Single P-channel MOSFET

ELM32413LA-S

■General description

ELM32413LA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance.

■Features

- Vds=-20V
- Id=-10A
- Rds(on) < 115mΩ (Vgs=-4.5V)
- Rds(on) < 180mΩ (Vgs=-2.5V)

■Maximum absolute ratings

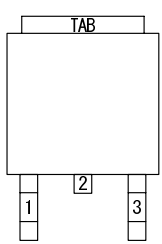
Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		Vds	-20	V	
Gate-source voltage		Vgs	±12	V	
Continuous drain current	Ta=25℃	Id	-10.0	A	
	Ta=70℃		-6.2		
Pulsed drain current		Idm	-24	A	3
Power dissipation	Ta=25℃	Pd	25.0	W	
	Ta=70℃		9.6		
Junction and storage temperature range		Tj, Tstg	-55 to 150	℃	

■Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	Steady-state	Rθjc		5	℃/W	
Maximum junction-to-ambient	Steady-state	Rθja		110	℃/W	

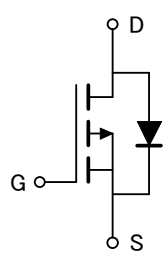
■Pin configuration

TO-252-3 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

■Circuit



■Electrical characteristics

Ta=25℃

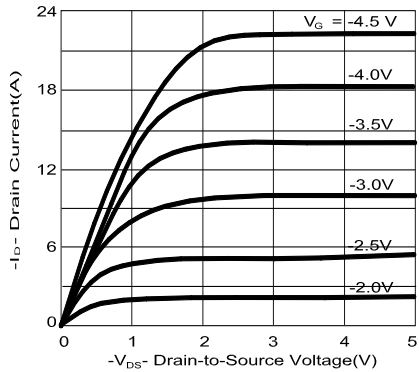
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=−250μA, Vgs=0V	−20			V	
Zero gate voltage drain current	Idss	Vds=−16V, Vgs=0V			−1	μA	
		Vds=−13.2V, Vgs=0V, Tj=125℃			−10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=−250μA	−0.45	−0.80	−1.20	V	
On state drain current	Id(on)	Vgs=−4.5V, Vds=−5V	−24			A	1
Static drain-source on-resistance	Rds(on)	Vgs=−4.5V, Id=−3A		93	115	mΩ	1
		Vgs=−2.5V, Id=−2A		124	180	mΩ	
Forward transconductance	Gfs	Vds=−5V, Id=−3A		4.4		S	1
Diode forward voltage	Vsd	Is=−10A, Vgs=0V			−1.2	V	1
Max. body-diode continuous current	Is				−10	A	
Pulsed body-diode current	Ism				−24	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=−6V, f=1MHz		430		pF	
Output capacitance	Coss			235		pF	
Reverse transfer capacitance	Crss			95		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=−4.5V, Vds=−10V Id=−3A		7.6	10.0	nC	2
Gate-source charge	Qgs			3.2		nC	2
Gate-drain charge	Qgd			2.0		nC	2
Turn-on delay time	td(on)	Vgs=−5V, Vds=−10V Id ≅ −1A, Rgen=6Ω			25	ns	2
Turn-on rise time	tr				60	ns	2
Turn-off delay time	td(off)				70	ns	2
Turn-off fall time	tf				60	ns	2

NOTE :

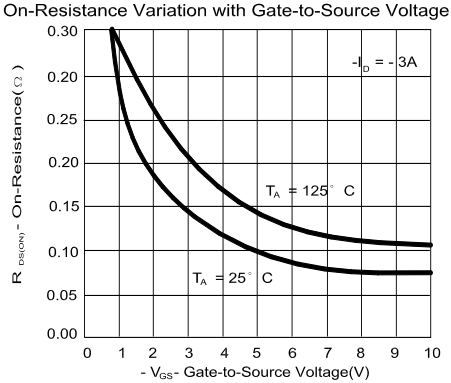
1. Pulse test : Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.

■Typical electrical and thermal characteristics

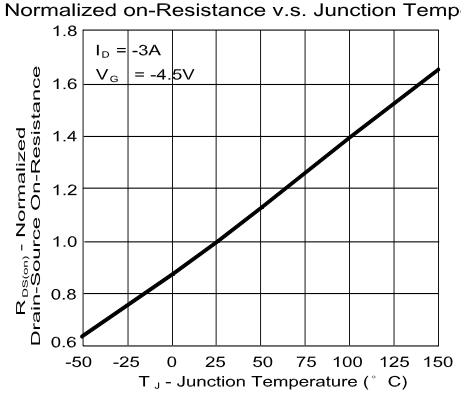
Typical output characteristics



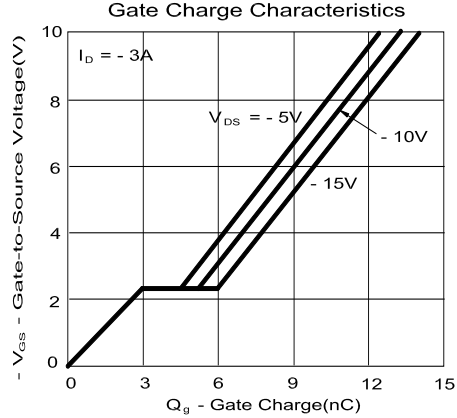
On-Resistance Variation with Gate-to-Source Voltage



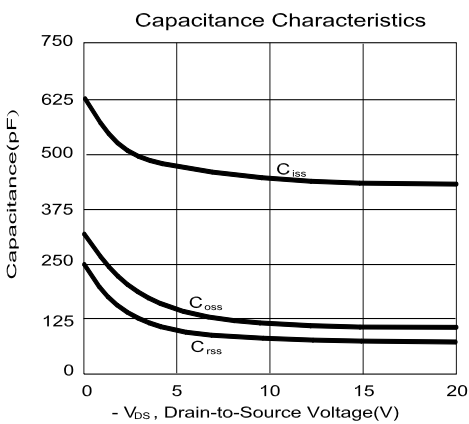
Normalized on-Resistance v.s. Junction Temperature



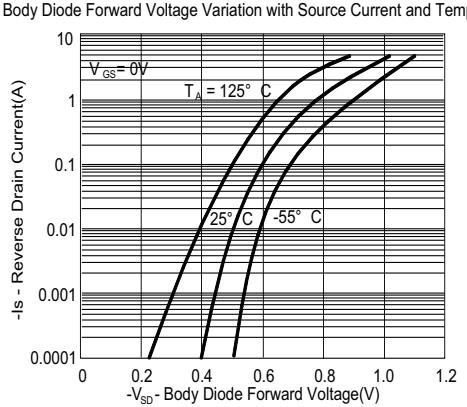
Gate Charge Characteristics



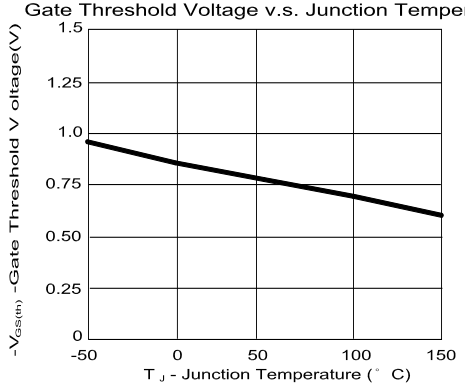
Capacitance Characteristics



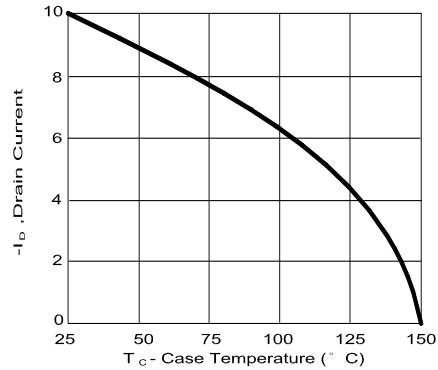
Body Diode Forward Voltage Variation with Source Current and Temperature



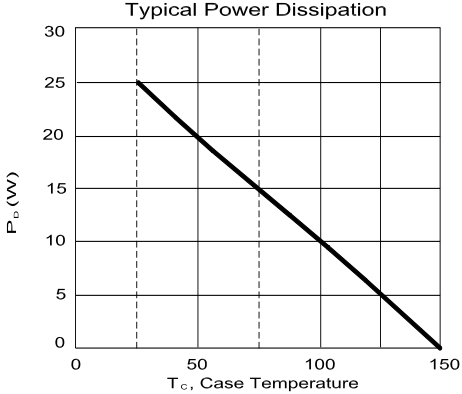
Gate Threshold Voltage v.s. Junction Temperature



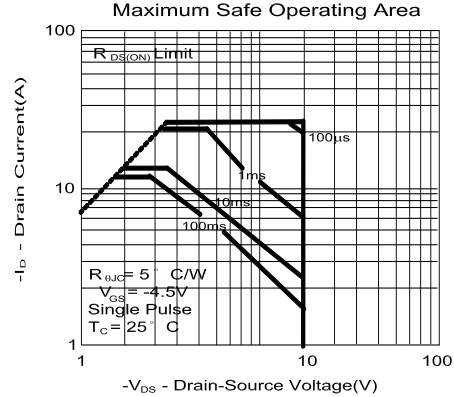
Maximum Drain Current v.s. Case Temperature



Typical Power Dissipation



Maximum Safe Operating Area



Effective Transient Thermal Impedance