

Single N-channel MOSFET

ELM53406CA-S

■ General description

ELM53406CA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

■ Features

- $V_{ds}=60V$
- $I_d=3.6A$ ($V_{gs}=10V$)
- $R_{ds(on)} < 70m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 78m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

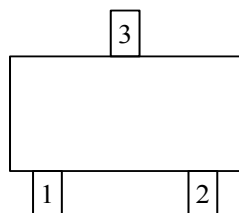
Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{ds}	60	V
Gate-source voltage	V_{gs}	± 20	V
Continuous drain current($T_j=150^\circ C$)	$T_a=25^\circ C$	3.6	A
	$T_a=70^\circ C$	2.8	
Pulsed drain current	I_{dm}	10	A
Power dissipation	$T_a=25^\circ C$	1.25	W
	$T_a=70^\circ C$	0.80	
Junction and storage temperature range	T_j, T_{stg}	- 55 to 150	$^\circ C$

■ Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Maximum junction-to-ambient	$R_{\theta ja}$		120	$^\circ C/W$

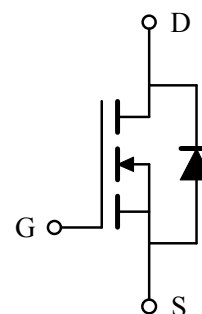
■ Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■ Circuit



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■ Electrical characteristics

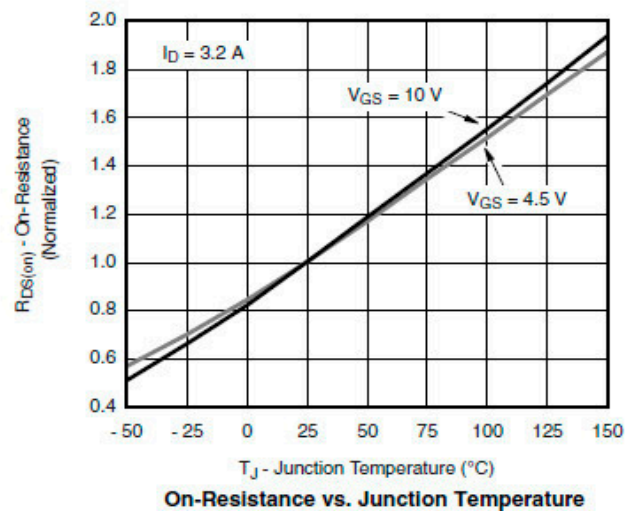
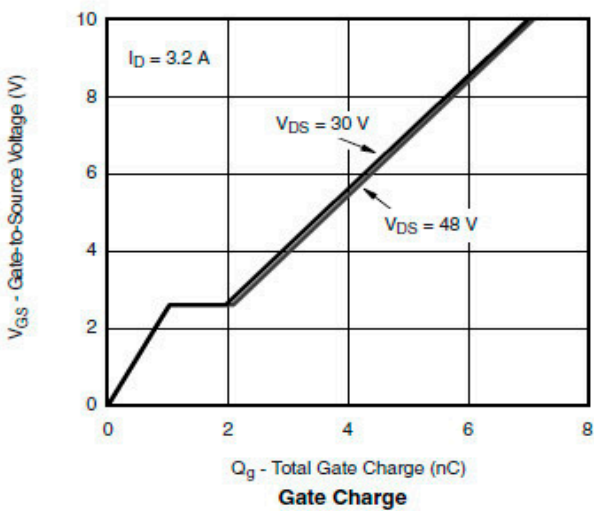
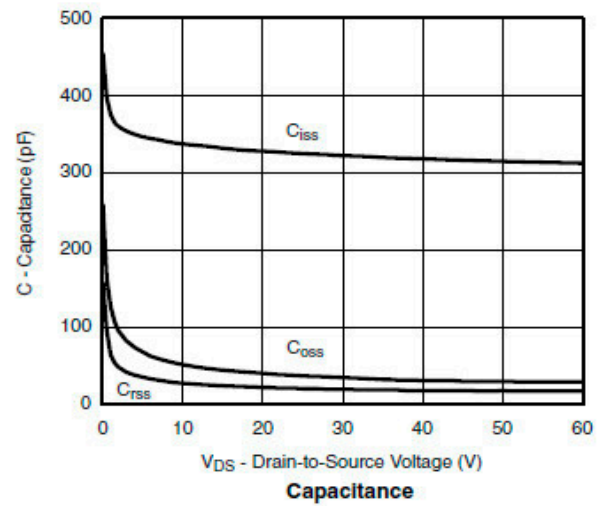
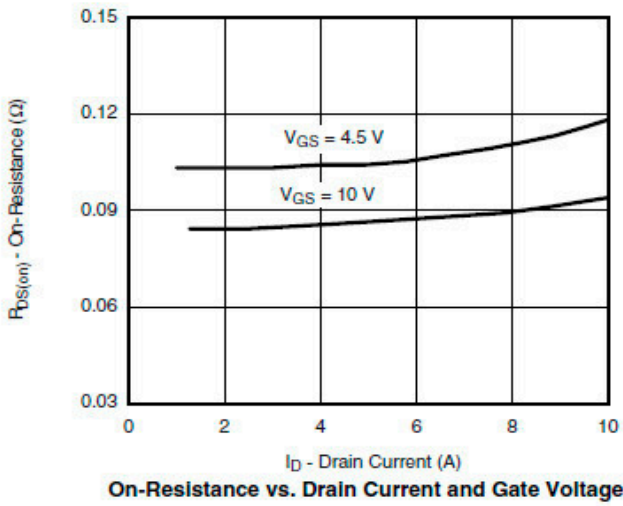
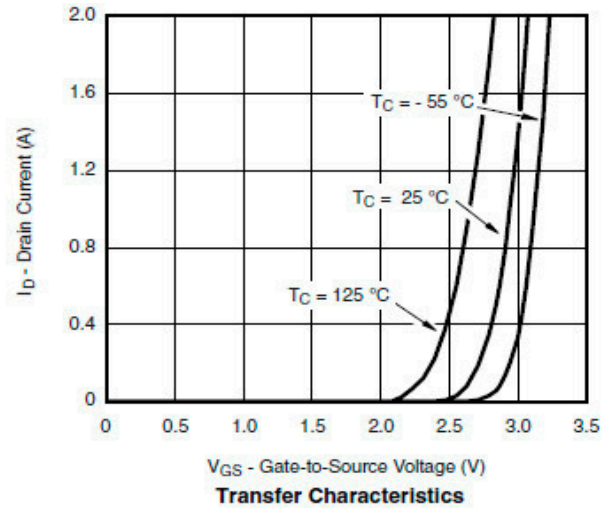
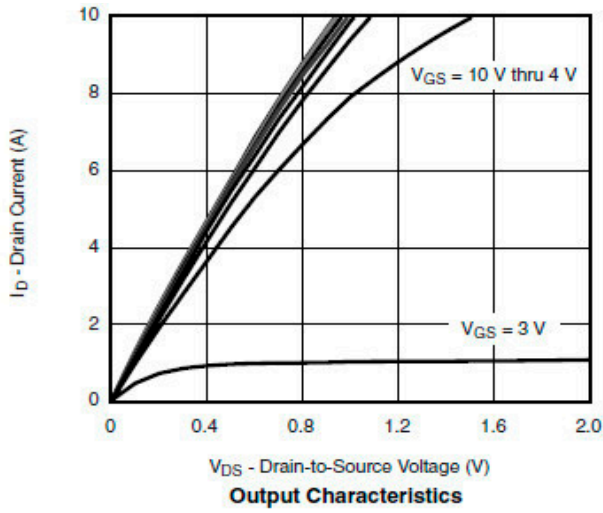
Ta=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	60			V
Zero gate voltage drain current	Idss	Vds=48V, Vgs=0V Tj=85°C			1	μA
					10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	1.0		2.0	V
On state drain current	Id(on)	Vgs=10V, Vds=5V	6			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=3.6A		55	70	mΩ
		Vgs=4.5V, Id=2.8A		60	78	
Forward transconductance	Gfs	Vds=15V, Id=3.2A		15		S
Diode forward voltage	Vsd	Is=2.5A, Vgs=0V		0.85	1.20	V
Max. body-diode continuous current	Is				1.6	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=30V, f=1MHz		400		pF
Output capacitance	Coss			40		pF
Reverse transfer capacitance	Crss			20		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=4.5V, Vds=30V Id=3.2A		6.0	12.0	nC
Gate-source charge	Qgs			1.5		nC
Gate-drain charge	Qgd			1.2		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=30V RL=12Ω, Id=2.5A Rgen=1Ω		8	15	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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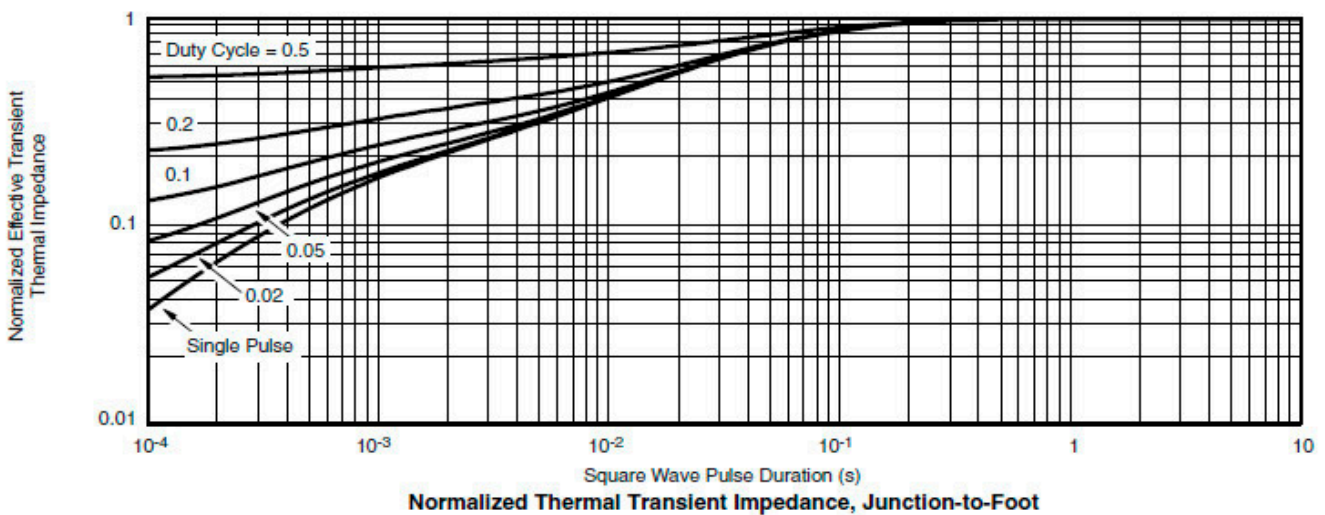
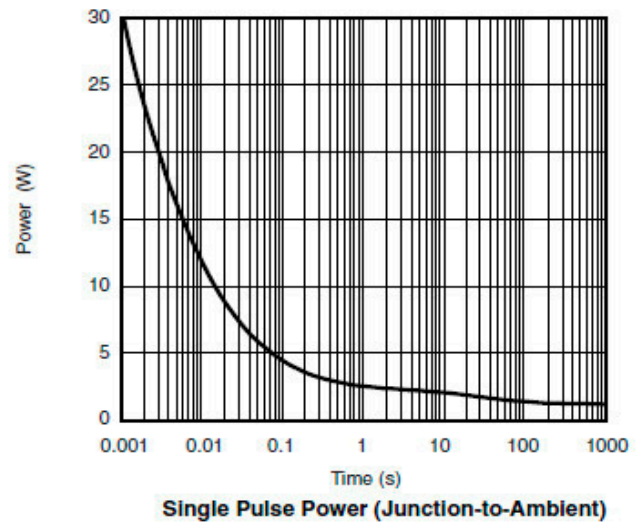
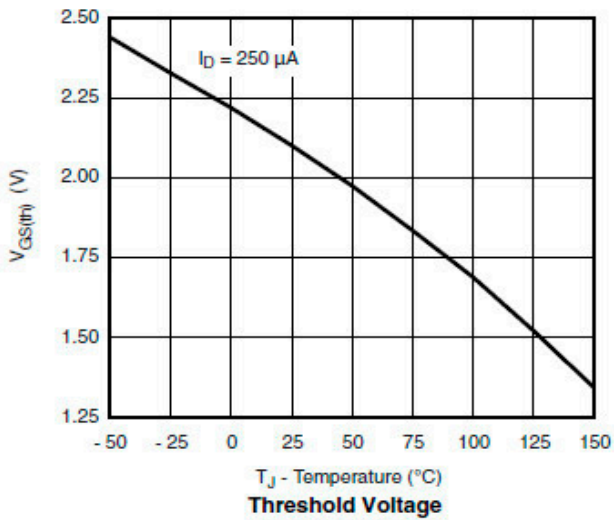
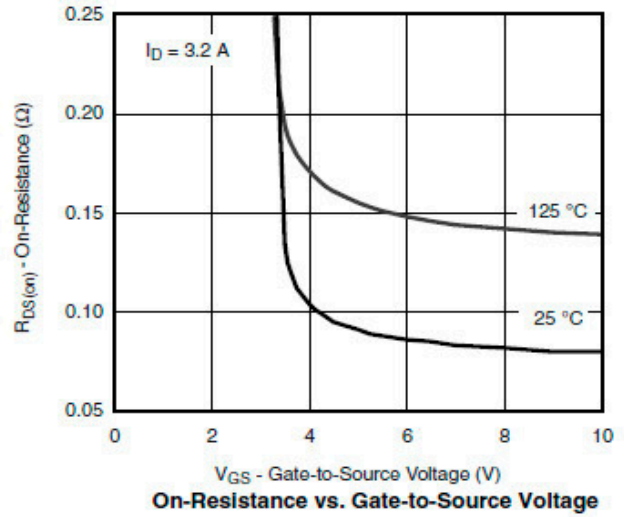
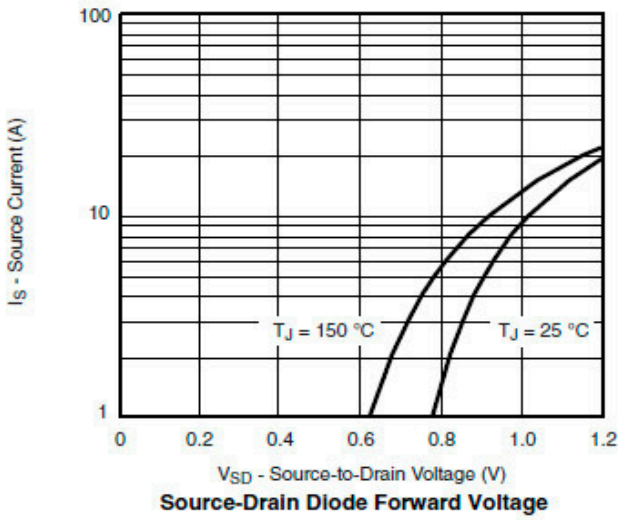
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■ Typical electrical and thermal characteristics



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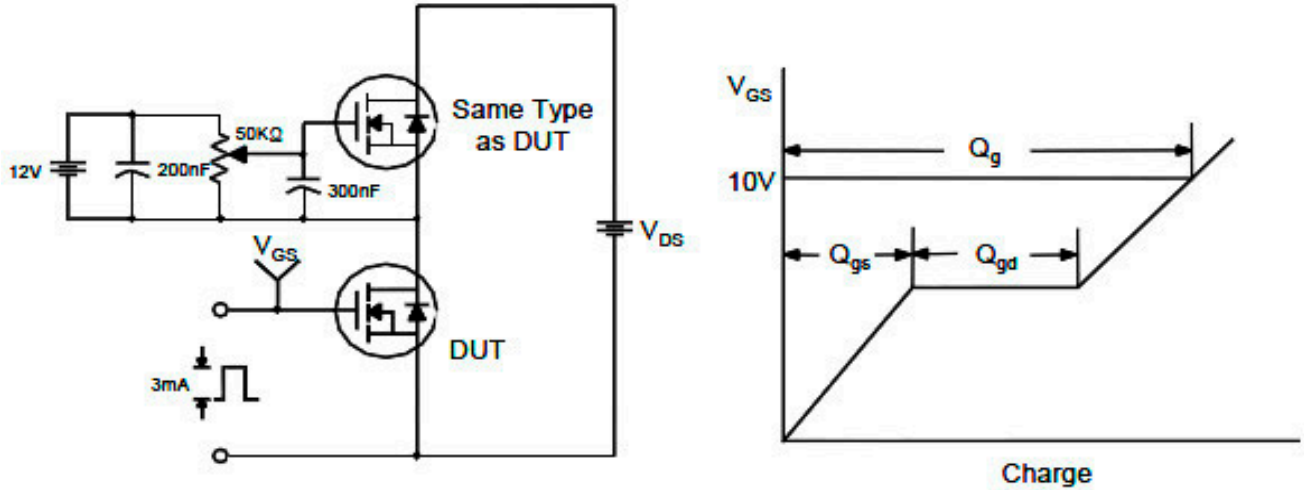


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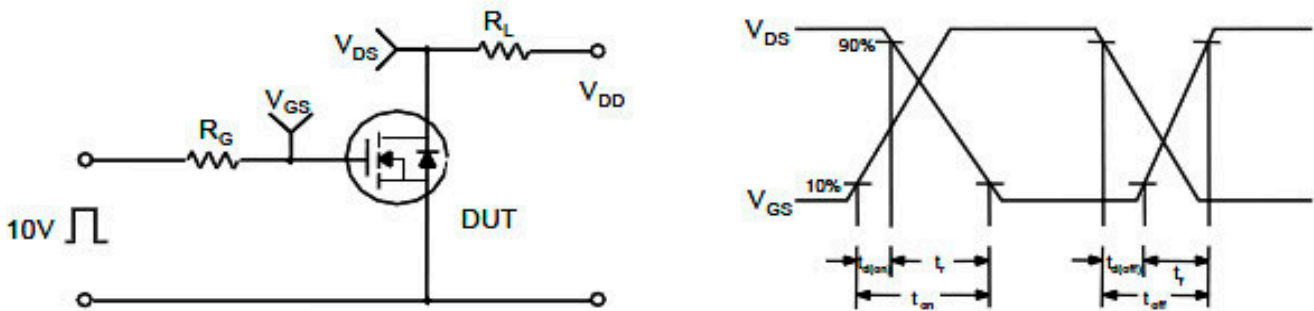
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

