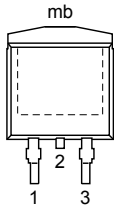
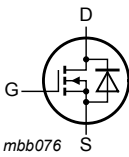


5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate	 D2PAK (SOT404)	 mbb076
2	D	drain[1]		
3	S	source		
mb	D	mounting base; connected to drain		

[1] It is not possible to make connection to pin 2.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PSMN3R7-100BSE	D2PAK	plastic, single-ended surface-mounted package (D2PAK); 3 terminals (one lead cropped); 2.54 mm pitch; 11 mm x 10 mm x 4.3 mm body	SOT404

7. 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 °C ≤ T _j ≤ 175 °C		-	100	V
V _{DGR}	drain-gate voltage	25 °C ≤ T _j ≤ 175 °C; R _{GS} = 20 kΩ		-	100	V
V _{GS}	gate-source voltage			-20	20	V
P _{tot}	total power dissipation	T _{mb} = 25 °C; Fig. 1		-	405	W
I _D	drain current	V _{GS} = 10 V; T _{mb} = 25 °C; Fig. 2	[1]	-	120	A
		V _{GS} = 10 V; T _{mb} = 100 °C; Fig. 2	[1]	-	120	A
I _{DM}	peak drain current	pulsed; t _p ≤ 10 μs; T _{mb} = 25 °C; Fig. 3		-	780	A
T _{stg}	storage temperature			-55	175	°C
T _j	junction temperature			-55	175	°C
T _{slid(M)}	peak soldering temperature			-	260	°C
Source-drain diode						
I _S	source current	T _{mb} = 25 °C		-	120	A
I _{SM}	peak source current	pulsed; t _p ≤ 10 μs; T _{mb} = 25 °C		-	780	A
Avalanche ruggedness						
E _{DS(AL)S}	non-repetitive drain-source avalanche energy	I _D = 120 A; V _{sup} ≤ 100 V; R _{GS} = 50 Ω; V _{GS} = 10 V; T _{j(init)} = 25 °C; unclamped; Fig. 4		-	542	mJ

[1] Continuous current is limited by package

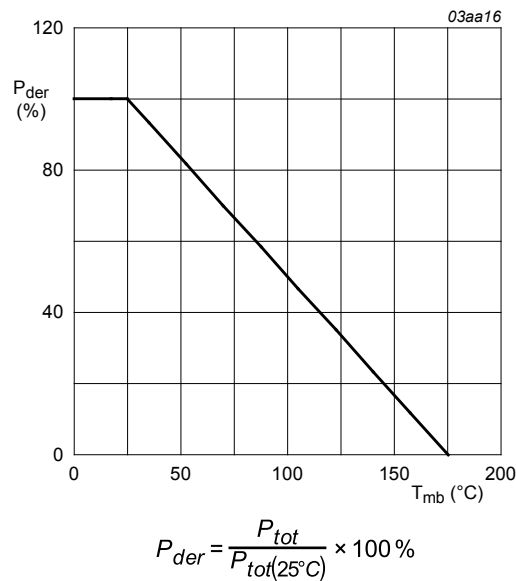


Fig. 1. Normalized total power dissipation as a function of mounting base temperature

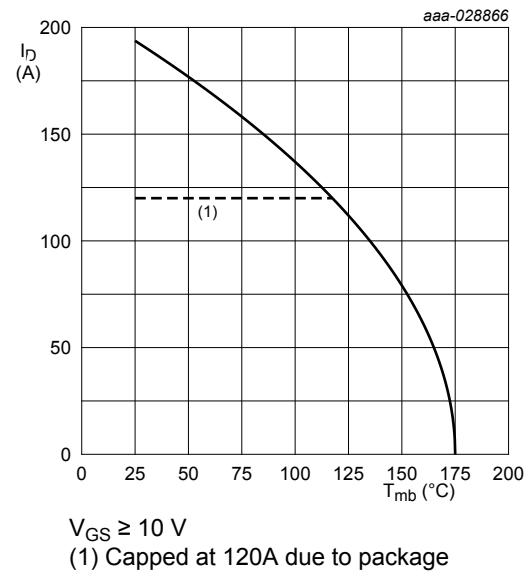


Fig. 2. Continuous drain current as a function of mounting base temperature

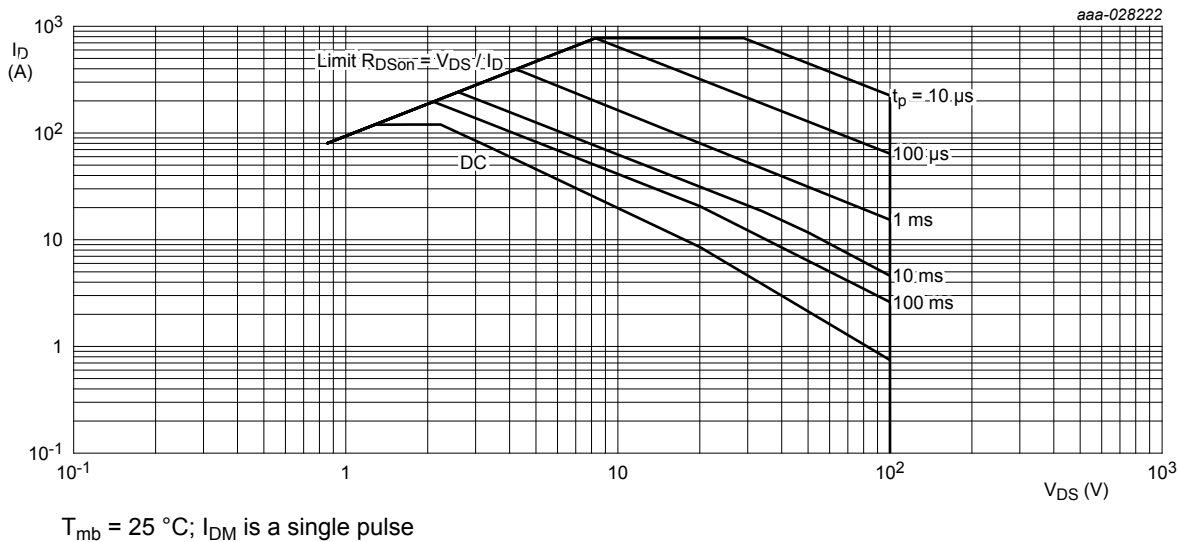
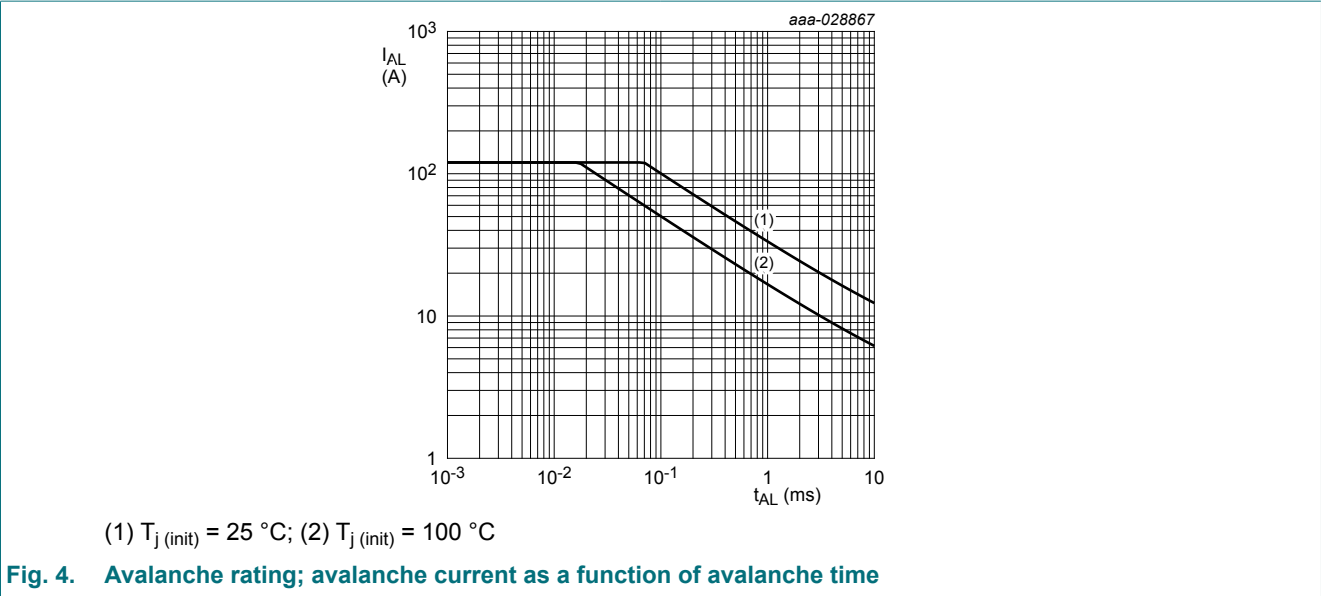


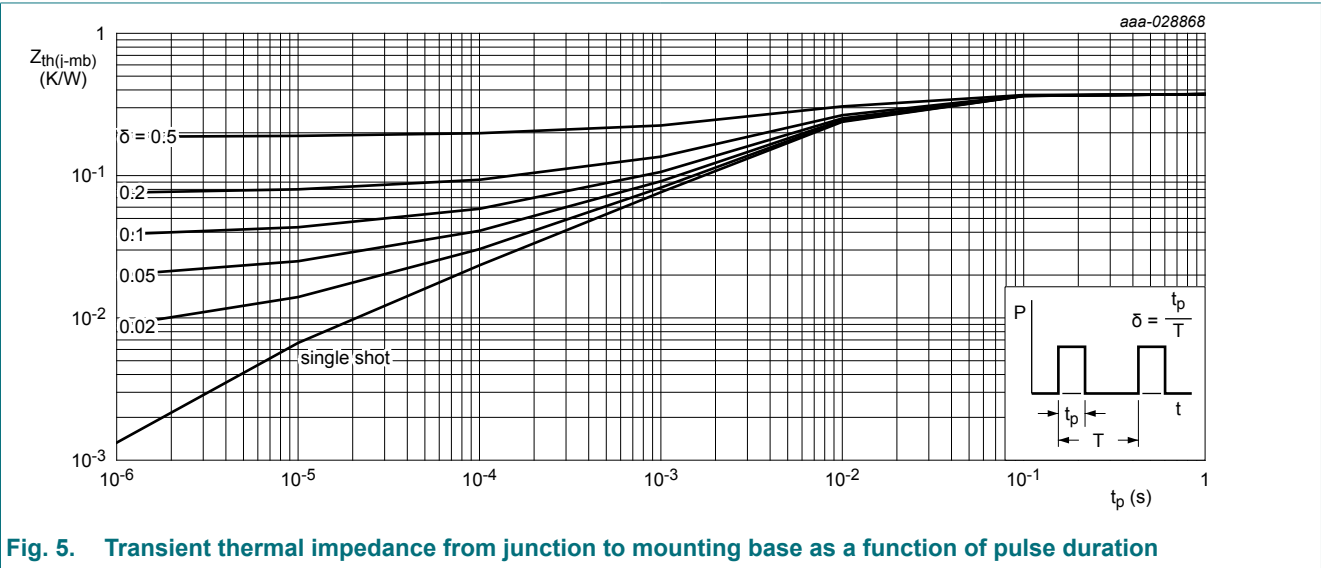
Fig. 3. Safe operating area; continuous and peak drain currents as a function of drain-source voltage



8. Thermal characteristics

Table 5. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	Fig. 5	-	0.3	0.37	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient		-	50	-	K/W



9. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V _{(BR)DSS}	drain-source breakdown voltage	I _D = 250 μA; V _{GS} = 0 V; T _j = 25 °C		100	-	-	V
		I _D = 250 μA; V _{GS} = 0 V; T _j = -55 °C		90	-	-	V
V _{GS(th)}	gate-source threshold voltage	I _D = 1 mA; V _{DS} =V _{GS} ; T _j = 25 °C; Fig. 10 ; Fig. 11		2	2.66	4	V
		I _D = 1 mA; V _{DS} =V _{GS} ; T _j = 175 °C; Fig. 11		1	-	-	V
		I _D = 1 mA; V _{DS} =V _{GS} ; T _j = -55 °C; Fig. 11		-	-	4.6	V
I _{DSS}	drain leakage current	V _{DS} = 100 V; V _{GS} = 0 V; T _j = 25 °C		-	0.026	2	μA
		V _{DS} = 100 V; V _{GS} = 0 V; T _j = 175 °C		-	-	500	μA
I _{GSS}	gate leakage current	V _{GS} = 20 V; V _{DS} = 0 V; T _j = 25 °C		-	2	100	nA
		V _{GS} = -20 V; V _{DS} = 0 V; T _j = 25 °C		-	2	100	nA
R _{DSon}	drain-source on-state resistance	V _{GS} = 10 V; I _D = 25 A; T _j = 25 °C; Fig. 12		-	3.36	3.95	mΩ
		V _{GS} = 10 V; I _D = 25 A; T _j = 100 °C; Fig. 13		-	-	7.3	mΩ
		V _{GS} = 10 V; I _D = 25 A; T _j = 175 °C; Fig. 13		-	-	10.7	mΩ
R _G	gate resistance	f = 1 MHz		0.49	0.98	1.96	Ω
Dynamic characteristics							
Q _{G(tot)}	total gate charge	I _D = 25 A; V _{DS} = 50 V; V _{GS} = 10 V; Fig. 14 ; Fig. 15		-	176	246	nC
		I _D = 0 A; V _{DS} = 0 V; V _{GS} = 10 V		-	71	99	nC
Q _{GS}	gate-source charge	I _D = 25 A; V _{DS} = 50 V; V _{GS} = 10 V; Fig. 14 ; Fig. 15		-	49.5	74	nC
Q _{GS(th)}	pre-threshold gate-source charge			-	30	-	nC
Q _{GS(th-pl)}	post-threshold gate-source charge			-	19.7	-	nC
Q _{GD}	gate-drain charge			-	45.2	77	nC
V _{GS(pl)}	gate-source plateau voltage	I _D = 25 A; V _{DS} = 50 V; Fig. 14 ; Fig. 15		-	4.9	-	V
C _{iss}	input capacitance	V _{DS} = 50 V; V _{GS} = 0 V; f = 1 MHz; T _j = 25 °C; Fig. 16		-	11692	16370	pF
C _{oss}	output capacitance			-	657	887	pF
C _{rss}	reverse transfer capacitance			-	353	494	pF
t _{d(on)}	turn-on delay time	V _{DS} = 50 V; R _L = 2 Ω; V _{GS} = 10 V; R _{G(ext)} = 5 Ω		-	40	60	ns
t _r	rise time			-	64	97	ns
t _{d(off)}	turn-off delay time			-	98	147	ns
t _f	fall time			-	69	104	ns
Source-drain diode							
V _{SD}	source-drain voltage	I _S = 25 A; V _{GS} = 0 V; T _j = 25 °C; Fig. 17		-	0.79	1.2	V
t _{rr}	reverse recovery time	I _S = 25 A; dI _S /dt = -100 A/μs; V _{GS} = 0 V; V _{DS} = 50 V; Fig. 18		-	70	91	ns
Q _r	recovered charge			-	195	254	nC

