

Single P-channel MOSFET

ELM53679SA-S

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

■ General description

ELM53679SA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■ Features

- $V_{ds} = -30V$
- $I_d = -20A$
- $R_{ds(on)} = 10m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} = 15m\Omega$ ($V_{gs} = -4.5V$)

■ Maximum absolute ratings

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

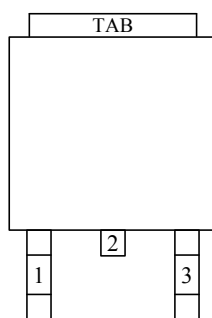
Parameter	Symbol	Limit	Unit	
Drain-source voltage	V_{ds}	-30	V	
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	$T_a = 25^\circ C$	-20	A
		$T_a = 70^\circ C$	-15	
Pulsed drain current	I_{dm}	-200	A	
Power dissipation	P_d	$T_c = 25^\circ C$	40	W
		$T_c = 70^\circ C$	15	
Operating junction 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	$^\circ C/W$

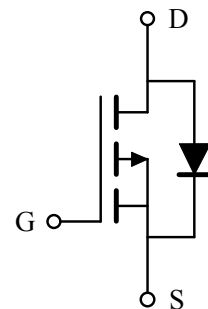
■ Pin configuration

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.

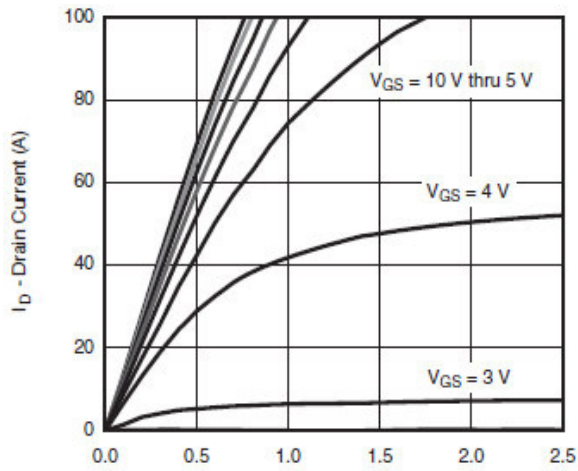
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-30			V
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V			-1	μA
		Vds=-24V, Vgs=0V, Ta=85°C			-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-3.0	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-5V	-50			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-20A		8.5	10.0	mΩ
		Vgs=-4.5V, Id=-15A		12.5	15.0	
Forward transconductance	Gfs	Vds=-15V, Id=-20A		45		S
Diode forward voltage	Vsd	Is=-1A, Vgs=0V		-0.7	-1.3	V
Max. body-diode continuous current	Is				-9	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz		2450		pF
Output capacitance	Coss			495		pF
Reverse transfer capacitance	Crss			415		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-10V, Vds=-15V Id=-20A		55	85	nC
Gate-source charge	Qgs			9		nC
Gate-drain charge	Qgd			12		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V RL=1.5Ω, Id=-10A Rgen=1Ω		10	20	ns
Turn-on rise time	tr			10	20	ns
Turn-off delay time	td(off)			30	50	ns
Turn-off fall time	tf			10	20	ns

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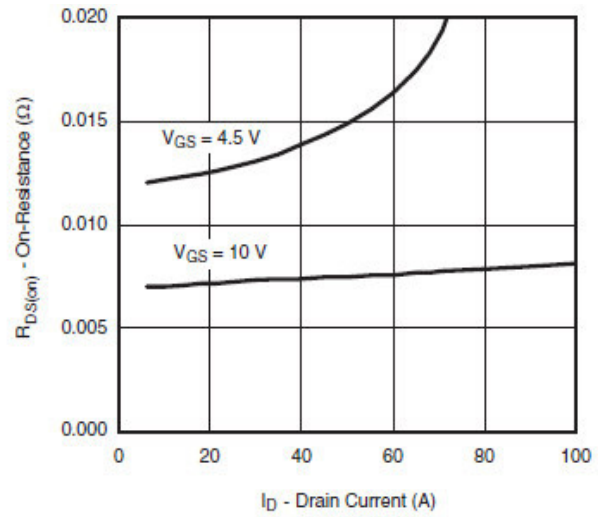
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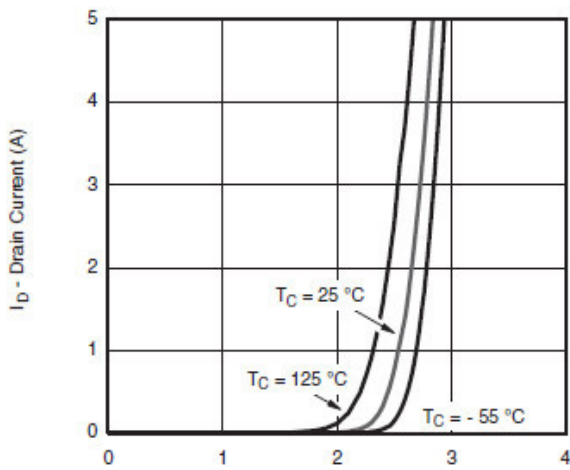
Typical electrical and thermal characteristics



