

# PMV30XN

20 V, 3.2 A N-channel Trench MOSFET



## 1. Product profile

### 1.1 General description

N-channel enhancement mode Field-Effect Transistor (FET) in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package using Trench MOSFET technology.

### 1.2 Features and benefits

- Low threshold voltage
- Very fast switching
- Trench MOSFET technology

### 1.3 Applications

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

### 1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{DS}$	drain-source voltage	$T_j = 25\text{ °C}$	-	-	20	V
$V_{GS}$	gate-source voltage		-12	-	12	V
$I_D$	drain current	$V_{GS} = 4.5\text{ V}; T_{amb} = 25\text{ °C}$	[1]	-	3.2	A
<b>Static characteristics</b>						
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = 4.5\text{ V}; I_D = 3.2\text{ A}; T_j = 25\text{ °C}$	-	28	35	mΩ

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for drain 6 cm<sup>2</sup>.

## 2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate		
2	S	source		
3	D	drain		

SOT23 (TO-236AB)

mbb076

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## 3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
PMV30XN	TO-236AB	plastic surface-mounted package; 3 leads	SOT23

## 4. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
PMV30XN	NZ%

[1] % = placeholder for manufacturing site code

## 5. 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	$T_j = 25\text{ °C}$	-	20	V	
$V_{GS}$	gate-source voltage		-12	12	V	
$I_D$	drain current	$V_{GS} = 4.5\text{ V}; T_{amb} = 25\text{ °C}$	[1]	-	3.2	A
		$V_{GS} = 4.5\text{ V}; T_{amb} = 100\text{ °C}$	[1]	-	2.1	A
$I_{DM}$	peak drain current	$T_{amb} = 25\text{ °C}; \text{single pulse}; t_p \leq 10\text{ }\mu\text{s}$	-	12.8	A	
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ °C}$	[2]	-	380	mW
			[1]	-	520	mW
		$T_{sp} = 25\text{ °C}$	-	1800	mW	
$T_j$	junction temperature		-55	150	°C	
$T_{amb}$	ambient temperature		-55	150	°C	
$T_{stg}$	storage temperature		-65	150	°C	

**Source-drain diode**

$I_S$	source current	$T_{amb} = 25\text{ °C}$	[1]	-	0.6	A
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[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for drain 6 cm<sup>2</sup>.

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

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## 6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static characteristics</b>						
$V_{(BR)DSS}$	drain-source breakdown voltage	$I_D = 250 \mu A; V_{GS} = 0 V; T_j = 25 \text{ }^\circ C$	20	-	-	V
$V_{GSth}$	gate-source threshold voltage	$I_D = 250 \mu A; V_{DS} = V_{GS}; T_j = 25 \text{ }^\circ C$	0.5	1	1.5	V
$I_{DSS}$	drain leakage current	$V_{DS} = 20 V; V_{GS} = 0 V; T_j = 25 \text{ }^\circ C$	-	-	1	$\mu A$
		$V_{DS} = 20 V; V_{GS} = 0 V; T_j = 150 \text{ }^\circ C$	-	-	10	$\mu A$
$I_{GSS}$	gate leakage current	$V_{GS} = 12 V; V_{DS} = 0 V; T_j = 25 \text{ }^\circ C$	-	-	100	nA
		$V_{GS} = -12 V; V_{DS} = 0 V; T_j = 25 \text{ }^\circ C$	-	-	100	nA
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 4.5 V; I_D = 3.2 A; T_j = 25 \text{ }^\circ C$	-	28	35	m $\Omega$
		$V_{GS} = 4.5 V; I_D = 3.2 A; T_j = 150 \text{ }^\circ C$	-	44	51	m $\Omega$
		$V_{GS} = 2.5 V; I_D = 2.6 A; T_j = 25 \text{ }^\circ C$	-	39	60	m $\Omega$
$g_{fs}$	forward transconductance	$V_{DS} = 10 V; I_D = 3 A; T_j = 25 \text{ }^\circ C$	-	15	-	S
<b>Dynamic characteristics</b>						
$Q_{G(tot)}$	total gate charge	$V_{DS} = 15 V; I_D = 3 A; V_{GS} = 4.5 V; T_j = 25 \text{ }^\circ C$	-	4.9	7.4	nC
$Q_{GS}$	gate-source charge		-	1.5	-	nC
$Q_{GD}$	gate-drain charge		-	2.9	-	nC
$C_{iss}$	input capacitance	$V_{DS} = 15 V; f = 1 \text{ MHz}; V_{GS} = 0 V; T_j = 25 \text{ }^\circ C$	-	420	-	pF
$C_{oss}$	output capacitance		-	125	-	pF
$C_{rss}$	reverse transfer capacitance		-	73	-	pF
$t_{d(on)}$	turn-on delay time	$V_{DS} = 15 V; V_{GS} = 4.5 V; R_{G(ext)} = 6 \Omega; T_j = 25 \text{ }^\circ C; I_D = 3 A$	-	11	-	ns
$t_r$	rise time		-	28	-	ns
$t_{d(off)}$	turn-off delay time		-	93	-	ns
$t_f$	fall time		-	51	-	ns
<b>Source-drain diode</b>						
$V_{SD}$	source-drain voltage	$I_S = 0.6 A; V_{GS} = 0 V; T_j = 25 \text{ }^\circ C$	-	0.67	1.2	V