Single P-channel MOSFET

ELM54425WSA-N

■General description

ELM54425WSA-N uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

■Features

- Vds=-30V
- Id=-13.0A
- Rds(on) = 12.0mΩ (Vgs=-10V)
- Rds(on) = 16.5mΩ (Vgs=-4.5V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

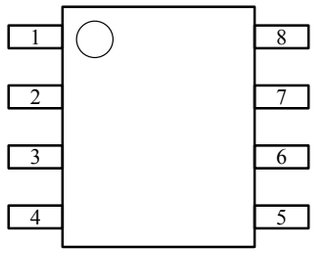
Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	-30	V
Gate-source voltage		Vgs	±20	V
Continuous drain current	Ta=25°C	Id	-13	A
	Ta=70°C		-10	
Pulsed drain current		Idm	-50	A
Power dissipation	Tc=25°C	Pd	2.8	W
	Tc=70°C		1.8	
Operating junction temperature		Tj	150	°C
Storage temperature range		Tstg	- 55 to 150	°C

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	Rθja		62.5	°C/W
Thermal resistance junction-to-case	Rθjc		19.0	°C/W

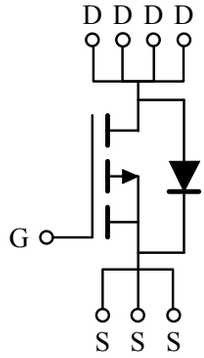
■Pin configuration

SOP-8(TOP VIEW)



Pin No.	Pin name
1	SOURCE
2	SOURCE
3	SOURCE
4	GATE
5	DRAIN
6	DRAIN
7	DRAIN
8	DRAIN

■Circuit

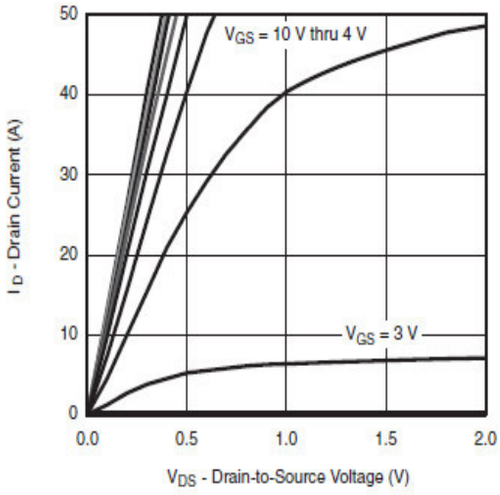


■Electrical characteristics

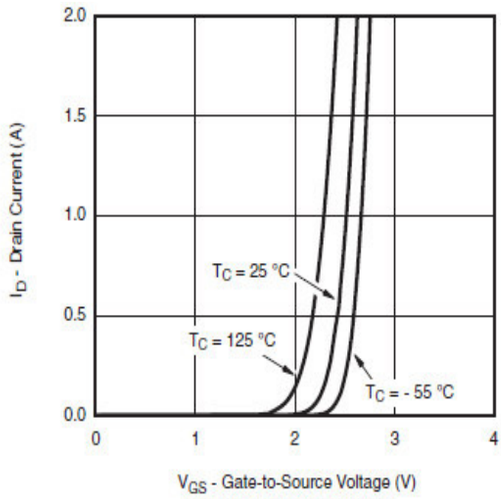
Ta=25°C. Unless otherwise noted.

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=±25V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0	-1.6	-2.0	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-10V	-30			A
		Vgs=-4.5V, Vds≥-5V	-5			
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-13A		10.0	12.0	mΩ
		Vgs=-4.5V, Id=-10A		14.0	16.5	
Forward transconductance	Gfs	Vds=-15V, Id=-13A		40		S
Diode forward voltage	Vsd	Is=-1.0A, Vgs=0V		-0.7	-1.3	V
Max. body-diode continuous current	Is				-2.0	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz		2600		pF
Output capacitance	Coss			450		pF
Reverse transfer capacitance	Crss			400		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-4.5V, Vds=-15V Id≡-10A		26	55	nC
Gate-source charge	Qgs			8		nC
Gate-drain charge	Qgd			12		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V RL=1.5Ω, Id≡-10A Rgen=1.0Ω		12	20	ns
Turn-on rise time	tr			10	25	ns
Turn-off delay time	td(off)			40	80	ns
Turn-off fall time	tf			10	20	ns