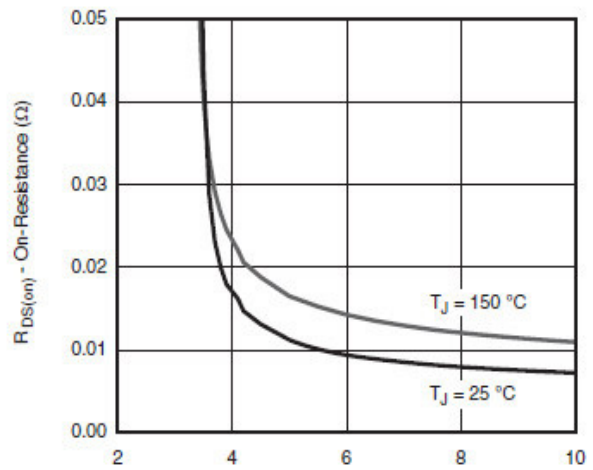
Output Characteristics



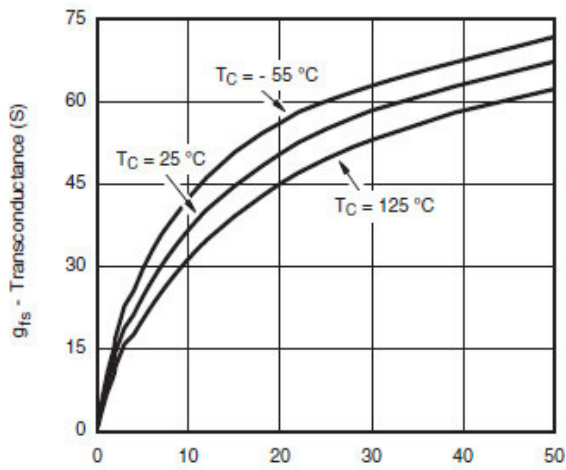
On-Resistance vs. Drain Current



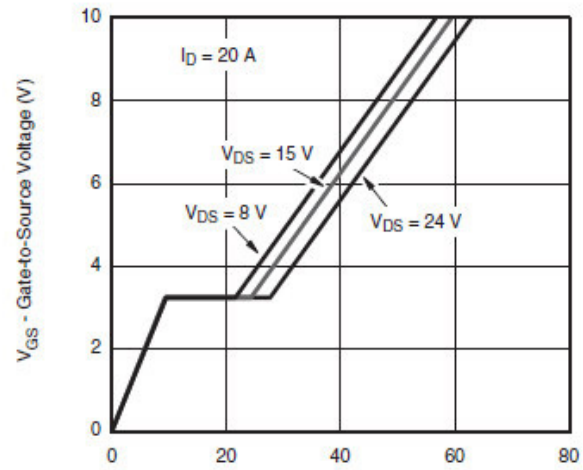
Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage



Transconductance

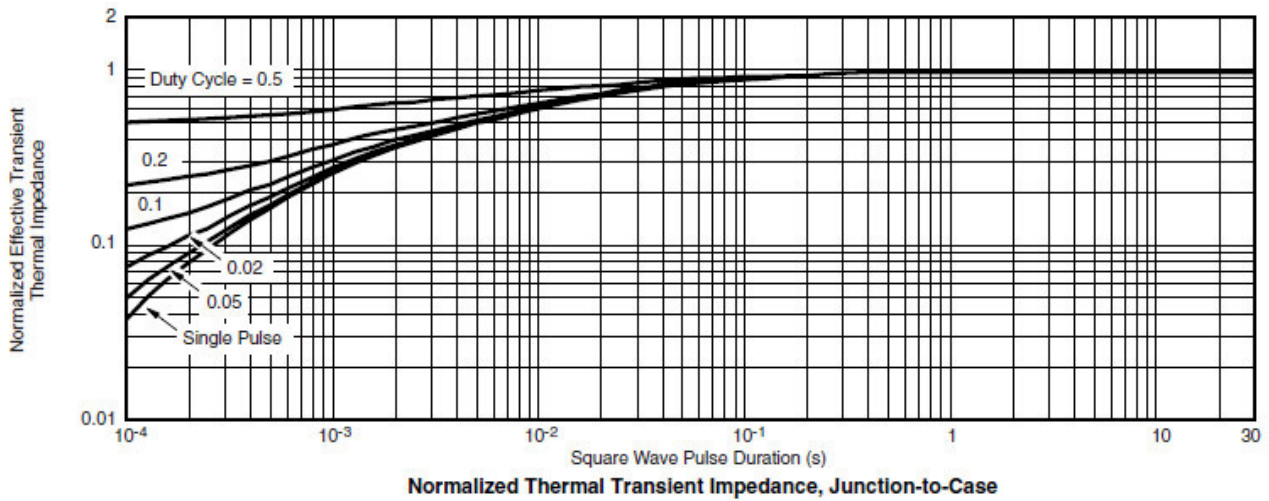
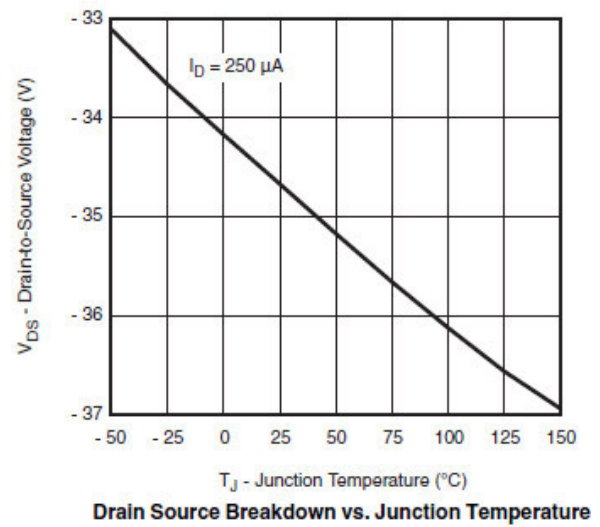
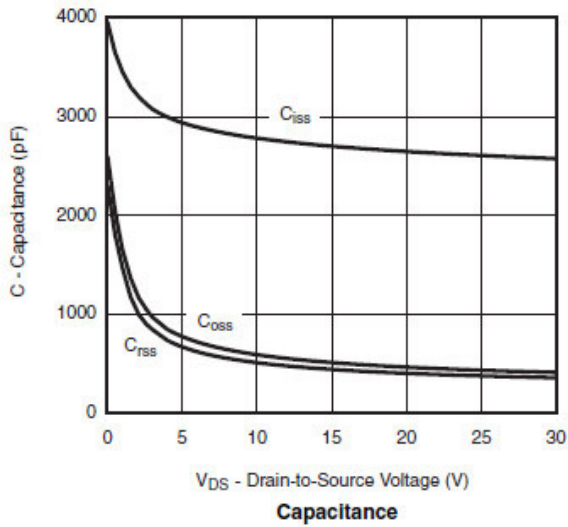
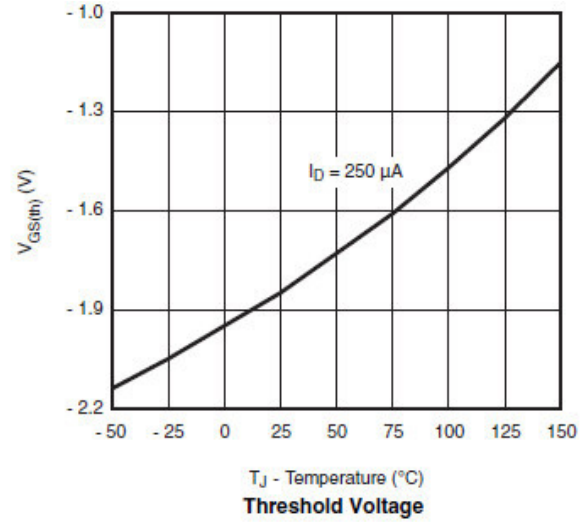
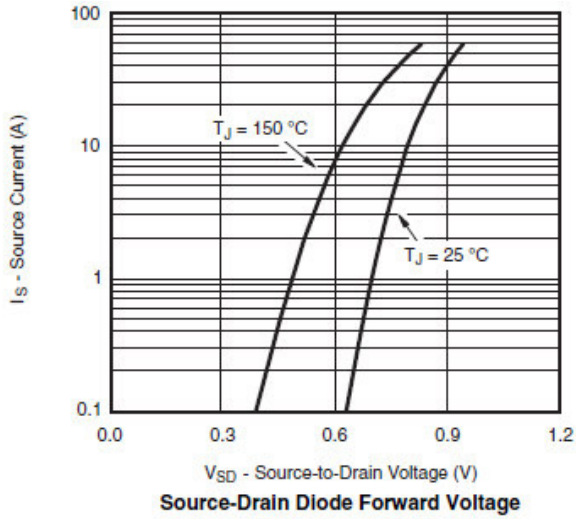


