

Single N-channel MOSFET

ELM32414LA-S

■ General description

ELM32414LA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

■ Features

- $V_{ds}=25V$
- $I_d=35A$
- $R_{ds(on)} < 20m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 31m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

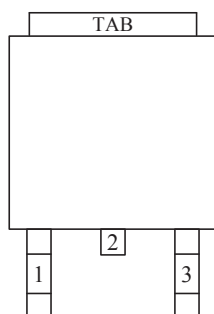
Parameter	Symbol	Limit	Unit	Note
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	$T_a=25^\circ C$	35	A
		$T_a=100^\circ C$	25	
Pulsed drain current	I_{dm}	120	A	3
Avalanche current	I_{ar}	15	A	
Avalanche energy	E_{as}	15.0	mJ	
Repetitive avalanche energy	E_{ar}	5.6	mJ	4
Power dissipation	P_d	$T_a=25^\circ C$	50	W
		$T_a=100^\circ C$	35	
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	$R_{\theta ja}$		75.0	$^\circ C/W$	
Maximum case-to-heatsink	$R_{\theta cs}$	0.7		$^\circ C/W$	

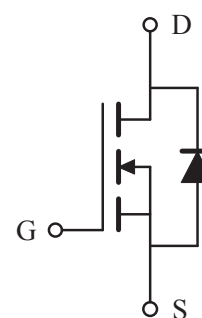
■ Pin configuration

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	1.5	2.5	V	
On state drain current	Id(on)	Vgs=10V, Vds=10V	35			A	1
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=15A		15.5	20.0	mΩ	1
		Vgs=4.5V, Id=15A		23.0	31.0	mΩ	
Forward transconductance	Gfs	Vds=15V, Id=30A	14	28		S	1
Diode forward voltage	Vsd	If=Is, Vgs=0V		1.1	1.4	V	1
Max. body-diode continuous current	Is				35	A	
Pulsed body-diode current	Ism				120	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=25V, f=1MHz		530	700	pF	
Output capacitance	Coss			200	275	pF	
Reverse transfer capacitance	Crss			60	90	pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=10V, Vds=12.5V Id=15A		8.4	11.0	nC	2
Gate-source charge	Qgs			2.5	3.1	nC	2
Gate-drain charge	Qgd			6.4	9.6	nC	2
Turn-on delay time	td(on)	Vgs=10V, Vds=15V, Id≈15A Rgen=12.7Ω		6.2	9.3	ns	2
Turn-on rise time	tr			11.0	17.0	ns	2
Turn-off delay time	td(off)			23.0	34.0	ns	2
Turn-off fall time	tf			18.0	27.0	ns	2
Body diode reverse recovery time	trr			15	18	ns	
Body diode reverse recovery charge	Qrr			2	3	nC	

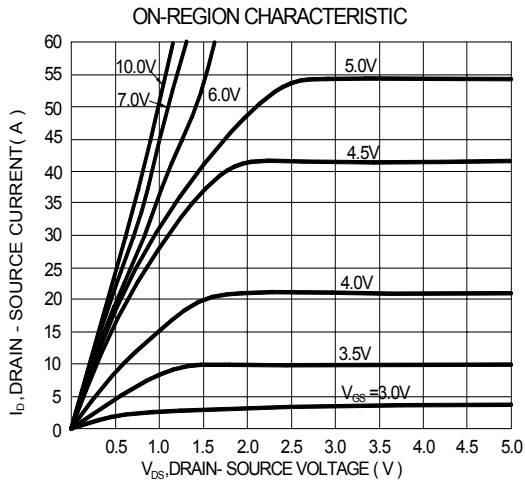
NOTE :

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%.

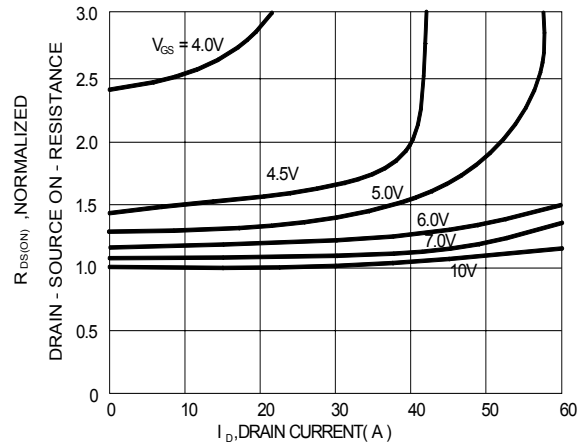
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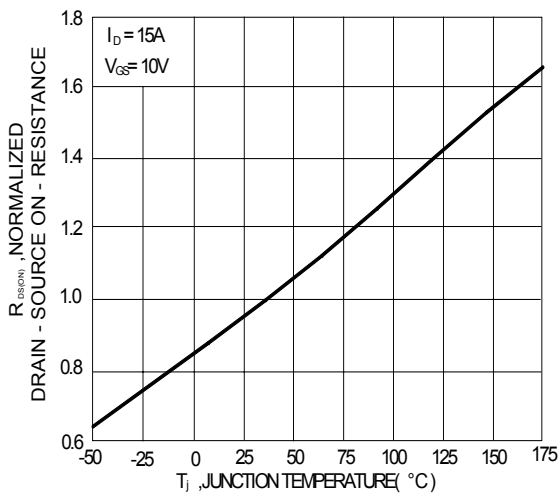
Typical electrical and thermal characteristics



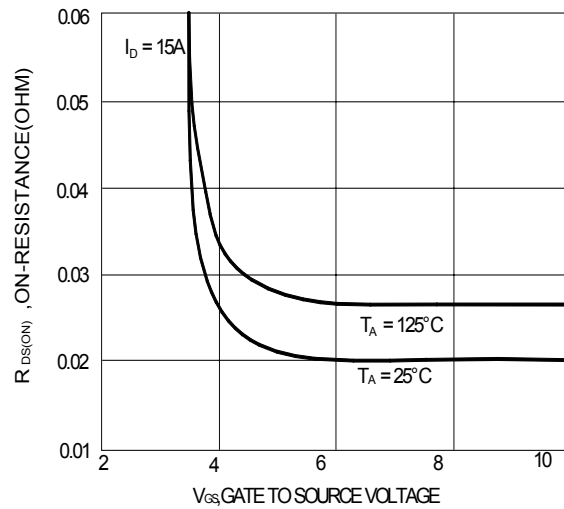
ON- RESISTANCE VARIATION WITH DRAIN CURRENT AND GATE VOLTAGE



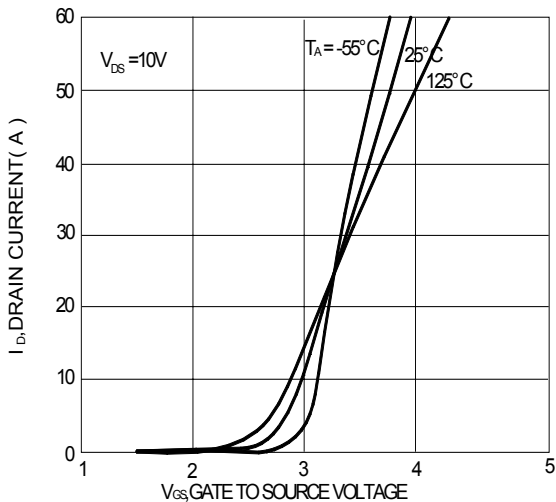
ON- RESISTANCE VARIATION WITH TEMPERATURE



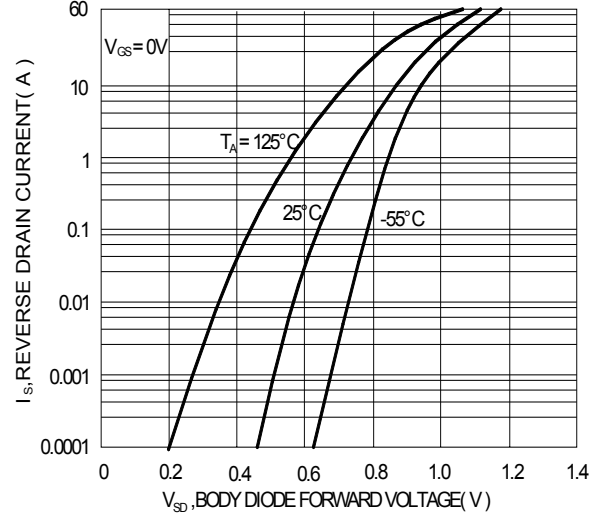
ON-RESISTANCE VARIATION WITH GATE-TO-SOURCE VOLTAGE



TRANSFER CHARACTERISTICS



BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE



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