

Single P-channel MOSFET

ELM33411CA-S

■ General description

ELM33411CA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

■ Features

- $V_{ds} = -20V$
- $I_d = -3A$
- $R_{ds(on)} < 100m\Omega$ ($V_{gs} = -4.5V$)
- $R_{ds(on)} < 140m\Omega$ ($V_{gs} = -2.5V$)
- $R_{ds(on)} < 240m\Omega$ ($V_{gs} = -1.8V$)

■ Maximum absolute ratings

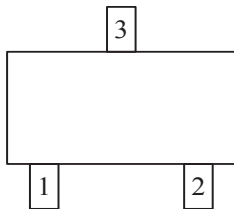
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	V_{ds}	-20	V	
Gate-source voltage	V_{gs}	± 12	V	
Continuous drain current	I_d	$T_a = 25^\circ C$	-3.0	A
		$T_a = 70^\circ C$	-2.4	
Pulsed drain current	I_{dm}	-10	A	3
Power dissipation	P_d	$T_a = 25^\circ C$	1.00	W
		$T_a = 70^\circ C$	0.64	
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	$^\circ C$	

■ Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-ambient	$R\theta_{ja}$		125	$^\circ C/W$	

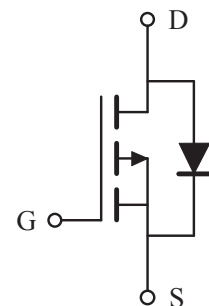
■ Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■ Circuit



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■Electrical characteristics

Ta=25°C

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°C			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-0.7	-0.8	-1.2	V	
On state drain current	Id(on)	Vgs=-4.5V, Vds=-5V	-10			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-4.5V, Id=-3A		84	100	mΩ	1
		Vgs=-2.5V, Id=-2.5A		116	140		
		Vgs=-1.8V, Id=-1A		185	240		
Forward transconductance	Gfs	Vds=-5V, Id=-3A		7		S	1
Diode forward voltage	Vsd	If=-1A, Vgs=0V			-1.2	V	1
Max. body-diode continuous current	Is				-1.6	A	
DYNAMIC PARAMETERS							
Input capacitance	Ciss			540		pF	
Output capacitance	Coss	Vgs=0V, Vds=-10V, f=1MHz		75		pF	
Reverse transfer capacitance	Crss			50		pF	
Gate resistance	Rg	Vgs=15mV, Vds=0V, f=1MHz		4.5		Ω	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-4.5V, Vds=-10V Id=-3A		6.2		nC	2
Gate-source charge	Qgs			0.6		nC	2
Gate-drain charge	Qgd			1.6		nC	2
Turn-on delay time	td(on)	Vgs=-4.5V, Vds=-10V Id≈-1A, Rgen=6Ω		11		ns	2
Turn-on rise time	tr			15		ns	2
Turn-off delay time	td(off)			50		ns	2
Turn-off fall time	tf			24		ns	2

