

# Single P-channel MOSFET

ELM34407AA-N

## General description

ELM34407AA-N uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate resistance.

## Features

- $V_{ds} = -30V$
- $I_d = -8A$
- $R_{ds(on)} < 32m\Omega$  ( $V_{gs} = -10V$ )
- $R_{ds(on)} < 55m\Omega$  ( $V_{gs} = -4.5V$ )

## Maximum absolute ratings

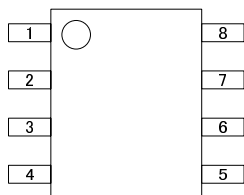
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	$V_{ds}$	-30	V	
Gate-source voltage	$V_{gs}$	$\pm 25$	V	
Continuous drain current	$I_d$	$T_a = 25^\circ C$	-8	A
		$T_a = 70^\circ C$	-7	
Pulsed drain current	$I_{dm}$	-30	A	3
Power dissipation	$P_d$	$T_a = 25^\circ C$	2.5	W
		$T_a = 70^\circ C$	1.3	
Junction and storage temperature range	$T_j, T_{stg}$	-55 to 150	$^\circ C$	

## Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	Steady-state	$R\theta_{jc}$		25	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state	$R\theta_{ja}$		50	$^\circ C/W$	

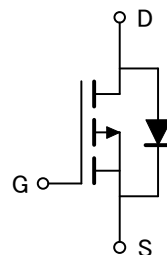
## Pin configuration

SOP-8 (TOP VIEW)



Pin No.	Pin name
1	SOURCE
2	SOURCE
3	SOURCE
4	GATE
5	DRAIN
6	DRAIN
7	DRAIN
8	DRAIN

## Circuit



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## Electrical characteristics

T<sub>a</sub>=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
<b>STATIC PARAMETERS</b>							
Drain-source breakdown voltage	BV <sub>dss</sub>	I <sub>d</sub> =-250 μA, V <sub>gs</sub> =0V	-30			V	
Zero gate voltage drain current	I <sub>dss</sub>	V <sub>ds</sub> =-24V, V <sub>gs</sub> =0V			-1	μA	
		V <sub>ds</sub> =-20V, V <sub>gs</sub> =0V, T <sub>j</sub> =125°C			-10		
Gate-body leakage current	I <sub>gss</sub>	V <sub>ds</sub> =0V, V <sub>gs</sub> =±25V			±100	nA	
Gate threshold voltage	V <sub>gs(th)</sub>	V <sub>ds</sub> =V <sub>gs</sub> , I <sub>d</sub> =-250 μA	-0.8	-1.5	-2.5	V	
On state drain current	I <sub>d(on)</sub>	V <sub>gs</sub> =-10V, V <sub>ds</sub> =-5V	-30			A	1
Static drain-source on-resistance	R <sub>ds(on)</sub>	V <sub>gs</sub> =-10V, I <sub>d</sub> =-8A		26	32	mΩ	1
		V <sub>gs</sub> =-4.5V, I <sub>d</sub> =-6A		44	55	mΩ	
Forward transconductance	G <sub>fs</sub>	V <sub>ds</sub> =-10V, I <sub>d</sub> =-6A		7		S	1
Diode forward voltage	V <sub>sd</sub>	I <sub>s</sub> =-1A, V <sub>gs</sub> =0V			-1	V	1
Max. body-diode continuous current	I <sub>s</sub>				-3	A	
Pulsed body-diode current	I <sub>sm</sub>				-6	A	3
<b>DYNAMIC PARAMETERS</b>							
Input capacitance	C <sub>iss</sub>	V <sub>gs</sub> =0V, V <sub>ds</sub> =-15V, f=1MHz		920		pF	
Output capacitance	C <sub>oss</sub>			190		pF	
Reverse transfer capacitance	C <sub>rss</sub>			120		pF	
<b>SWITCHING PARAMETERS</b>							
Total gate charge	Q <sub>g</sub>	V <sub>gs</sub> =-10V, V <sub>ds</sub> =-15V I <sub>d</sub> =-6A		18.5		nC	2
Gate-source charge	Q <sub>gs</sub>			2.7		nC	2
Gate-drain charge	Q <sub>gd</sub>			4.5		nC	2
Turn-on delay time	t <sub>d(on)</sub>	V <sub>gs</sub> =-10V, V <sub>ds</sub> =-10V I <sub>d</sub> ≈ -1A, R <sub>gen</sub> =3 Ω		7.7		ns	2
Turn-on rise time	t <sub>r</sub>			5.7		ns	2
Turn-off delay time	t <sub>d(off)</sub>			20.0		ns	2
Turn-off fall time	t <sub>f</sub>			9.5		ns	2
Body diode reverse recovery charge	Q <sub>rr</sub>				7.9		nC

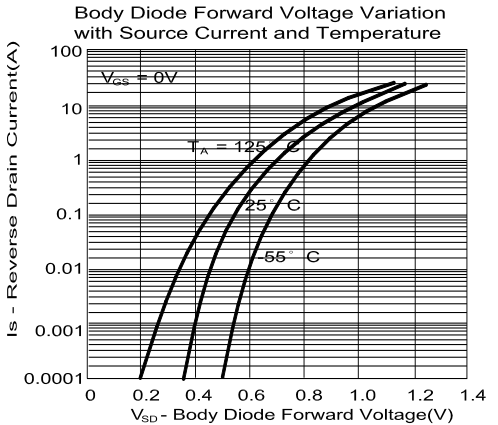
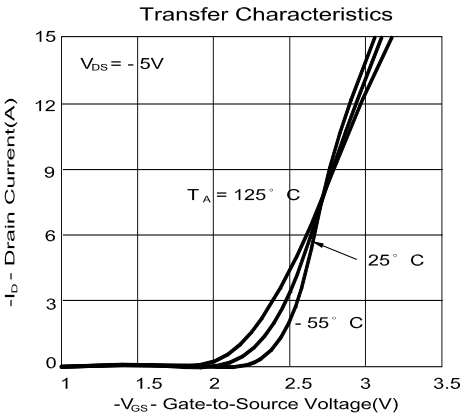
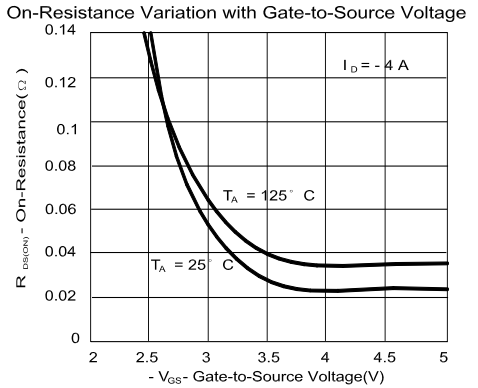
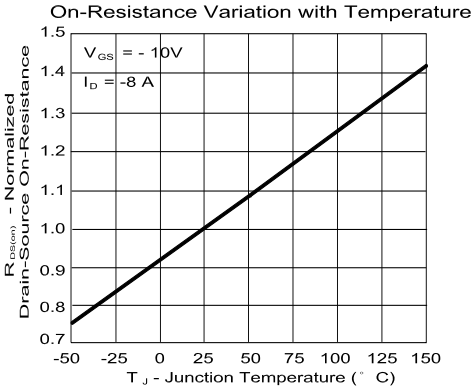
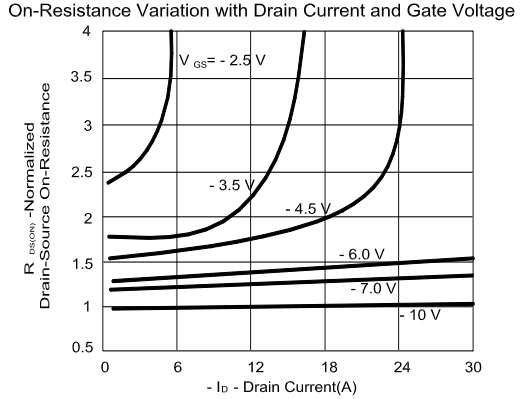
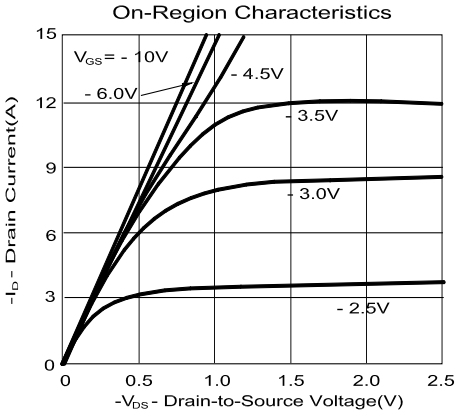
NOTE :

1. Pulsed width ≤ 300 μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

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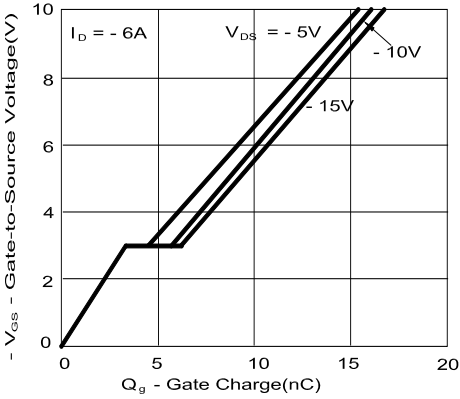
### Typical electrical and thermal characteristics



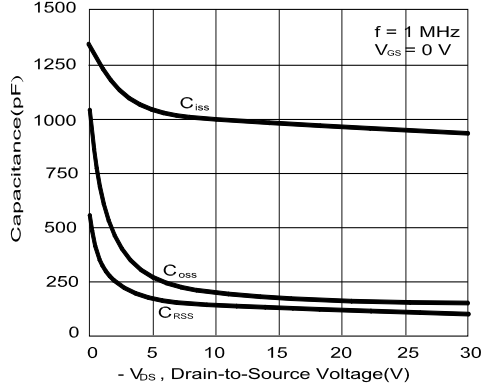
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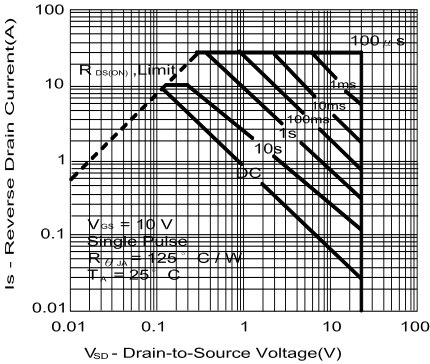
Gate Charge Characteristics



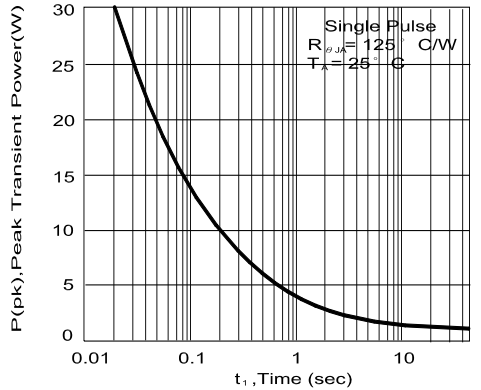
Capacitance Characteristics



Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

