

# Single P-channel MOSFET

ELM34413AA-N

<http://www.elm-tech.com>

## ■ General description

ELM34413AA-N uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate resistance.

## ■ Features

- $V_{ds} = -30V$
- $I_d = -12A$
- $R_{ds(on)} < 12m\Omega$  ( $V_{gs} = -10V$ )
- $R_{ds(on)} < 19m\Omega$  ( $V_{gs} = -4.5V$ )

## ■ Maximum absolute ratings

$T_a = 25^\circ C$ . Unless otherwise noted.

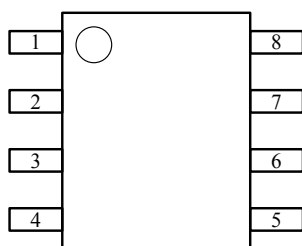
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	$V_{ds}$	-30	V	
Gate-source voltage	$V_{gs}$	$\pm 25$	V	
Continuous drain current	$I_d$	$T_a = 25^\circ C$	-12	A
		$T_a = 70^\circ C$	-9	
Pulsed drain current	$I_{dm}$	-50	A	3
Power dissipation	$P_d$	$T_c = 25^\circ C$	2.5	W
		$T_c = 70^\circ C$	1.3	
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	$R_{\theta jc}$		25	$^\circ C/W$	
Maximum junction-to-ambient	$R_{\theta ja}$		50	$^\circ C/W$	

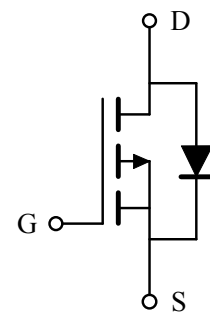
## ■ Pin configuration

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

Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
<b>STATIC PARAMETERS</b>							
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-30			V	
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V			-1	μA	
		Vds=-20V, Vgs=0V, Ta=125°C			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±25V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0	-1.5	-3.0	V	
On state drain current	Id(on)	Vgs=-10V, Vds=-5V	-50			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-12A		10	12	mΩ	1
		Vgs=-4.5V, Id=-9A		15	19		
Forward transconductance	Gfs	Vds=-10V, Id=-12A		29		S	1
Diode forward voltage	Vsd	Is=If, Vgs=0V			-1.2	V	1
Max. body-diode continuous current	Is				-2.1	A	
Pulsed body-diode current	Ism				-4	A	3
<b>DYNAMIC PARAMETERS</b>							
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz		3450		pF	
Output capacitance	Coss			1000		pF	
Reverse transfer capacitance	Crss			414		pF	
<b>SWITCHING PARAMETERS</b>							
Total gate charge	Qg	Vgs=-10V, Vds=-15V Id=-12A		34.5	48.3	nC	2
Gate-source charge	Qgs			10.3		nC	2
Gate-drain charge	Qgd			12.6		nC	2
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V Id=-1A, Rgen=6Ω		13.8		ns	2
Turn-on rise time	tr			18.4		ns	2
Turn-off delay time	td(off)			57.5		ns	2
Turn-off fall time	tf			115.0		ns	2

NOTE :

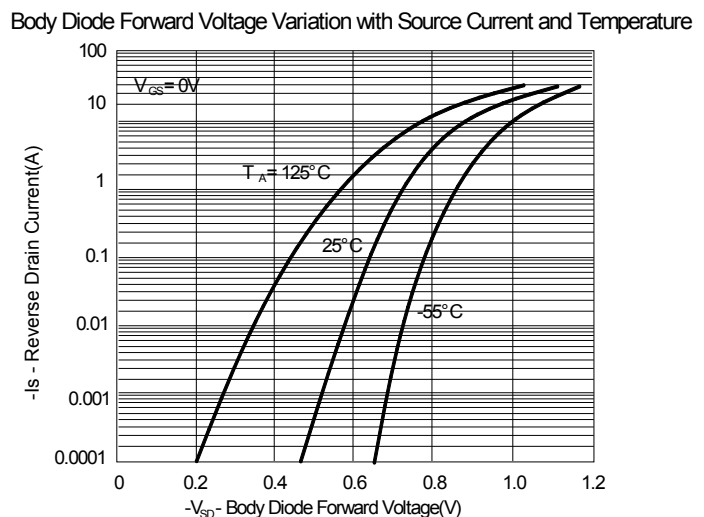
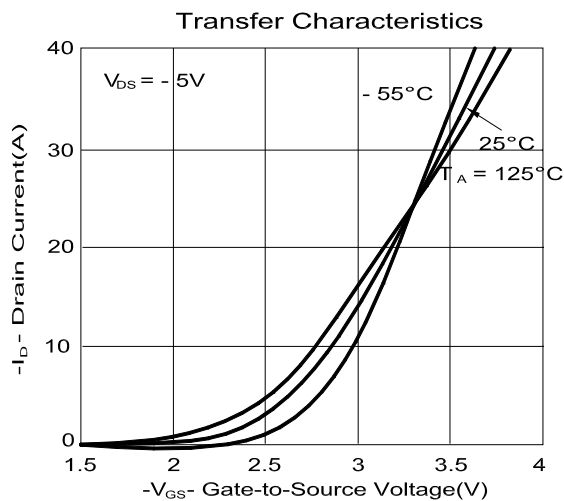
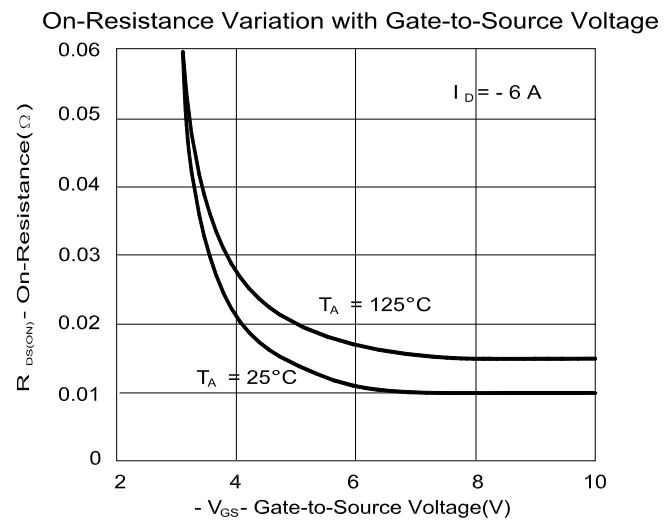
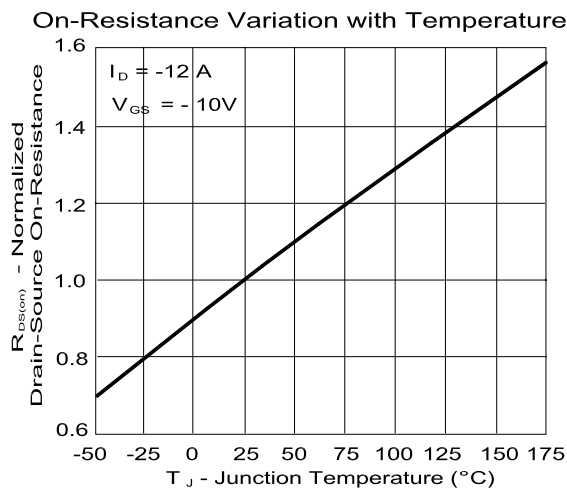
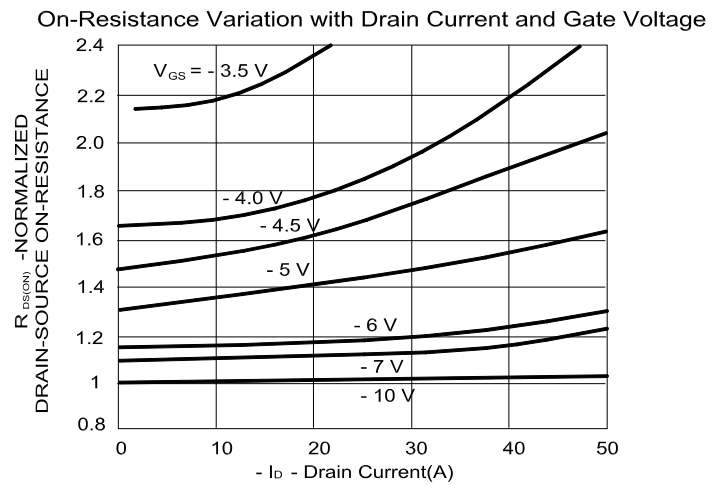
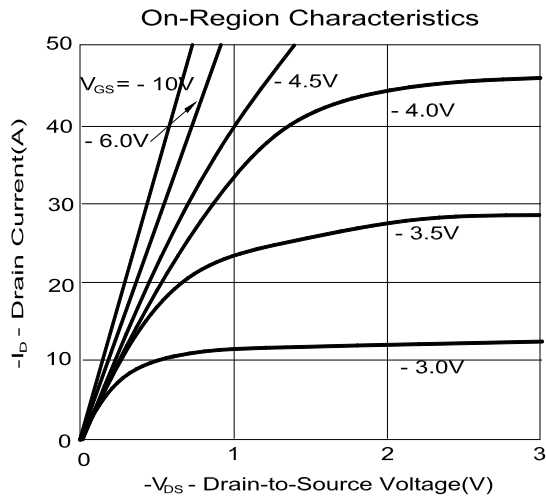
1. Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

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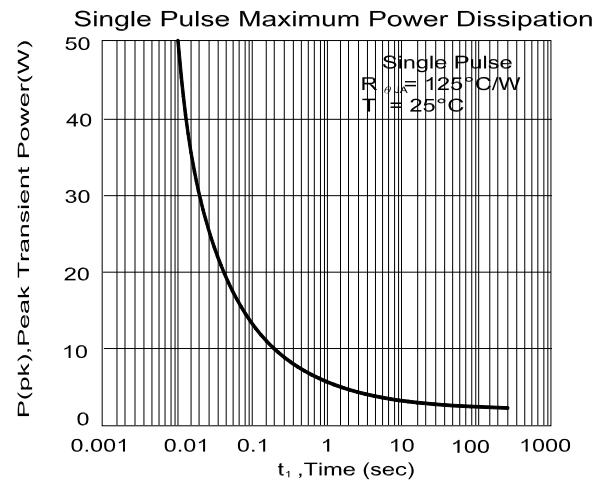
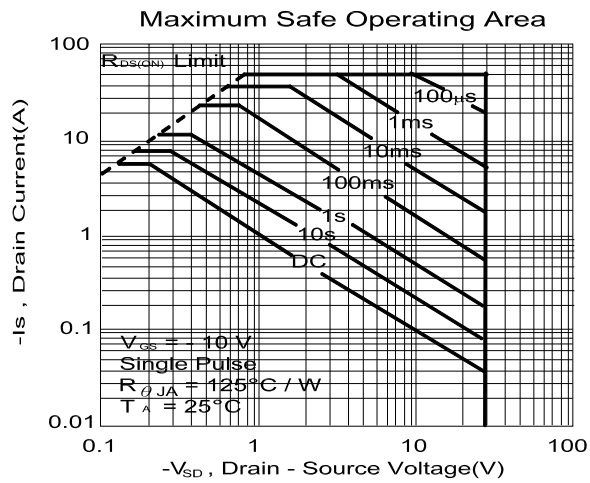
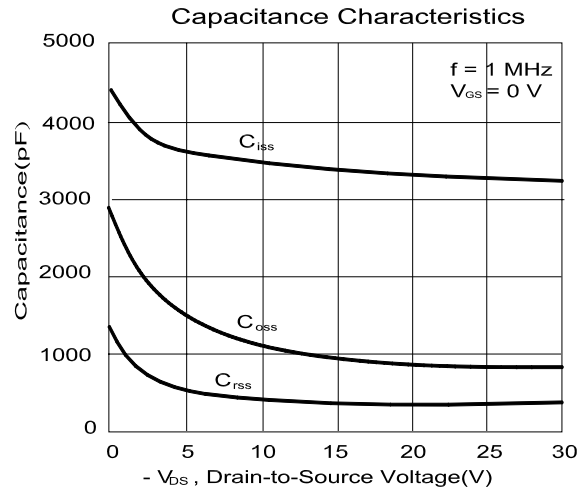
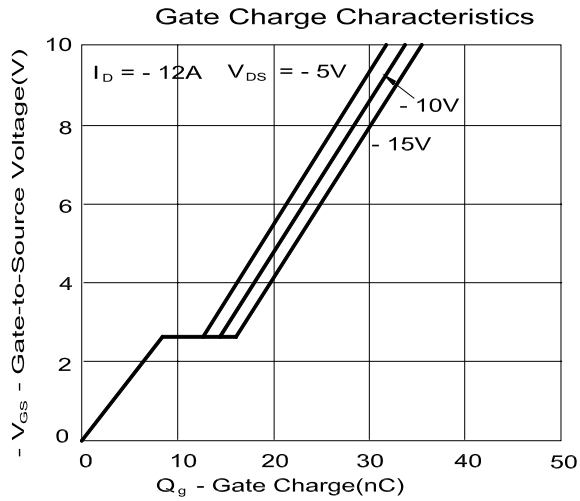
### ■ Typical electrical and thermal characteristics



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### Transient Thermal Response Curve

