

Single P-channel MOSFET

ELM55039SA-S

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

■General description

ELM55039SA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■Features

- $V_{ds} = -100V$
- $I_d = -25A$
- $R_{ds(on)} = 90m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} = 100m\Omega$ ($V_{gs} = -4.5V$)

■Maximum absolute ratings

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

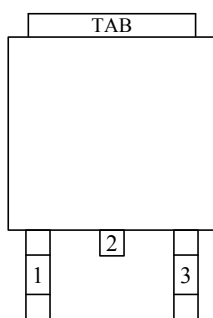
Parameter		Symbol	Limit	Unit
Drain-source voltage		V_{ds}	-100	V
Gate-source voltage		V_{gs}	± 20	V
Continuous drain current	$T_a = 25^\circ C$	I_d	-25	A
	$T_a = 70^\circ C$		-15	
Pulsed drain current		I_{dm}	-50	A
Power dissipation	$T_c = 25^\circ C$	P_d	40	W
	$T_c = 70^\circ C$		15	
Operating junction 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	$^\circ C/W$

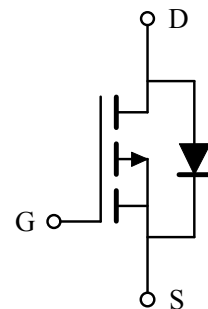
■Pin configuration

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.

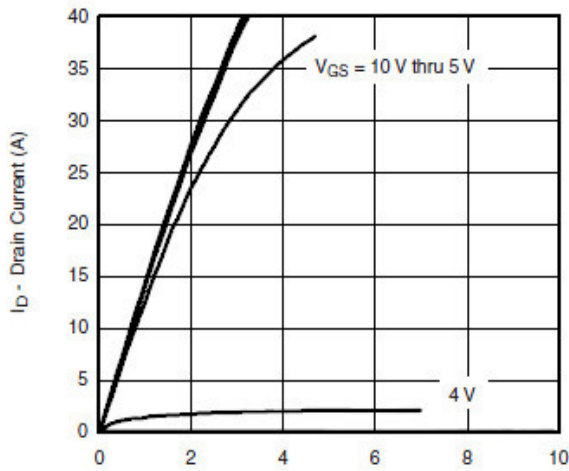
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-100			V
Zero gate voltage drain current	Idss	Vds=-80V, Vgs=0V			-1	μA
		Vds=-80V, Vgs=0V, Ta=85°C			-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-2.5	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-10V	-25			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-12A		80	90	mΩ
		Vgs=-4.5V, Id=-8A		88	100	
Forward transconductance	Gfs	Vds=-15V, Id=-5.2A		19		S
Diode forward voltage	Vsd	Is=-2A, Vgs=0V		-0.8	-1.3	V
Max. body-diode continuous current	Is				-8	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-60V, f=1MHz		4300		pF
Output capacitance	Coss			280		pF
Reverse transfer capacitance	Crss			220		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-10V, Vds=-75V Id=-5.2A		85	150	nC
Gate-source charge	Qgs			18		nC
Gate-drain charge	Qgd			28		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-75V RL=16Ω, Id=-4.8A Rgen=6Ω		25	50	ns
Turn-on rise time	tr			45	85	ns
Turn-off delay time	td(off)			115	200	ns
Turn-off fall time	tf			65	130	ns

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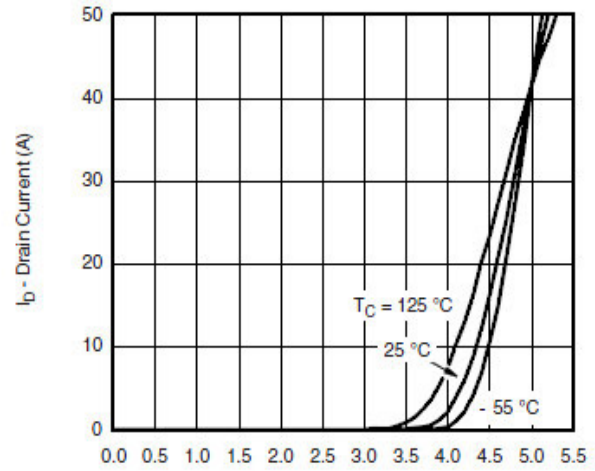
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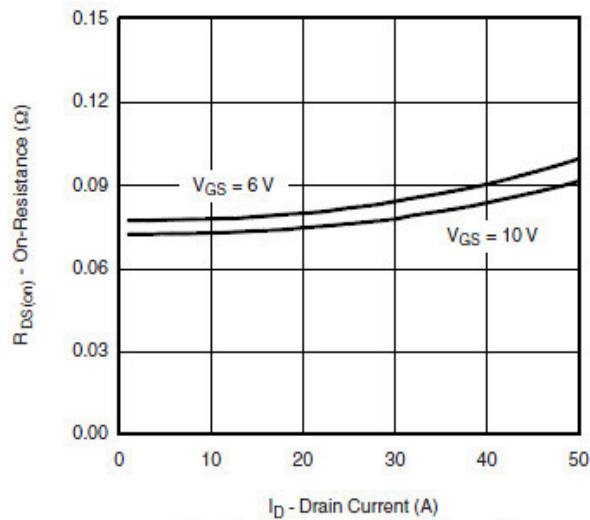
■ Typical electrical and thermal characteristics



