Single P-channel MOSFET

ELM595781WSA-N

■General description

ELM595781WSA-N uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

■Features

• Vds=-60V

• Id=-6.0A

• Rds(on) = 40mΩ (Vgs=-10V)

• Rds(on) = 48mΩ (Vgs=-4.5V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	-60	V
Gate-source voltage		Vgs	±20	V
Continuous drain current	Ta=25°C	Id	-6	A
	Ta=70°C		-5	
Pulsed drain current		Idm	-20	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

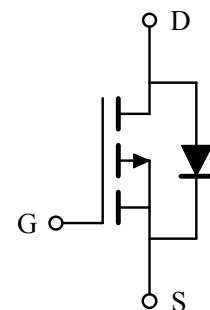| Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	Rθja		62.5	°C/W

■Pin configuration

SOP-8(TOP VIEW)
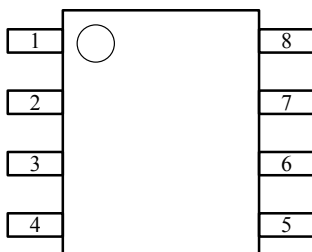
Pin No.	Pin name
1	SOURCE
2	SOURCE
3	SOURCE
4	GATE
5	DRAIN
6	DRAIN
7	DRAIN
8	DRAIN

■Circuit

Single P-channel MOSFET

ELM595781WSA-N

## ■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	-60			V
Zero gate voltage drain current	Idss	Vds=-48V, Vgs=0V			-1	μA
		Vds=-48V, Vgs=0V, Ta=85°C			-20	
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	-6			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-6A		33	40	mΩ
		Vgs=-4.5V, Id=-5A		39	48	
Forward transconductance	Gfs	Vds=-15V, Id=-6A		25		S
Diode forward voltage	Vsd	Is=-3A, Vgs=0V		-0.8	-1.3	V
Max. body-diode continuous current	Is				-2.0	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-30V, f=1MHz		1900		pF
Output capacitance	Coss			210		pF
Reverse transfer capacitance	Crss			170		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-4.5V, Vds=-30V Id=-6A		20	38	nC
Gate-source charge	Qgs			8		nC
Gate-drain charge	Qgd			10		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-30V RL=5Ω, Id=-6A Rgen=1Ω		10	20	ns
Turn-on rise time	tr			12	25	ns
Turn-off delay time	td(off)			30	60	ns
Turn-off fall time	tf			10	20	ns

Single P-channel MOSFET

ELM595781WSA-N
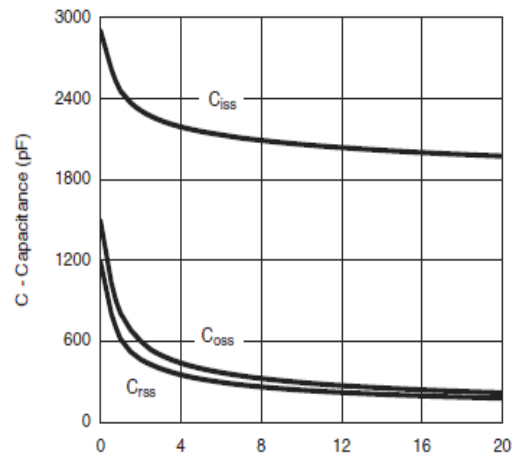
■Typical electrical and thermal characteristics
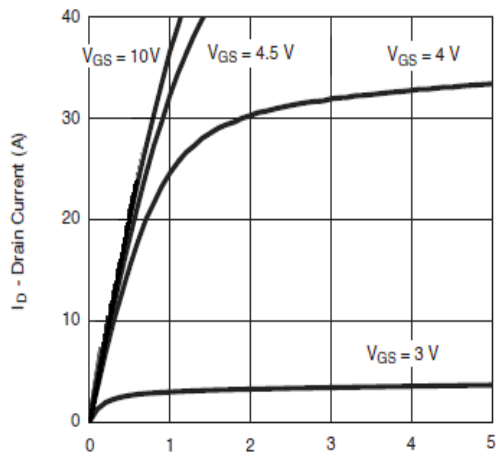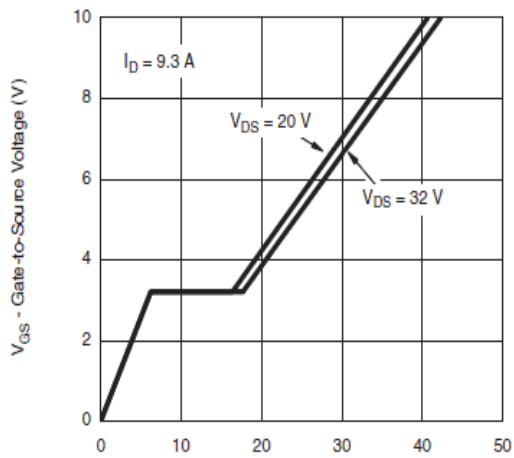

Output Characteristics
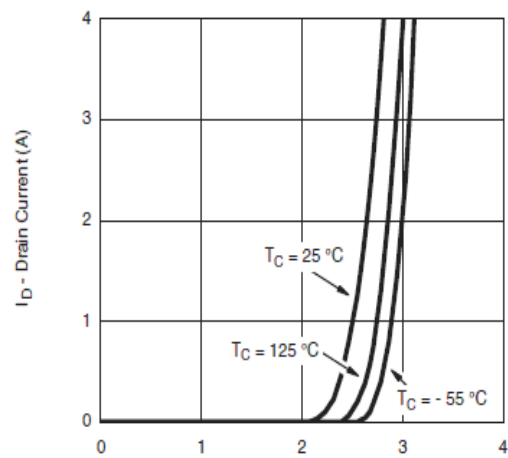
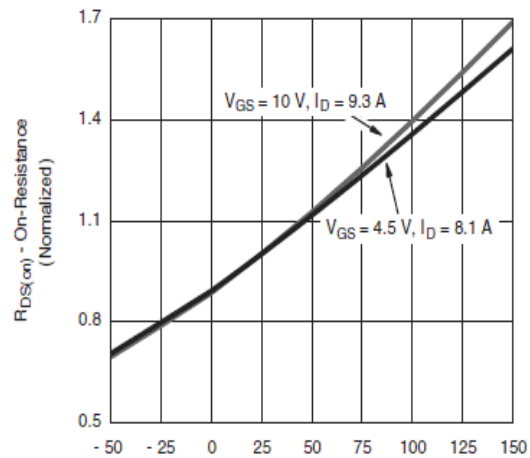**Transfer Characteristics**
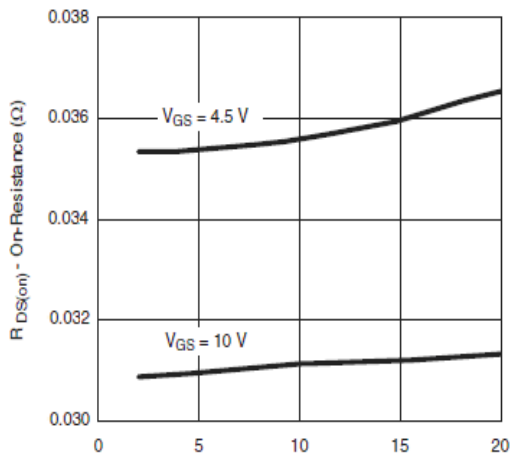
On-Resistance vs. Drain Current and Gate Voltage
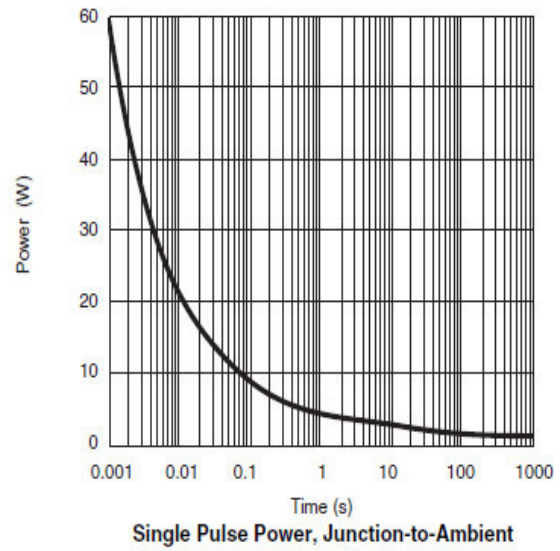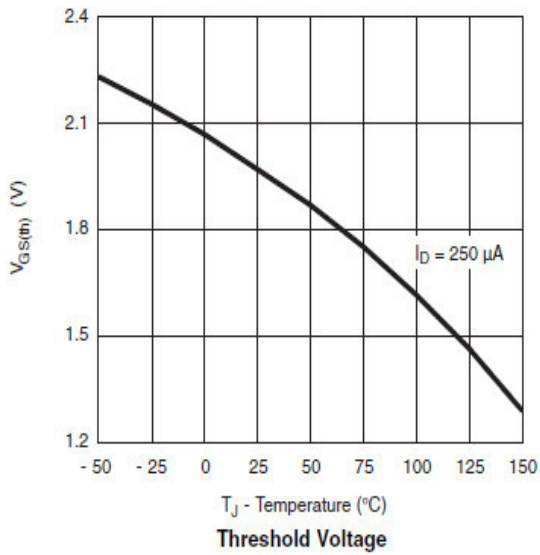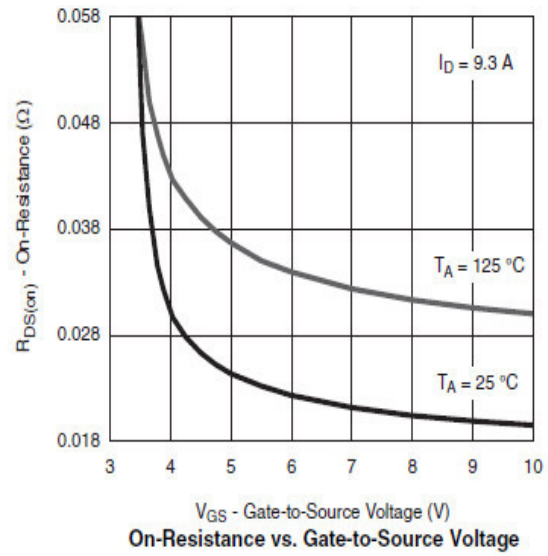

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

Single P-channel MOSFET

ELM595781WSA-N

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-Case
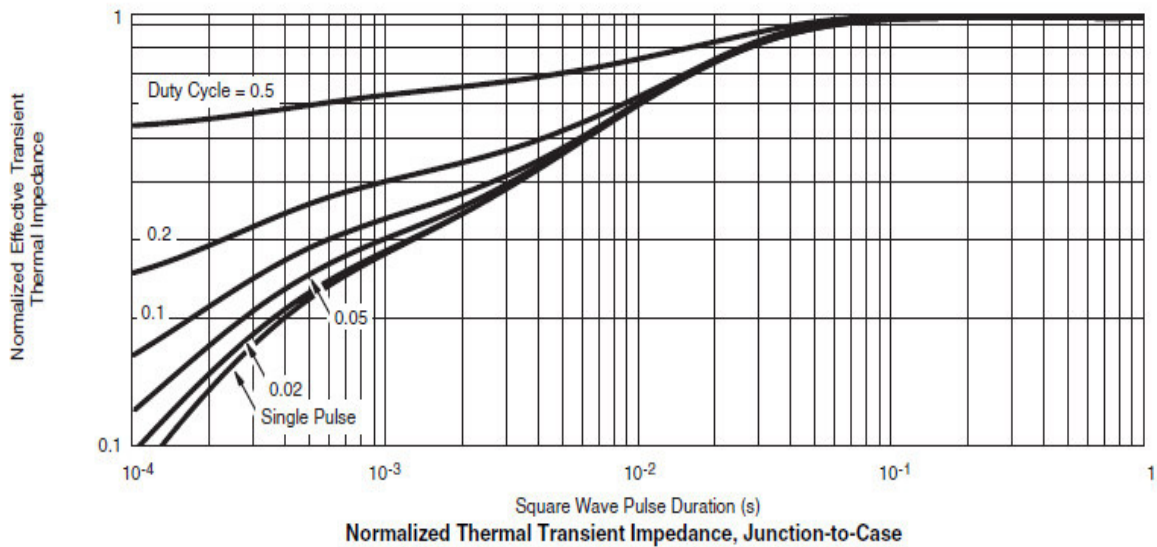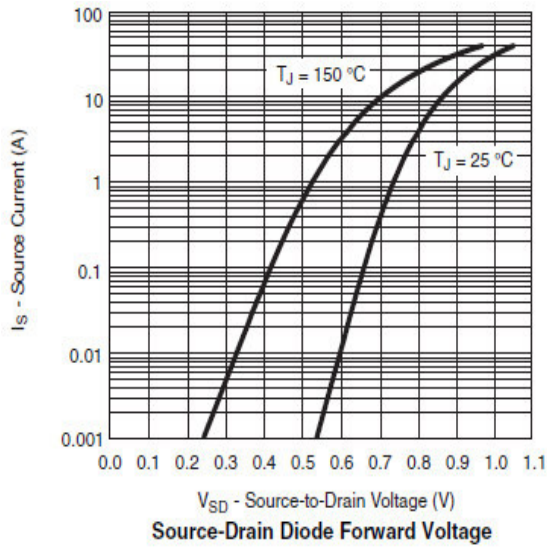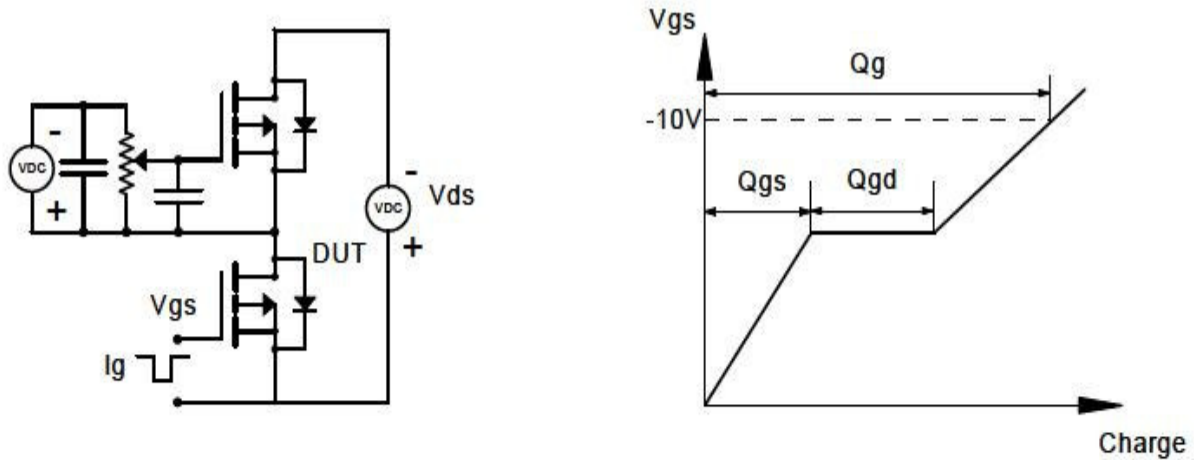
Single P-channel MOSFET
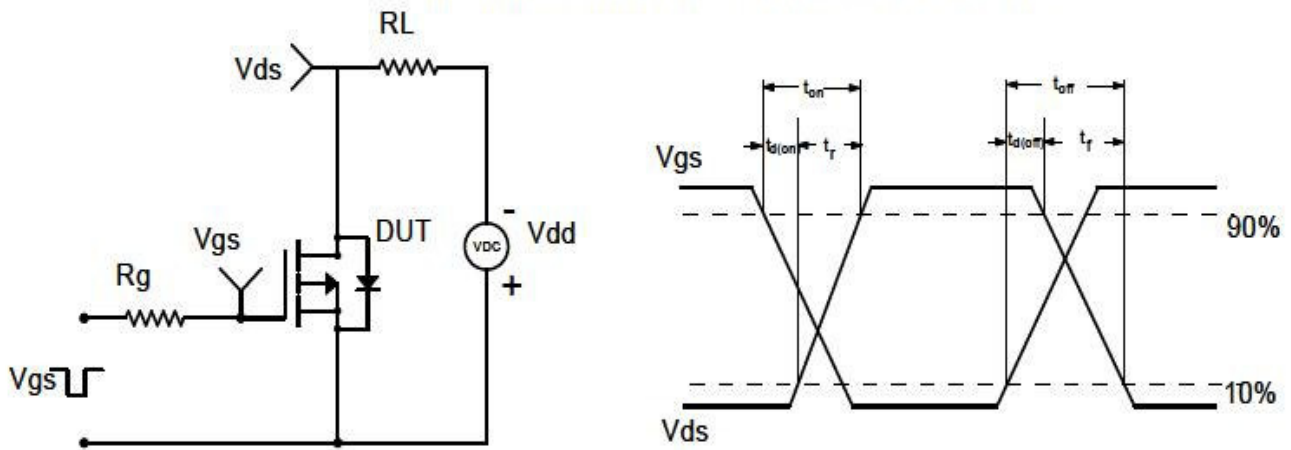
ELM595781WSA-N

■Test circuit and waveform

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Diode Recovery Test Circuit & Waveforms

$$Q_{rr} = \int Idt$$