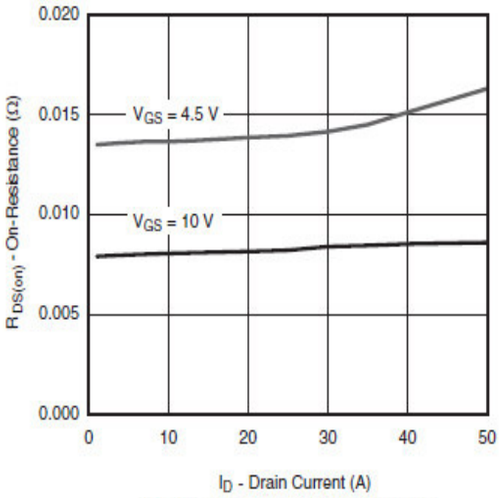
■Typical electrical and thermal characteristics



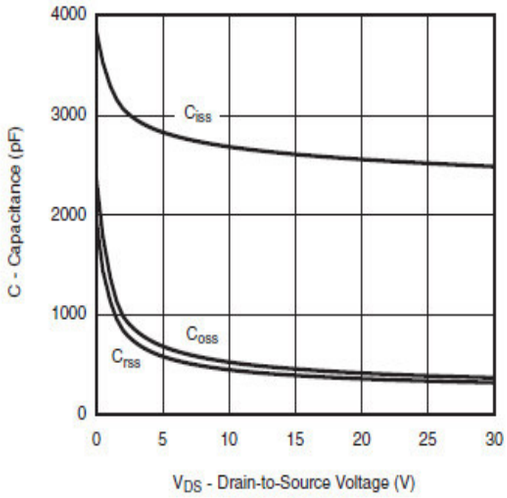
Output Characteristics



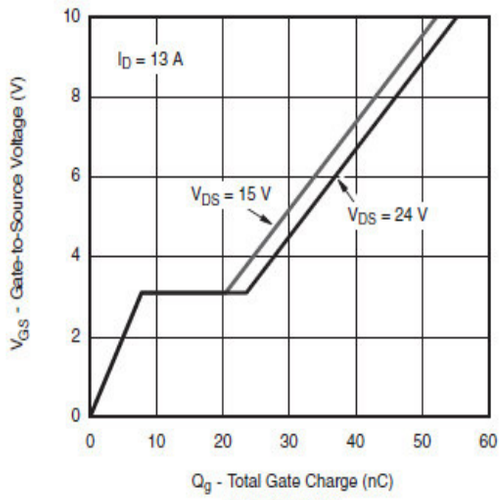
Transfer Characteristics



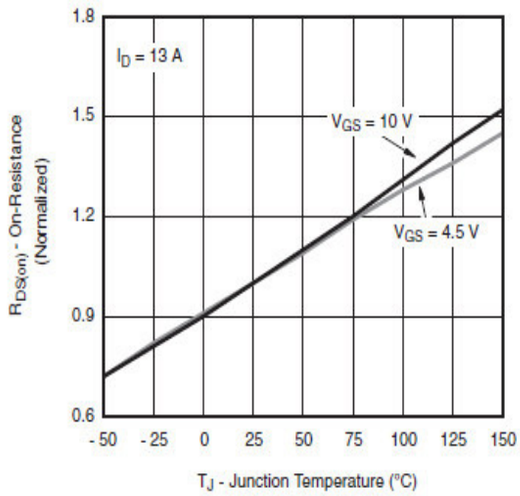
On-Resistance vs. Drain Current



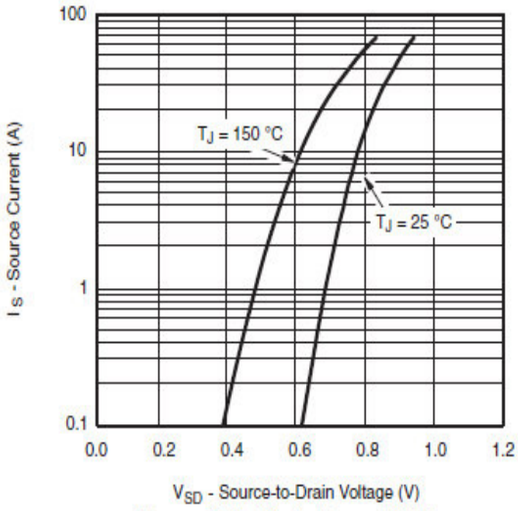
Capacitance



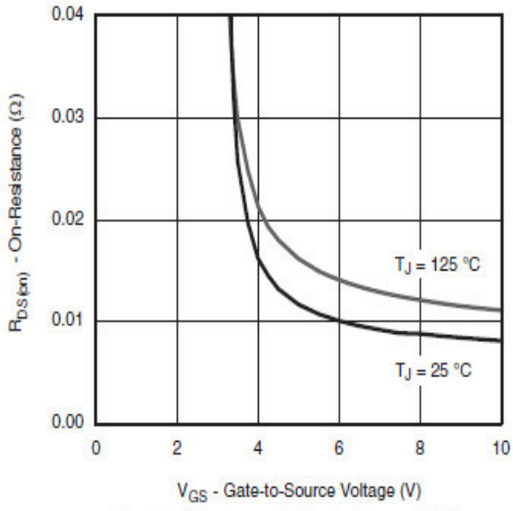
Gate Charge



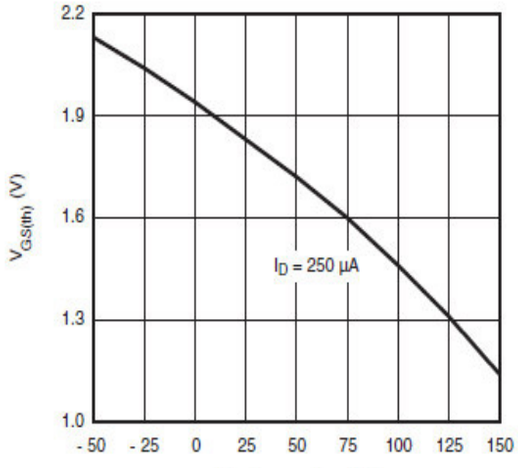
On-Resistance vs. Junction Temperature



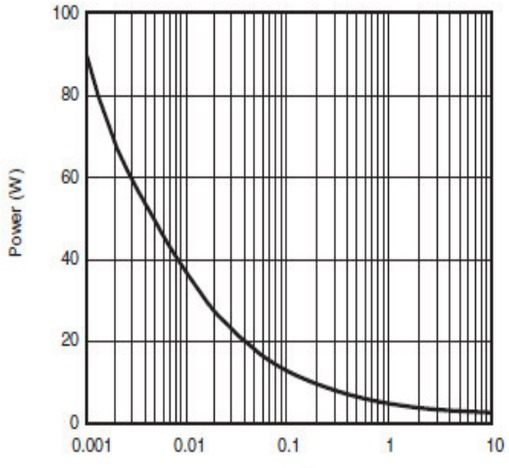
Source-Drain Diode Forward Voltage



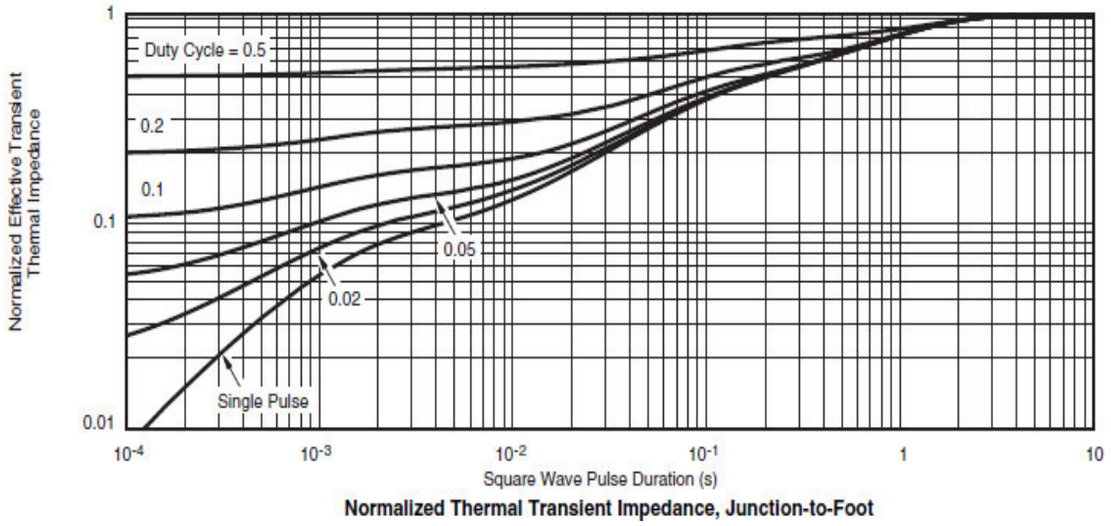
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