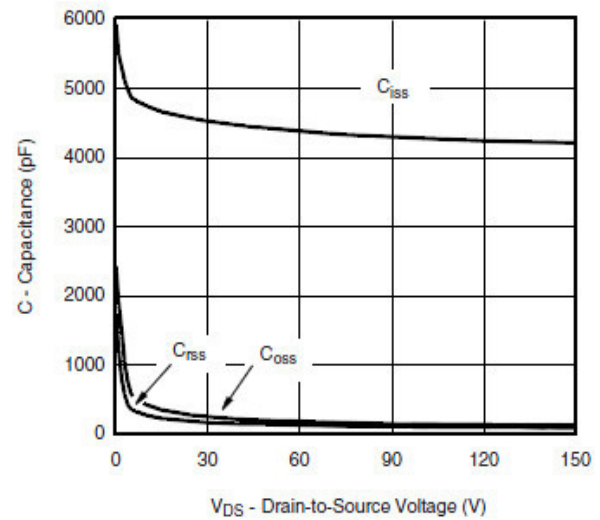
Output Characteristics



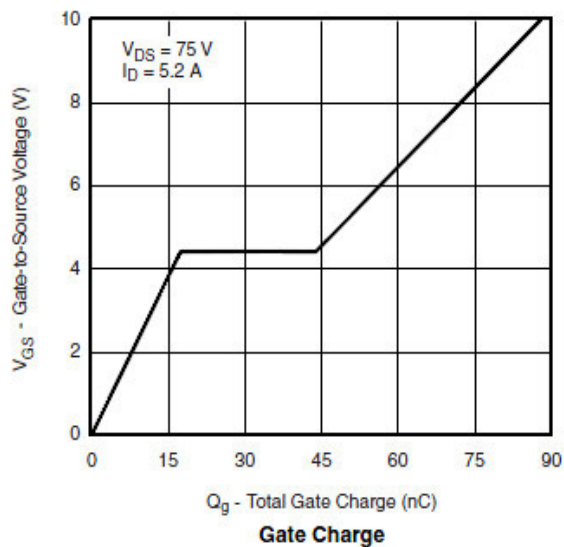
Transfer Characteristics



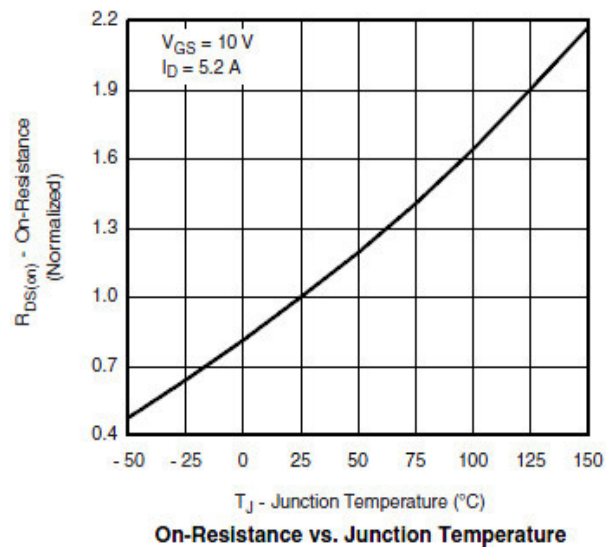
On-Resistance vs. Drain Current



Capacitance



Gate Charge

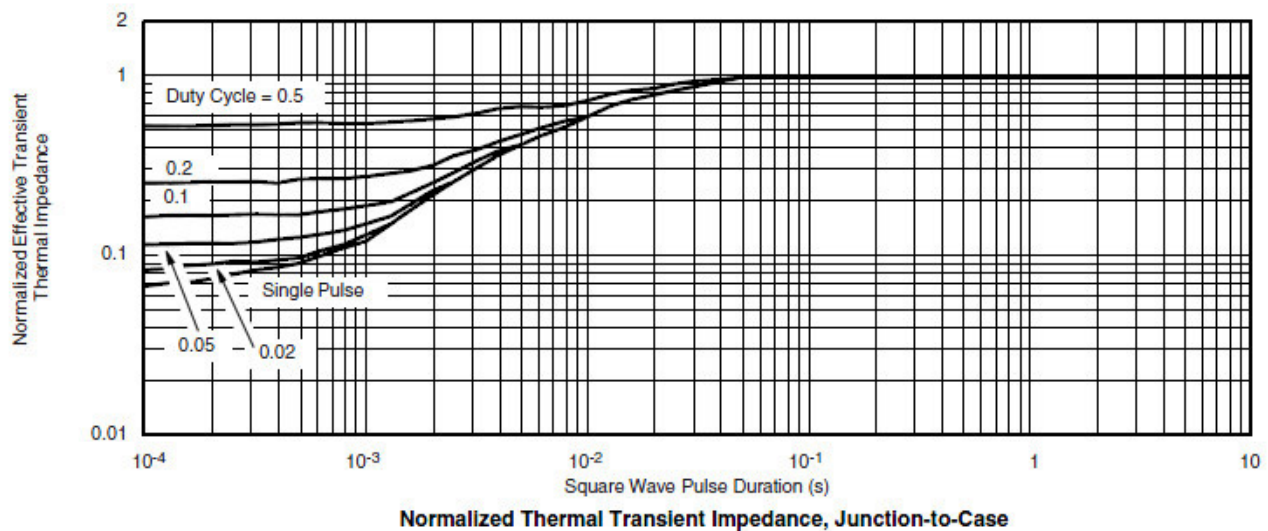
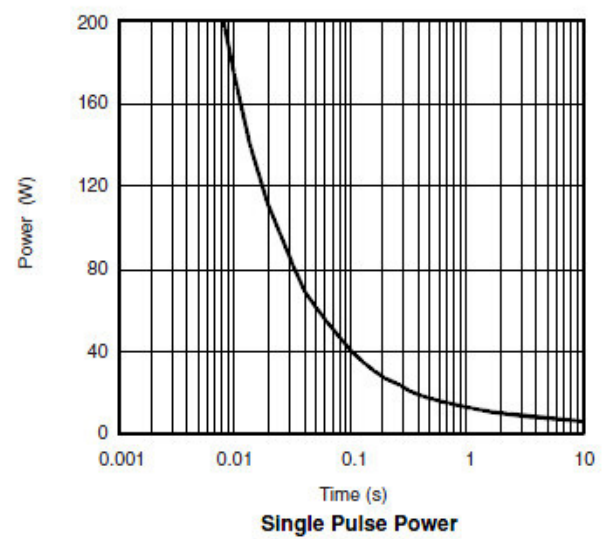
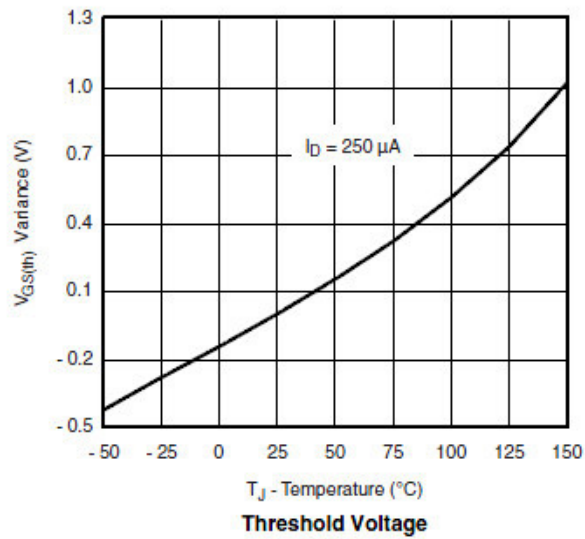
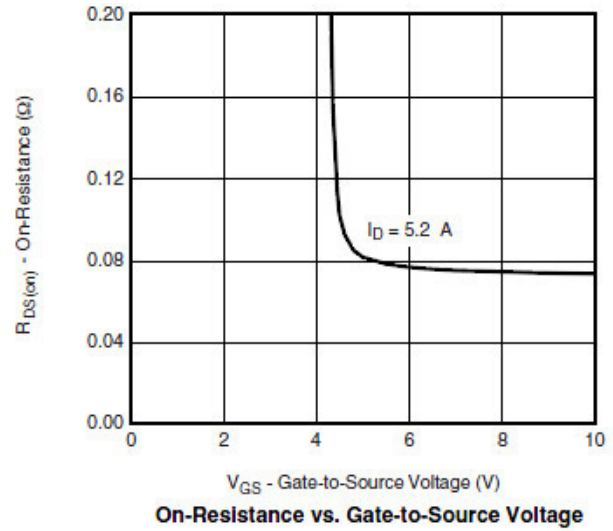
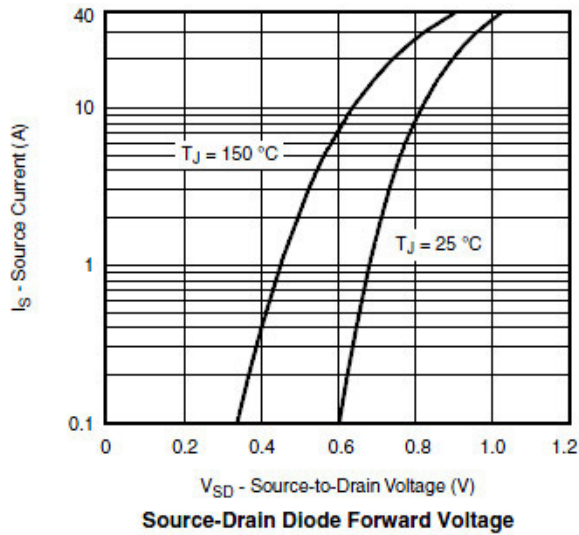


