Single N-channel MOSFET

ELM33402CA-S

■General description

ELM33402CA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance.

■Features

- Vds=20V
- Id=3A
- Rds(on) < 75mΩ (Vgs=4.5V)
- Rds(on) < 105mΩ (Vgs=2.5V)

■Maximum absolute ratings

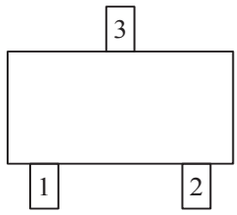
Parameter		Symbol	Limit	Unit	Note
Gate-source voltage		Vgs	±12	V	
Continuous drain current	Ta=25°C	Id	3	A	
	Ta=100°C		2		
Pulsed drain current		Idm	20	A	3
Power dissipation	Ta=25°C	Pd	0.6	W	
	Ta=100°C		0.5		
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C	

■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	

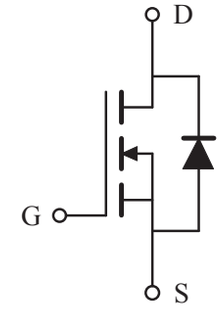
■Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit



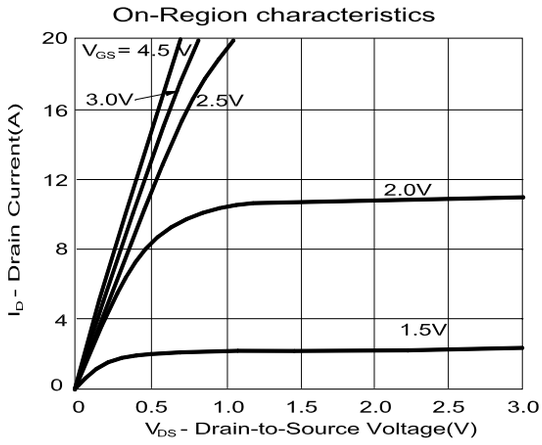
■Electrical characteristics

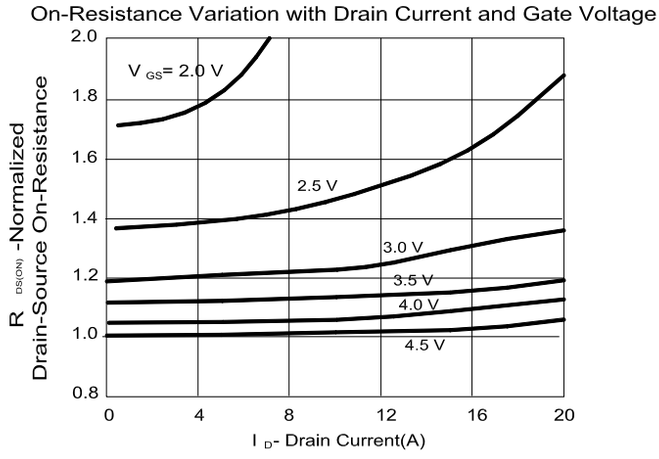
Ta=25°C

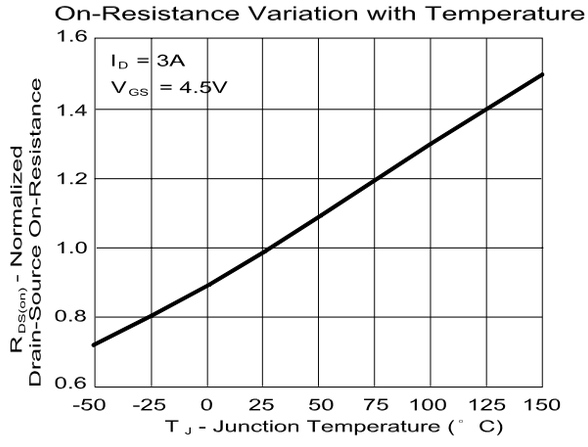
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	20			V	
Zero gate voltage drain current	Idss	Vds=16V, Vgs=0V			1	μA	
		Vds=16V, Vgs=0V, Tj=125°C			10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.45	0.75	1.20	V	
On state drain current	Id(on)	Vgs=10V, Vds=10V	3			A	1
Static drain-source on-resistance	Rds(on)	Vgs=4.5V, Id=3A		50	75	mΩ	1
		Vgs=2.5V, Id=1.5A		70	105	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=10V, 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≈1A 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

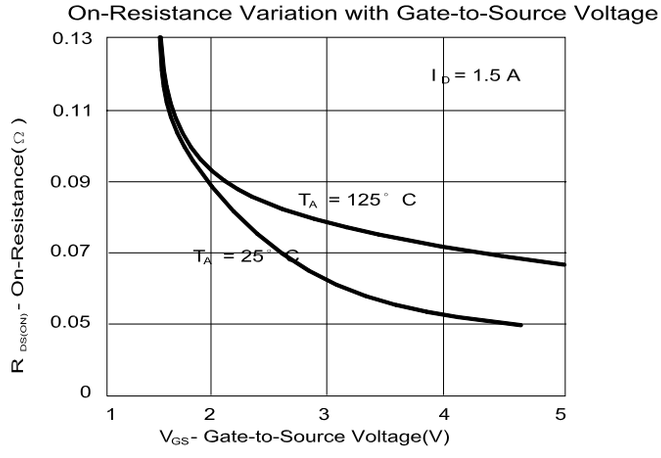
NOTE :
1. Pulse test : Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

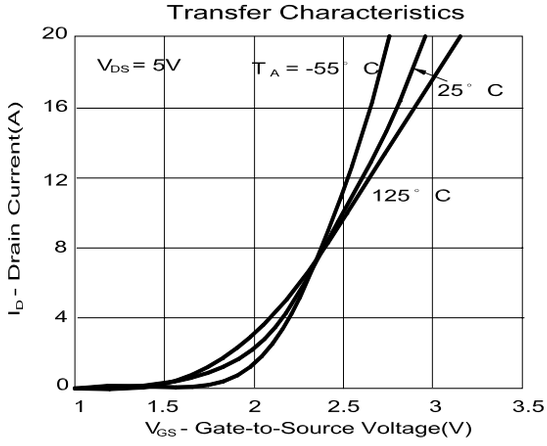
■Typical electrical and thermal characteristics

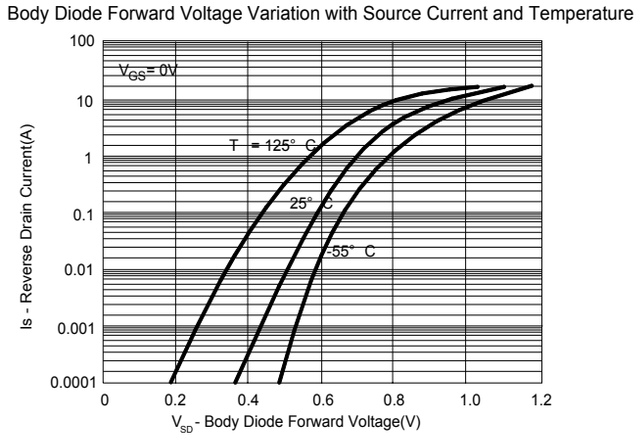




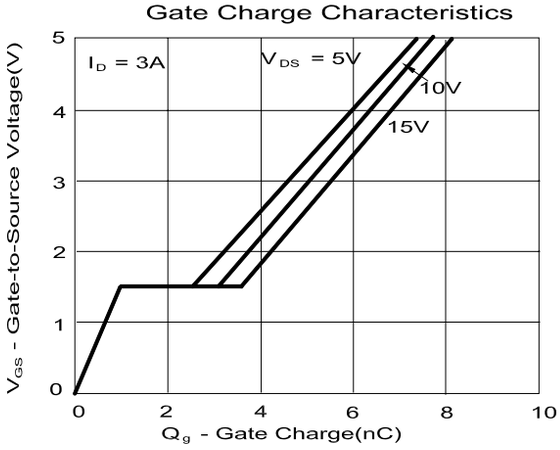




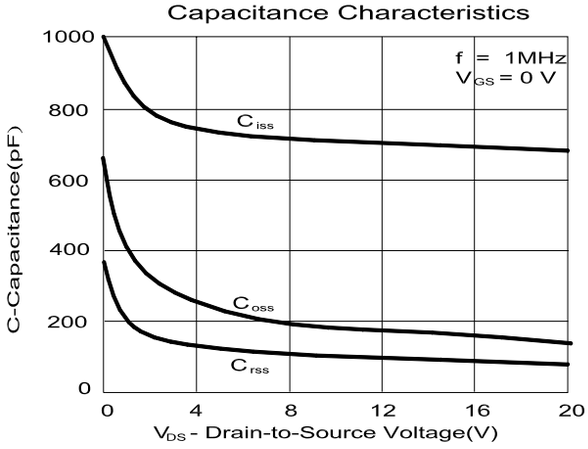




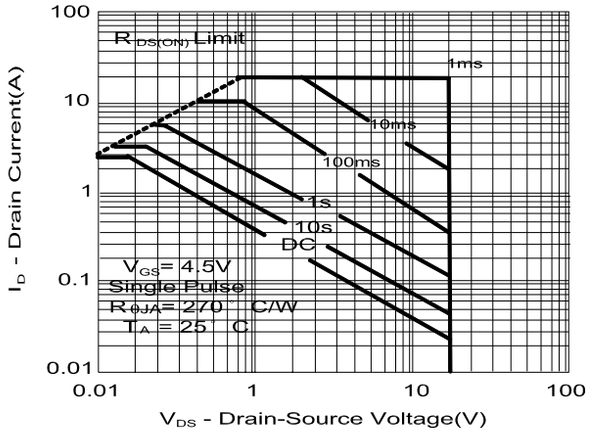
Gate Charge Characteristics



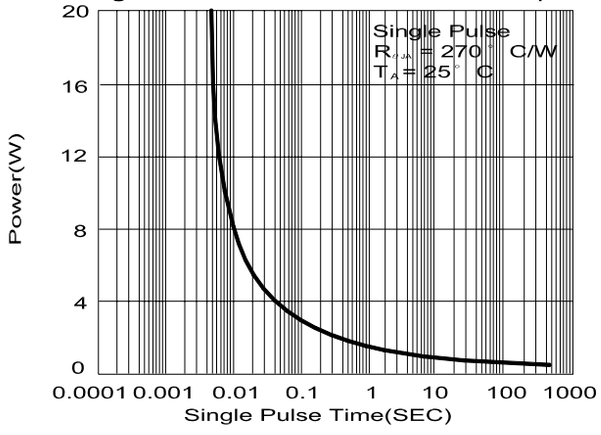
Capacitance Characteristics



Maximum Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve