

PMN25ENE 30 V, N-channel Trench MOSFET 16 April 2018

Product data sheet

1. General description

N-channel enhancement mode Field-Effect Transistor (FET) in a small SOT457 (SC-74) Surface-Mounted Device (SMD) plastic package using Trench MOSFET technology.

2. Features and benefits

- Trench MOSFET technology •
- Logic-level compatible
- Very fast switching •
- ElectroStatic Discharge (ESD) protection > 2 kV HBM •

3. Applications

- Relay driver
- High-speed line driver
- Low-side load switch
- Switching circuits

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
V _{DS}	drain-source voltage	T _j = 25 °C		-	-	30	V
V _{GS}	gate-source voltage			-20	-	20	V
I _D	drain current	V_{GS} = 10 V; T_{amb} = 25 °C; t ≤ 5 s	[1]	-	-	8	А
Static characteristics							
R _{DSon}	drain-source on-state resistance	V_{GS} = 10 V; I _D = 6.1 A; T _j = 25 °C		-	17	24	mΩ

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and mounting pad for drain 6 cm².

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5. Pinning information

Symbol	Description	Simplified outline	Graphic symbol
D	drain		D
D	drain		
G	gate		G ← → ➡ 本 \
S	source	TSOP6 (SOT457)	
D	drain		
D	drain		S 017aaa255
	D D G S D	DdrainDdrainGgateSsourceDdrain	DdrainDdrainGgateSsourceDdrain

6. Ordering information

Table 3. Ordering information							
Type number	Package						
	Name	Description	Version				
PMN25ENE	TSOP6	plastic surface-mounted package (TSOP6); 6 leads	SOT457				

7. Marking

Table 4. Marking codes						
Type number	Marking code					
PMN25ENE	3Н					

8. Limiting values

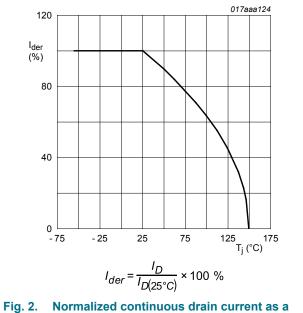
Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V _{DS}	drain-source voltage	T _j = 25 °C		-	30	V
V _{GS}	gate-source voltage	_		-20	20	V
Ι _D	drain current	V _{GS} = 10 V; T _{amb} = 25 °C; t ≤ 5 s	[1]	-	8	А
		V _{GS} = 10 V; T _{amb} = 25 °C	[1]	-	6.1	А
		V _{GS} = 10 V; T _{amb} = 100 °C	[1]	-	3.8	А
I _{DM}	peak drain current	T_{amb} = 25 °C; single pulse; $t_p \le 10 \ \mu s$		-	25	А
P _{tot}	total power dissipation	T _{amb} = 25 °C	[2]	-	560	mW
			[1]	-	1.4	W
		T _{sp} = 25 °C		-	6.25	mW
Tj	junction temperature			-55	150	°C
T _{amb}	ambient temperature			-55	150	°C
T _{stg}	storage temperature			-65	150	°C
Source-drai	n diode		·	·		
I _S	source current	T _{amb} = 25 °C	[1]	-	1.4	А

Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and mounting pad for drain 6 cm².
 Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

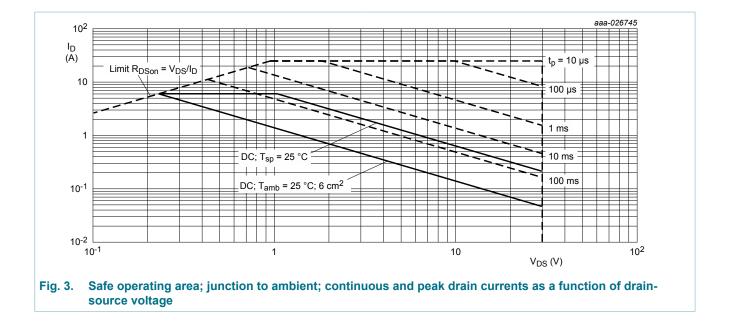
017aaa123 120 Pder (%) 80 40 0 125 175 T_j (°C) , - 75 - 25 25 75 $P_{der} = \frac{P_{tot}}{P_{tot(25^{\circ}C)}} \times 100 \%$ Normalized total power dissipation as a Fig. 1. function of junction temperature





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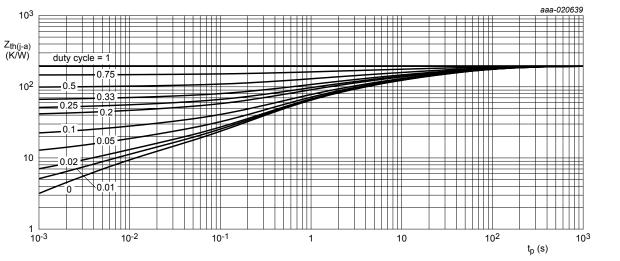
9. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
R _{th(j-a)}	thermal resistance from junction to ambient		[1]	-	195	225	K/W
			[2]	-	78	90	K/W
		in free air; t ≤ 5 s	[2]	-	55	63	K/W
R _{th(j-sp)}	thermal resistance from junction to solder point			-	15	20	K/W

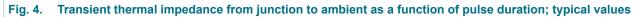
Table 6. Thermal characteristics

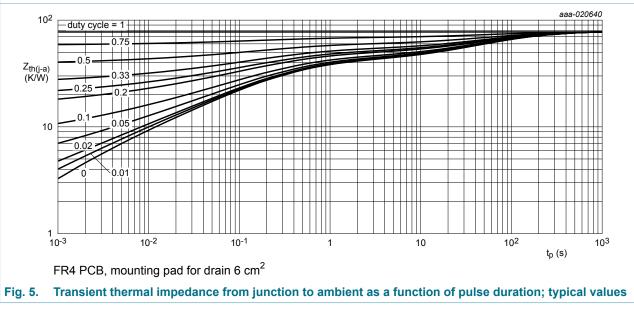
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for drain 6 cm².



FR4 PCB, standard footprint



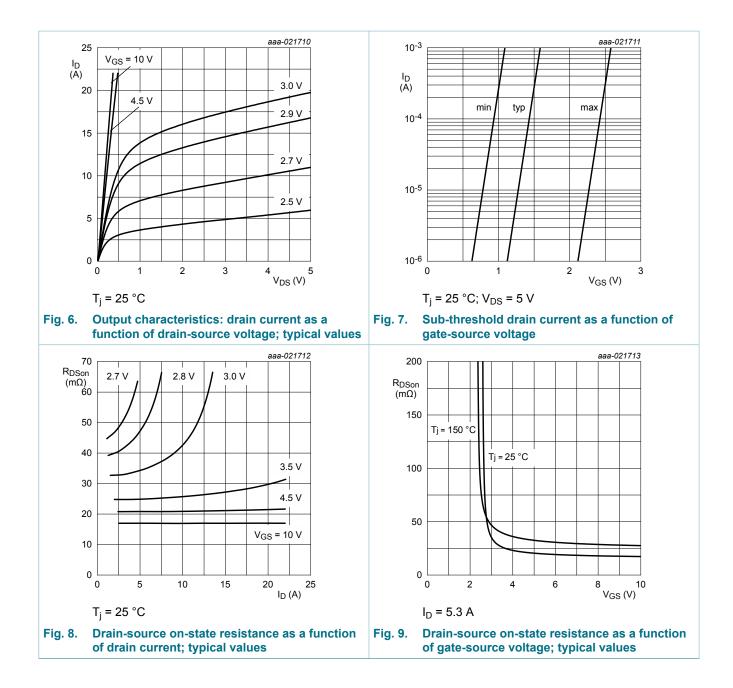


10. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static chara	octeristics					
V _{(BR)DSS}	drain-source breakdown voltage	I _D = 250 μA; V _{GS} = 0 V; T _j = 25 °C	30	-	-	V
V _{GSth}	gate-source threshold voltage	I_D = 250 µA; V_{DS} = V_{GS} ; T_j = 25 °C	1	1.5	2.5	V
I _{DSS}	drain leakage current	V_{DS} = 30 V; V_{GS} = 0 V; T_j = 25 °C	-	-	1	μA
I _{GSS}	gate leakage current	V_{GS} = 20 V; V_{DS} = 0 V; T_j = 25 °C	-	-	10	μA
		V_{GS} = -20 V; V_{DS} = 0 V; T_j = 25 °C	-	-	-10	μA
		V _{GS} = 10 V; V _{DS} = 0 V; T _j = 25 °C	-	-	5	μA
		V_{GS} = -10 V; V_{DS} = 0 V; T_j = 25 °C	-	-	-5	μA
R _{DSon} drain-	drain-source on-state	V _{GS} = 10 V; I _D = 6.1 A; T _j = 25 °C	-	17	24	mΩ
	resistance	V _{GS} = 10 V; I _D = 6.1 A; T _j = 150 °C	-	27	38	mΩ
		V _{GS} = 4.5 V; I _D = 5.3 A; T _j = 25 °C	-	22	32	mΩ
9 _{fs}	forward transconductance	V _{DS} = 10 V; I _D = 5.5 A; T _j = 25 °C	-	24	-	S
R _G	gate resistance	f = 1 MHz	-	8	-	Ω
Dynamic ch	aracteristics					
Q _{G(tot)}	total gate charge	V_{DS} = 15 V; I _D = 5.5 A; V _{GS} = 10 V;	-	12.6	18	nC
Q _{GS}	gate-source charge	T _j = 25 °C	-	1.2	-	nC
Q _{GD}	gate-drain charge		-	2.7	-	nC
C _{iss}	input capacitance	V _{DS} = 15 V; f = 1 MHz; V _{GS} = 0 V;	-	597	-	pF
C _{oss}	output capacitance	T _j = 25 °C	-	117	-	pF
C _{rss}	reverse transfer capacitance		-	94	-	pF
t _{d(on)}	turn-on delay time	V _{DS} = 15 V; I _D = 5.5 A; V _{GS} = 10 V;	-	8	-	ns
t _r	rise time	$R_{G(ext)} = 6 \Omega; T_j = 25 °C$	-	23	-	ns
t _{d(off)}	turn-off delay time] [-	33	-	ns
t _f	fall time		-	30	-	ns
Source-drai	n diode	·				
V _{SD}	source-drain voltage	I _S = 1.4 A; V _{GS} = 0 V; T _i = 25 °C	-	0.7	1.2	V

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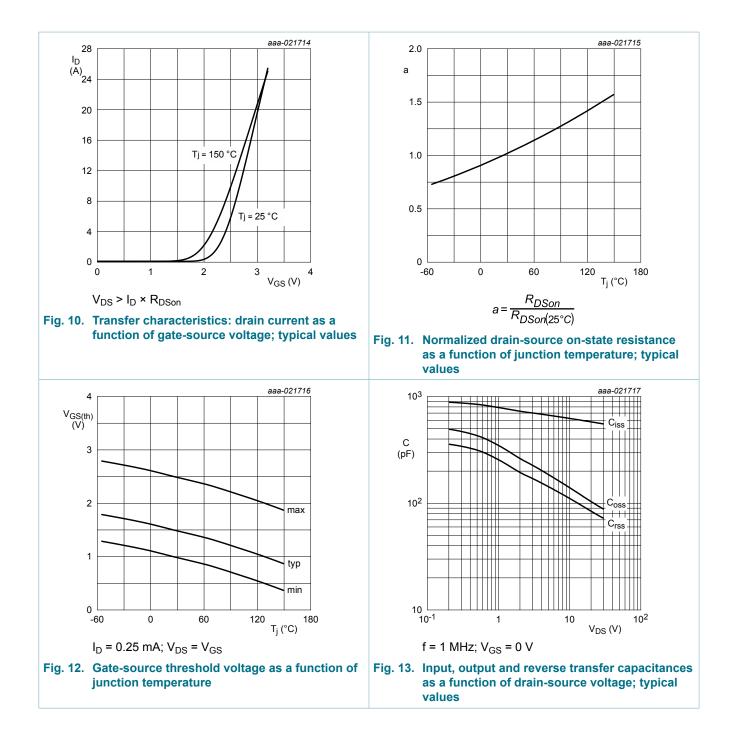
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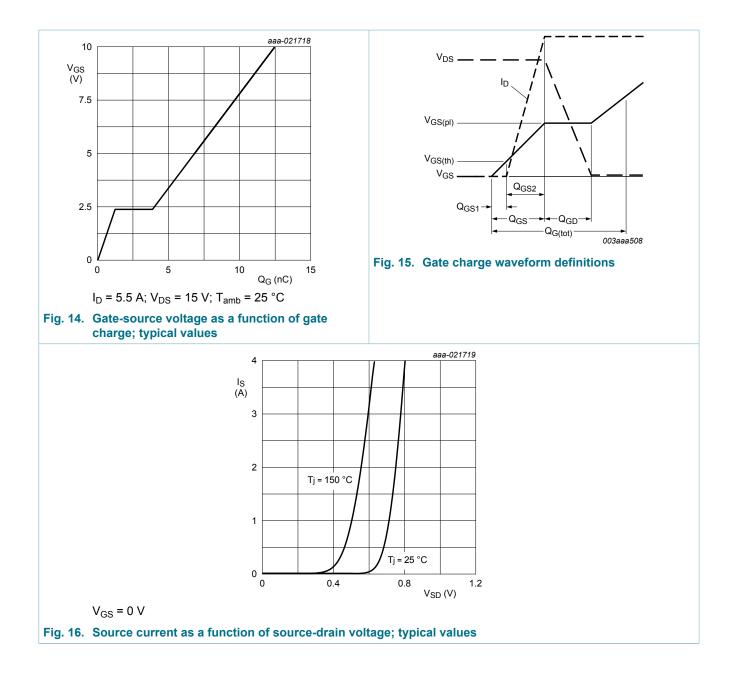


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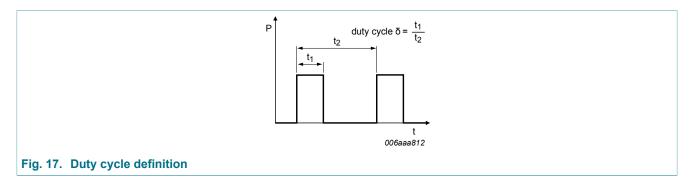
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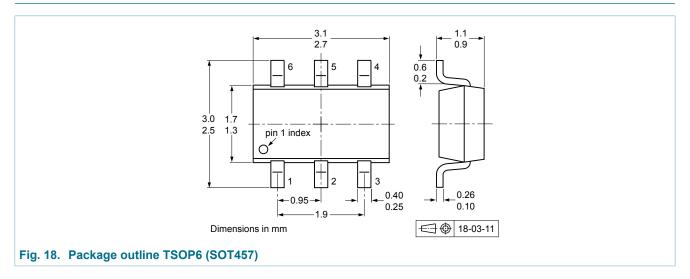
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11. Test information

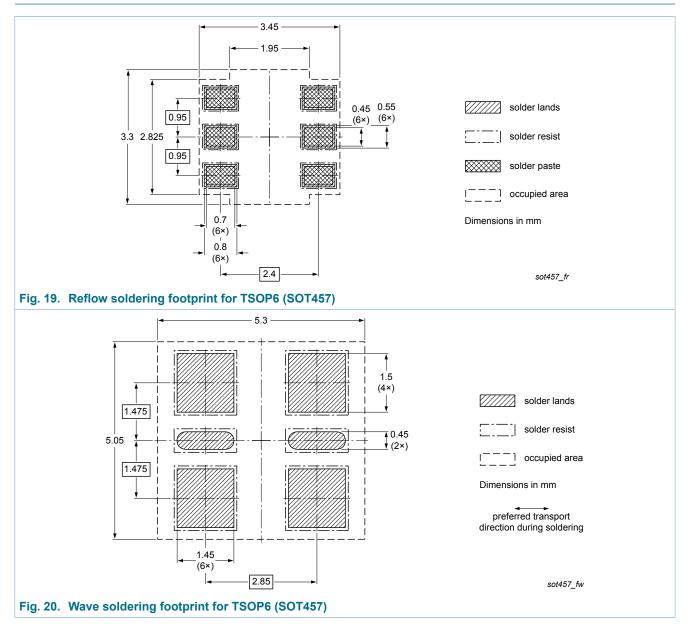


12. Package outline



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13. Soldering



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14. Revision history

Table 8. Revision history						
Data sheet ID	Release date	Data sheet status	Change notice	Supersedes		
PMN25ENE v.1	20180416	Product data sheet	-	-		

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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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