

PMZ390UNE 30 V, N-channel Trench MOSFET 12 March 2015

Product data sheet

1. **General description**

N-channel enhancement mode Field-Effect Transistor (FET) in a leadless ultra small DFN1006-3 (SOT883) Surface-Mounted Device (SMD) plastic package using Trench MOSFET technology.

2. Features and benefits

- Trench MOSFET technology •
- Low threshold voltage
- Very fast switching •
- ElectroStatic Discharge (ESD) protection: 2 kV HBM •
- Leadless ultra small SMD plastic package: 1.0 × 0.6 × 0.48 mm

3. Applications

- Relay driver
- High-speed line driver
- Low-side loadswitch
- Switching circuits

Quick reference data 4.

Table 1. Quid	ck reference data						
Symbol	Parameter	Conditions		Min	Тур	Мах	Unit
V _{DS}	drain-source voltage	T _j = 25 °C		-	-	30	V
V _{GS}	gate-source voltage			-8	-	8	V
I _D	drain current	V_{GS} = 4.5 V; T_{amb} = 25 °C	[1]	-	-	0.9	А
Static characteristics							
R _{DSon}	drain-source on-state resistance	V _{GS} = 4.5 V; I _D = 0.9 A; T _j = 25 °C		-	390	470	mΩ

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for drain 1 cm².



5. Pinning information

Table 2.	Pinning	information		
Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate	1	D
2	S	source	2 2 3	
3	D	drain	Transparent top view DFN1006-3 (SOT883)	G G S 017aaa255

6. Ordering information

Table 3. Ordering information							
Type number	Package						
	Name	Description	Version				
PMZ390UNE	DFN1006-3	DFN1006-3: leadless ultra small plastic package; 3 solder lands	SOT883				

7. Marking

Table 4. Marking codes	
Type number	Marking code
PMZ390UNE	ZY

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			-8	8	V
I _D	drain current	V_{GS} = 4.5 V; T_{amb} = 25 °C	[1]	-	0.9	А
		V_{GS} = 4.5 V; T_{amb} = 100 °C	[1]	-	0.6	А
I _{DM}	peak drain current	T_{amb} = 25 °C; single pulse; $t_p \le 10 \ \mu s$		-	4	А
P _{tot}	total power dissipation	T _{amb} = 25 °C	[2]	-	350	mW
			[1]	-	715	mW
		T _{sp} = 25 °C		-	5430	mW
Tj	junction temperature			-55	150	°C
T _{amb}	ambient temperature			-55	150	°C
T _{stg}	storage temperature			-65	150	°C
Source-dra	in diode	1	1	1	1	
I _S	source current	T _{amb} = 25 °C	[1]	-	0.7	А

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

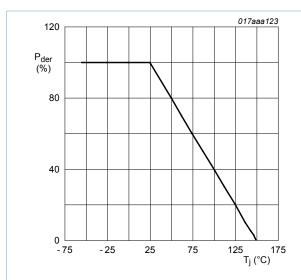
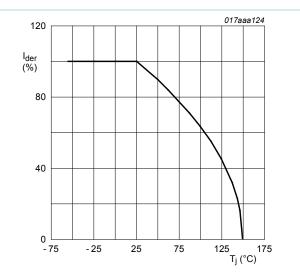


