

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

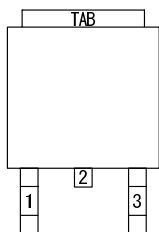
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	V_{ds}	30	V	
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	$T_a=25^\circ C$	12	A
		$T_a=70^\circ C$	10	
Pulsed drain current	I_{dm}	30	A	3
Power dissipation	P_d	$T_a=25^\circ C$	32	W
		$T_a=70^\circ C$	22	
Junction and storage temperature 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	$^\circ C/W$	

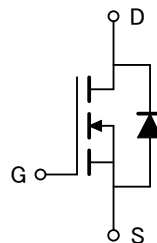
Pin configuration

TO-252-3 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

Circuit



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Electrical characteristics

T_a=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
STATIC PARAMETERS								
Drain-source breakdown voltage	BV _{dss}	I _d =250 μA, V _{gs} =0V	30			V		
Zero gate voltage drain current	I _{dss}	V _{ds} =24V, V _{gs} =0V			1	μA		
		V _{ds} =20V, V _{gs} =0V, T _j =55°C			10			
Gate-body leakage current	I _{gss}	V _{ds} =0V, V _{gs} =±20V			±250	nA		
Gate threshold voltage	V _{gs(th)}	V _{ds} =V _{gs} , I _d =250 μA	1.0	1.5	2.5	V		
On state drain current	I _{d(on)}	V _{gs} =10V, V _{ds} =5V	30			A	1	
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =12A		18	25	mΩ	1	
		V _{gs} =4.5V, I _d =6A		25	37	mΩ		
Forward transconductance	G _{fs}	V _{ds} =5V, I _d =12A		19		S	1	
Diode forward voltage	V _{sd}	I _f =1A, V _{gs} =0V			1	V	1	
Max. body-diode continuous current	I _s				1.3	A		
Pulsed body-diode current	I _{sm}				2.6	A	3	
DYNAMIC PARAMETERS								
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =10V, f=1MHz		790		pF		
Output capacitance	C _{oss}				175		pF	
Reverse transfer capacitance	C _{rss}				65		pF	
SWITCHING PARAMETERS								
Total gate charge	Q _g	V _{gs} =10V, V _{ds} =15V, I _d =12A		16.0		nC	2	
Gate-source charge	Q _{gs}			2.5		nC	2	
Gate-drain charge	Q _{gd}			2.1		nC	2	
Turn-on delay time	t _{d(on)}	V _{gs} =10V, V _{ds} =10V, I _d ≈ 1A R _{gen} =6 Ω		2.2	4.4	ns	2	
Turn-on rise time	t _r			7.5	15.0	ns	2	
Turn-off delay time	t _{d(off)}			11.8	21.3	ns	2	
Turn-off fall time	t _f			3.7	7.4	ns	2	

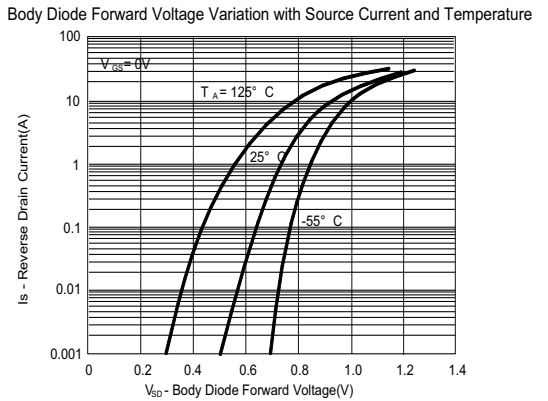
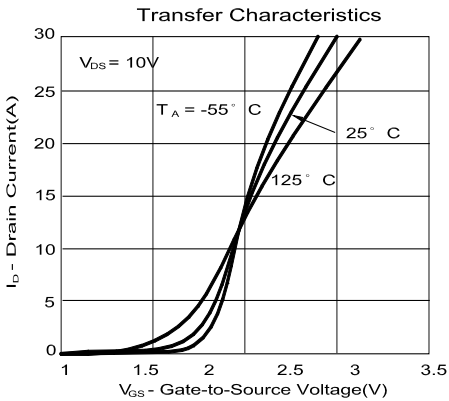
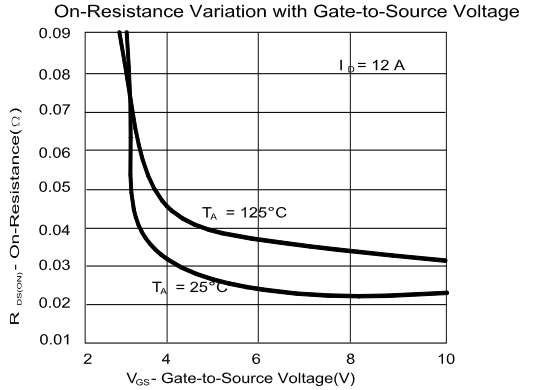
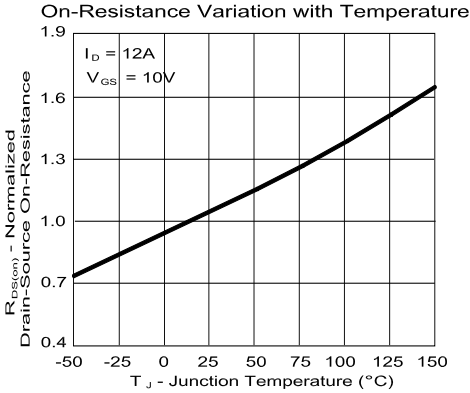
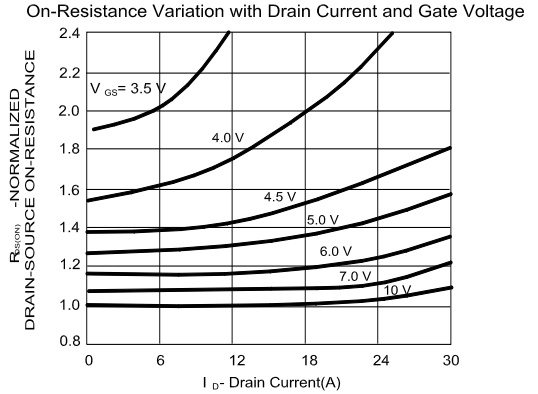
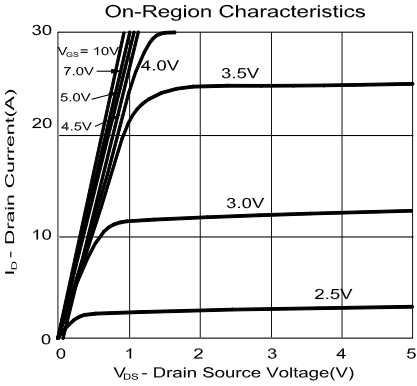
NOTE :

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

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Typical electrical and thermal characteristics



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