

# Single P-channel MOSFET

## ELM53435WA-S

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

### ■ General description

ELM53435WA-S uses advanced trench technology to provide excellent  $R_{ds(on)}$ , low gate charge and operation with gate voltages and internal ESD protection.

### ■ Features

- $V_{ds} = -200V$
- $I_d = -1.0A$
- $R_{ds(on)} = 2400m\Omega$  ( $V_{gs} = -10V$ )
- $R_{ds(on)} = 2600m\Omega$  ( $V_{gs} = -4.5V$ )
- ESD protected

### ■ Maximum absolute ratings

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

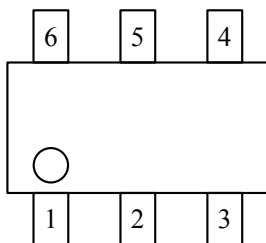
Parameter	Symbol	Limit	Unit
Drain-source voltage	$V_{ds}$	-200	V
Gate-source voltage	$V_{gs}$	$\pm 20$	V
Continuous drain current ( $T_j = 150^\circ C$ )	Id	$T_a = 25^\circ C$	-1.0
		$T_a = 70^\circ C$	-0.6
Pulsed drain current	$I_{dm}$	-1.6	A
Power dissipation	Pd	$T_c = 25^\circ C$	3.2
		$T_c = 70^\circ C$	2.1
Operating junction temperature	$T_j$	150	$^\circ C$
Junction and 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	$^\circ C/W$

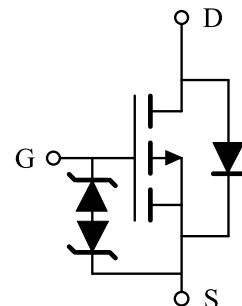
### ■ Pin configuration

SOT-26(TOP VIEW)



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

### ■ Circuit



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### ■ Electrical characteristics

Ta=25°C. Unless otherwise noted.

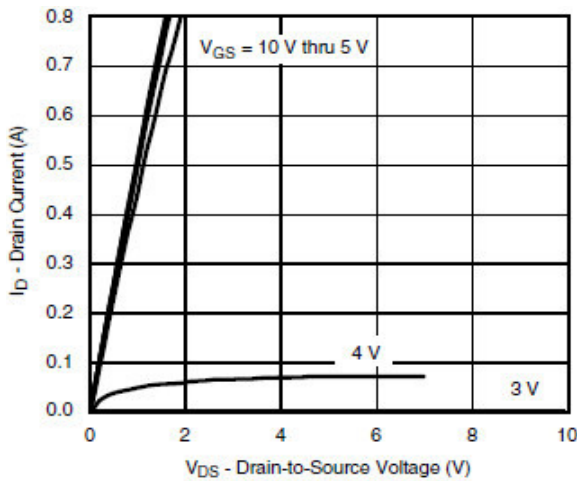
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
<b>STATIC PARAMETERS</b>						
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-200			V
Zero gate voltage drain current	Idss	Vds=-160V			-1	μA
		Vgs=0V		Ta=85°C	-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±10	μA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-2.5	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-10V	-0.6			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-1.0A		2000	2400	mΩ
		Vgs=-4.5V, Id=-0.6A		2100	2600	
Forward transconductance	Gfs	Vds=-10V, Id=-0.5A		1.5		S
Diode forward voltage	Vsd	Is=-0.3A, Vgs=0V		-0.75	-1.20	V
Max. body-diode continuous current	Is				-1.6	A
<b>DYNAMIC PARAMETERS</b>						
Input capacitance	Ciss			155		pF
Output capacitance	Coss	Vgs=0V, Vds=-75V, f=1MHz		8		pF
Reverse transfer capacitance	Crss			6		pF
<b>SWITCHING PARAMETERS</b>						
Total gate charge	Qg	Vgs=-10V, Vds=-75V Id≐-0.5A		4.20	8.00	nC
Gate-source charge	Qgs			0.98		nC
Gate-drain charge	Qgd			1.32		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-75V RL=75Ω, Id≐-1.0A Rgen=1.0Ω		5	10	ns
Turn-on rise time	tr			10	20	ns
Turn-off delay time	td(off)			20	40	ns
Turn-off fall time	tf			10	20	ns

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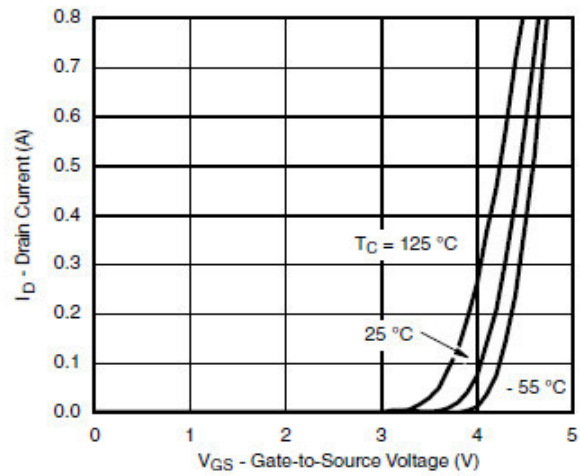
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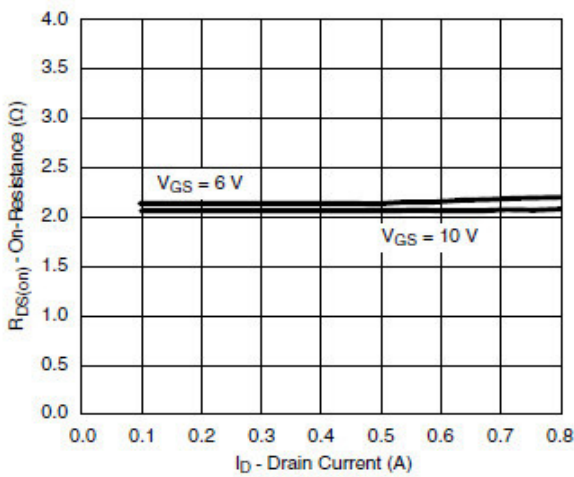
## ■ Typical electrical and thermal characteristics



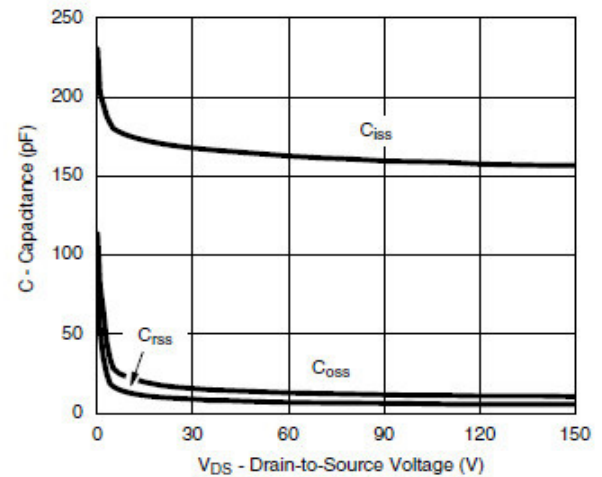
Output Characteristics



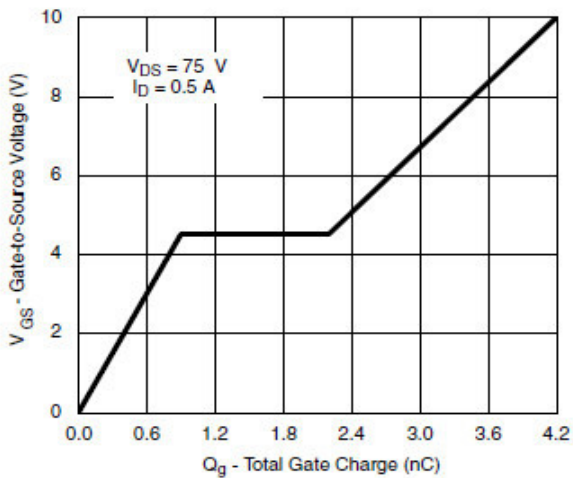
Transfer Characteristics



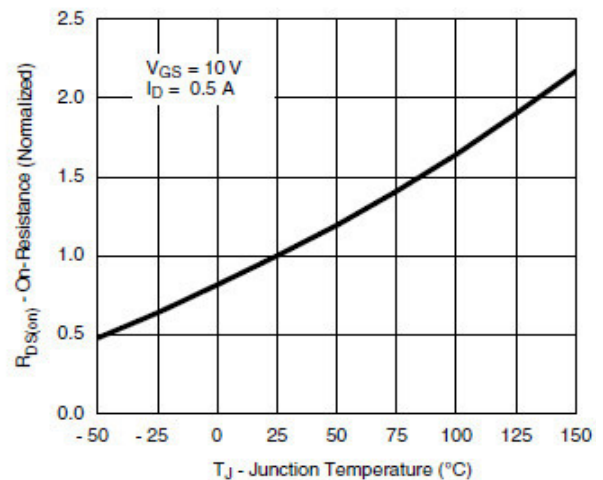
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

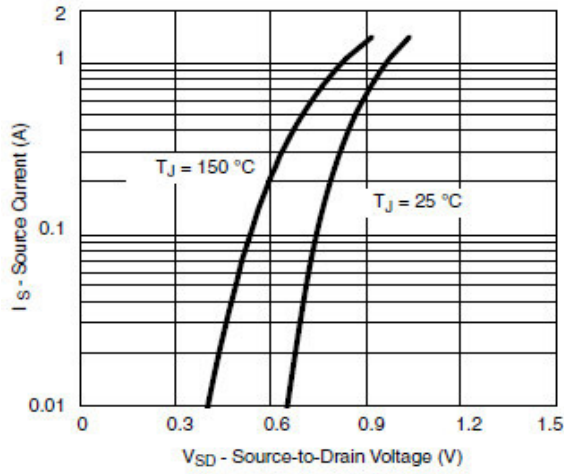


On-Resistance vs. Junction Temperature

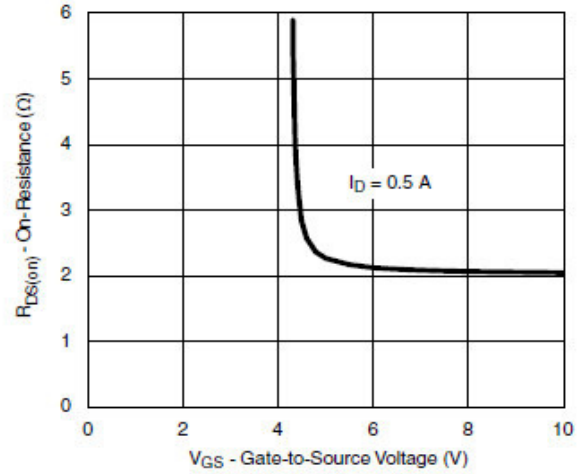
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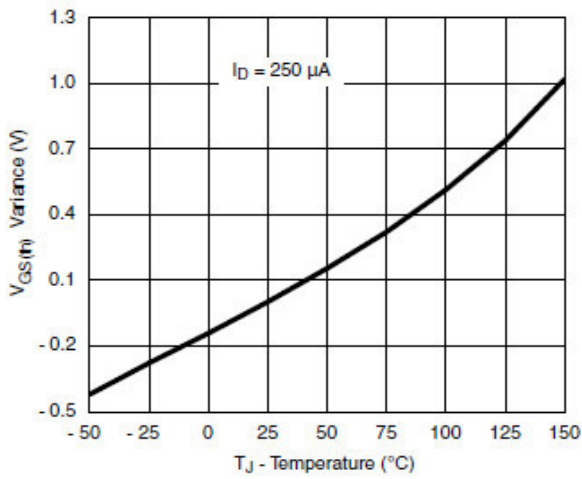
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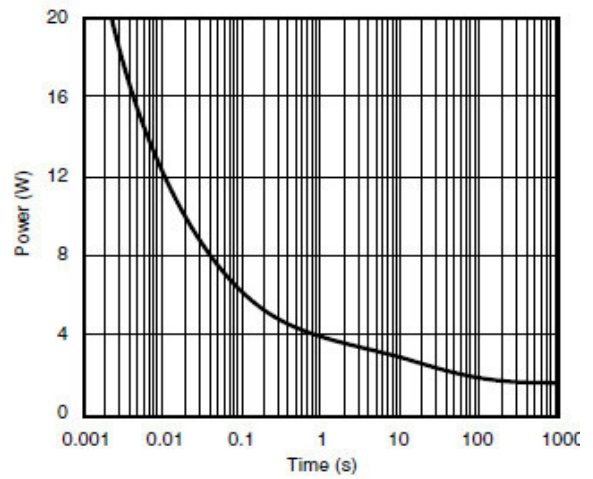
Source-Drain Diode Forward Voltage



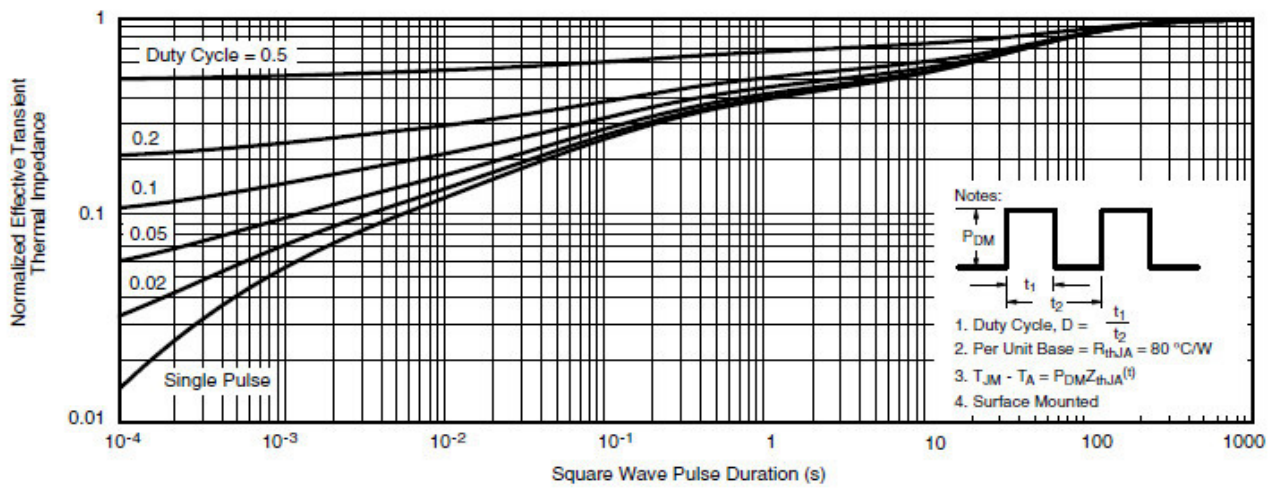
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

- Notes:
- Duty Cycle,  $D = \frac{t_1}{t_2}$
  - Per Unit Base =  $R_{thJA} = 80 \text{ } ^\circ\text{C/W}$
  - $T_{JM} - T_A = P_{DM} Z_{thJA}^{(t)}$
  - Surface Mounted

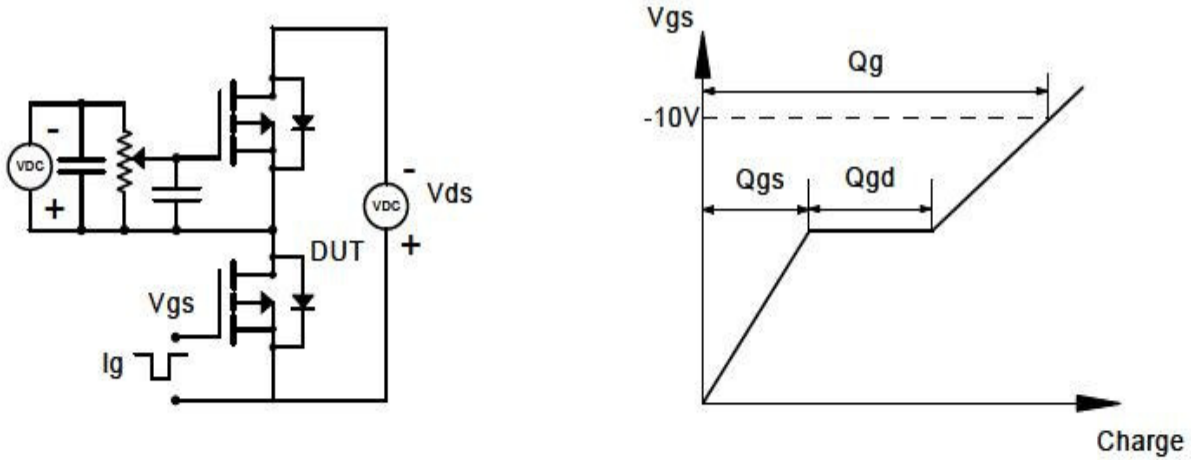
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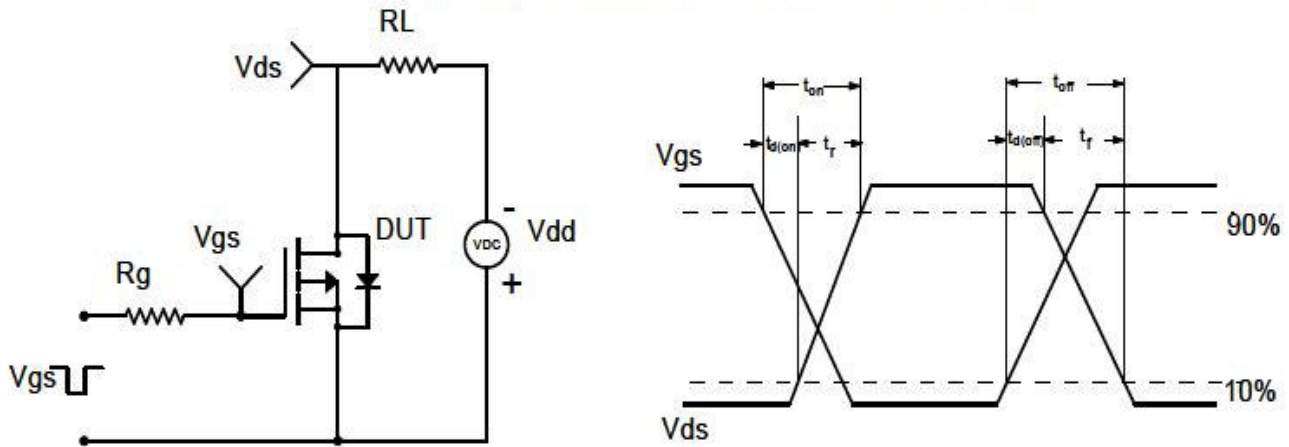
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## ■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