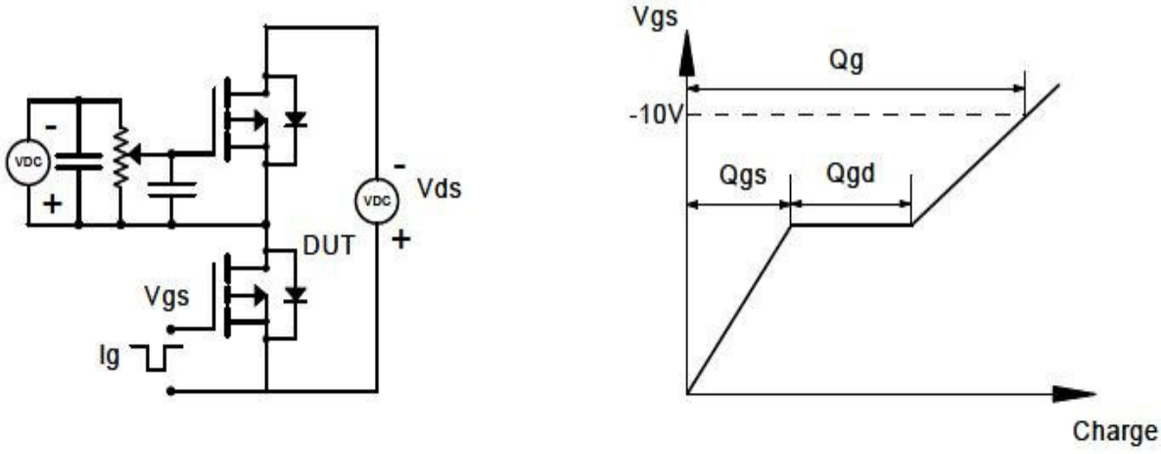
Single Pulse Power (Junction-to-Ambient)



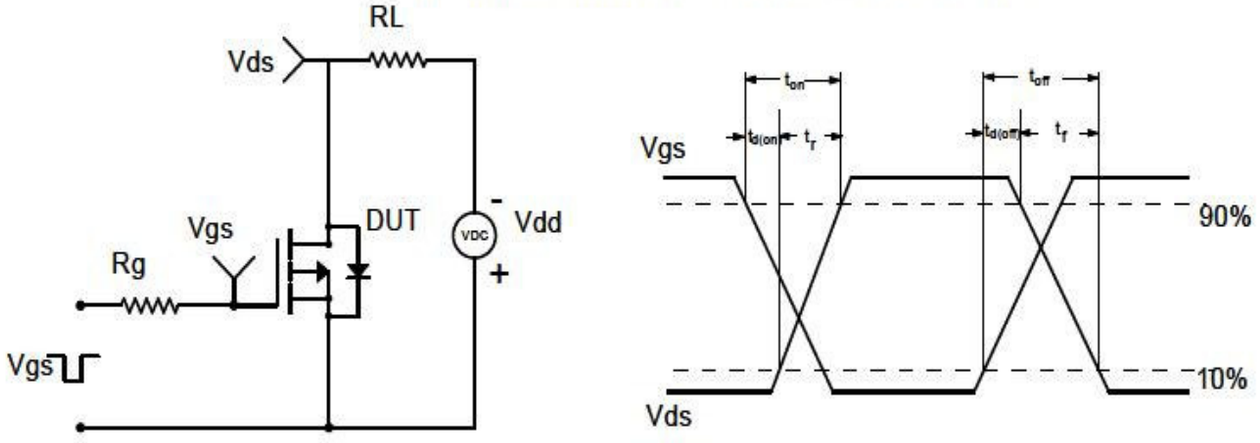
Normalized Thermal Transient Impedance, Junction-to-Foot

■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms