

Single P-channel MOSFET

ELM37401FA-S

General description

ELM37401FA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds} = -20V$
- $I_d = -1.4A$
- $R_{ds(on)} < 115m\Omega$ ($V_{gs} = -4.5V$)
- $R_{ds(on)} < 215m\Omega$ ($V_{gs} = -2.5V$)
- $R_{ds(on)} < 350m\Omega$ ($V_{gs} = -1.8V$)

Maximum absolute ratings

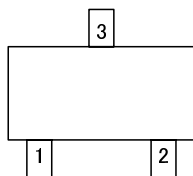
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	-20	V		
Gate-source voltage	V_{gs}	± 12	V		
Continuous drain current	I_d	$T_a = 25^\circ C$	-1.4	A	
		$T_a = 70^\circ C$	-1.1		
Pulsed drain current	I_{dm}	-10	A	3	
Power dissipation	P_d	$T_a = 25^\circ C$	0.35	W	
		$T_a = 70^\circ C$	0.22		
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	$^\circ C/W$	

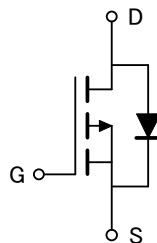
Pin configuration

SC-70 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

Circuit



Single P-channel MOSFET

ELM37401FA-S

Electrical characteristics

T_a=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BV _{dss}	V _{gs} =0V, I _d =-250μA	-20			V	
Zero gate voltage drain current	I _{dss}	V _{ds} =-16V, V _{gs} =0V			-1	μA	
		V _{ds} =-16V, V _{gs} =0V, T _j =125°C			-10		
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 =-250μA	-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 =-1.4A		98	115	mΩ	1
		V _{gs} =-2.5V, I _d =-1.2A		150	215	mΩ	
		V _{gs} =-1.8V, I _d =-1A		250	350	mΩ	
Forward transconductance	G _{fs}	V _{ds} =-5V, I _d =-1.4A		7		S	1
Diode forward voltage	V _{sd}	I _s =-1A, V _{gs} =0V			-1.0	V	1
Max. body-diode continuous current	I _s				-0.7	A	
Pulsed body-diode current	I _{sm}				-1.4	A	3
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}			476		pF	
Output capacitance	C _{oss}	V _{gs} =0V, V _{ds} =-10V, f=1MHz		260		pF	
Reverse transfer capacitance	C _{rss}			105		pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =-4.5V, V _{ds} =-10V I _d =-1.4A		5.63	8.45	nC	2
Gate-source charge	Q _{gs}			2.35		nC	2
Gate-drain charge	Q _{gd}			1.47		nC	2
Turn-on delay time	t _{d(on)}	V _{gs} =-4.5V, V _{ds} =-10V I _d ≅-1A, R _{gen} =6Ω		11	22	ns	2
Turn-on rise time	t _r			32	55	ns	2
Turn-off delay time	t _{d(off)}			38	68	ns	2
Turn-off fall time	t _f			32	55	ns	2

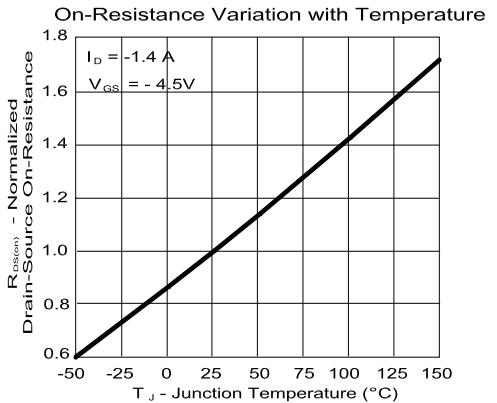
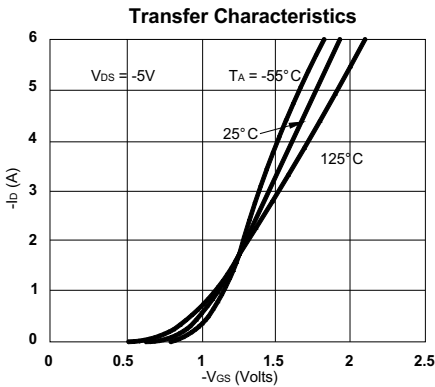
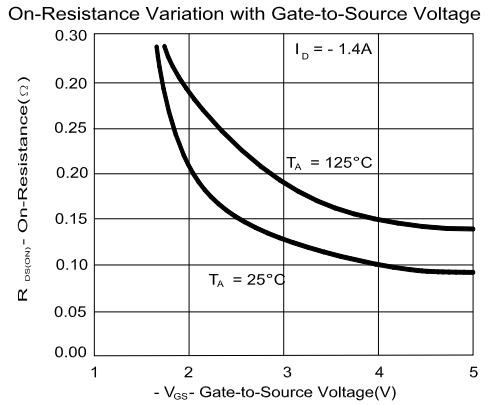
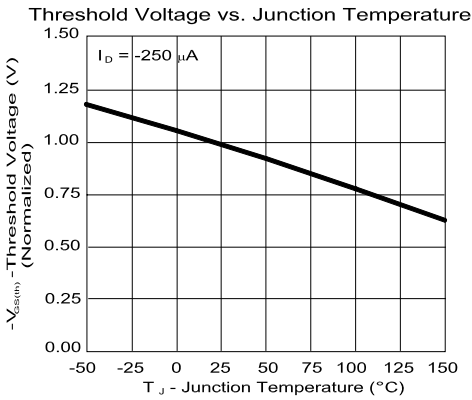
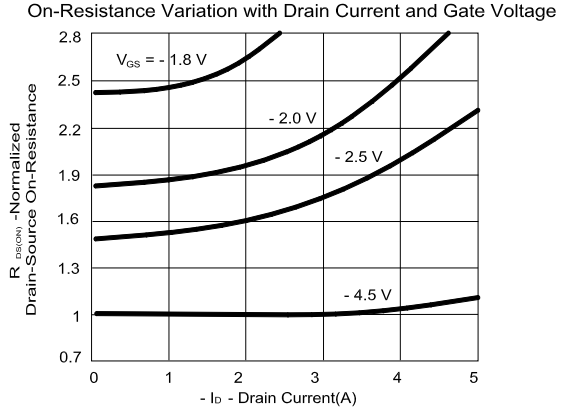
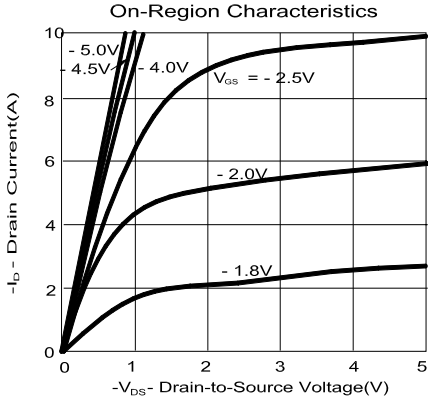
NOTE :

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%.

Single P-channel MOSFET

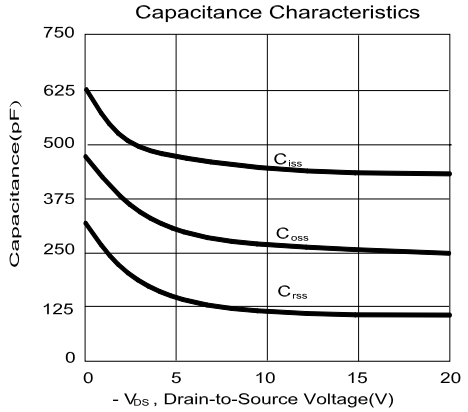
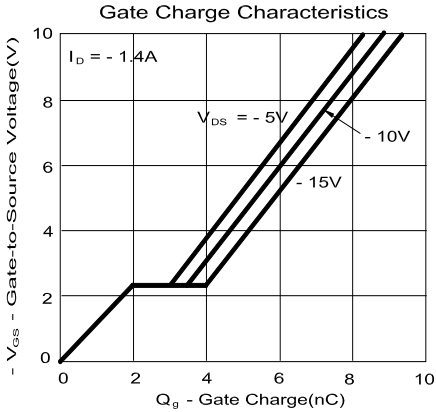
ELM37401FA-S

Typical electrical and thermal characteristics

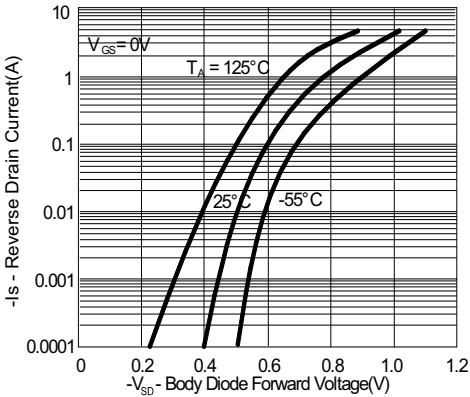


Single P-channel MOSFET

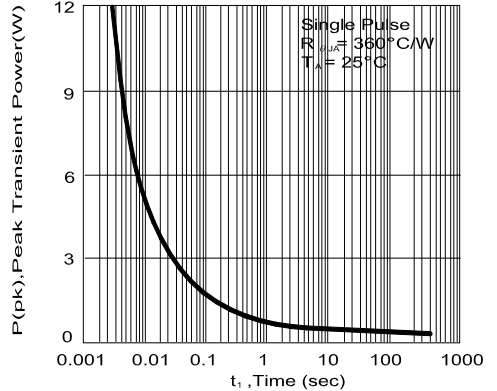
ELM37401FA-S



Body Diode Forward Voltage Variation with Source Current and Temperature



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

