

Single N-channel MOSFET

ELM37400FA-S

General description

ELM37400FA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and operation with gate voltages as low as 1.8V.

Features

- $V_{ds}=20V$
- $I_d=1.8A$
- $R_{ds(on)} < 60m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} < 85m\Omega$ ($V_{gs}=2.5V$)
- $R_{ds(on)} < 140m\Omega$ ($V_{gs}=1.8V$)

Maximum absolute ratings

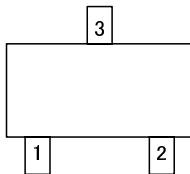
Parameter		Symbol	Limit	Unit	Note
Gate-source voltage		V_{gs}	± 12	V	
Continuous drain current	$T_a=25^{\circ}C$	I_d	1.8	A	
	$T_a=100^{\circ}C$		1.4		
Pulsed drain current		I_{dm}	10	A	3
Power dissipation	$T_a=25^{\circ}C$	P_d	0.35	W	
	$T_a=70^{\circ}C$		0.22		
Junction and storage temperature range		T_j, T_{stg}	-55 to 150	$^{\circ}C$	

Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-ambient	$t \leq 5s$	$R\theta_{ja}$		360	$^{\circ}C/W$	
Maximum junction-to-ambient	Steady-state			425	$^{\circ}C/W$	
Maximum junction-to-lead	Steady-state	$R\theta_{jl}$		320	$^{\circ}C/W$	

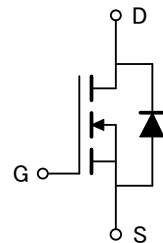
Pin configuration

SC-70 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

Circuit



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Electrical characteristics

Ta=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250 μ A, Vgs=0V	20			V	
Zero gate voltage drain current	Idss	Vds=16V Vgs=0V			1	μ A	
		Tj=125°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs= $\pm$ 12V			$\pm$ 100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250 μ A	0.4	0.8	1.2	V	
On state drain current	Id(on)	Vgs=4.5V, Vds=5V	10			A	1
Static drain-source on-resistance	Rds(on)	Vgs=4.5V, Id=1.8A		50	60	m Ω	1
		Vgs=2.5V, Id=1.5A		60	85	m Ω	1
		Vgs=1.8V, Id=1.2A		82	140	m Ω	1
Forward transconductance	Gfs	Vds=10V, Id=1.8A		5.5		S	1
Diode forward voltage	Vsd	If=Is, Vgs=0V			1	V	1
Max. body-diode continuous current	Is				0.9	A	
Pulsed body-diode current	Ism				1.8	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=10V, f=1MHz		418		pF	
Output capacitance	Coss			60		pF	
Reverse transfer capacitance	Crss			42		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=10V, Id=1.8A		5.4		nC	2
Gate-source charge	Qgs			0.7		nC	2
Gate-drain charge	Qgd			1.7		nC	2
Turn-on delay time	td(on)	Vgs=4.5V, Vds=10V Id $\cong$ 1A, Rgen=2.5 Ω		2.7		ns	2
Turn-on rise time	tr			2.5		ns	2
Turn-off delay time	td(off)			24.0		ns	2
Turn-off fall time	tf			3.2		ns	2

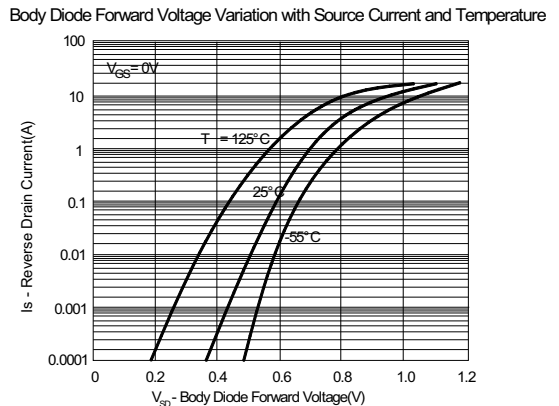
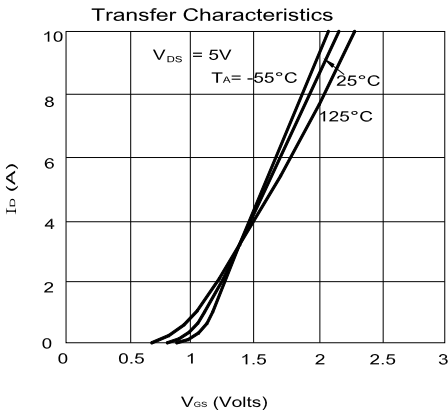
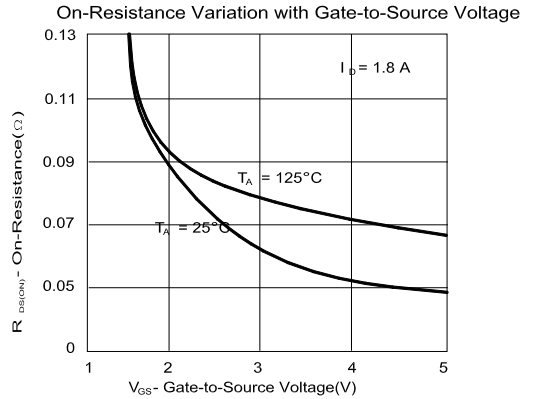
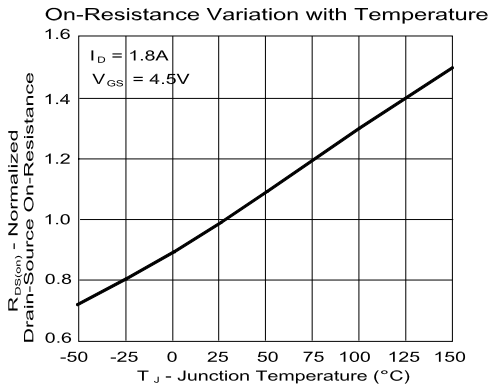
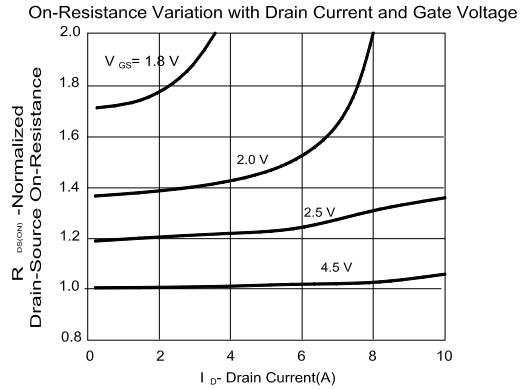
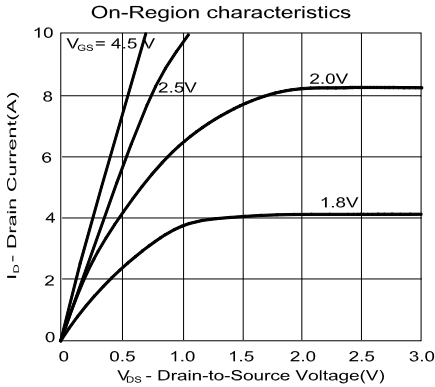
NOTE :

1. Pulse test : Pulsed width $\leq$ 300 μ sec and Duty cycle $\leq$ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle $\leq$ 1%.

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Typical electrical and thermal characteristics



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