Single P-channel MOSFET

ELM34409AA-N

■General description

ELM34409AA-N uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance.

■Features

- Vds=-30V
- Id=-9A
- Rds(on) < 20mΩ (Vgs=-10V)
- Rds(on) < 35mΩ (Vgs=-4.5V)

■Maximum absolute ratings

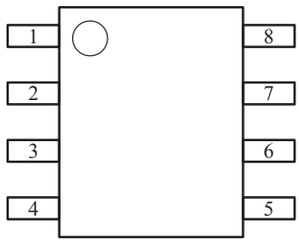
Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		Vds	-30	V	
Gate-source voltage		Vgs	±25	V	
Continuous drain current	Ta=25°C	Id	-9	A	
	Ta=70°C		-7		
Pulsed drain current		Idm	-50	A	3
Avalanche current		Ias	-26	A	
Avalanche energy	L=0.1mH	Eas	34	mJ	
Power dissipation	Ta=25°C	Pd	2.5	W	
	Ta=70°C		1.6		
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C	

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	Rθjc		25	°C/W	
Maximum junction-to-ambient	Rθja		50	°C/W	

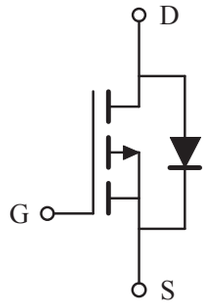
■Pin configuration

SOP-8(TOP VIEW)



Pin No.	Pin name
1	SOURCE
2	SOURCE
3	SOURCE
4	GATE
5	DRAIN
6	DRAIN
7	DRAIN
8	DRAIN

■Circuit



■Electrical characteristics

Ta=25°C

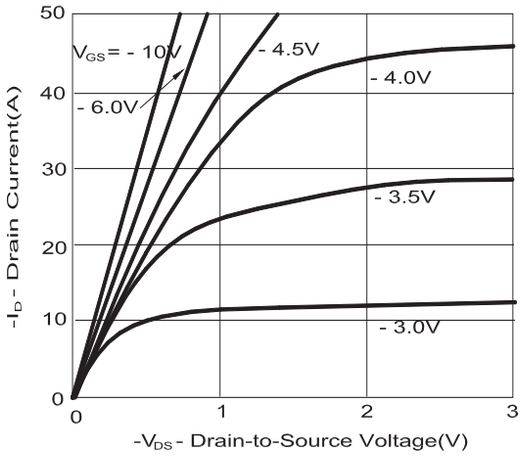
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-30			V	
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V			-1	μA	
		Vds=-20V,Vgs=0V, Tj=125°C			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±25V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0	-1.5	-3.0	V	
On state drain current	Id(on)	Vgs=-10V, Vds=-5V	9			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-9A		15	20	mΩ	1
		Vgs=-4.5V, Id=-7A		25	35		
Forward transconductance	Gfs	Vds=-10V, Id=-9A		24		S	1
Diode forward voltage	Vsd	If=-1A, Vgs=0V			-1.2	V	1
Max. body-diode continuous current	Is				-2.1	A	
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz		1610		pF	
Output capacitance	Coss			410		pF	
Reverse transfer capacitance	Crss			200		pF	
Gate resistance	Rg	Vgs=15mV, Vds=0V, f=1MHz		3.7		Ω	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-10V, Vds=-15V Id=-9A		31.4		nC	2
Gate-source charge	Qgs			4.5		nC	2
Gate-drain charge	Qgd			8.2		nC	2
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V Id≈-1A, Rl=1Ω, Rgen=6Ω		5.7		ns	2
Turn-on rise time	tr			10.0		ns	2
Turn-off delay time	td(off)			18.0		ns	2
Turn-off fall time	tf			5.0		ns	2

NOTE :

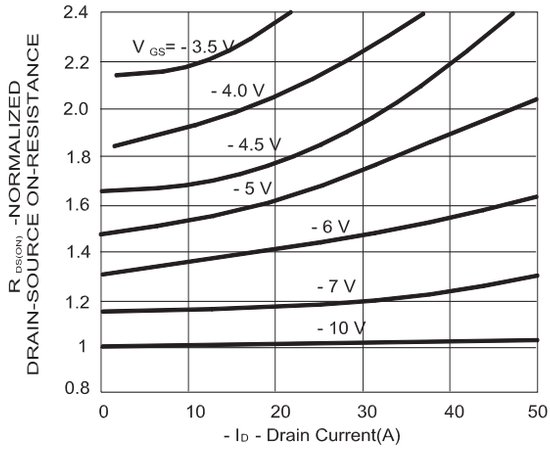
1. Pulsed width≤300μsec and Duty cycle≤2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.

■Typical electrical and thermal characteristics

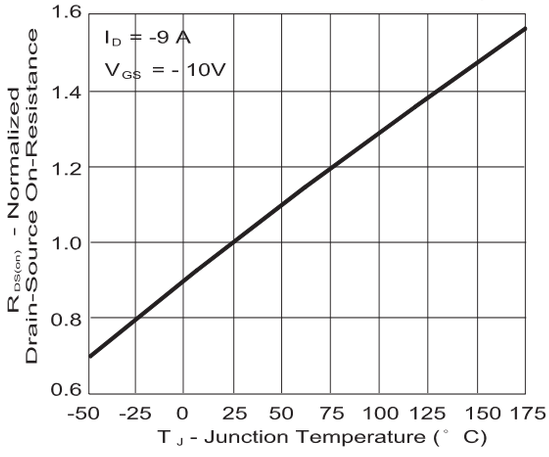
On-Region Characteristics



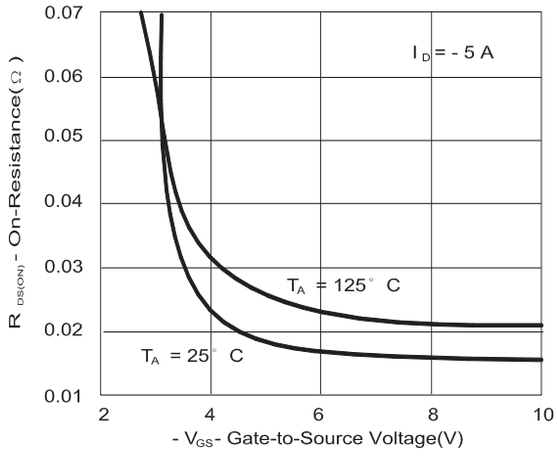
On-Resistance Variation with Drain Current and Gate Voltage



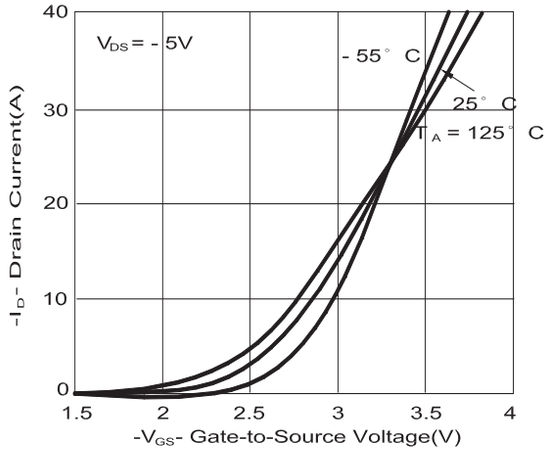
On-Resistance Variation with Temperature



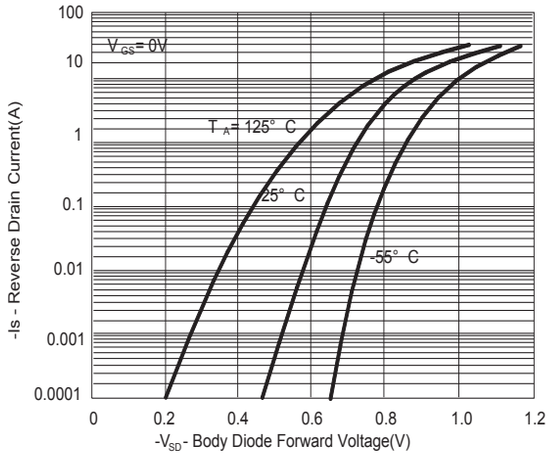
On-Resistance Variation with Gate-to-Source Voltage



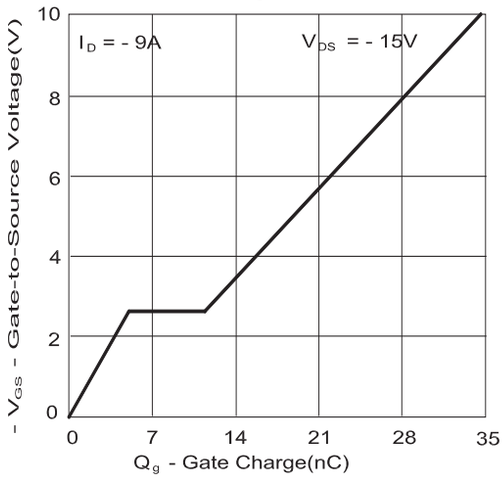
Transfer Characteristics



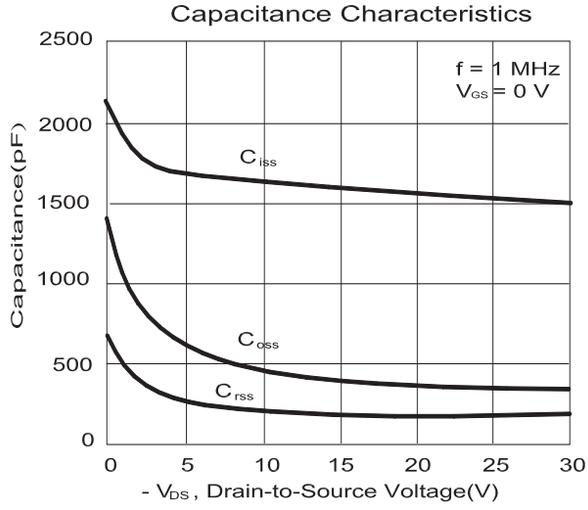
Body Diode Forward Voltage Variation with Source Current and Temperature



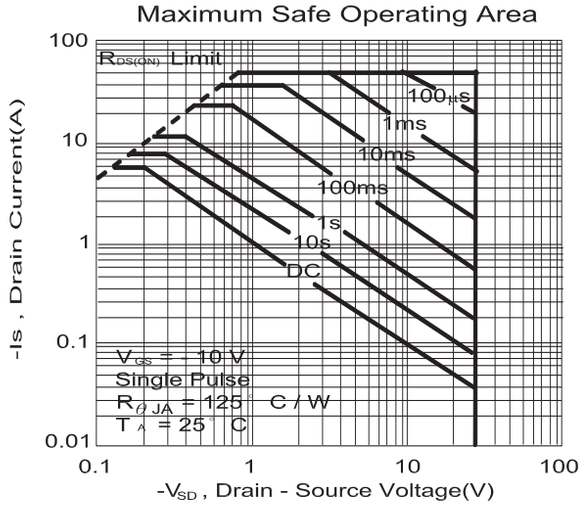
Gate Charge Characteristics



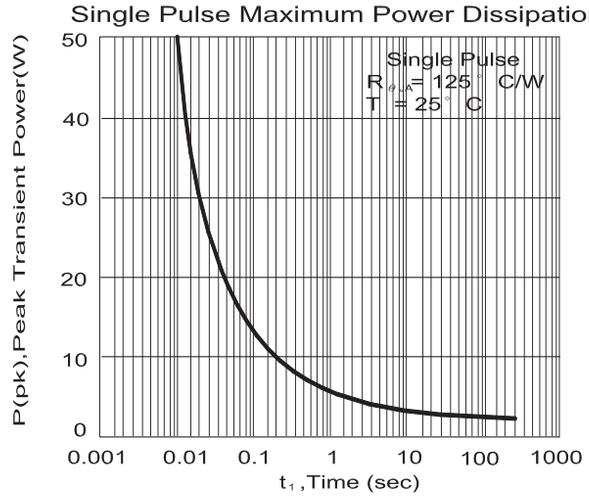
Capacitance Characteristics



Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve