



PSMN2R3-100SSE

24 February 2020

Objective data sheet

1. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{DS}	drain-source voltage	$25\text{ °C} \leq T_j \leq 150\text{ °C}$	-	-	100	V
I_D	drain current	$V_{GS} = 10\text{ V}; T_{mb} = 25\text{ °C}$	-	-	246	A
P_{tot}	total power dissipation	$T_{mb} = 25\text{ °C}; \text{Fig. 1}$	-	-	284	W
T_j	junction temperature		-55	-	150	°C
Static characteristics						
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = 10\text{ V}; I_D = 25\text{ A}; T_j = 25\text{ °C}$	-	1.79	2.28	mΩ
		$V_{GS} = 10\text{ V}; I_D = 25\text{ A}; T_j = 100\text{ °C}$	-	2.8	3.6	mΩ
Dynamic characteristics						
Q_{GD}	gate-drain charge	$I_D = 25\text{ A}; V_{DS} = 50\text{ V}; V_{GS} = 10\text{ V}; \text{Fig. 3}$	[tbd]	32	[tbd]	nC
$Q_{G(tot)}$	total gate charge		[tbd]	162	[tbd]	nC
Avalanche ruggedness						
$E_{DS(AL)S}$	non-repetitive drain-source avalanche energy	$I_D = 82\text{ A}; V_{sup} \leq 100\text{ V}; R_{GS} = 50\text{ }\Omega; V_{GS} = 10\text{ V}; T_{j(init)} = 25\text{ °C}; \text{unclamped}$	[1]	-	732	mJ
Source-drain diode						
Q_r	recovered charge	$I_S = 25\text{ A}; di_S/dt = -100\text{ A}/\mu\text{s}; V_{GS} = 0\text{ V}; V_{DS} = 50\text{ V}; \text{Fig. 4}$	[2]	92	-	nC

[1] Protected by 100% test

[2] includes capacitive recovery

2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate	<p>LFPAK88 (SOT1235)</p>	<p>mbb076</p>
2	S	source		
3	S	source		
4	S	source		
mb	D	mounting base; connected to drain		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PSMN2R3-100SSE	LFPAK88	plastic, single-ended surface-mounted package (LFPAK88); 4 leads; 2 mm pitch; 8 mm x 8 mm x 1.6 mm body	SOT1235

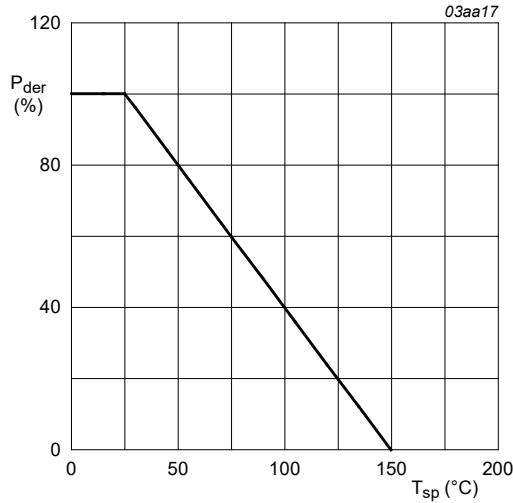
4. Limiting values

Table 4. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit	
V_{DS}	drain-source voltage	$25\text{ °C} \leq T_j \leq 150\text{ °C}$	-	100	V	
V_{DGR}	drain-gate voltage	$25\text{ °C} \leq T_j \leq 150\text{ °C}$; $R_{GS} = 20\text{ k}\Omega$	-	100	V	
V_{GS}	gate-source voltage		-20	20	V	
P_{tot}	total power dissipation	$T_{mb} = 25\text{ °C}$; Fig. 1	-	284	W	
I_D	drain current	$V_{GS} = 10\text{ V}$; $T_{mb} = 25\text{ °C}$	-	246	A	
		$V_{GS} = 10\text{ V}$; $T_{mb} = 100\text{ °C}$	-	156	A	
I_{DM}	peak drain current	pulsed; $t_p \leq 10\text{ }\mu\text{s}$; $T_{mb} = 25\text{ °C}$; Fig. 2	-	986	A	
T_{stg}	storage temperature		-55	150	°C	
T_j	junction temperature		-55	150	°C	
$T_{sld(M)}$	peak soldering temperature		-	260	°C	
Source-drain diode						
I_S	source current	$T_{mb} = 25\text{ °C}$	-	237	A	
I_{SM}	peak source current	pulsed; $t_p \leq 10\text{ }\mu\text{s}$; $T_{mb} = 25\text{ °C}$	-	986	A	
Avalanche ruggedness						
$E_{DS(AL)S}$	non-repetitive drain-source avalanche energy	$I_D = 82\text{ A}$; $V_{sup} \leq 100\text{ V}$; $R_{GS} = 50\text{ }\Omega$; $V_{GS} = 10\text{ V}$; $T_{j(init)} = 25\text{ °C}$; unclamped	[1]	-	732	mJ
I_{AS}	non-repetitive avalanche current	$V_{sup} \leq 100\text{ V}$; $V_{GS} = 10\text{ V}$; $T_{j(init)} = 25\text{ °C}$; $R_{GS} = 50\text{ }\Omega$	[1]	-	86	A

