

Single P-channel MOSFET

ELM36405EA-S

General description

ELM36405EA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds} = -20V$
- $I_d = -5A$
- $R_{ds(on)} < 44m\Omega$ ($V_{gs} = -4.5V$)
- $R_{ds(on)} < 70m\Omega$ ($V_{gs} = -2.5V$)
- $R_{ds(on)} < 100m\Omega$ ($V_{gs} = -1.8V$)

Maximum absolute ratings

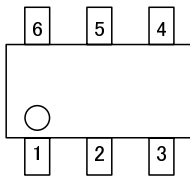
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	-20	V		
Gate-source voltage	V_{gs}	± 12	V		
Continuous drain current	I_d	$T_a = 25^\circ C$	-5	A	
		$T_a = 70^\circ C$	-4		
Pulsed drain current	I_{dm}	-20	A	3	
Power dissipation	P_d	$T_a = 25^\circ C$	2.0	W	
		$T_a = 70^\circ C$	1.4		
Junction 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	$t \leq 5s$	$R\theta_{ja}$		62.5	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state			110.0	$^\circ C/W$	
Maximum junction-to-lead	Steady-state	$R\theta_{j\ell}$		50.0	$^\circ C/W$	

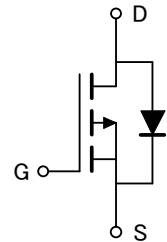
Pin configuration

SOT-26 (TOP VIEW)



Pin No.	Pin name
1	DRAIN
2	DRAIN
3	GATE
4	SOURCE
5	DRAIN
6	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	-0.45	-0.80	-1.20	V	
On state drain current	Id(on)	Vgs=-10V, Vds=-5V	-20			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-4.5V, Id=-5A		37	44	mΩ	1
		Vgs=-2.5V, Id=-4A		55	70	mΩ	
		Vgs=-1.8V, Id=-2A		75	100	mΩ	
Forward transconductance	Gfs	Vds=-5V, Id=-5A		14		S	1
Diode forward voltage	Vsd	Is=-1A, Vgs=0V			-1	V	1
Max. body-diode continuous current	Is				-3	A	
Pulsed body-diode current	Ism				-6	A	3
DYNAMIC PARAMETERS							
Input capacitance	Ciss			1100		pF	
Output capacitance	Coss	Vgs=0V, Vds=-10V, f=1MHz		170		pF	
Reverse transfer capacitance	Crss			140		pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-4.5V, Vds=-10V Id=-5A		12.5		nC	2
Gate-source charge	Qgs			2.1		nC	2
Gate-drain charge	Qgd			3.5		nC	2
Turn-on delay time	td(on)	Vgs=-4.5V, Vds=-10V Id ≅ -1A, Rgen=3Ω		7		ns	2
Turn-on rise time	tr			10		ns	2
Turn-off delay time	td(off)			30		ns	2
Turn-off fall time	tf			22		ns	2
Body diode reverse recovery charge	Qrr				20		nC

