Single N-channel MOSFET

ELM33404CA-S

■General description

ELM33404CA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance.

■Features

- Vds=30V
- Id=3A
- Rds(on) < 85mΩ (Vgs=10V)
- Rds(on) < 115mΩ (Vgs=4.5V)

■Maximum absolute ratings

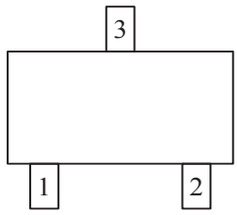
Parameter		Symbol	Limit	Unit	Note
Gate-source voltage		Vgs	±20	V	
Continuous drain current	Ta=25°C	Id	3	A	
	Ta=100°C		2		
Pulsed drain current		Idm	20	A	3
Power dissipation	Ta=25°C	Pd	0.6	W	
	Ta=100°C		0.5		
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C	

■Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	Steady-state	Rθjc		65	°C/W	
Maximum junction-to-ambient	Steady-state	Rθja		230	°C/W	

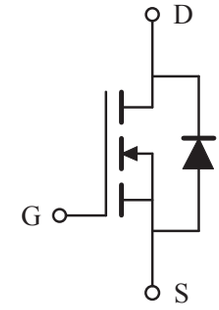
■Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit



■Electrical characteristics

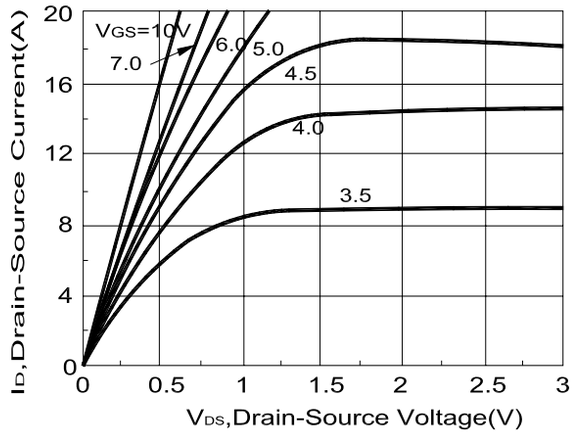
Ta=25°C

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=125°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.8	1.2	2.5	V	
On state drain current	Id(on)	Vgs=10V, Vds=10V	3			A	1
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=3A		48	85	mΩ	1
		Vgs=4.5V, Id=1.5A		70	115	mΩ	
Forward transconductance	Gfs	Vds=15V, Id=3A		16		S	1
Diode forward voltage	Vsd	If=Is, Vgs=0V			1.5	V	1
Max. body-diode continuous current	Is				2.3	A	
Pulsed body-diode current	Ism				4.6	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=15V, f=1MHz		450		pF	
Output capacitance	Coss			200		pF	
Reverse transfer capacitance	Crss			60		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=10V, Vds=15V, Id=3A		15.0		nC	2
Gate-source charge	Qgs			2.0		nC	2
Gate-drain charge	Qgd			7.0		nC	2
Turn-on delay time	td(on)	Vgs=10V, Vds=15V, Id≈3A Rl=1Ω, Rgen=2.5Ω		6.0		ns	2
Turn-on rise time	tr			6.0		ns	2
Turn-off delay time	td(off)			20.0		ns	2
Turn-off fall time	tf			5.0		ns	2

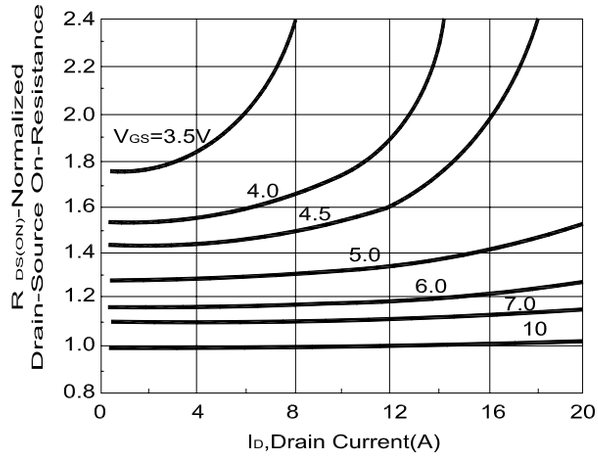
NOTE :
1. Pulse test : Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

■Typical electrical and thermal characteristics

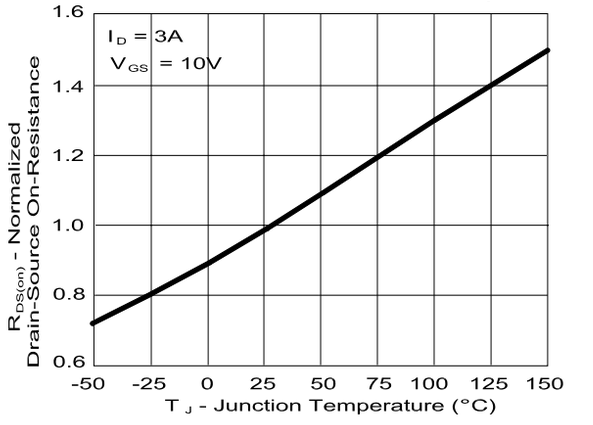
On-Region Characteristics.



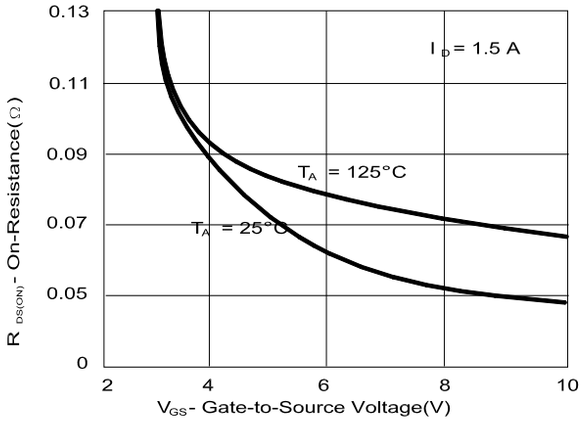
On-Resistance Variation with Drain Current and Gate Voltage.



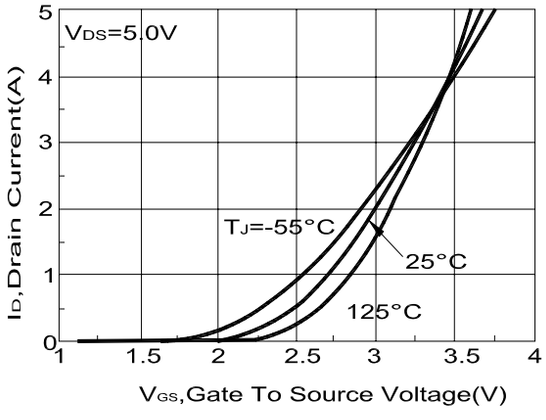
On-Resistance Variation with Temperature



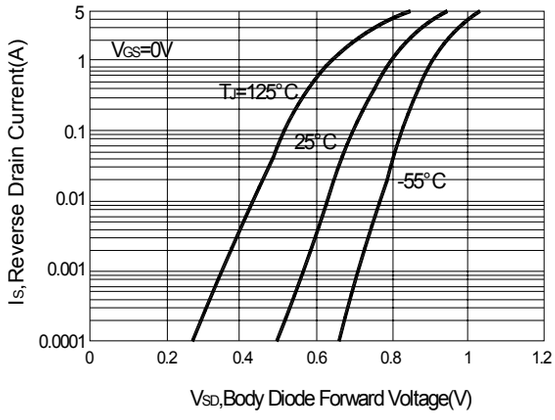
On-Resistance Variation with Gate-to-Source Voltage



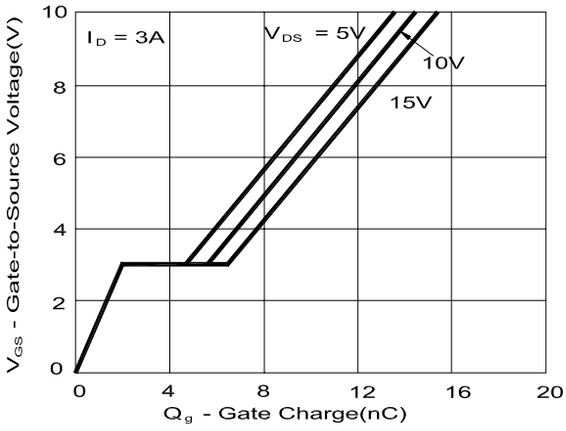
Transfer Characteristics.



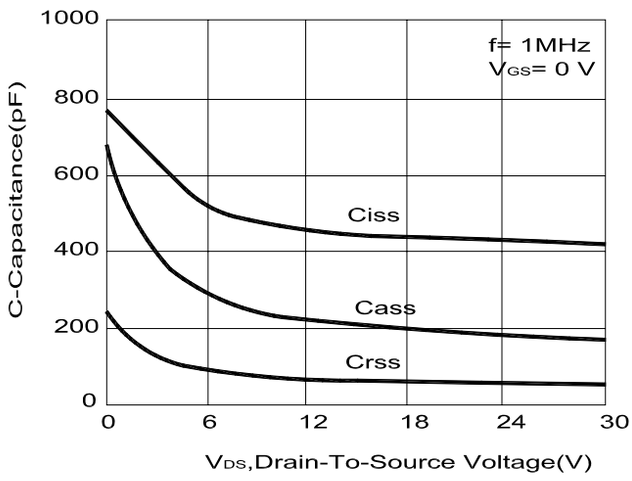
Body Diode Forward Voltage Variation with Source Current and Temperature.



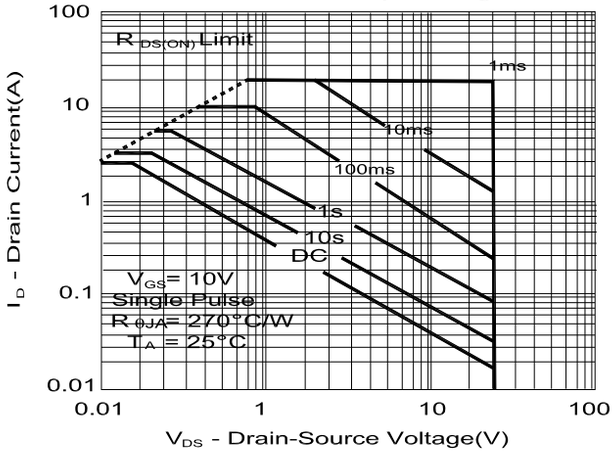
Gate Charge Characteristics



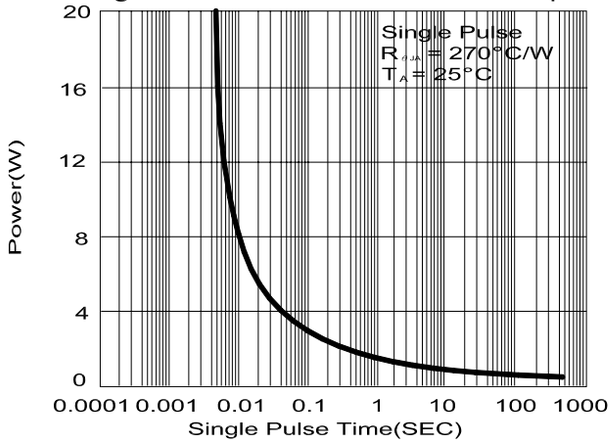
Capacitance Characteristics.



Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve