

Single P-channel MOSFET

ELM52125SA-S

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

■ General description

ELM52125SA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage. Internal ESD protection is included.

■ Features

- $V_{ds} = -200V$
- $I_d = -0.5A$
- $R_{ds(on)} = 2400m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} = 2600m\Omega$ ($V_{gs} = -4.5V$)
- ESD Rating : $>2000V$ HBM

■ Maximum absolute ratings

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

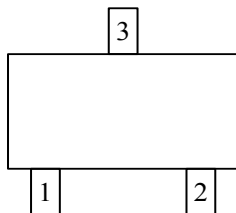
Parameter	Symbol	Limit	Unit	
Drain-source voltage	V_{ds}	-200	V	
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current ($T_j = 150^\circ C$)	I_d	$T_a = 25^\circ C$	-0.5	A
		$T_a = 70^\circ C$	-0.3	
Pulsed drain current	I_{dm}	-1.0	A	
Power dissipation	P_d	$T_c = 25^\circ C$	3.2	W
		$T_c = 70^\circ C$	2.1	
Operating junction temperature	T_j	150	$^\circ C$	
Junction and storage temperature range	T_{stg}	-55 to 150	$^\circ C$	

■ Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	$R_{\theta ja}$		120	$^\circ C/W$

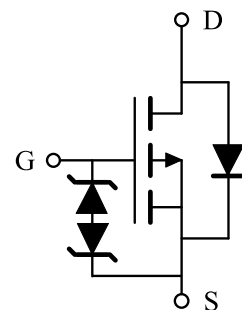
■ Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■ Circuit



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■ Electrical characteristics

Ta=25°C. Unless otherwise noted.

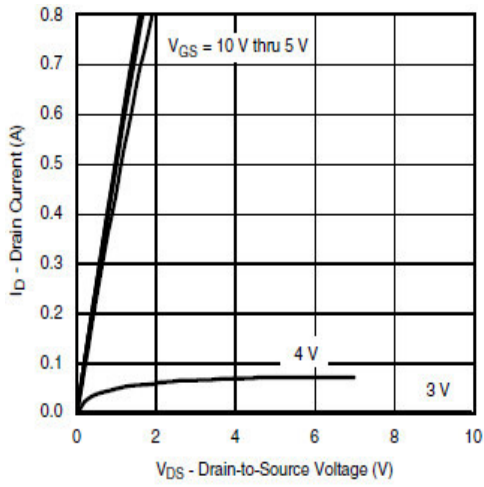
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-200			V
Zero gate voltage drain current	Idss	Vds=-160V, Vgs=0V			-1	μA
		Vds=-160V, Vgs=0V, Ta=85°C			-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±10	μA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-2.5	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-10V	-0.6			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-0.5A		2000	2400	mΩ
		Vgs=-4.5V, Id=-0.3A		2100	2600	
Forward transconductance	Gfs	Vds=-10V, Id=-0.5A		1.5		S
Diode forward voltage	Vsd	Is=-0.3A, Vgs=0V		-0.75	-1.20	V
Max. body-diode continuous current	Is				-1.0	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-75V, f=1MHz		155		pF
Output capacitance	Coss			8		pF
Reverse transfer capacitance	Crss			6		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-10V, Vds=-75V Id=-0.5A		4.20	8.00	nC
Gate-source charge	Qgs			0.98		nC
Gate-drain charge	Qgd			1.32		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-75V RL=75Ω, Id=-1.0A Rgen=1.0Ω		5	10	ns
Turn-on rise time	tr			10	20	ns
Turn-off delay time	td(off)			20	40	ns
Turn-off fall time	tf			10	20	ns