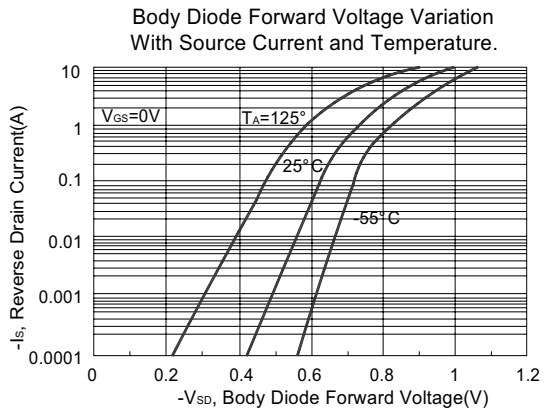
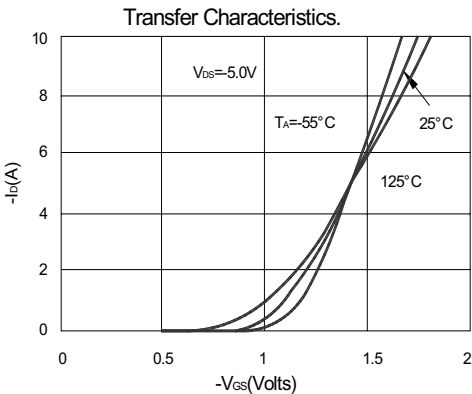
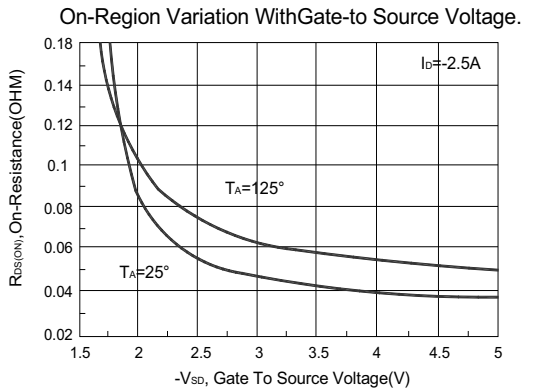
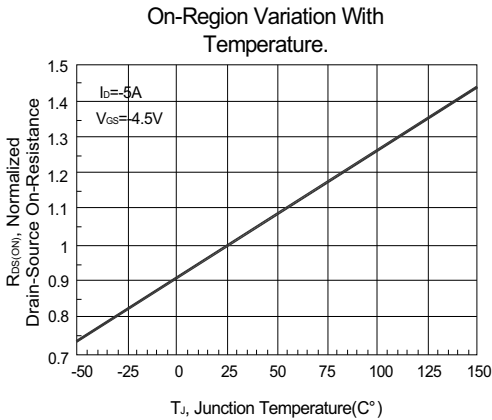
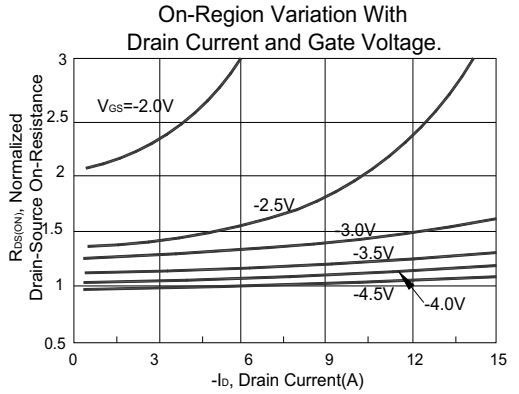
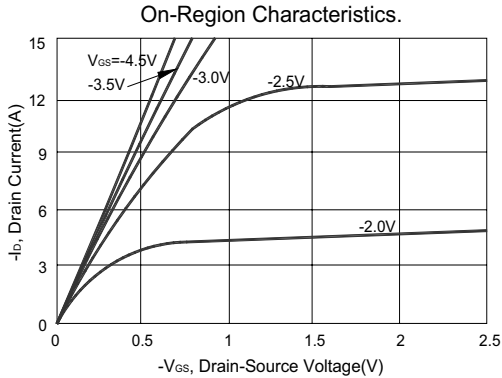
NOTE :

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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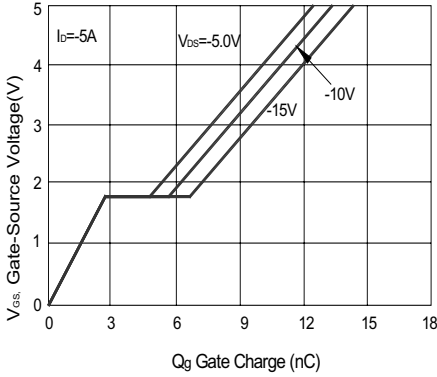
Typical electrical and thermal characteristics



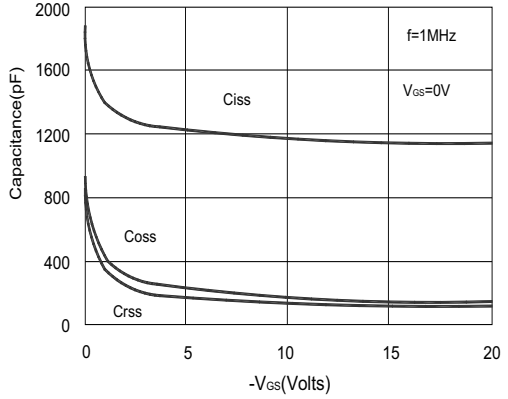
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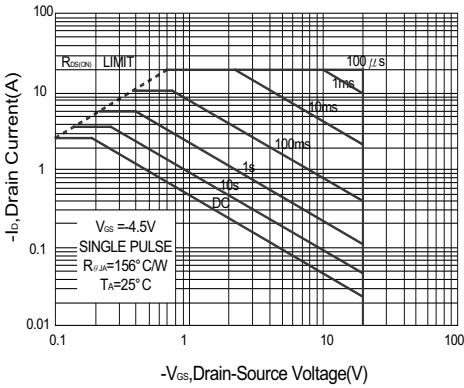
Gate Charge Characteristics.



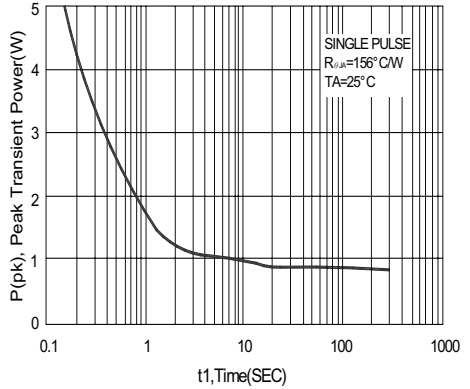
Capacitance Characteristics.



Maximum Safe Operating Area.



Sing Pulse Maximum Power Dissipation.



Transient Thermal Response Curve.

