

Single N-channel MOSFET

ELM51032EA-S

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

■ General description

ELM51032EA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage. ESD protection is included.

■ Features

- $V_{ds}=30V$
- $I_d=0.7A$
- $R_{ds(on)} = 500m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} = 600m\Omega$ ($V_{gs}=2.5V$)
- $R_{ds(on)} = 880m\Omega$ ($V_{gs}=1.8V$)
- ESD Protected.

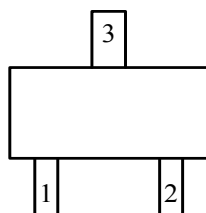
■ Maximum absolute ratings

$T_a=25^\circ C$. 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	$T_a=25^\circ C$	0.7
		$T_a=70^\circ C$	0.4
Pulsed drain current	I_{dm}	1.0	A
Power dissipation	P_d	$T_c=25^\circ C$	0.27
		$T_c=70^\circ C$	0.16
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	$^\circ C$

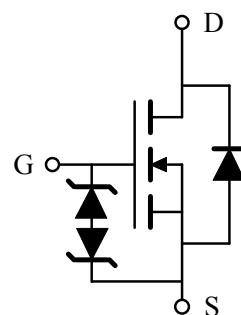
■ Pin configuration

SOT-523(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■ Circuit



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

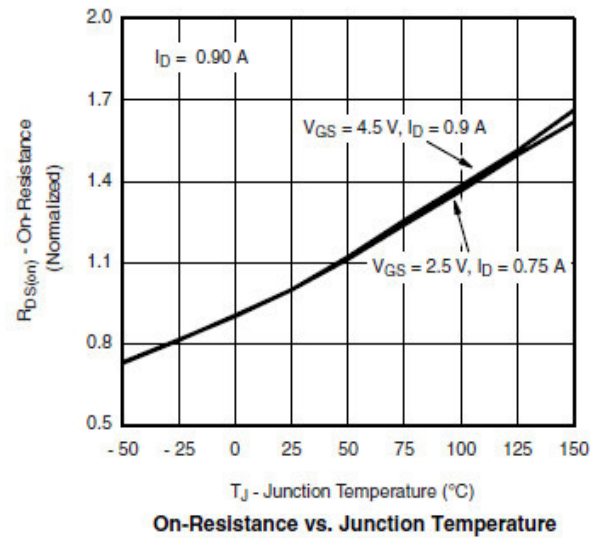
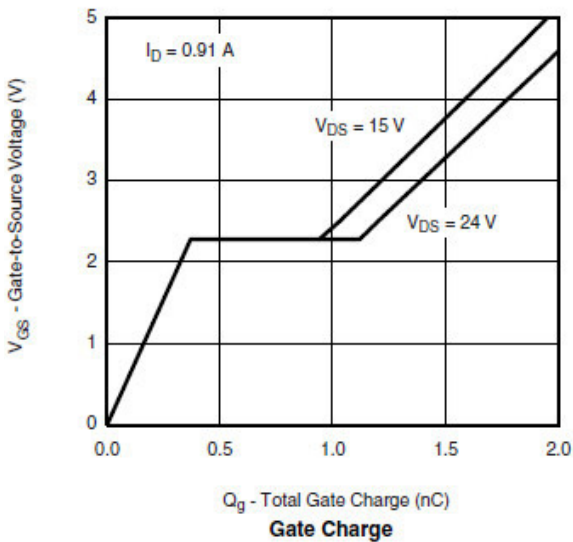
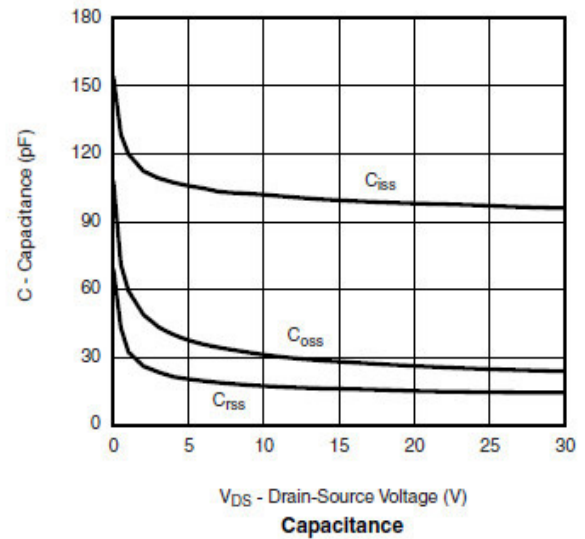
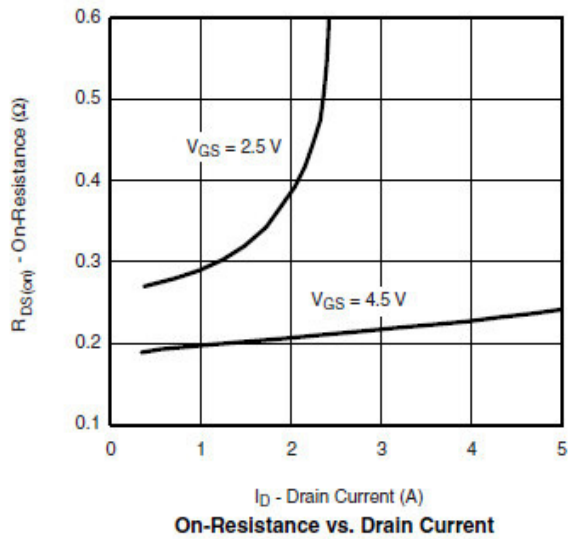
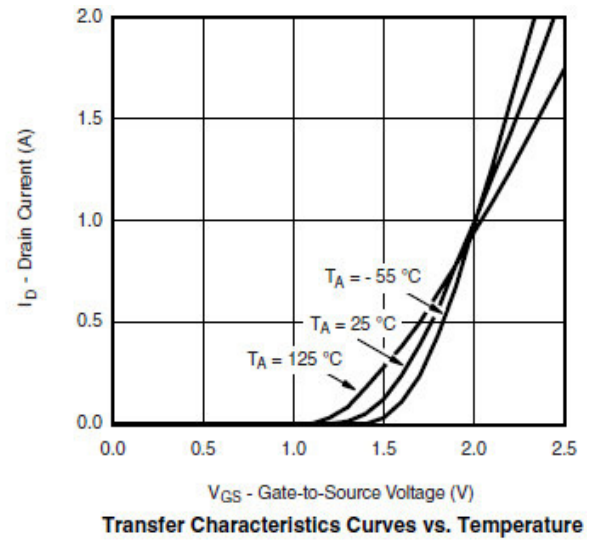
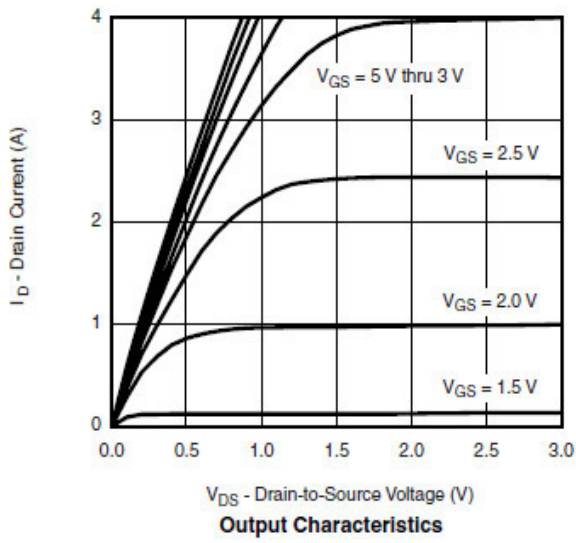
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	30			V
Zero gate voltage drain current	Idss	Vds=24V, Vgs=0V			1	μA
		Ta=85°C			5	
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±5	mA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	0.5		1.5	V
On state drain current	Id(on)	Vgs=4.5V, Vds≥5V	0.7			A
Static drain-source on-resistance	Rds(on)	Vgs=4.5V, Id=0.6A		400	500	mΩ
		Vgs=2.5V, Id=0.5A		500	600	
		Vgs=1.8V, Id=0.4A		750	880	
Forward transconductance	Gfs	Vds=10V, Id=0.4A		1		S
Diode forward voltage	Vsd	Is=0.15A, Vgs=0V		0.6	1.5	V
Max. body-diode continuous current	Is				0.3	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss			85		pF
Output capacitance	Coss	Vgs=0V, Vds=15V, f=1MHz		25		pF
Reverse transfer capacitance	Crss			15		pF
SWITCHING PARAMETERS						
Total gate charge	Qg			1.4	1.8	nC
Gate-source charge	Qgs	Vgs=4.5V, Vds=15V, Id=0.6A		0.3		nC
Gate-drain charge	Qgd			0.6		nC
Turn-on delay time	td(on)			15	25	ns
Turn-on rise time	tr	Vgs=4.5V, Vds=15V		25	45	ns
Turn-off delay time	td(off)	RL=20Ω, Id=0.5A, Rgen=1Ω		15	25	ns
Turn-off fall time	tf			10	20	ns

