

# Single N-channel MOSFET

## ELM599770A-S

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

### ■General description

ELM599770A-S uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate threshold voltage.

### ■Features

- $V_{ds}=60V$
- $I_d=12A$
- $R_{ds(on)} = 118m\Omega$  ( $V_{gs}=10V$ )
- $R_{ds(on)} = 130m\Omega$  ( $V_{gs}=4.5V$ )

### ■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

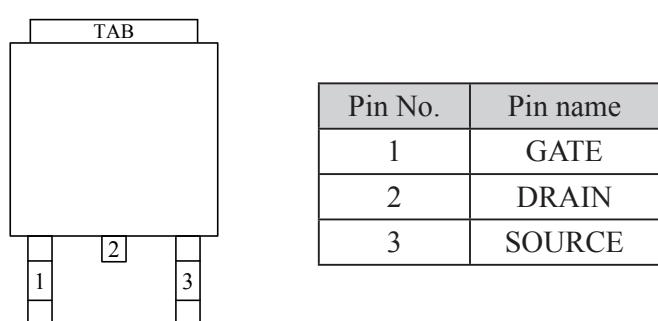
Parameter	Symbol	Limit	Unit
Drain-source voltage	$V_{ds}$	60	V
Gate-source voltage	$V_{gs}$	$\pm 20$	V
Continuous drain current Ta=25°C	$I_d$	12	A
Ta=70°C		8	
Pulsed drain current	$I_{dm}$	30	A
Avalanche current	$I_{as}$	15	A
Power dissipation Tc=25°C	$P_d$	40	W
Tc=70°C		15	
Junction and storage temperature range	$T_j, T_{stg}$	-55 to 150	°C

### ■Thermal characteristics

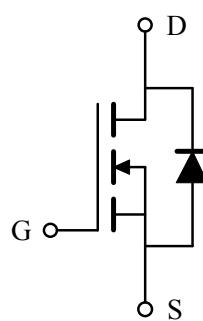
Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	$R_{\theta ja}$		62.5	°C/W

### ■Pin configuration

TO-252-3(TOP VIEW)



### ■Circuit



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### ■ Electrical characteristics

T<sub>a</sub>=25°C. Unless otherwise noted.

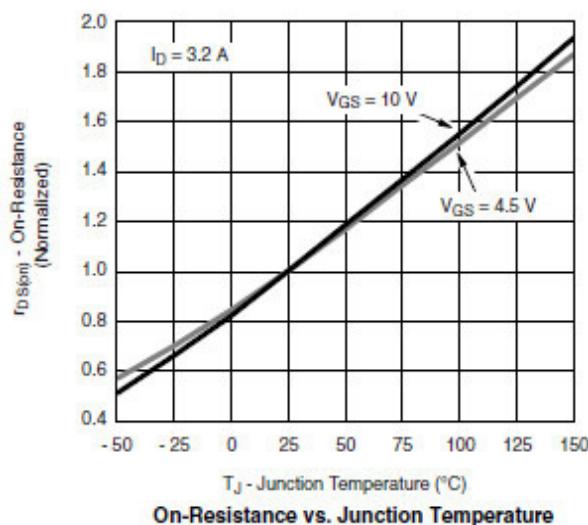
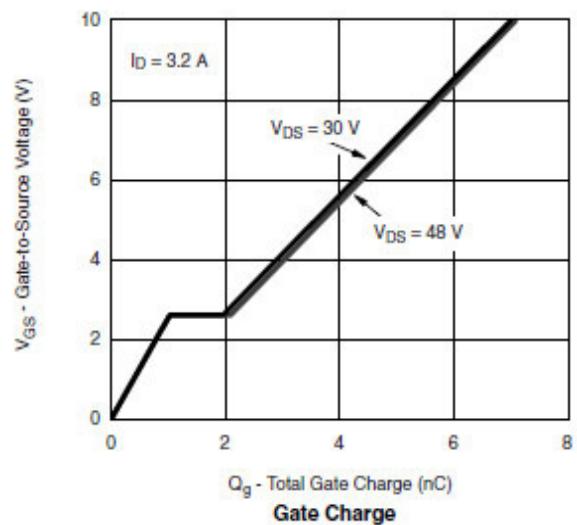
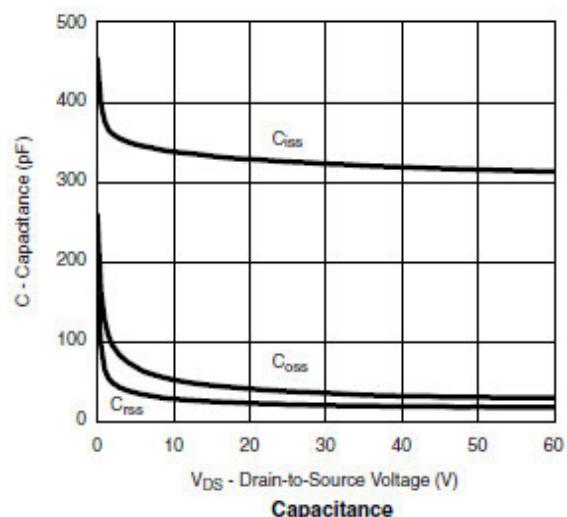
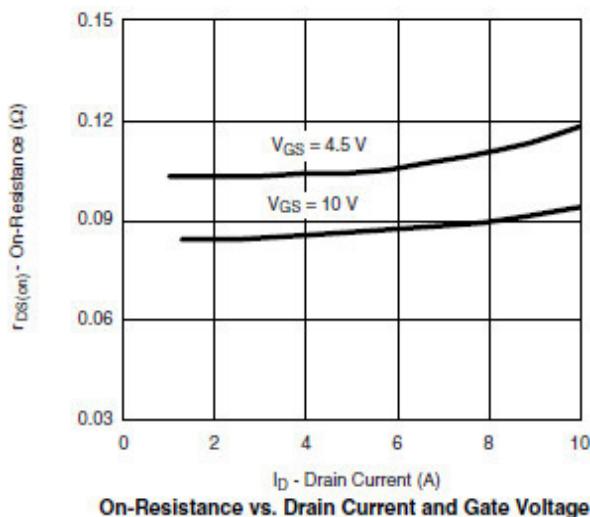
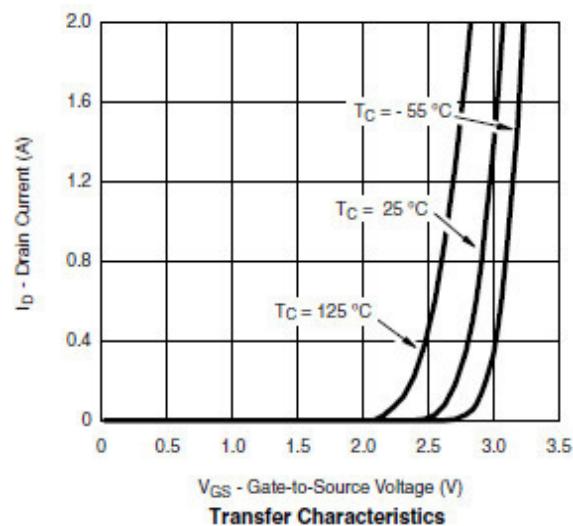
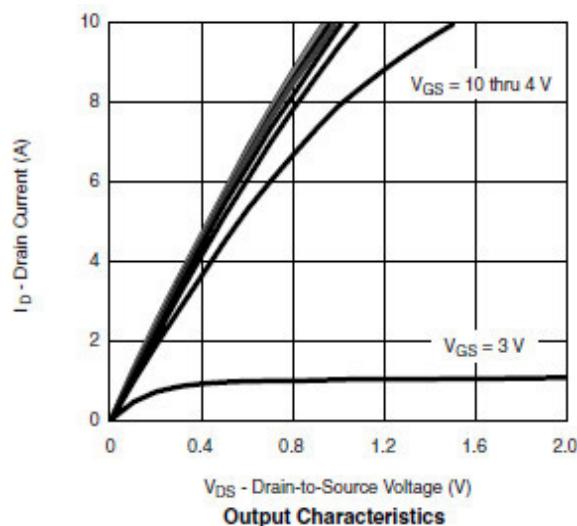
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	BVdss	Id=250µA, Vgs=0V	60			V
Zero gate voltage drain current	Idss	Vds=60V, Vgs=0V			1	µA
		Vds=60V, Vgs=0V, Ta=85°C			5	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250µA	0.7		2.5	V
On state drain current	Id(on)	Vgs=4.5V, Vds=5V	30			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=8A			118	mΩ
		Vgs=4.5V, Id=6A			130	
Forward transconductance	Gfs	Vds=15V, Id=5.3A		12		S
Diode forward voltage	Vsd	Is=2A, Vgs=0V		0.8	1.2	V
Max. body-diode continuous current	Is				12	A
<b>DYNAMIC PARAMETERS</b>						
Input capacitance	Ciss	Vgs=0V, Vds=25V, f=1MHz		480		pF
Output capacitance	Coss			50		pF
Reverse transfer capacitance	Crss			35		pF
<b>SWITCHING PARAMETERS</b>						
Total gate charge	Qg	Vgs=4.5V, Vds=48V, Id=5A		6	12	nC
Gate-source charge	Qgs			2		nC
Gate-drain charge	Qgd			3		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=30V, RL=6Ω Id=5A, Rgen=3.3Ω		6	12	ns
Turn-on rise time	tr			6	12	ns
Turn-off delay time	td(off)			12	20	ns
Turn-off fall time	tf			4	10	ns

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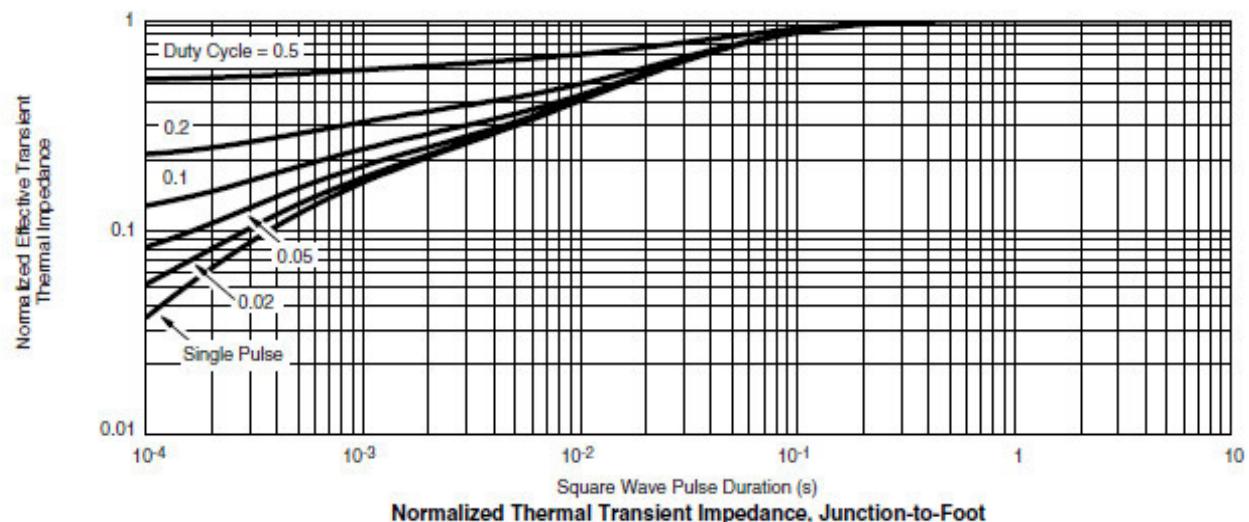
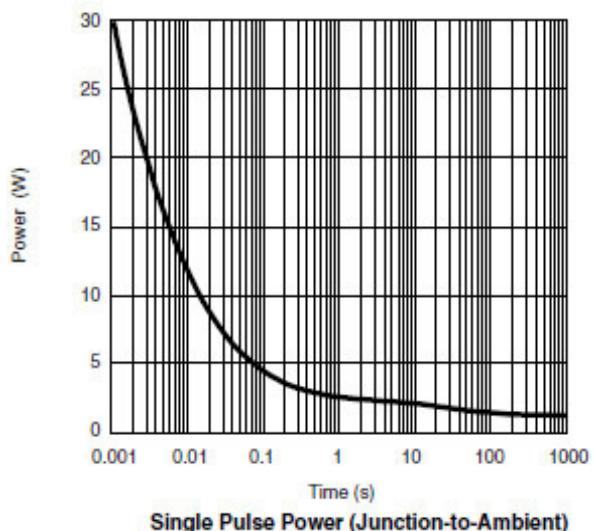
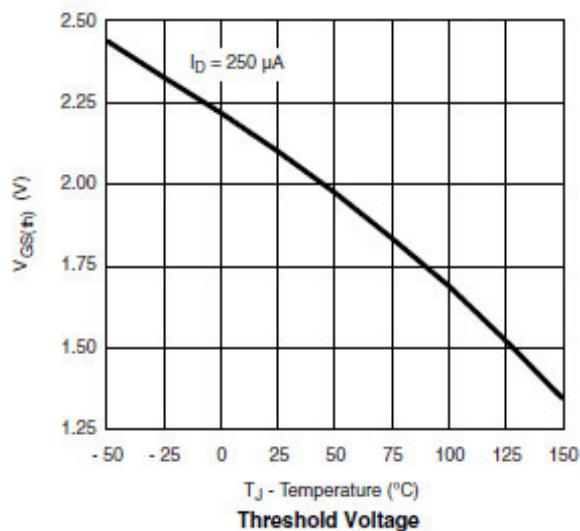
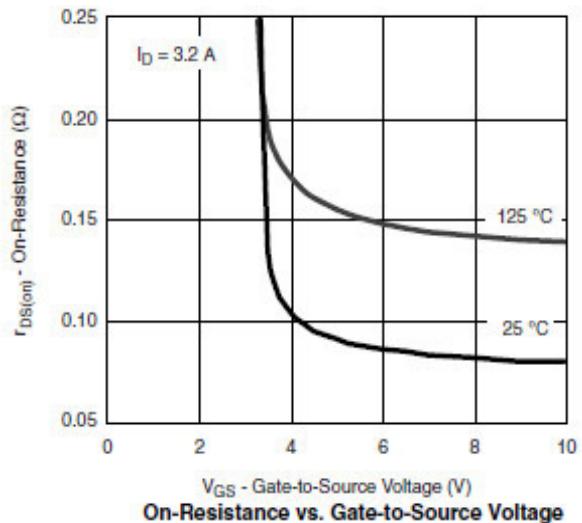
## ■ Typical electrical and thermal characteristics



