

Single P-channel MOSFET

ELM54403WA-N

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

■ General description

ELM54403WA-N uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■ Features

- $V_{ds} = -20V$
- $I_d = -9.0A$
- $R_{ds(on)} = 26m\Omega$ ($V_{gs} = -4.5V$)
- $R_{ds(on)} = 34m\Omega$ ($V_{gs} = -2.5V$)
- $R_{ds(on)} = 82m\Omega$ ($V_{gs} = -1.8V$)

■ Maximum absolute ratings

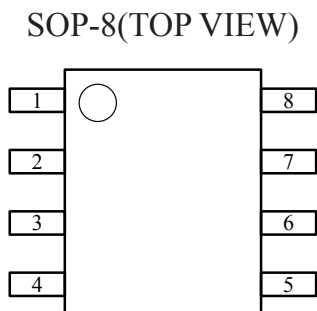
$T_a = 25^\circ C$. Unless otherwise noted.

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{ds}	-20	V
Gate-source voltage	V_{gs}	± 12	V
Continuous drain current	I_d	$T_a = 25^\circ C$	-9.0
		$T_a = 70^\circ C$	-6.0
Pulsed drain current	I_{dm}	-40	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

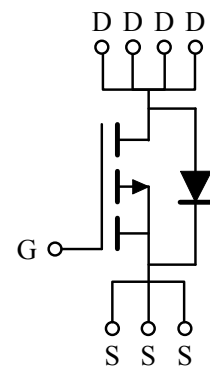
Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	$R_{\theta ja}$		62.5	$^\circ C/W$