Fig. 1. Normalized total power dissipation as a function of junction temperature

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



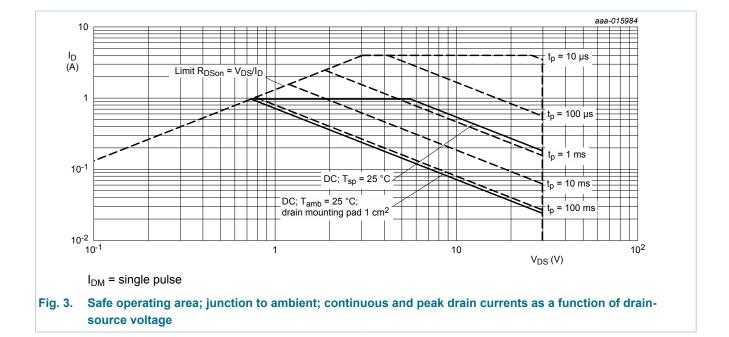


$$I_{der} = \frac{I_D}{I_{D(25^\circ \text{C})}} \times 100 \%$$

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9. Thermal characteristics

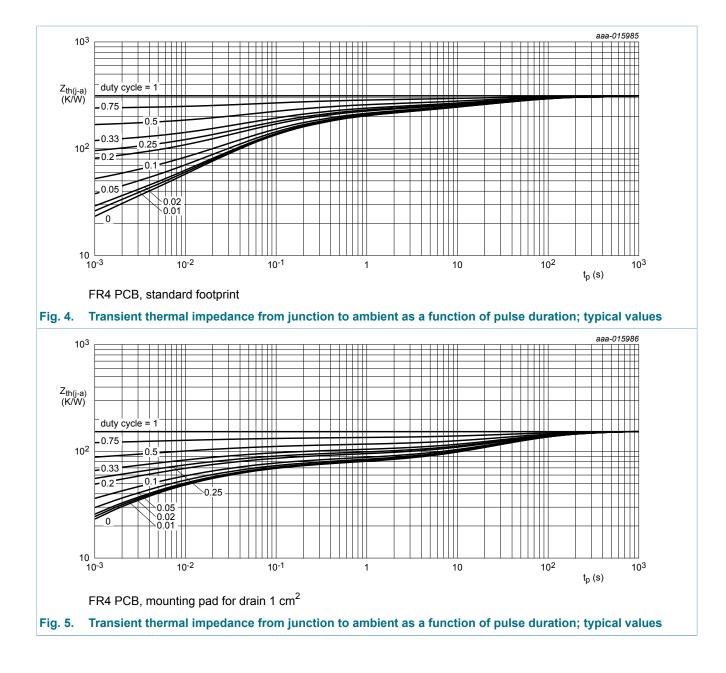
Table 6. Thermal characteristics							
Symbol	Parameter	Conditions		Min	Тур	Max	Unit
R _{th(j-a)}	thermal resistance	in free air	[1]	-	315	360	K/W
	from junction to ambient		[2]	-	150	175	K/W
R _{th(j-sp)}	thermal resistance from junction to solder point			-	20	23	K/W

[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 drain 1 cm².

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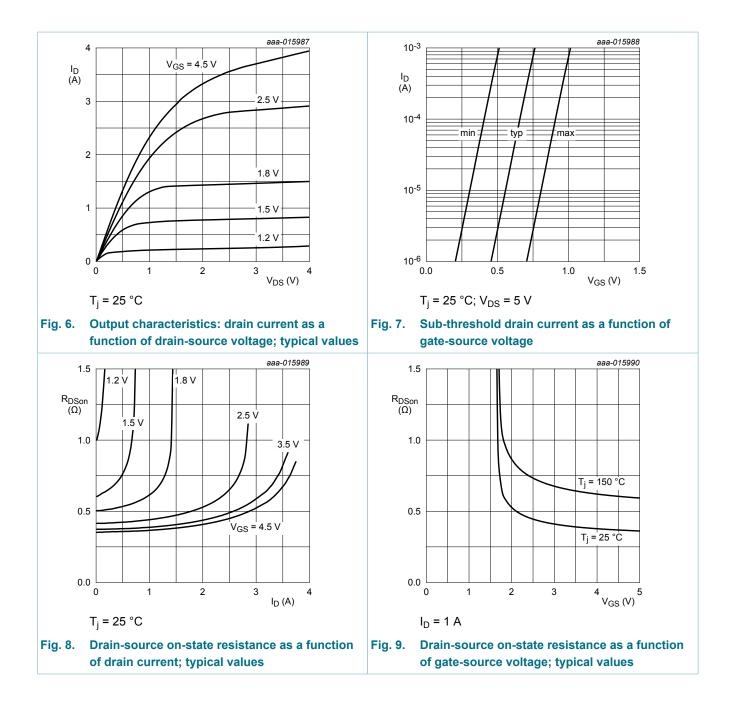
10. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
Static chara	octeristics	1	I I			
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	0.45	0.7	0.95	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} = 8 V; V_{DS} = 0 V; T_j = 25 °C	-	-	5	μA
		V _{GS} = -8 V; V _{DS} = 0 V; T _j = 25 °C	-	-	-5	μA
		V_{GS} = 4.5 V; V_{DS} = 0 V; T_j = 25 °C	-	-	1	μA
		V_{GS} = -4.5 V; V_{DS} = 0 V; T_j = 25 °C	-	-	-1	μA
		V_{GS} = 2.5 V; V_{DS} = 0 V; T_j = 25 °C	-	-	100	nA
		V _{GS} = -2.5 V; V _{DS} = 0 V; T _j = 25 °C	-	-	-100	nA
R _{DSon}	drain-source on-state	V_{GS} = 4.5 V; I _D = 0.9 A; T _j = 25 °C	-	390	470	mΩ
	resistance	V _{GS} = 4.5 V; I _D = 0.9 A; T _j = 150 °C	-	660	790	mΩ
		V_{GS} = 2.5 V; I _D = 0.8 A; T _j = 25 °C	-	460	620	mΩ
		V _{GS} = 1.8 V; I _D = 0.12 A; T _j = 25 °C	-	530	770	mΩ
		V _{GS} = 1.5 V; I _D = 0.01 A; T _j = 25 °C	-	610	1020	mΩ
9 _{fs}	forward transconductance	V_{DS} = 10 V; I _D = 1 A; T _j = 25 °C	-	2	-	S
Dynamic ch	aracteristics	1	I I			
Q _{G(tot)}	total gate charge	V_{DS} = 15 V; I _D = 0.8 A; V _{GS} = 4.5 V;	-	0.8	1.3	nC
Q _{GS}	gate-source charge	T _j = 25 °C	-	0.1	-	nC
Q _{GD}	gate-drain charge		-	0.2	-	nC
C _{iss}	input capacitance	V_{DS} = 15 V; f = 1 MHz; V_{GS} = 0 V;	-	41	-	pF
C _{oss}	output capacitance	T _j = 25 °C	-	6	-	pF
C _{rss}	reverse transfer capacitance	-	-	5	-	pF
t _{d(on)}	turn-on delay time	V_{DS} = 15 V; I _D = 0.8 A; V _{GS} = 4.5 V;	-	4	-	ns
t _r	rise time	R _{G(ext)} = 6 Ω; T _j = 25 °C	-	8	-	ns
t _{d(off)}	turn-off delay time		-	12	-	ns
t _f	fall time		-	3	-	ns
Source-drai	n diode	1	1			
V _{SD}	source-drain voltage	I _S = 0.7 A; V _{GS} = 0 V; T _j = 25 °C	_	0.86	1.2	V

