

# Single N-channel MOSFET

## ELM584150WA-S

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

### ■ General description

ELM584150WA-S uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and low gate threshold voltage.

### ■ Features

- $V_{ds}=150V$
- $I_d=2.0A$
- $R_{ds(on)} = 310m\Omega$  ( $V_{gs}=10V$ )
- $R_{ds(on)} = 320m\Omega$  ( $V_{gs}=6V$ )

### ■ Maximum absolute ratings

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

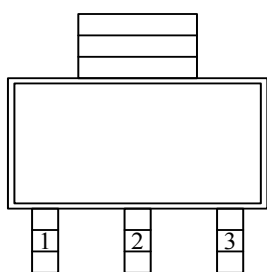
Parameter	Symbol	Limit	Unit
Drain-source voltage	$V_{ds}$	150	V
Gate-source voltage	$V_{gs}$	$\pm 20$	V
Continuous drain current( $T_j=150^\circ C$ )	Id	$T_a=25^\circ C$	2.0
		$T_a=70^\circ C$	1.5
Pulsed drain current	$I_{dm}$	8	A
Power dissipation	Pd	$T_c=25^\circ C$	2.8
		$T_c=70^\circ C$	1.2
Operating 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	$R_{\theta ja}$		120	$^\circ C/W$

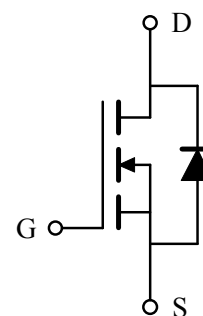
### ■ Pin configuration

SOT-223(TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

### ■ Circuit



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### ■ Electrical characteristics

Ta=25°C. Unless otherwise noted.

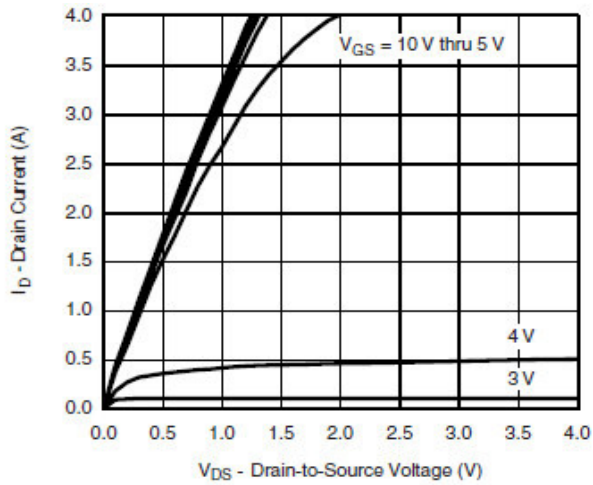
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	150			V
Zero gate voltage drain current	Idss	Vds=100V, Vgs=0V			1	μA
		Ta=85°C			10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	2.0		4.0	V
On state drain current	Id(on)	Vgs=4.5V, Vds≥5V	5			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=1.5A		270	310	mΩ
		Vgs=6V, Id=1.0A		290	320	
Forward transconductance	Gfs	Vds=15V, Id=1.5A		4.1		S
Diode forward voltage	Vsd	Is=1.7A, Vgs=0V		0.85	1.20	V
Max. body-diode continuous current	Is				1.6	A
<b>DYNAMIC PARAMETERS</b>						
Input capacitance	Ciss	Vgs=0V, Vds=50V, f=1MHz		400		pF
Output capacitance	Coss			20		pF
Reverse transfer capacitance	Crss			15		pF
<b>SWITCHING PARAMETERS</b>						
Total gate charge	Qg	Vgs=10V, Vds=75V Id≐1.5A		5.5	10.0	nC
Gate-source charge	Qgs			1.2		nC
Gate-drain charge	Qgd			2.0		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=75V RL=75Ω, Id≐1.0A Rgen=6.0Ω		10	20	ns
Turn-on rise time	tr			10	20	ns
Turn-off delay time	td(off)			25	50	ns
Turn-off fall time	tf			15	30	ns

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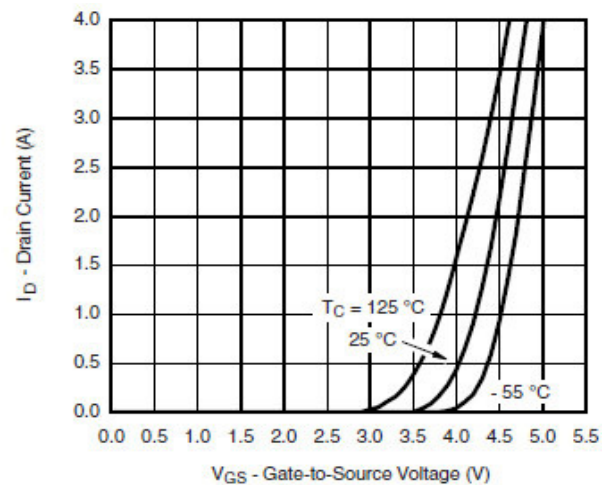
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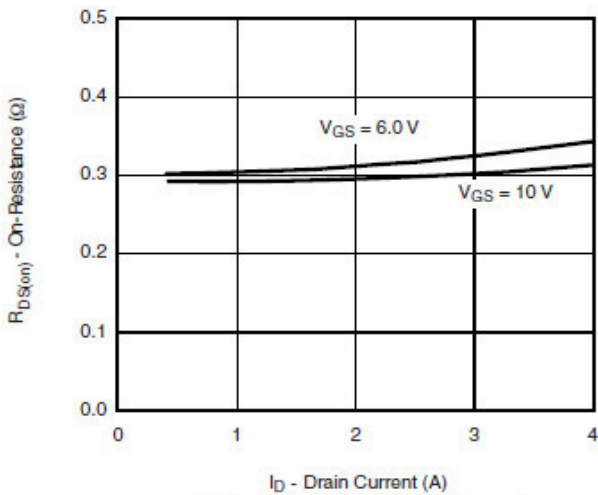
## ■ Typical electrical and thermal characteristics