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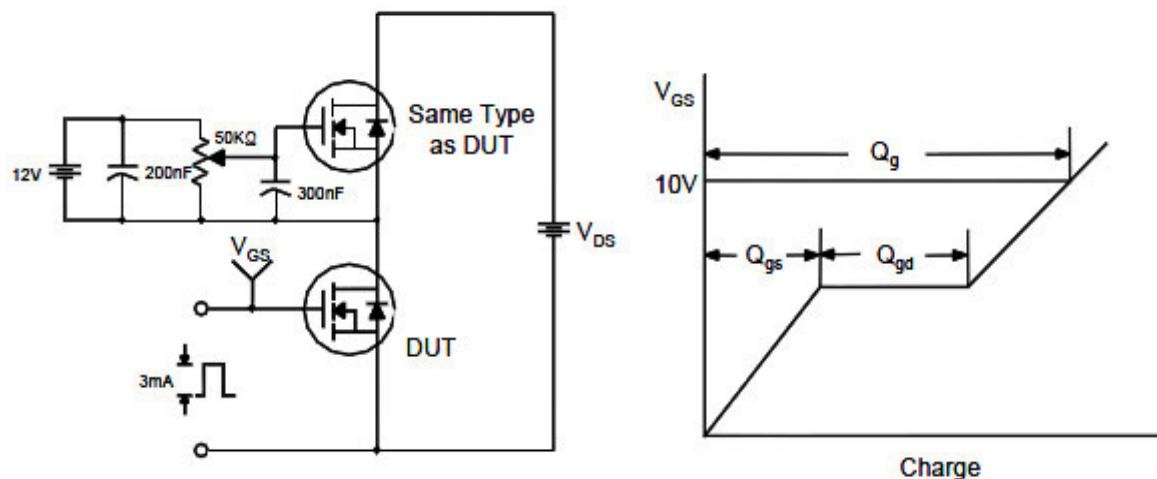
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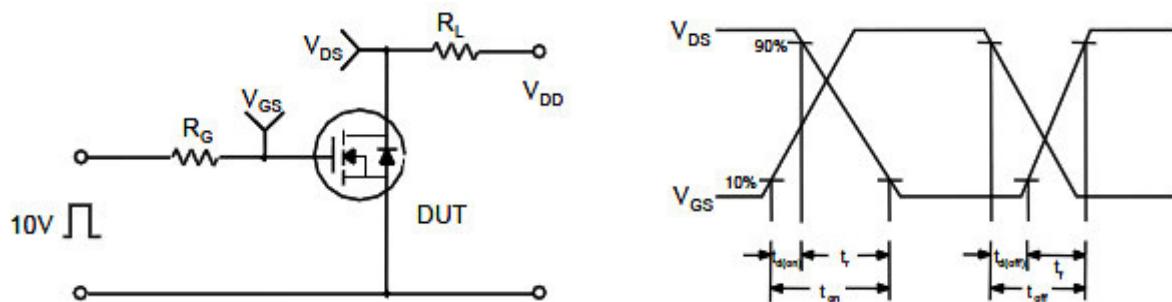
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## ■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

