

Single N-channel MOSFET

ELM33410CA-S

General description

ELM33410CA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds}=20V$
- $I_d=5A$
- $R_{ds(on)} < 32m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} < 50m\Omega$ ($V_{gs}=2.5V$)
- $R_{ds(on)} < 80m\Omega$ ($V_{gs}=1.8V$)

Maximum absolute ratings

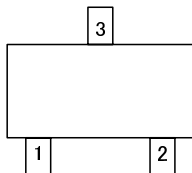
Parameter	Symbol	Limit	Unit	Note
Gate-source voltage	V_{gs}	± 12	V	
Continuous drain current	I_d	5	A	
		4		
Pulsed drain current	I_{dm}	30	A	3
Power dissipation	P_d	1.25	W	
		0.80		
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	$^{\circ}C$	

Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-ambient	Steady-state	$R\theta_{ja}$	75	100	$^{\circ}C/W$	

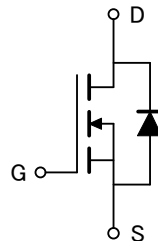
Pin configuration

SOT-23 (TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

Circuit



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Electrical characteristics

T_a=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BV _{dss}	I _d =250 μA, V _{gs} =0V	20			V	
Zero gate voltage drain current	I _{dss}	V _{ds} =16V, V _{gs} =0V			1	μA	
		V _{ds} =16V, V _{gs} =0V, T _j =70°C			10		
Gate-body leakage current	I _{gss}	V _{ds} =0V, V _{gs} =±12V			±100	nA	
Gate threshold voltage	V _{gs(th)}	V _{ds} =V _{gs} , I _d =250 μA	0.45	0.75	1.20	V	
On state drain current	I _{d(on)}	V _{gs} =4.5V, V _{ds} =5V	30			A	1
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =4.5V, I _d =5A		27	32	mΩ	1
		V _{gs} =2.5V, I _d =4A		38	50	mΩ	
		V _{gs} =1.8V, I _d =2A		57	80	mΩ	
Forward transconductance	G _{fs}	V _{ds} =5V, I _d =5A		12		S	1
Diode forward voltage	V _{sd}	I _f =I _s , V _{gs} =0V			1.3	V	1
Max. body-diode continuous current	I _s				1.3	A	
Pulsed body-diode current	I _{sm}				30	A	3
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =10V, f=1MHz		740		pF	
Output capacitance	C _{oss}			90		pF	
Reverse transfer capacitance	C _{rss}			66		pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =4.5V, V _{ds} =10V, I _d =5A		8.0	12.0	nC	2
Gate-source charge	Q _{gs}			3.6		nC	2
Gate-drain charge	Q _{gd}			2.0		nC	2
Turn-on delay time	t _{d(on)}	V _{gs} =4.5V, V _{ds} =10V, I _d ≈ 1A R _{gen} =0.2 Ω		8	14	ns	2
Turn-on rise time	t _r			6	12	ns	2
Turn-off delay time	t _{d(off)}			19	45	ns	2
Turn-off fall time	t _f			7	23	ns	2

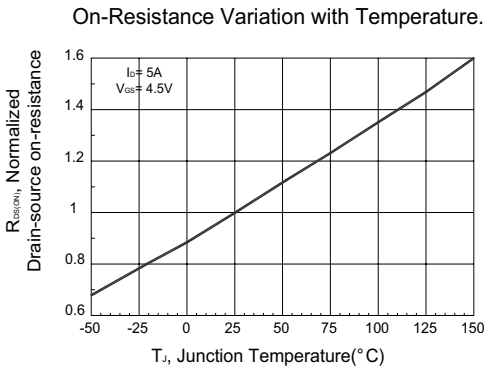
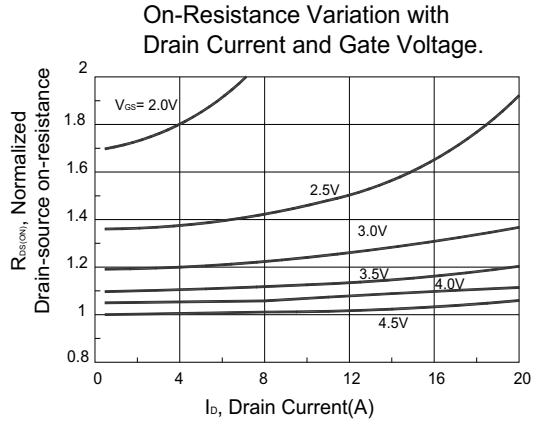
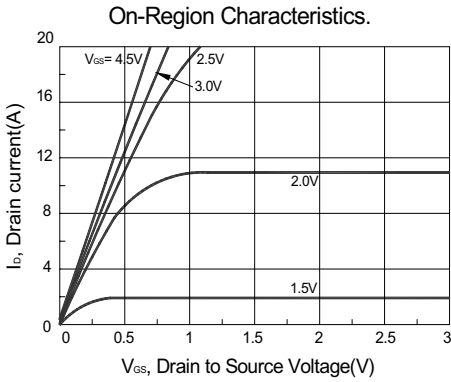
NOTE :

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

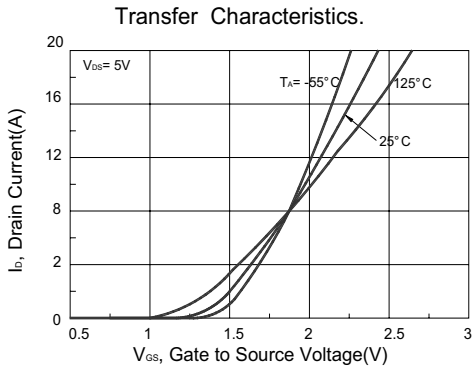
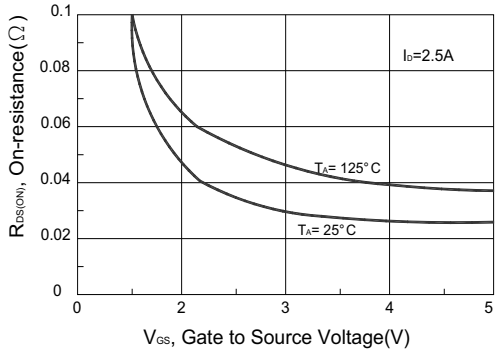
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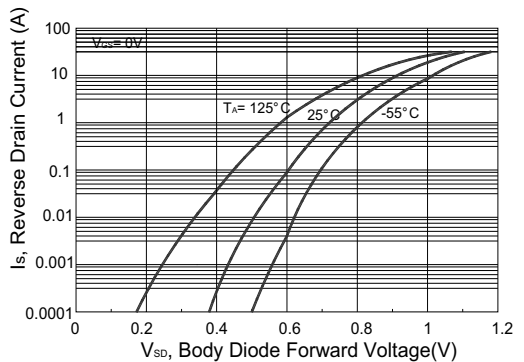
Typical electrical and thermal characteristics



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



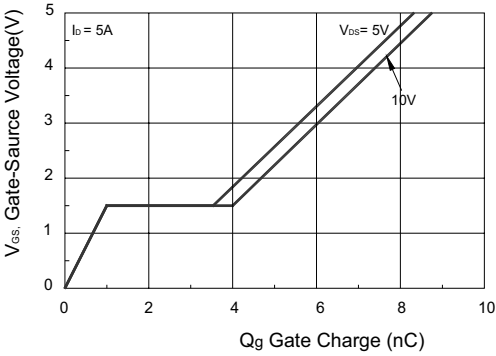
Body Diode Forward Voltage Variation with Source Current and Temperature.



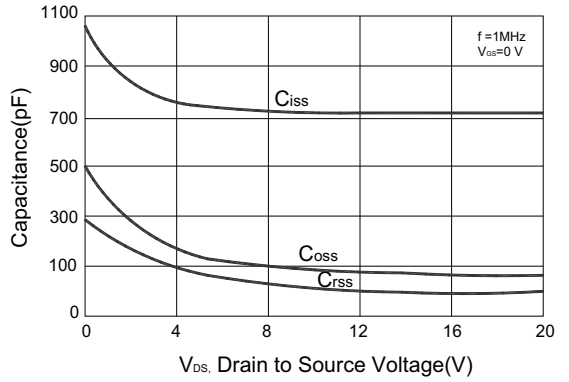
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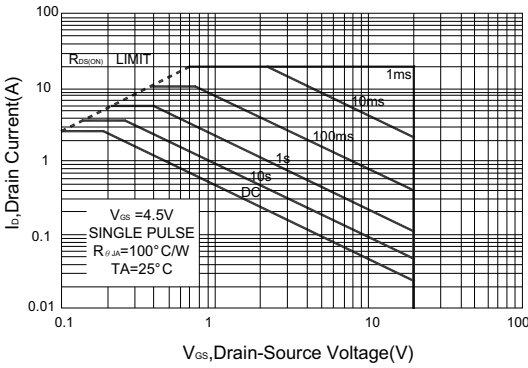
Gate-Charge Characteristics



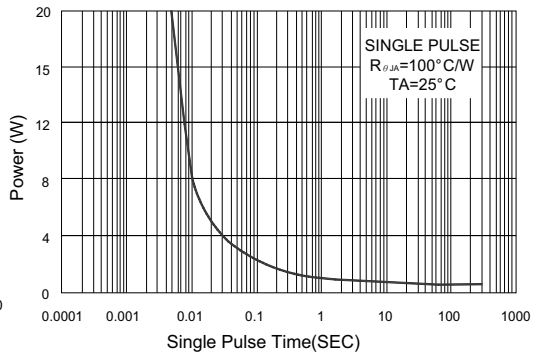
Capacitance Characteristics



Maximum Safe Operating Area.



Single Pulse Maximum Power Dissipation.



Transient Thermal Response Curve.