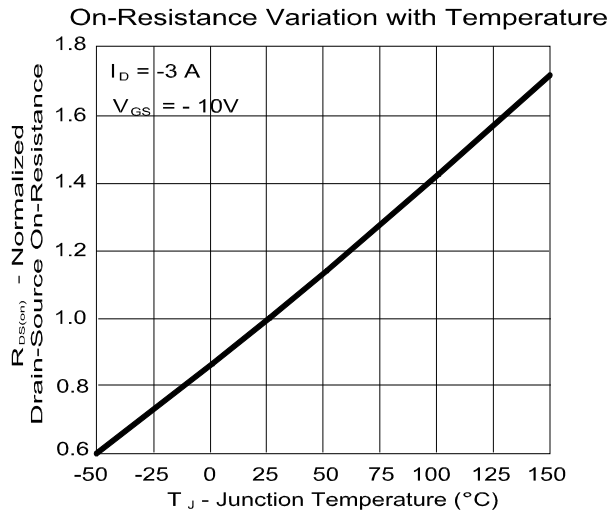
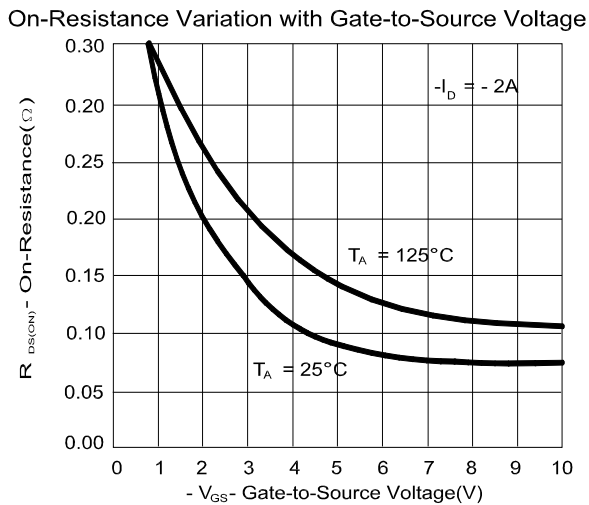
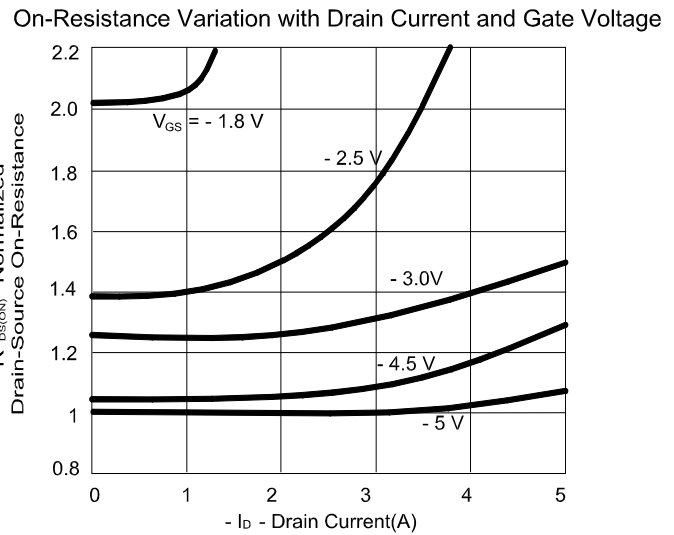
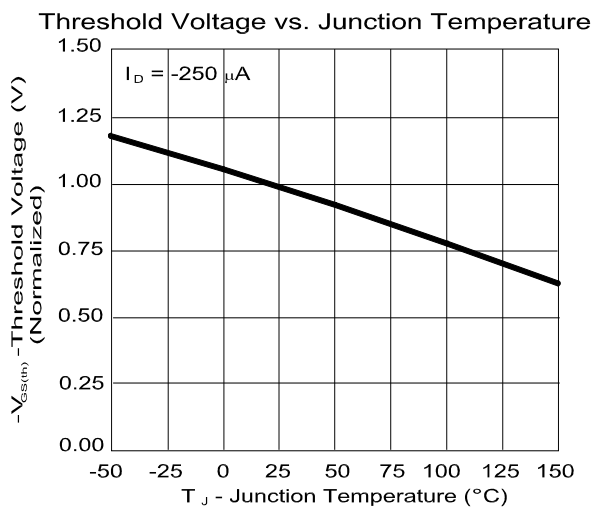
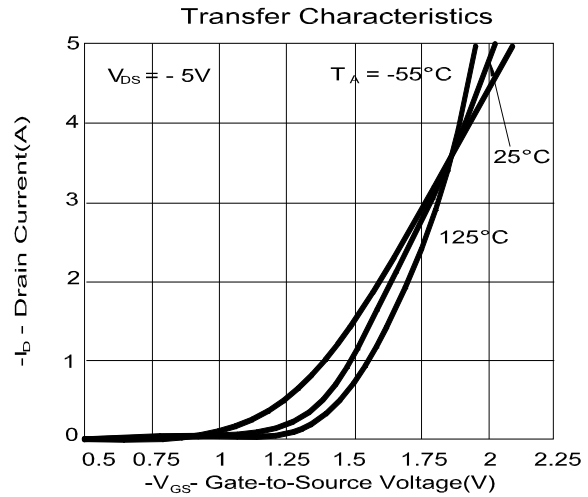
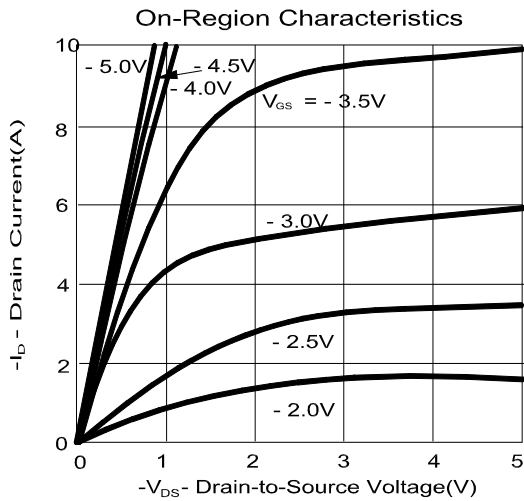
NOTE :

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%.

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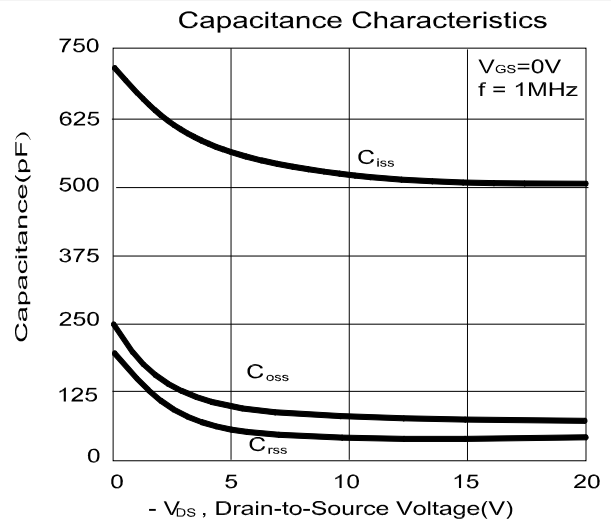
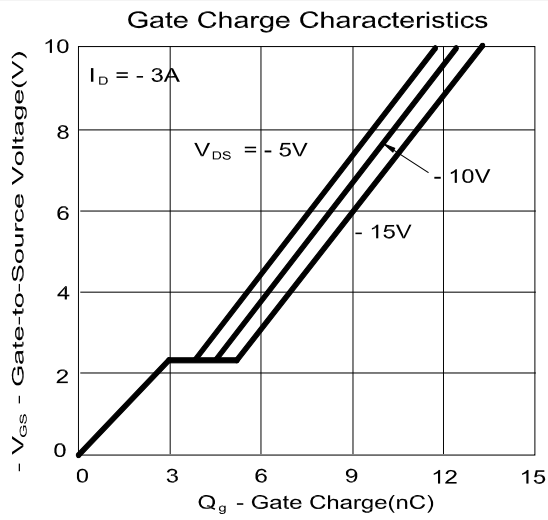
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■ Typical electrical and thermal characteristics

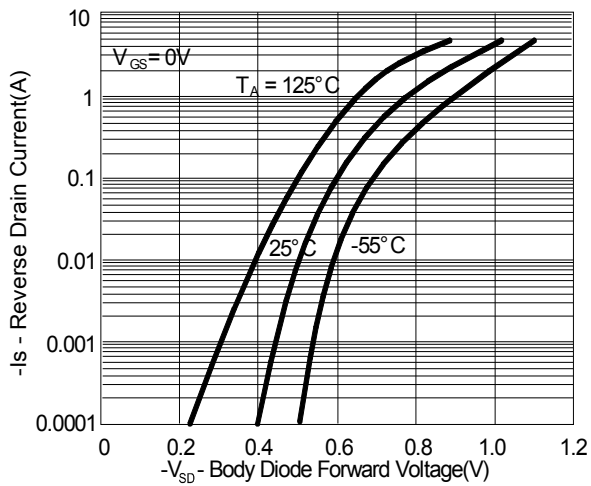


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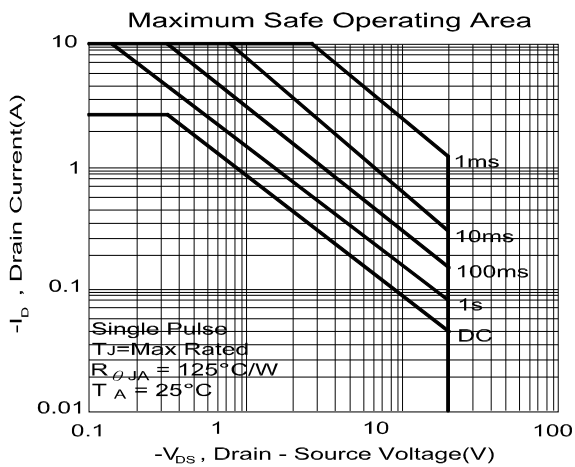
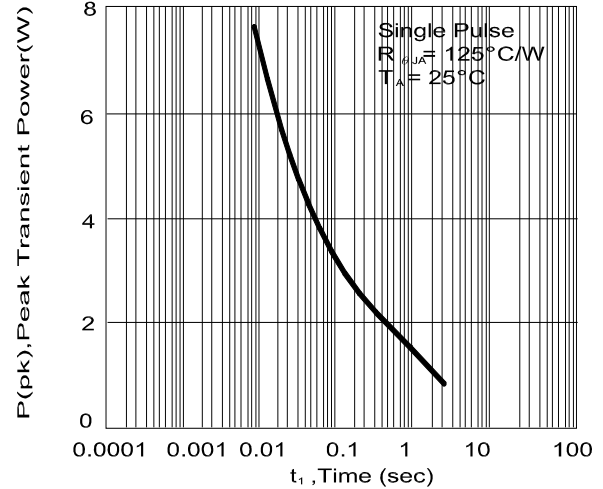
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Body Diode Forward Voltage Variation with Source Current and Temperature



Single Pulse Maximum Power Dissipation



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Transient Thermal Response Curve

