

Complementary MOSFET

ELM34609AA-N

■ General Description

ELM34609AA-N uses advanced trench technology to provide excellent $R_{ds(on)}$ and low gate charge.

■ Features

- | | |
|---|--|
| N-channel | P-channel |
| • $V_{ds}=30V$ | $V_{ds}=-30V$ |
| • $I_d=4A$ | $I_d=-3A$ |
| • $R_{ds(on)} < 65m\Omega (V_{gs}=10V)$ | $R_{ds(on)} < 150m\Omega (V_{gs}=-10V)$ |
| • $R_{ds(on)} < 120m\Omega (V_{gs}=4.5V)$ | $R_{ds(on)} < 250m\Omega (V_{gs}=-4.5V)$ |

■ Maximum Absolute Ratings

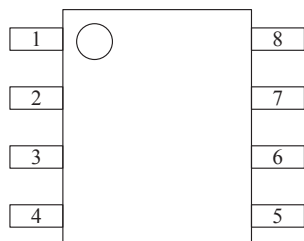
Parameter	Symbol	N-ch (Max.)	P-ch (Max.)	Unit	Note
Drain-source voltage	V_{ds}	30	-30	V	
Gate-source voltage	V_{gs}	± 20	± 20	V	
Continuous drain current	I_d	$T_a=25^\circ C$	4	-3	A
		$T_a=70^\circ C$	3	-2	
Pulsed drain current	I_{dm}	10	-10	A	3
Power dissipation	P_d	$T_a=25^\circ C$	2.0	2.0	W
		$T_a=70^\circ C$	1.3	1.3	
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	-55 to 150	$^\circ C$	

■ Thermal Characteristics

Parameter	Symbol	Device	Typ.	Max.	Unit	Note
Maximum junction-to-ambient	$R_{\theta ja}$	N-ch		110	$^\circ C/W$	
Maximum junction-to-ambient	$R_{\theta ja}$	P-ch		110	$^\circ C/W$	

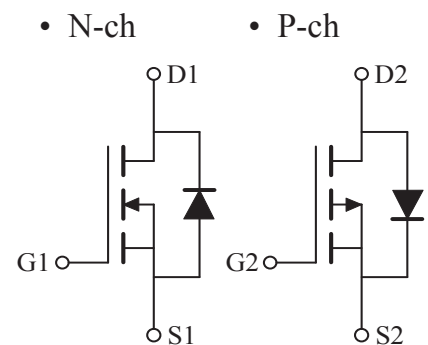
■ Pin configuration

SOP-8(TOP VIEW)



Pin No.	Pin name
1	SOURCE1
2	GATE1
3	SOURCE2
4	GATE2
5	DRAIN2
6	DRAIN2
7	DRAIN1
8	DRAIN1

■ Circuit



Complementary MOSFET

ELM34609AA-N

■Electrical Characteristics (N-ch)

Ta=25°C

Parameter	Symbol	Conditions	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=55°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.9	1.5	2.5	V	
On state drain current	Id(on)	Vgs=10V, Vds=5V	10			A	1
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=4A		48	65	mΩ	1
		Vgs=4.5V, Id=3A		72	120		
Forward transconductance	Gfs	Vds=10V, Id=3A		6		S	1
Diode forward voltage	Vsd	If=0.9A, Vgs=0V			1.2	V	1
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=10V, f=1MHz		265		pF	
Output capacitance	Coss			65		pF	
Reverse transfer capacitance	Crss			40		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=10V, Vds=15V, Id=3A		5.0	7.5	nC	2
Gate-source charge	Qgs			0.8		nC	2
Gate-drain charge	Qgd			1.0		nC	2
Turn-on delay time	td(on)	Vgs=10V, Vds=15V, Id≈1A Rl=15Ω, Rgen=6Ω		7	11	ns	2
Turn-on rise time	tr			12	18	ns	2
Turn-off delay time	td(off)			12	18	ns	2
Turn-off fall time	tf			7	11	ns	2
Body-diode reverse recovery time	trr	If=0.9A, dl/dt=100A/μs		40	80	ns	

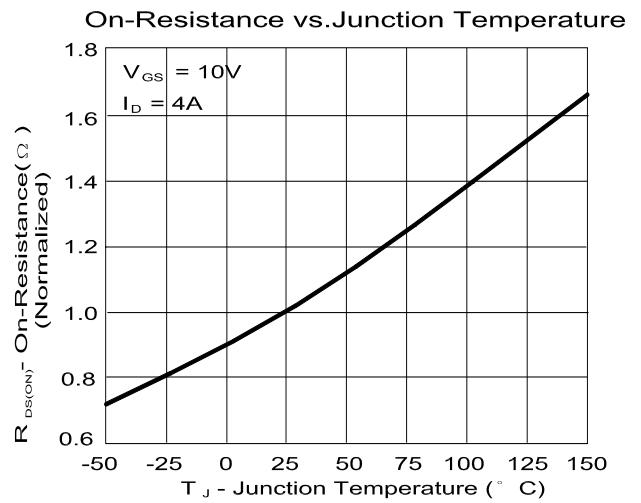
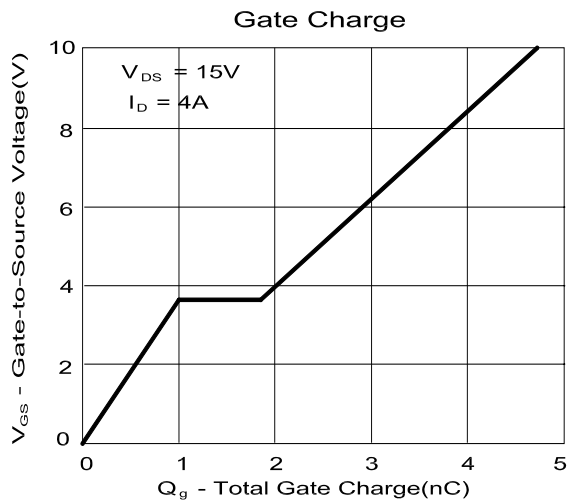
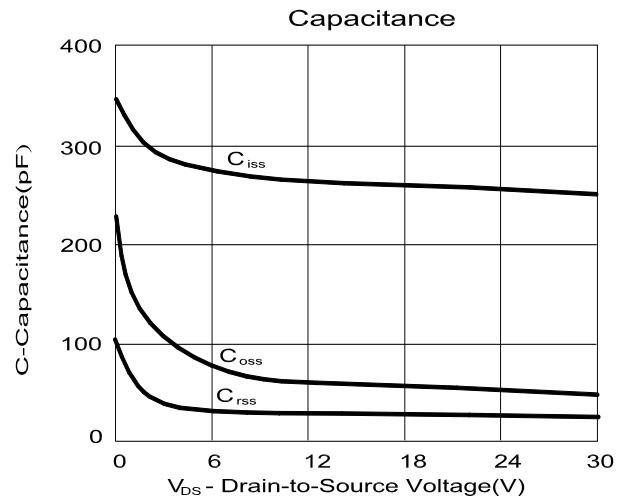
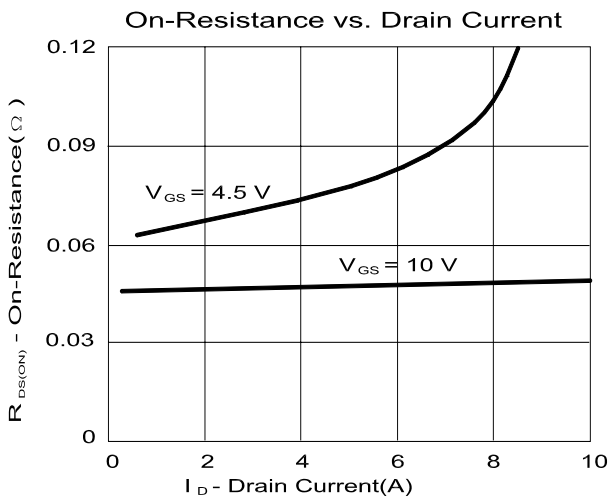
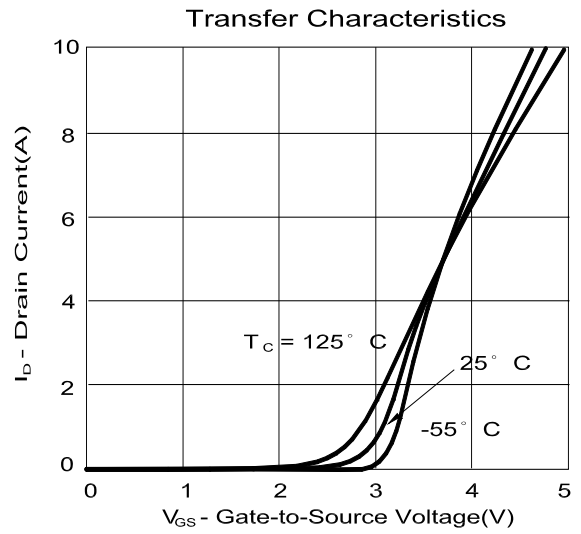
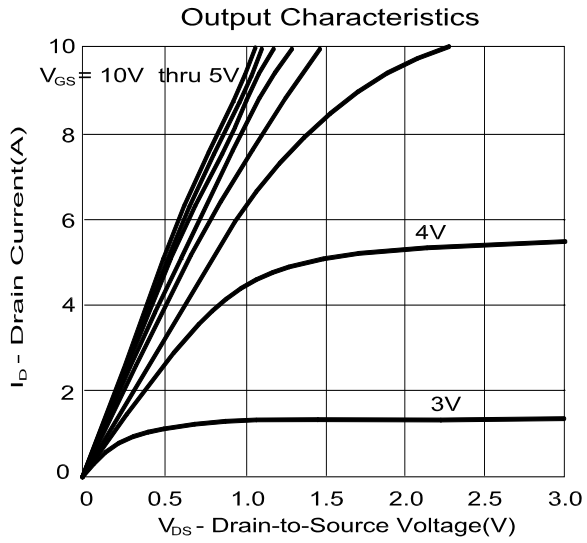
NOTE :

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

Complementary MOSFET

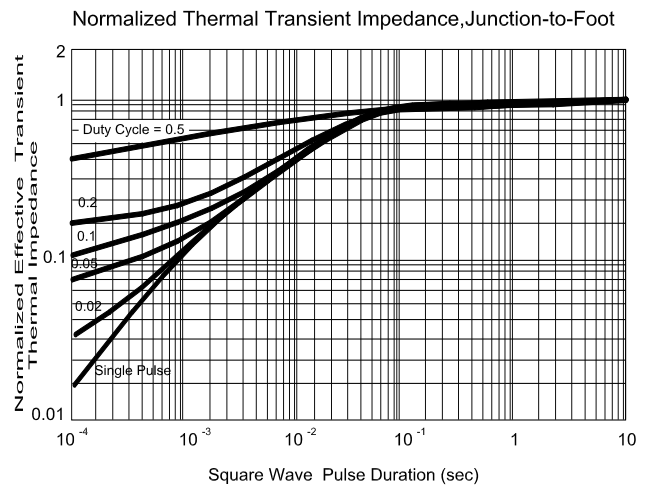
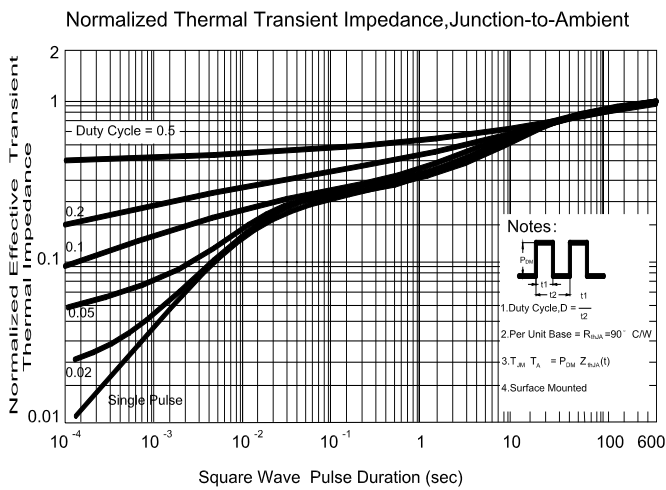
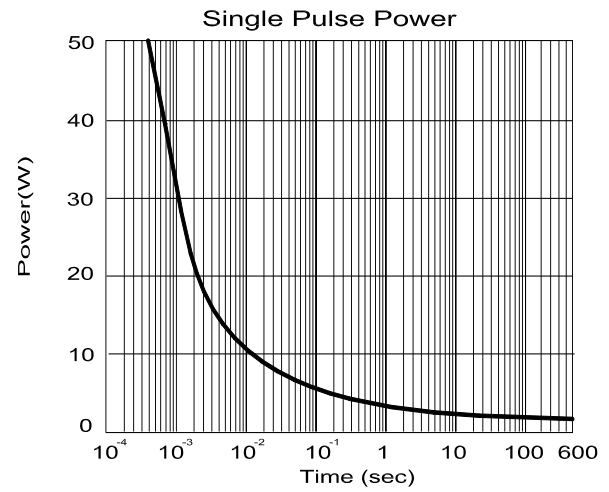
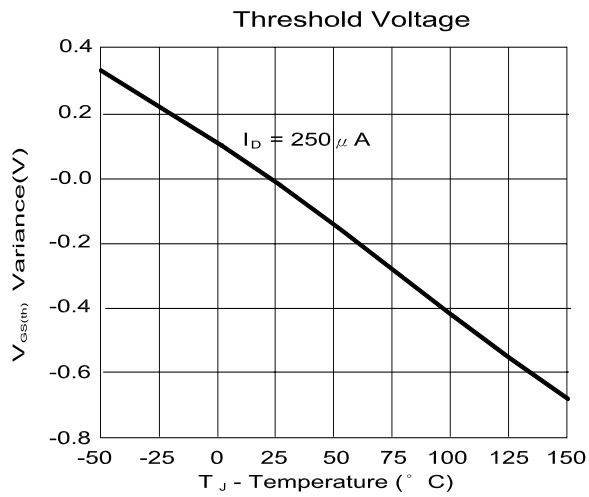
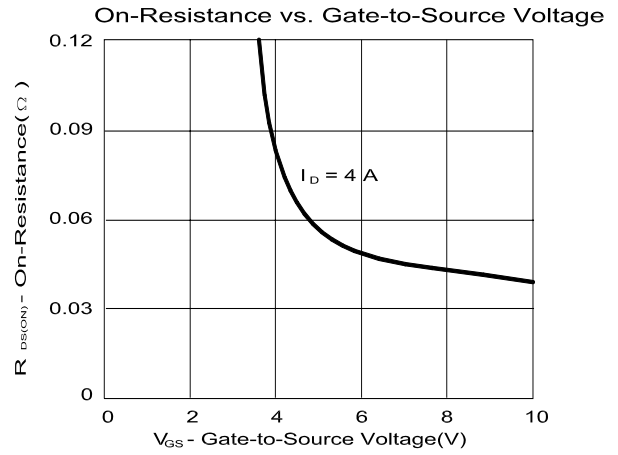
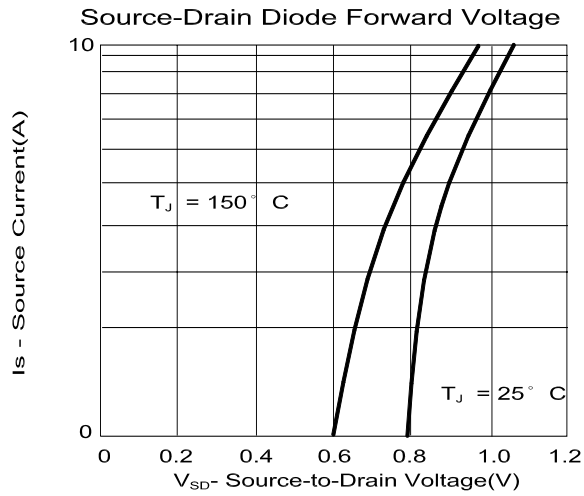
ELM34609AA-N

■ Typical Electrical and Thermal Characteristics (N-ch)



Complementary MOSFET

ELM34609AA-N



Complementary MOSFET

ELM34609AA-N

■Electrical Characteristics (P-ch)

Ta=25°C

Parameter	Symbol	Conditions	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=55°C			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-0.9	-1.5	-2.5	V	
On state drain current	Id(on)	Vgs=-10V, Vds=-5V	-10			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-3A		100	150	mΩ	1
		Vgs=-4.5V, Id=-2A		170	250		
Forward transconductance	Gfs	Vds=-10V, Id=-2A		3		S	1
Diode forward voltage	Vsd	If=-0.9A, Vgs=0V			-1.2	V	1
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-10V, f=1MHz		290		pF	
Output capacitance	Coss			65		pF	
Reverse transfer capacitance	Crss			40		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-10V, Vds=-15V Id=-2A		5.5	6.6	nC	2
Gate-source charge	Qgs			1.2		nC	2
Gate-drain charge	Qgd			0.9		nC	2
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V Id≈-1A, Rl=15Ω, Rgen=6Ω		8	12	ns	2
Turn-on rise time	tr			11	18	ns	2
Turn-off delay time	td(off)			14	21	ns	2
Turn-off fall time	tf			8	12	ns	2
Body-diode reverse recovery time	trr	If=-0.9A, dl/dt=100A/μs		40	80	ns	

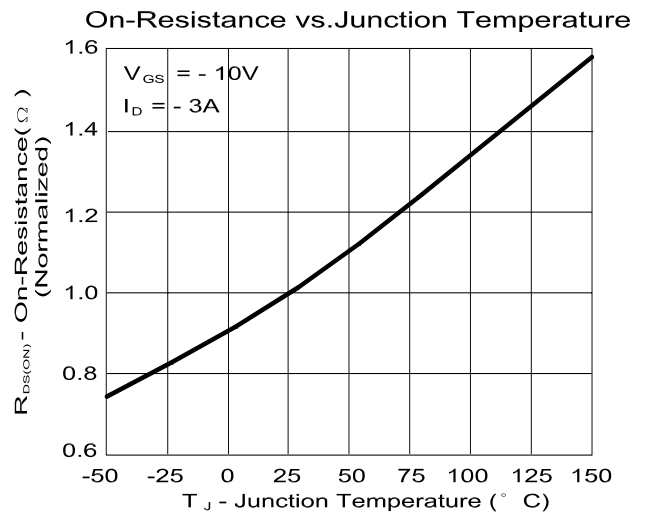
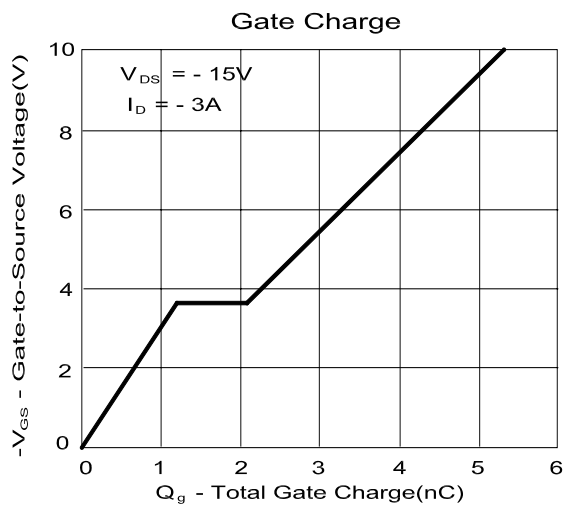
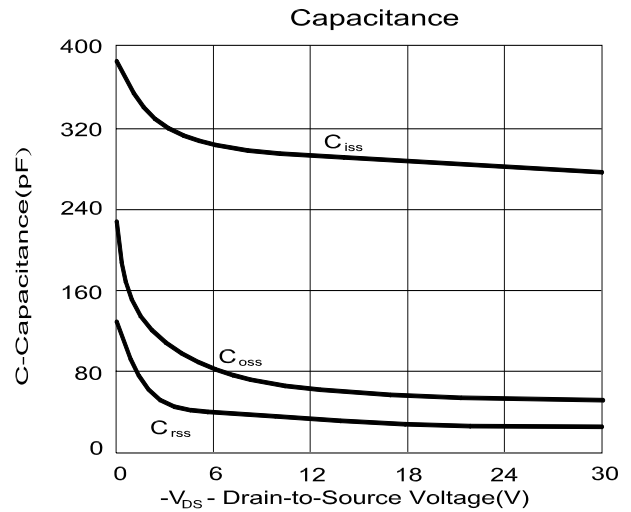
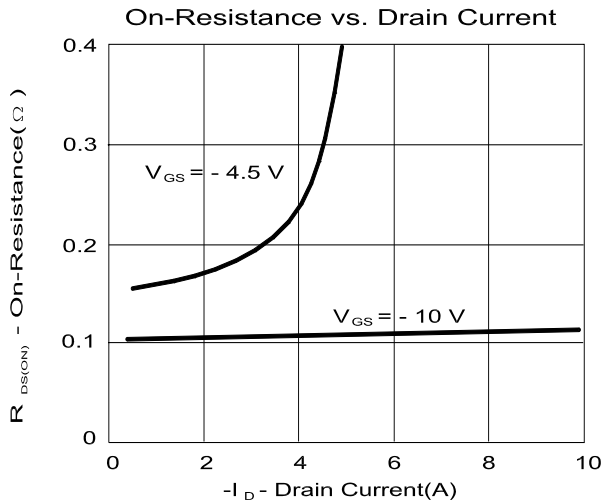
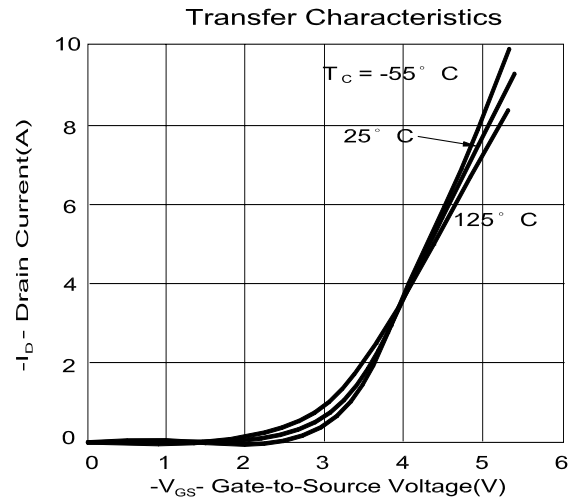
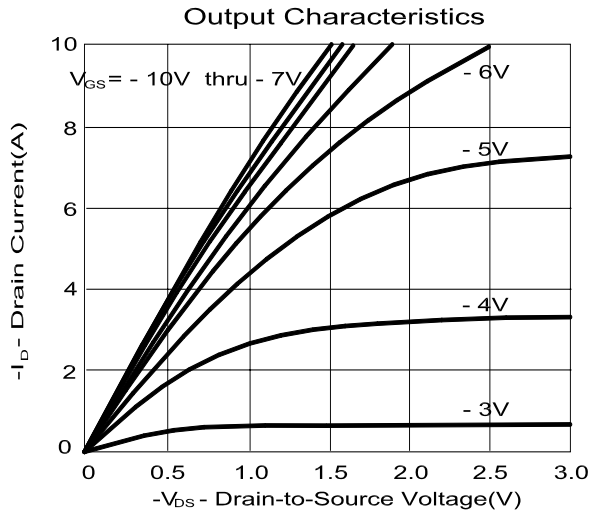
NOTE :

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

Complementary MOSFET

ELM34609AA-N

■ Typical Electrical and Thermal Characteristics (P-ch)



Complementary MOSFET

ELM34609AA-N