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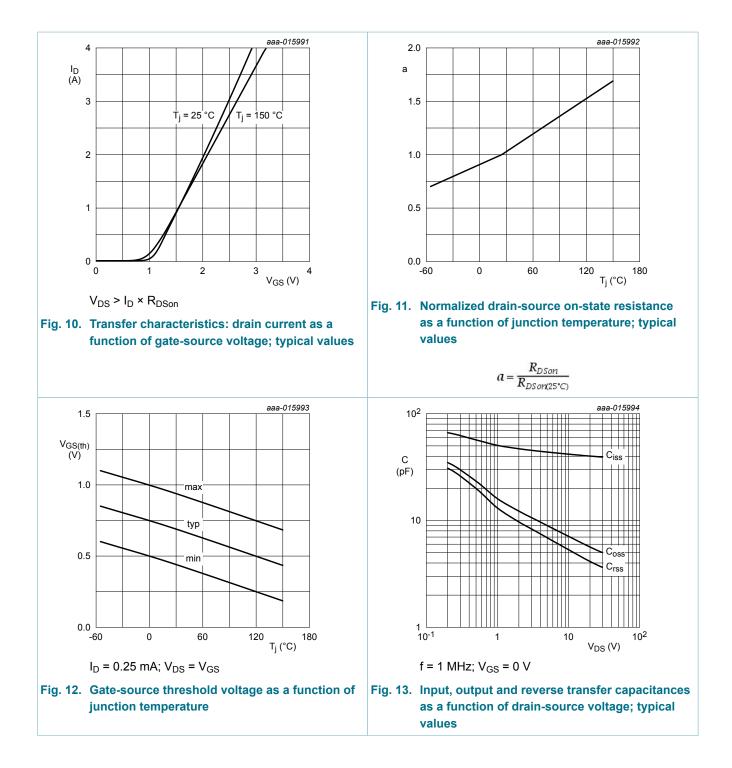
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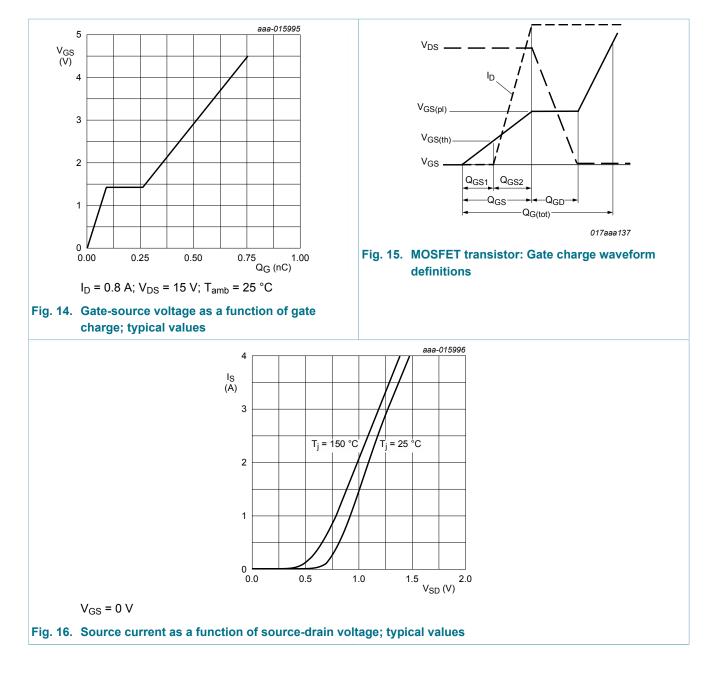
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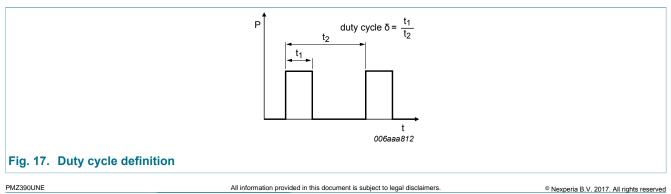


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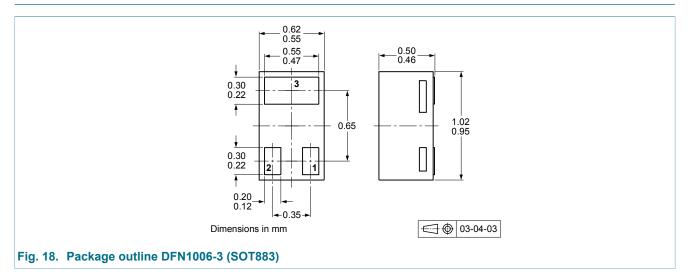


11. Test information

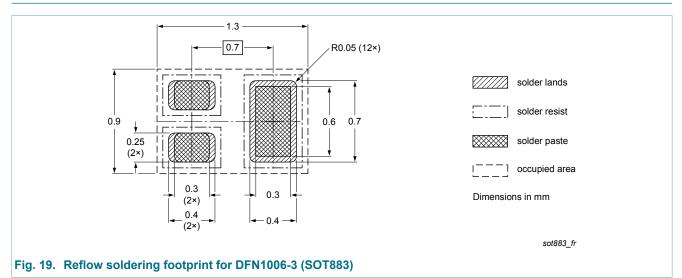


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12. Package outline



13. Soldering



14. Revision history

Table 8. Revision his	story			
Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMZ390UNE v.1	20150312	Product data sheet	-	-

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15. 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.
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Product [short] data sheet	Production	This document contains the product specification.

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