Single P-channel MOSFET

ELM36401EA-S

■General description

ELM36401EA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance.

■Features

- Vds=-20V
- Id=-3A
- Rds(on) < 85mΩ (Vgs=-10V)
- Rds(on) < 118mΩ (Vgs=-4.5V)
- Rds(on) < 215mΩ (Vgs=-2.5V)

■Maximum absolute ratings

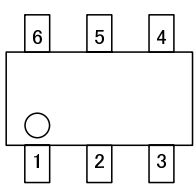
Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		Vds	-20	V	
Gate-source voltage		Vgs	±12	V	
Continuous drain current	Ta=25℃	Id	-3.0	A	
	Ta=70℃		-1.4		
Pulsed drain current		Idm	-10	A	3
Power dissipation	Ta=25℃	Pd	1.25	W	
	Ta=70℃		0.80		
Junction and storage temperature range		Tj, Tstg	-55 to 150	℃	

■Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-ambient	Steady-state	Rθja		166	℃/W	

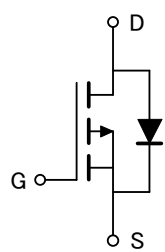
■Pin configuration

SOT-26 (TOP VIEW)



Pin No.	Pin name
1	DRAIN
2	DRAIN
3	GATE
4	SOURCE
5	DRAIN
6	DRAIN

■Circuit



■Electrical characteristics

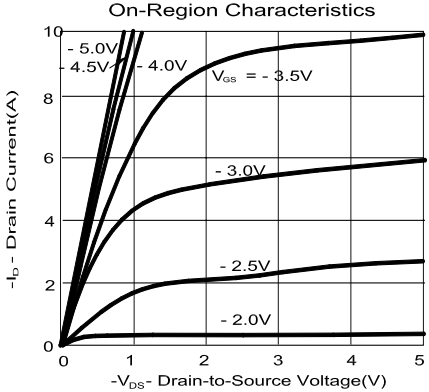
Ta=25℃

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-20			V	
Zero gate voltage drain current	Idss	Vds=-16V, Vgs=0V			-1	μA	
		Vds=-16V, Vgs=0V, Tj=125℃			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-0.45	-0.80	-1.20	V	
On state drain current	Id(on)	Vgs=-4.5V, Vds=-5V	-6			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-2A		72	85	mΩ	1
		Vgs=-4.5V, Id=-2A		98	118	mΩ	
		Vgs=-2.5V, Id=-1A		150	215	mΩ	
Forward transconductance	Gfs	Vds=-5V, Id=-2A		16		S	1
Diode forward voltage	Vsd	Is=-1A, Vgs=0V			-1.2	V	1
Max. body-diode continuous current	Is				-1.6	A	
Pulsed body-diode current	Ism				-3	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-6V, f=1MHz		430		pF	
Output capacitance	Coss			235		pF	
Reverse transfer capacitance	Crss			95		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-4.5V, Vds=-10V Id=-2A		7.6	10.0	nC	2
Gate-source charge	Qgs			3.2		nC	2
Gate-drain charge	Qgd			2.0		nC	2
Turn-on delay time	td(on)	Vgs=-4.5V, Vds=-10V Id≅-1A, Rgen=6Ω		11	22	ns	2
Turn-on rise time	tr			32	55	ns	2
Turn-off delay time	td(off)			38	68	ns	2
Turn-off fall time	tf			32	55	ns	2

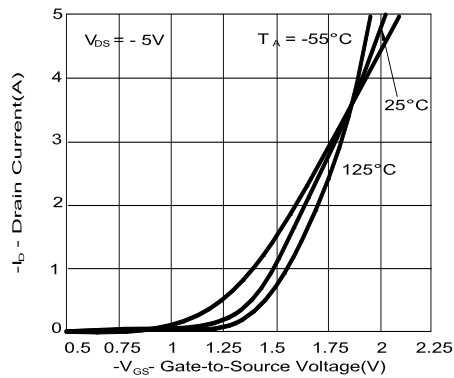
NOTE :
1. Pulsed width≤300μsec and Duty cycle≤2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

■Typical electrical and thermal characteristics

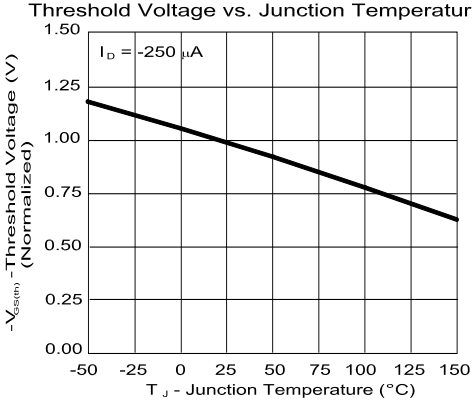
On-Region Characteristics



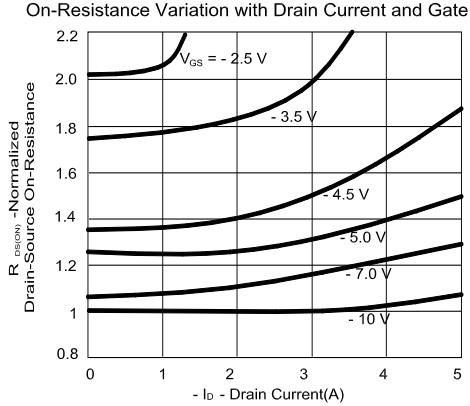
Transfer Characteristics



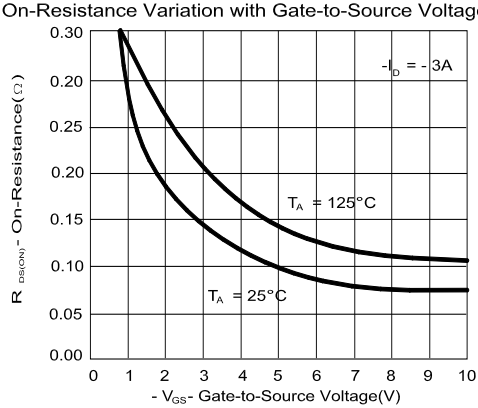
Threshold Voltage vs. Junction Temperature



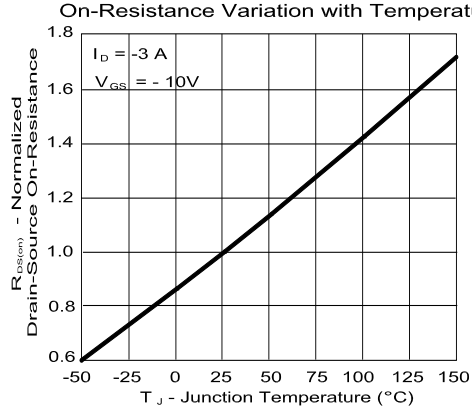
On-Resistance Variation with Drain Current and Gate Voltage



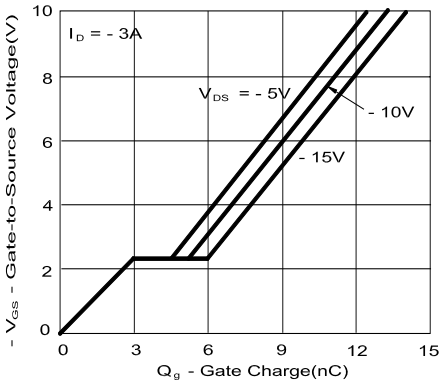
On-Resistance Variation with Gate-to-Source Voltage



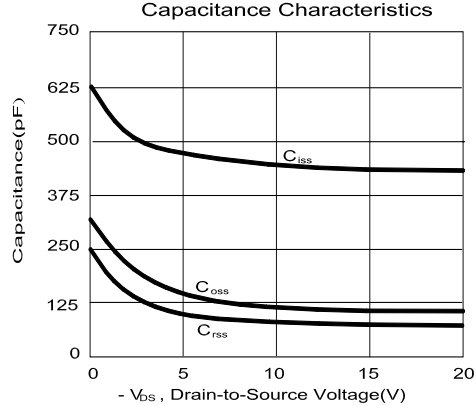
On-Resistance Variation with Temperature



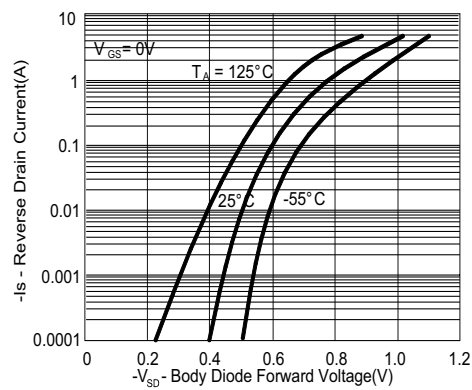
Gate Charge Characteristics



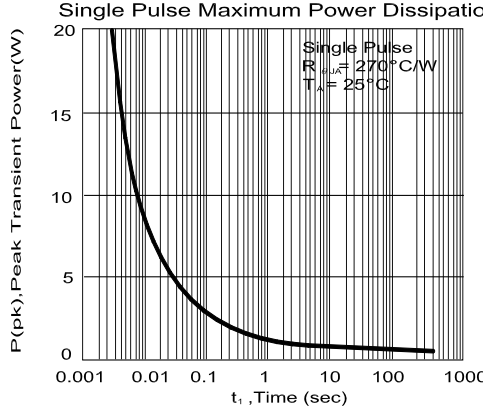
Capacitance Characteristics



Body Diode Forward Voltage Variation with Source Current and Temperature



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve