Single N-channel MOSFET

ELM54804A-S

■General description

ELM54804A-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

■Features

- Vds=40V
- Id=18A
- Rds(on) = 48mΩ (Vgs=10V)
- Rds(on) = 70mΩ (Vgs=4.5V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

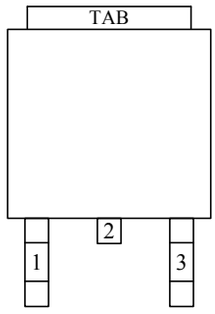
Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	40	V
Gate-source voltage		Vgs	±20	V
Continuous drain current(Tj=150°C)	Ta=25°C	Id	18	A
	Ta=70°C		15	
Pulsed drain current		Idm	40	A
Single pulse avalanche current	L=0.1mH	Ias	25	A
Avalanche energy		Eas	35	mJ
Power dissipation	Tc=25°C	Pd	40	W
	Tc=70°C		15	
Operating junction temperature		Tj	150	°C
Storage temperature range		Tstg	- 55 to 150	°C

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	Rθja		62.5	°C/W

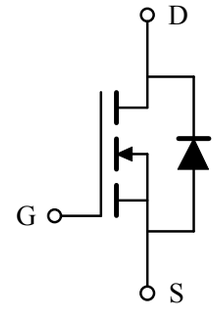
■Pin configuration

TO-252-3(TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

■Circuit

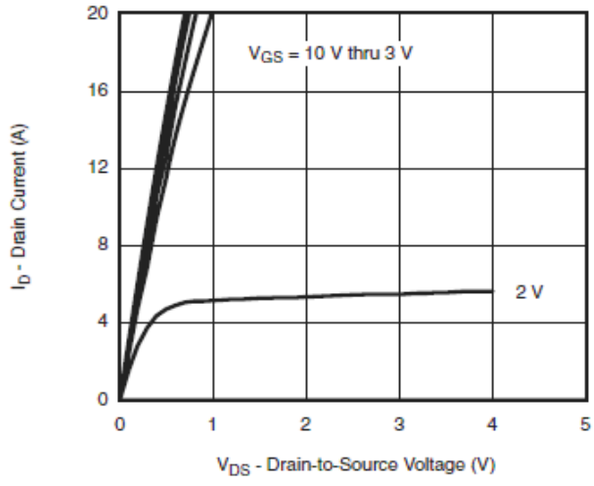


■Electrical characteristics

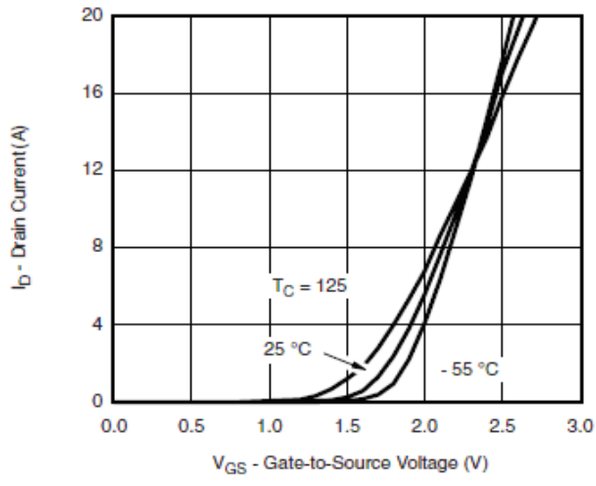
Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V		40			V
Zero gate voltage drain current	Idss	Vds=40V, Vgs=0V				1	μA
			Ta=85°C			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		10			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=16A			42	48	mΩ
		Vgs=4.5V, Id=10A			56	70	
Forward transconductance	Gfs	Vds=15V, Id=5.0A			25		S
Diode forward voltage	Vsd	Is=2A, Vgs=0V			0.85	1.20	V
Max. body-diode continuous current	Is					8	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=20V, f=1MHz			850		pF
Output capacitance	Coss				110		pF
Reverse transfer capacitance	Crss				75		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=20V Id≡5.0A			10.0	14.0	nC
Gate-source charge	Qgs				2.8		nC
Gate-drain charge	Qgd				3.2		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=20V RL=4Ω, Id≡5.0A Rgen=1Ω			6	12	ns
Turn-on rise time	tr				10	20	ns
Turn-off delay time	td(off)				20	36	ns
Turn-off fall time	tf				6	12	ns

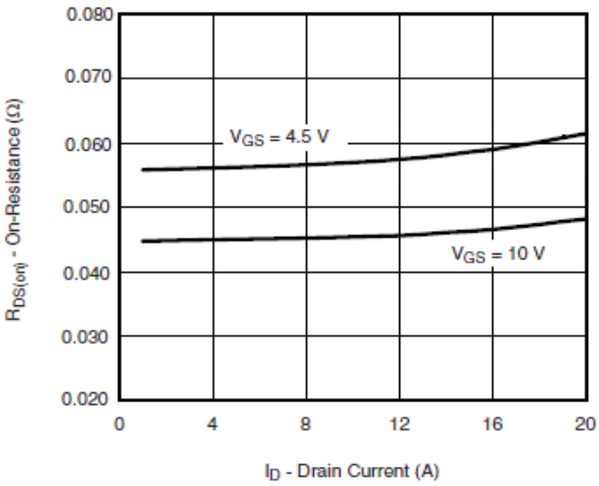
■Typical electrical and thermal characteristics



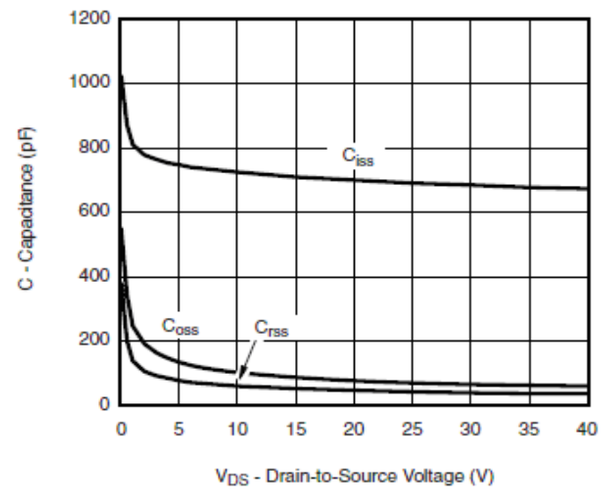
Output Characteristics



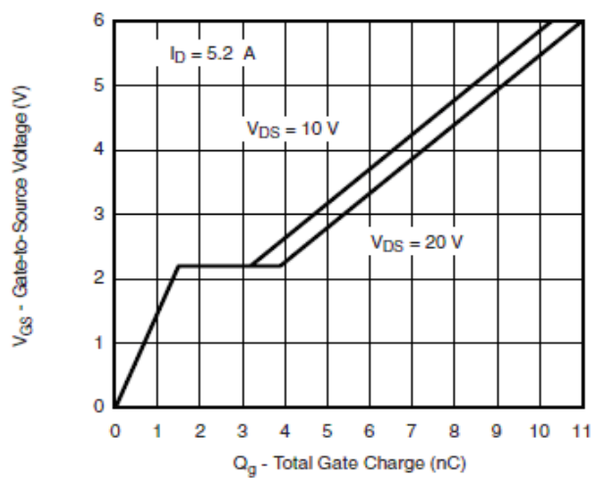
Transfer Characteristics



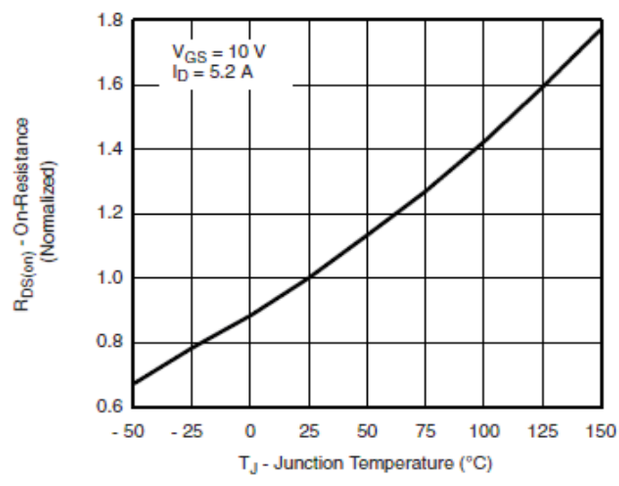
On-Resistance vs. Drain Current



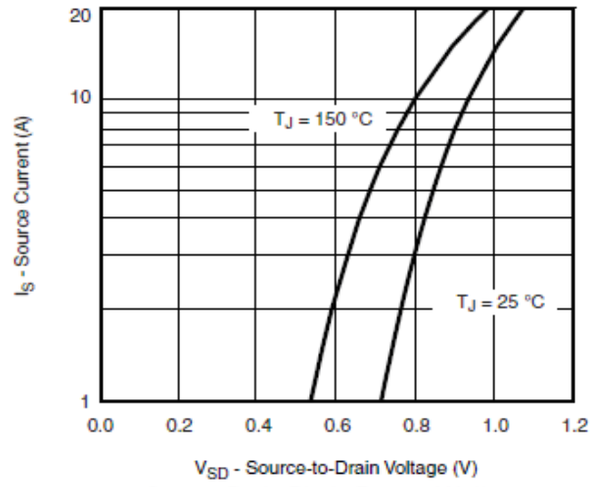
Capacitance



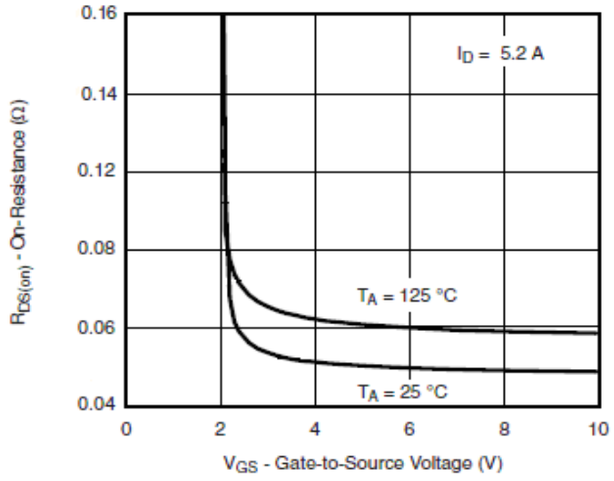
Gate Charge



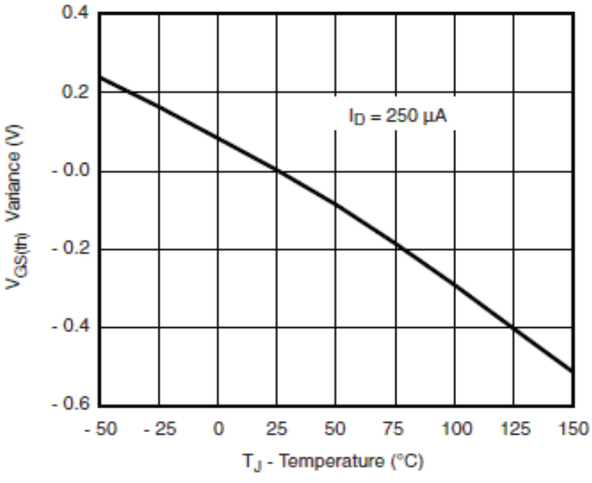
On-Resistance vs. Junction Temperature



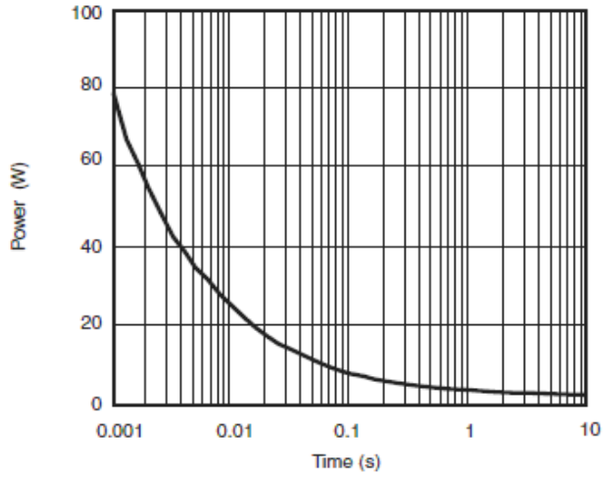
Source-Drain Diode Forward Voltage



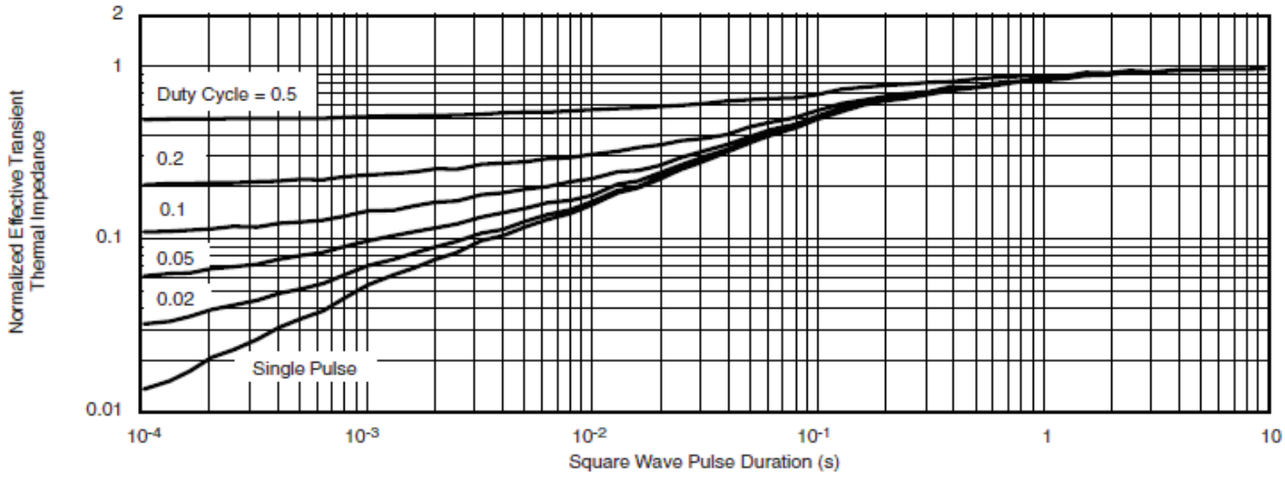
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



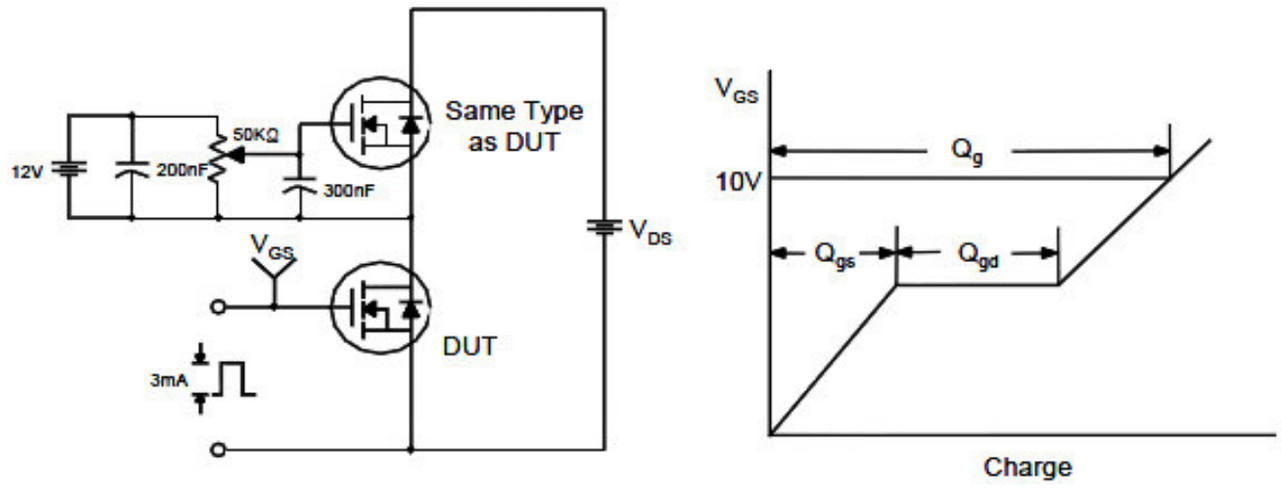
Single Pulse Power, Junction-to-Ambient



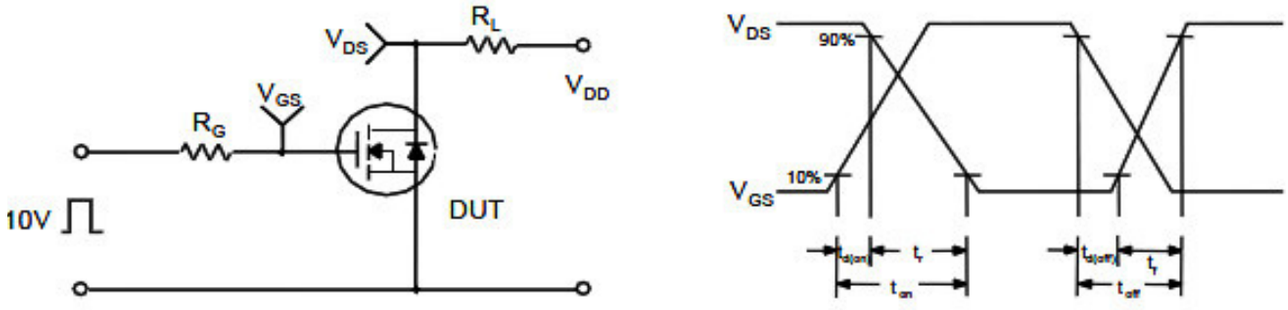
Normalized Thermal Transient Impedance, Junction-to-Foot

■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms