

Single P-channel MOSFET

ELM32401LA-S

General description

ELM32401LA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds} = -60V$
- $I_d = -7A$
- $R_{ds(on)} < 90m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} < 135m\Omega$ ($V_{gs} = -4.5V$)

Maximum absolute ratings

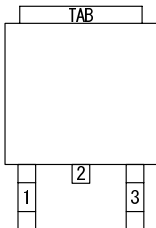
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	-60	V		
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current	I_d	$T_a = 25^\circ C$	-7	A	
		$T_a = 70^\circ C$	-6		
Pulsed drain current	I_{dm}	-30	A	3	
Power dissipation	P_d	$T_a = 25^\circ C$	28	W	
		$T_a = 70^\circ C$	18		
Junction 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	$R_{\theta jc}$		3	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state	$R_{\theta ja}$		75	$^\circ C/W$	

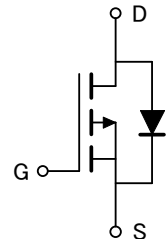
Pin configuration

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	-60			V	
Zero gate voltage drain current	Idss	Vds=-48V, Vgs=0V			-1	μA	
		Vds=-44V, Vgs=0V, Tj=125°C			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±250	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1	-2	-3	V	
On state drain current	Id(on)	Vgs=-10V, Vds=-5V	-32			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-7A		70	90	mΩ	1
		Vgs=-4.5V, Id=-6A		100	135	mΩ	
Forward transconductance	Gfs	Vds=-10V, Id=-7A		9		S	1
Diode forward voltage	Vsd	Is=If, Vgs=0V			-1	V	1
Max. body-diode continuous current	Is				-1.3	A	
Pulsed body-diode current	Ism				-2.6	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-30V, f=1MHz		760		pF	
Output capacitance	Coss			90		pF	
Reverse transfer capacitance	Crss			40		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-10V, Vds=-30V Id=-7A		15.0		nC	2
Gate-source charge	Qgs			2.5		nC	2
Gate-drain charge	Qgd			3.0		nC	2
Turn-on delay time	td(on)	Vgs=-10V, Vds=-20V Id ≈ -1A, Rgen=6Ω		7	14	ns	2
Turn-on rise time	tr			10	20	ns	2
Turn-off delay time	td(off)			19	34	ns	2
Turn-off fall time	tf			12	22	ns	2
Body diode reverse recovery time	trr			15.5		ns	
Body diode reverse recovery charge	Qrr	If=-7A, dI/dt=100A/μs		7.9		nC	

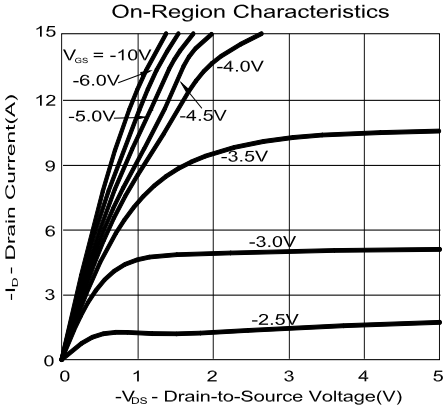
NOTE :

1. Pulse test : Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.

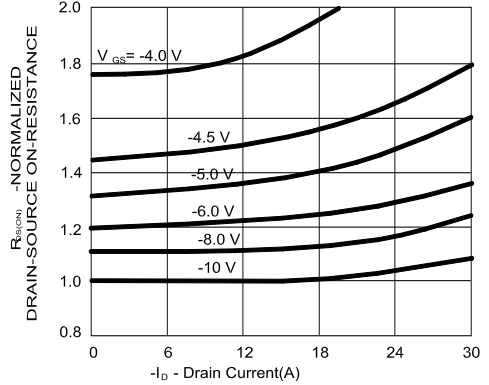
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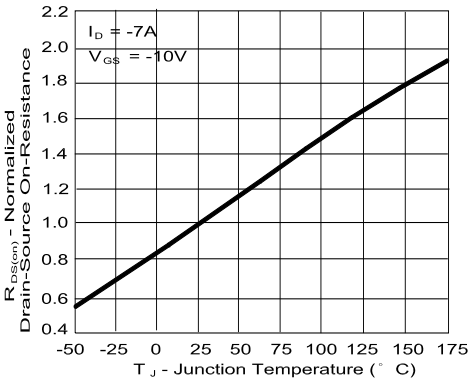
Typical electrical and thermal characteristics



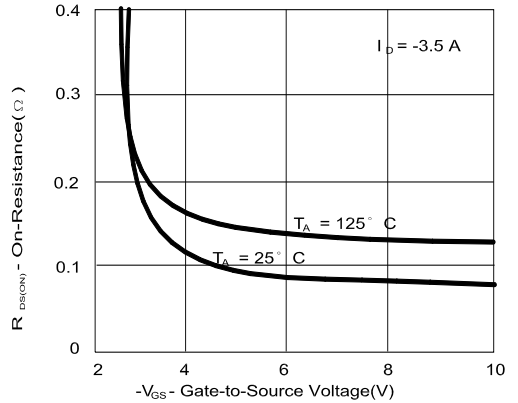
On-Resistance Variation with Drain Current and Gate Voltage



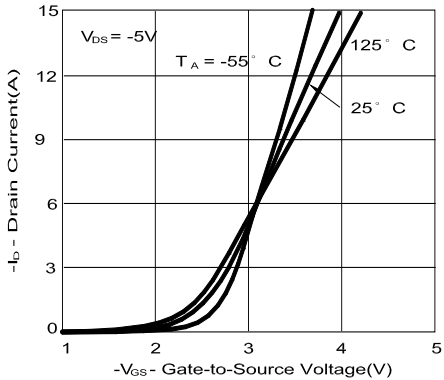
On-Resistance Variation with Temperature



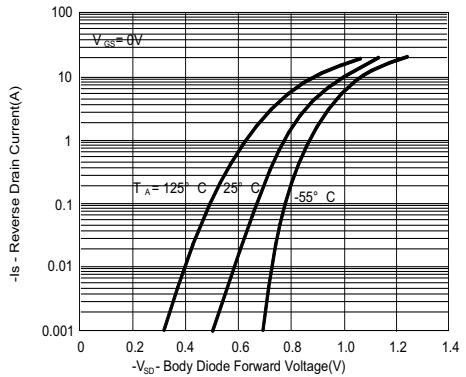
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics



Body Diode Forward Voltage Variation with Source Current and Temperature



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