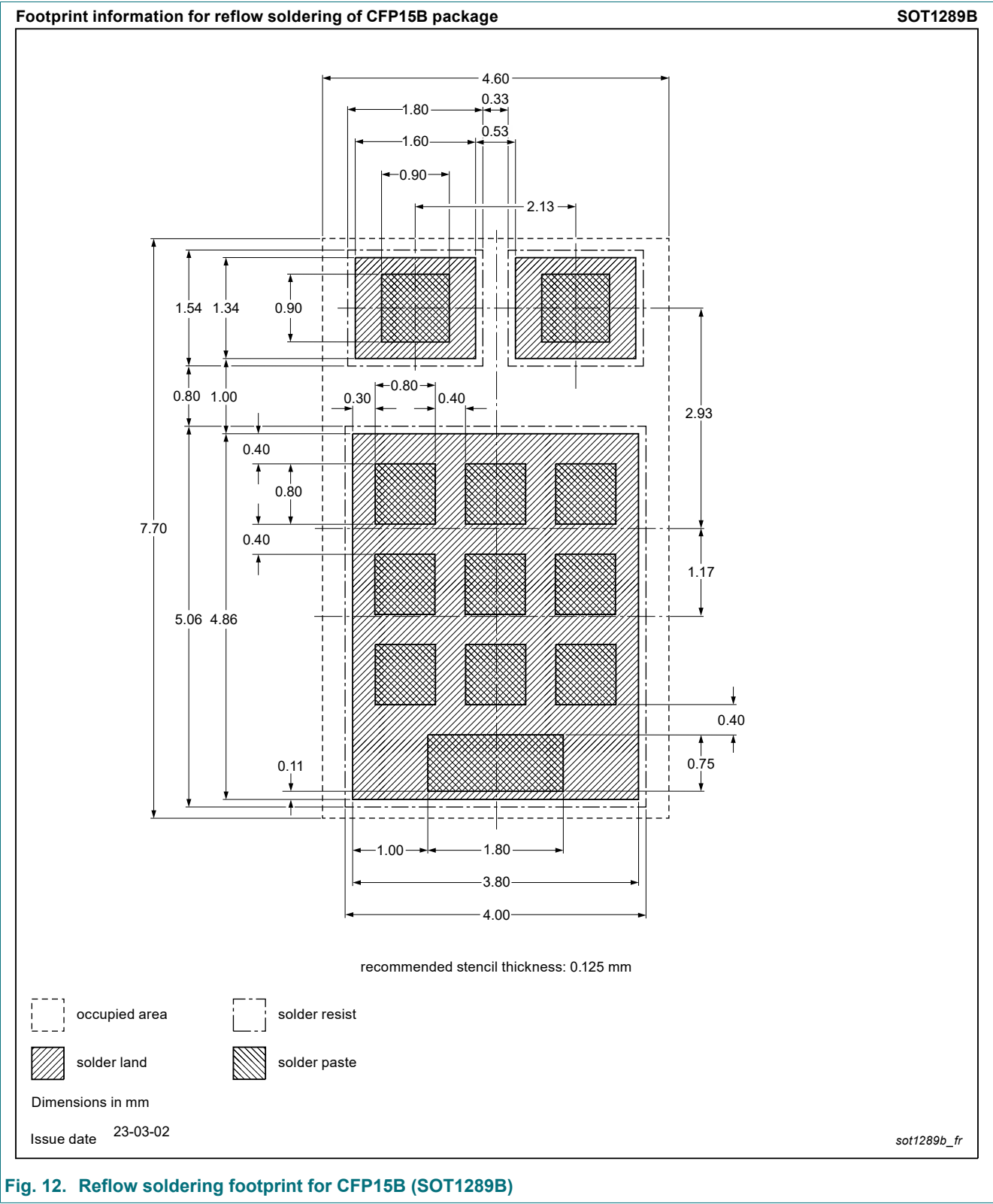
## 11. Package outline



**Fig. 11. Package outline CFP15B (SOT1289B)**



12. Soldering



13. Revision history

Table 8. Revision history

| Data sheet ID | Release date | Data sheet status  | Change notice | Supersedes |
|---------------|--------------|--------------------|---------------|------------|
| MJPE45H11 v.1 | 20250422     | Product data sheet | -             | -          |

14. 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. |
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- [2] The term 'short data sheet' is explained in section "Definitions".
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