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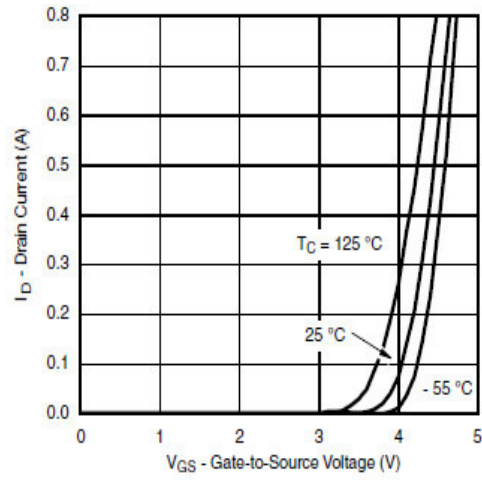
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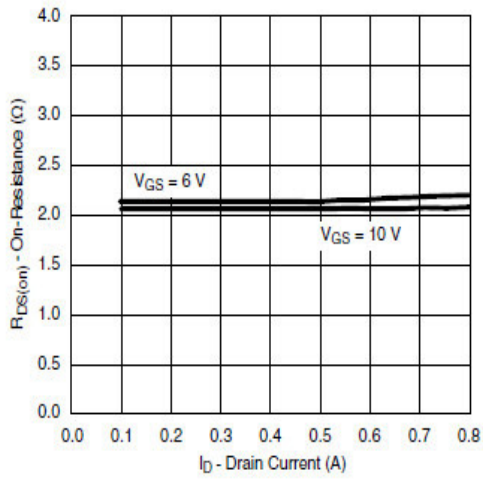
■ Typical electrical and thermal characteristics



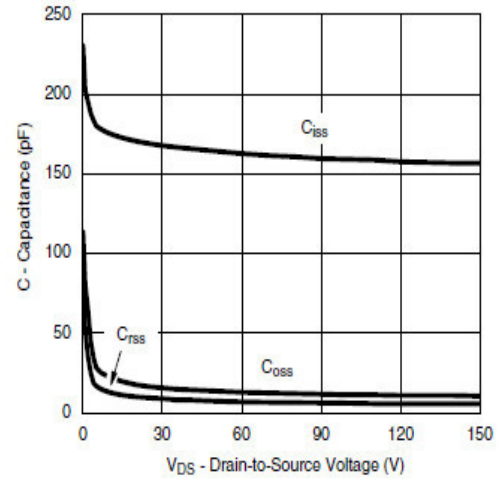
Output Characteristics



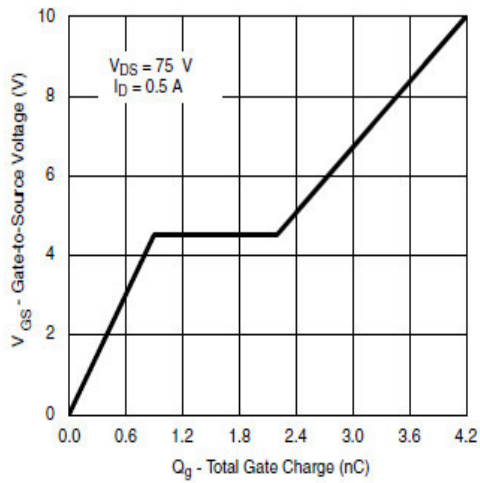
Transfer Characteristics



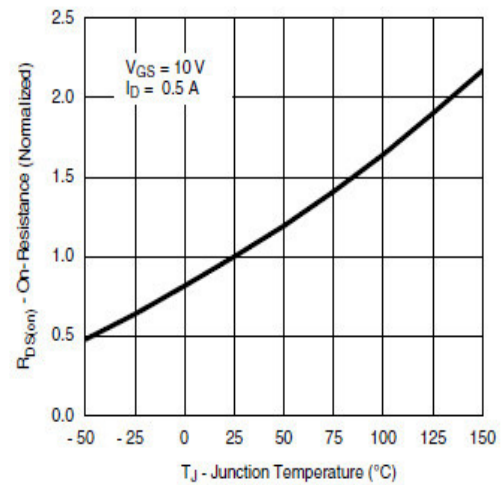
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

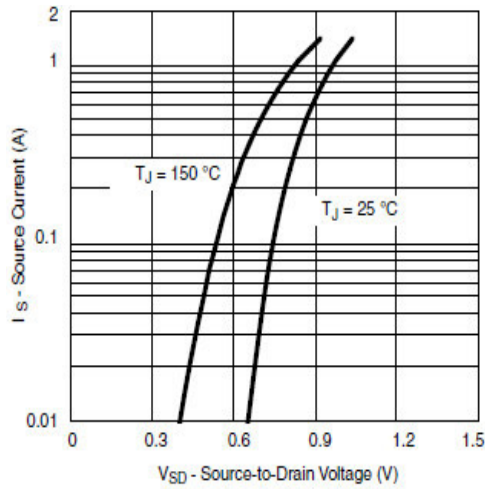


On-Resistance vs. Junction Temperature

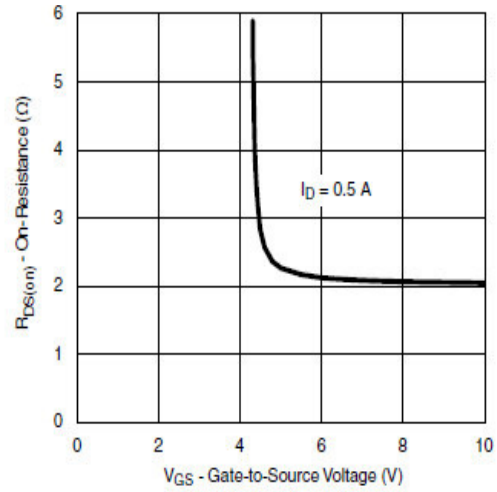
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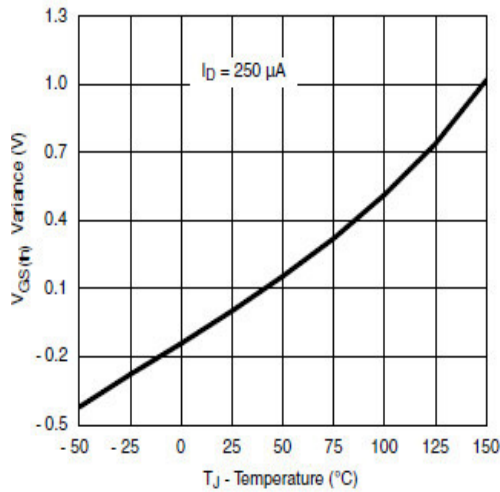
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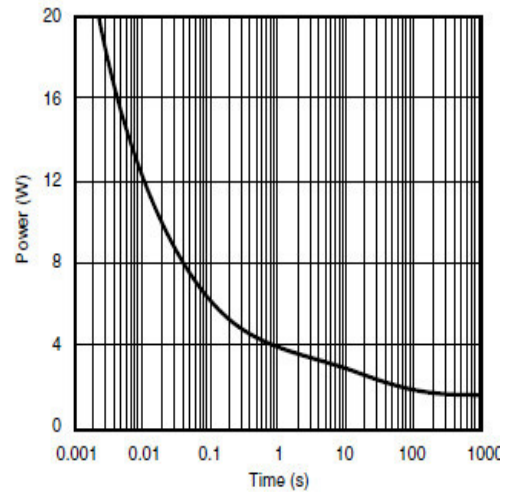
Source-Drain Diode Forward Voltage



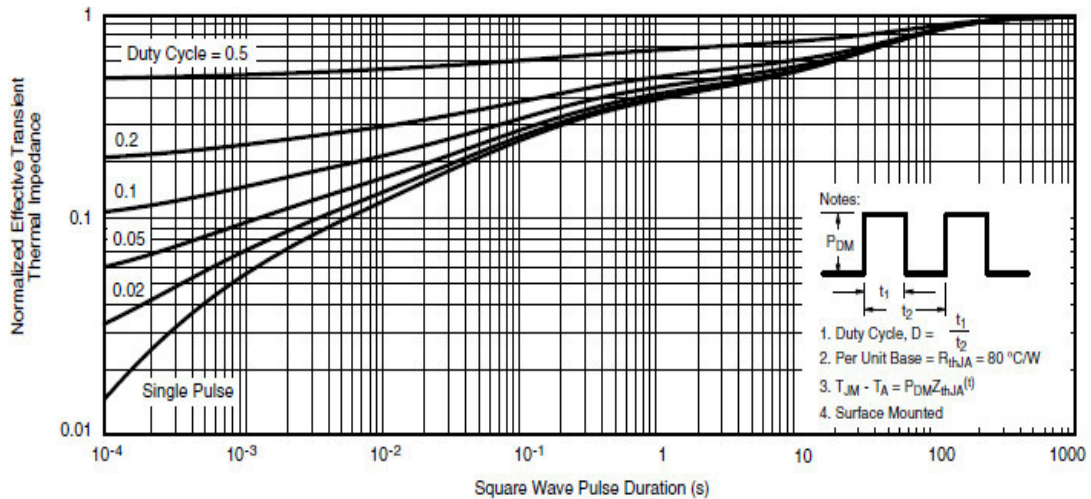
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

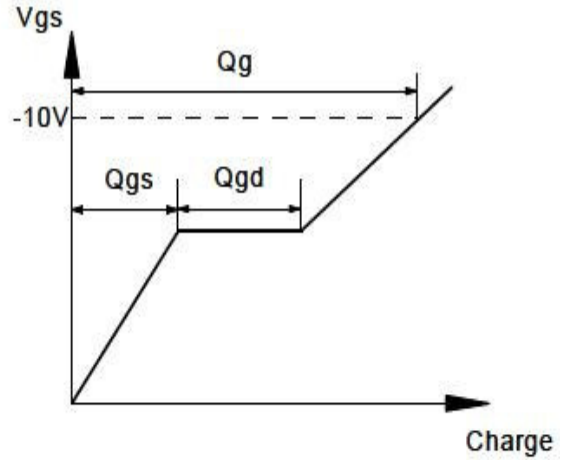
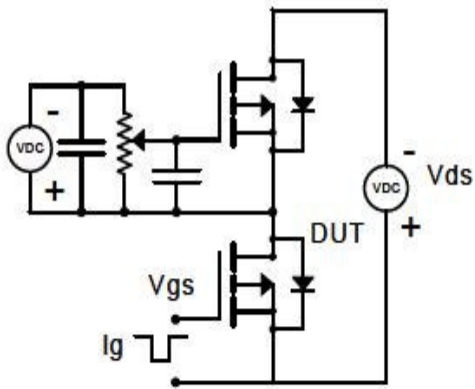
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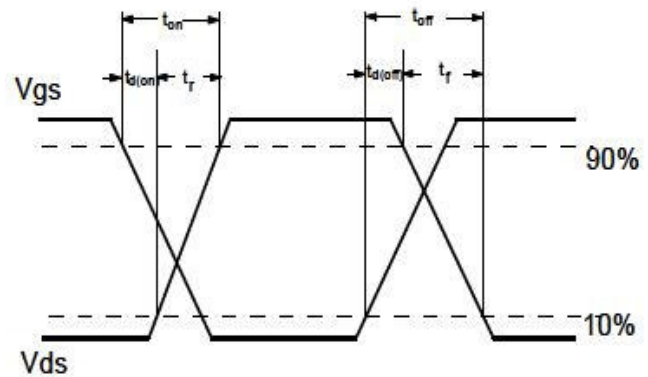
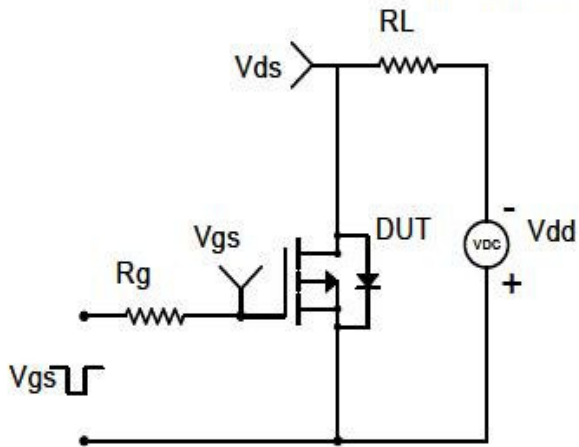
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