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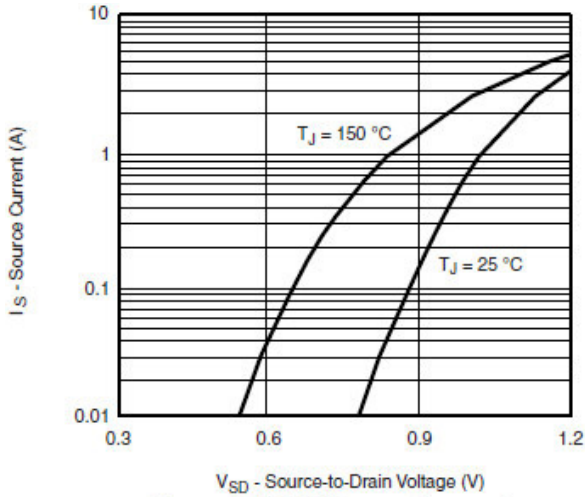
Typical electrical and thermal characteristics



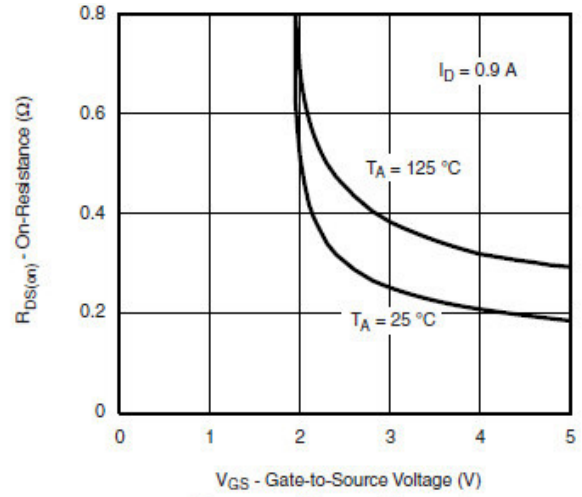
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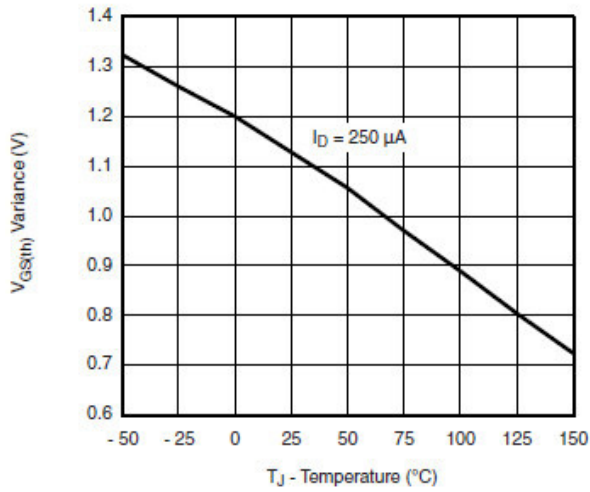
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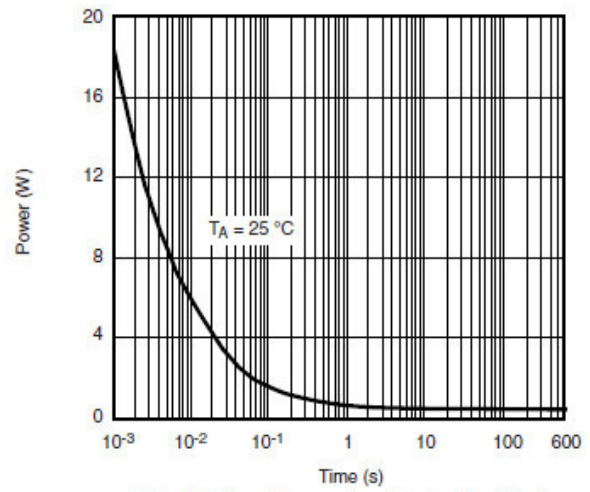
Forward Diode Voltage vs. Temperature



