

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

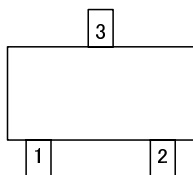
Parameter	Symbol	Limit	Unit	Note	
Gate-source voltage	V_{gs}	± 12	V		
Continuous drain current	I_d	$T_a=25^\circ C$	1.8	A	
		$T_a=100^\circ C$	1.4		
Pulsed drain current	I_{dm}	10	A	3	
Power dissipation	P_d	$T_a=25^\circ C$	0.35	W	
		$T_a=70^\circ C$	0.22		
Junction and storage temperature range	T_j,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

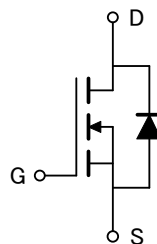
Pin configuration

SC-70 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

Circuit



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Electrical characteristics

T_a=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BV _{dss}	I _d =250 μA, V _{gs} =0V	20			V	
Zero gate voltage drain current	I _{dss}	V _{ds} =16V			1	μA	
		V _{gs} =0V			10		
		T _j =125°C					
Gate-body leakage current	I _{gss}	V _{ds} =0V, V _{gs} =±12V			±100	nA	
Gate threshold voltage	V _{gs(th)}	V _{ds} =V _{gs} , I _d =250 μA	0.4	0.8	1.2	V	
On state drain current	I _{d(on)}	V _{gs} =4.5V, V _{ds} =5V	10			A	1
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =4.5V, I _d =1.8A		50	60	mΩ	1
		V _{gs} =2.5V, I _d =1.5A		60	85	mΩ	1
		V _{gs} =1.8V, I _d =1.2A		82	140	mΩ	1
Forward transconductance	G _{fs}	V _{ds} =10V, I _d =1.8A		5.5		S	1
Diode forward voltage	V _{sd}	I _f =I _s , V _{gs} =0V			1	V	1
Max. body-diode continuous current	I _s				0.9	A	
Pulsed body-diode current	I _{sm}				1.8	A	3
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =10V, f=1MHz		418		pF	
Output capacitance	C _{oss}			60		pF	
Reverse transfer capacitance	C _{rss}			42		pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =4.5V, V _{ds} =10V, I _d =1.8A		5.4		nC	2
Gate-source charge	Q _{gs}			0.7		nC	2
Gate-drain charge	Q _{gd}			1.7		nC	2
Turn-on delay time	t _{d(on)}	V _{gs} =4.5V, V _{ds} =10V I _d ≅ 1A, R _{gen} =2.5 Ω		2.7		ns	2
Turn-on rise time	t _r			2.5		ns	2
Turn-off delay time	t _{d(off)}			24.0		ns	2
Turn-off fall time	t _f			3.2		ns	2

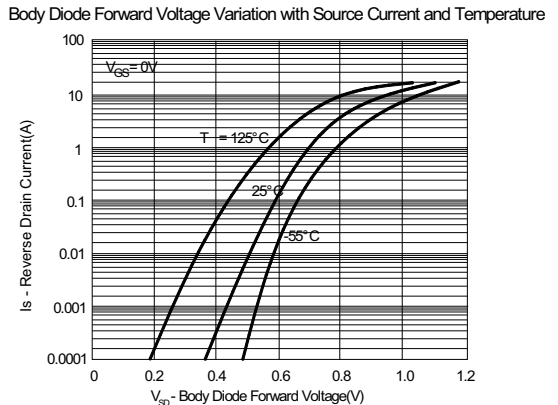
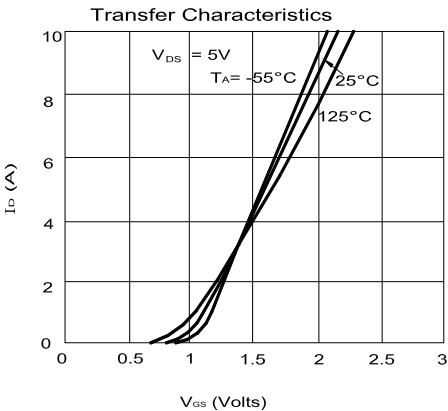
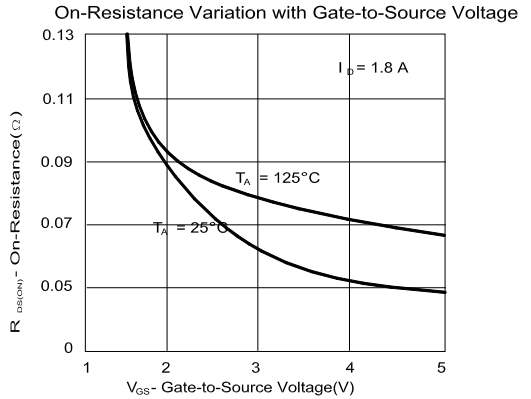
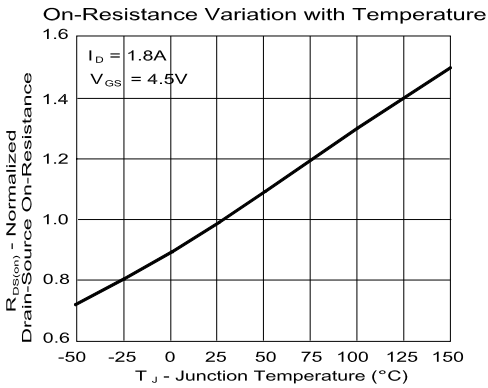
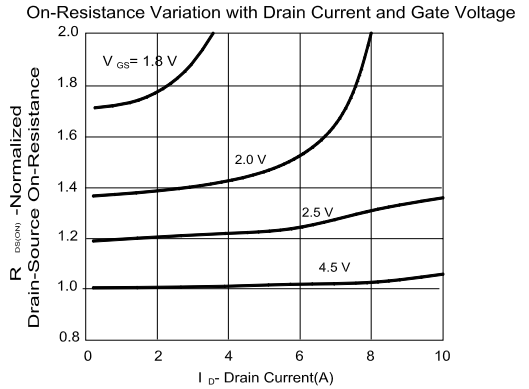
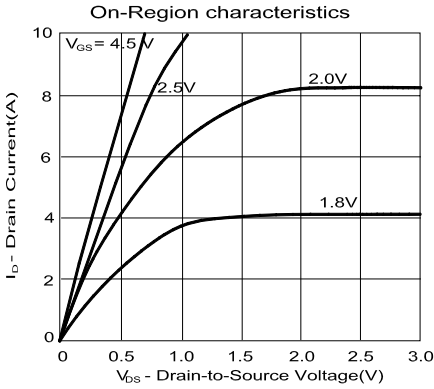
NOTE :

1. Pulse test : Pulsed width ≤ 300 μsec 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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Typical electrical and thermal characteristics



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