

Dual N-channel MOSFET

ELM54214WA-N

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

■ General description

ELM54214WA-N uses advanced trench technology to provide excellent $R_{ds(on)}$ and low gate charge.

■ Features

- $V_{ds}=30V$
- $I_d=9A$
- $R_{ds(on)} = 16m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} = 18m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

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

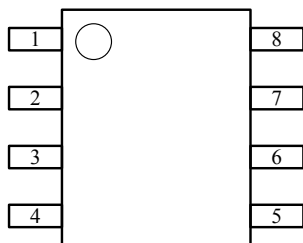
Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{ds}	30	V
Gate-source voltage	V_{gs}	± 20	V
Continuous drain current($T_j=150^\circ C$)	I_d	$T_a=25^\circ C$	9.0
		$T_a=70^\circ C$	7.5
Pulsed drain current	I_{dm}	20	A
Power dissipation	P_d	$T_c=25^\circ C$	2.8
		$T_c=70^\circ C$	1.8
Operating junction 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	$^\circ C/W$

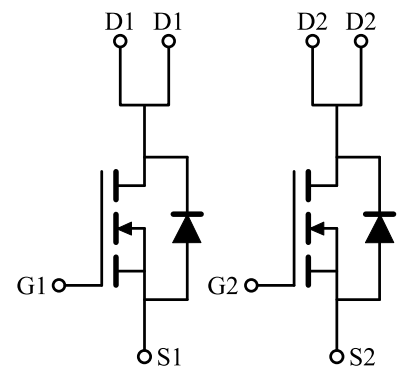
■ Pin configuration

SOP-8(TOP VIEW)



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

■ Circuit



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■ Electrical characteristics

Ta=25°C. Unless otherwise noted.

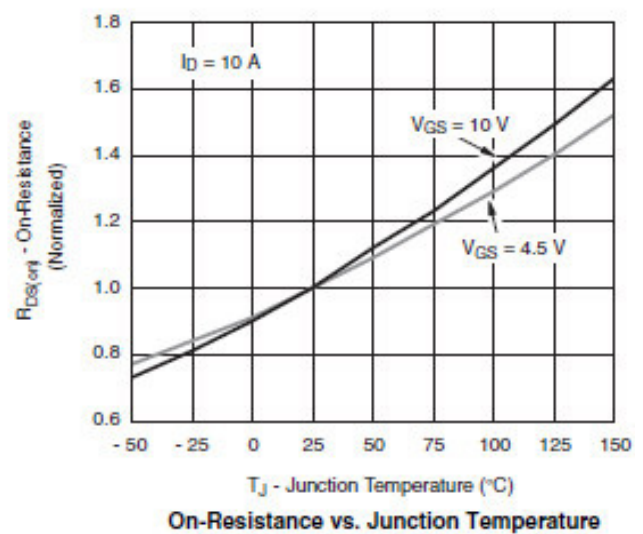
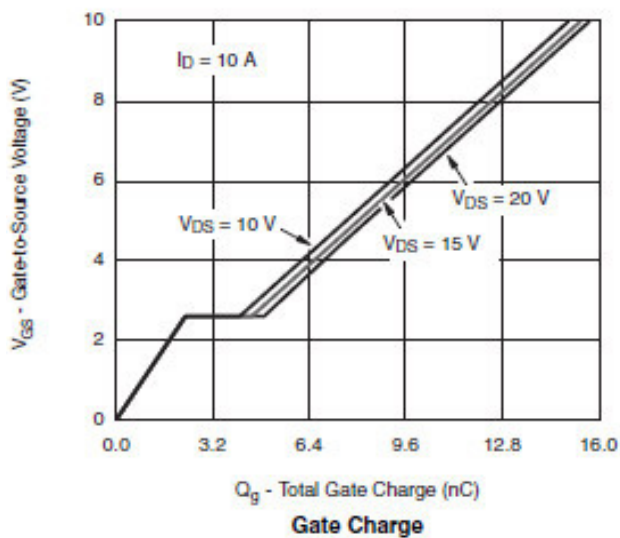
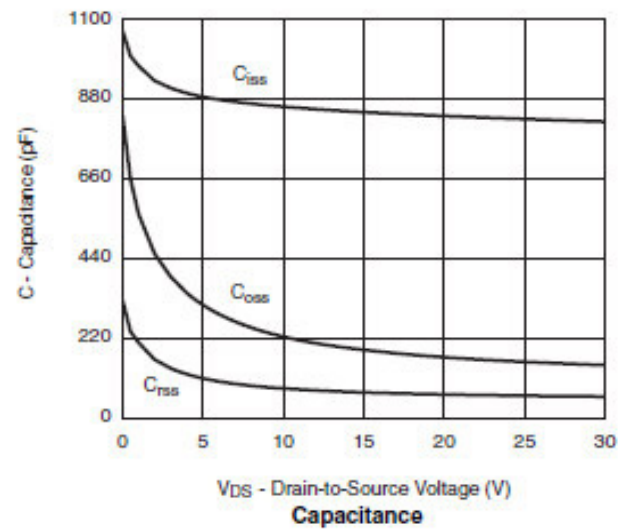
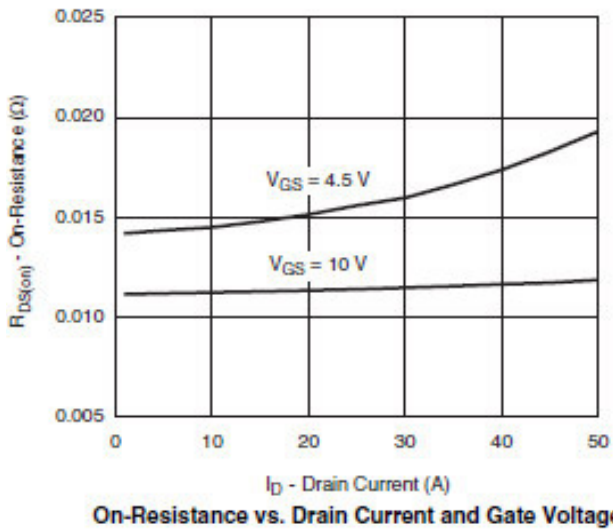
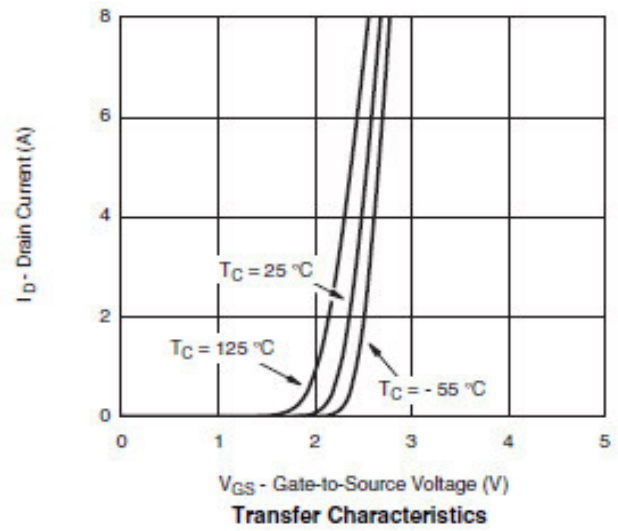
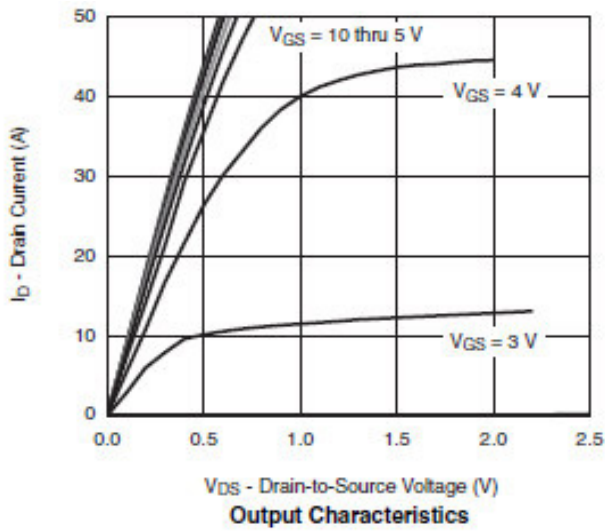
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	30			V
Zero gate voltage drain current	Idss	Vds=30V Vgs=0V			1	μA
		Ta=85°C			10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.5		1.8	V
On state drain current	Id(on)	Vgs=10V, Vds≥5V	15			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=9A		13	16	mΩ
		Vgs=4.5V, Id=8A		14	18	
Forward transconductance	Gfs	Vds=15V, Id=10A		24		S
Diode forward voltage	Vsd	Is=3.0A, Vgs=0V		0.8	1.3	V
Max. body-diode continuous current	Is				1.5	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=15V, f=1MHz		800		pF
Output capacitance	Coss			180		pF
Reverse transfer capacitance	Crss			70		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=4.5V, Vds=15V Id≐10A		8.0	12.0	nC
Gate-source charge	Qgs			2.0		nC
Gate-drain charge	Qgd			2.3		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=15V, Id≐10A RL=1.5Ω, Rgen=1.0Ω		8	15	ns
Turn-on rise time	tr			8	15	ns
Turn-off delay time	td(off)			16	28	ns
Turn-off fall time	tf			8	16	ns