■ Pin configuration



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

■ Circuit



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

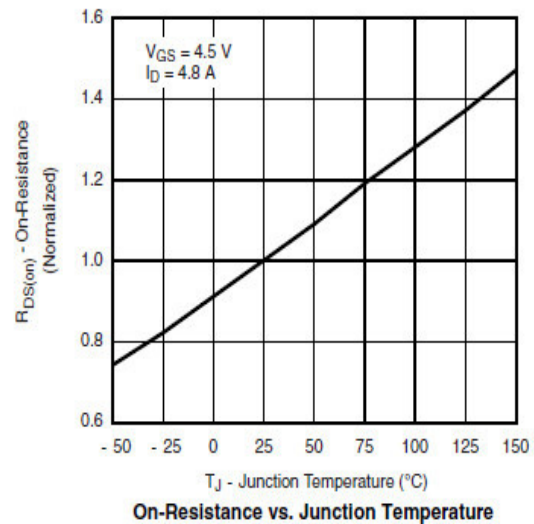
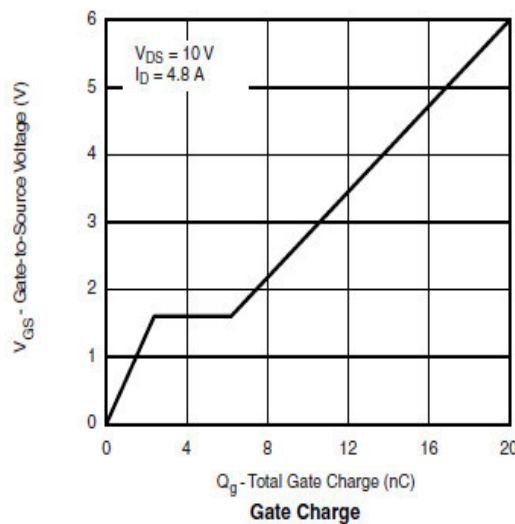
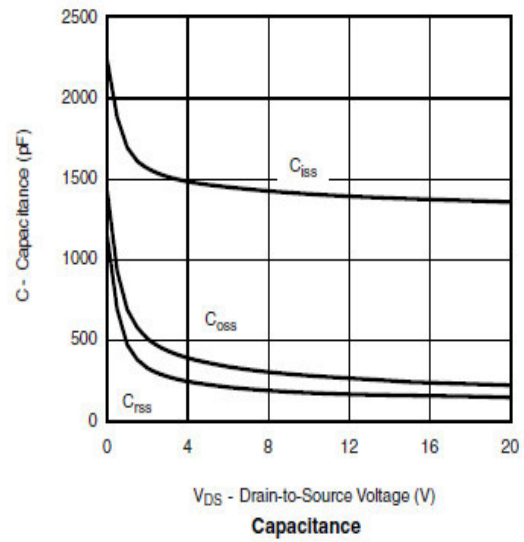
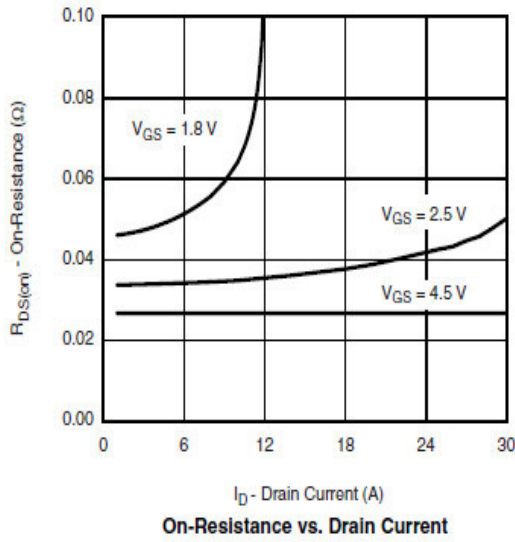
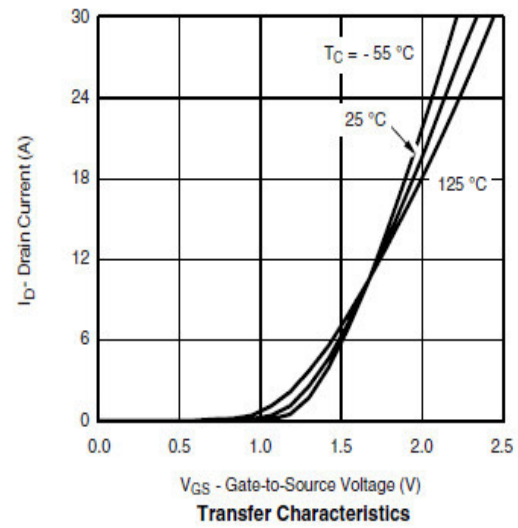
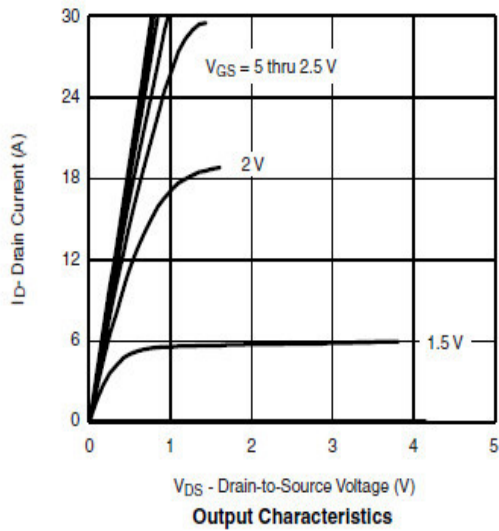
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-20			V
Zero gate voltage drain current	Idss	Vds=-16V, Vgs=0V			-1	μA
		Vds=-16V, Vgs=0V, Ta=85°C			-10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-0.4		-0.8	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-10V	-30			A
		Vgs=-4.5V, Vds≥-5V	-5			
Static drain-source on-resistance	Rds(on)	Vgs=-4.5V, Id=-9.0A		18	26	mΩ
		Vgs=-2.5V, Id=-8.0A		24	34	
		Vgs=-1.8V, Id=-6.0A		58	82	
Forward transconductance	Gfs	Vds=-5V, Id=-3.6A		10		S
Diode forward voltage	Vsd	Is=-1.6A, Vgs=0V		-0.85	-1.20	V
Max. body-diode continuous current	Is				-2.0	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-10V, f=1MHz		1450		pF
Output capacitance	Coss			350		pF
Reverse transfer capacitance	Crss			215		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-5.0V, Vds=-10V Id=-4.8A		17.0	35.0	nC
Gate-source charge	Qgs			2.5		nC
Gate-drain charge	Qgd			4.0		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-10V RL=15Ω, Id=-5A Rgen=6Ω		18	30	ns
Turn-on rise time	tr			30	50	ns
Turn-off delay time	td(off)			100	150	ns
Turn-off fall time	tf			55	80	ns

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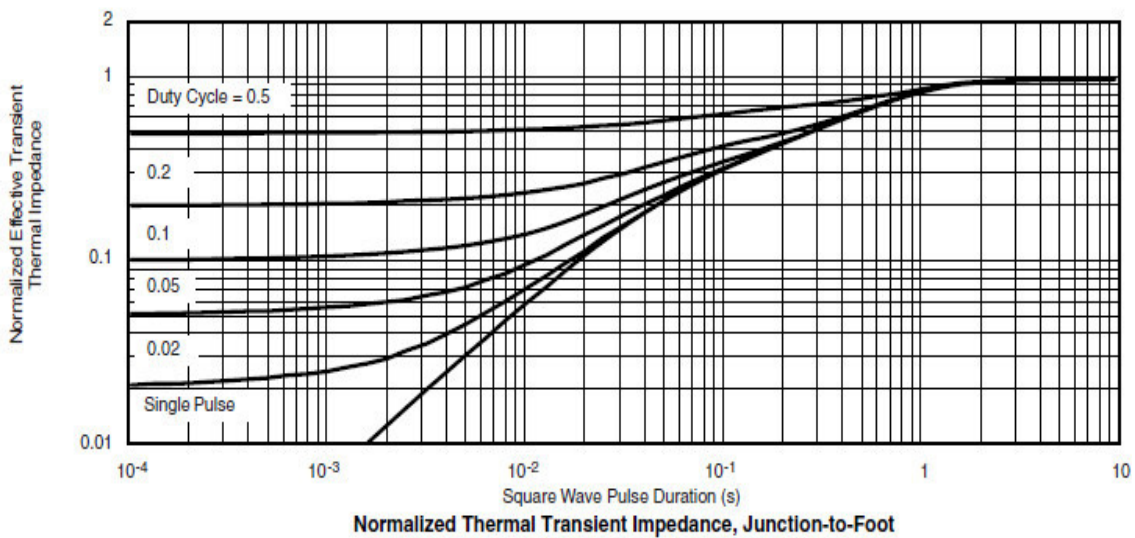
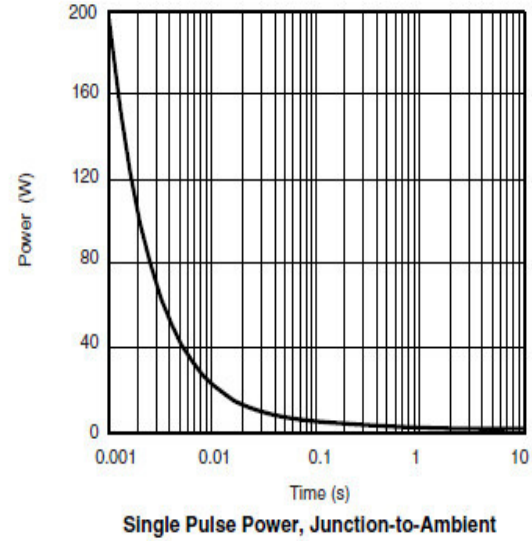
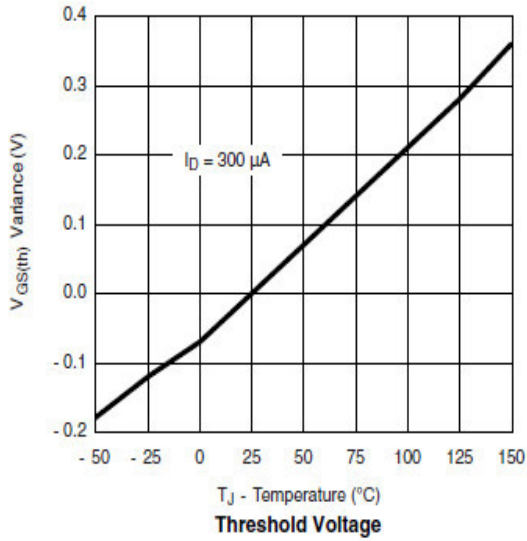
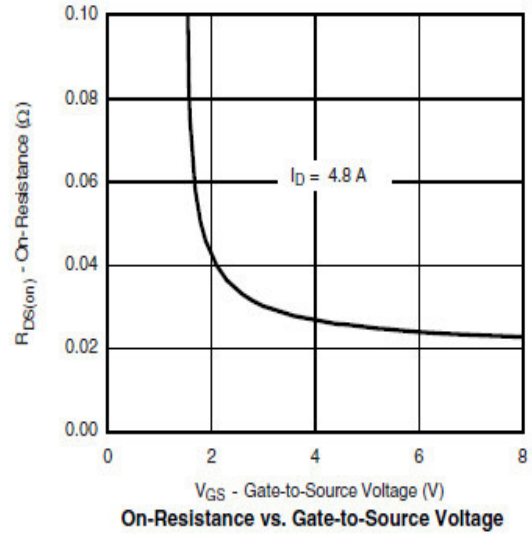
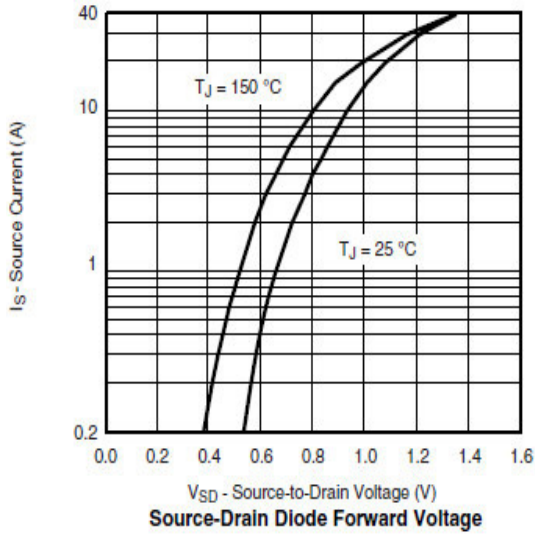
■ Typical electrical and thermal characteristics



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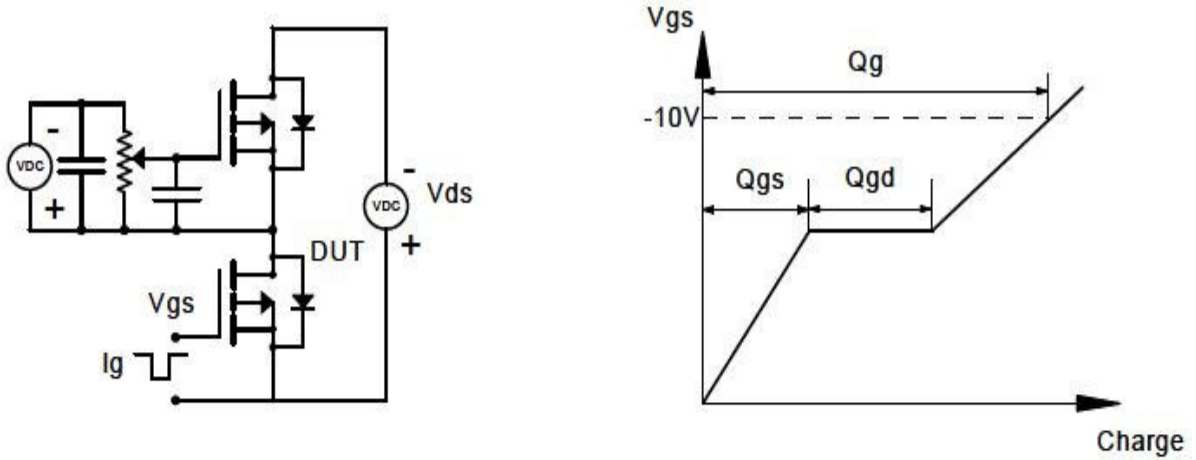
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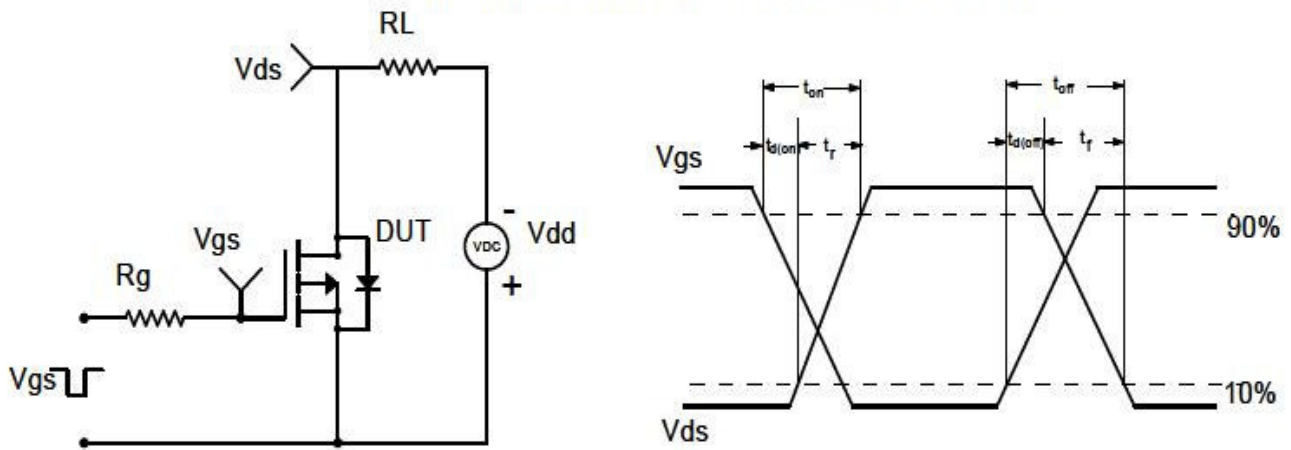
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

