

Single N-channel MOSFET

ELM34416AA-N

■ General description

ELM34416AA-N uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

■ Features

- $V_{ds}=30V$
- $I_d=11A$
- $R_{ds(on)} < 12.0m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 17.5m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

$T_a=25^\circ C$. Unless otherwise noted.

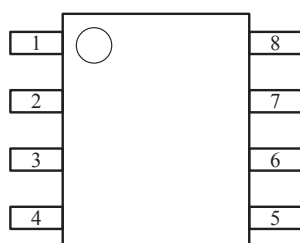
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	V_{ds}	30	V	
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	$T_a=25^\circ C$	11	A
		$T_a=100^\circ C$	7	
Pulsed drain current	I_{dm}	40	A	3
Avalanche current	I_{as}	28	A	
Avalanche energy	E_{as}	40	mJ	
Power dissipation	P_d	$T_c=25^\circ C$	2.5	W
		$T_c=100^\circ C$	1.0	
Operating 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	$R_{\theta jc}$		25	$^\circ C/W$	
Maximum junction-to-ambient	$R_{\theta ja}$		50		

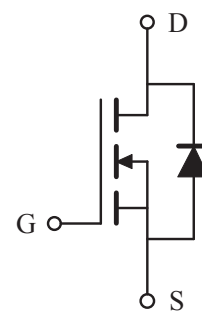
■ Pin configuration

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



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

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, Ta=125°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	1.5	1.8	2.5	V	
On-state drain current	Id(on)	Vds=10V, Vgs=10V	40			A	1
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=11A		8.5	12.0	mΩ	1
		Vgs=4.5V, Id=11A		14.0	17.5	mΩ	
Forward transconductance	Gfs	Vds=5V, Id=11A		40		S	1
Diode forward voltage	Vsd	If=25A, Vgs=0V			1.3	V	1
Max. body-diode continuous current	Is				1.9	A	
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=12V, f=1MHz		846		pF	
Output capacitance	Coss			225		pF	
Reverse transfer capacitance	Crss			126		pF	
Gate resistance	Rg	Vgs=0V, f=1MHz		1.65		Ω	
SWITCHING PARAMETERS							
Total gate charge(Vgs=10V)	Qg	Vds=15V, Id=8.8A		17.0		nC	2
Total gate charge(Vgs=4.5V)				8.1		nC	2
Gate-source charge	Qgs			2.7		nC	2
Gate-drain charge	Qgd			4.0		nC	2
Turn-on delay time	td(on)			9		ns	2
Turn-on rise time	tr	Vgs=10V, Vds=15V		30		ns	2
Turn-off delay time	td(off)	Id=12.5A, Rgen=6Ω		20		ns	2
Turn-off fall time	tf			6		ns	2
Body diode reverse recovery time	trr	If=11A, dIf/dt=100A/μs		21		ns	
Body diode reverse recovery charge	Qrr			10		nC	

NOTE :

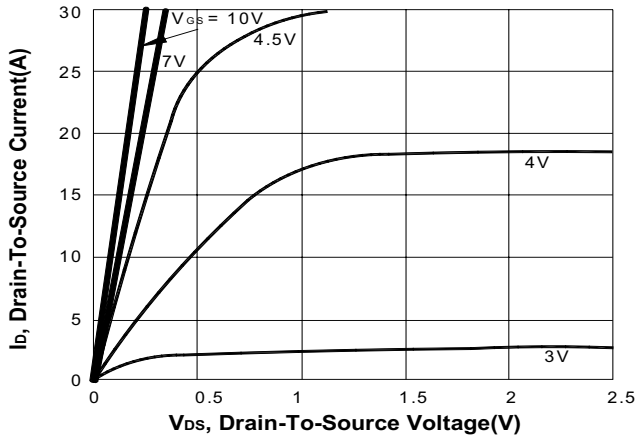
1. Pulsed width≤300μsec and Duty cycle≤2%;
2. Independent of operating temperature;
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

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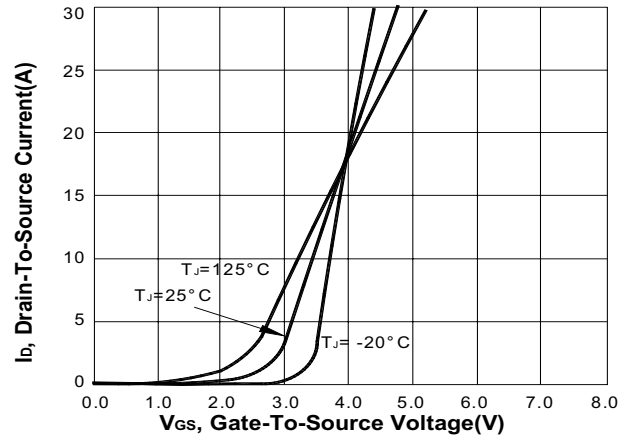
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■ Typical electrical and thermal characteristics

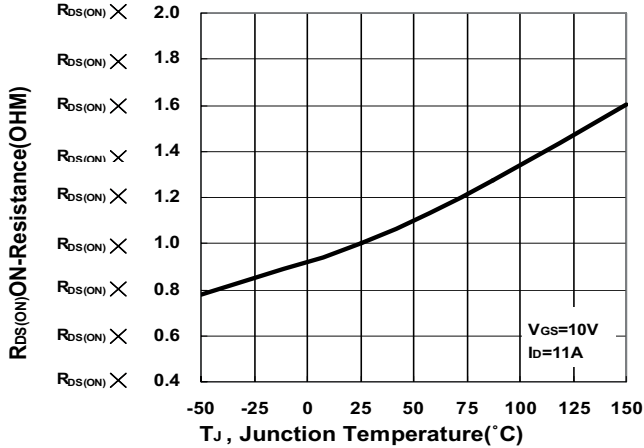
Output Characteristics



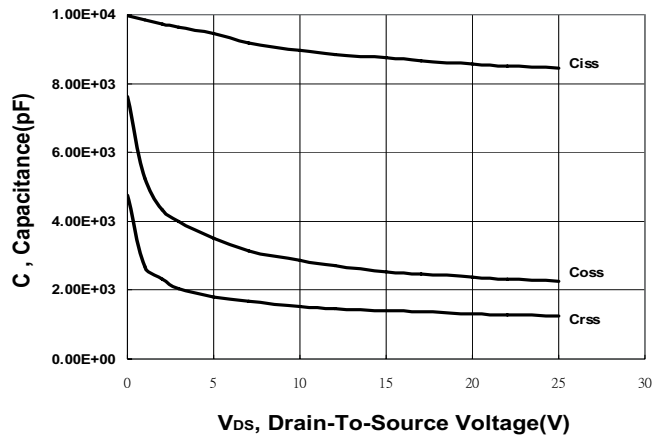
Transfer Characteristics



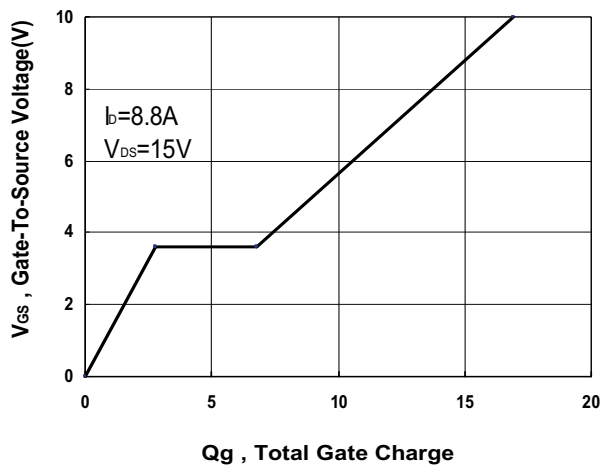
On-Resistance VS Temperature



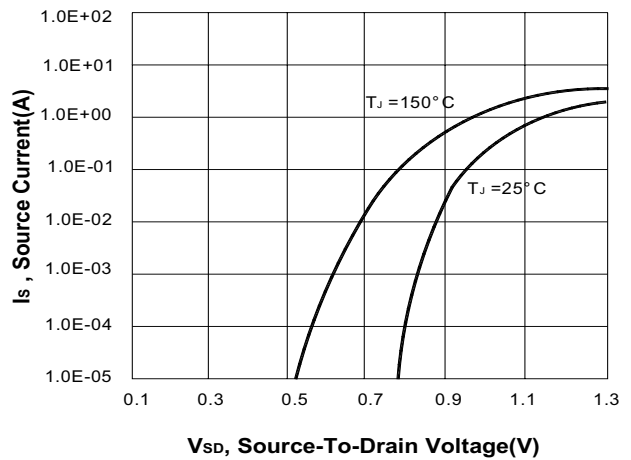
Capacitance Characteristic



Gate charge Characteristics



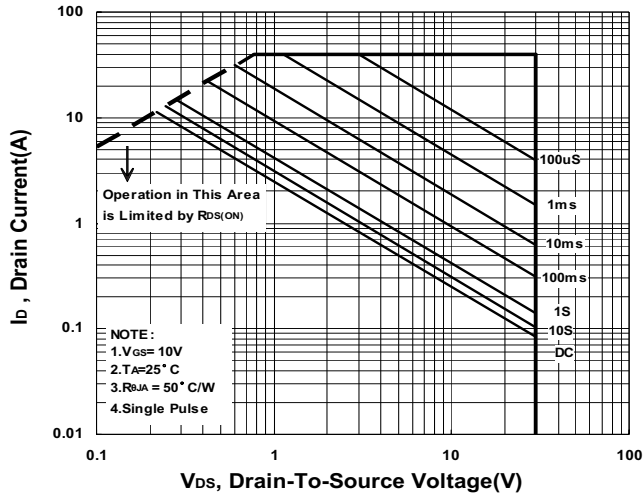
Source-Drain Diode Forward Voltage



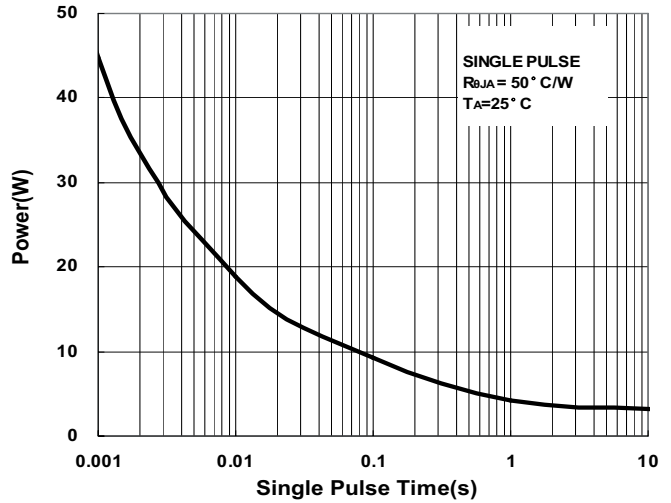
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Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

