

Single N-channel MOSFET

ELM32412LA-S

General description

ELM32412LA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds}=40V$
- $I_d=12A$
- $R_{ds(on)} < 25m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 45m\Omega$ ($V_{gs}=4.5V$)

Maximum absolute ratings

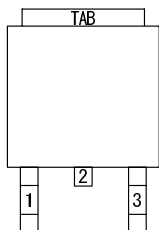
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	40	V		
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current	I_d	$T_a=25^\circ C$	12	A	
		$T_a=100^\circ C$	10		
Pulsed drain current	I_{dm}	45	A	3	
Power dissipation	P_d	$T_a=25^\circ C$	41	W	
		$T_a=100^\circ C$	32		
Junction and 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	$^\circ C/W$	

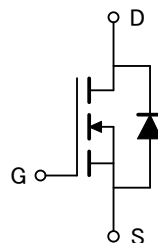
Pin configuration

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	40			V	
Zero gate voltage drain current	I _{dss}	V _{ds} =32V, V _{gs} =0V			1	μA	
		V _{ds} =30V, V _{gs} =0V, T _j =125°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	2	3	V	
On state drain current	I _{d(on)}	V _{gs} =10V, V _{ds} =10V	45			A	1
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =12A		21	25	mΩ	1
		V _{gs} =4.5V, I _d =10A		35	45	mΩ	
Forward transconductance	G _{fs}	V _{ds} =10V, I _d =12A		18		S	1
Diode forward voltage	V _{sd}	I _f =I _s , V _{gs} =0V			1.2	V	1
Max. body-diode continuous current	I _s				12	A	
Pulsed body-diode current	I _{sm}				40	A	3
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =10V, f=1MHz		760		pF	
Output capacitance	C _{oss}			165		pF	
Reverse transfer capacitance	C _{rss}			55		pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =10V, V _{ds} =20V, 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} =20V, I _d ≈ 1A R _l =1 Ω, R _{gen} =6 Ω		2.1	4.2	ns	2
Turn-on rise time	t _r			7.2	14.0	ns	2
Turn-off delay time	t _{d(off)}			11.6	21.0	ns	2
Turn-off fall time	t _f			3.5	7.2	ns	2
Body diode reverse recovery time	t _{rr}	I _f =5A, dI/dt=100A/μs		14.5		ns	
Body diode reverse recovery charge	Q _{rr}			7.2		nC	

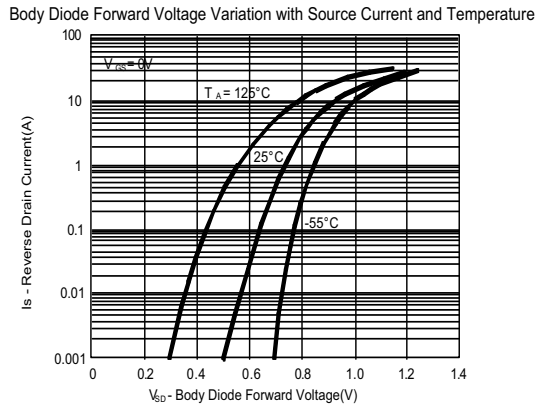
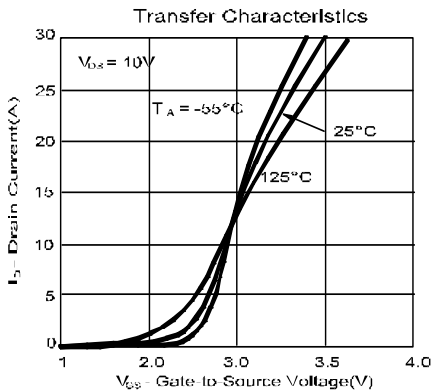
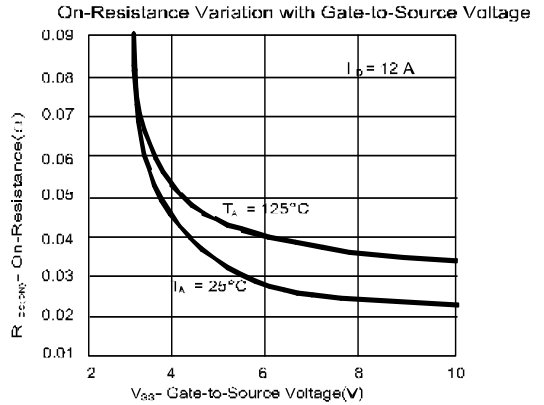
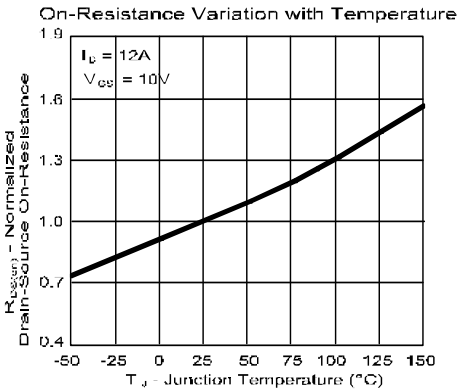
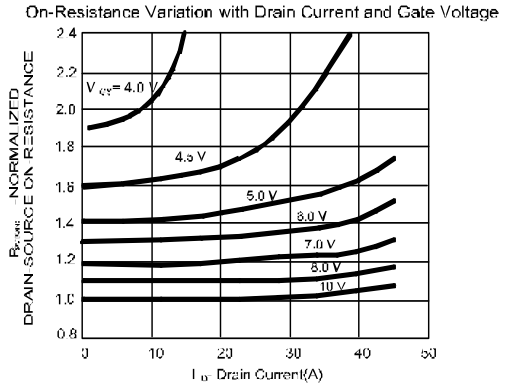
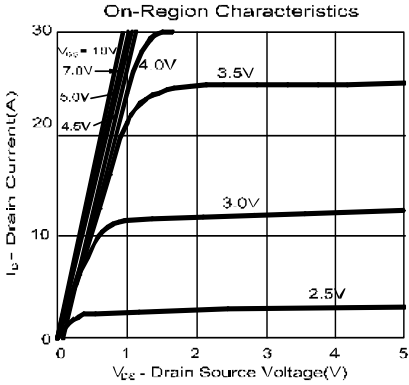
NOTE :

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

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Typical electrical and thermal characteristics



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