

1. Product profile

1.1 General description

P-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

- 1.8 V drain-source on-state resistance rated
- Very fast switching
- Trench MOSFET technology

1.3 Applications

- Relay driver
- High-side loadswitch
- High-speed line driver
- 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]	-	-4	A
Static characteristics						
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = -4.5\text{ V}; I_D = -2.4\text{ A}; T_j = 25\text{ °C}$	-	32	36	mΩ

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

PMV32UP

20 V, 4 A P-channel Trench MOSFET



2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	gate	<p>SOT23 (TO-236AB)</p>	<p>017aaa094</p>
2	S	source		
3	D	drain		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMV32UP	TO-236AB	plastic surface-mounted package; 3 leads	SOT23

4. Marking

Table 4. Marking codes

Type number	Marking code ^[1]
PMV32UP	NF%

[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		-8	8	V	
I_D	drain current	$V_{GS} = -4.5\text{ V}; T_{amb} = 25\text{ °C}$	[1]	-	-4	A
		$V_{GS} = -4.5\text{ V}; T_{amb} = 100\text{ °C}$	[1]	-	-2.5	A
I_{DM}	peak drain current	$T_{amb} = 25\text{ °C};$ single pulse; $t_p \leq 10\text{ }\mu\text{s}$	-	-16	A	
P_{tot}	total power dissipation	$T_{amb} = 25\text{ °C}$	[2]	-	510	mW
			[1]	-	930	mW
		$T_{sp} = 25\text{ °C}$		-	4150	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]	-	-1	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 cm².

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

6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	207	245	K/W
			[2]	-	117	135	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	25	30	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 6 cm².

7. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static characteristics						
$V_{(BR)DSS}$	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	$I_D = -250 \mu A$; $V_{DS} = V_{GS}$; $T_j = 25 \text{ }^\circ C$	-0.45	-0.7	-0.95	V
I_{DSS}	drain leakage current	$V_{DS} = -20 V$; $V_{GS} = 0 V$; $T_j = 25 \text{ }^\circ C$	-	-	-1	μA
		$V_{DS} = -20 V$; $V_{GS} = 0 V$; $T_j = 150 \text{ }^\circ C$	-	-	-10	μA
I_{GSS}	gate leakage current	$V_{GS} = -8 V$; $V_{DS} = 0 V$; $T_j = 25 \text{ }^\circ C$	-	-	-100	nA
R_{DSon}	drain-source on-state resistance	$V_{GS} = -4.5 V$; $I_D = -2.4 A$; $T_j = 25 \text{ }^\circ C$	-	32	36	m Ω
		$V_{GS} = -4.5 V$; $I_D = -2.4 A$; $T_j = 150 \text{ }^\circ C$	-	46	53	m Ω
		$V_{GS} = -2.5 V$; $I_D = -2.0 A$; $T_j = 25 \text{ }^\circ C$	-	40	46	m Ω
		$V_{GS} = -1.8 V$; $I_D = -1.8 A$; $T_j = 25 \text{ }^\circ C$	-	55	73	m Ω
g_{fs}	forward transconductance	$V_{DS} = -5 V$; $I_D = -2.4 A$; $T_j = 25 \text{ }^\circ C$	-	13	-	S
Dynamic characteristics						
$Q_{G(tot)}$	total gate charge	$I_D = -1 A$; $V_{DS} = -10 V$; $V_{GS} = -4.5 V$; $T_j = 25 \text{ }^\circ C$	-	15.5	-	nC
Q_{GS}	gate-source charge		-	2.7	-	nC
Q_{GD}	gate-drain charge		-	2.2	-	nC
C_{iss}	input capacitance	$V_{GS} = 0 V$; $V_{DS} = -10 V$; $f = 1 \text{ MHz}$; $T_j = 25 \text{ }^\circ C$	-	1890	-	pF
C_{oss}	output capacitance		-	175	-	pF
C_{rss}	reverse transfer capacitance		-	112	-	pF
$t_{d(on)}$	turn-on delay time	$V_{DS} = -10 V$; $V_{GS} = -5 V$; $R_{G(ext)} = 6 \text{ } \Omega$; $T_j = 25 \text{ }^\circ C$; $I_D = -1 A$	-	13	-	ns
t_r	rise time		-	21	-	ns
$t_{d(off)}$	turn-off delay time		-	95	-	ns
t_f	fall time		-	33	-	ns
Source-drain diode						
V_{SD}	source-drain voltage	$I_S = -2.4 A$; $V_{GS} = 0 V$; $T_j = 25 \text{ }^\circ C$	-	-0.75	-1	V