

Single N-channel MOSFET

ELM33404CA-S

General description

ELM33404CA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds}=30V$
- $I_d=3A$
- $R_{ds(on)} < 85m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 115m\Omega$ ($V_{gs}=4.5V$)

Maximum absolute ratings

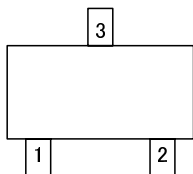
Parameter	Symbol	Limit	Unit	Note
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	3	A	
		2		
Pulsed drain current	I_{dm}	20	A	3
Power dissipation	P_d	0.6	W	
		0.5		
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	$^{\circ}C$	

Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	Steady-state	$R\theta_{jc}$		65	$^{\circ}C/W$	
Maximum junction-to-ambient	Steady-state	$R\theta_{ja}$		230	$^{\circ}C/W$	

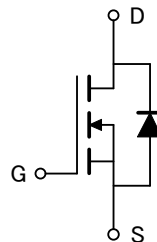
Pin configuration

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	30			V	
Zero gate voltage drain current	I _{dss}	V _{ds} =24V, V _{gs} =0V			1	μA	
		V _{ds} =20V, V _{gs} =0V, T _j =125°C			10		
Gate-body leakage current	I _{gss}	V _{ds} =0V, V _{gs} =±20V			±100	nA	
Gate threshold voltage	V _{gs(th)}	V _{ds} =V _{gs} , I _d =250 μA	0.8	1.2	2.5	V	
On state drain current	I _{d(on)}	V _{gs} =10V, V _{ds} =10V	3			A	1
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =3A		48	85	mΩ	1
		V _{gs} =4.5V, I _d =1.5A		70	115	mΩ	
Forward transconductance	G _{fs}	V _{ds} =15V, I _d =3A		16		S	1
Diode forward voltage	V _{sd}	I _f =I _s , V _{gs} =0V			1.5	V	1
Max. body-diode continuous current	I _s				2.3	A	
Pulsed body-diode current	I _{sm}				4.6	A	3
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =15V, f=1MHz		450		pF	
Output capacitance	C _{oss}			200		pF	
Reverse transfer capacitance	C _{rss}			60		pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =10V, V _{ds} =15V, I _d =3A		15.0		nC	2
Gate-source charge	Q _{gs}			2.0		nC	2
Gate-drain charge	Q _{gd}			7.0		nC	2
Turn-on delay time	t _{d(on)}	V _{gs} =10V, V _{ds} =15V, I _d ≈ 3A R _l =1 Ω, R _{gen} =2.5 Ω		6.0		ns	2
Turn-on rise time	t _r			6.0		ns	2
Turn-off delay time	t _{d(off)}			20.0		ns	2
Turn-off fall time	t _f			5.0		ns	2

NOTE :

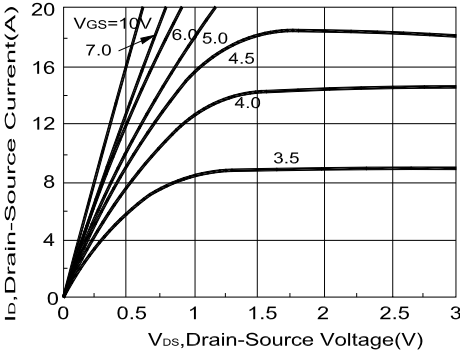
1. Pulse test : Pulsed width ≤ 300 μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.
4. Duty cycle ≤ 1%.

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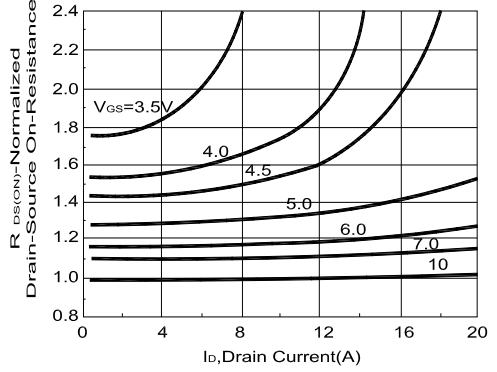
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Typical electrical and thermal characteristics

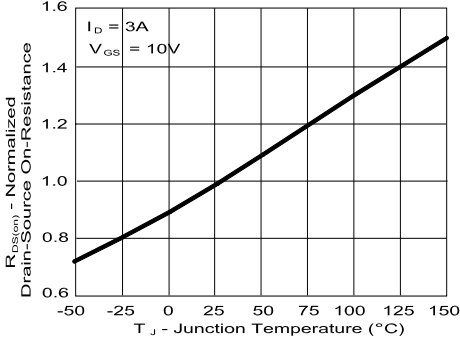
On-Region Characteristics.



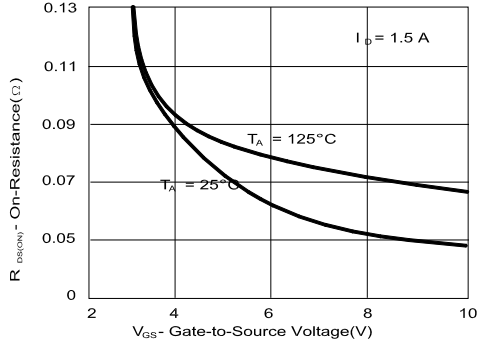
On-Resistance Variation with Drain Current and Gate Voltage.



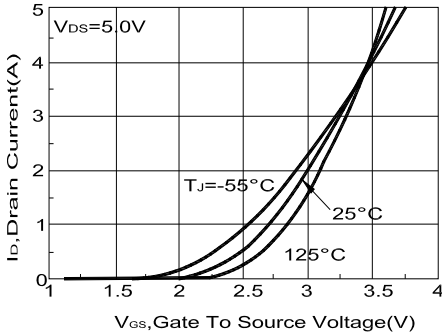
On-Resistance Variation with Temperature



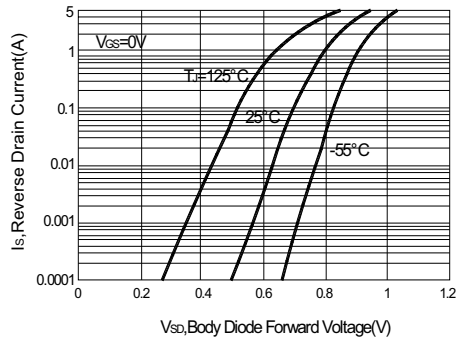
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics.



Body Diode Forward Voltage Variation with Source Current and Temperature.



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