On-Resistance vs. Junction Temperature

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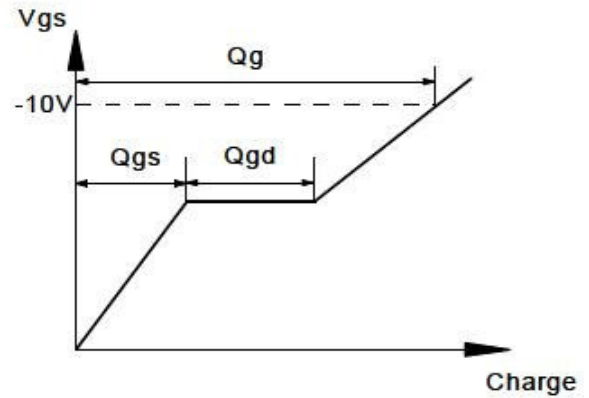
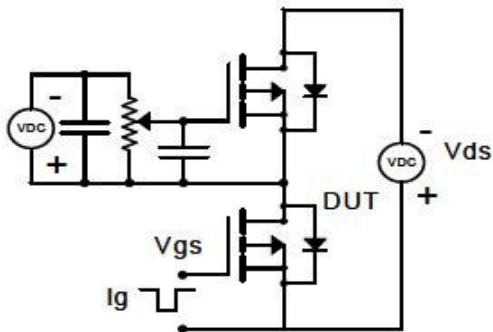
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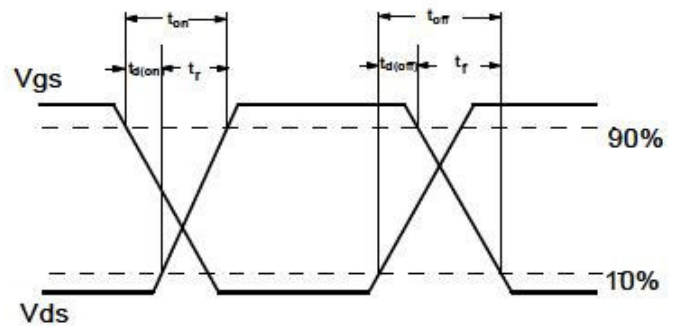
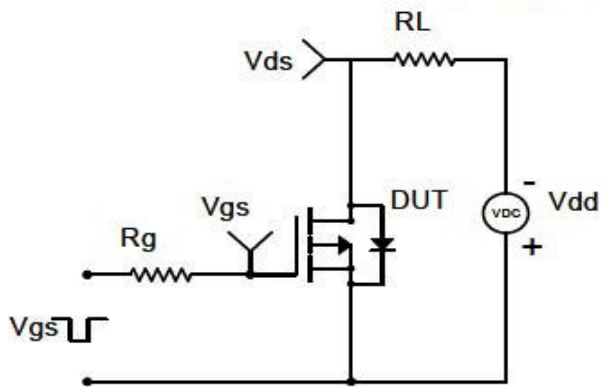
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

