

Single N-channel MOSFET

ELM598750SA-S

<http://www.elm-tech.com>

■General description

ELM598750SA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

■Features

- V_{DS}=80V
- I_D=40A
- R_{DS(on)} = 9.8mΩ (V_{GS}=10V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

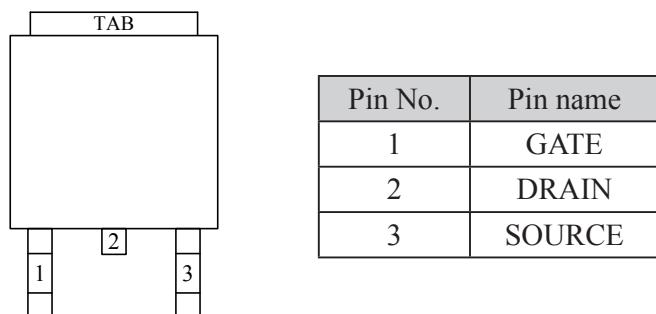
Parameter	Symbol	Limit	Unit
Drain-source voltage	V _{DS}	80	V
Gate-source voltage	V _{GS}	±25	V
Continuous drain current(T _j =150°C)	T _a =25°C	40	A
	T _a =70°C	30	
Pulsed drain current	I _{DM}	60	A
Power dissipation	T _c =25°C	40	W
	T _c =70°C	15	
Operating junction temperature	T _j	150	°C
Storage temperature range	T _{STG}	-55 to 150	°C

■Thermal characteristics

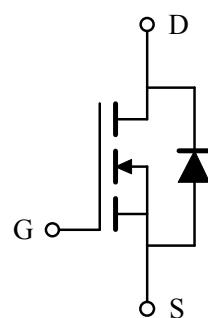
Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	R _{θJA}		62.5	°C/W

■Pin configuration

TO-252-3(TOP VIEW)



■Circuit



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

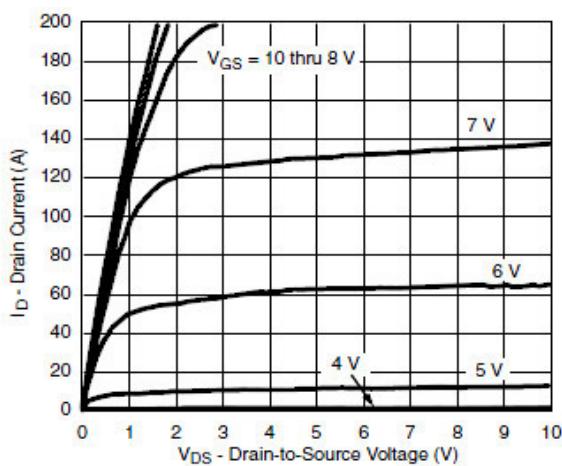
Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V		80	83		V
Zero gate voltage drain current	Idss	Vds=64V, Vgs=0V			1		μA
			Ta=85°C			30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA		2.0	3.0	4.0	V
On state drain current	Id(on)	Vgs=10V, Vds≥10V		75			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=40A			7.8	9.8	mΩ
Forward transconductance	Gfs	Vds=15V, Id=30A			55		S
Diode forward voltage	Vsd	Is=30A, Vgs=0V			0.8	1.5	V
Max. body-diode continuous current	Is					40	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=30V, f=1MHz			3480		pF
Output capacitance	Coss				410		pF
Reverse transfer capacitance	Crss				200		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=10V, Vds=40V Id=15A			69	90	nC
Gate-source charge	Qgs				18		nC
Gate-drain charge	Qgd				20		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=38V RL=3.1Ω, Id=12.5A Rgen=1.0Ω			25	45	ns
Turn-on rise time	tr				15	30	ns
Turn-off delay time	td(off)				35	60	ns
Turn-off fall time	tf				10	20	ns

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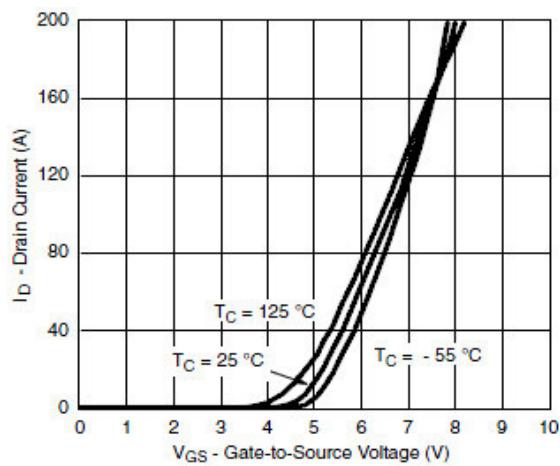
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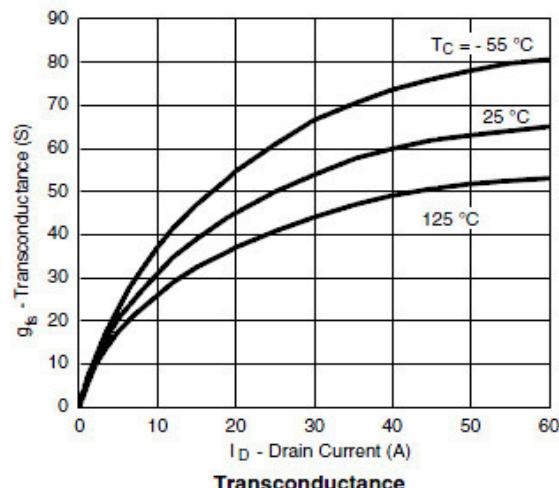
■ Typical electrical and thermal characteristics



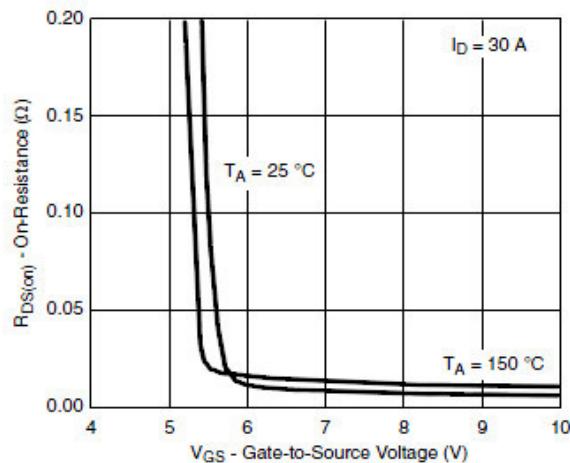
Output Characteristics



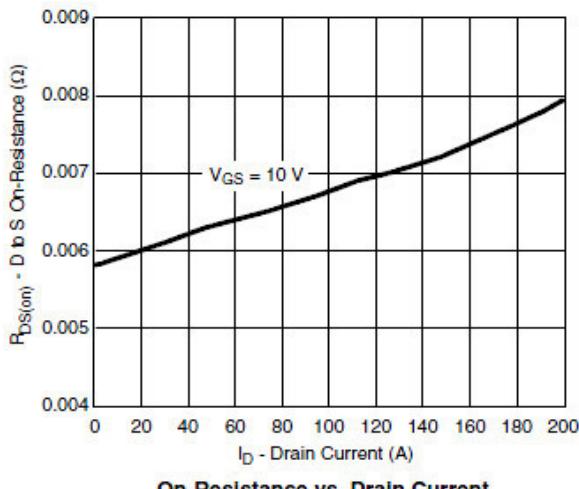
Transfer Characteristics



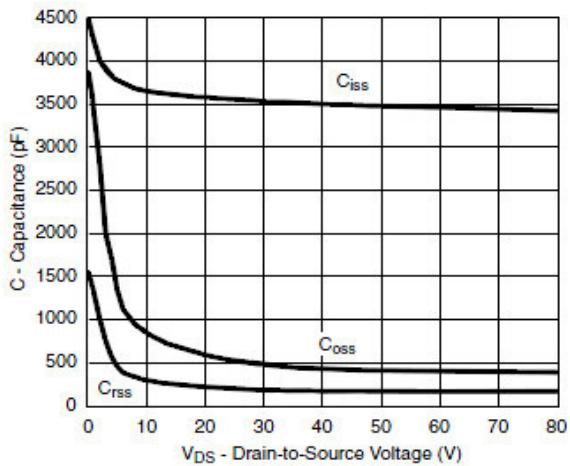
Transconductance



On-Resistance vs. Gate-to-Source Voltage vs. Temperature



On-Resistance vs. Drain Current

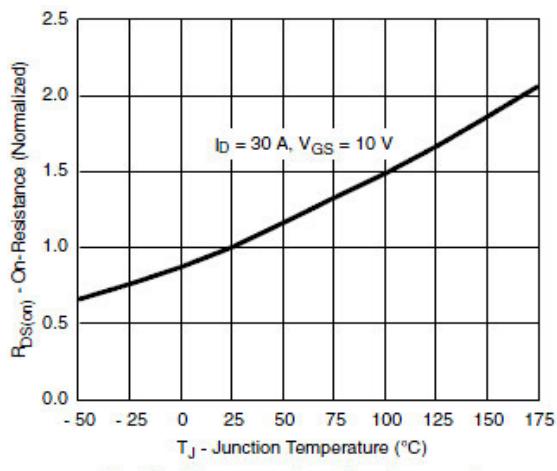


Capacitance

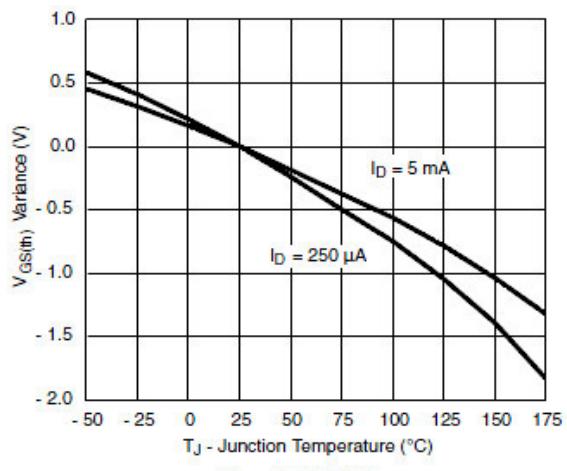
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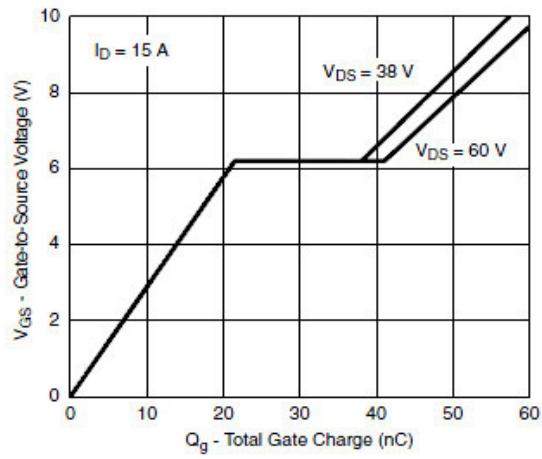
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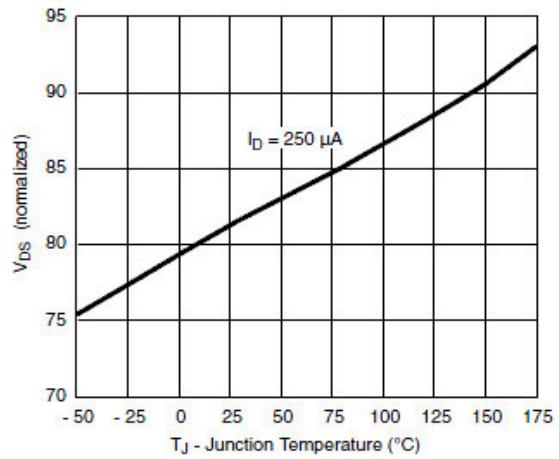
On-Resistance vs. Junction Temperature



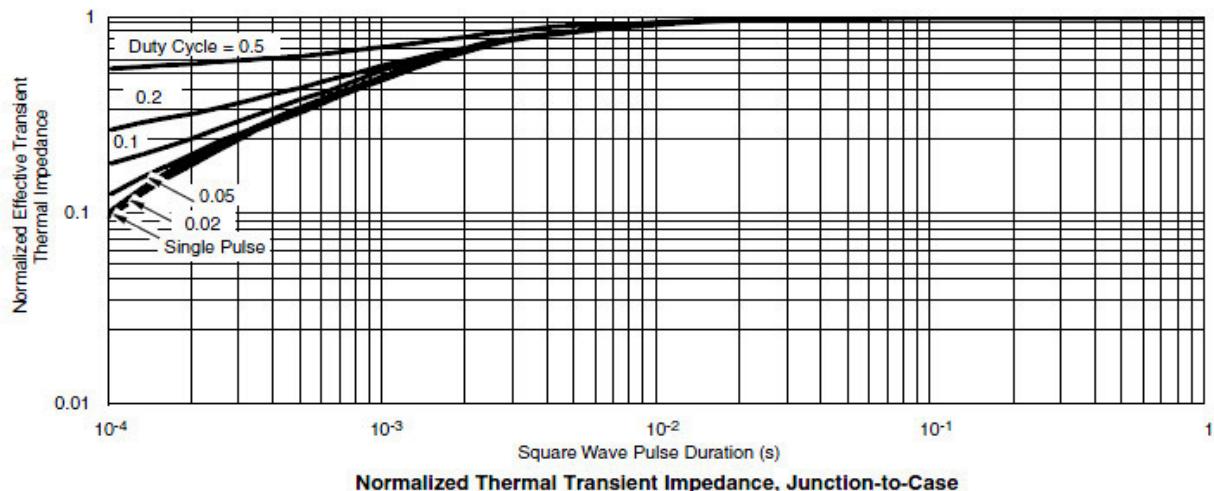
Threshold Voltage



Gate Charge



Drain Source Breakdown vs. Junction Temperature



Normalized Thermal Transient Impedance, Junction-to-Case

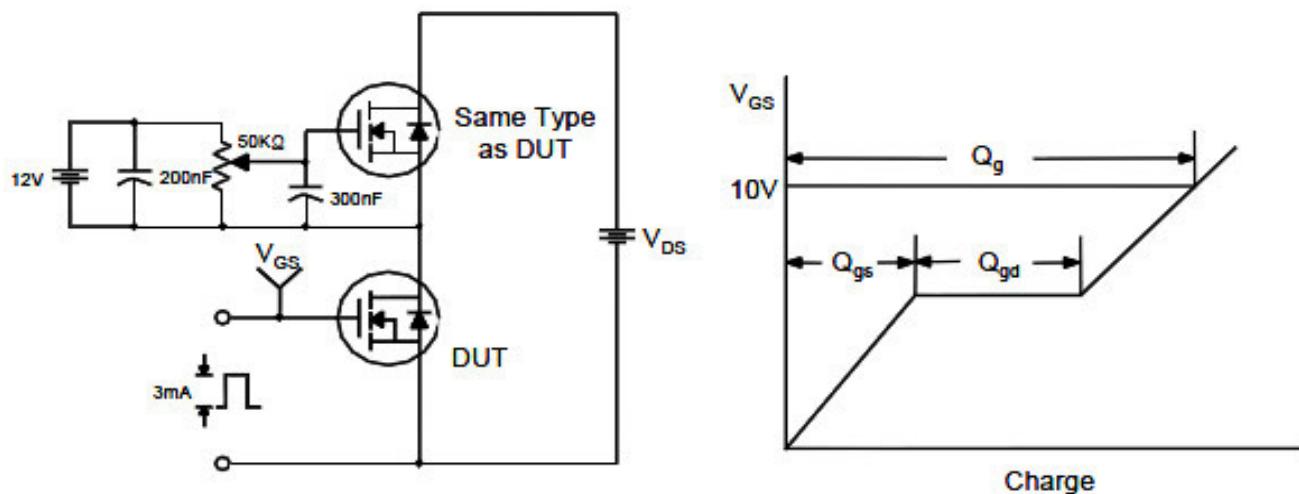
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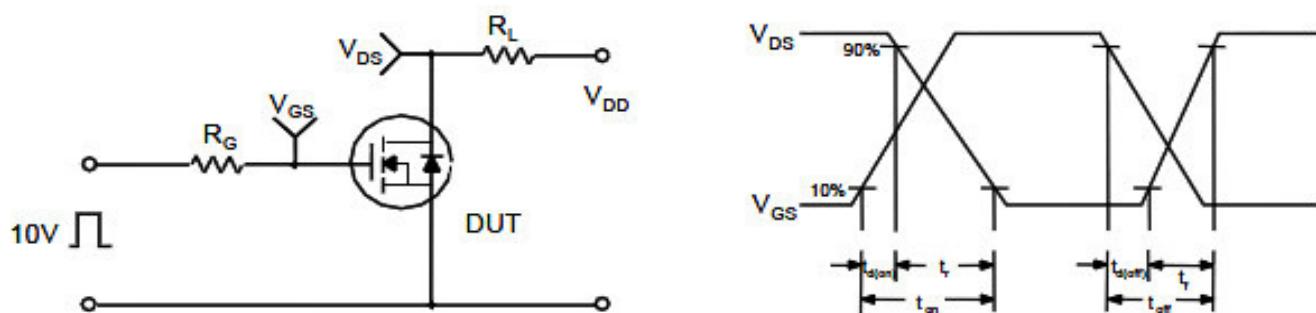
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