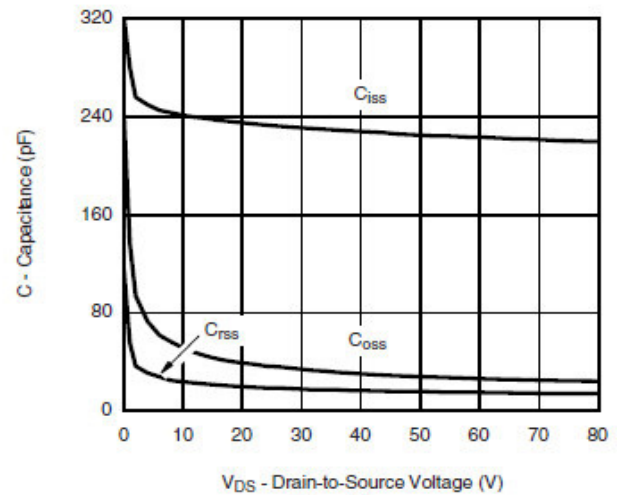
Output Characteristics



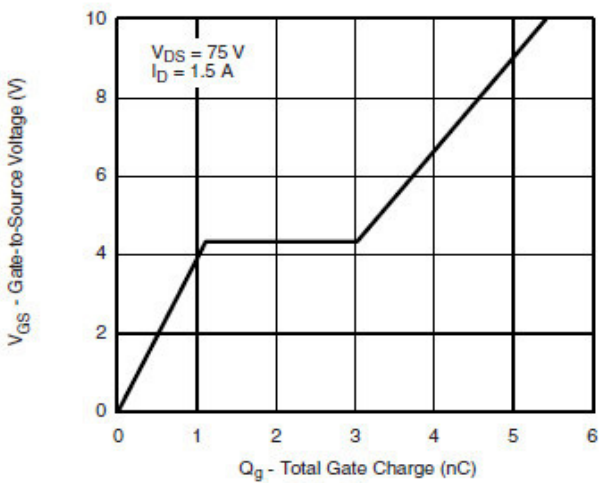
Transfer Characteristics



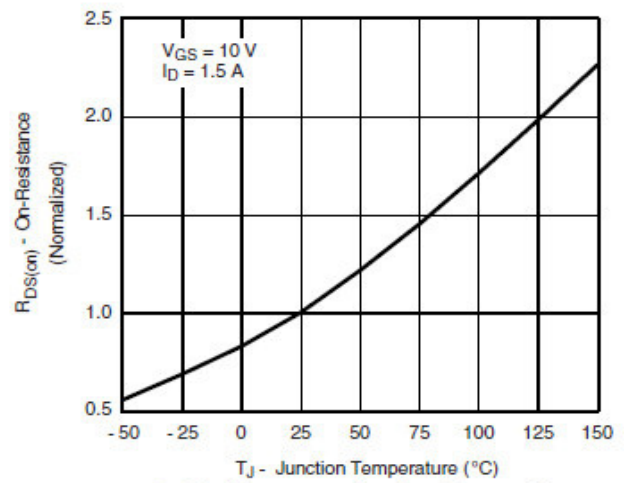
On-Resistance vs. Drain Current



Capacitance



Gate Charge

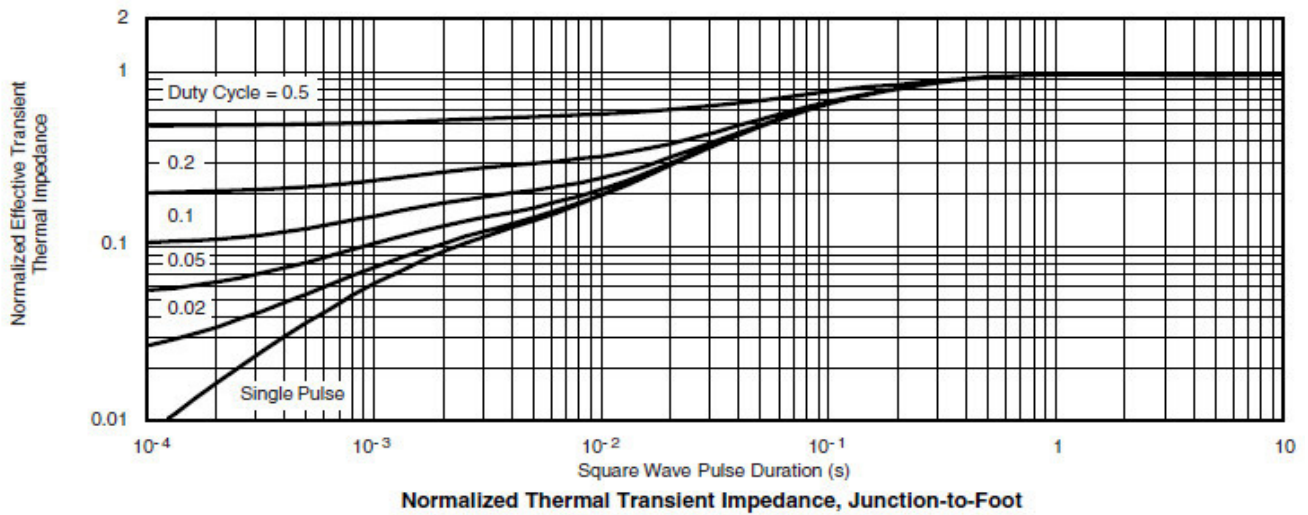
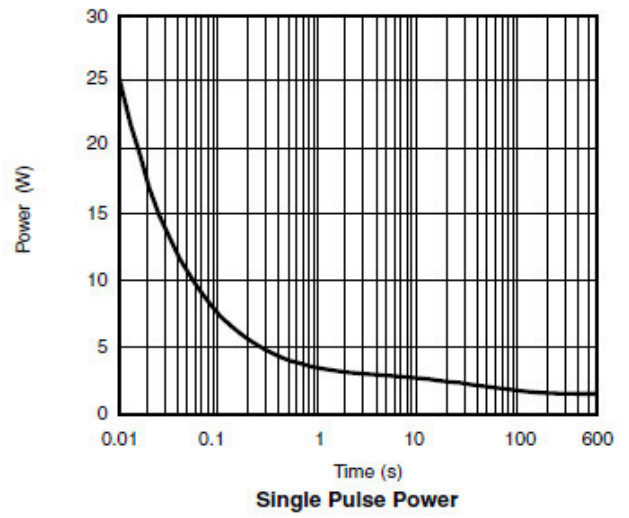
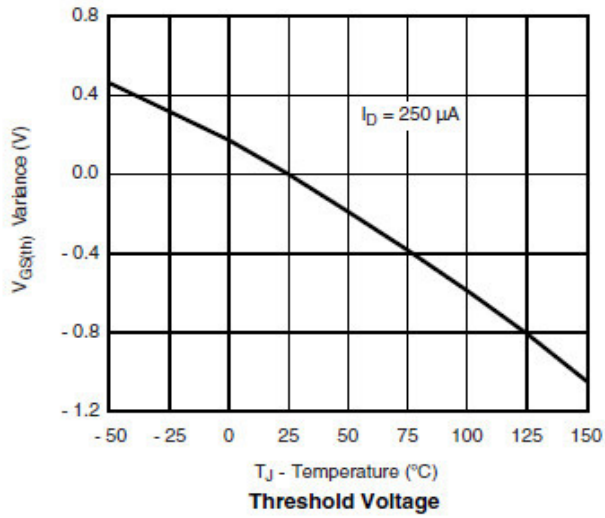
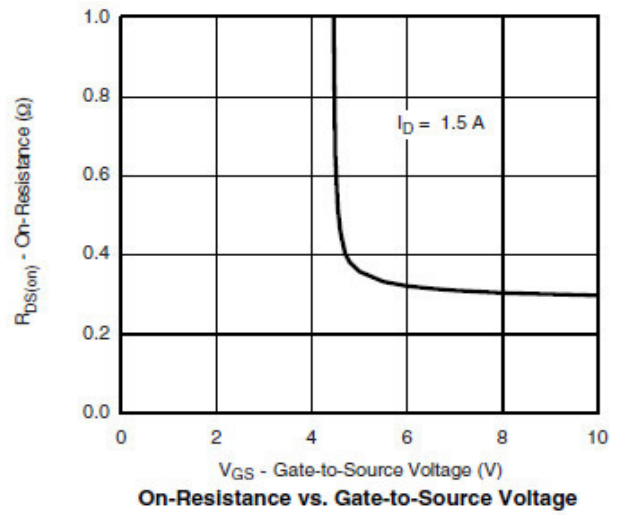
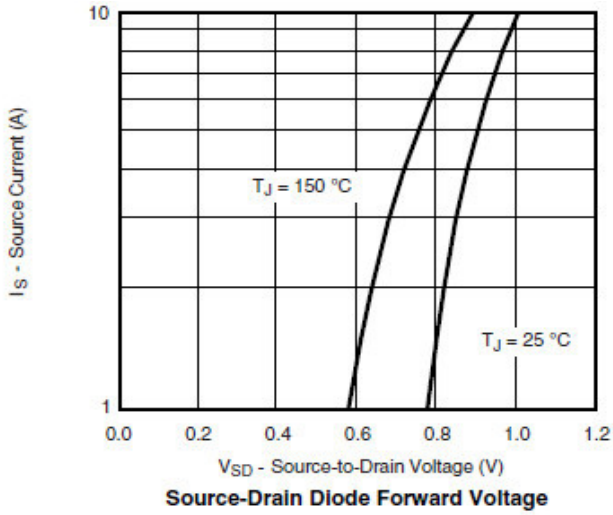


On-Resistance vs. Junction Temperature

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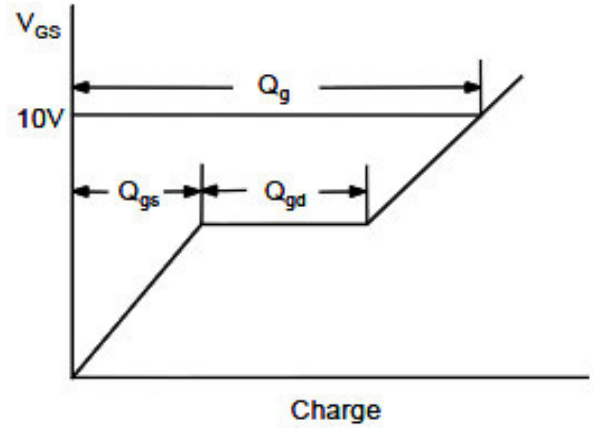
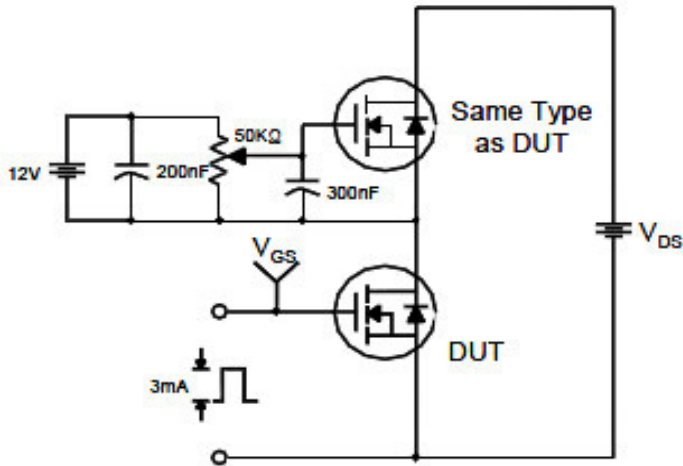
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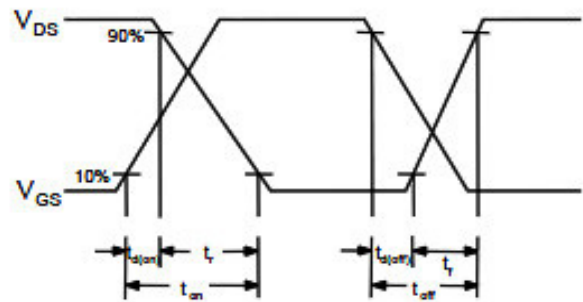
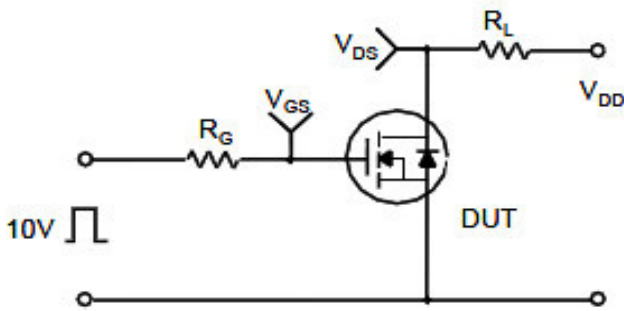
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## ■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

