Single N-channel MOSFET

ELM33400CA-S

■General description

ELM33400CA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance.

■Features

- Vds=30V
- Id=6A
- Rds(on) < 28mΩ (Vgs=10V)
- Rds(on) < 32mΩ (Vgs=4.5V)
- Rds(on) < 52mΩ (Vgs=2.5V)

■Maximum absolute ratings

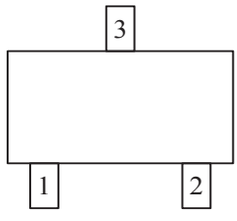
Parameter		Symbol	Limit	Unit	Note
Gate-source voltage		Vgs	±12	V	
Continuous drain current	Ta=25°C	Id	6	A	
	Ta=70°C		5		
Pulsed drain current		Idm	30	A	3
Power dissipation	Ta=25°C	Pd	1.25	W	
	Ta=70°C		0.80		
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C	

■Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-ambient	Steady-state	Rθja	75	100	°C/W	

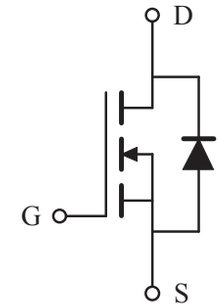
■Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit



■Electrical characteristics

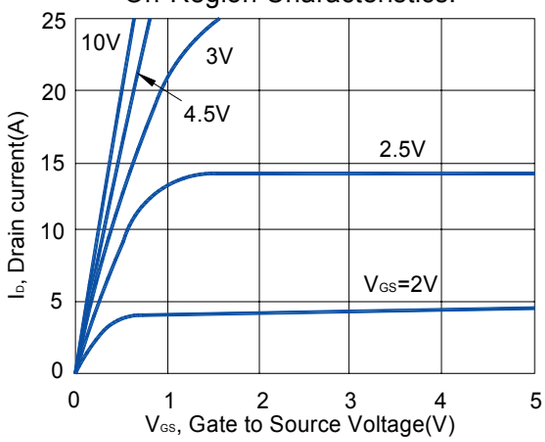
Ta=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	30			V	
Zero gate voltage drain current	Idss	Vds=24V, Vgs=0V			1	μA	
		Vds=20V, Vgs=0V, Tj=70°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.7	1.1	1.4	V	
On state drain current	Id(on)	Vgs=4.5V, Vds=5V	30			A	1
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=6A		23	28	mΩ	1
		Vgs=4.5V, Id=5A		27	32	mΩ	
		Vgs=2.5V, Id=4A		43	52	mΩ	
Forward transconductance	Gfs	Vds=5V, Id=5A		15		S	1
Diode forward voltage	Vsd	If=Is, Vgs=0V			1.3	V	1
Max. body-diode continuous current	Is				1.3	A	
Pulsed body-diode current	Ism				30	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=10V, f=1MHz		740		pF	
Output capacitance	Coss			90		pF	
Reverse transfer capacitance	Crss			66		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=15V, Id=5A		8.0	12.0	nC	2
Gate-source charge	Qgs			3.6		nC	2
Gate-drain charge	Qgd			2.0		nC	2
Turn-on delay time	td(on)	Vgs=4.5V, Vds=10V, Id≈1A Rgen=0.2Ω		8	14	ns	2
Turn-on rise time	tr			6	12	ns	2
Turn-off delay time	td(off)			19	45	ns	2
Turn-off fall time	tf			7	23	ns	2

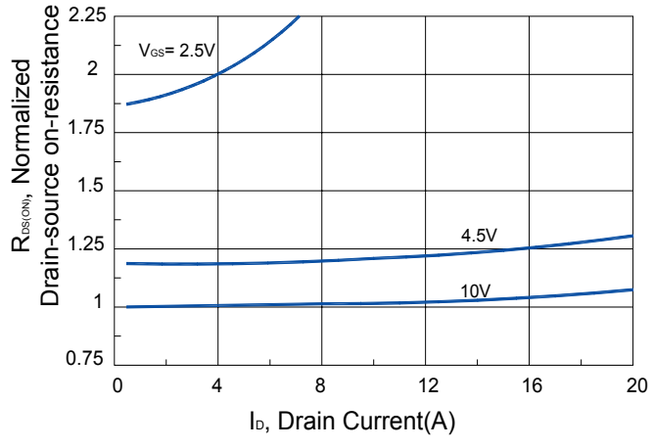
NOTE :
1. Pulse test : Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

■Typical electrical and thermal characteristics

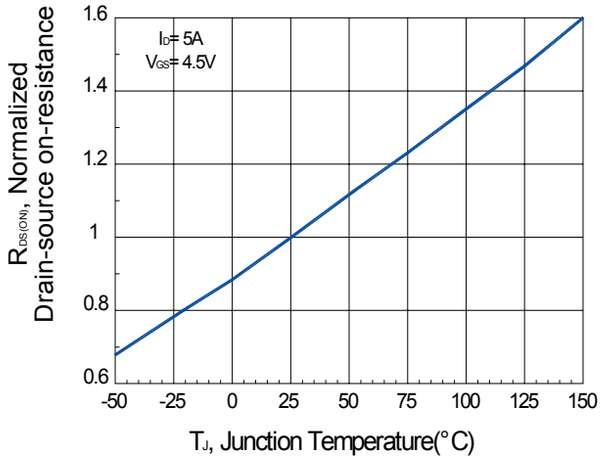
On-Region Characteristics.



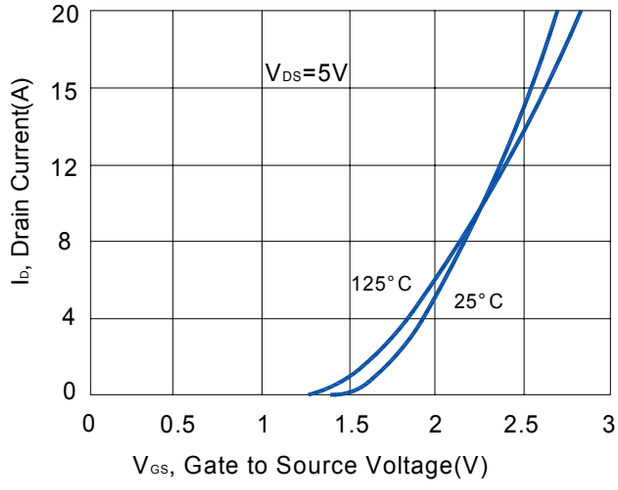
On-Resistance Variation with Drain Current and Gate Voltage.



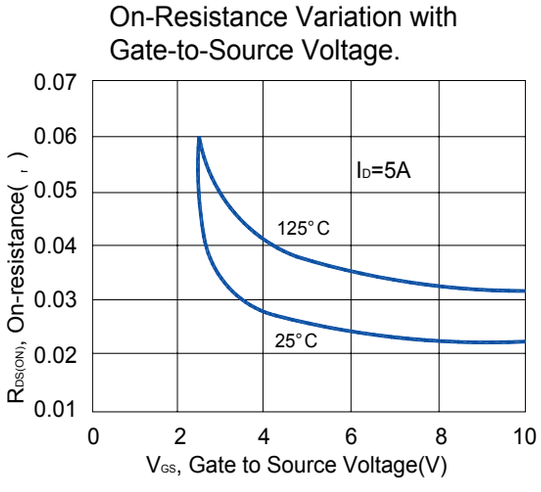
On-Resistance Variation with Temperature.



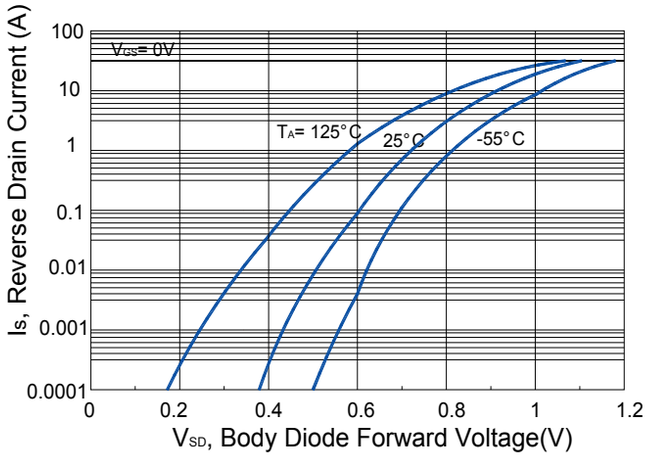
Transfer Characteristics.



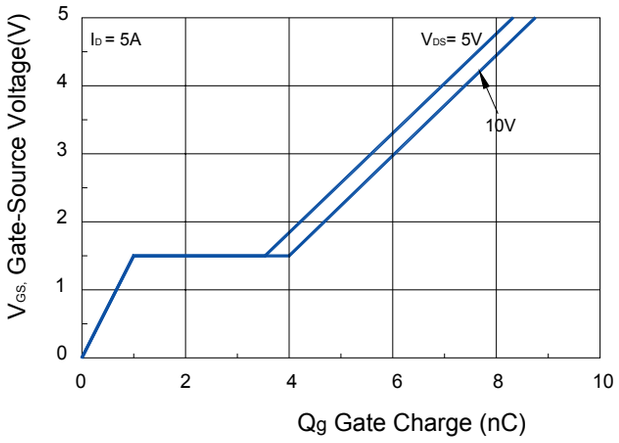
On-Resistance Variation with Gate-to-Source Voltage.



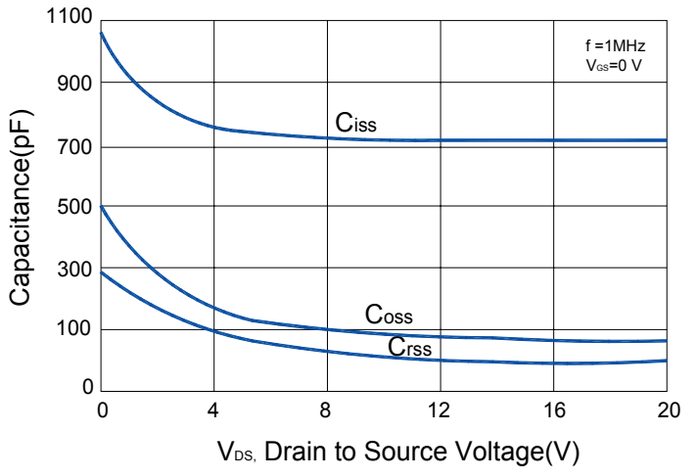
Body Diode Forword Voltage Variation with Source Current and Temperature.



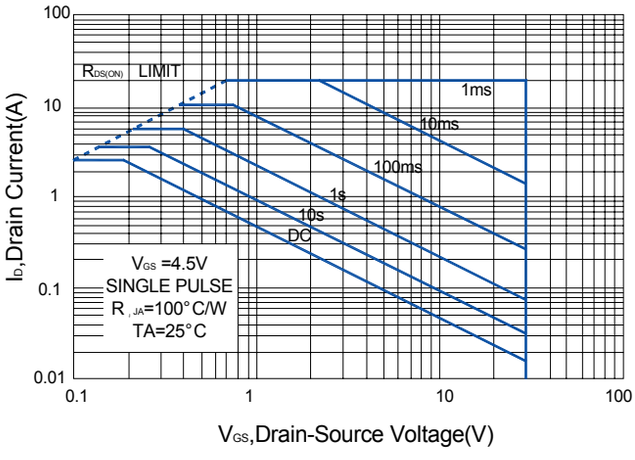
Gate-Charge Characteristics



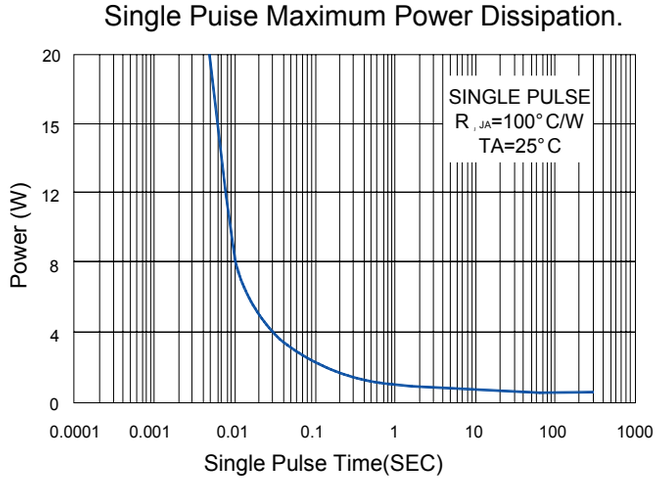
Capacitance Characteristics



Maxmum Safe Operating Area.



Single Puise Maximum Power Dissipation.



Transisent Thermal Response Curve.