

# PMV16UN

20 V, 5.8 A N-channel Trench MOSFET

Rev. 1 — 4 April 2011

Product data sheet

## 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		-8	-	8	V
$I_D$	drain current	$V_{GS} = 4.5\text{ V}; T_{amb} = 25\text{ °C}$	[1]	-	5.8	A
<b>Static characteristics</b>						
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = 4.5\text{ V}; I_D = 5.8\text{ A}; T_j = 25\text{ °C}$	-	15	18	mΩ

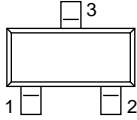
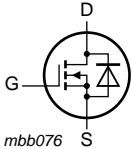
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for drain 6 cm<sup>2</sup>.

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## 2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate	 <p>SOT23 (TO-236AB)</p>	 <p>mbb076</p>
2	S	source		
3	D	drain		

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMV16UN	TO-236AB	plastic surface-mounted package; 3 leads	SOT23

## 4. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
PMV16UN	KV%

[1] % = placeholder for manufacturing site code

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### 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		-8	8	V
$I_D$	drain current	$V_{GS} = 4.5\text{ V}; T_{amb} = 25\text{ °C}$	[1]	5.8	A
		$V_{GS} = 4.5\text{ V}; T_{amb} = 100\text{ °C}$	[1]	3.6	A
$I_{DM}$	peak drain current	$T_{amb} = 25\text{ °C};$ single pulse; $t_p \leq 10\text{ }\mu\text{s}$	-	25	A
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ °C}$	[2]	510	mW
			[1]	930	mW
		$T_{sp} = 25\text{ °C}$	-	4170	mW
$T_j$	junction temperature		-55	150	°C
$T_{amb}$	ambient temperature		-55	150	°C
$T_{stg}$	storage temperature		-65	150	°C
<b>Source-drain diode</b>					
$I_S$	source current	$T_{amb} = 25\text{ °C}$	[1]	1	A

[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	$I_D = 250 \mu A; V_{DS} = V_{GS}; T_j = 25 \text{ }^\circ C$	0.4	0.7	1	V
$I_{DSS}$	drain leakage current	$V_{DS} = 20 V; V_{GS} = 0 V; T_j = 25 \text{ }^\circ C$	-	-	1	$\mu A$
		$V_{DS} = 20 V; V_{GS} = 0 V; T_j = 150 \text{ }^\circ C$	-	-	20	$\mu A$
$I_{GSS}$	gate leakage current	$V_{GS} = 8 V; V_{DS} = 0 V; T_j = 25 \text{ }^\circ C$	-	-	100	nA
		$V_{GS} = -8 V; V_{DS} = 0 V; T_j = 25 \text{ }^\circ C$	-	-	100	nA
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 4.5 V; I_D = 5.8 A; T_j = 25 \text{ }^\circ C$	-	15	18	m $\Omega$
		$V_{GS} = 4.5 V; I_D = 5.8 A; T_j = 150 \text{ }^\circ C$	-	23	28	m $\Omega$
		$V_{GS} = 2.5 V; I_D = 5.1 A; T_j = 25 \text{ }^\circ C$	-	18	23	m $\Omega$
		$V_{GS} = 1.8 V; I_D = 3.9 A; T_j = 25 \text{ }^\circ C$	-	25	40	m $\Omega$
$g_{fs}$	forward transconductance	$V_{DS} = 5 V; I_D = 3 A; T_j = 25 \text{ }^\circ C$	-	18	-	S
<b>Dynamic characteristics</b>						
$Q_{G(tot)}$	total gate charge	$I_D = 3 A; V_{DS} = 10 V; V_{GS} = 4.5 V; T_j = 25 \text{ }^\circ C$	-	7.4	11	nC
$Q_{GS}$	gate-source charge		-	1	-	nC
$Q_{GD}$	gate-drain charge		-	1.9	-	nC
$C_{iss}$	input capacitance	$V_{GS} = 0 V; V_{DS} = 10 V; f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ C$	-	670	-	pF
$C_{oss}$	output capacitance		-	195	-	pF
$C_{rss}$	reverse transfer capacitance		-	85	-	pF
$t_{d(on)}$	turn-on delay time	$V_{DS} = 10 V; V_{GS} = 4.5 V; R_{G(ext)} = 10 \text{ } \Omega; T_j = 25 \text{ }^\circ C; I_D = 5.8 A$	-	12	-	ns
$t_r$	rise time		-	40	-	ns
$t_{d(off)}$	turn-off delay time		-	170	-	ns
$t_f$	fall time		-	85	-	ns
<b>Source-drain diode</b>						
$V_{SD}$	source-drain voltage	$I_S = 1 A; V_{GS} = 0 V; T_j = 25 \text{ }^\circ C$	-	0.7	1.2	V