Dual N-channel MOSFET (common drain)

ELM53814WA-N

http://www.elm-tech.com

■General description

ELM53814WA-N 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=14A
- Rds(on) = 14mΩ (Vgs=4.5V)
- Rds(on) = 18mΩ (Vgs=2.5V)
- Rds(on) = 30mΩ (Vgs=1.8V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

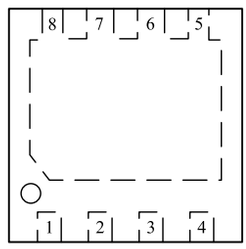
Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	20	V
Gate-source voltage		Vgs	±12	V
Continuous drain current(Tj=150°C)	Ta=25°C	Id	14	A
	Ta=70°C		10	
Pulsed drain current		Idm	20	A
Power dissipation	Tc=25°C	Pd	2.0	W
	Tc=70°C		1.5	
Operating junction temperature		Tj	150	°C
Storage temperature range		Tstg	- 55 to 150	°C

■Thermal characteristics

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

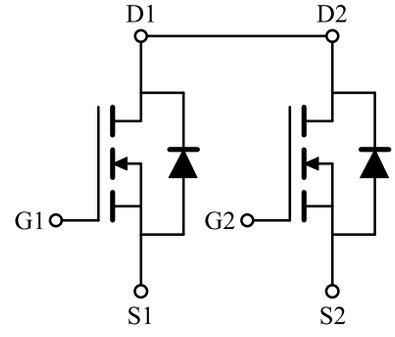
■Pin configuration

DFN8-3×3(TOP VIEW)



Pin No.	Pin name
1	SOURCE1
2	GATE1
3	SOURCE2
4	GATE2
5	DRAIN1 / DRAIN2
6	DRAIN1 / DRAIN2
7	DRAIN1 / DRAIN2
8	DRAIN1 / DRAIN2

■Circuit

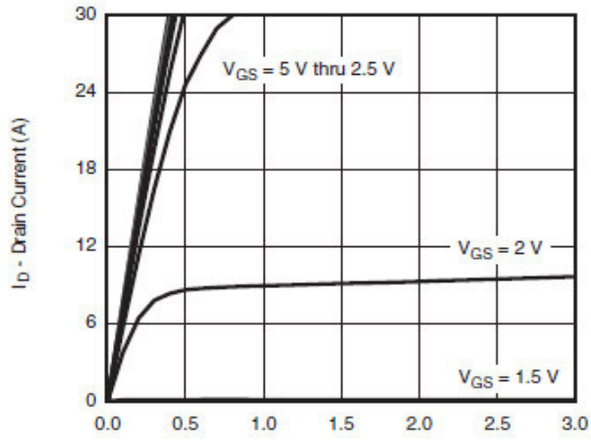


■Electrical characteristics

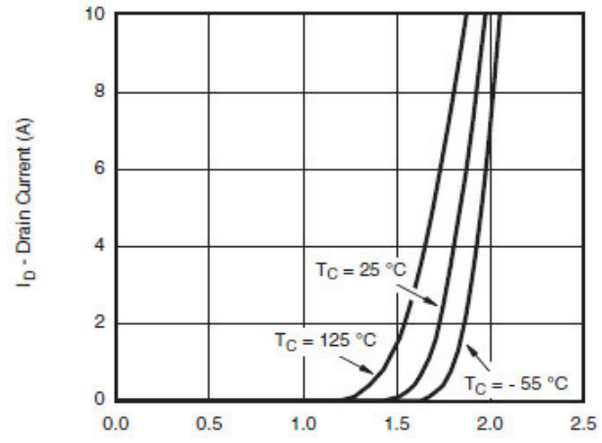
Ta=25°C. Unless otherwise noted.

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			10	
Gate-source 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		30			A
Static drain-source on-resistance	Rds(on)	Vgs=4.5V, Id=14A			10	14	mΩ
		Vgs=2.5V, Id=12A			14	18	
		Vgs=1.8V, Id=10A			23	30	
Forward transconductance	Gfs	Vds=10V, Id=7.0A			40		S
Diode forward voltage	Vsd	Is=1.6A, Vgs=0V			0.8	1.3	V
Max. body-diode continuous current	Is					1.5	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=10V, f=1MHz			1450		pF
Output capacitance	Coss				285		pF
Reverse transfer capacitance	Crss				145		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=10V, Id≡6.0A			13.0	19.0	nC
Gate-source charge	Qgs				2.8		nC
Gate-drain charge	Qgd				2.0		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=10V RL=1.3Ω, Id≡6.0A Rgen=1.0Ω			10	20	ns
Turn-on rise time	tr				10	20	ns
Turn-off delay time	td(off)				25	40	ns
Turn-off fall time	tf				10	20	ns

