

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

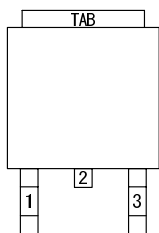
Parameter	Symbol	Limit	Unit	Note	
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current	I_d	$T_a=25^\circ C$	35	A	
		$T_a=100^\circ C$	25		
Pulsed drain current	I_{dm}	120	A	3	
Avalanche current	I_{ar}	15	A		
Avalanche energy	E_{as}	15.0	mJ		
Repetitive avalanche energy	E_{ar}	5.6	mJ	4	
Power 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	Steady-state	$R\theta_{jc}$		2.5	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state	$R\theta_{ja}$		75.0	$^\circ C/W$	
Maximum case-to-heatsink		$R\theta_{cs}$	0.7		$^\circ C/W$	

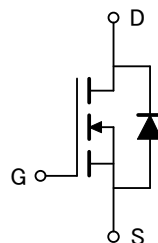
Pin configuration

TO-252-3 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

Circuit



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Electrical characteristics

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	25			V		
Zero gate voltage drain current	I _{dss}	V _{ds} =20V, V _{gs} =0V			25	μA		
		V _{ds} =20V, V _{gs} =0V, T _j =125°C			250			
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} =10V	35			A	1	
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =15A		15.5	20.0	mΩ	1	
		V _{gs} =4.5V, I _d =15A		23.0	31.0	mΩ		
Forward transconductance	G _{fs}	V _{ds} =15V, I _d =30A	14	28		S	1	
Diode forward voltage	V _{sd}	I _f =I _s , V _{gs} =0V		1.1	1.4	V	1	
Max. body-diode continuous current	I _s				35	A		
Pulsed body-diode current	I _{sm}				120	A	3	
DYNAMIC PARAMETERS								
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =25V, f=1MHz		530	700	pF		
Output capacitance	C _{oss}			200	275	pF		
Reverse transfer capacitance	C _{rss}			60	90	pF		
SWITCHING PARAMETERS								
Total gate charge	Q _g	V _{gs} =10V, V _{ds} =12.5V I _d =15A		8.4	11.0	nC	2	
Gate-source charge	Q _{gs}			2.5	3.1	nC	2	
Gate-drain charge	Q _{gd}			6.4	9.6	nC	2	
Turn-on delay time	t _{d(on)}	V _{gs} =10V, V _{ds} =15V, I _d ≈ 15A R _{gen} =12.7 Ω		6.2	9.3	ns	2	
Turn-on rise time	t _r			11.0	17.0	ns	2	
Turn-off delay time	t _{d(off)}			23.0	34.0	ns	2	
Turn-off fall time	t _f			18.0	27.0	ns	2	
Body diode reverse recovery time	t _{rr}			15	18	ns		
Body diode reverse recovery charge	Q _{rr}				2	3	nC	

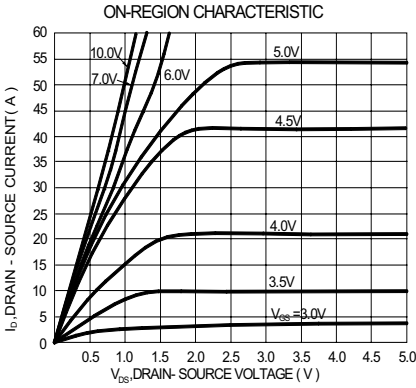
NOTE :

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%.

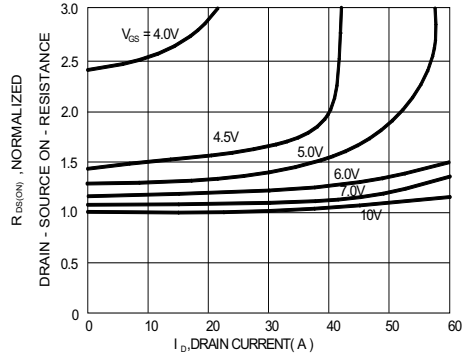
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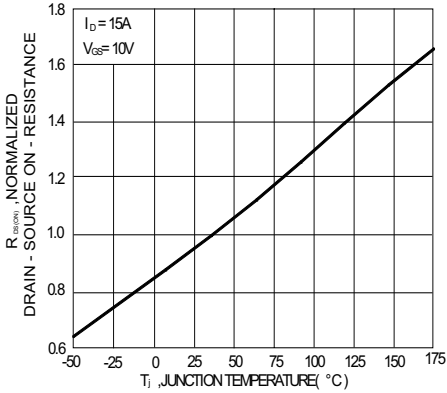
Typical electrical and thermal characteristics



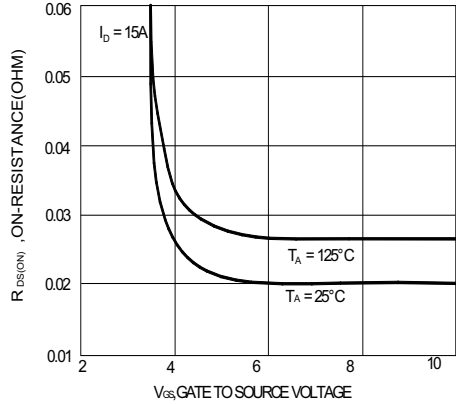
ON- RESISTANCE VARIATION WITH DRAIN CURRENT AND GATE VOLTAGE



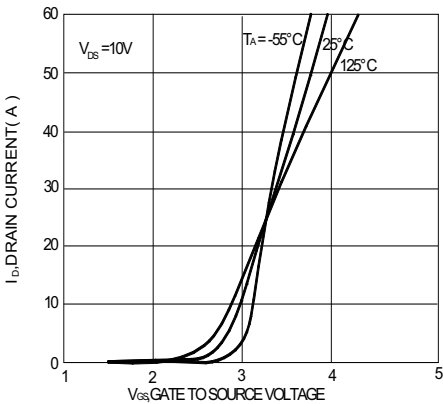
ON- RESISTANCE VARIATION WITH TEMPERATURE



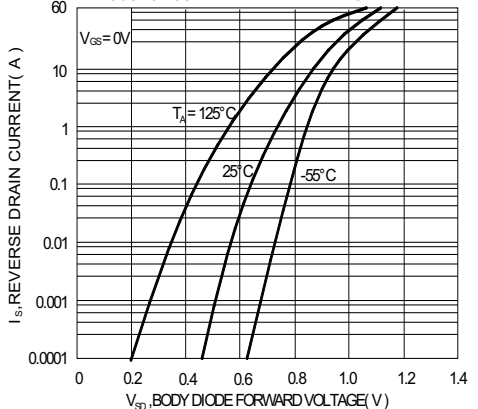
ON-RESISTANCE VARIATION WITH GATE-TO-SOURCE VOLTAGE



TRANSFER CHARACTERISTICS



BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE



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