

Dual N-channel MOSFET (common drain)

ELM53814WA-N

<http://www.elm-tech.com>

■ General description

ELM53814WA-N uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and operation with gate voltages as low as 1.8V.

■ Features

- $V_{ds}=20V$
- $I_d=14A$
- $R_{ds(on)} = 14m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} = 18m\Omega$ ($V_{gs}=2.5V$)
- $R_{ds(on)} = 30m\Omega$ ($V_{gs}=1.8V$)

■ Maximum absolute ratings

$T_a=25^\circ C$. Unless otherwise noted.

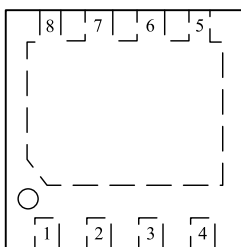
Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{ds}	20	V
Gate-source voltage	V_{gs}	± 12	V
Continuous drain current($T_j=150^\circ C$)	Id	$T_a=25^\circ C$	14
		$T_a=70^\circ C$	10
Pulsed drain current	I_{dm}	20	A
Power dissipation	Pd	$T_c=25^\circ C$	2.0
		$T_c=70^\circ C$	1.5
Operating junction temperature	T_j	150	$^\circ C$
Storage temperature range	T_{stg}	- 55 to 150	$^\circ C$

■ Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	$R_{\theta ja}$		62.5	$^\circ C/W$

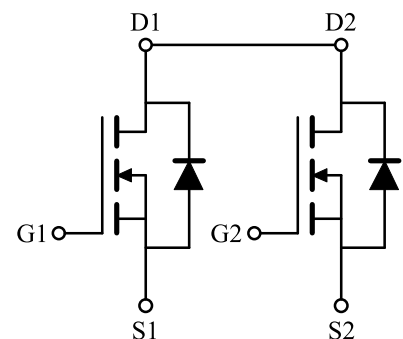
■ Pin configuration

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



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

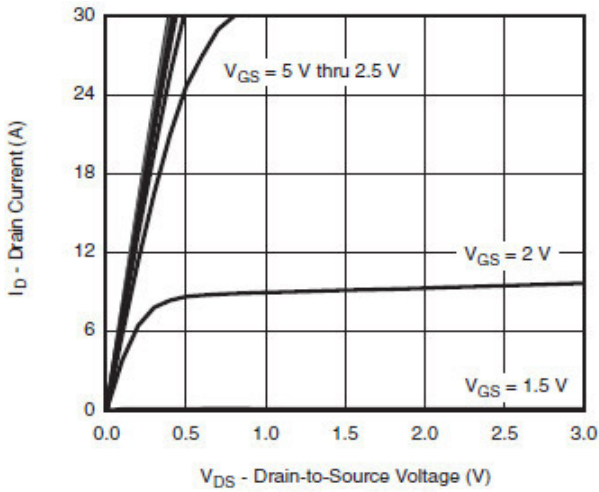
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	20			V
Zero gate voltage drain current	Idss	Vds=20V, Vgs=0V Ta=85°C			1	μA
					10	
Gate-source leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, 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

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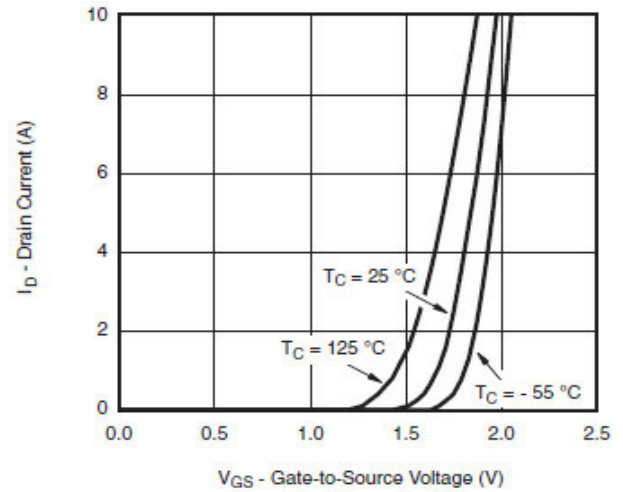
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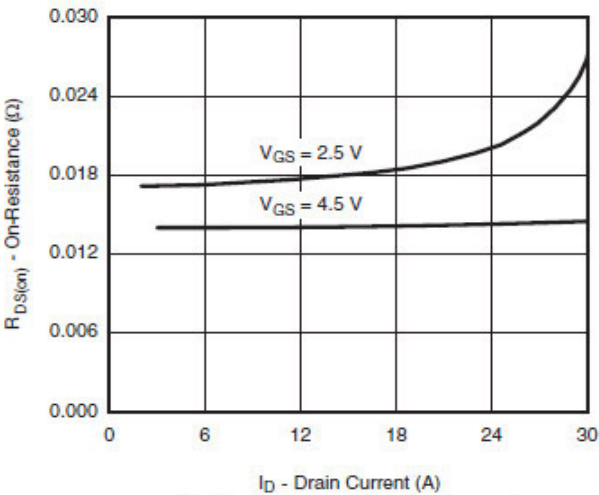
Typical electrical and thermal characteristics



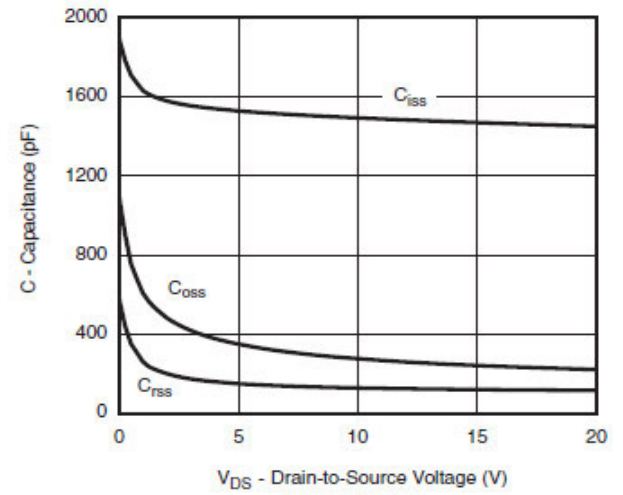
Output Characteristics



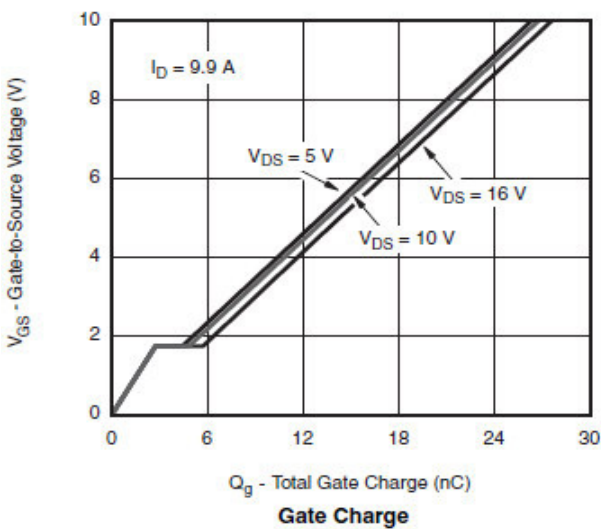
Transfer Characteristics



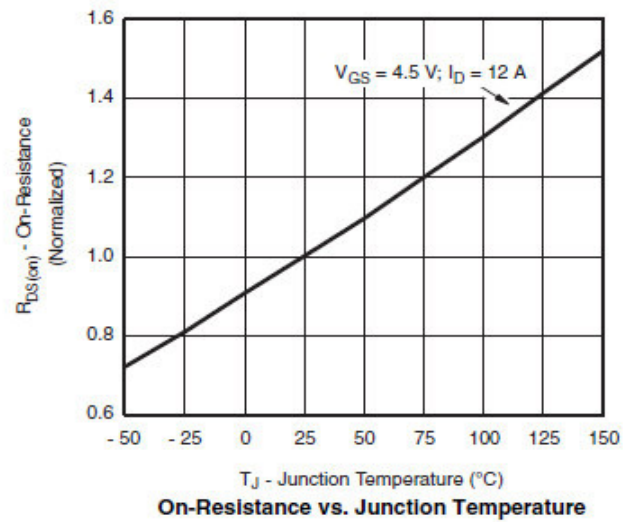
On-Resistance vs. Drain Current



Capacitance



Gate Charge

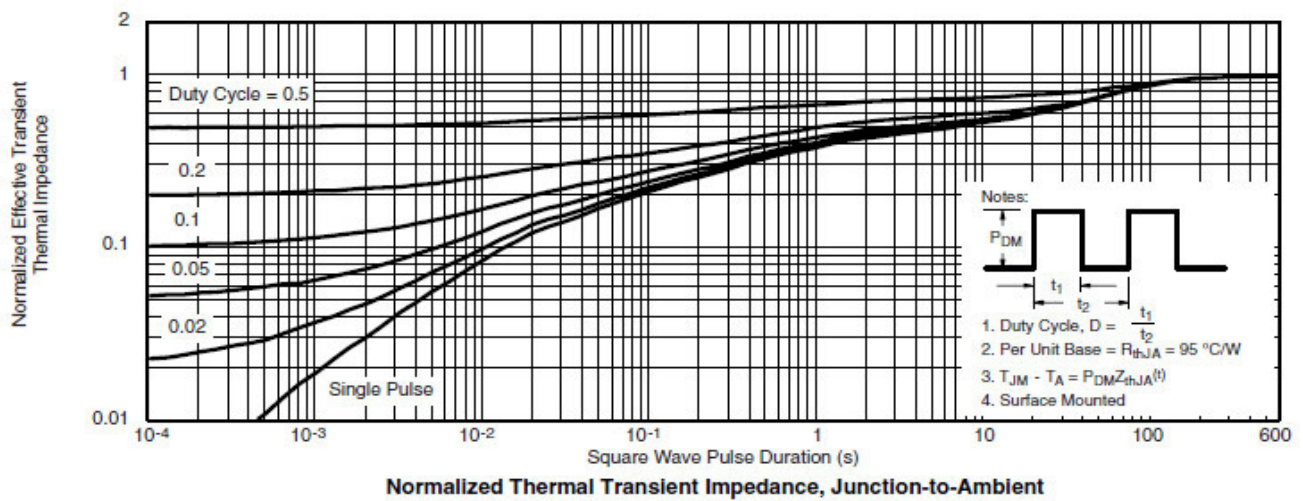
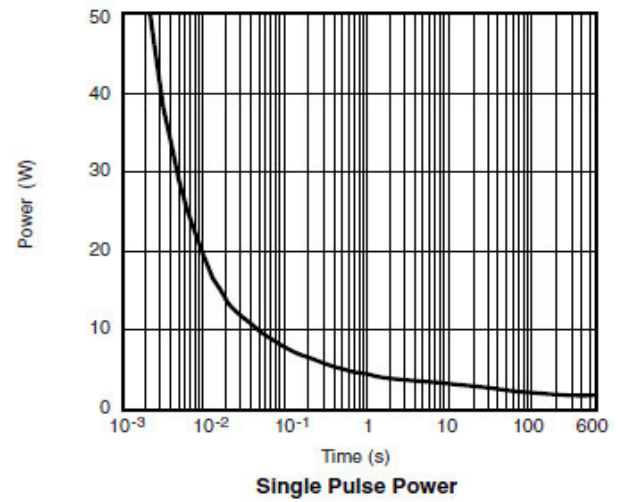
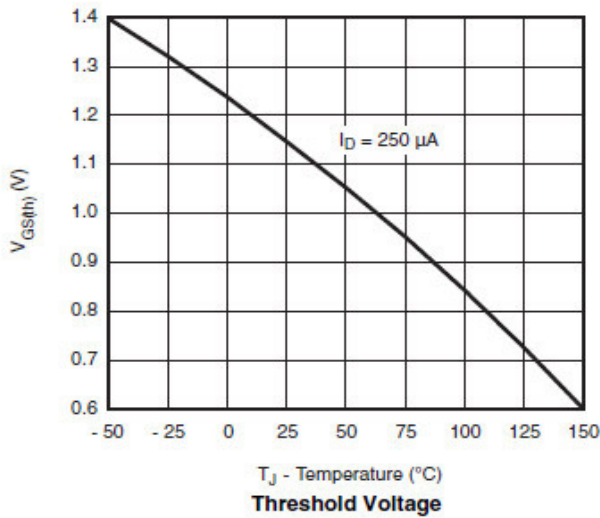
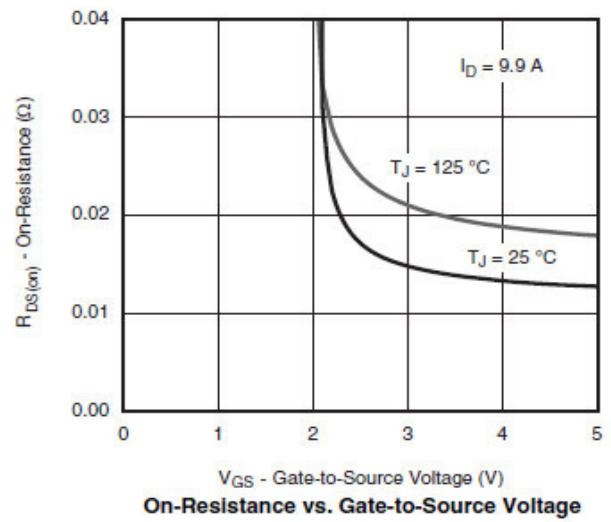
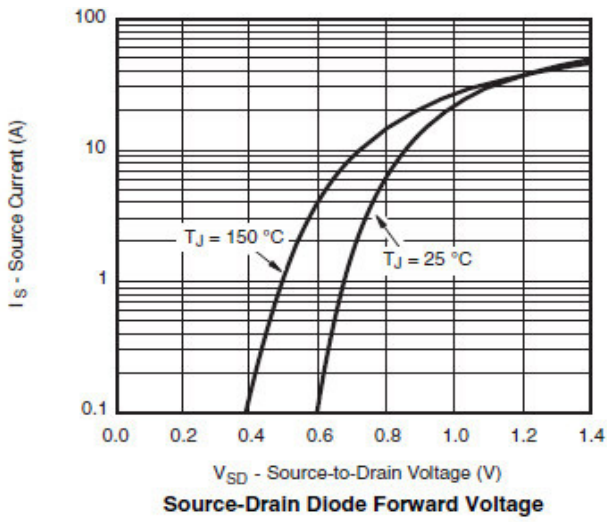


On-Resistance vs. Junction Temperature

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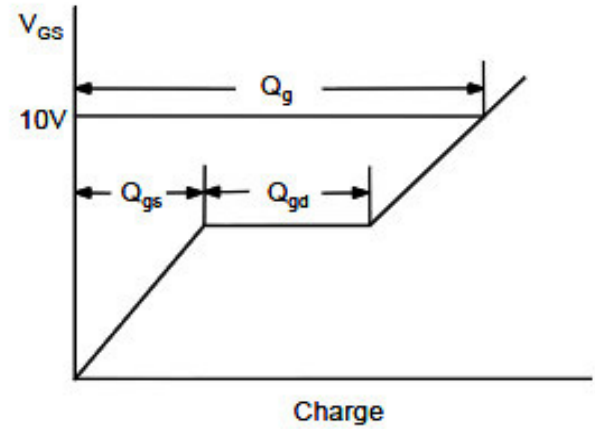
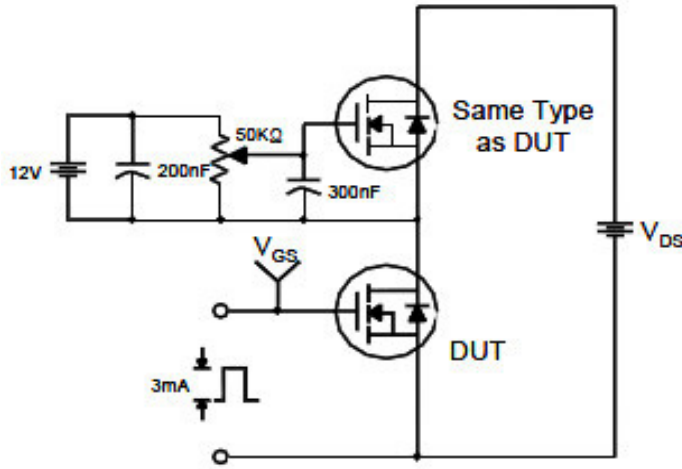
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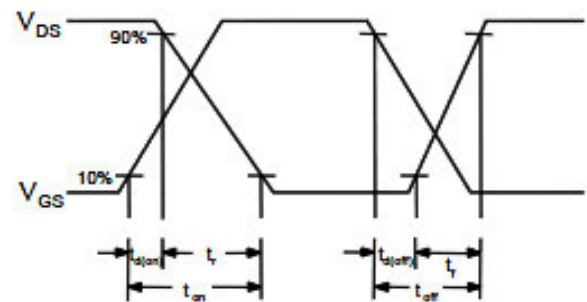
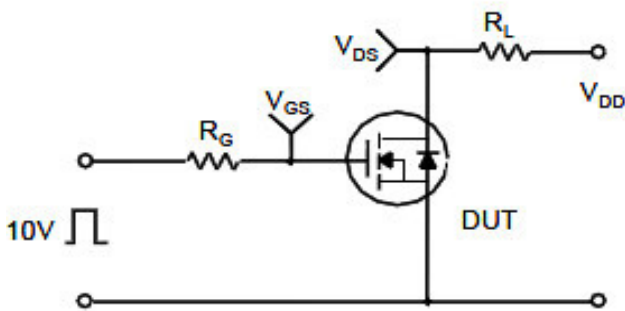
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

