Single P-channel MOSFET

ELM57113WSA-N

■General description

ELM57113WSA-N uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

■Features

- Vds=-100V
- Id=-9.0A
- Rds(on) = 87mΩ (Vgs=-10V)
- Rds(on) = 95mΩ (Vgs=-4.5V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	-100	V
Gate-source voltage		Vgs	±20	V
Continuous drain current(Tj=150°C)	Ta=25°C	Id	-9.0	A
	Ta=70°C		-6.0	
Pulsed drain current		Idm	-15	A
Power dissipation	Tc=25°C	Pd	28	W
	Tc=70°C		18	
Operating junction temperature		Tj	150	°C
Storage temperature range		Tstg	- 55 to 150	°C

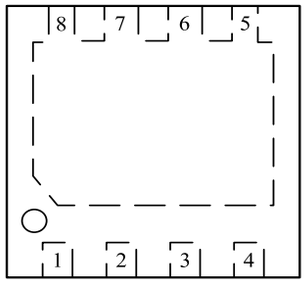
■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	Rθja		40	°C/W

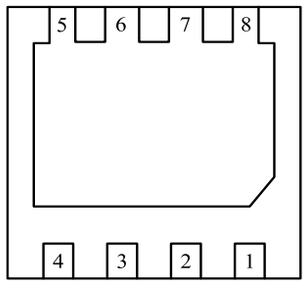
■Pin configuration

DFN8-3×3

(TOP VIEW)

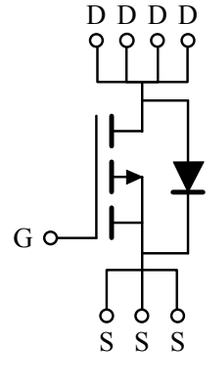


(BOTTOM VIEW)



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

■Circuit

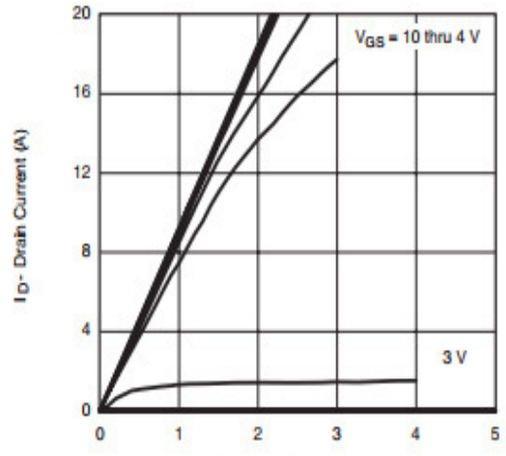


■Electrical characteristics

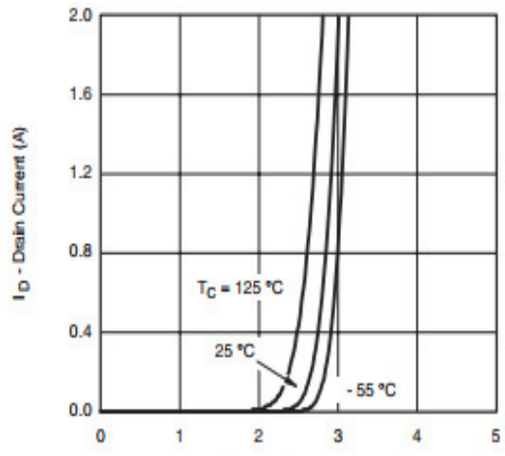
Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-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=-7.0A		77	87	mΩ
		Vgs=-4.5V, Id=-5.0A		85	95	
Forward transconductance	Gfs	Vds=-15V, Id=-3.5A		19		S
Diode forward voltage	Vsd	Is=-2.0A, Vgs=0V		-0.8	-1.3	V
Max. body-diode continuous current	Is				-9.0	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-50V, f=1MHz		1800		pF
Output capacitance	Coss			150		pF
Reverse transfer capacitance	Crss			100		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-4.5V, Vds=-50V Id≡-4.0A		20	40	nC
Gate-source charge	Qgs			5		nC
Gate-drain charge	Qgd			10		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-50V RL=12.5Ω, Id≡-4.0A Rgen=1.0Ω		15	30	ns
Turn-on rise time	tr			15	30	ns
Turn-off delay time	td(off)			45	90	ns
Turn-off fall time	tf			15	30	ns

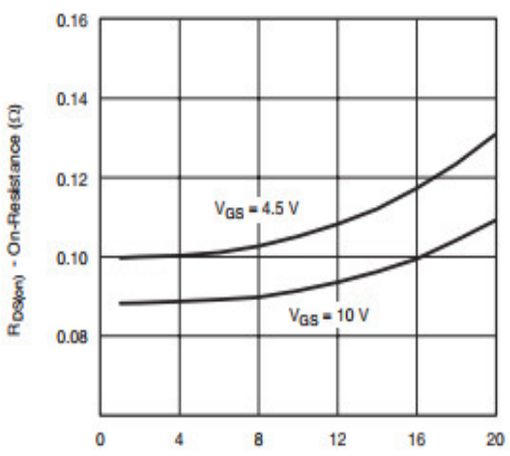
■Typical electrical and thermal characteristics



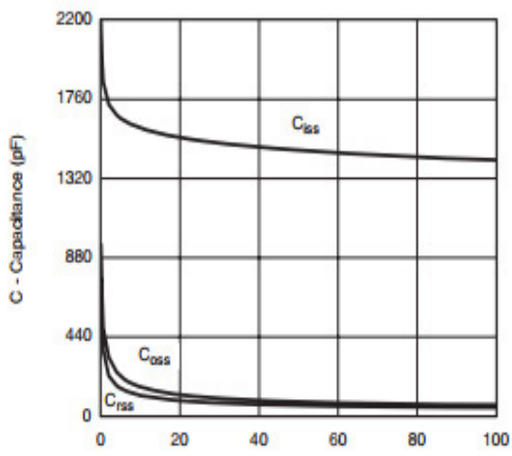
Output Characteristics



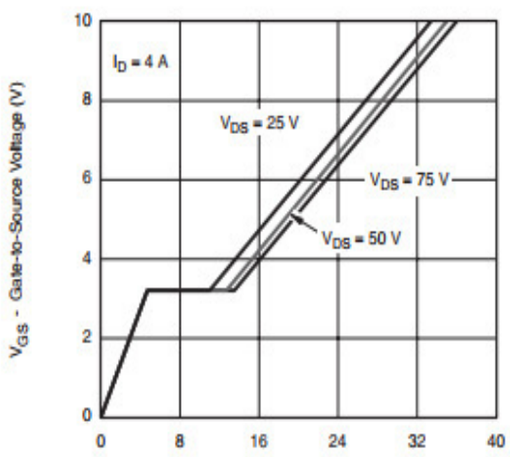
Transfer Characteristics



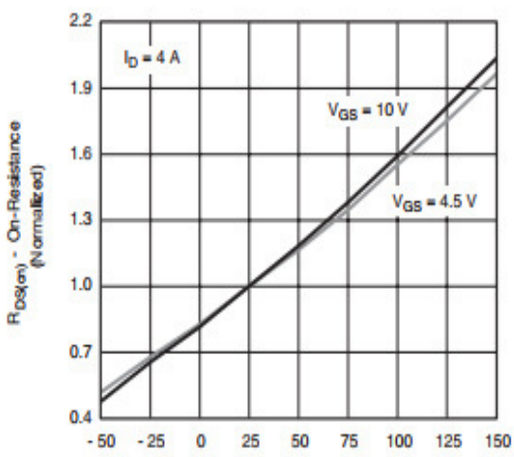
On-Resistance vs. Drain Current and Gate Voltage



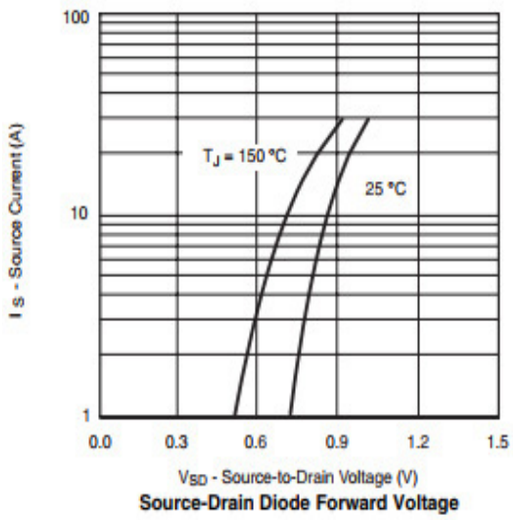
Capacitance



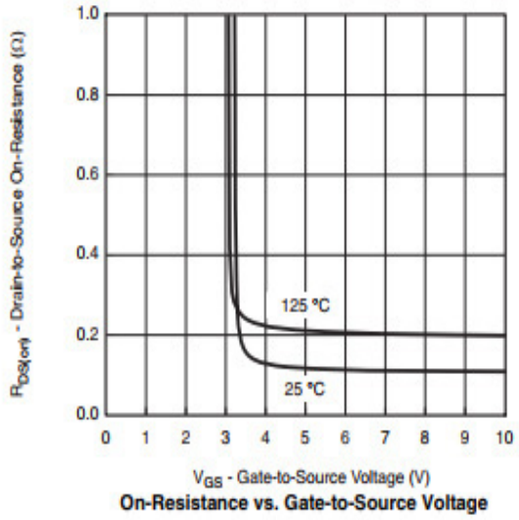
Gate Charge



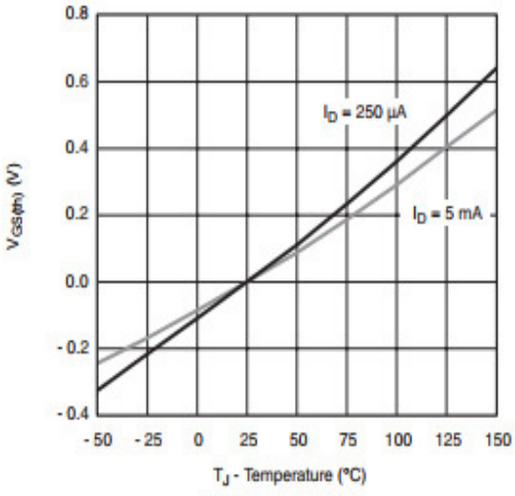
On-Resistance vs. Junction Temperature



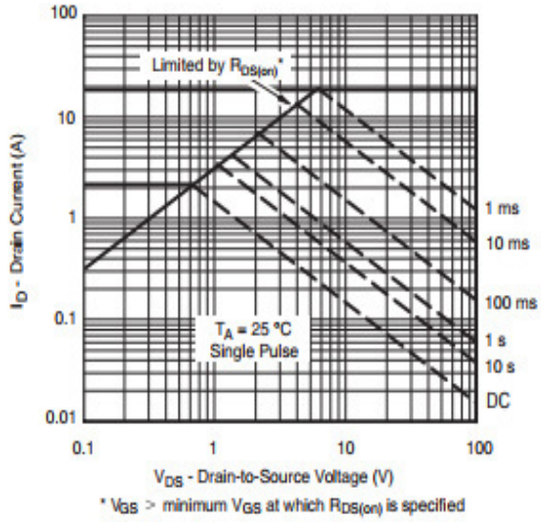
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

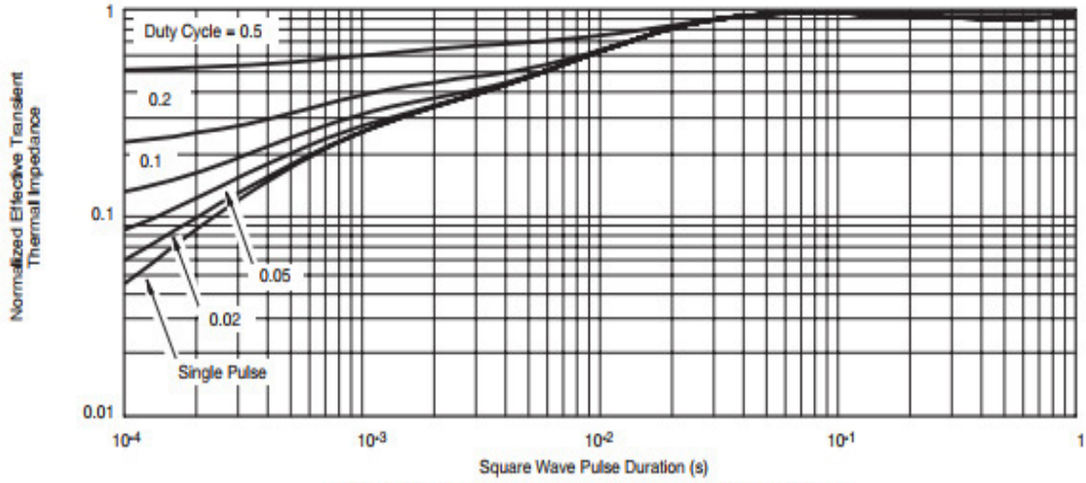


Threshold Voltage



* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

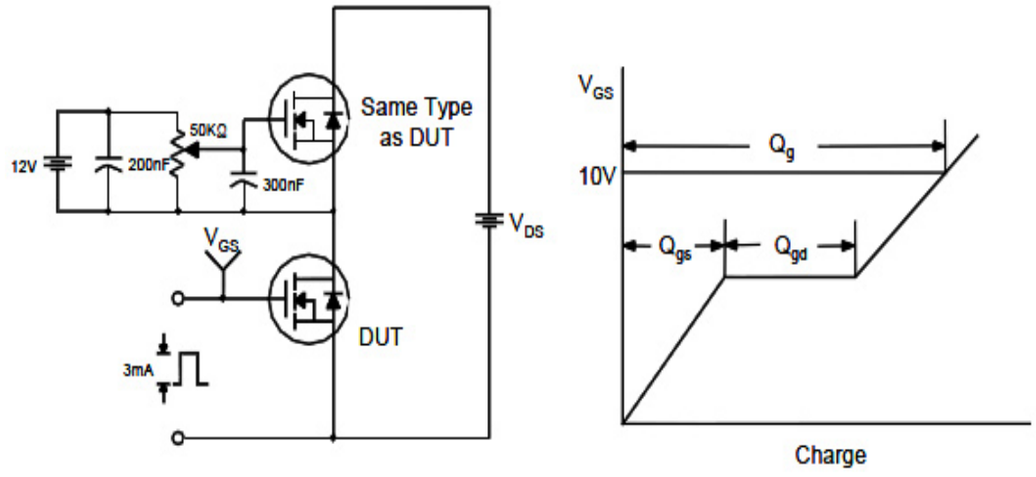
Safe Operating Area, Junction-to-Ambient



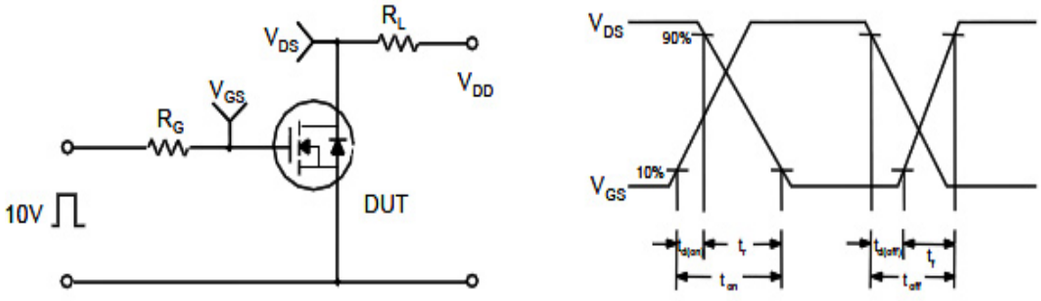
Normalized Thermal Transient Impedance, Junction-to-Case

■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms