

Single P-channel MOSFET

ELM321604A-S

■ General description

ELM321604A-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

■ Features

- $V_{ds} = -40V$
- $I_d = -43A$
- $R_{ds(on)} < 16m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} < 20m\Omega$ ($V_{gs} = -7V$)

■ Maximum absolute ratings

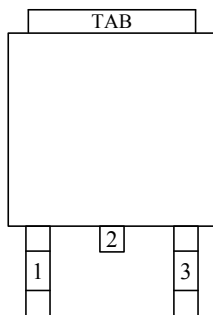
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	V_{ds}	-40	V	
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	$T_a = 25^\circ C$	-43	A
		$T_a = 70^\circ C$	-34	
Pulsed drain current	I_{dm}	-130	A	3
Avalanche current	I_{as}	-40.8	A	
Avalanche energy	$L = 0.1mH$	Eas	83	mJ
Power dissipation	P_d	$T_a = 25^\circ C$	50	W
		$T_a = 70^\circ C$	32	
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	$R_{\theta jc}$		2.5	$^\circ C/W$	
Maximum junction-to-ambient	Steady-state	$R_{\theta ja}$		75.0	$^\circ C/W$	

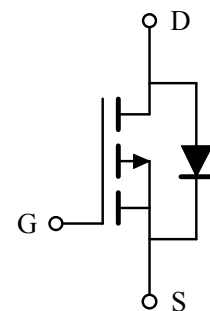
■ Pin configuration

TO-252-3(TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

■ 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	Id=-250μA, Vgs=0V	-40			V	
Zero gate voltage drain current	Idss	Vds=-32V, Vgs=0V			-1	μA	
		Vds=-30V, Vgs=0V Tj=125°C			-10		
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.5	-2.2	-3.0	V	
On state drain current	Id(on)	Vds=-5V, Vgs=-10V	-130			A	1
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-25A		13	16	mΩ	1
		Vgs=-7V, Id=-15A		16	20	mΩ	
Forward transconductance	Gfs	Vds=-5V, Id=-25A		24		S	1
Diode forward voltage	Vsd	If=-25A, Vgs=0V			-1.3	V	1
Max. body-diode continuous current	Is				-43	A	
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-15V f=1MHz		2350		pF	
Output capacitance	Coss			480		pF	
Reverse transfer capacitance	Crss			310		pF	
Gate resistance	Rg	Vgs=0V, Vds=0V, f=1MHz		4.3		Ω	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-10V, Vds=-20V Id=-25A		42		nC	2
Gate-source charge	Qgs			9		nC	2
Gate-drain charge	Qgd			10		nC	2
Turn-on delay time	td(on)	Vgs=-10V, Vds=-20V Id=-1A, Rgen=6Ω		15		ns	2
Turn-on rise time	tr			43		ns	2
Turn-off delay time	td(off)			62		ns	2
Turn-off fall time	tf			50		ns	2
Body diode reverse recovery time	trr	If=-20A, dl/dt=100A/μs		43		ns	
Body diode reverse recovery charge	Qrr			31		nC	

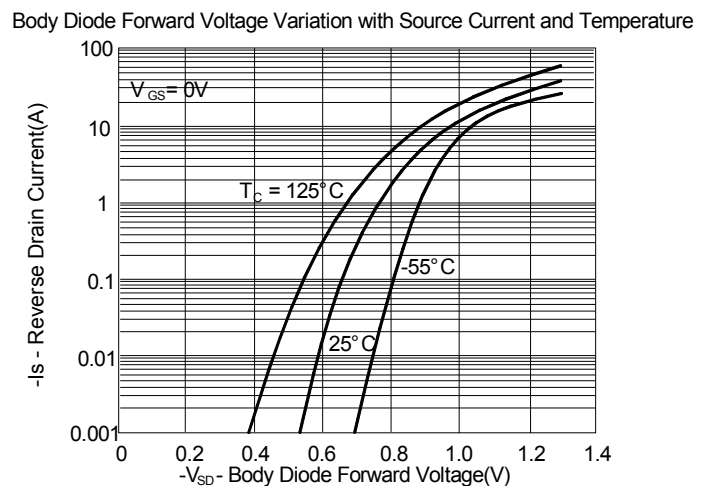
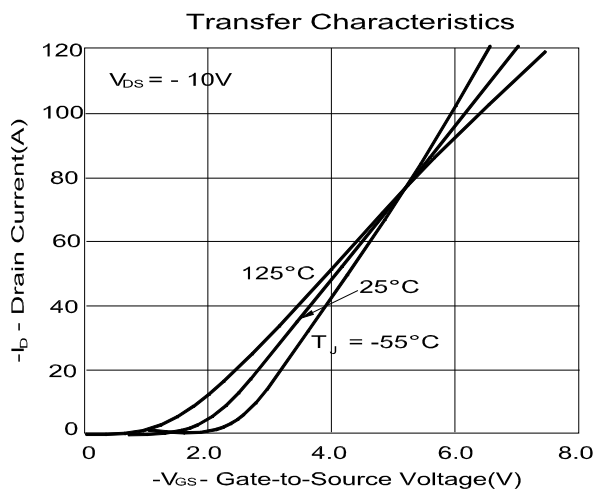
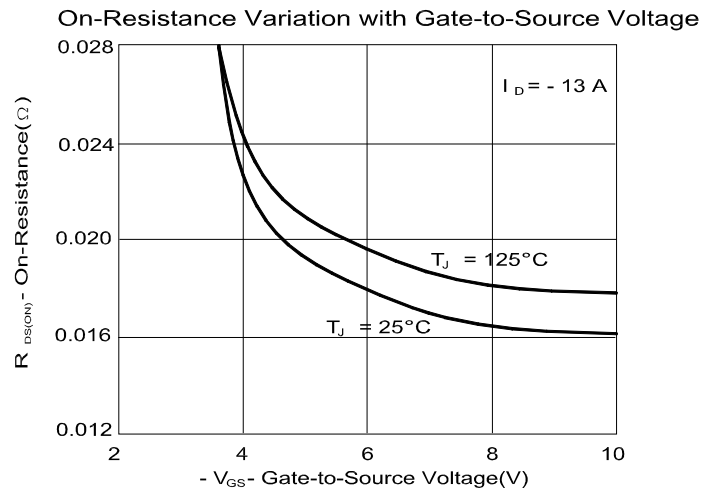
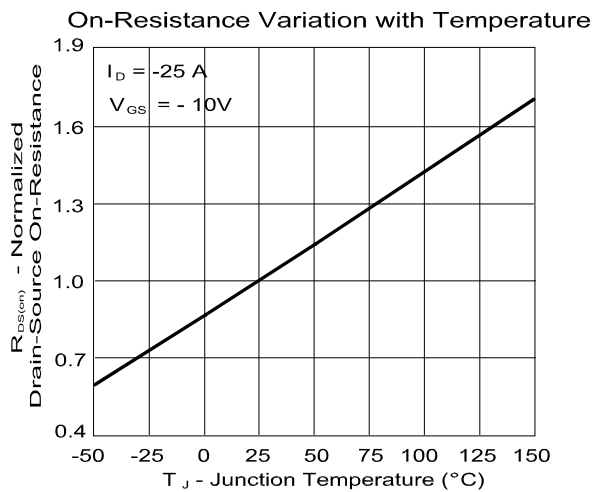
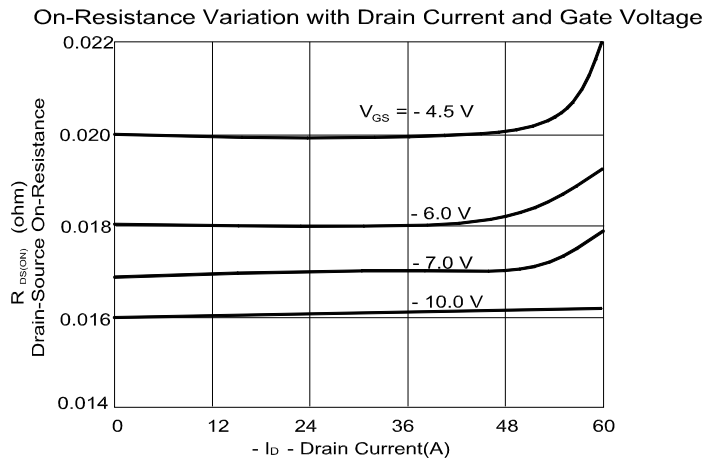
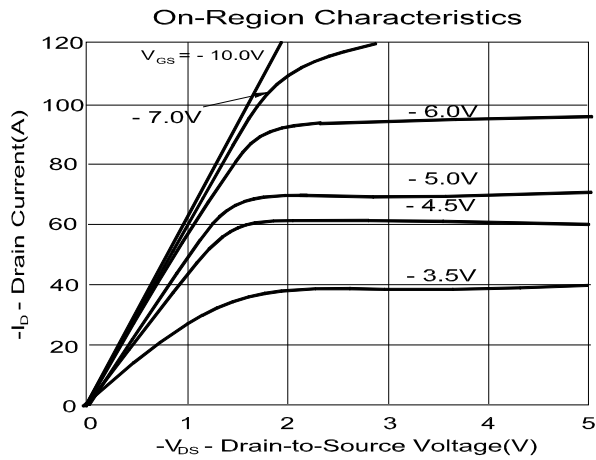
NOTE :

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

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■ Typical electrical and thermal characteristics



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