

Single P-channel MOSFET

ELM333405CA-S

General description

ELM333405CA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds} = -30V$
- $I_d = -2A$
- $R_{ds(on)} < 150m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} < 250m\Omega$ ($V_{gs} = -4.5V$)

Maximum absolute ratings

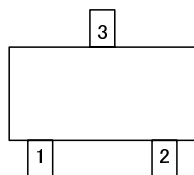
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	-30	V		
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current	I_d	$T_a = 25^\circ C$	-2.0	A	
		$T_a = 70^\circ C$	-1.4		
Pulsed drain current	I_{dm}	-10	A	3	
Power dissipation	P_d	$T_a = 25^\circ C$	1.25	W	
		$T_a = 70^\circ C$	0.80		
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	$R_{\theta ja}$		166	$^\circ C/W$	

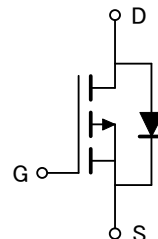
Pin configuration

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}	V _{gs} =0V, I _d =-250μA	-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 =-250μA	-1.0	-1.5	-2.5	V	
On state drain current	I _{d(on)}	V _{gs} =-10V, V _{ds} =-5V	-5			A	1
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =-10V, I _d =-2A		100	150	mΩ	1
		V _{gs} =-4.5V, I _d =-1A		180	250	mΩ	
Forward transconductance	G _{fs}	V _{ds} =-5V, I _d =-2A		16		S	1
Diode forward voltage	V _{sd}	I _s =-1A, V _{gs} =0V			-1.2	V	1
Max. body-diode continuous current	I _s				-1.6	A	
Pulsed body-diode current	I _{sm}				-3	A	3
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =-15V, f=1MHz		410		pF	
Output capacitance	C _{oss}			220		pF	
Reverse transfer capacitance	C _{rss}			85		pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =-10V, V _{ds} =-15V I _d =-2A		5.80	10.00	nC	2
Gate-source charge	Q _{gs}			0.85		nC	2
Gate-drain charge	Q _{gd}			1.70		nC	2
Turn-on delay time	t _{d(on)}	V _{gs} =-10V, V _{ds} =-15V I _d ≈ -1A, R _{gen} =6Ω		13		ns	2
Turn-on rise time	t _r			36		ns	2
Turn-off delay time	t _{d(off)}			42		ns	2
Turn-off fall time	t _f			34		ns	2

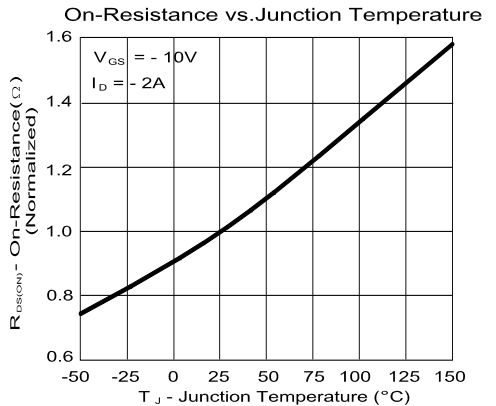
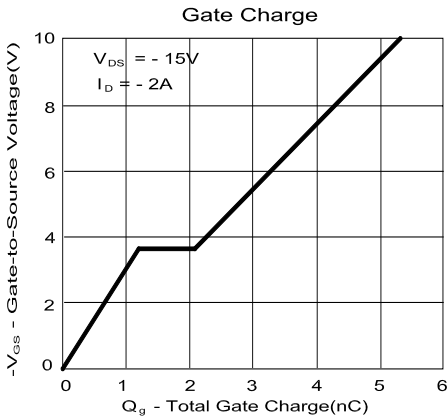
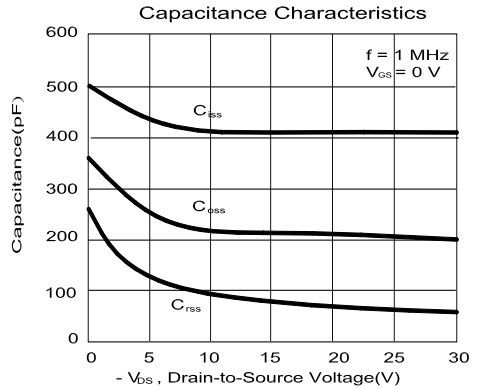
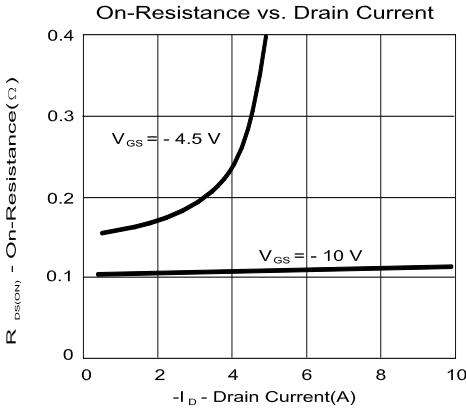
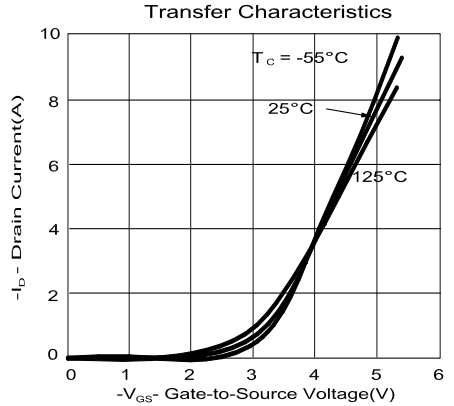
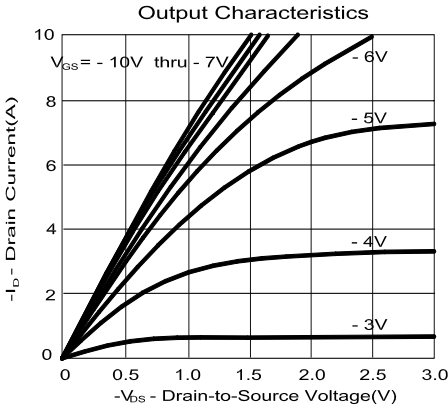
NOTE :

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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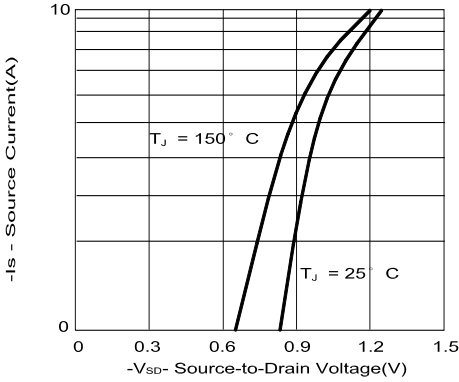
Typical electrical and thermal characteristics



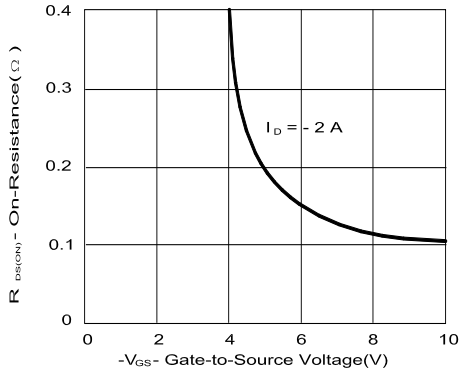
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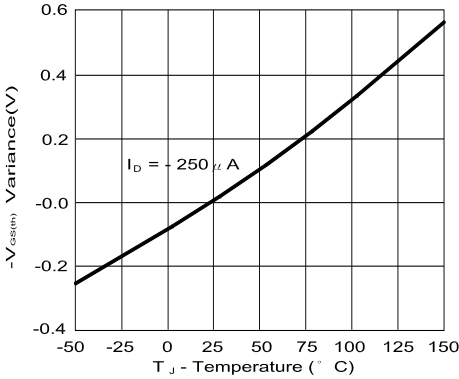
Source-Drain Diode Forward Voltage



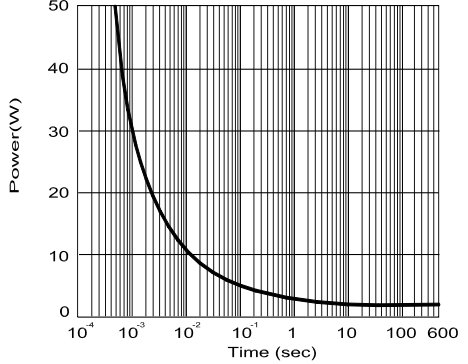
On-Resistance vs. Gate-to-Source Voltage



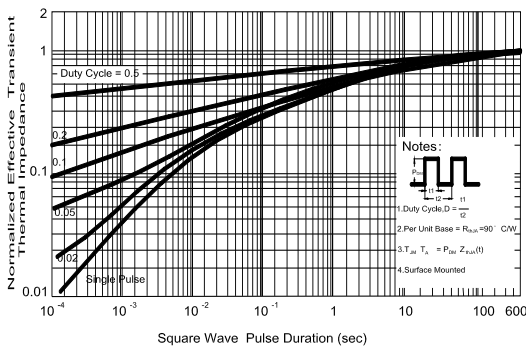
Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