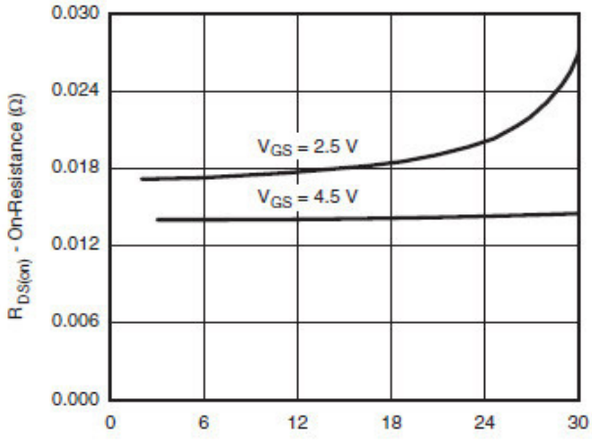
■Typical electrical and thermal characteristics



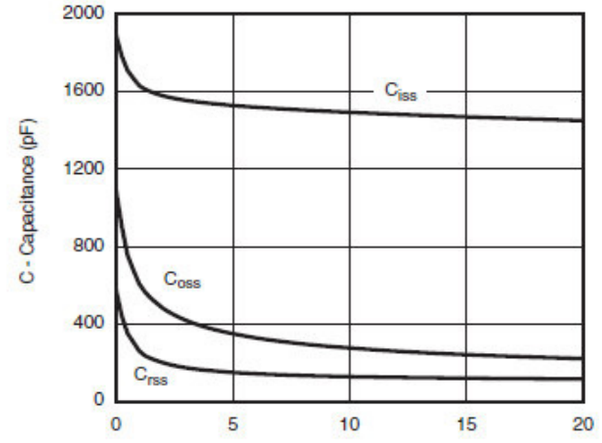
Output Characteristics



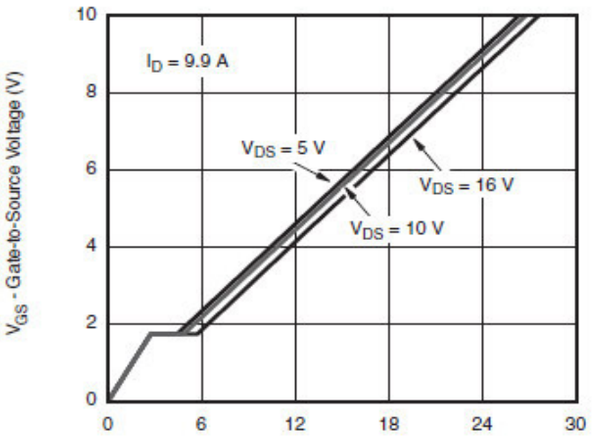
Transfer Characteristics



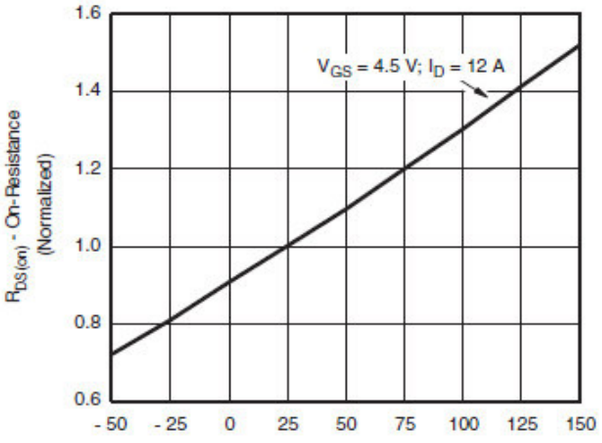
On-Resistance vs. Drain Current



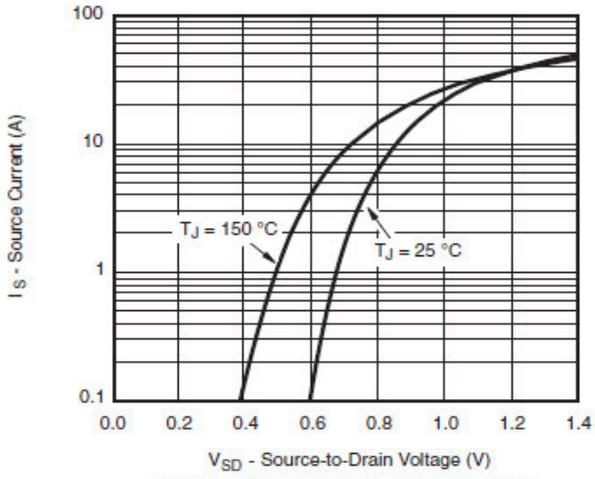
