

Single N-channel MOSFET

ELM32424LA-S

■ General description

ELM32424LA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

■ Features

- $V_{ds}=25V$
- $I_d=50A$
- $R_{ds(on)} < 9.5m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 16m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

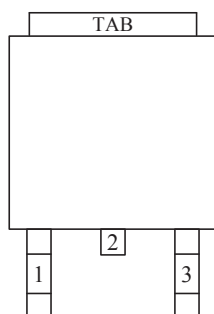
Parameter	Symbol	Limit	Unit	Note
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	$T_a=25^\circ C$	50	A
		$T_a=100^\circ C$	35	
Pulsed drain current	I_{dm}	200	A	3
Avalanche current	I_{ar}	40	A	
Avalanche energy	E_{as}	250	mJ	
Repetitive avalanche energy	E_{ar}	8.6	mJ	4
Power dissipation	P_d	$T_a=25^\circ C$	50	W
		$T_a=100^\circ C$	30	
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	$R_{\theta jc}$		2.5	$^\circ C/W$	
Maximum junction-to-ambient	$R_{\theta ja}$		62.5	$^\circ C/W$	
Maximum case-to-heatsink	$R_{\theta cs}$	0.6		$^\circ C/W$	

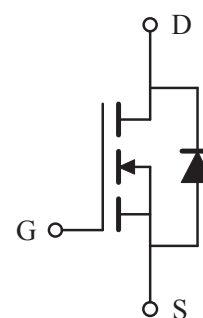
■ Pin configuration

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
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	25			V	
Zero gate voltage drain current	Idss	Vds=20V, Vgs=0V			25	μA	
		Vds=20V, Vgs=0V, Tj=125°C			250		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±250	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	1.0	1.6	3.0	V	
On state drain current	Id(on)	Vgs=10V, Vds=10V	50			A	1
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=25A		7.5	9.5	mΩ	1
		Vgs=4.5V, Id=20A		11.0	16.0	mΩ	
Forward transconductance	Gfs	Vds=10V, Id=25A		32		S	1
Diode forward voltage	Vsd	Is=25A, Vgs=0V		0.9	1.3	V	1
Max. body-diode continuous current	Is				50	A	
Pulsed body-diode current	Ism				150	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=15V, f=1MHz		1200	1800	pF	
Output capacitance	Coss			600	1000	pF	
Reverse transfer capacitance	Crss			350	500	pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=10V, Vds=10V, Id=25A		25	50	nC	2
Gate-source charge	Qgs			15		nC	2
Gate-drain charge	Qgd			10		nC	2
Turn-on delay time	td(on)	Vgs=10V, Vds=15V, Id≈50A Rl=1Ω, Rgen=24Ω		6	16	ns	2
Turn-on rise time	tr			120	250	ns	2
Turn-off delay time	td(off)			40	90	ns	2
Turn-off fall time	tf			105	200	ns	2
Body diode reverse recovery time	trr			70		ns	
Peak reverse recovery current	Irm(rec)	If=Is, dI/dt=100A/μs		200		A	
Body diode reverse recovery charge	Qrr			0.043		μC	

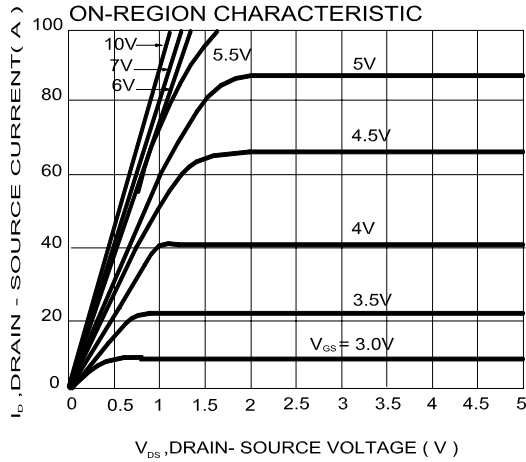
NOTE :

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%.

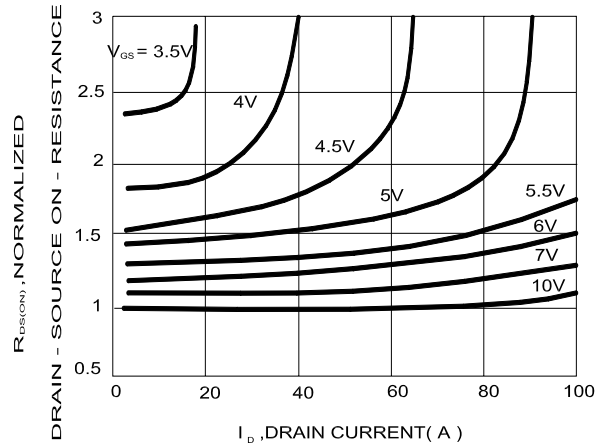
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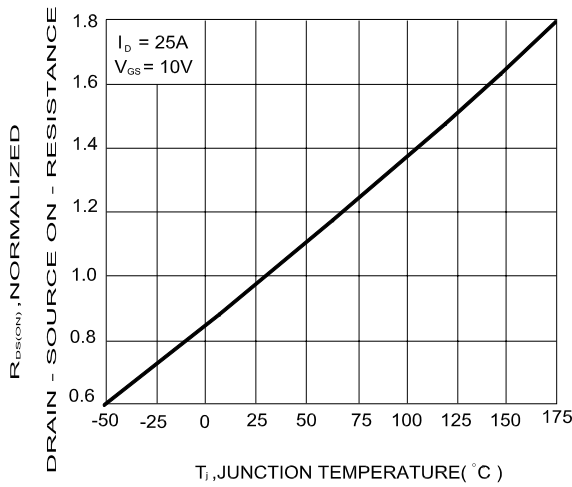
■ Typical electrical and thermal characteristics



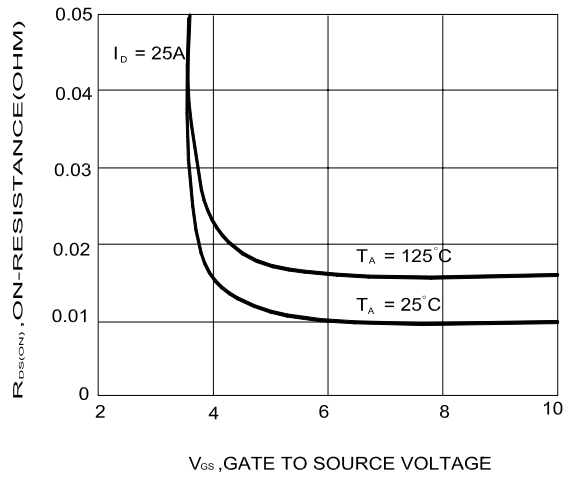
ON- RESISTANCE VARIATION WITH DRAIN CURRENT AND GATE



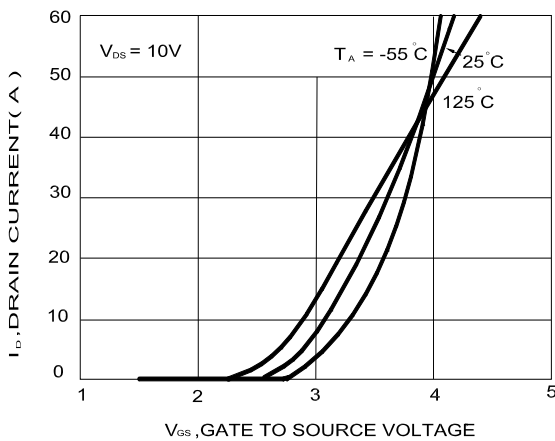
ON- RESISTANCE VARIATION WITH TEMPERATURE



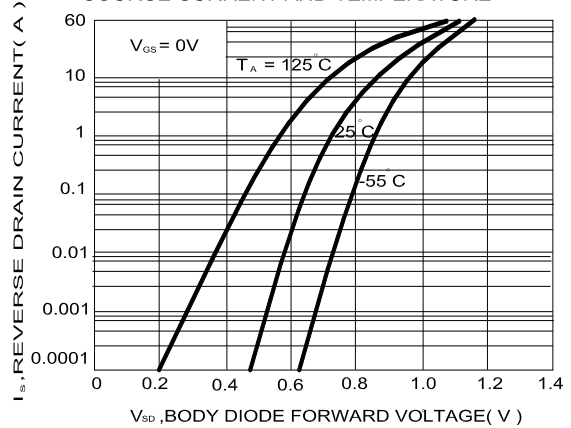
ON-RESISTANCE VARIATION WITH GATE-TO-SOYRCE VOLTAGE



TRANSFER CHARACTERISTICS



BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE



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