Single P-channel MOSFET

ELM2H401SA-S

■General description

ELM2H401SA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance. The package is SOT-723.

■Features

- Vds=-20V
- Id=-0.4A
- Rds(on) < 650mΩ (Vgs=-4.5V)
- Rds(on) < 900mΩ (Vgs=-2.5V)
- Rds(on) < 1400mΩ (Vgs=-1.8V)
- Rds(on) < 2300mΩ (Vgs=-1.5V)

■Application

- Notebook
- Load Switch
- Baterry Protection
- Hand-held instruments

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

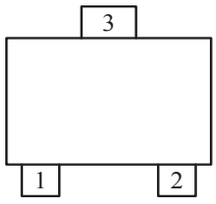
Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	-20	V
Gate-source voltage		Vgs	±8	V
Continuous drain current	Ta=25°C	Id	-400	mA
	Ta=100°C		-250	
Pulsed drain current [1]		Idm	-1.6	A
Power dissipation	Tc=25°C	Pd	450	mW
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Maximum junction-to-ambient	Rθja		280	°C/W

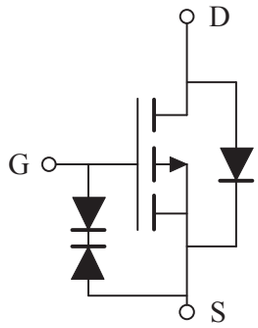
■Pin configuration

SOT-723(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit



■Electrical characteristics

Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-20			V
Zero gate voltage drain current	Idss	Vds=-20V, Vgs=0V, Ta=25°C			-1	μA
		Vds=-16V, Vgs=0V, Ta=125°C			-10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±8V			±20	μA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-0.3	-0.7	-1.0	V
Static drain-source on-resistance	Rds(on)	Vgs=-4.5V, Id=-0.3A		500	650	mΩ
		Vgs=-2.5V, Id=-0.2A		700	900	
		Vgs=-1.8V, Id=-0.1A		1100	1400	
		Vgs=-1.5V, Id=-0.1A		1700	2300	
Max. body-diode continuous current	Is	Vgs=Vds=0			-0.4	A
Pulsed source current	Ism				-0.8	A
Diode forward voltage	Vsd	Is=-0.2A, Vgs=0V			-1	V
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-10V, f=1MHz		40.0	78.0	pF
Output capacitance	Coss			15.0	30.0	pF
Reverse transfer capacitance	Crss			6.5	13.0	pF
SWITCHING PARAMETERS						
Total gate charge [2, 3]	Qg	Vgs=-4.5V, Vds=-10V Id=-0.2A		1.00	2.00	nC
Gate-source charge [2, 3]	Qgs			0.28	0.50	nC
Gate-drain charge [2, 3]	Qgd			0.18	0.40	nC
Turn-on delay time [2, 3]	td(on)	Vgs=-4.5V, Vds=-10V Id=-0.2A, Rgen=10Ω		8.0	16.0	ns
Turn-on rise time [2, 3]	tr			5.2	10.0	ns
Turn-off delay time [2, 3]	td(off)			30.0	60.0	ns
Turn-off fall time [2, 3]	tf			18.0	36.0	ns

NOTE :

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

■Typical electrical and thermal characteristics

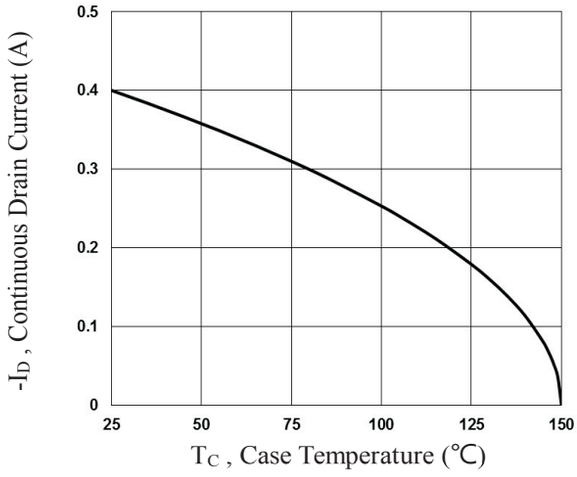


Fig.1 Continuous Drain Current vs. T_C

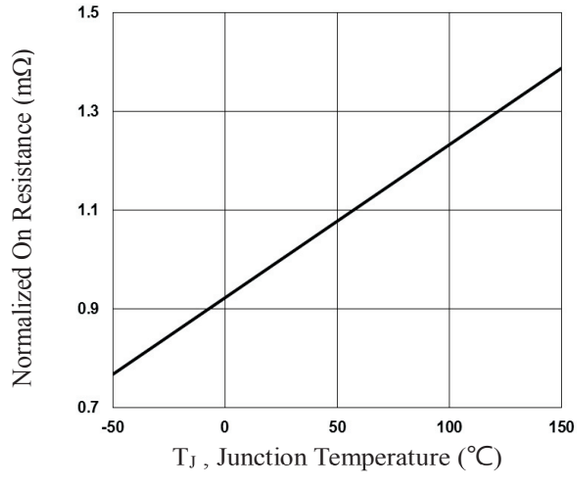


Fig.2 Normalized RDSON vs. T_J

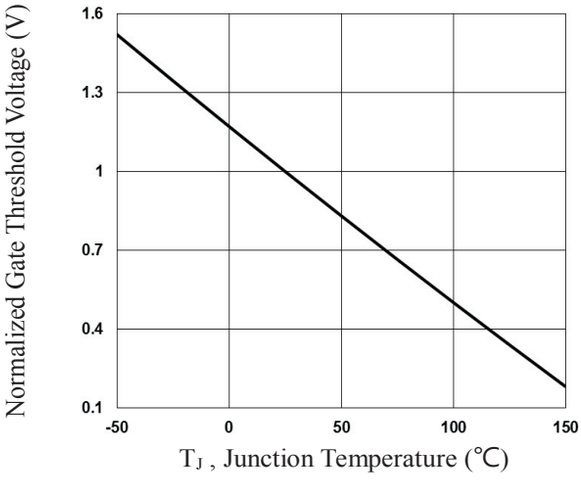


Fig.3 Normalized V_{th} vs. T_J

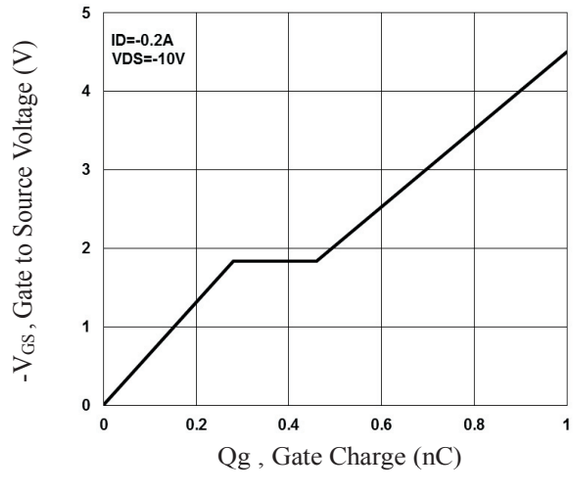


Fig.4 Gate Charge Waveform

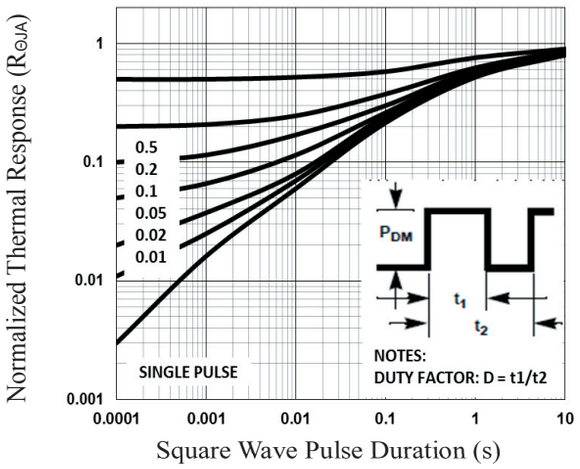


Fig.5 Normalized Transient Response

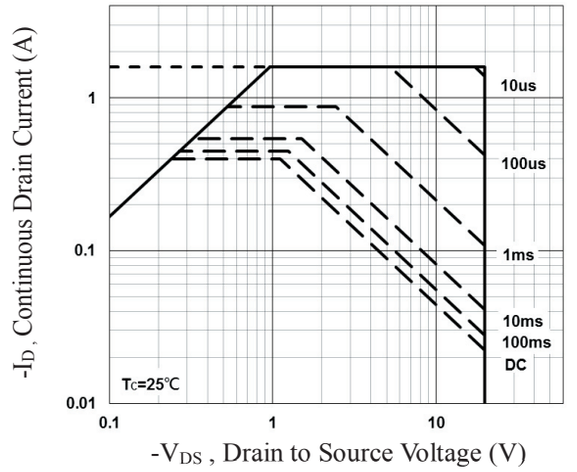


Fig.6 Maximum Safe Operation Area

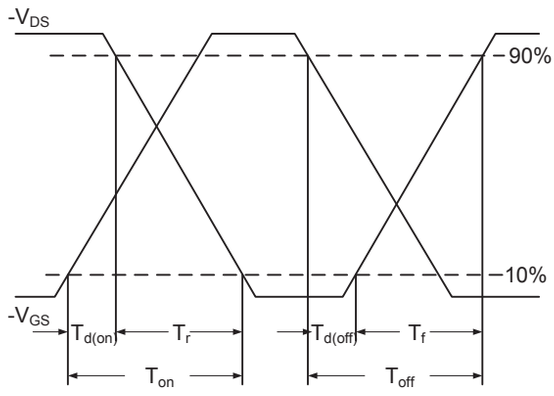


Fig.7 Switching Time Waveform

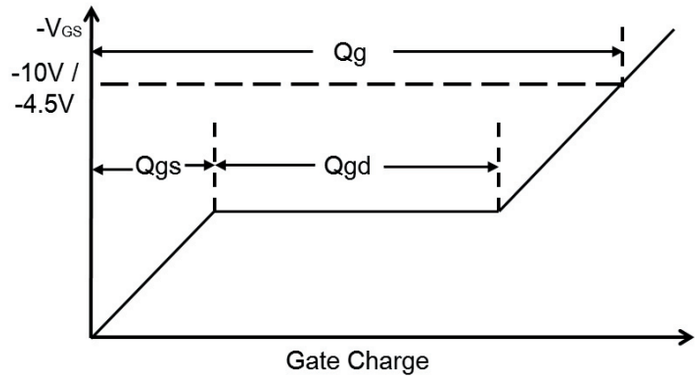


Fig.8 Gate Charge Waveform