Gate Charge

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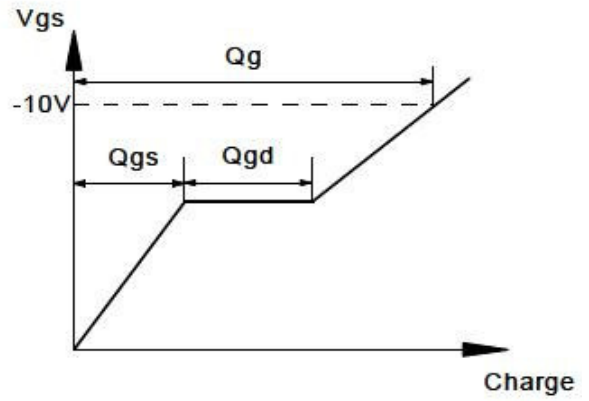
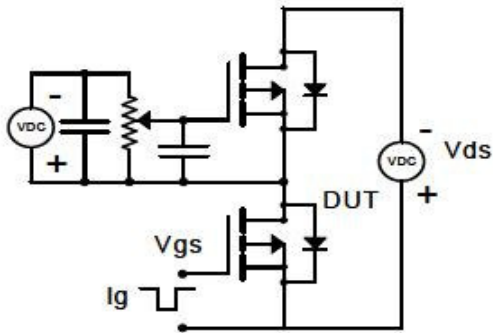
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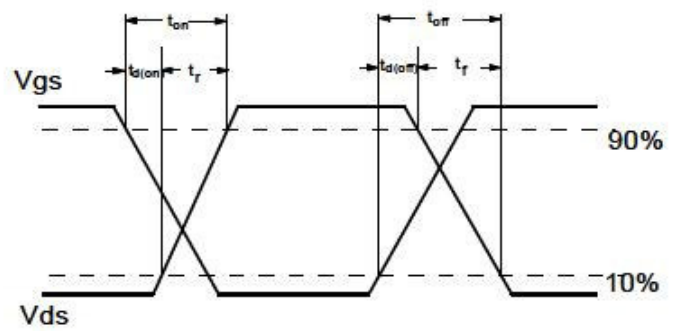
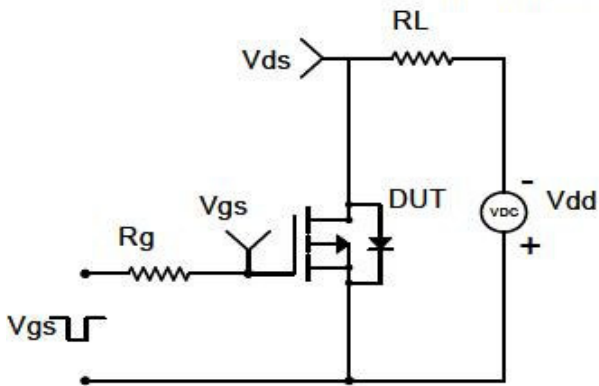
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

