

Single N-channel MOSFET

ELM32432LA-S

General description

ELM32432LA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds}=27V$
- $I_d=50A$
- $R_{ds(on)} < 12m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 18m\Omega$ ($V_{gs}=4.5V$)

Maximum absolute ratings

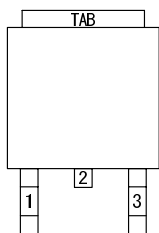
Parameter	Symbol	Limit	Unit	Note	
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current	I_d	$T_a=25^\circ C$	50	A	
		$T_a=100^\circ C$	35		
Pulsed drain current	I_{dm}	150	A	3	
Avalanche current	I_{ar}	33	A		
Avalanche energy	$L=0.1mH$	E_{as}	250	mJ	
Repetitive avalanche energy	$L=0.05mH$	E_{ar}	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	Steady-state	$R\theta_{jc}$		2.5	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state	$R\theta_{ja}$		62.5	$^\circ C/W$	
Maximum case-to-heatsink		$R\theta_{cs}$	0.6		$^\circ C/W$	

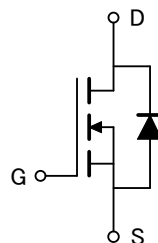
Pin configuration

TO-252-3 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

Circuit



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Electrical characteristics

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	27			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	1.6	3.0	V	
On state drain current	I _{d(on)}	V _{gs} =10V, V _{ds} =10V	50			A	1
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =25A		10	12	mΩ	1
		V _{gs} =4.5V, I _d =20A		15	18	mΩ	
Forward transconductance	G _{fs}	V _{ds} =10V, I _d =25A		32		S	1
Diode forward voltage	V _{sd}	I _s =25A, V _{gs} =0V		0.9	1.3	V	1
Max. body-diode continuous current	I _s				50	A	
Pulsed body-diode current	I _{sm}				150	A	3
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =15V, f=1MHz		1200	1800	pF	
Output capacitance	C _{oss}			600	1000	pF	
Reverse transfer capacitance	C _{rss}			350	500	pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =10V, V _{ds} =10V, I _d =25A		25	50	nC	2
Gate-source charge	Q _{gs}			15		nC	2
Gate-drain charge	Q _{gd}			10		nC	2
Turn-on delay time	t _{d(on)}	V _{gs} =10V, V _{ds} =15V, I _d ≈ 50A R _l =1 Ω, R _{gen} =24 Ω		6	16	ns	2
Turn-on rise time	t _r			120	250	ns	2
Turn-off delay time	t _{d(off)}			40	90	ns	2
Turn-off fall time	t _f			105	200	ns	2
Body diode reverse recovery time	t _{rr}			70		ns	
Peak reverse recovery current	I _{rm(rec)}	I _f =I _s , dI/dt=100A/μs		200		A	
Body diode reverse recovery charge	Q _{rr}			0.043		μC	

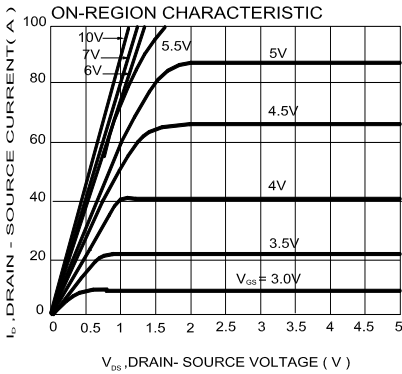
NOTE :

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%.

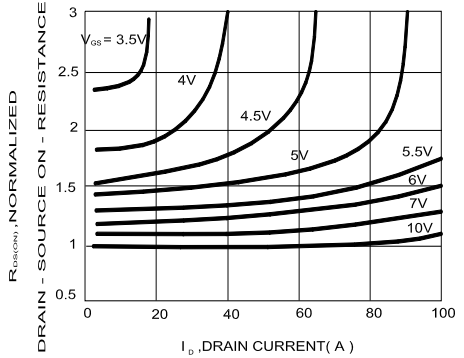
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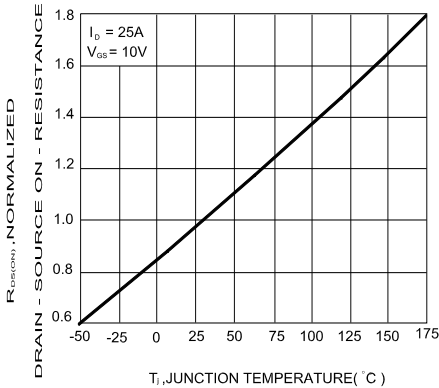
Typical electrical and thermal characteristics



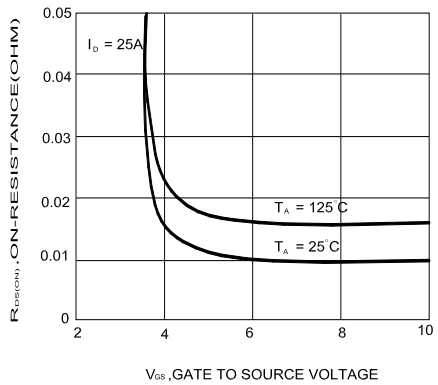
ON- RESISTANCE VARIATION WITH DRAIN CURRENT AND GATE



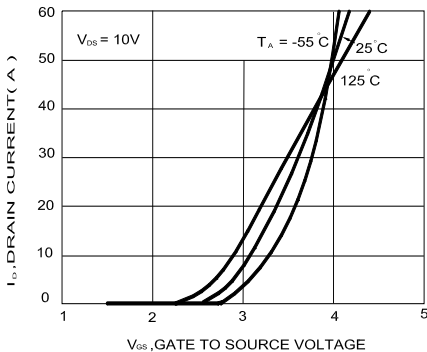
ON- RESISTANCE VARIATION WITH TEMPERATURE



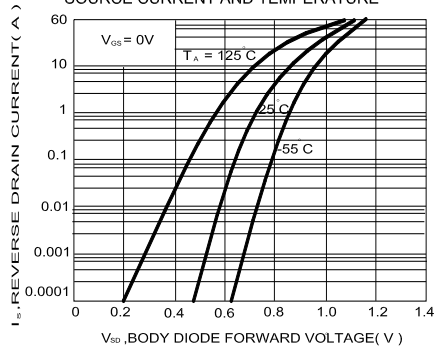
ON-RESISTANCE VARIATION WITH GATE-TO-SOURCE VOLTAGE



TRANSFER CHARACTERISTICS



BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE



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