[1] Protected by 100% test



$$P_{der} = \frac{P_{tot}}{P_{tot(25^{\circ}C)}} \times 100\%$$

Fig. 1. Normalized total power dissipation as a function of mounting base temperature

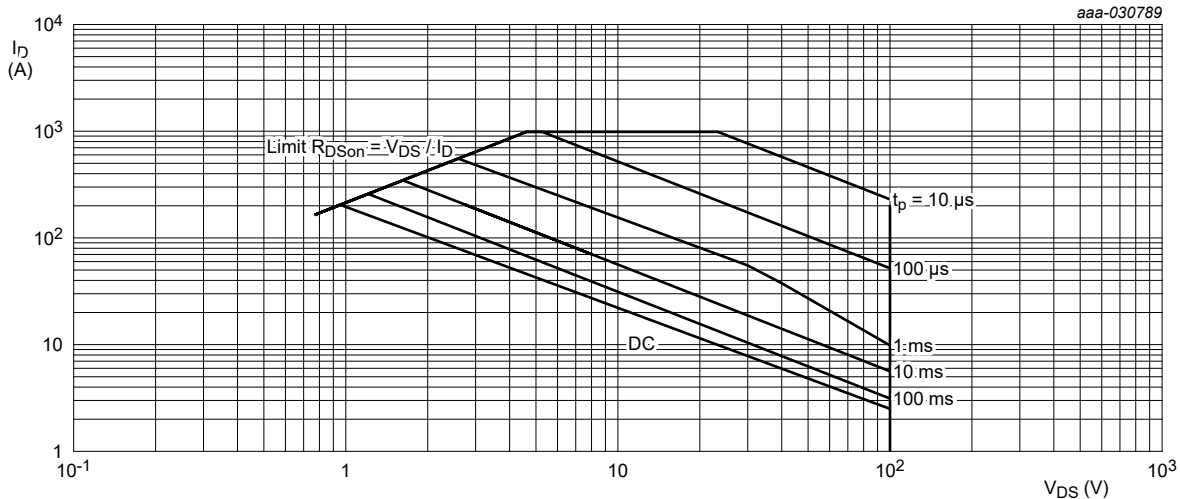


Fig. 2. Safe operating area; continuous and peak drain currents as a function of drain-source voltage

5. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
R _{th(j-mb)}	thermal resistance from junction to mounting base		-	[tbd]	0.44	K/W

6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	drain-source breakdown voltage	$I_D = 250 \mu A; V_{GS} = 0 V; T_j = 25 \text{ }^\circ C$	100	-	-	V
		$I_D = 250 \mu A; V_{GS} = 0 V; T_j = -55 \text{ }^\circ C$	90	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$I_D = 1 \text{ mA}; V_{DS}=V_{GS}; T_j = 25 \text{ }^\circ C$	2	3	4	V
		$I_D = 1 \text{ mA}; V_{DS}=V_{GS}; T_j = -55 \text{ }^\circ C$	-	[tbd]	-	V
		$I_D = 1 \text{ mA}; V_{DS}=V_{GS}; T_j = 150 \text{ }^\circ C$	-	[tbd]	-	V
$\Delta V_{GS(th)}/\Delta T$	gate-source threshold voltage variation with temperature	$25 \text{ }^\circ C \leq T_j \leq 150 \text{ }^\circ C$	-	[tbd]	-	mV/K
I_{DSS}	drain leakage current	$V_{DS} = 100 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 25 \text{ }^\circ C$	-	0.1	25	μA
		$V_{DS} = 100 \text{ V}; V_{GS} = 0 \text{ V}; T_j = 125 \text{ }^\circ C$	-	-	100	μA
I_{GSS}	gate leakage current	$V_{GS} = 20 \text{ V}; V_{DS} = 0 \text{ V}; T_j = 25 \text{ }^\circ C$	-	2	100	nA
		$V_{GS} = -20 \text{ V}; V_{DS} = 0 \text{ V}; T_j = 25 \text{ }^\circ C$	-	2	100	nA
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = 10 \text{ V}; I_D = 25 \text{ A}; T_j = 25 \text{ }^\circ C$	-	1.79	2.28	m Ω
		$V_{GS} = 7 \text{ V}; I_D = 25 \text{ A}; T_j = 25 \text{ }^\circ C$	-	2.5	3.2	m Ω
		$V_{GS} = 10 \text{ V}; I_D = 25 \text{ A}; T_j = 100 \text{ }^\circ C$	-	2.8	3.6	m Ω
		$V_{GS} = 10 \text{ V}; I_D = 25 \text{ A}; T_j = 150 \text{ }^\circ C$	-	3.6	4.7	m Ω
R_G	gate resistance	$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ C$	[tbd]	0.53	[tbd]	Ω
Dynamic characteristics						
$Q_{G(tot)}$	total gate charge	$I_D = 25 \text{ A}; V_{DS} = 50 \text{ V}; V_{GS} = 10 \text{ V};$ Fig. 3	[tbd]	162	[tbd]	nC
		$I_D = 0 \text{ A}; V_{DS} = 0 \text{ V}; V_{GS} = 10 \text{ V}$	-	89	-	nC
Q_{GS}	gate-source charge	$I_D = 25 \text{ A}; V_{DS} = 50 \text{ V}; V_{GS} = 10 \text{ V};$ Fig. 3	[tbd]	48	[tbd]	nC
$Q_{GS(th)}$	pre-threshold gate-source charge		-	[tbd]	-	nC
$Q_{GS(th-pl)}$	post-threshold gate-source charge		-	[tbd]	-	nC
Q_{GD}	gate-drain charge		[tbd]	32	[tbd]	nC
$V_{GS(pl)}$	gate-source plateau voltage	$I_D = 25 \text{ A}; V_{DS} = 50 \text{ V};$ Fig. 3	-	[tbd]	-	V
C_{iss}	input capacitance	$V_{DS} = 50 \text{ V}; V_{GS} = 0 \text{ V}; f = 1 \text{ MHz};$ $T_j = 25 \text{ }^\circ C$	[tbd]	11670	[tbd]	pF
C_{oss}	output capacitance		[tbd]	2744	[tbd]	pF
C_{rss}	reverse transfer capacitance		[tbd]	47	[tbd]	pF
$t_{d(on)}$	turn-on delay time	$V_{DS} = 50 \text{ V}; R_L = 2 \text{ } \Omega; V_{GS} = 10 \text{ V};$ $R_{G(ext)} = 5 \text{ } \Omega$	-	44	-	ns
t_r	rise time		-	38	-	ns
$t_{d(off)}$	turn-off delay time		-	96	-	ns
t_f	fall time		-	51	-	ns
Source-drain diode						
V_{SD}	source-drain voltage	$I_S = 25 \text{ A}; V_{GS} = 0 \text{ V}; T_j = 25 \text{ }^\circ C$	-	0.8	1.2	V

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t_{rr}	reverse recovery time	$I_S = 25 \text{ A}$; $di_S/dt = -100 \text{ A}/\mu\text{s}$; $V_{GS} = 0 \text{ V}$;	-	90	-	ns
Q_r	recovered charge	$V_{DS} = 50 \text{ V}$; Fig. 4	[1]	92	-	nC

[1] includes capacitive recovery

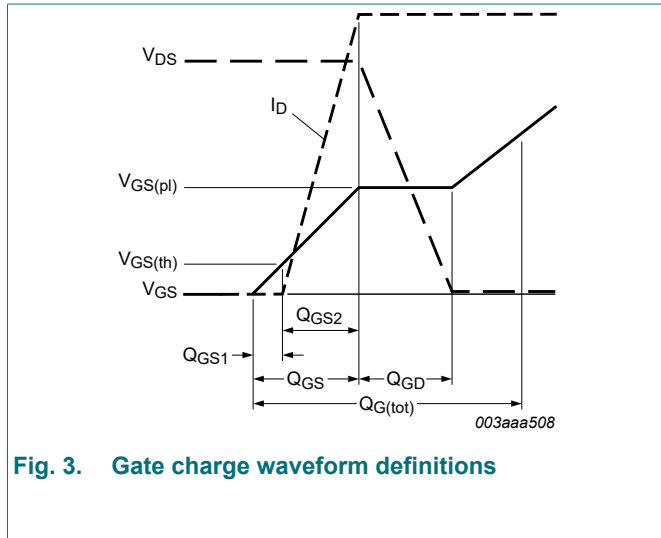


Fig. 3. Gate charge waveform definitions

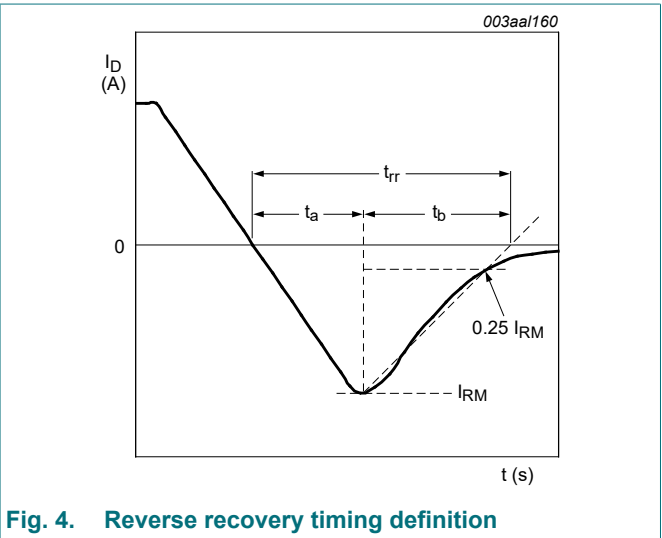


Fig. 4. Reverse recovery timing definition

7. Package outline

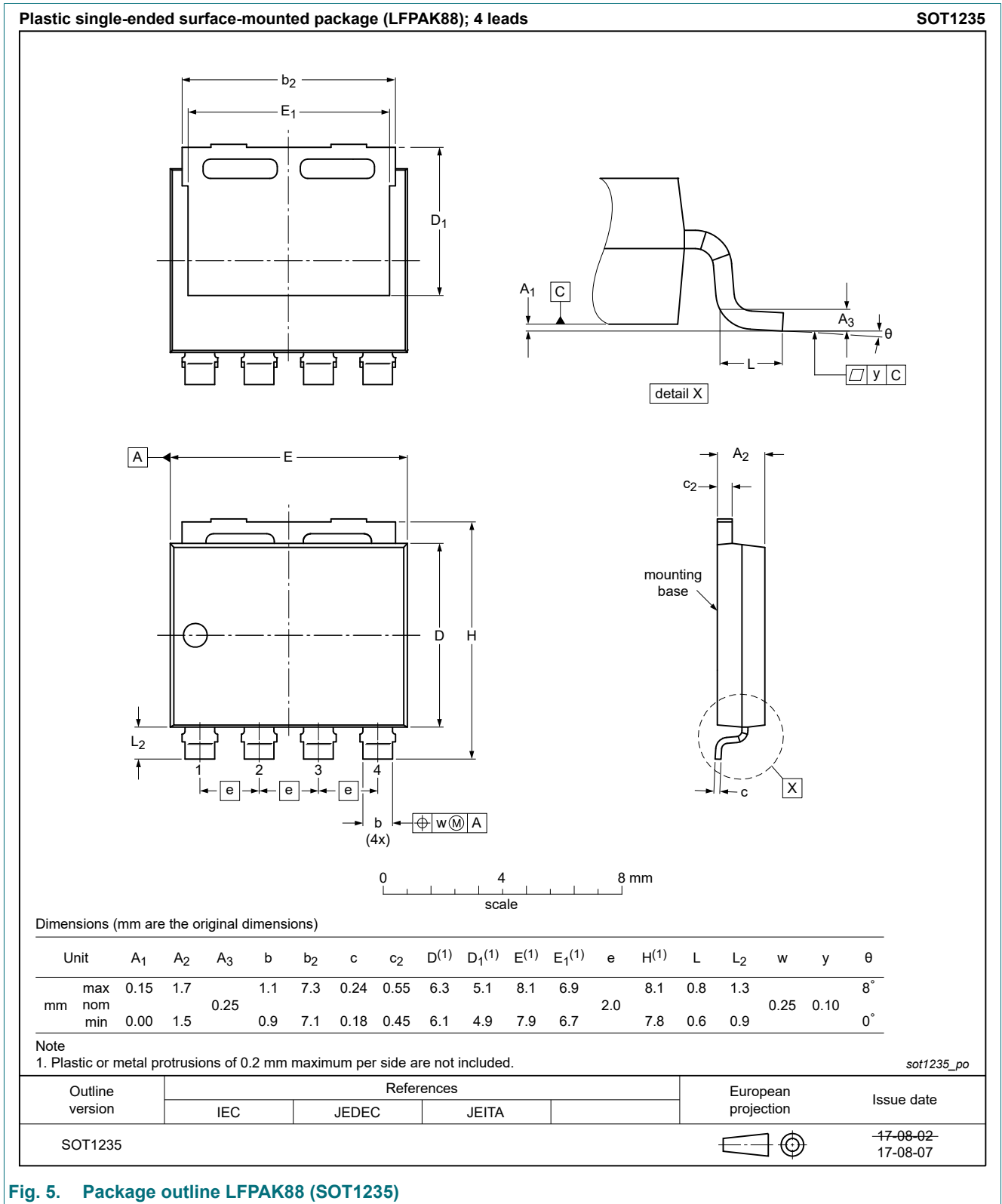


Fig. 5. Package outline LPAK88 (SOT1235)

8. Soldering

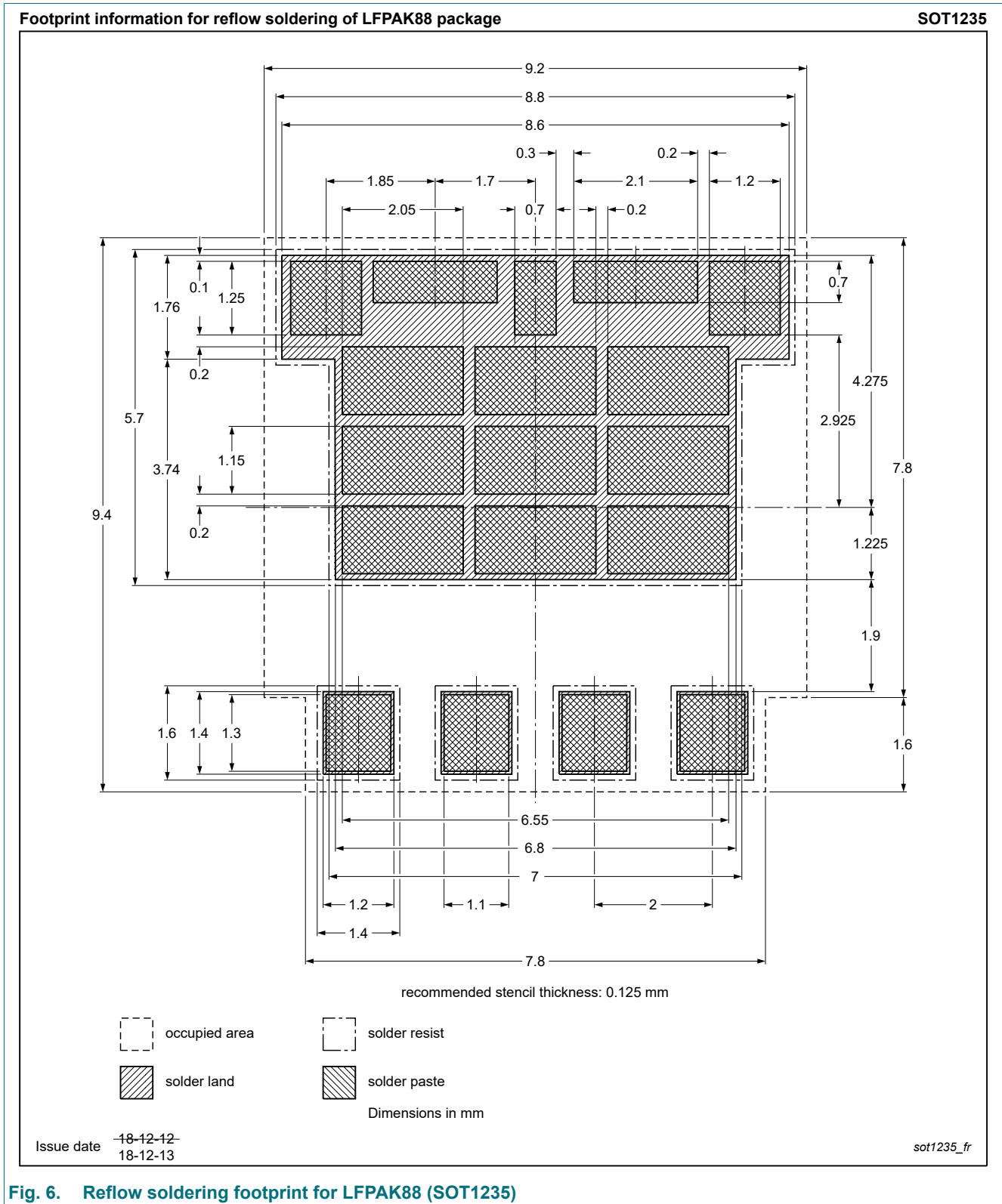


Fig. 6. Reflow soldering footprint for LFPAK88 (SOT1235)

9. Legal information

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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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Date of release: 24 February 2020
