

# Single N-channel MOSFET

## ELM53484SA-S

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

### ■ General description

ELM53484SA-S uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate threshold voltage.

### ■ Features

- $V_{ds}=30V$
- $I_d=30A$
- $R_{ds(on)} = 13m\Omega$  ( $V_{gs}=10V$ )
- $R_{ds(on)} = 18m\Omega$  ( $V_{gs}=4.5V$ )

### ■ Maximum absolute ratings

$T_a=25^\circ C$ . Unless otherwise noted.

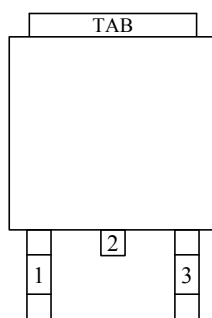
Parameter	Symbol	Limit	Unit	
Drain-source voltage	$V_{ds}$	30	V	
Gate-source voltage	$V_{gs}$	$\pm 20$	V	
Continuous drain current( $T_j=150^\circ C$ )	$I_d$	$T_a=25^\circ C$	30	A
		$T_a=70^\circ C$	18	
Pulsed drain current	$I_{dm}$	40	A	
Power dissipation	$P_d$	$T_c=25^\circ C$	40	W
		$T_c=70^\circ C$	15	
Operating junction temperature	$T_j$	150	$^\circ C$	
Storage temperature range	$T_{stg}$	- 55 to 150	$^\circ C$	

### ■ Thermal characteristics

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

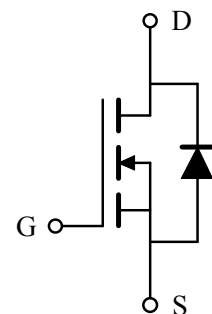
### ■ Pin configuration

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. Unless otherwise noted.

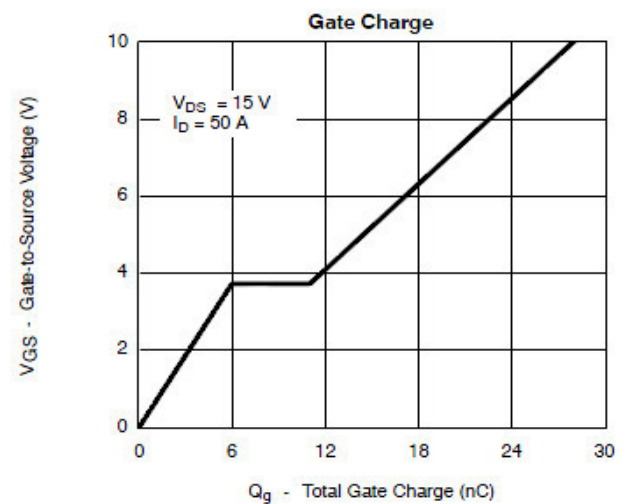
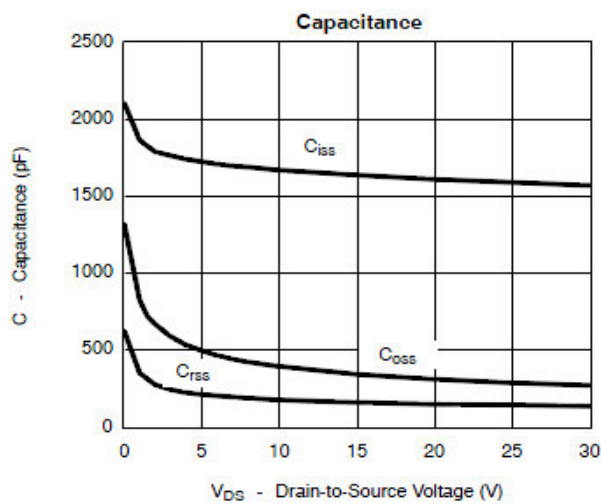
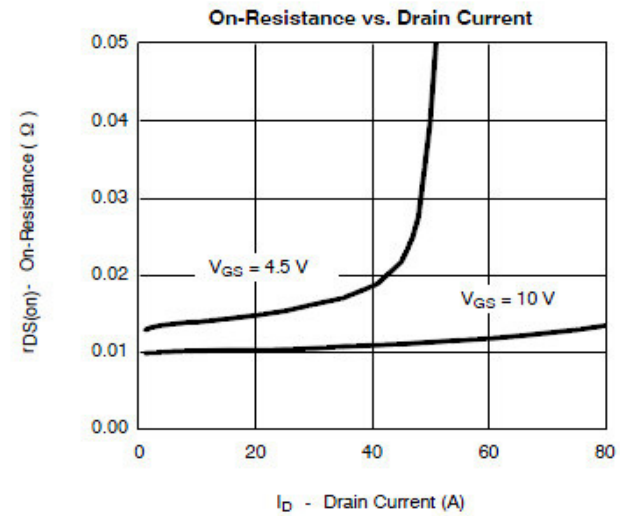
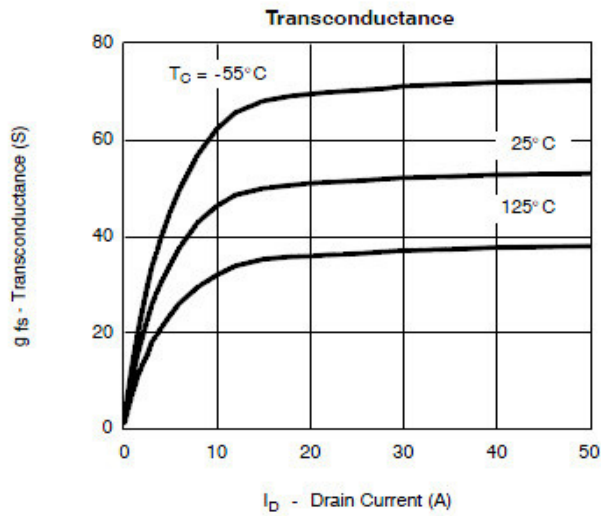
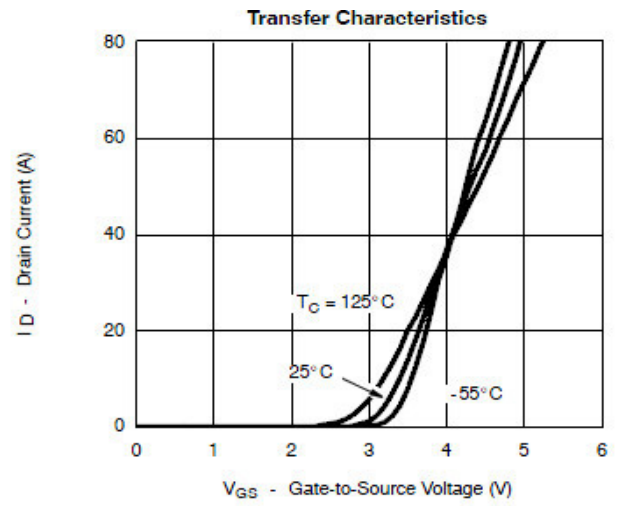
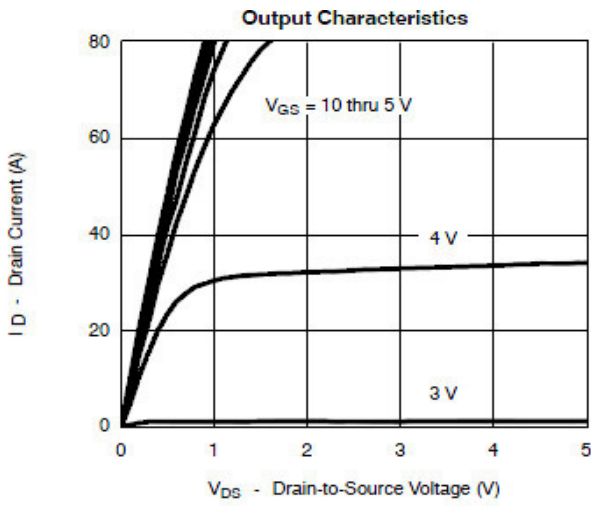
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	30			V
Zero gate voltage drain current	Idss	Vds=24V, Vgs=0V Ta=85°C			1	μA
					10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	1.0		2.0	V
On state drain current	Id(on)	Vgs=10V, Vds≥5V	15			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=12A		10	13	mΩ
		Vgs=4.5V, Id=10A		14	18	
Forward transconductance	Gfs	Vds=15V, Id=10A		24		S
Diode forward voltage	Vsd	Is=12A, Vgs=0V		0.8	1.3	V
Max. body-diode continuous current	Is				9	A
<b>DYNAMIC PARAMETERS</b>						
Input capacitance	Ciss	Vgs=0V, Vds=15V, f=1MHz		950		pF
Output capacitance	Coss			200		pF
Reverse transfer capacitance	Crss			85		pF
<b>SWITCHING PARAMETERS</b>						
Total gate charge	Qg	Vgs=4.5V, Vds=15V Id≐10A		10.0	15.0	nC
Gate-source charge	Qgs			3.8		nC
Gate-drain charge	Qgd			3.2		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=15V RL=1.5Ω, Id≐10A Rgen=1.0Ω		10	20	ns
Turn-on rise time	tr			10	20	ns
Turn-off delay time	td(off)			20	35	ns
Turn-off fall time	tf			10	20	ns

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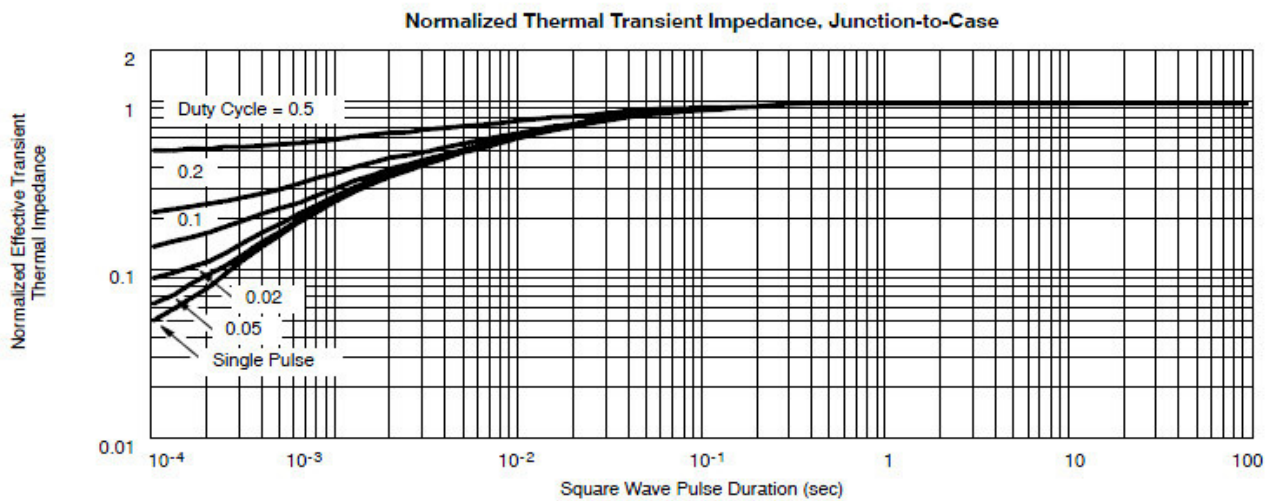
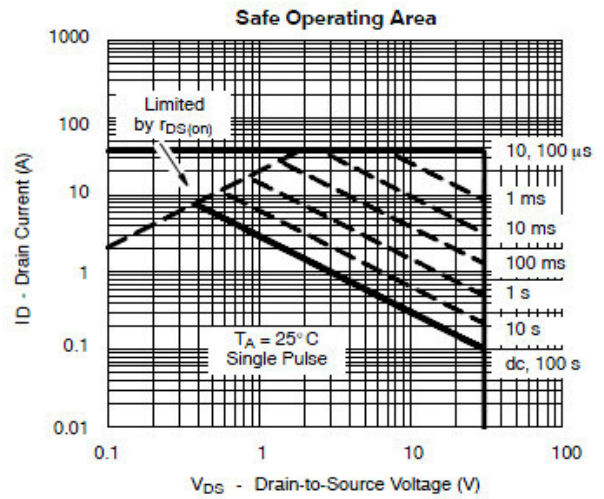
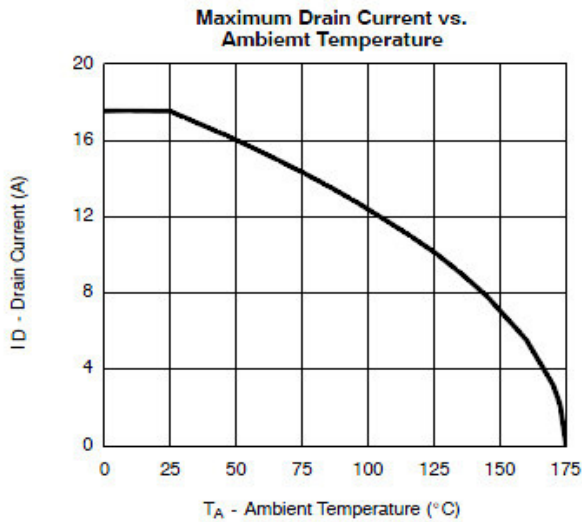
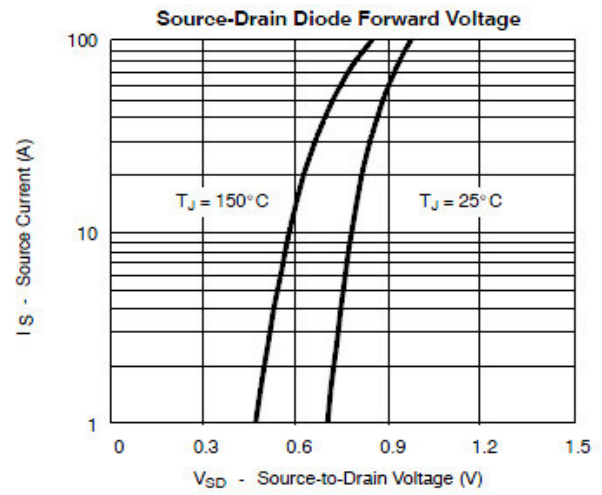
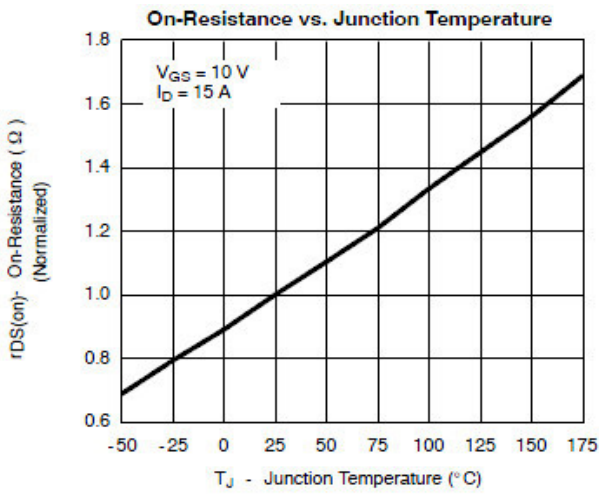
### ■ Typical electrical and thermal characteristics



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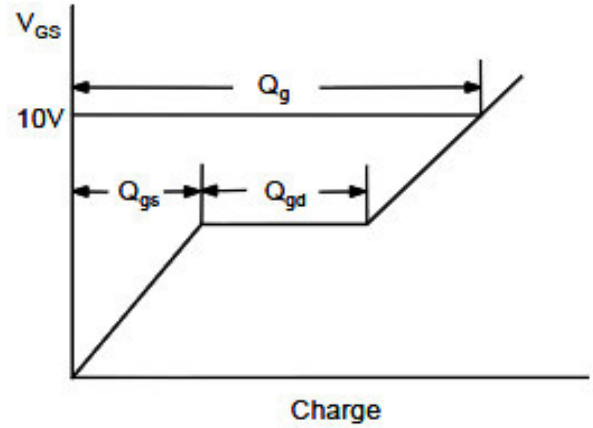
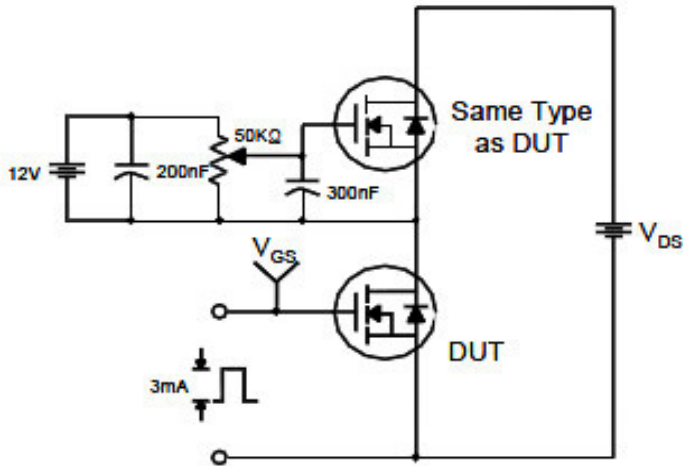
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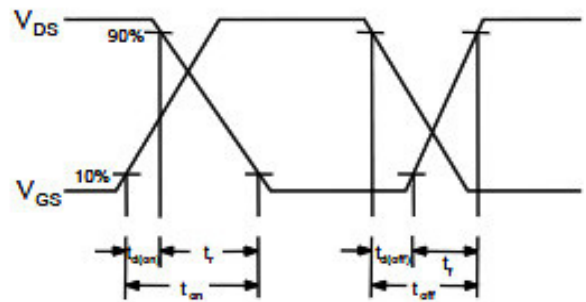
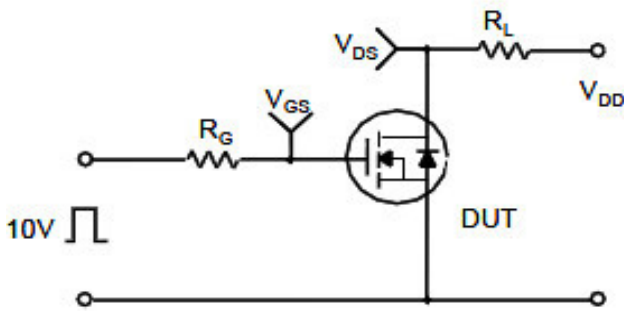
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## ■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

