Single P-channel MOSFET

ELM51303A-S

■General description

ELM51303A-S uses advanced trench technology to provide excellent Rds(on), low gate charge and operation with gate voltages as low as 1.8V.

■Features

- Vds=-20V
- Id=-1.0A
- Rds(on) = 600mΩ (Vgs=-4.5V)
- Rds(on) = 800mΩ (Vgs=-2.5V)
- Rds(on) = 1300mΩ (Vgs=-1.8V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

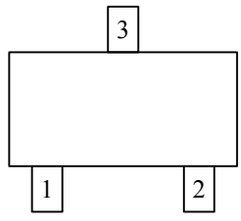
Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	-20	V
Gate-source voltage		Vgs	±12	V
Continuous drain current	Ta=25°C	Id	-1.0	A
	Ta=70°C		-0.6	
Pulsed drain current		Idm	-6	A
Power dissipation	Tc=25°C	Pd	0.35	W
	Tc=70°C		0.22	
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	Rθja		120	°C/W

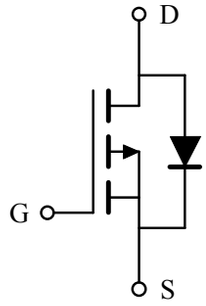
■Pin configuration

SC-70(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit

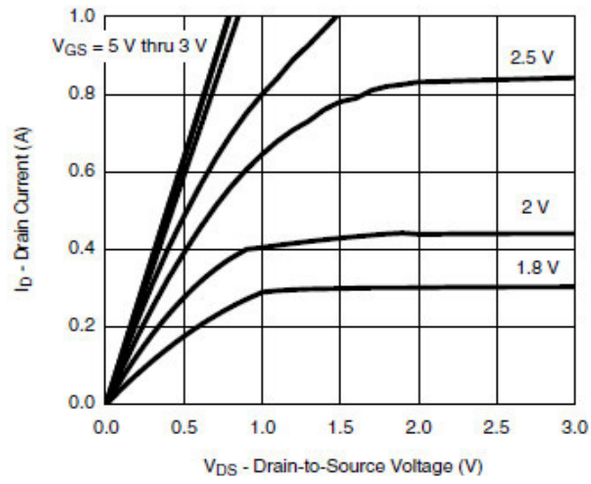


■Electrical characteristics

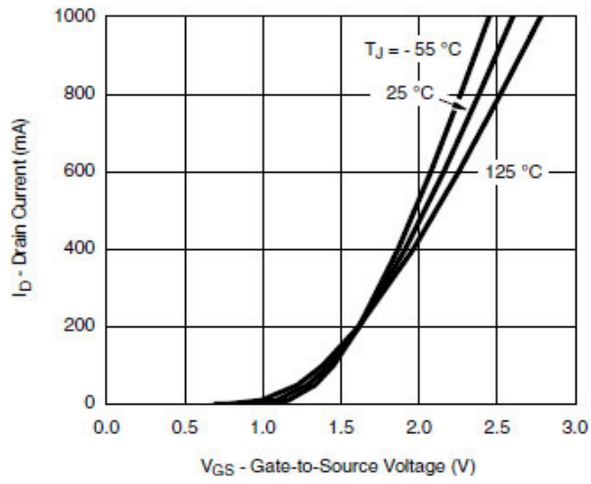
Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V		-20			V
Zero gate voltage drain current	Idss	Vds=-20V, Vgs=0V				-1	μA
			Ta=85°C			-5	
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA		-0.4		-1.0	V
On state drain current	Id(on)	Vgs=-4.5V, Vds=-5V		-0.7			A
Static drain-source on-resistance	Rds(on)	Vgs=-4.5V, Id=-0.45A			500	600	mΩ
		Vgs=-2.5V, Id=-0.35A			700	800	
		Vgs=-1.8V, Id=-0.25A			1000	1300	
Forward transconductance	Gfs	Vds=-10V, Id=-0.4A			1		S
Diode forward voltage	Vsd	Is=-0.15A, Vgs=0V			-0.65	-1.20	V
Max. body-diode continuous current	Is					-1.0	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-10V, f=1MHz			70	100	pF
Output capacitance	Coss				20		pF
Reverse transfer capacitance	Crss				10		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-4.5V, Vds=-10V Id=-0.25A			1.0	1.3	nC
Gate-source charge	Qgs				0.1		nC
Gate-drain charge	Qgd				0.3		nC
Turn-on delay time	td(on)	Vgs=-4.5V, Vds=-10V RL=30Ω, Id=-0.2A Rgen=10Ω			10	15	ns
Turn-on rise time	tr				10	15	ns
Turn-off delay time	td(off)				40	60	ns
Turn-off fall time	tf				30	50	ns

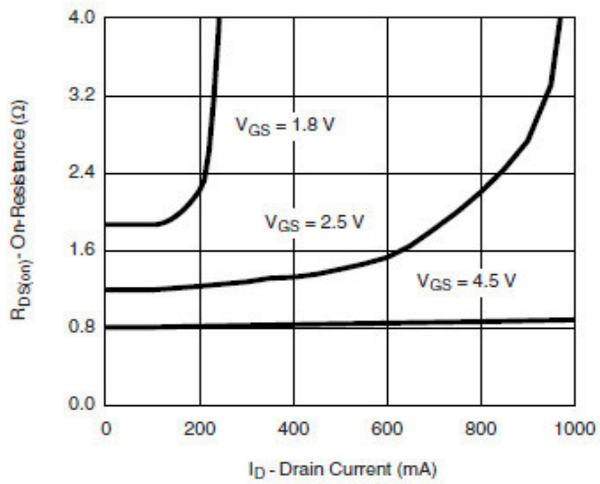
■Typical electrical and thermal characteristics



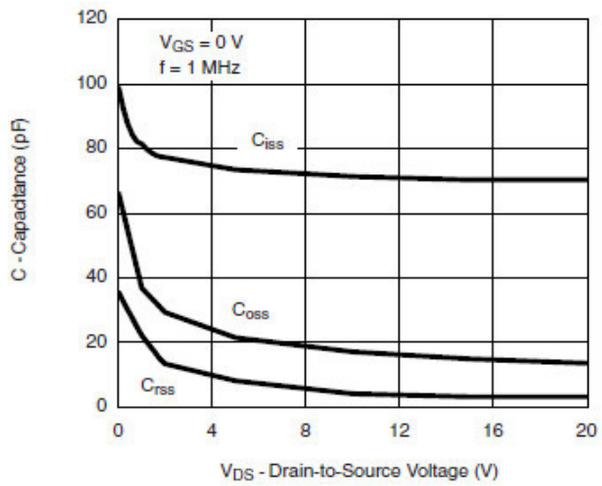
Output Characteristics



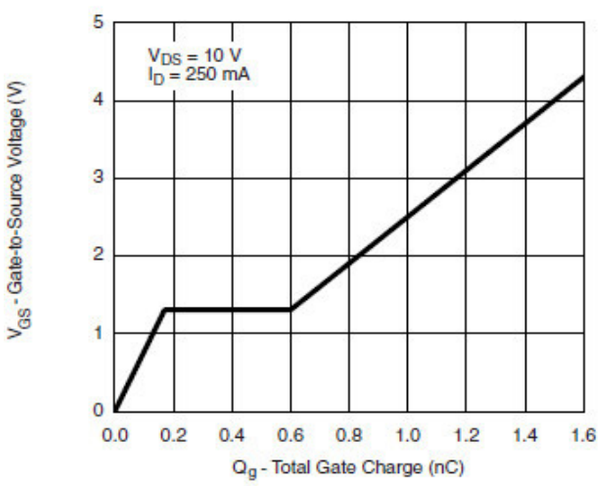
Transfer Characteristics



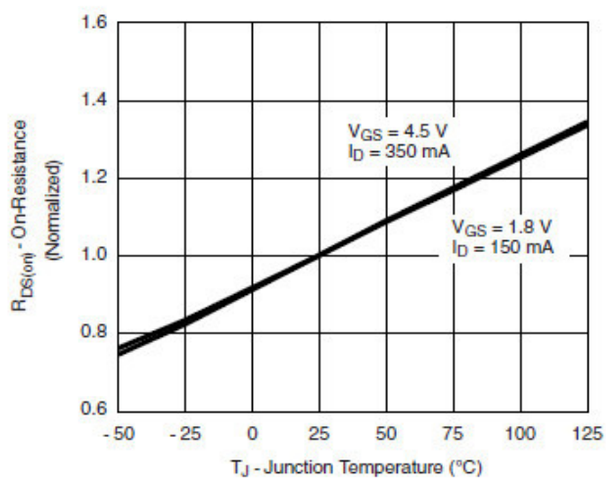
On-Resistance vs. Drain Current



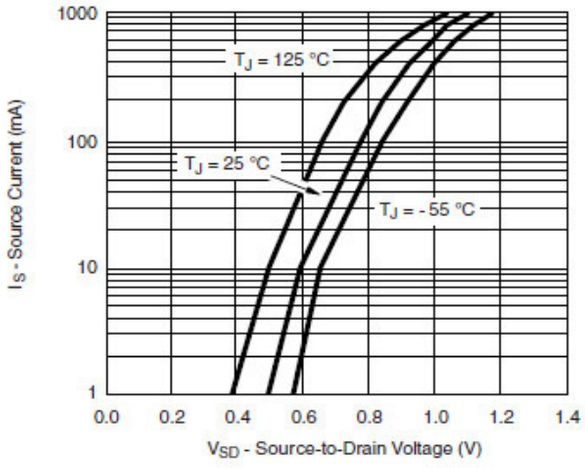
Capacitance



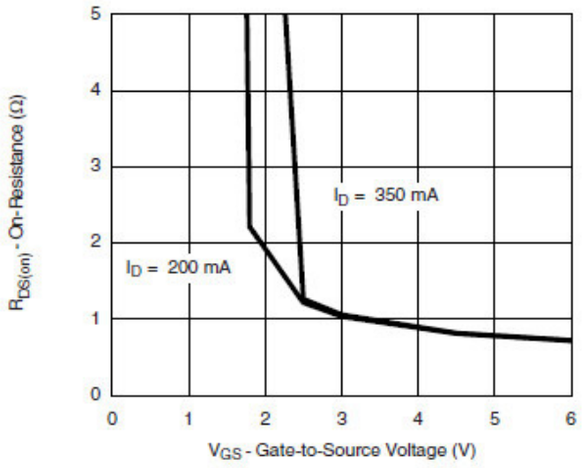
Gate Charge



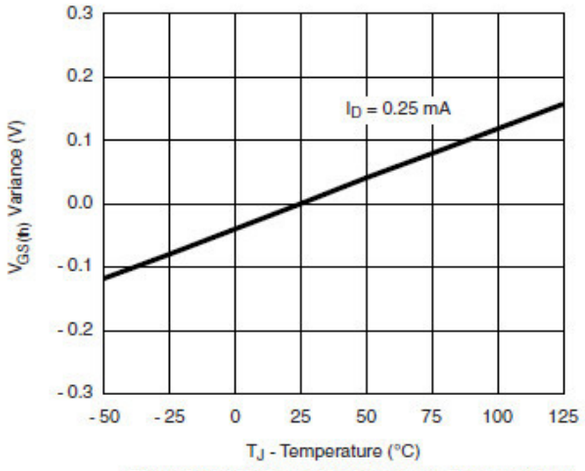
On-Resistance vs. Junction Temperature



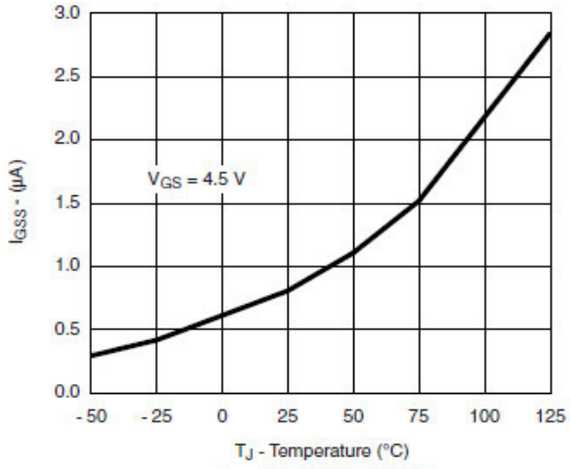
Source-Drain Diode Forward Voltage



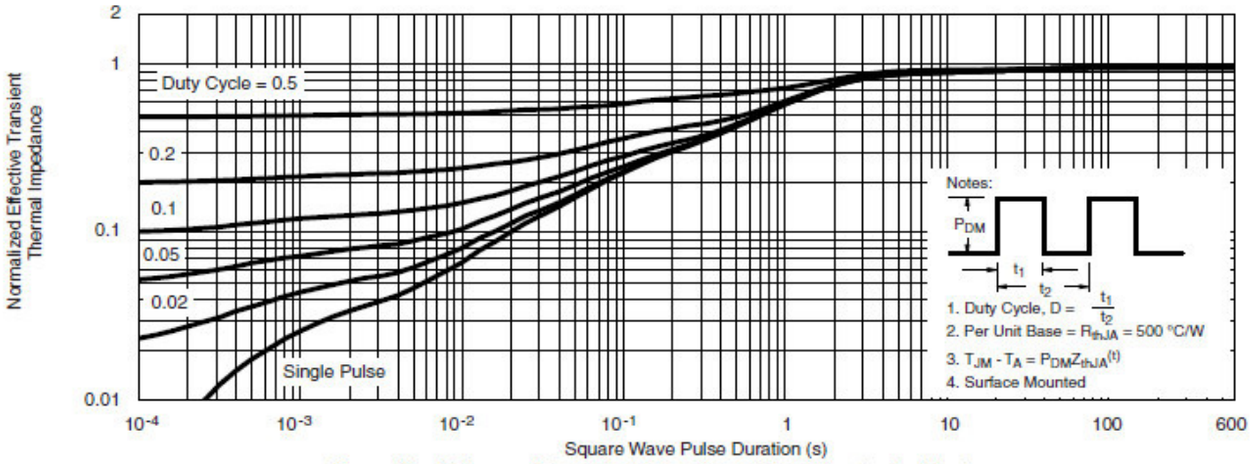
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage Variance vs. Temperature



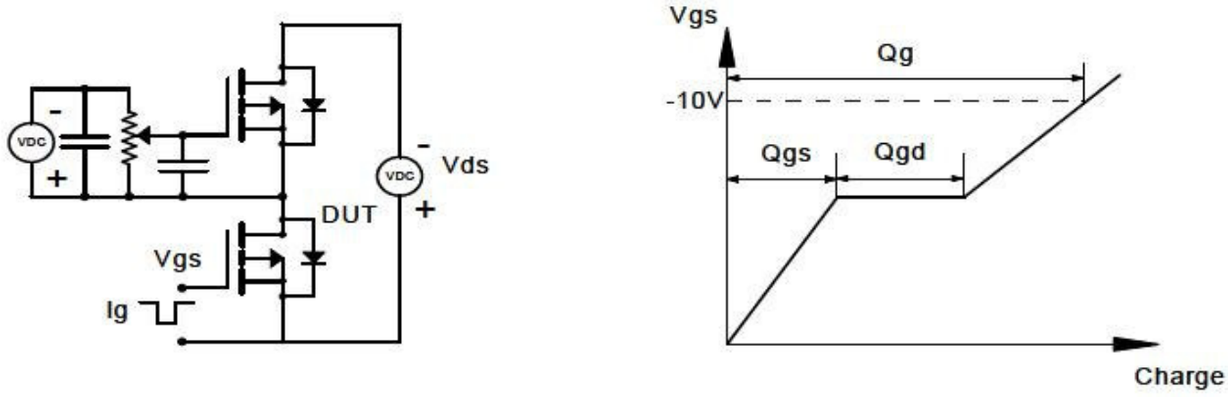
I_{GSS} vs. Temperature



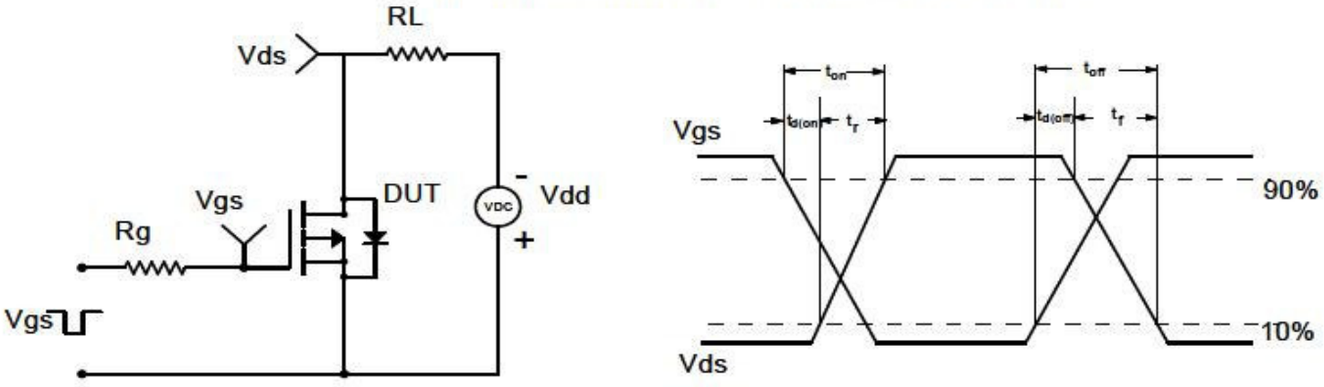
Normalized Thermal Transient Impedance, Junction-to-Ambient

■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms