# PMEG10050ELP

## 100 V, 5 A low leakage current 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

- Extremely low leakage current
- High power capability due to clip-bonding technology
- High temperature $T_j \leq 175$ °C
- Small and flat lead SMD plastic package

## 3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- 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 | δ = 0.5; f = 20 kHz; square wave; $T_{sp} \leq$ 148 °C | | - | - | 5 | A |
| $V_R$ | reverse voltage | $T_j$ = 25 °C | | - | - | 100 | V |
| $V_F$ | forward voltage | $I_F$ = 5 A; pulsed; $T_j$ = 25 °C | [1] | - | 780 | 880 | mV |
| $I_R$ | reverse current | $V_R$ = 100 V; pulsed; $T_j$ = 25 °C | [1] | - | 110 | 450 | nA |

[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] |   CFP5 (SOD128) |   sym001 |
| 2 | A | anode | | |

[1] The marking bar indicates the cathode.

# 6. Ordering information

**Table 3. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| PMEG10050ELP | CFP5 | plastic, surface mounted package; 2 terminals; 4 mm pitch; 3.8 mm x 2.6 mm x 1 mm body | SOD128 |

# 7. Marking

**Table 4. Marking codes**

| Type number | Marking code |
|---|---|
| PMEG10050ELP | GM |

# 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 | $T_j$ = 25 °C | | - | 100 | V |
| $I_{F(AV)}$ | average forward current | δ = 0.5; f = 20 kHz; square wave; $T_{sp}$ ≤ 148 °C | | - | 5 | A |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p$ = 8.3 ms; half-sine wave; $T_{j(init)}$ = 25 °C | | - | 70 | A |
| $P_{tot}$ | total power dissipation | $T_{amb}$ ≤ 25 °C | [1] | - | 750 | mW |
| | | | [2] | - | 1250 | mW |
| $T_j$ | junction temperature | | | - | 175 | °C |
| $T_{amb}$ | ambient temperature | | | -55 | 175 | °C |
| $T_{stg}$ | storage temperature | | | -65 | 175 | °C |

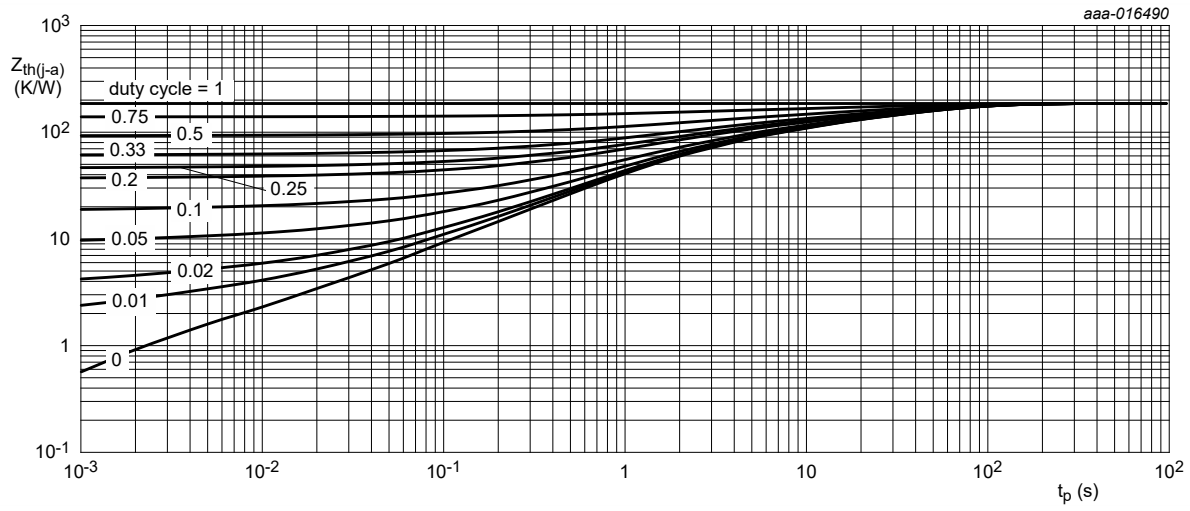
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 $cm^2$.

# 9. Thermal characteristics

**Table 6. Thermal characteristics**

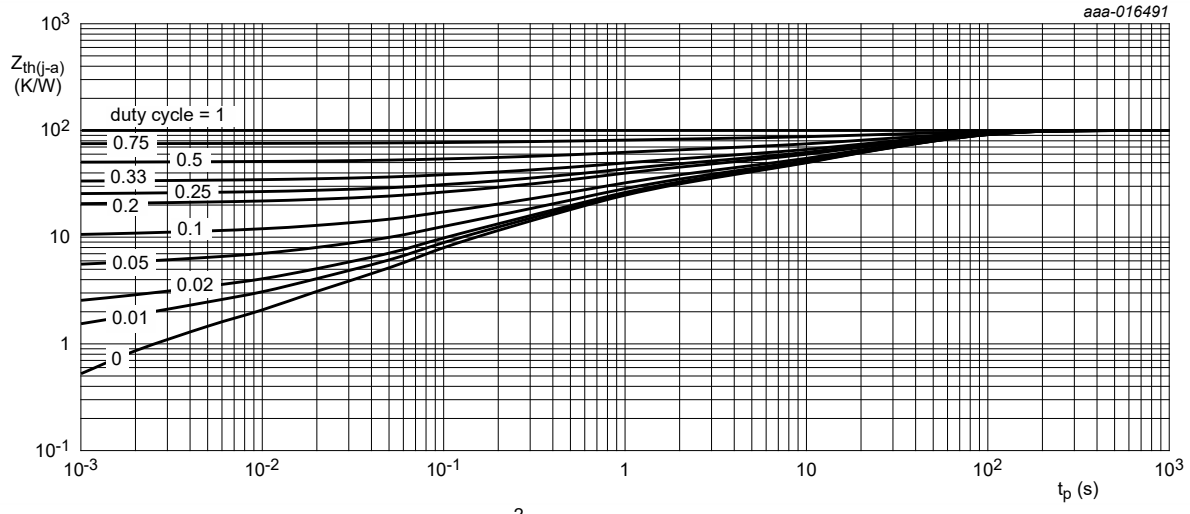
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] [2] | - | - | 200 | K/W |
| | | | [1] [3] | - | - | 120 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder 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 $cm^2$.
[4] Soldering point of cathode tab.




FR4 PCB, standard footprint

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




FR4 PCB, mounting pad for cathode 1 $cm^2$

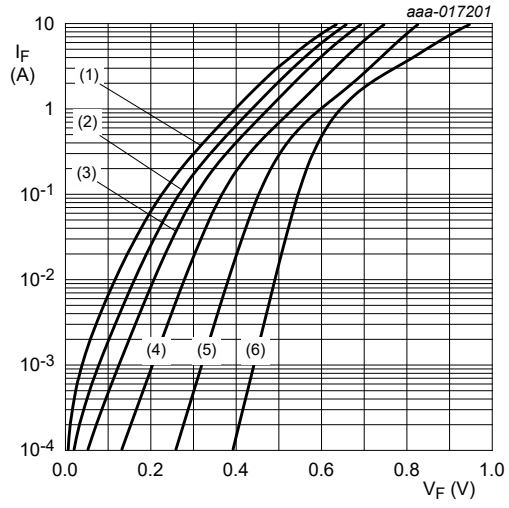
**Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values**

# 10. Characteristics

**Table 7. Characteristics**

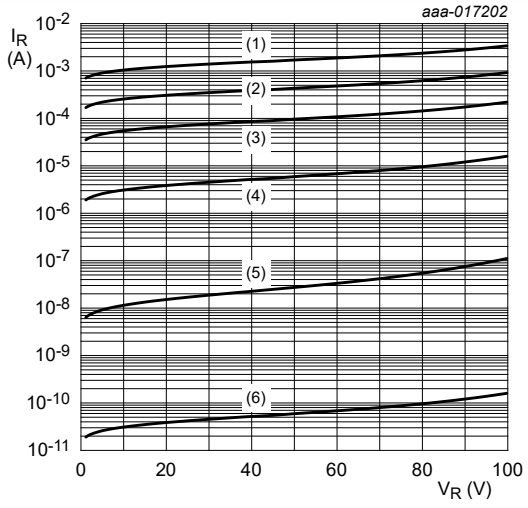
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $V_{(BR)R}$ | reverse breakdown voltage | $I_R$ = 1 mA; pulsed; $T_j$ = 25 °C | [1] | 100 | - | - | V |
| $V_F$ | forward voltage | $I_F$ = 1 A; pulsed; $T_j$ = 25 °C | [1] | - | 600 | 670 | mV |
| | | $I_F$ = 5 A; pulsed; $T_j$ = 25 °C | [1] | - | 780 | 880 | mV |
| | | $I_F$ = 5 A; pulsed; $T_j$ = -40 °C | [1] | - | 860 | - | mV |
| | | $I_F$ = 5 A; pulsed; $T_j$ = 125 °C | [1] | - | 650 | - | mV |
| $I_R$ | reverse current | $V_R$ = 60 V; pulsed; $T_j$ = 25 °C | [1] | - | 35 | - | nA |
| | | $V_R$ = 100 V; pulsed; $T_j$ = 25 °C | [1] | - | 110 | 450 | nA |
| | | $V_R$ = 100 V; pulsed; $T_j$ = 125 °C | [1] | - | 220 | 1500 | µA |
| $C_d$ | diode capacitance | $V_R$ = 1 V; f = 1 MHz; $T_j$ = 25 °C | | - | 200 | - | pF |
| | | $V_R$ = 4 V; f = 1 MHz; $T_j$ = 25 °C | | - | 120 | - | pF |
| | | $V_R$ = 10 V; f = 1 MHz; $T_j$ = 25 °C | | - | 78 | - | pF |
| $t_{rr}$ | reverse recovery time ramp recovery | $dI_F/dt$ = 200 A/µs; $I_F$ = 6 A; $V_R$ = 26 V; $T_j$ = 25 °C | | - | 13.4 | - | ns |
| $I_{RM}$ | peak reverse recovery current | | | - | 1.35 | - | A |
| $Q_{rr}$ | reverse recovery charge | | | - | 10.2 | - | nC |

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



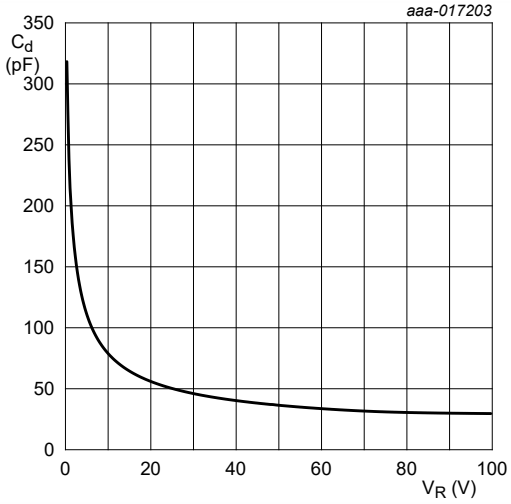

(1) $T_j$ = 175 °C
(2) $T_j$ = 150 °C
(3) $T_j$ = 125 °C
(4) $T_j$ = 85 °C
(5) $T_j$ = 25 °C
(6) $T_j$ = −40 °C

**Fig. 3. Forward current as a function of forward voltage; typical values**



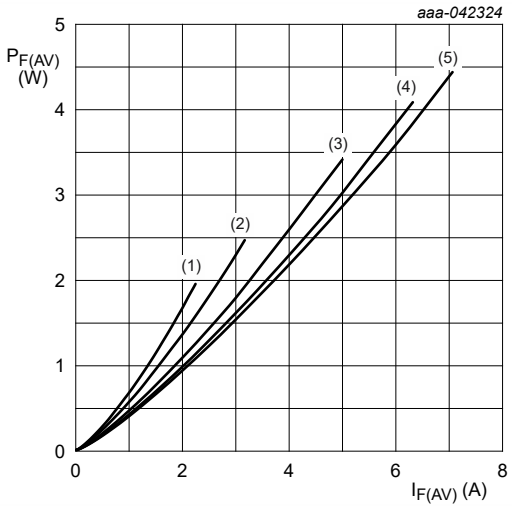

(1) $T_j$ = 175 °C
(2) $T_j$ = 150 °C
(3) $T_j$ = 125 °C
(4) $T_j$ = 85 °C
(5) $T_j$ = 25 °C
(6) $T_j$ = −40 °C

**Fig. 4. Reverse current as a function of reverse voltage; typical values**



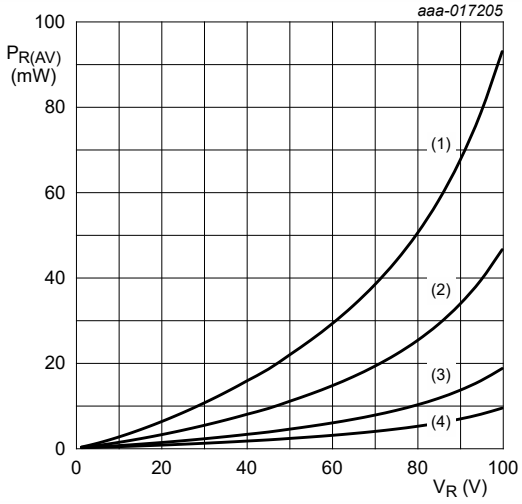

f = 1 MHz; $T_{amb}$ = 25 °C

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



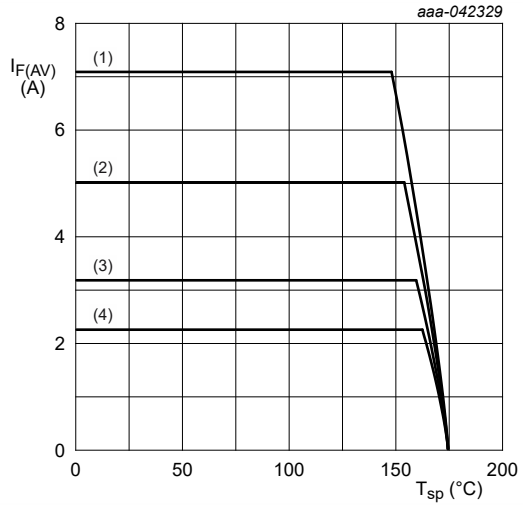

$T_j$ = 175 °C
(1) δ = 0.1
(2) δ = 0.2
(3) δ = 0.5
(4) δ = 0.8
(5) δ = 1

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




$T_j$ = 150 °C
(1) δ = 1 (DC)
(2) δ = 0.5; f = 20 kHz
(3) δ = 0.2; f = 20 kHz
(4) δ = 0.1; f = 20 kHz

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




$T_j$ = 175 °C
(1) δ = 1; DC
(2) δ = 0.5; f = 20 kHz
(3) δ = 0.2; f = 20 kHz
(4) δ = 0.1; f = 20 kHz

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

## 11. Test information

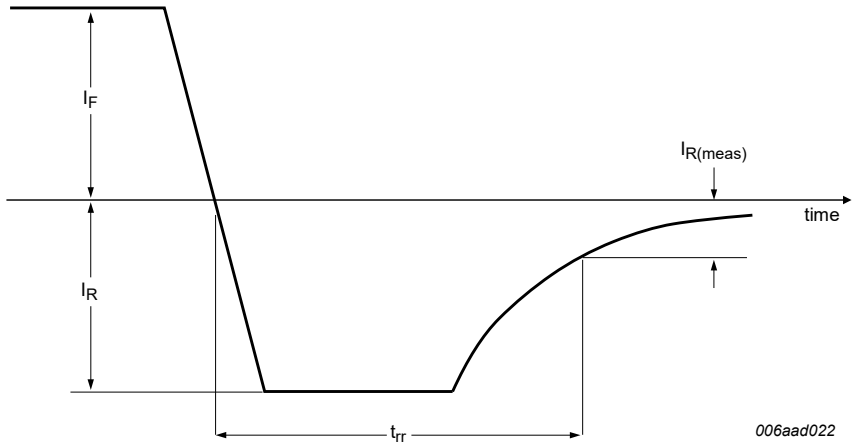



**Fig. 9. Reverse recovery definition**

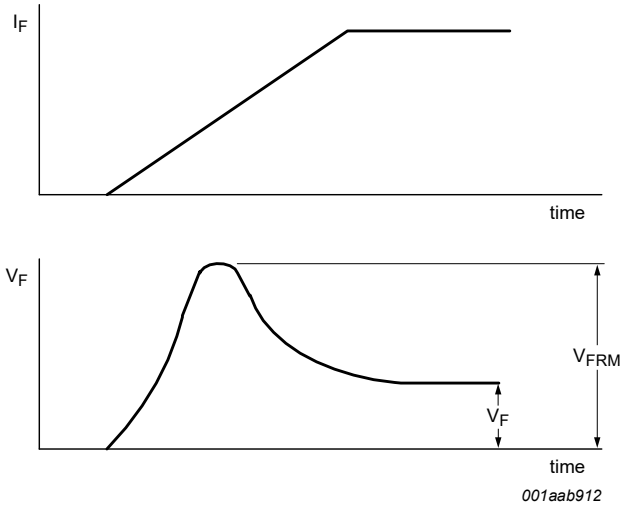



**Fig. 10. Forward recovery definition**

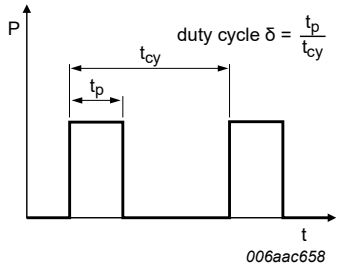



**Fig. 11. Duty cycle definition**

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. Package outline

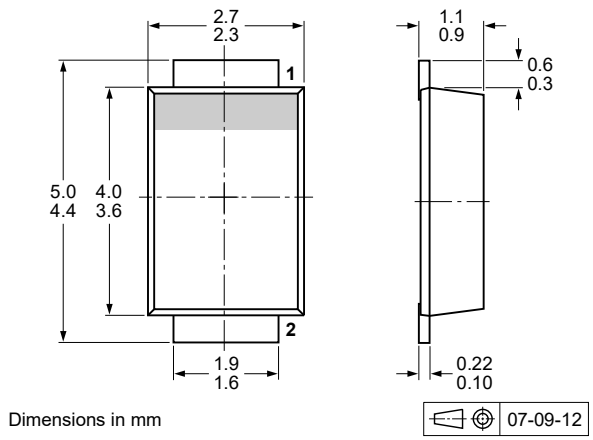



**Fig. 12. Package outline CFP5 (SOD128)**

## 13. Soldering

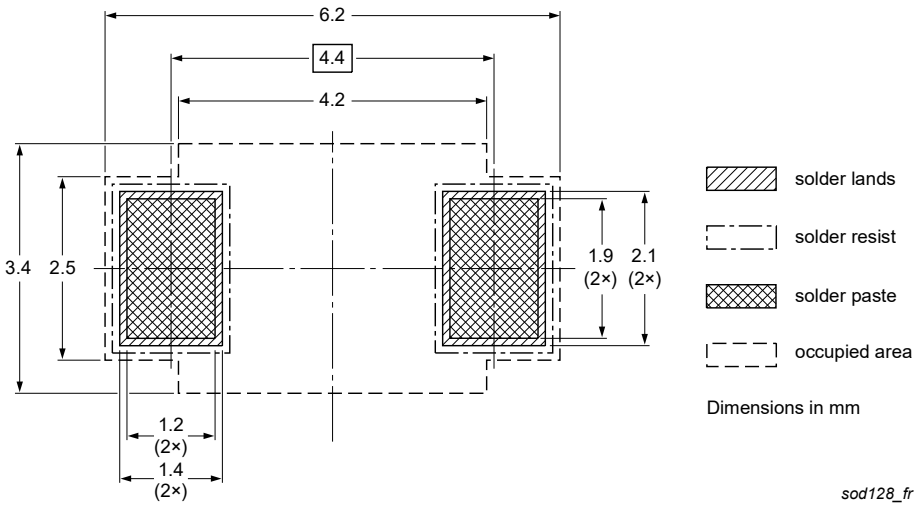
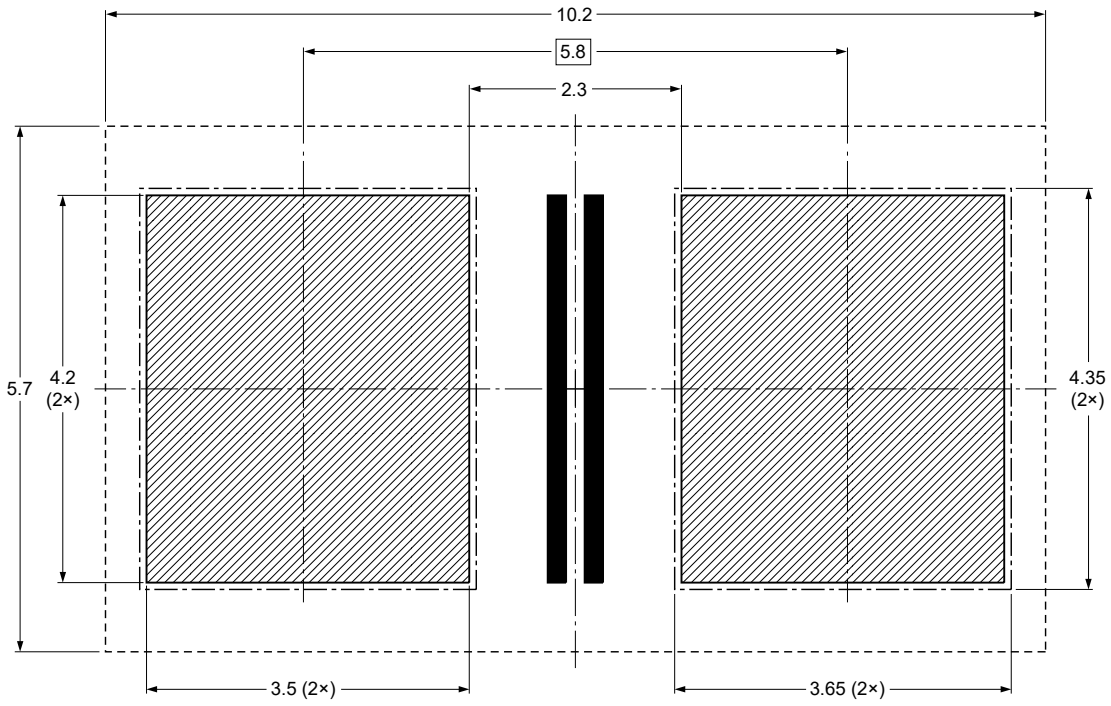



**Fig. 13. Reflow soldering footprint for CFP5 (SOD128)**

**Wave soldering footprint information** **SOD128**




occupied area

solder resist

solder lands

dummy track (solder resist and Cu free)

Dimensions in mm

Issue date ~~17-06-06~~ 17-06-07

*sod128_fw*

**Fig. 14. Wave soldering footprint for CFP5 (SOD128)**

# 14. Revision history

**Table 8. Revision history**

| Data sheet ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| PMEG10050ELP v.1 | 20250310 | 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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