

# Single P-channel MOSFET

## ELM342004A-N

### ■ General description

ELM342004A-N uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate resistance.

### ■ Features

- $V_{ds} = -40V$
- $I_d = -8.7A$
- $R_{ds(on)} < 20m\Omega$  ( $V_{gs} = -10V$ )
- $R_{ds(on)} < 32m\Omega$  ( $V_{gs} = -4.5V$ )

### ■ Maximum absolute ratings

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

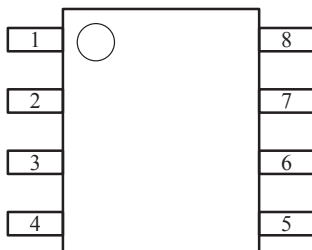
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	$V_{ds}$	-40	V	
Gate-source voltage	$V_{gs}$	$\pm 20$	V	
Continuous drain current	$I_d$	$-8.7$	A	
		$-7.0$		
Pulsed drain current	$I_{dm}$	-45	A	3
Avalanche current	$I_{as}$	-45	A	
Avalanche energy	$L = 0.1mH$	103	mJ	4
Power dissipation	$P_d$	2.5	W	
		1.6		
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		

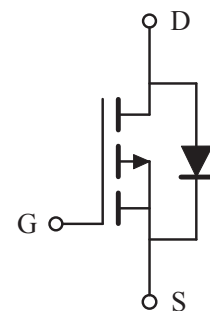
### ■ Pin configuration

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
<b>STATIC PARAMETERS</b>							
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-40			V	
Zero gate voltage drain current	Idss	Vds=-32V, Vgs=0V			-1	μA	
		Vds=-30V, Vgs=0V, Ta=55°C			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.5	-1.9	-3.0	V	
On-state drain current	Id(on)	Vds=-5V, Vgs=-10V	-45			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-8A		15	20	mΩ	1
		Vgs=-4.5V, Id=-6A		23	32		
Forward transconductance	Gfs	Vds=-5V, Id=-8A		30		S	1
Diode forward voltage	Vsd	If=-8A, Vgs=0V			-1.3	V	1
Max. body-diode continuous current	Is				-1.9	A	
Pulsed body-diode current	Ism				-45	A	3
<b>DYNAMIC PARAMETERS</b>							
Input capacitance	Ciss			2670		pF	
Output capacitance	Coss	Vgs=0V, Vds=-30V, f=1MHz		392		pF	
Reverse transfer capacitance	Crss			280		pF	
Gate resistance	Rg	Vgs=0V, Vds=0V, f=1MHz		4.65		Ω	
<b>SWITCHING PARAMETERS</b>							
Total gate charge	Qg	Vgs=-10V, Vds=-20V Id=-8A		50		nC	2
Gate-source charge	Qgs			10		nC	2
Gate-drain charge	Qgd			13		nC	2
Turn-on delay time	td(on)	Vgs=-10V, Vds=-30V RL=1Ω, Id=-8A, Rgen=6Ω		10		ns	2
Turn-on rise time	tr			20		ns	2
Turn-off delay time	td(off)			55		ns	2
Turn-off fall time	tf			30		ns	2
Reverse recovery time	trr	If=-8A, dIf/dt=100A/μs		26		ns	
Reverse recovery charge	Qrr			17		nC	

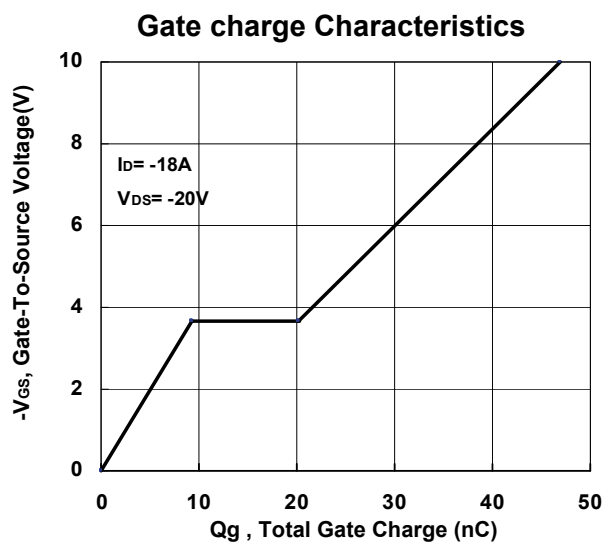
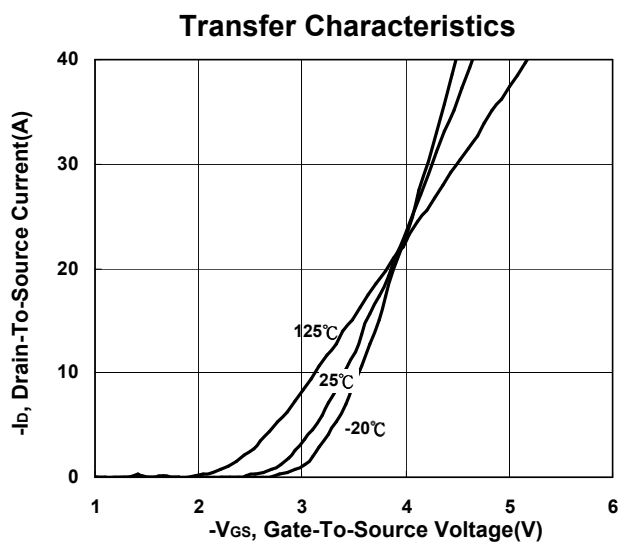
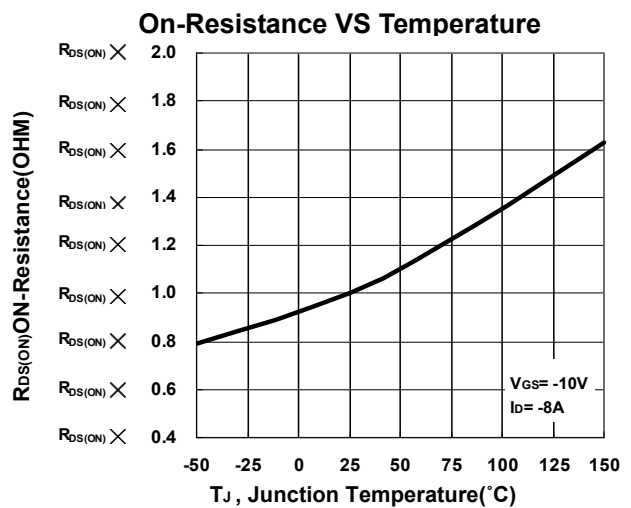
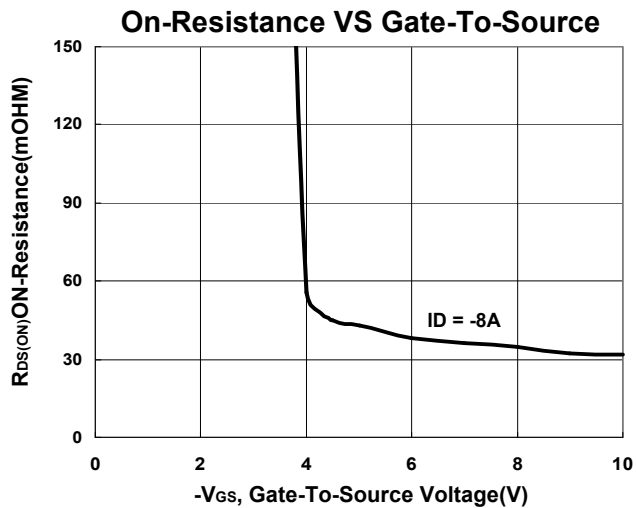
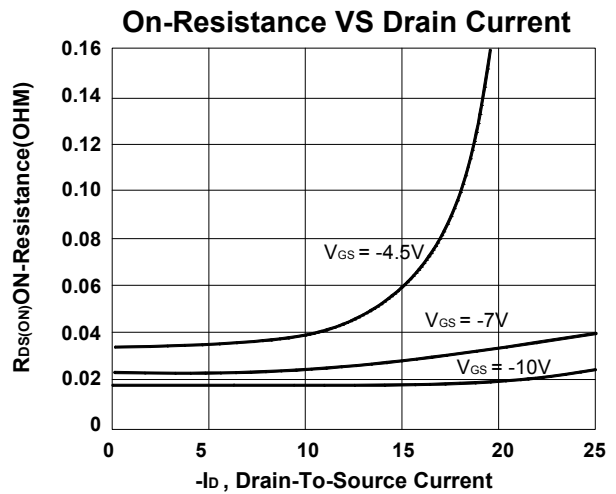
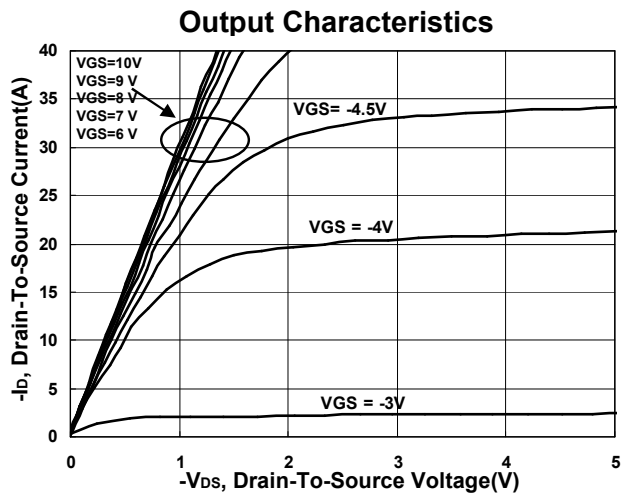
NOTE :

1. Pulsed test : Pulsed width≤300μsec and Duty cycle≤2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Vdd=-20V. Starting Tj=25°C.

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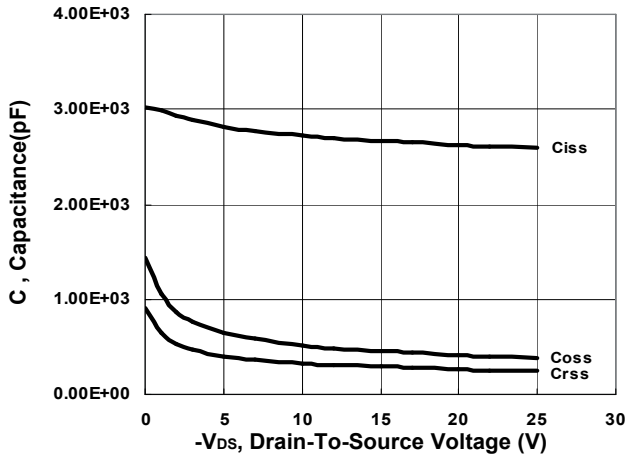
### Typical electrical and thermal characteristics



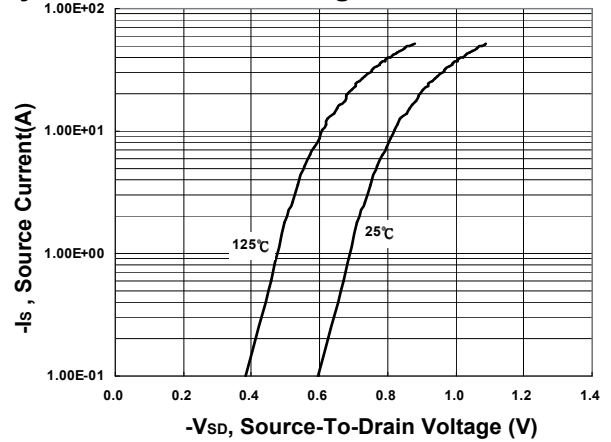
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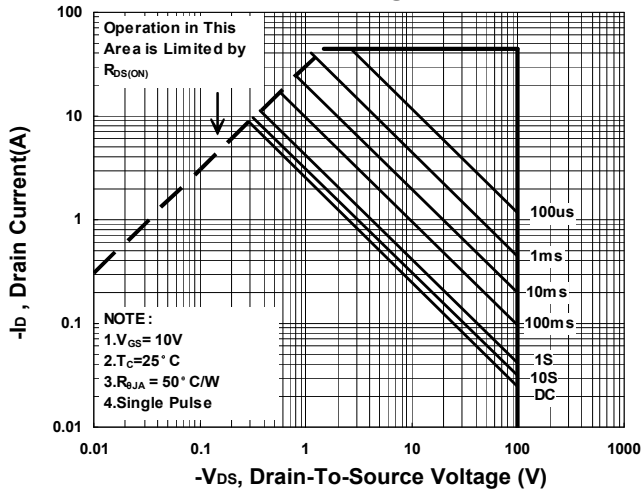
Capacitance Characteristic



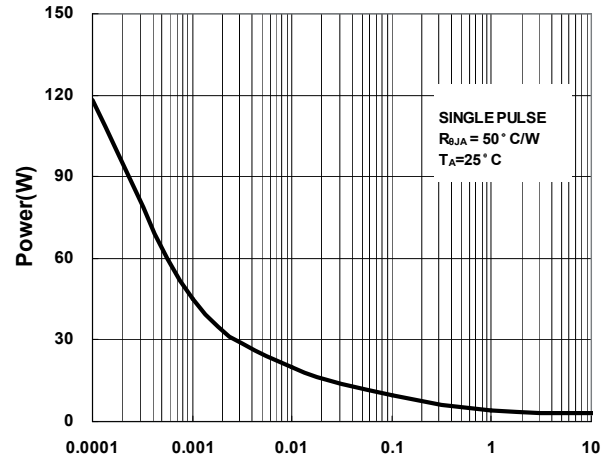
Body Diode Forward Voltage VS Source current



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