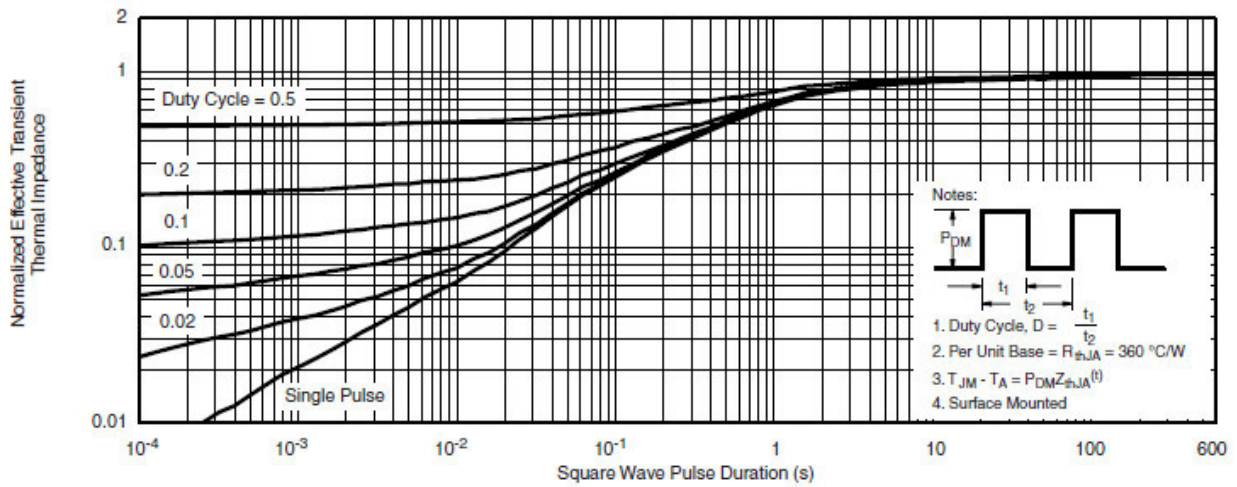
$R_{DS(on)}$ vs. V_{GS} vs. Temperature



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

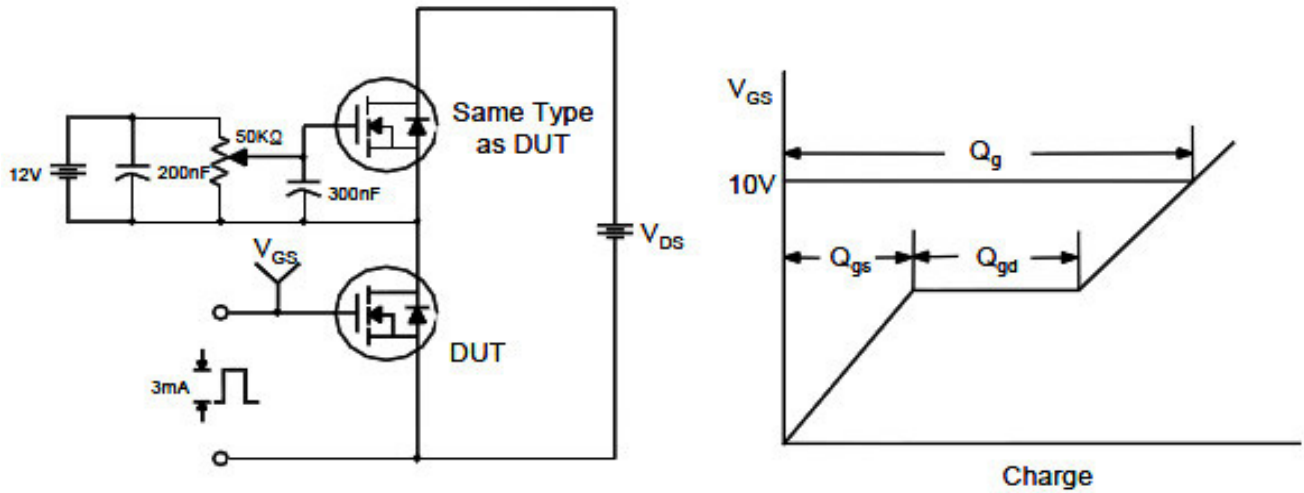
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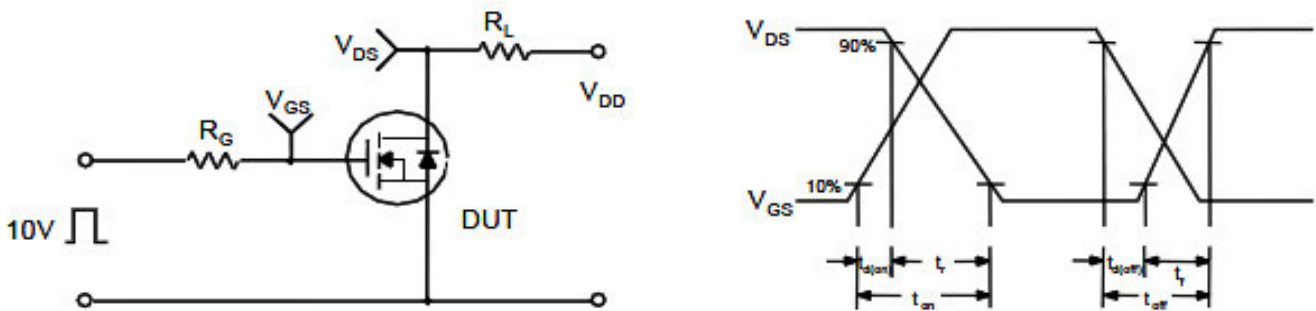
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

