PMV16UN

20 V, 5.8 A N-channel Trench MOSFET

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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

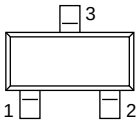
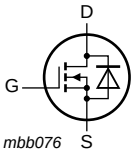
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{DS}	drain-source voltage	T_j = 25 °C		-	-	20	V
V_{GS}	gate-source voltage			-8	-	8	V
I_D	drain current	V_{GS} = 4.5 V; T_{amb} = 25 °C	[1]	-	-	5.8	A
Static characteristics							
R_{DSon}	drain-source on-state resistance	V_{GS} = 4.5 V; I_D = 5.8 A; T_j = 25 °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^2.

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)

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[1]
PMV16UN	KV%

[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 °C		-	20	V
V_{GS}	gate-source voltage			-8	8	V
I_D	drain current	V_{GS} = 4.5 V; T_{amb} = 25 °C	[1]	-	5.8	A
		V_{GS} = 4.5 V; T_{amb} = 100 °C	[1]	-	3.6	A
I_{DM}	peak drain current	T_{amb} = 25 °C; single pulse; $t_p \leq 10$ µs		-	25	A
P_{tot}	total power dissipation	T_{amb} = 25 °C	[2]	-	510	mW
			[1]	-	930	mW
		T_{sp} = 25 °C		-	4170	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 °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^2.

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

6. Characteristics

Table 6. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	drain-source breakdown voltage	I_D = 250 µA; V_{GS} = 0 V; T_j = 25 °C	20	-	-	V
V_{GSth}	gate-source threshold voltage	I_D = 250 µA; V_{DS} = V_{GS}; T_j = 25 °C	0.4	0.7	1	V
I_{DSS}	drain leakage current	V_{DS} = 20 V; V_{GS} = 0 V; T_j = 25 °C	-	-	1	µA
		V_{DS} = 20 V; V_{GS} = 0 V; T_j = 150 °C	-	-	20	µA
I_{GSS}	gate leakage current	V_{GS} = 8 V; V_{DS} = 0 V; T_j = 25 °C	-	-	100	nA
		V_{GS} = -8 V; V_{DS} = 0 V; T_j = 25 °C	-	-	100	nA
R_{DSon}	drain-source on-state resistance	V_{GS} = 4.5 V; I_D = 5.8 A; T_j = 25 °C	-	15	18	mΩ
		V_{GS} = 4.5 V; I_D = 5.8 A; T_j = 150 °C	-	23	28	mΩ
		V_{GS} = 2.5 V; I_D = 5.1 A; T_j = 25 °C	-	18	23	mΩ
		V_{GS} = 1.8 V; I_D = 3.9 A; T_j = 25 °C	-	25	40	mΩ
g_{fs}	forward transconductance	V_{DS} = 5 V; I_D = 3 A; T_j = 25 °C	-	18	-	S
Dynamic characteristics						
$Q_{G(tot)}$	total gate charge	I_D = 3 A; V_{DS} = 10 V; V_{GS} = 4.5 V; T_j = 25 °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 MHz; T_j = 25 °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 Ω; T_j = 25 °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
Source-drain diode						
V_{SD}	source-drain voltage	I_S = 1 A; V_{GS} = 0 V; T_j = 25 °C	-	0.7	1.2	V