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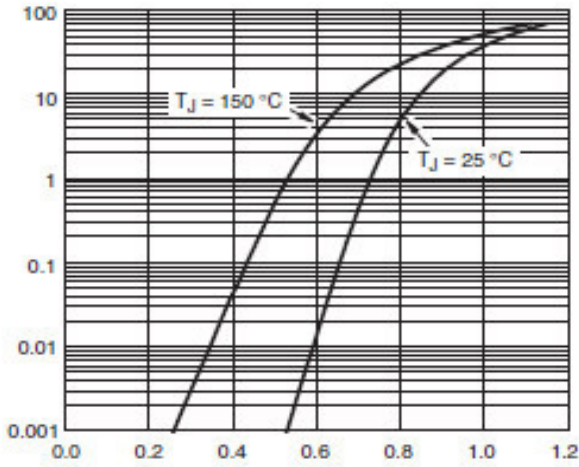
■ Typical electrical and thermal characteristics



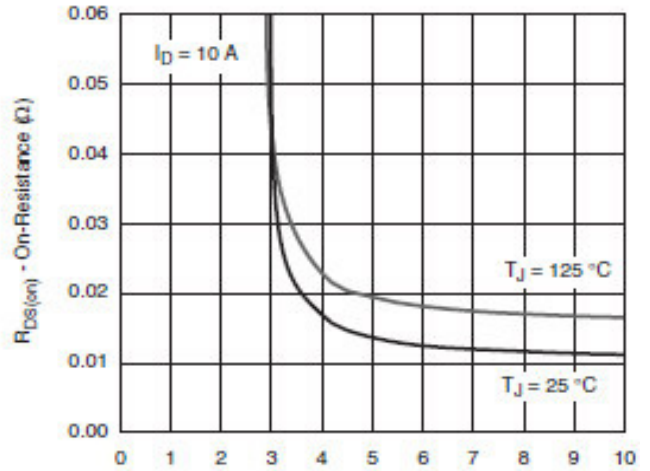
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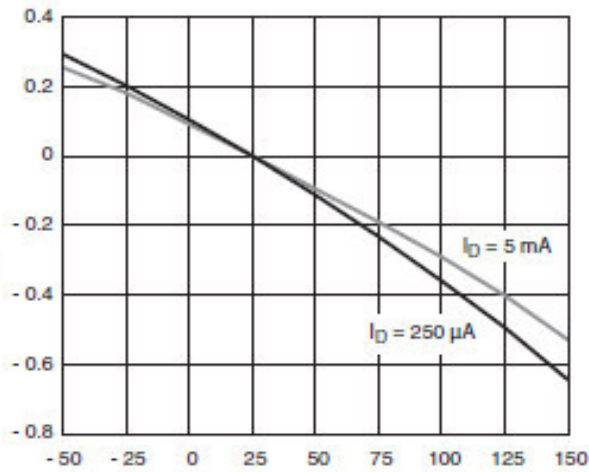
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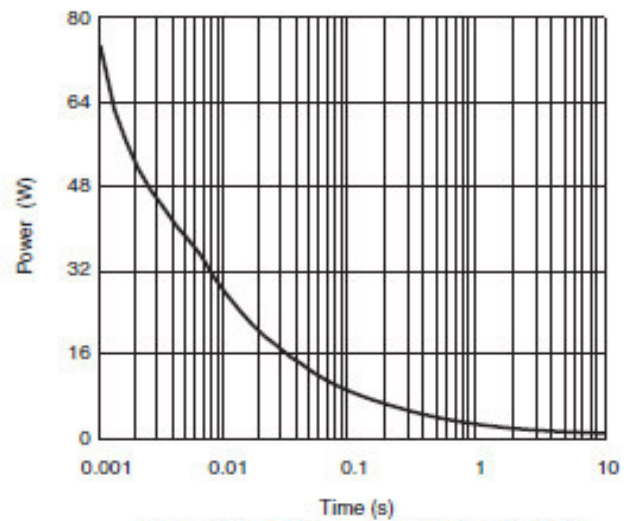
V_{SD} - Source-to-Drain Voltage (V)
Source-Drain Diode Forward Voltage



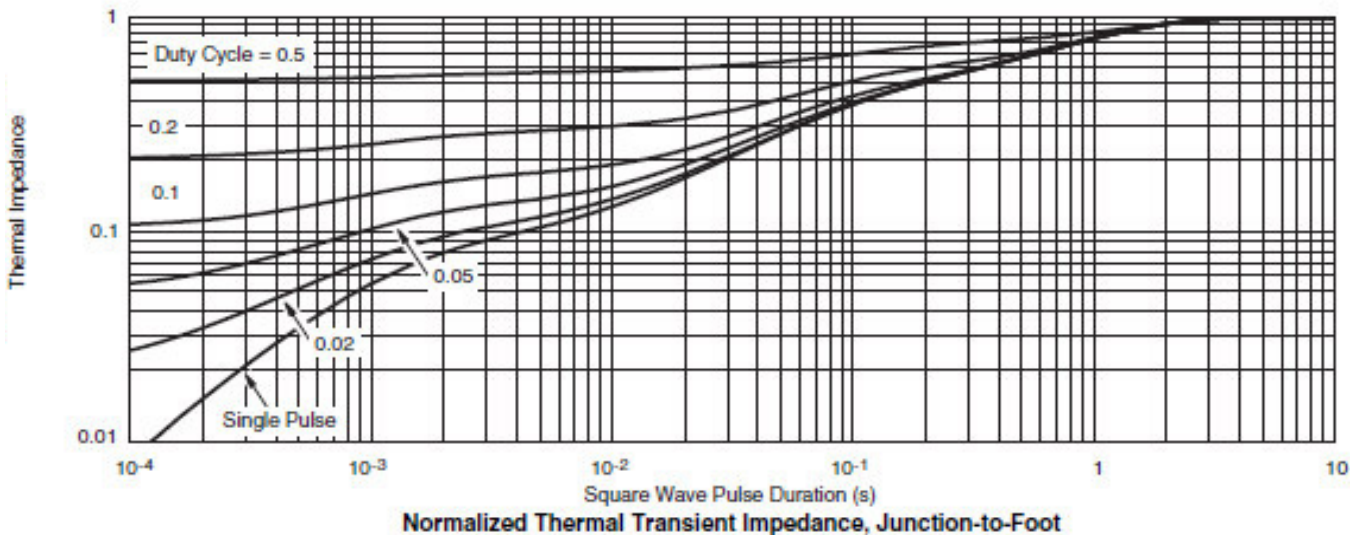
V_{GS} - Gate-to-Source Voltage (V)
On-Resistance vs. Gate-to-Source Voltage



T_J - Temperature ($^\circ\text{C}$)
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

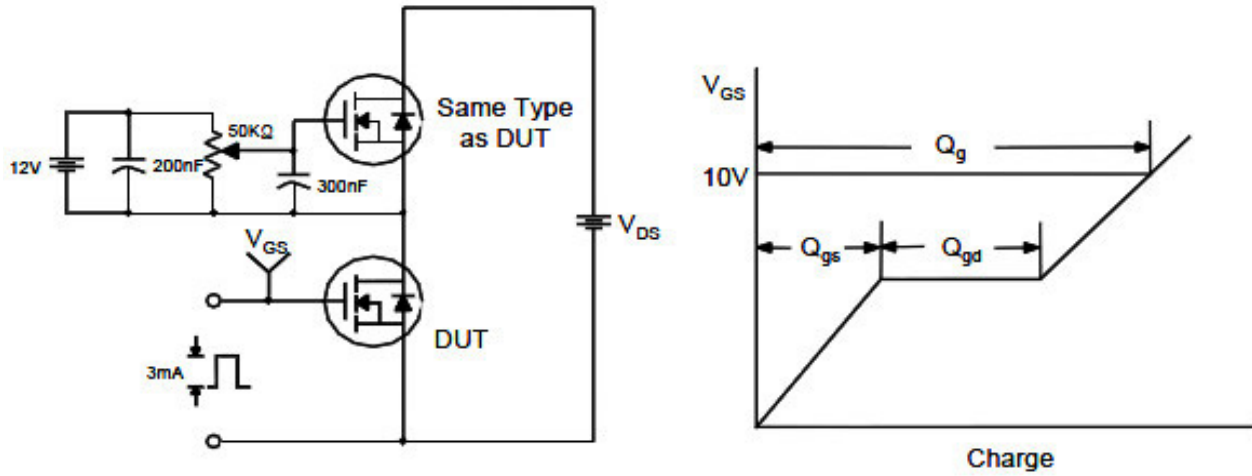
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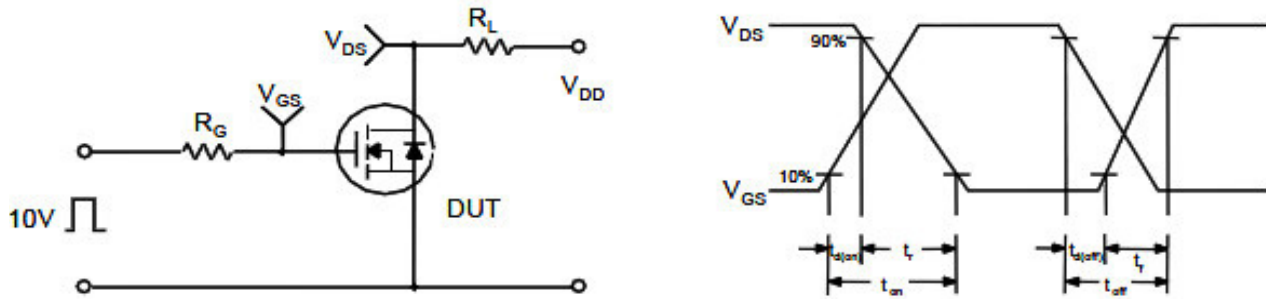
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

