

# Single N-channel MOSFET

## ELM32404LA-S

### ■ General description

ELM32404LA-S uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate resistance.

### ■ Features

- $V_{ds}=30V$
- $I_d=12A$
- $R_{ds(on)} < 25m\Omega$  ( $V_{gs}=10V$ )
- $R_{ds(on)} < 37m\Omega$  ( $V_{gs}=4.5V$ )

### ■ Maximum absolute ratings

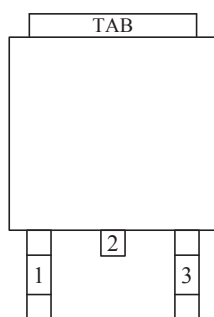
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	$V_{ds}$	30	V	
Gate-source voltage	$V_{gs}$	$\pm 20$	V	
Continuous drain current	$I_d$	$T_a=25^\circ C$	12	A
		$T_a=70^\circ C$	10	
Pulsed drain current	$I_{dm}$	30	A	3
Power dissipation	$P_d$	$T_a=25^\circ C$	32	W
		$T_a=70^\circ C$	22	
Junction 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	$R_{\theta jc}$		3	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state	$R_{\theta ja}$		75	$^\circ C/W$	

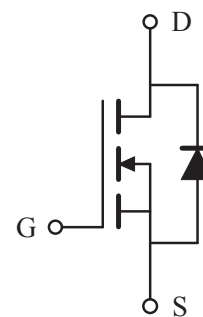
### ■ Pin configuration

TO-252-3(TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

### ■ Circuit



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### ■Electrical characteristics

Ta=25°C

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, Tj=55°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±250	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	1.0	1.5	2.5	V	
On state drain current	Id(on)	Vgs=10V, Vds=5V	30			A	1
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=12A		18	25	mΩ	1
		Vgs=4.5V, Id=6A		25	37	mΩ	
Forward transconductance	Gfs	Vds=5V, Id=12A		19		S	1
Diode forward voltage	Vsd	If=1A, Vgs=0V			1	V	1
Max. body-diode continuous current	Is				1.3	A	
Pulsed body-diode current	Ism				2.6	A	3
<b>DYNAMIC PARAMETERS</b>							
Input capacitance	Ciss	Vgs=0V, Vds=10V, f=1MHz		790		pF	
Output capacitance	Coss			175		pF	
Reverse transfer capacitance	Crss			65		pF	
<b>SWITCHING PARAMETERS</b>							
Total gate charge	Qg	Vgs=10V, Vds=15V, Id=12A		16.0		nC	2
Gate-source charge	Qgs			2.5		nC	2
Gate-drain charge	Qgd			2.1		nC	2
Turn-on delay time	td(on)	Vgs=10V, Vds=10V, Id≈1A Rgen=6Ω		2.2	4.4	ns	2
Turn-on rise time	tr			7.5	15.0	ns	2
Turn-off delay time	td(off)			11.8	21.3	ns	2
Turn-off fall time	tf			3.7	7.4	ns	2

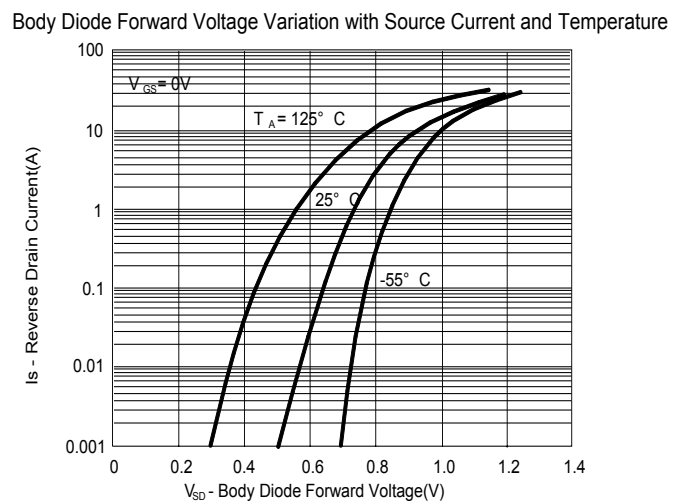
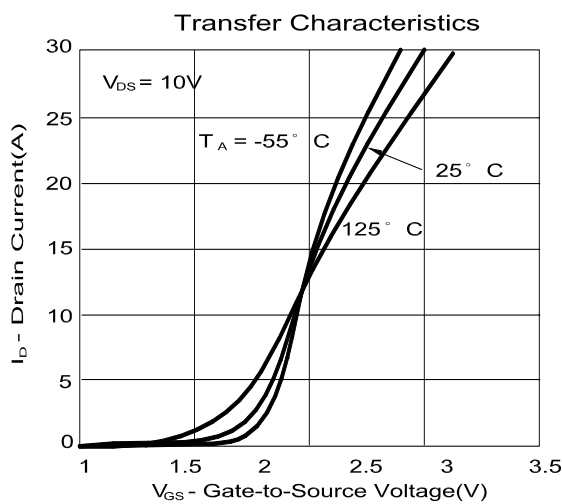
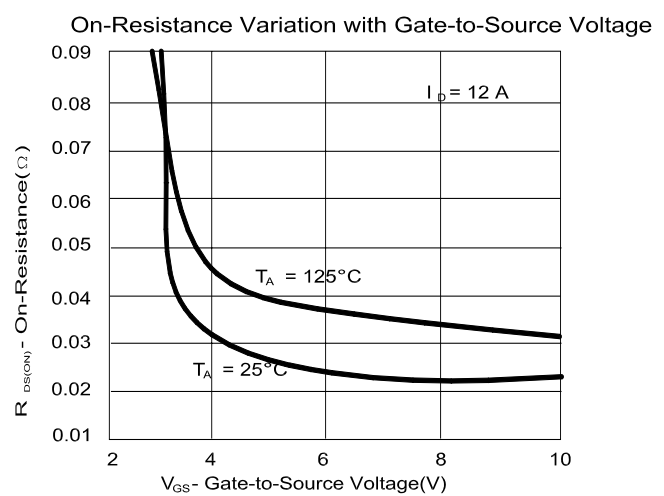
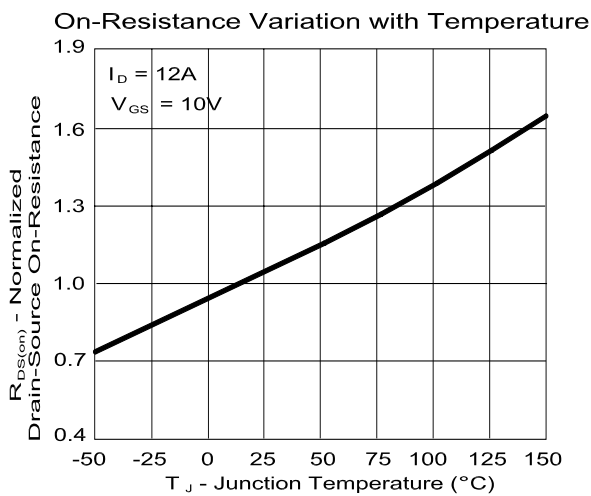
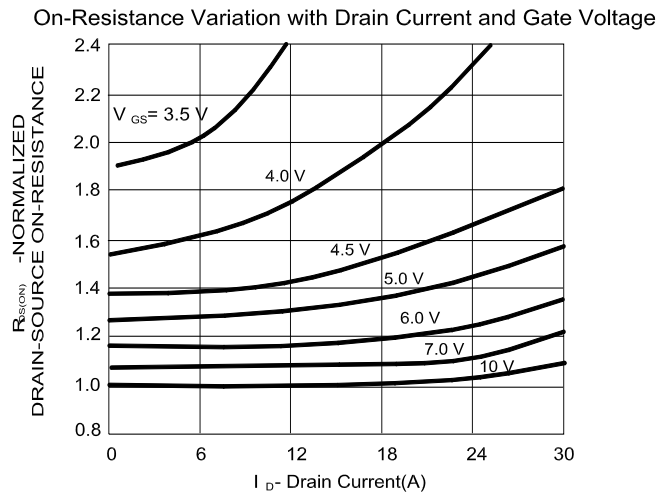
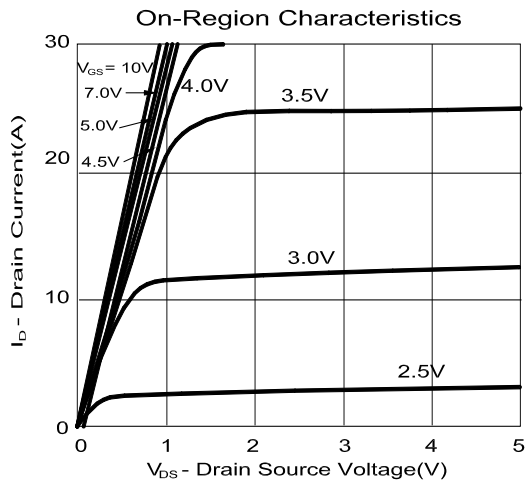
NOTE :

1. Pulse test : 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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