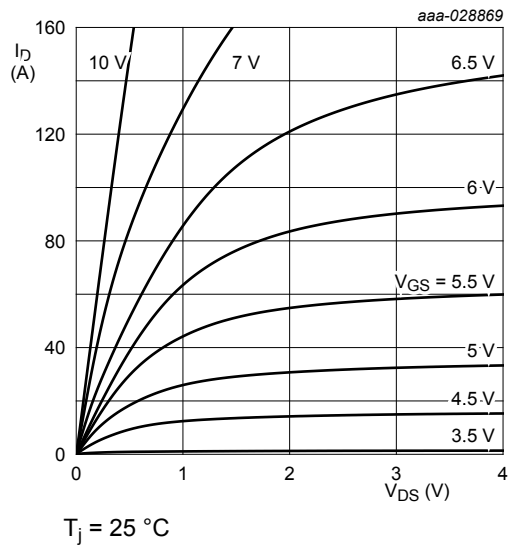


Fig. 6. Output characteristics; drain current as a function of drain-source voltage; typical values

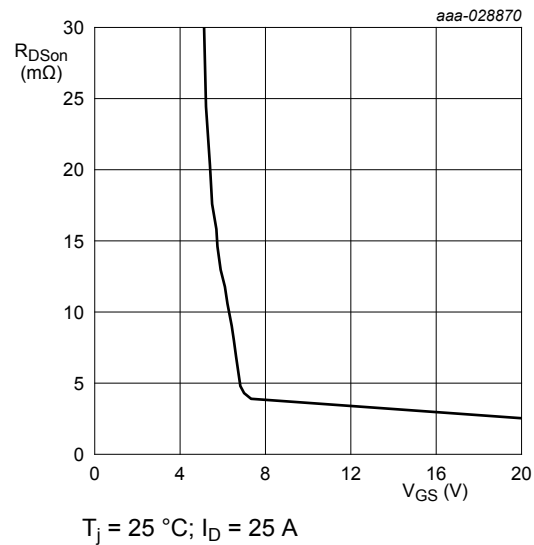


Fig. 7. Drain-source on-state resistance as a function of gate-source voltage; typical values

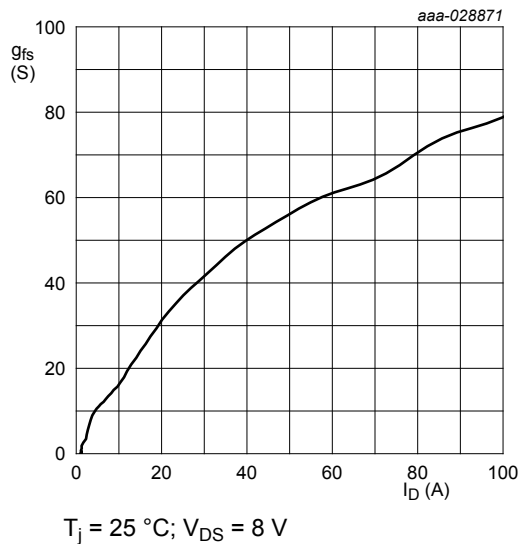


Fig. 8. Forward transconductance as a function of drain current; typical values

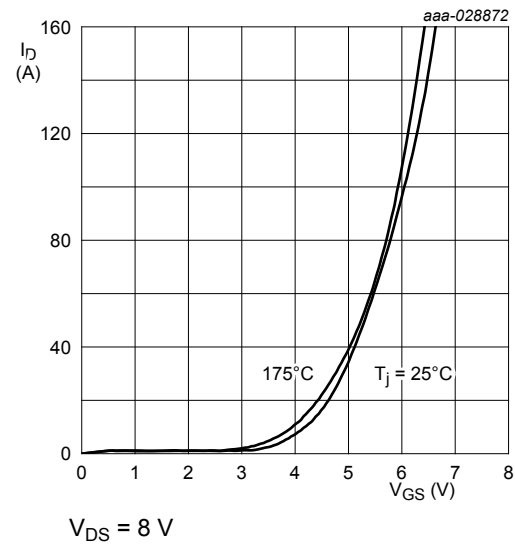


Fig. 9. Transfer characteristics; drain current as a function of gate-source voltage; typical values

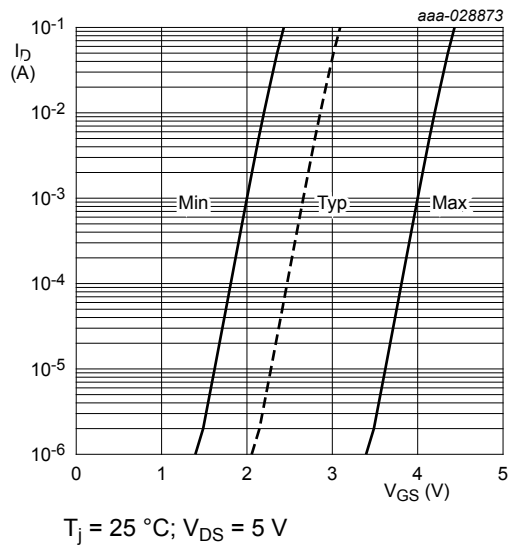


Fig. 10. Sub-threshold drain current as a function of gate-source voltage

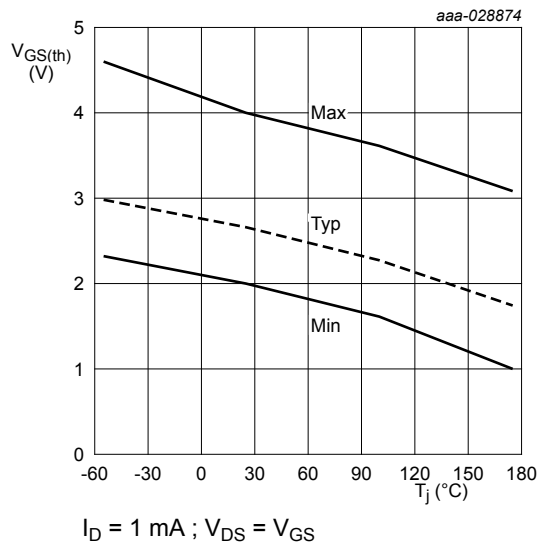


Fig. 11. Gate-source threshold voltage as a function of junction temperature

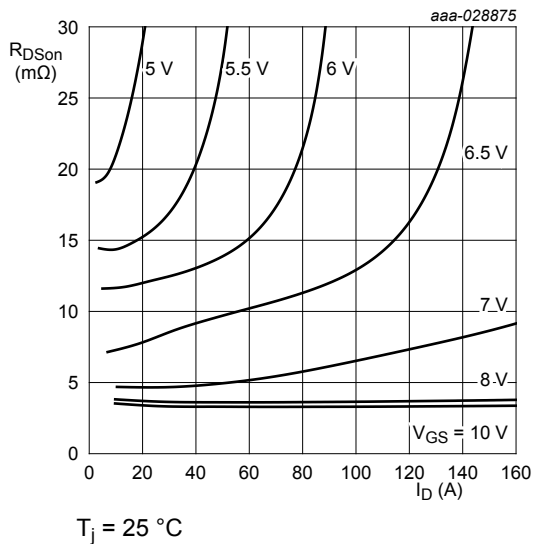


Fig. 12. Drain-source on-state resistance as a function of drain current; typical values

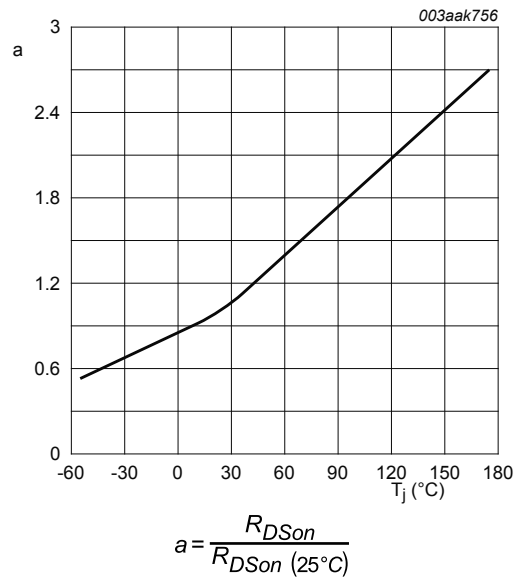


Fig. 13. Normalized drain-source on-state resistance factor as a function of junction temperature

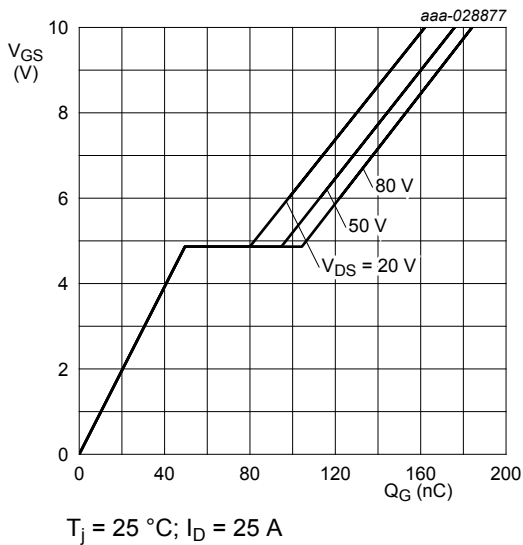


Fig. 14. Gate-source voltage as a function of gate charge; typical values

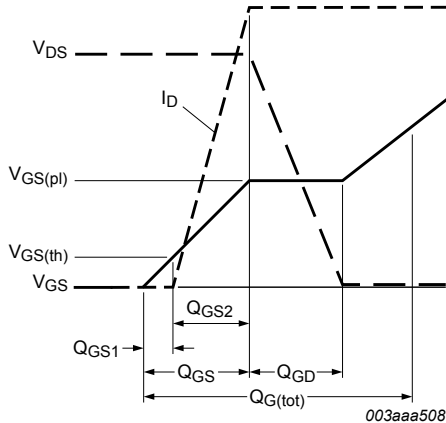


Fig. 15. Gate charge waveform definitions

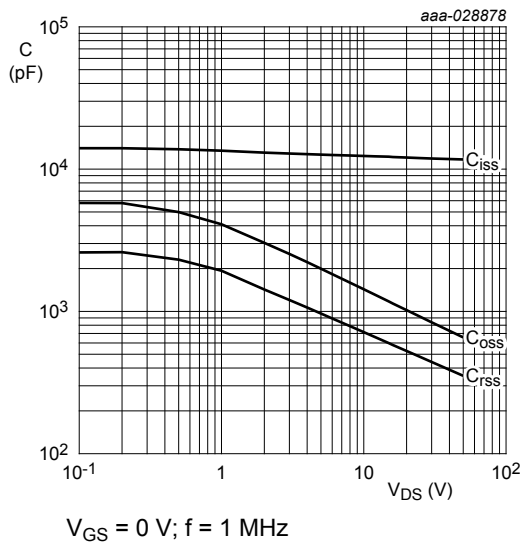


Fig. 16. Input, output and reverse transfer capacitances as a function of drain-source voltage; typical values

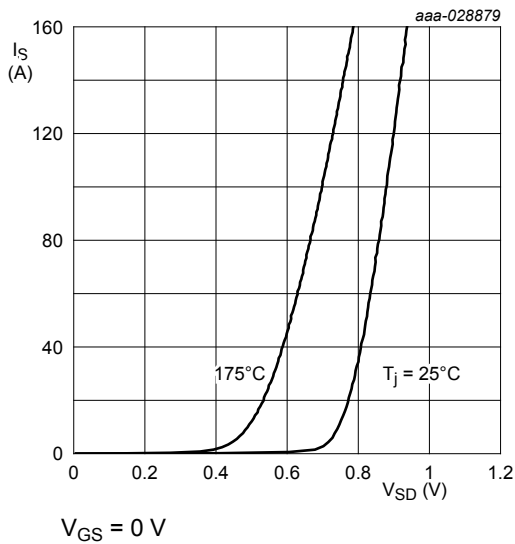


Fig. 17. Source-drain (diode forward) current as a function of source-drain (diode forward) voltage; typical values

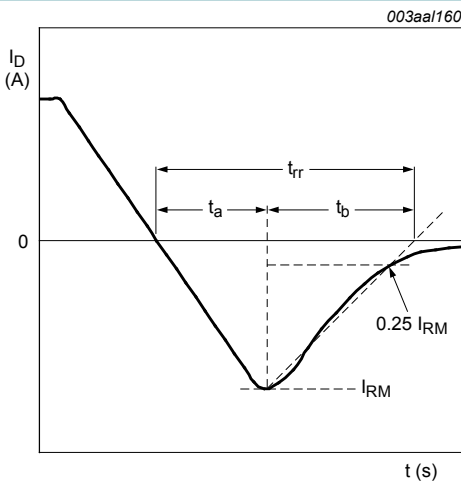


Fig. 18. Reverse recovery timing definition

10. Package outline

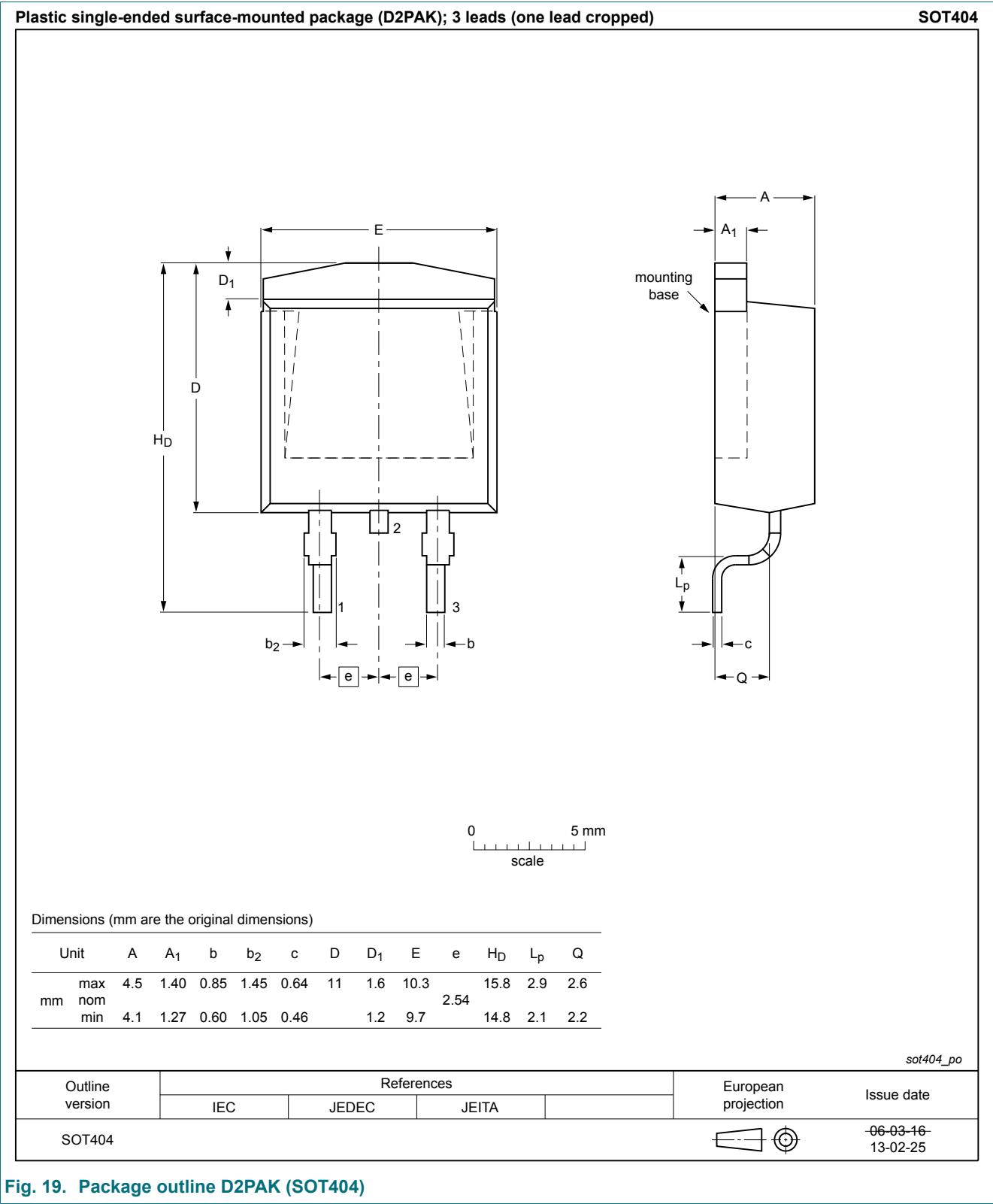


Fig. 19. Package outline D2PAK (SOT404)

11. Soldering

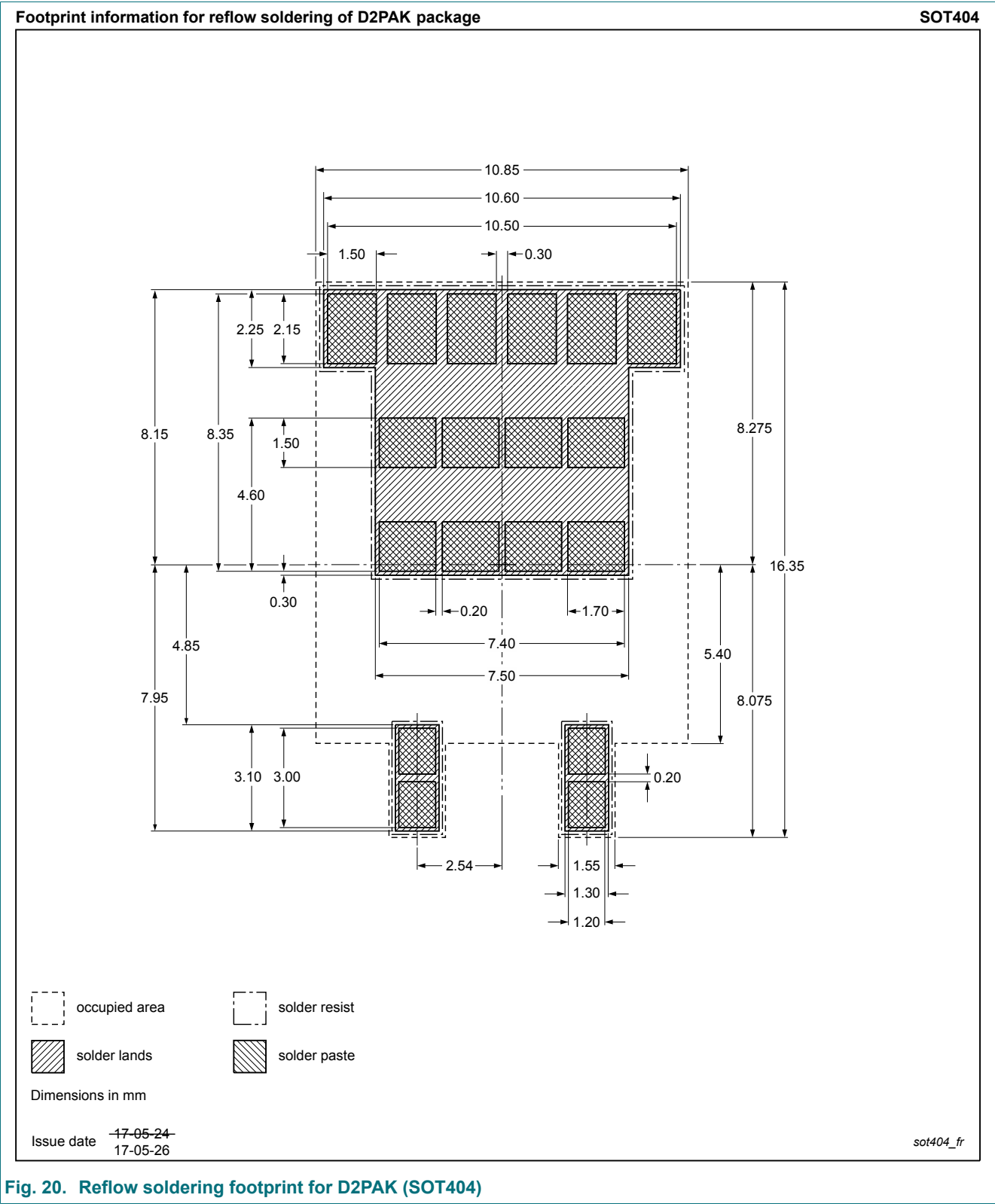


Fig. 20. Reflow soldering footprint for D2PAK (SOT404)

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Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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