



# PMEG4050CEP

40 V, 5 A low VF Schottky barrier rectifier

10 March 2025

Product data sheet

## 1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD128 small and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Average forward current:  $I_{F(AV)} \leq 5$  A
- Reverse voltage:  $V_R \leq 40$  V
- Low forward voltage
- High power capability due to clip-bond technology
- Small and flat lead SMD plastic package
- Suitable for both reflow and wave soldering

## 3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse polarity protection
- Low power consumption applications

## 4. Quick reference data

Table 1. Quick reference data

| Symbol      | Parameter               | Conditions                                                       |     | Min | Typ | Max | Unit |
|-------------|-------------------------|------------------------------------------------------------------|-----|-----|-----|-----|------|
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$ ; $f = 20$ kHz; square wave; $T_{sp} \leq 147$ °C |     | -   | -   | 5   | A    |
| $V_R$       | reverse voltage         | $T_j = 25$ °C                                                    |     | -   | -   | 40  | V    |
| $V_F$       | forward voltage         | $I_F = 5$ A; pulsed; $T_j = 25$ °C                               | [1] | -   | 530 | 620 | mV   |
| $I_R$       | reverse current         | $V_R = 40$ V; pulsed; $T_j = 25$ °C                              | [1] | -   | 25  | 100 | μA   |

[1] Very short pulse, in order to maintain a stable junction temperature.

## 5. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline                                                                                   | Graphic symbol                                                                                  |
|-----|--------|-------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| 1   | K      | cathode[1]  | <br>CFP5 (SOD128) | <br>sym001 |
| 2   | A      | anode       |                                                                                                      |                                                                                                 |

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

| Type number                 | Package |                                                                                        |                        |
|-----------------------------|---------|----------------------------------------------------------------------------------------|------------------------|
|                             | Name    | Description                                                                            | Version                |
| <a href="#">PMEG4050CEP</a> | CFP5    | plastic, surface mounted package; 2 terminals; 4 mm pitch; 3.8 mm x 2.6 mm x 1 mm body | <a href="#">SOD128</a> |

7. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| PMEG4050CEP | GF           |

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>R</sub>     | reverse voltage                     | T <sub>j</sub> = 25 °C                                                |     | -   | 40   | V    |
| I <sub>F(AV)</sub> | average forward current             | δ = 0.5; f = 20 kHz; square wave; T <sub>sp</sub> ≤ 147 °C            |     | -   | 5    | A    |
| I <sub>FSM</sub>   | non-repetitive peak forward current | t <sub>p</sub> = 8.3 ms; half-sine wave; T <sub>j(init)</sub> = 25 °C |     | -   | 50   | A    |
| P <sub>tot</sub>   | total power dissipation             | T <sub>amb</sub> ≤ 25 °C                                              | [1] | -   | 750  | mW   |
|                    |                                     |                                                                       | [2] | -   | 1.25 | 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 PCB, single-sided copper, tin-plated and standard footprint.  
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.

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] | -   | -   | 200 | K/W  |
|                |                                                  |             | [1] [3] | -   | -   | 120 | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |             | [4]     | -   | -   | 12  | K/W  |

- [1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses  $P_R$  are a significant part of the total power losses.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [4] Soldering point of cathode tab.

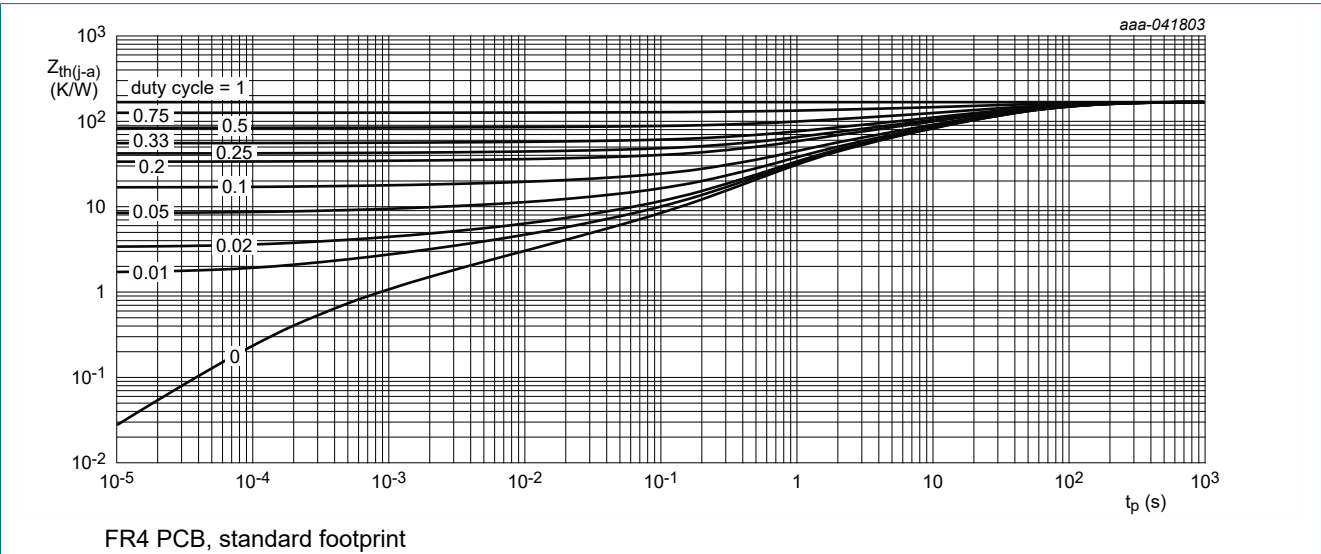


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

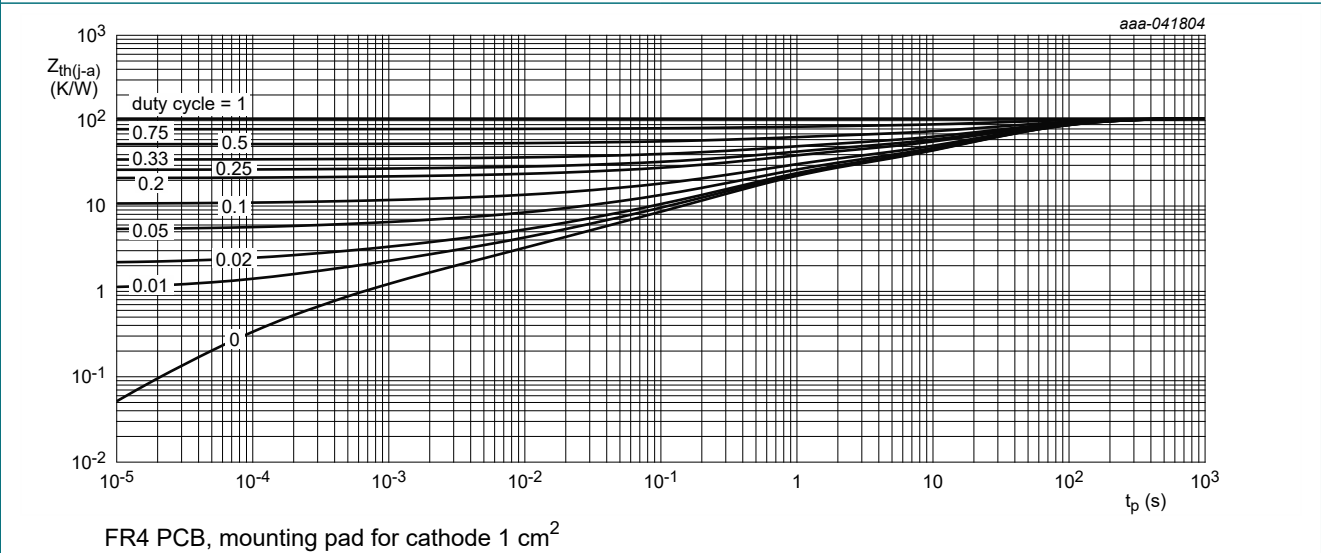


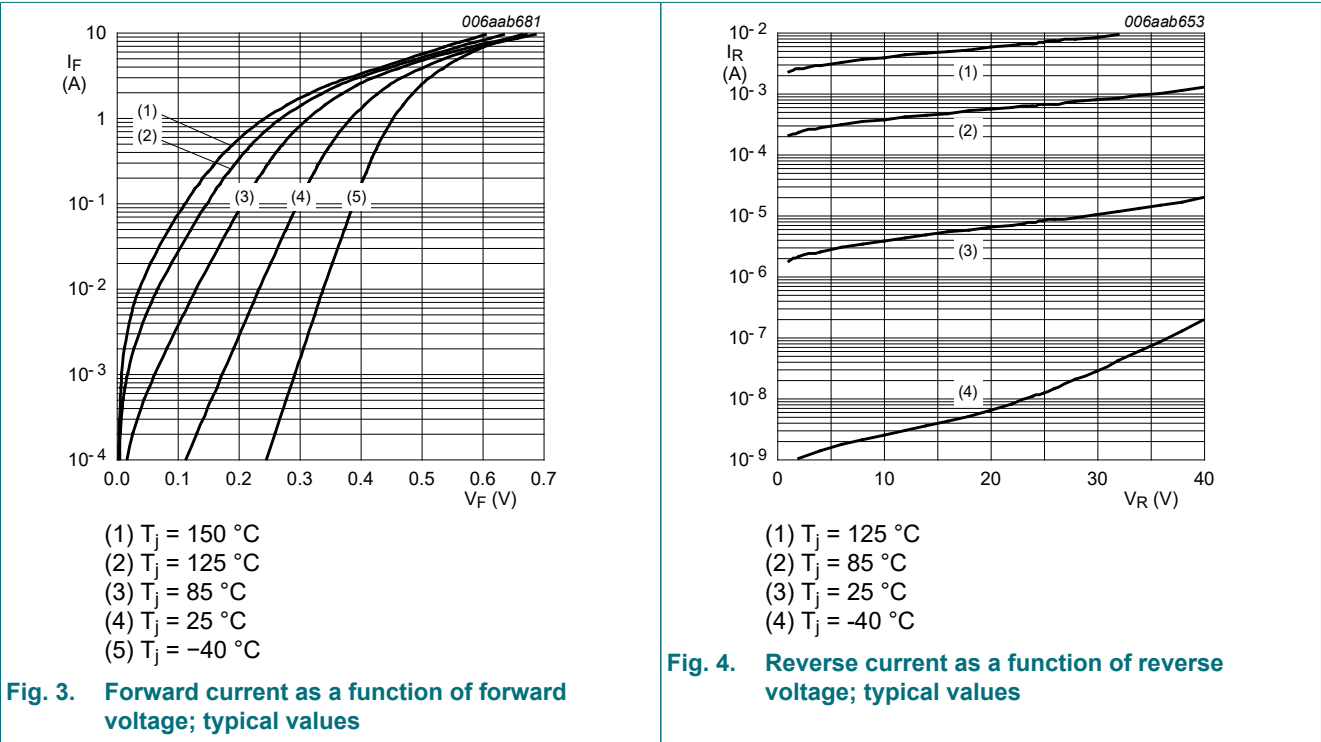
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

| Symbol          | Parameter                     | Conditions                                                                                          |     | Min | Typ  | Max | Unit |
|-----------------|-------------------------------|-----------------------------------------------------------------------------------------------------|-----|-----|------|-----|------|
| V <sub>F</sub>  | forward voltage               | I <sub>F</sub> = 1 A; pulsed; T <sub>j</sub> = 25 °C                                                | [1] | -   | 380  | 440 | mV   |
|                 |                               | I <sub>F</sub> = 5 A; pulsed; T <sub>j</sub> = 25 °C                                                | [1] | -   | 530  | 620 | mV   |
|                 |                               | I <sub>F</sub> = 5 A; pulsed; T <sub>j</sub> = -40 °C                                               | [1] | -   | 570  | -   | mV   |
|                 |                               | I <sub>F</sub> = 5 A; pulsed; T <sub>j</sub> = 125 °C                                               | [1] | -   | 510  | -   | mV   |
| I <sub>R</sub>  | reverse current               | V <sub>R</sub> = 10 V; pulsed; T <sub>j</sub> = 25 °C                                               | [1] | -   | 5    | -   | μA   |
|                 |                               | V <sub>R</sub> = 40 V; pulsed; T <sub>j</sub> = 25 °C                                               | [1] | -   | 25   | 100 | μA   |
| C <sub>d</sub>  | diode capacitance             | V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>j</sub> = 25 °C                                             |     | -   | 250  | -   | pF   |
|                 |                               | V <sub>R</sub> = 10 V; f = 1 MHz; T <sub>j</sub> = 25 °C                                            |     | -   | 95   | -   | pF   |
| t <sub>rr</sub> | reverse recovery time         | dI <sub>F</sub> /dt = 200 A/μs; I <sub>F</sub> = 6 A; V <sub>R</sub> = 26 V; T <sub>j</sub> = 25 °C |     | -   | 8.9  | -   | ns   |
|                 | ramp recovery                 |                                                                                                     |     | -   | 0.83 | -   | A    |
| I <sub>RM</sub> | peak reverse recovery current |                                                                                                     |     | -   | 4.2  | -   | nC   |
| Q <sub>rr</sub> | reverse recovery charge       |                                                                                                     |     | -   | -    | -   | -    |

[1] Very short pulse, in order to maintain a stable junction temperature.



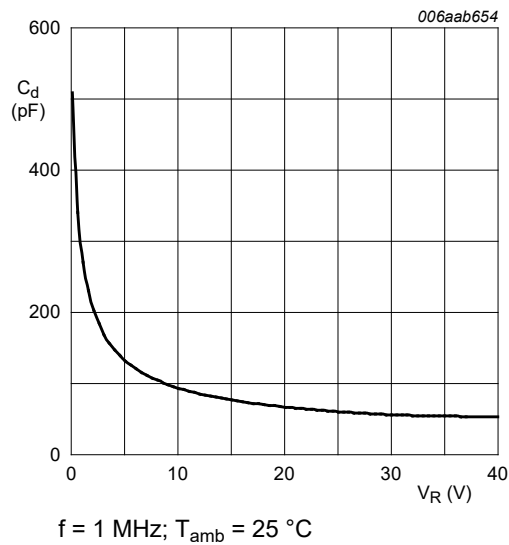


Fig. 5. Diode capacitance as a function of reverse voltage; typical values

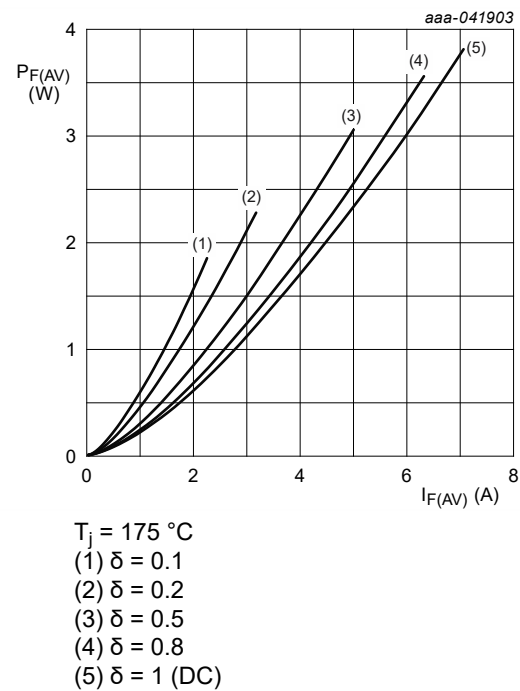


Fig. 6. Average forward power dissipation as a function of average forward current; typical values