Capacitance



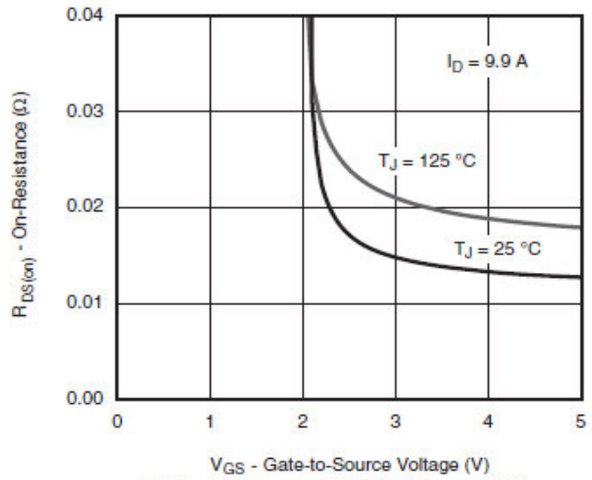
Gate Charge



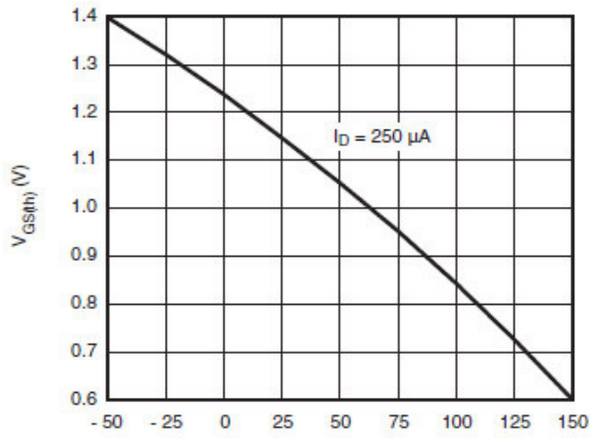
On-Resistance vs. Junction Temperature



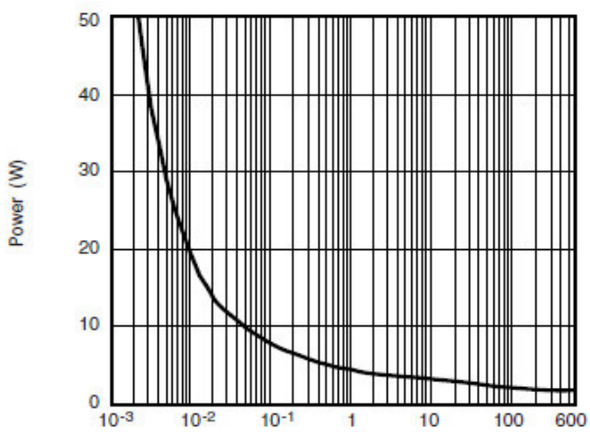
Source-Drain Diode Forward Voltage



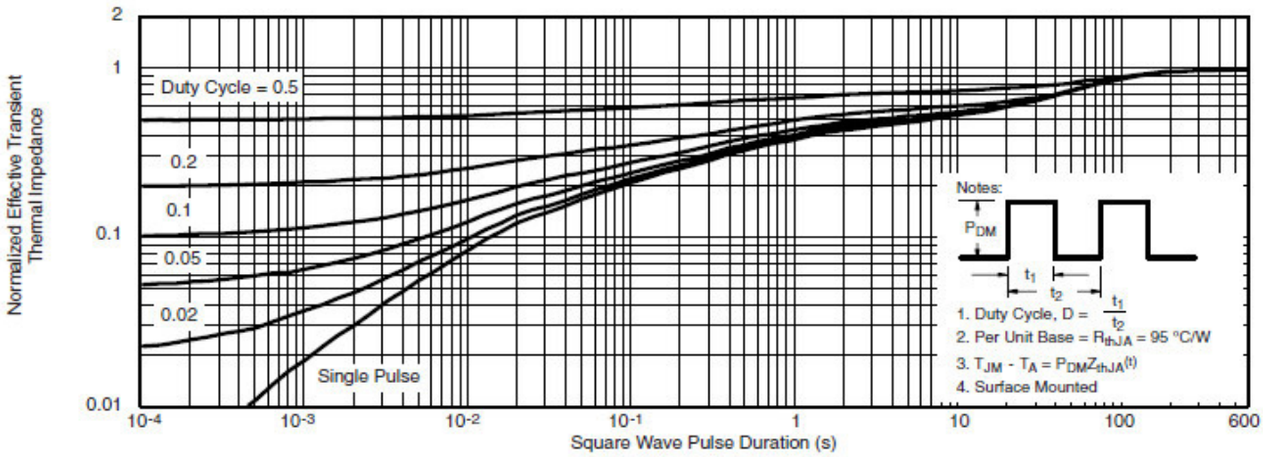
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



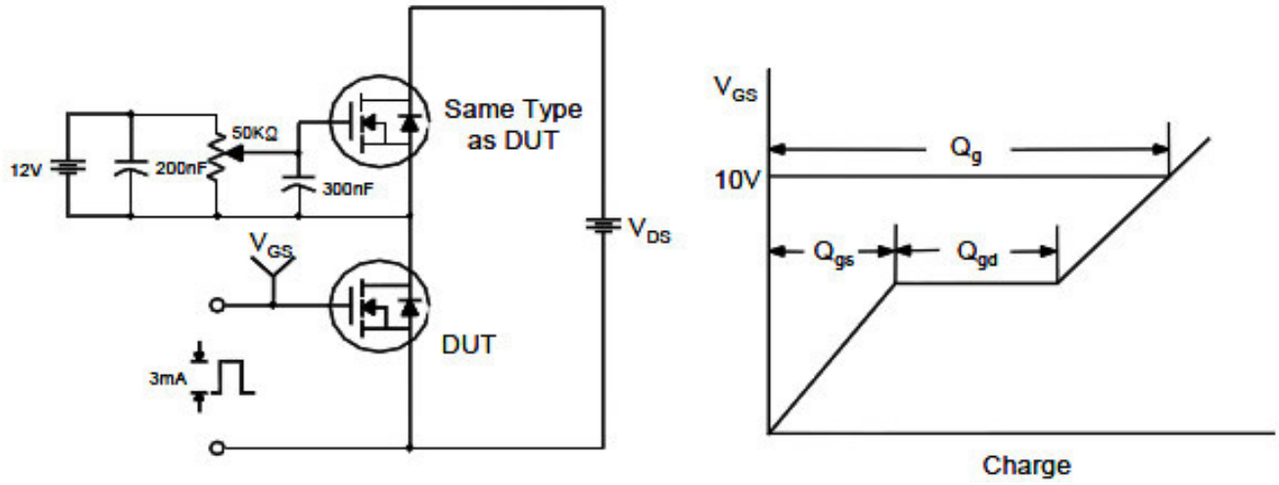
Single Pulse Power



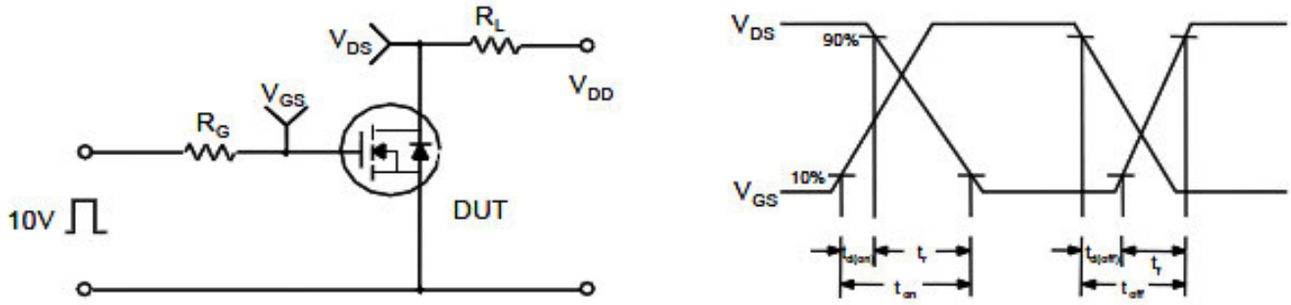
Normalized Thermal Transient Impedance, Junction-to-Ambient

■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms