PMEG10030CELP-Q

100 V, 3 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

- High power capability due to clip-bonding technology
- Extremely low leakage current
- High temperature $T_j \leq 175$ °C
- Small and flat lead SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

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

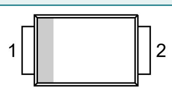
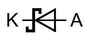
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_{F(AV)}$	average forward current	δ = 0.5; f = 20 kHz; square wave; $T_{sp} \leq$ 161 °C		-	-	3	A
V_R	reverse voltage	T_j = 25 °C		-	-	100	V
V_F	forward voltage	I_F = 3 A; pulsed; T_j = 25 °C	[1]	-	760	850	mV
I_R	reverse current	V_R = 100 V; pulsed; T_j = 25 °C	[1]	-	70	300	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
PMEG10030CELP-Q	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
PMEG10030CELP-Q	GL

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} ≤ 161 °C		-	3	A
I_{FSM}	non-repetitive peak forward current	t_p = 8.3 ms; half-sine wave; $T_{j(init)}$ = 25 °C		-	50	A
P_{tot}	total power dissipation	T_{amb} ≤ 25 °C	[1]	-	750	mW
			[2]	-	1.25	W
T_j	junction temperature			-	175	°C
T_{amb}	ambient temperature			-55	175	°C
T_{stg}	storage temperature			-65	175	°C

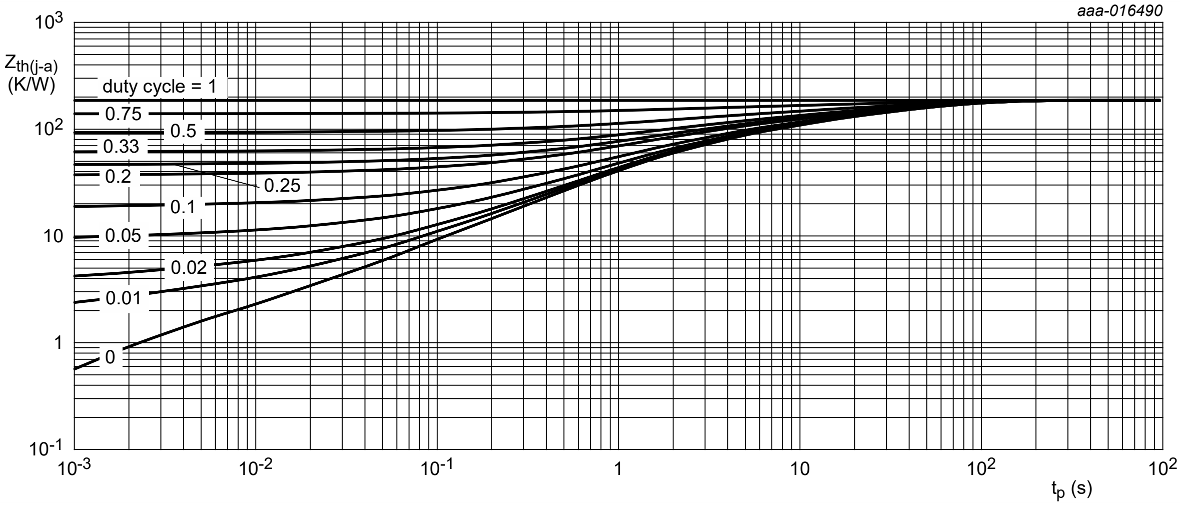
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.

9. Thermal characteristics

Table 6. Thermal characteristics

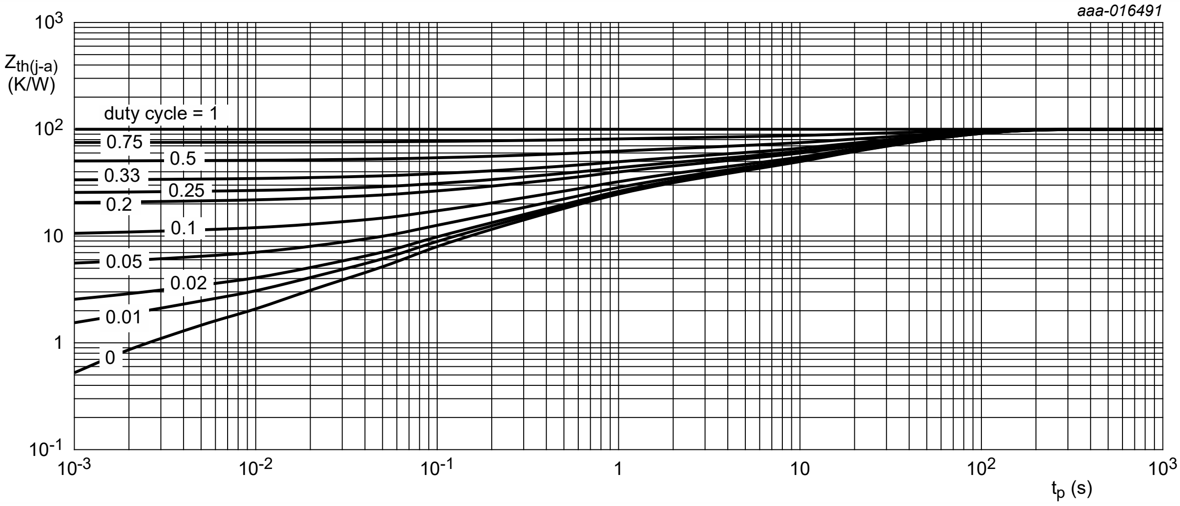
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	200	K/W
			[1] [3]	-	-	120	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	12	K/W

[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

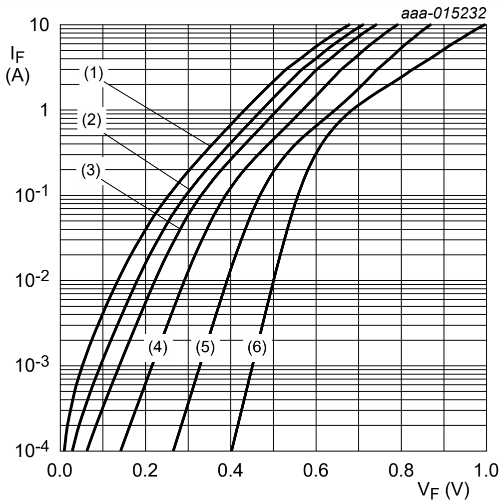
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

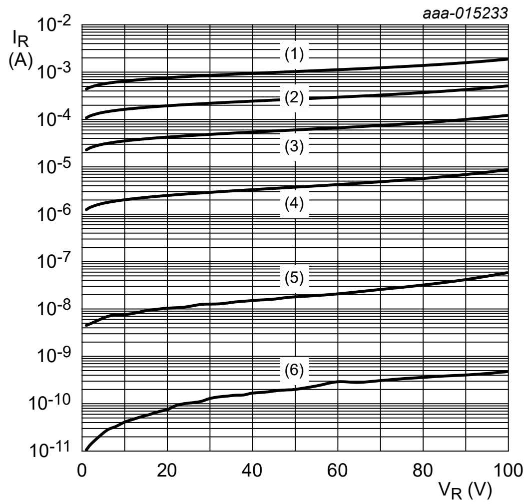
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_{(BR)R}$	reverse breakdown voltage	I_R = 1 mA; pulsed; T_j = 25 °C	[1]	100	-	-	V
V_F	forward voltage	I_F = 1 A; pulsed; T_j = 25 °C	[1]	-	650	710	mV
		I_F = 3 A; pulsed; T_j = 25 °C	[1]	-	760	850	mV
		I_F = 3 A; pulsed; T_j = -40 °C	[1]	-	830	-	mV
		I_F = 3 A; pulsed; T_j = 125 °C	[1]	-	620	-	mV
I_R	reverse current	V_R = 60 V; pulsed; T_j = 25 °C	[1]	-	25	-	nA
		V_R = 100 V; pulsed; T_j = 25 °C	[1]	-	70	300	nA
		V_R = 100 V; pulsed; T_j = 125 °C	[1]	-	120	1000	μA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz; T_j = 25 °C		-	135	-	pF
		V_R = 4 V; f = 1 MHz; T_j = 25 °C		-	80	-	pF
		V_R = 10 V; f = 1 MHz; T_j = 25 °C		-	50	-	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		-	13.6	-	ns
I_{RM}	peak reverse recovery current	dI_F/dt = 200 A/s; I_F = 6 A; V_R = 26 V; T_j = 25 °C		-	1.4	-	A
Q_{rr}	reverse recovery charge			-	10.6	-	nC

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



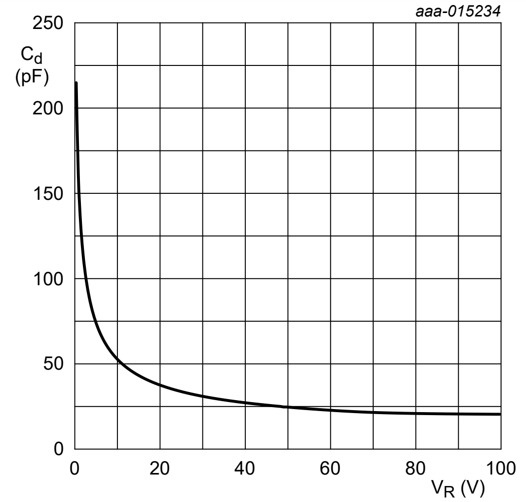
(1) T_j = 175 °C
(2) T_j = 150 °C
(3) T_j = 125 °C
(4) T_j = 85 °C
(5) T_j = 25 °C
(6) T_j = −40 °C

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



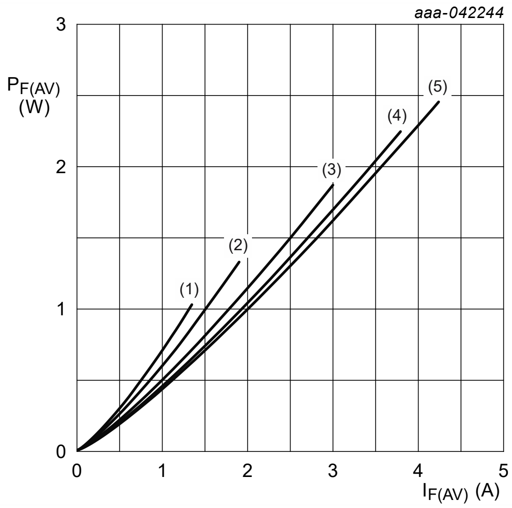
(1) T_j = 175 °C
(2) T_j = 150 °C
(3) T_j = 125 °C
(4) T_j = 85 °C
(5) T_j = 25 °C
(6) T_j = −40 °C

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



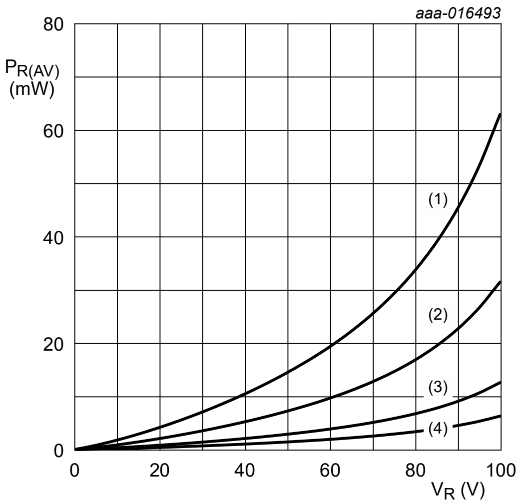
f = 1 MHz; T_{amb} = 25 °C

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



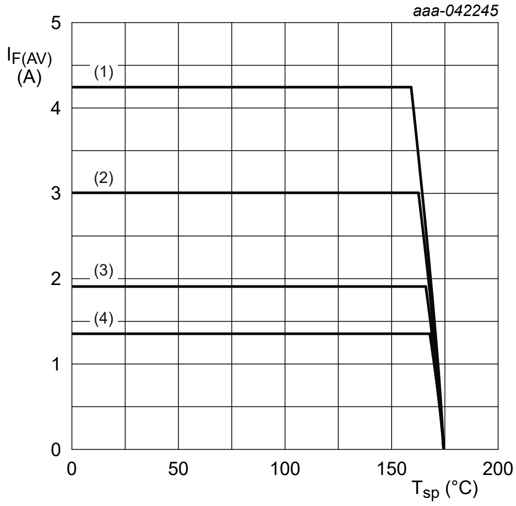
T_j = 175 °C
(1) δ = 0.1
(2) δ = 0.2
(3) δ = 0.5
(4) δ = 0.8
(5) δ = 1 (DC)

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

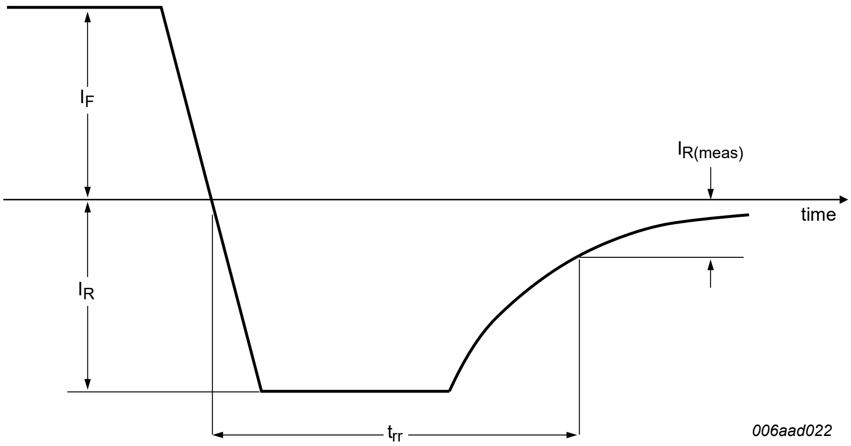


Fig. 9. Reverse recovery definition

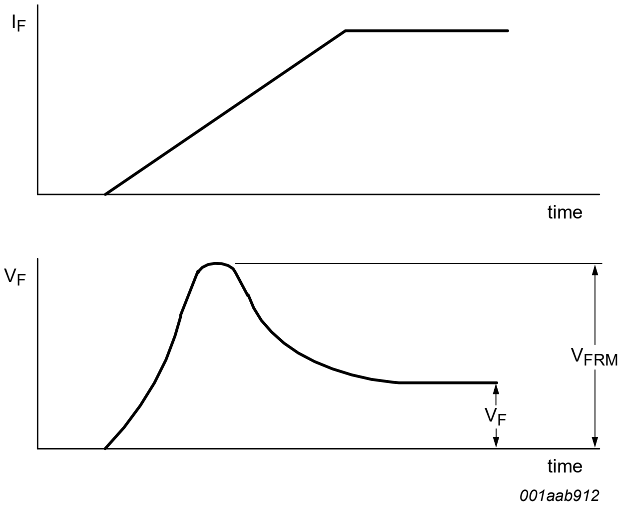


Fig. 10. Forward recovery definition

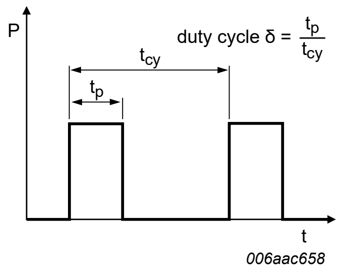


Fig. 11. Duty cycle definition

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.

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

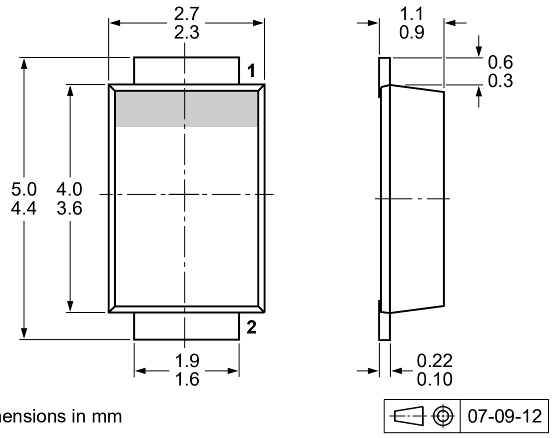


Fig. 12. Package outline CFP5 (SOD128)

13. Soldering

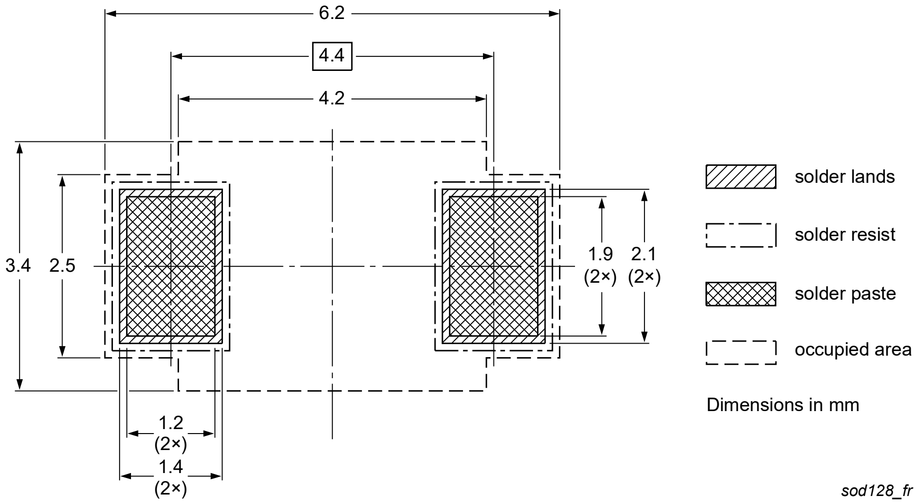


Fig. 13. Reflow soldering footprint for CFP5 (SOD128)

Wave soldering footprint information **SOD128**

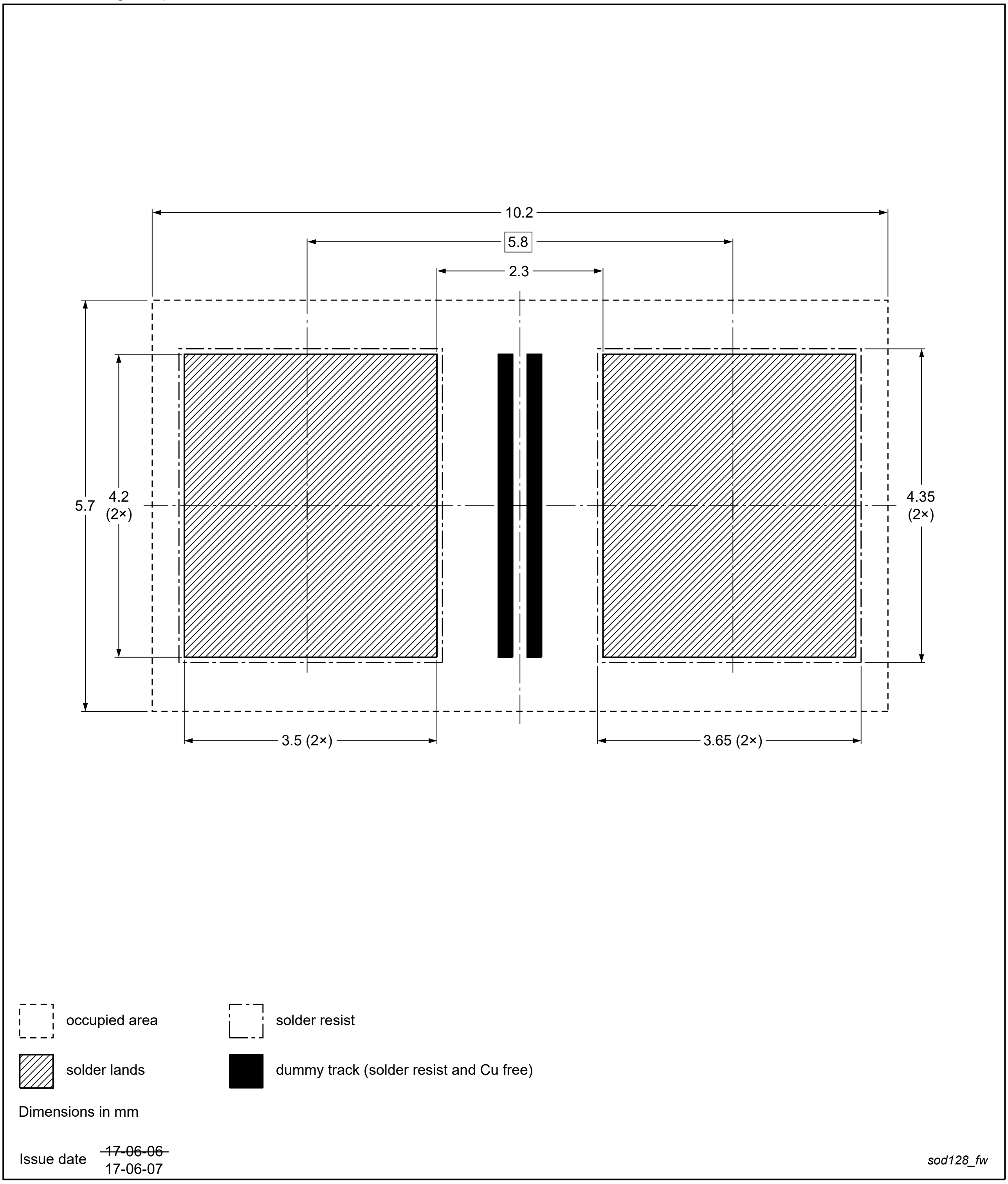


Fig. 14. Wave soldering footprint for CFP5 (SOD128)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG10030CELP-Q 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.

[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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