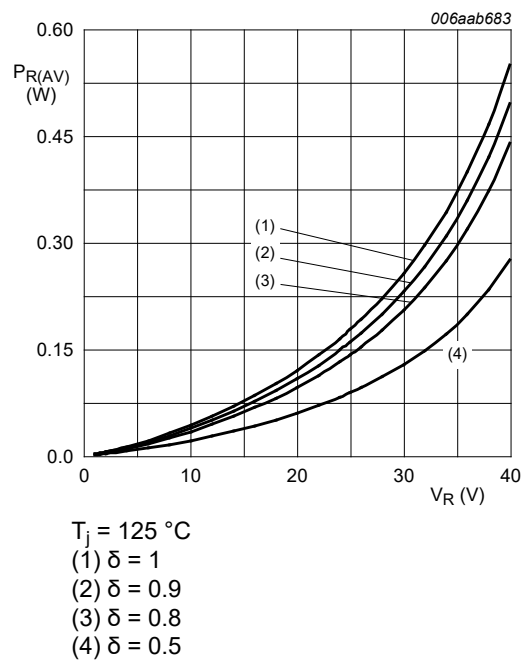


Fig. 7. Average reverse power dissipation as a function of reverse voltage; typical values

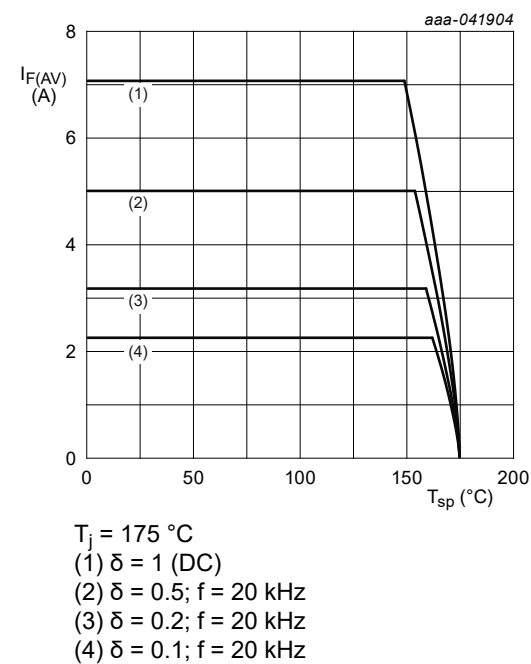


Fig. 8. Average forward current as a function of solder point temperature; typical values

11. Test information

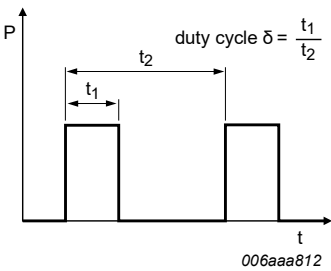


Fig. 9. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations:

$I_{F(AV)} = I_M \times \delta$  with  $I_M$  defined as peak current

$I_{RMS} = I_{F(AV)}$  at DC

$I_{RMS} = I_M \times \sqrt{\delta}$  with  $I_{RMS}$  defined as RMS current

12. Soldering

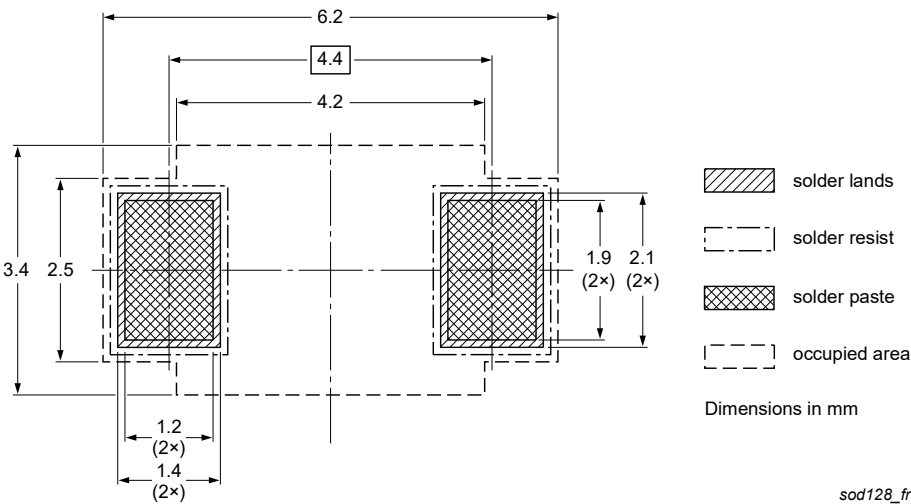


Fig. 10. Reflow soldering footprint for CFP5 (SOD128)

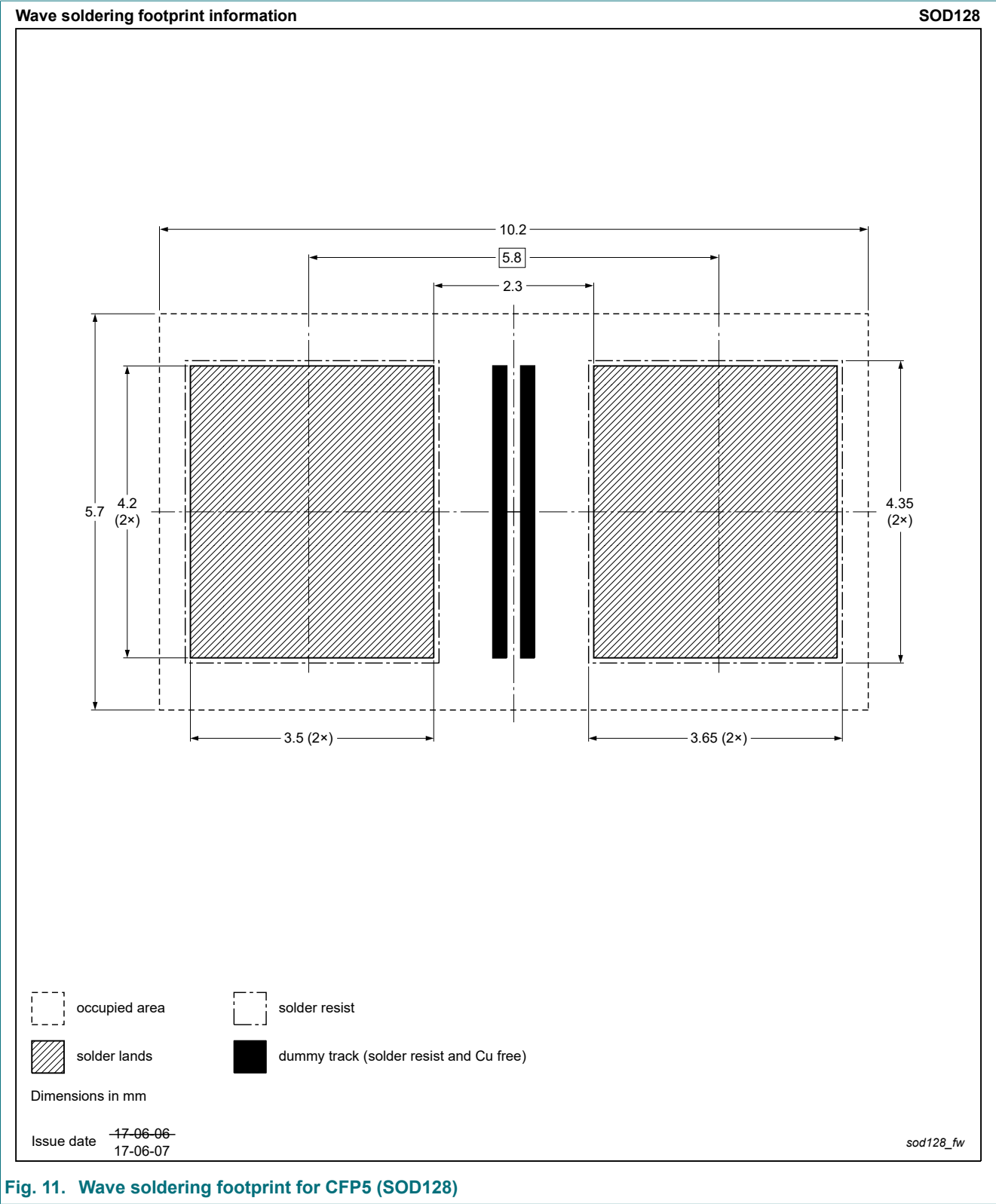


Fig. 11. Wave soldering footprint for CFP5 (SOD128)

13. Revision history

Table 8. Revision history

| Data sheet ID   | Release date | Data sheet status  | Change notice | Supersedes |
|-----------------|--------------|--------------------|---------------|------------|
| PMEG4050CEP v.1 | 20250310     | 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. |
| 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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