

Dual N-channel MOSFET

ELM51932EA-S

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

■ General description

ELM51932EA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and operation with gate voltages as low as 2.5V and internal ESD protection.

■ Features

- $V_{ds}=30V$
- $I_d=1.8A$
- $R_{ds(on)} = 450m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} = 600m\Omega$ ($V_{gs}=2.5V$)
- ESD protected

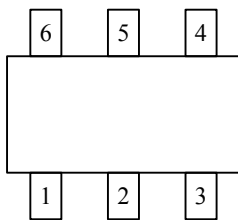
■ Maximum absolute ratings

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

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{ds}	30	V
Gate-source voltage	V_{gs}	± 12	V
Continuous drain current($T_j=150^\circ C$)	I_d	$T_a=25^\circ C$	1.8
		$T_a=70^\circ C$	1.0
Pulsed drain current	I_{dm}	6	A
Power dissipation	P_d	$T_c=25^\circ C$	0.3
		$T_c=70^\circ C$	0.2
Operating junction temperature	T_j	- 55 to 150	$^\circ C$
Storage temperature range	T_{stg}	- 55 to 150	$^\circ C$

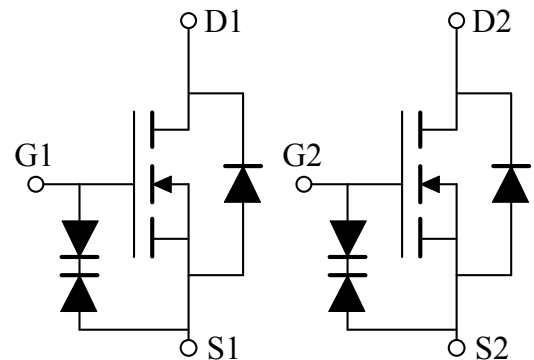
■ Pin configuration

SC-70-6(TOP VIEW)



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

■ Circuit



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■ Electrical characteristics

Ta=25°C. Unless otherwise noted.

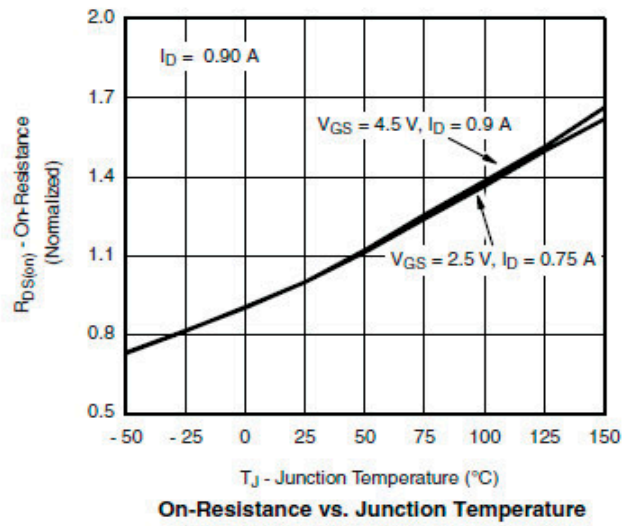
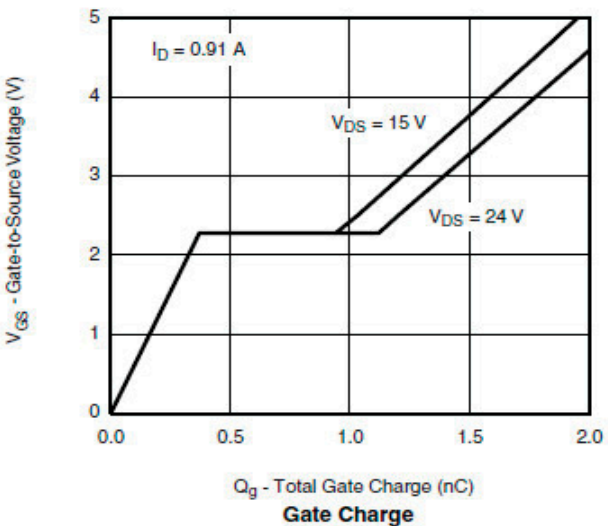
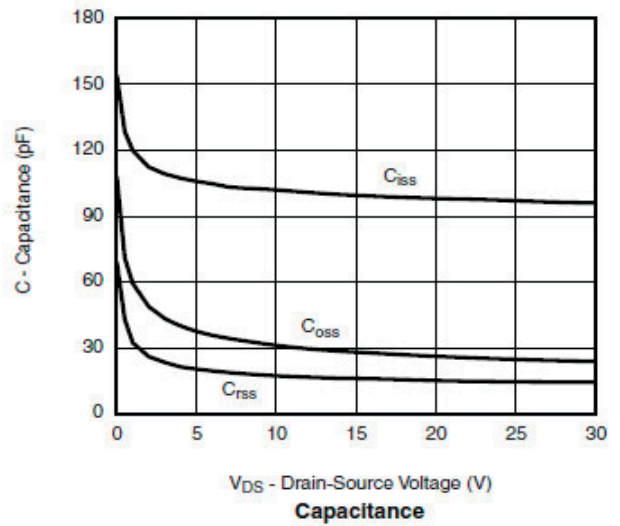
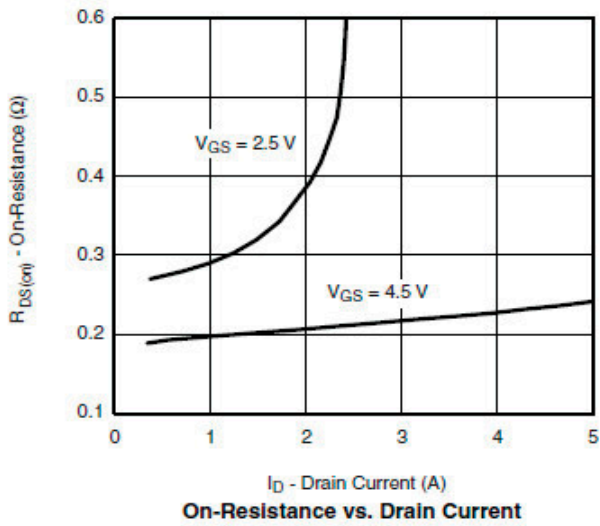
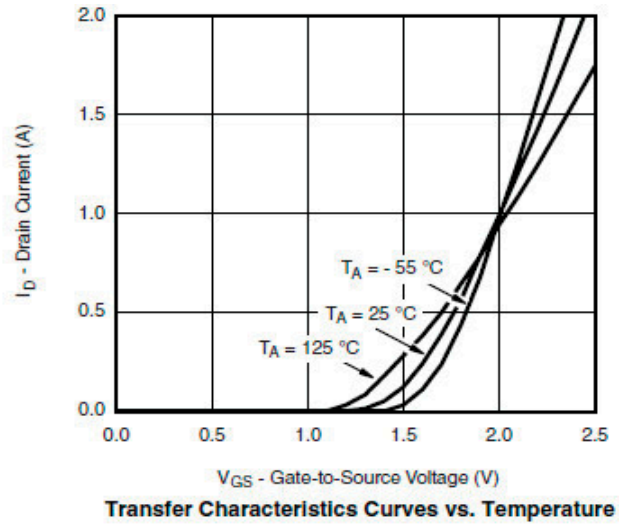
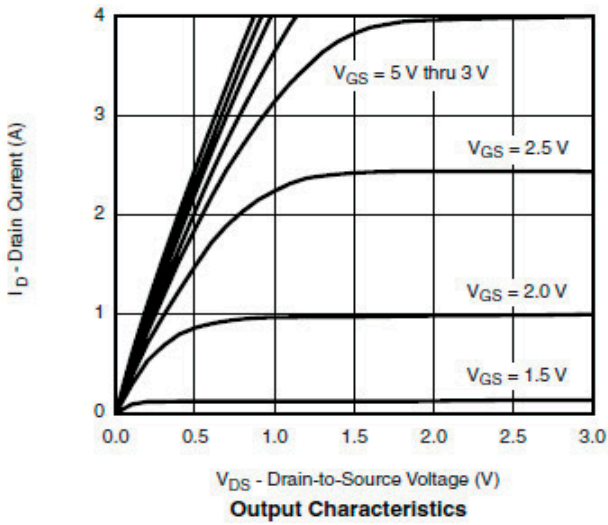
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	30			V
Zero gate voltage drain current	Idss	Vds=24V, Vgs=0V Ta=85°C			1	μA
					5	
Gate-source leakage current	Igss	Vds=0V, Vgs=±12V			±5	mA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.5		1.5	V
On state drain current	Id(on)	Vgs=4.5V, Vds≥5V	1.8			A
Static drain-source on-resistance	Rds(on)	Vgs=4.5V, Id=1.5A		400	450	mΩ
		Vgs=2.5V, Id=1.2A		550	600	
Forward transconductance	Gfs	Vds=10V, Id=1.0A		1		S
Diode forward voltage	Vsd	Is=1.0A, Vgs=0V		0.65	1.20	V
Max. body-diode continuous current	Is				1.0	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=15V, f=1MHz		85		pF
Output capacitance	Coss			25		pF
Reverse transfer capacitance	Crss			15		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=4.5V, Vds=15V, Id≐1.2A		1.4	1.8	pC
Gate-source charge	Qgs			0.3		pC
Gate-drain charge	Qgd			0.6		pC
Turn-on delay time	td(on)	Vgs=4.5V, Vds=15V RL=20Ω, Id≐1.2A Rgen=1.0Ω		15	25	ns
Turn-on rise time	tr			25	45	ns
Turn-off delay time	td(off)			15	25	ns
Turn-off fall time	tf			10	20	ns

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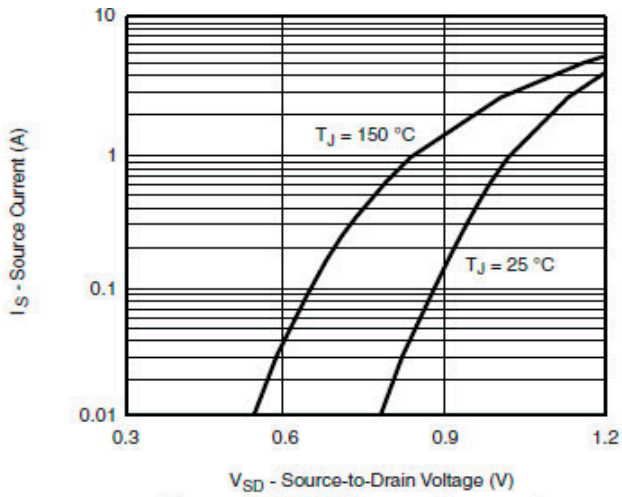
■ Typical electrical and thermal characteristics



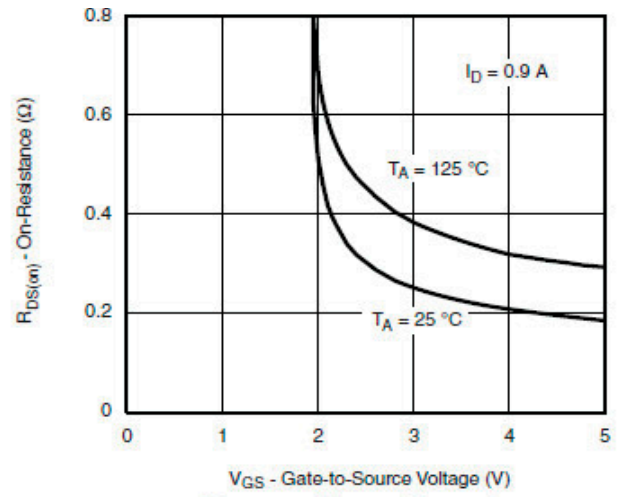
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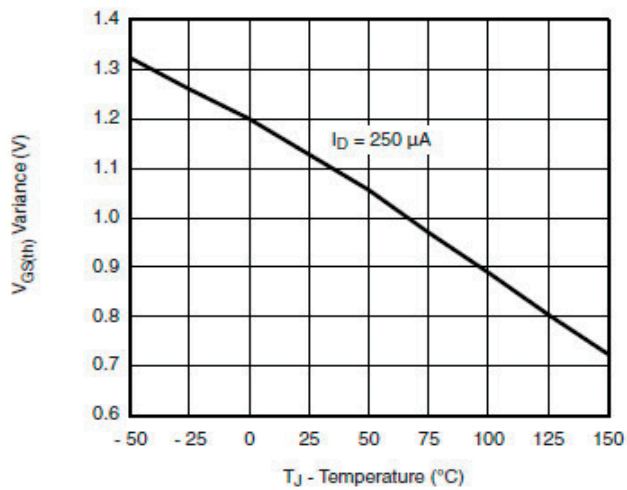
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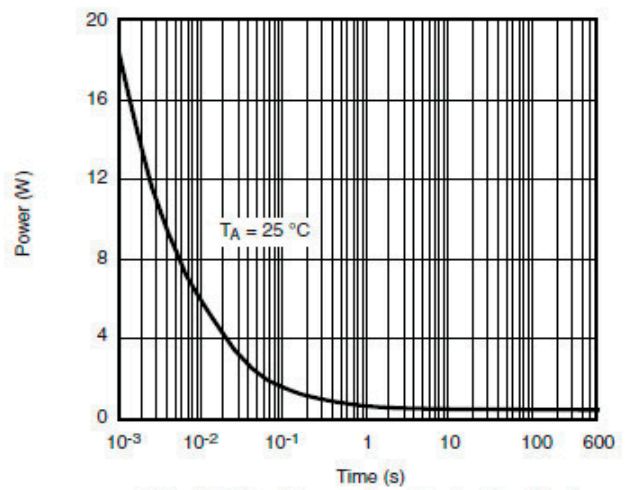
Forward Diode Voltage vs. Temperature



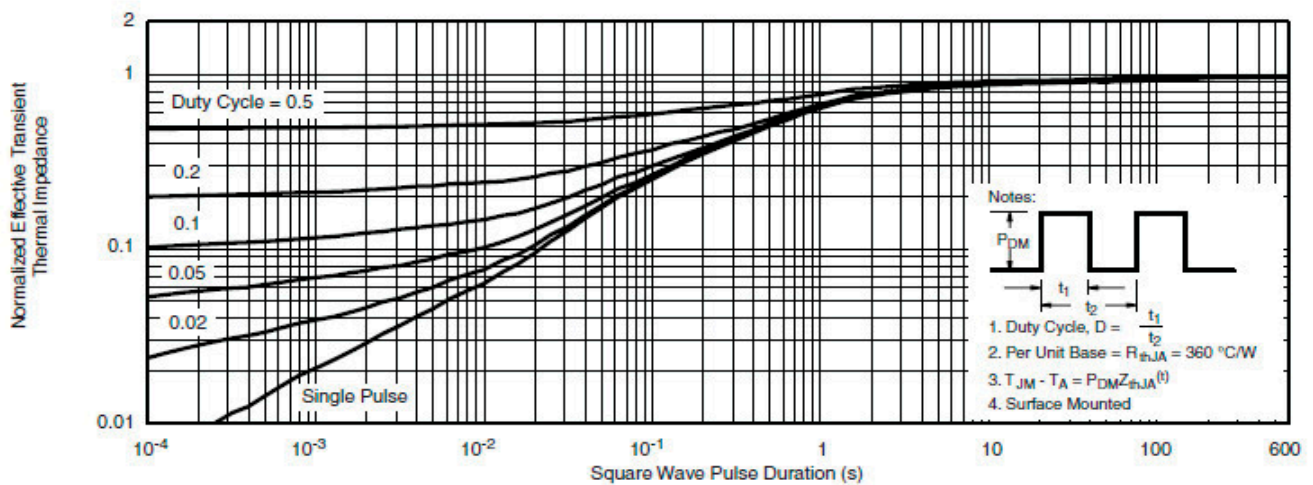
$R_{DS(on)}$ vs. V_{GS} vs. Temperature



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

- Notes:
- Duty Cycle, $D = \frac{t_1}{t_1 + t_2}$
 - Per Unit Base = $R_{thJA} = 360^\circ\text{C/W}$
 - $T_{JM} - T_A = PDMZ_{thJA}^{(t)}$
 - Surface Mounted

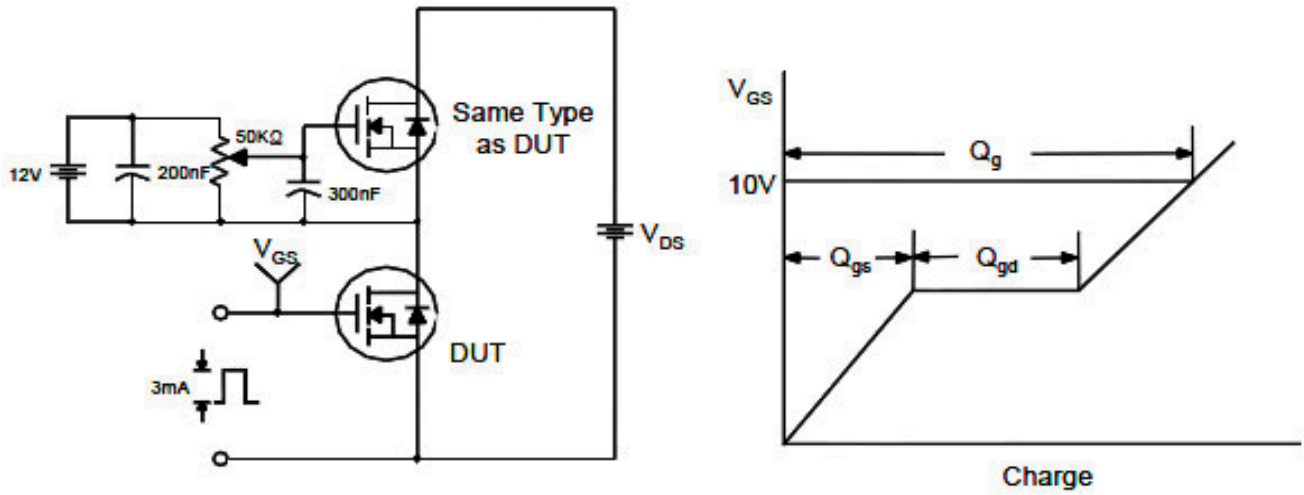
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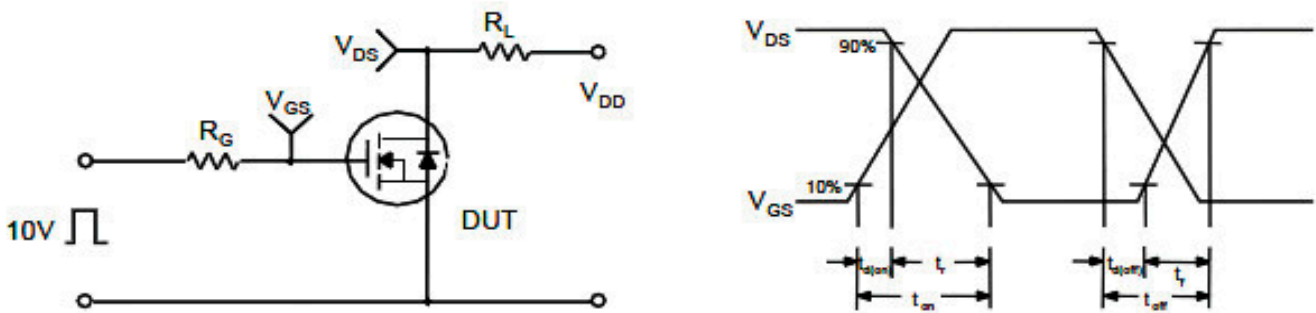
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

