

# Single N-channel MOSFET

## ELM32420LA-S

### ■ General description

ELM32420LA-S uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate resistance.

### ■ Features

- $V_{ds}=20V$
- $I_d=45A$
- $R_{ds(on)} < 14m\Omega$  ( $V_{gs}=5V$ )
- $R_{ds(on)} < 26m\Omega$  ( $V_{gs}=2.5V$ )

### ■ Maximum absolute ratings

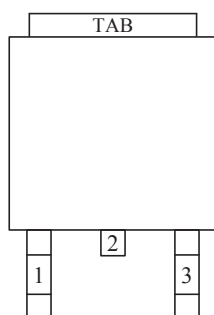
Parameter	Symbol	Limit	Unit	Note
Gate-source voltage	$V_{gs}$	$\pm 12$	V	
Continuous drain current	$I_d$	$T_a=25^\circ C$	45	A
		$T_a=100^\circ C$	30	
Pulsed drain current	$I_{dm}$	140	A	3
Power dissipation	$P_d$	$T_a=25^\circ C$	48	W
		$T_a=100^\circ C$	20	
Junction and storage temperature range	$T_j, T_{stg}$	-55 to 150	$^\circ C$	

### ■ Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	Steady-state	$R\theta_{jc}$		2.6	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state	$R\theta_{ja}$		110.0	$^\circ C/W$	

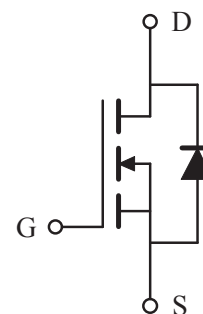
### ■ Pin configuration

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	20			V	
Zero gate voltage drain current	Idss	Vds=16V, Vgs=0V			1	μA	
		Vds=13.2V, Vgs=0V, Tj=125°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.45	0.75	1.25	V	
On state drain current	Id(on)	Vgs=4.5V, Vds=5V	45			A	1
Static drain-source on-resistance	Rds(on)	Vgs=5V, Id=18A		11	14	mΩ	1
		Vgs=2.5V, Id=9A		18	26	mΩ	
Forward transconductance	Gfs	Vds=10V, Id=18A		26		S	1
Diode forward voltage	Vsd	If=Is, Vgs=0V			1.3	V	1
Max. body-diode continuous current	Is				45	A	
Pulsed body-diode current	Ism				140	A	3
<b>DYNAMIC PARAMETERS</b>							
Input capacitance	Ciss	Vgs=0V, Vds=15V, f=1MHz		500		pF	
Output capacitance	Coss			310		pF	
Reverse transfer capacitance	Crss			125		pF	
<b>SWITCHING PARAMETERS</b>							
Total gate charge	Qg	Vgs=5V, Vds=10V, Id=18A		17.0		nC	2
Gate-source charge	Qgs			1.5		nC	2
Gate-drain charge	Qgd			10.5		nC	2
Turn-on delay time	td(on)	Vgs=5V, Vds=10V, Id≈18A Rgen=3.3Ω		7.5		ns	2
Turn-on rise time	tr			83.0		ns	2
Turn-off delay time	td(off)			18.0		ns	2
Turn-off fall time	tf			23.0		ns	2
Body diode reverse recovery time	trr			37		ns	
Peak reverse recovery current	Irm(rec)		If=Is, dI/dt=100A/μs		200		A
Body diode reverse recovery charge	Qrr			0.043		μC	

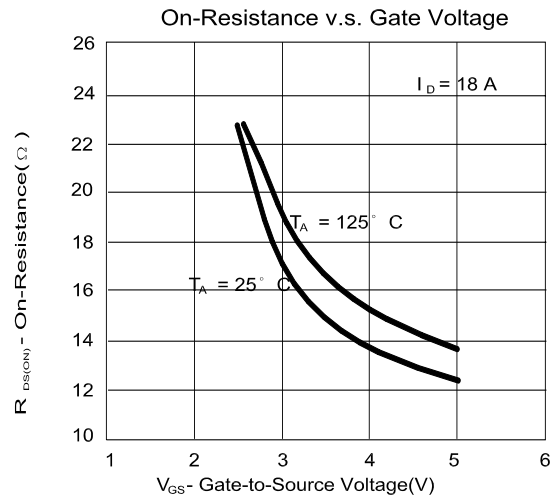
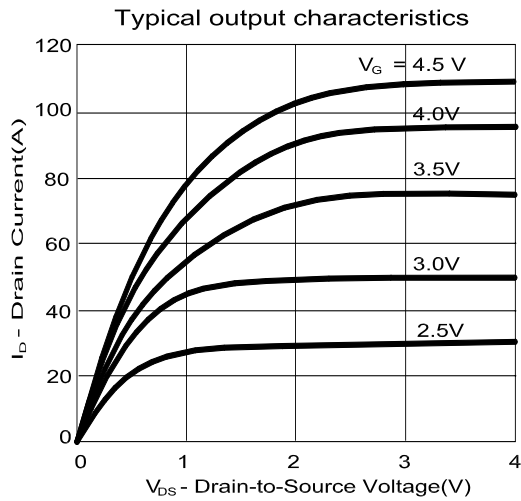
NOTE :

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%.

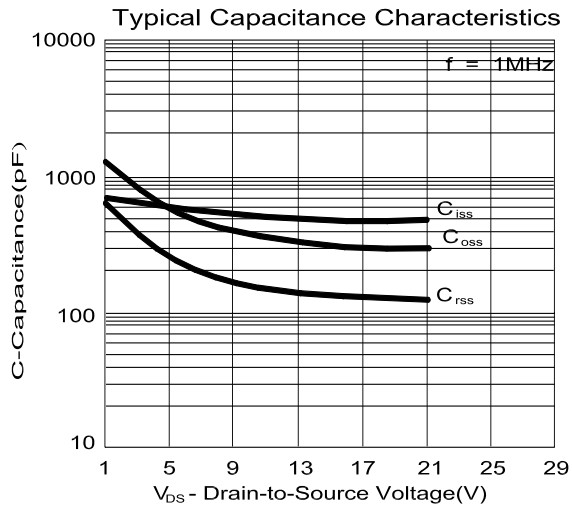
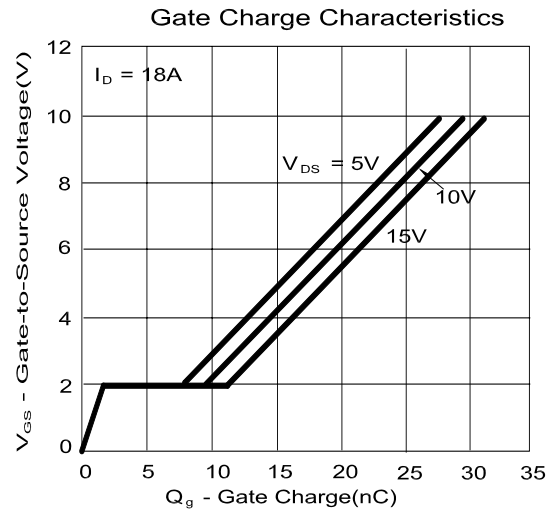
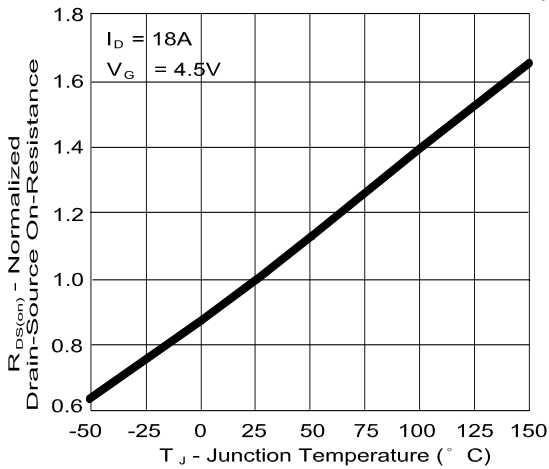
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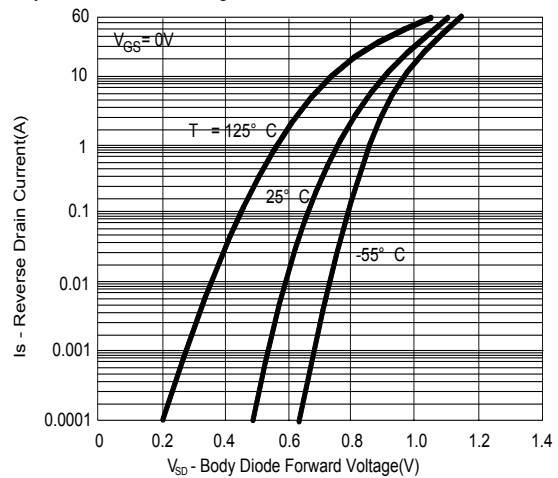
### ■ Typical electrical and thermal characteristics



Normalized on-Resistance v.s. Junction Temperature



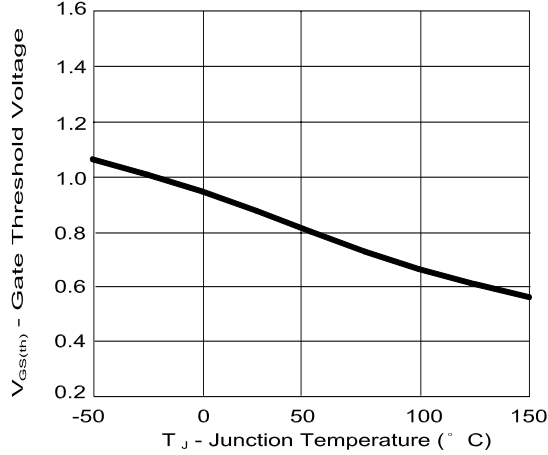
Body Diode Forward Voltage Variation with Source Current and Temperature



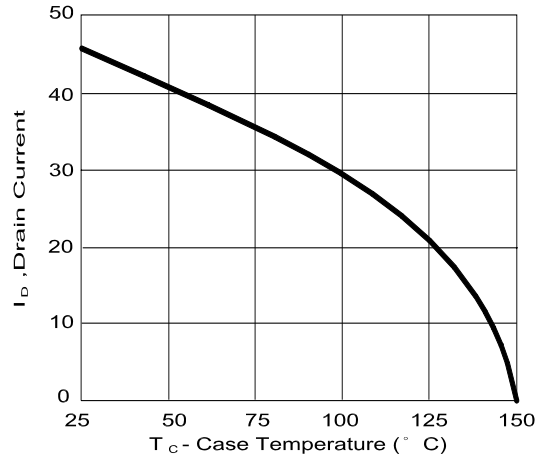
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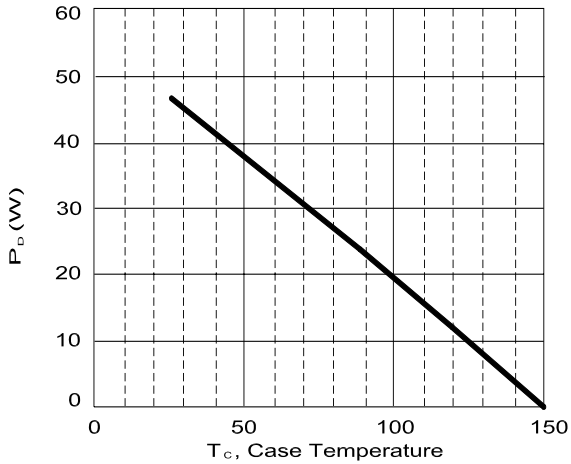
Gate Threshold Voltage v.s. Junction Temperature



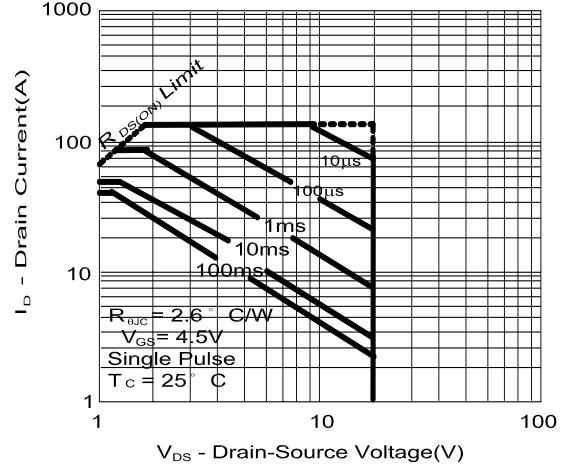
Maximum Drain Current v.s. Case Temperature



Typical Power Dissipation



Maximum Safe Operating Area



Effective Transient Thermal Impedance

