

Dual N-channel MOSFET

ELM56820A-S

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

■General description

ELM56820A-S uses advanced trench technology to provide excellent $R_{ds(on)}$ and low gate charge.

■Features

- $V_{ds}=20V$
- $I_d=3.4A$
- $R_{ds(on)} = 58m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} = 68m\Omega$ ($V_{gs}=2.5V$)
- $R_{ds(on)} = 88m\Omega$ ($V_{gs}=1.8V$)

■Maximum absolute ratings

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

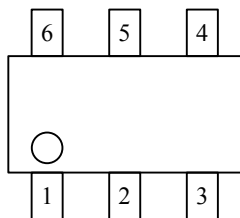
Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{ds}	20	V
Gate-source voltage	V_{gs}	± 12	V
Continuous drain current($T_j=150^\circ C$)	I_d	3.4	A
		2.4	
Pulsed drain current	I_{dm}	20	A
Power dissipation	P_d	2.0	W
		1.3	
Operating junction temperature	T_j	150	$^\circ C$
Storage temperature range	T_{stg}	-55 to 150	$^\circ C$

■Thermal characteristics

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

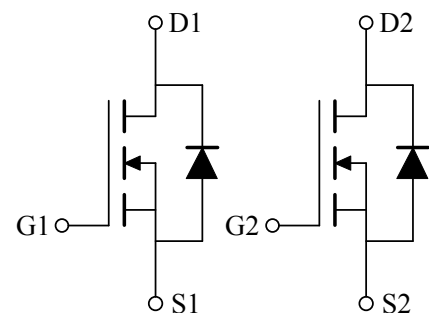
■Pin configuration

SOT-26(TOP VIEW)



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

■Circuit



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

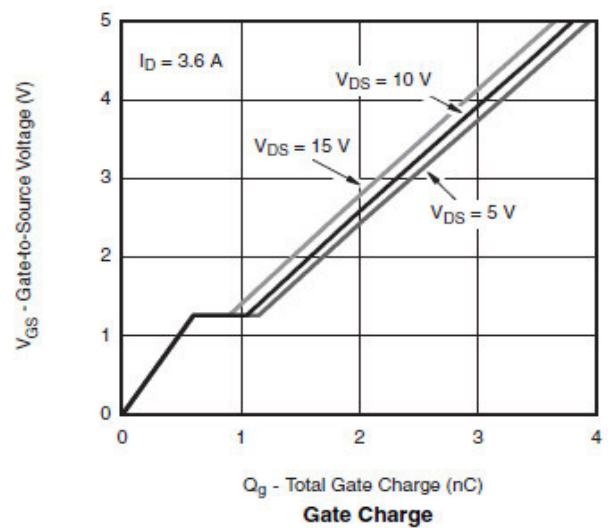
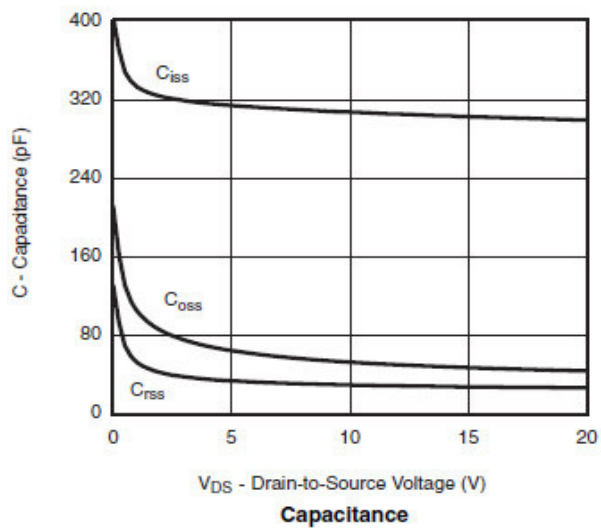
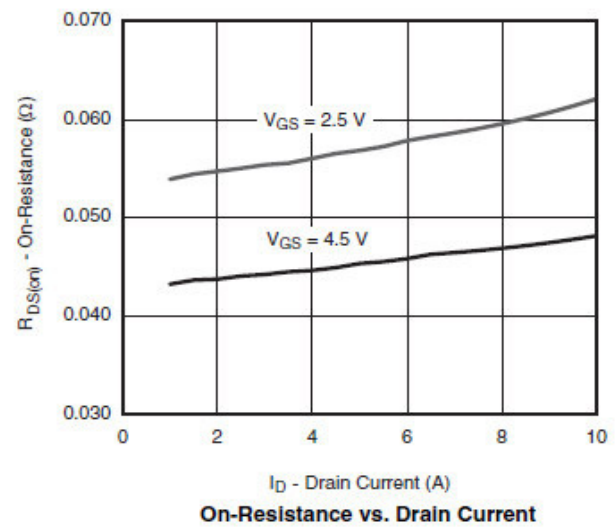
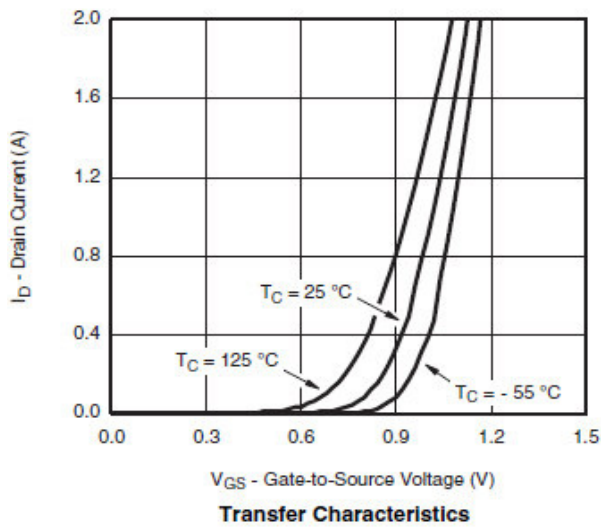
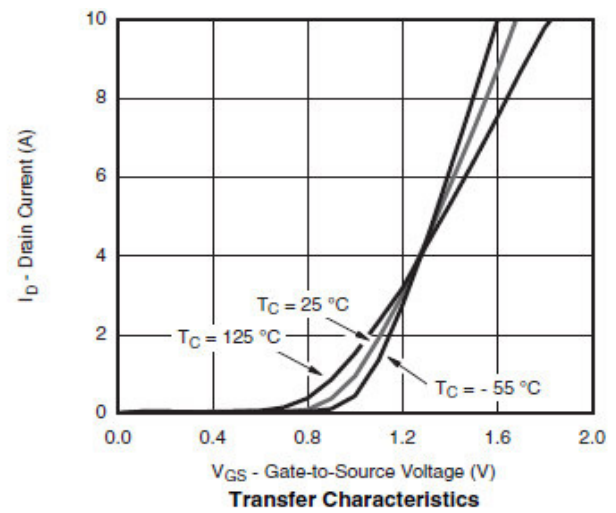
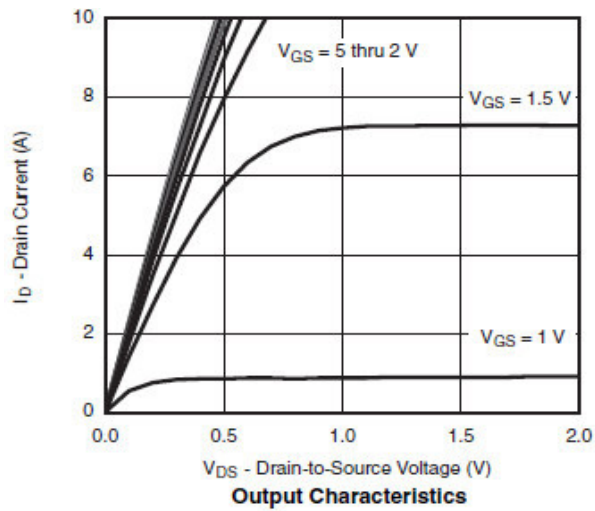
Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V		20			V
Zero gate voltage drain current	Idss	Vds=16V				1	μA
		Vgs=0V	Ta=85°C			10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA		0.3		0.8	V
On state drain current	Id(on)	Vgs=4.5V, Vds≥5V		6			A
		Vgs=2.5V, Vds≥5V		4			
Static drain-source on-resistance	Rds(on)	Vgs=4.5V, Id=3.4A			46	58	mΩ
		Vgs=2.5V, Id=3.0A			56	68	
		Vgs=1.8V, Id=2.4A			76	88	
Forward transconductance	Gfs	Vds=5V, Id=3.6A			10		S
Diode forward voltage	Vsd	Is=1.6A, Vgs=0V			0.85	1.20	V
Max. body-diode continuous current	Is					1.7	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=10V, f=1MHz			340		pF
Output capacitance	Coss				115		pF
Reverse transfer capacitance	Crss				33		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=10V Id≒3.6A			4.2	5.0	nC
Gate-source charge	Qgs				0.6		nC
Gate-drain charge	Qgd				0.4		nC
Turn-on delay time	td(on)	Vgs=4.5V, Vds=10V, Id≒3.6A RL=2.8Ω, Rgen=1.0Ω			8	15	ns
Turn-on rise time	tr				8	15	ns
Turn-off delay time	td(off)				25	40	ns
Turn-off fall time	tf				8	15	ns

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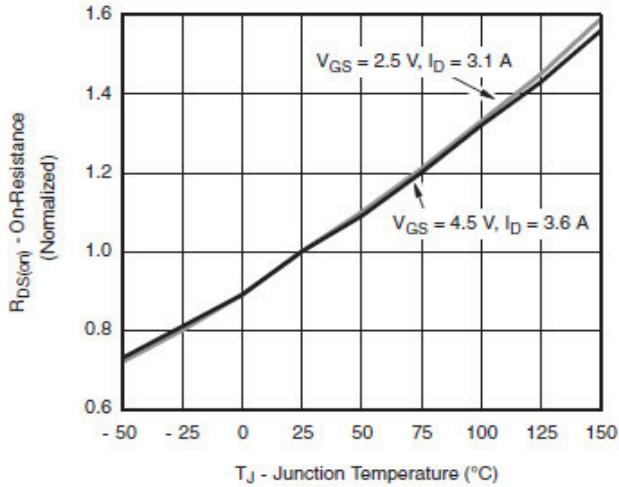
■ Typical electrical and thermal characteristics



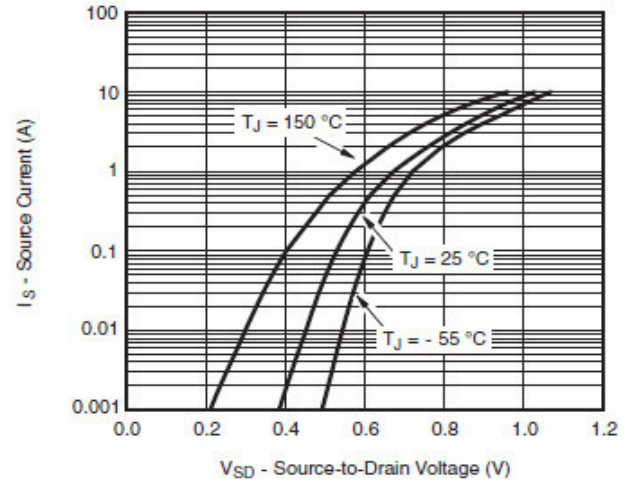
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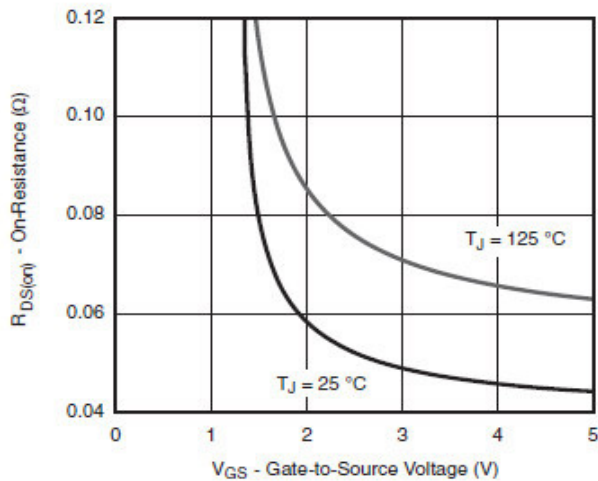
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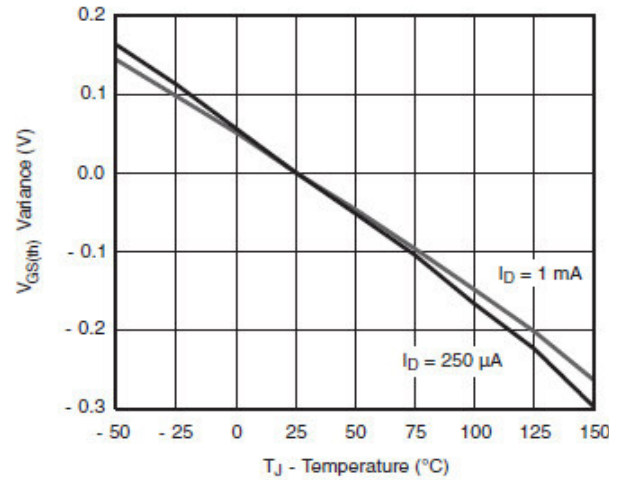
On-Resistance vs. Junction Temperature



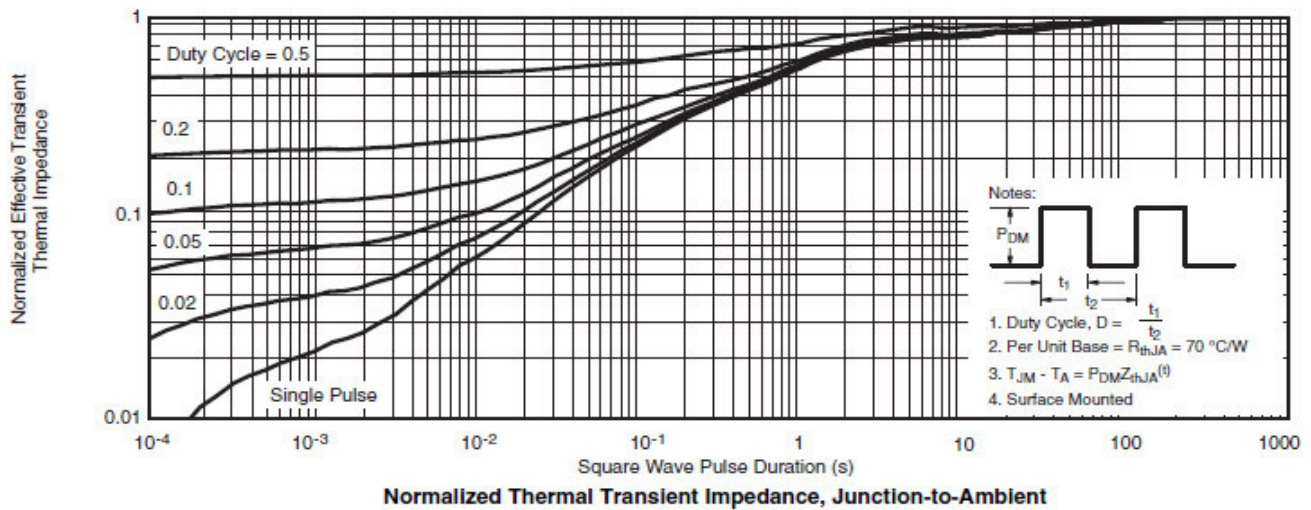
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



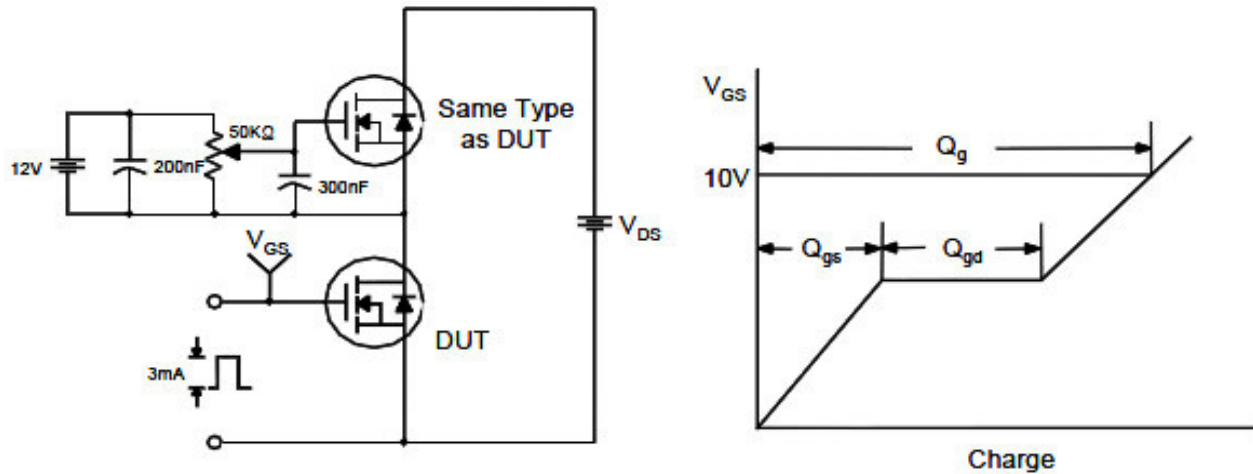
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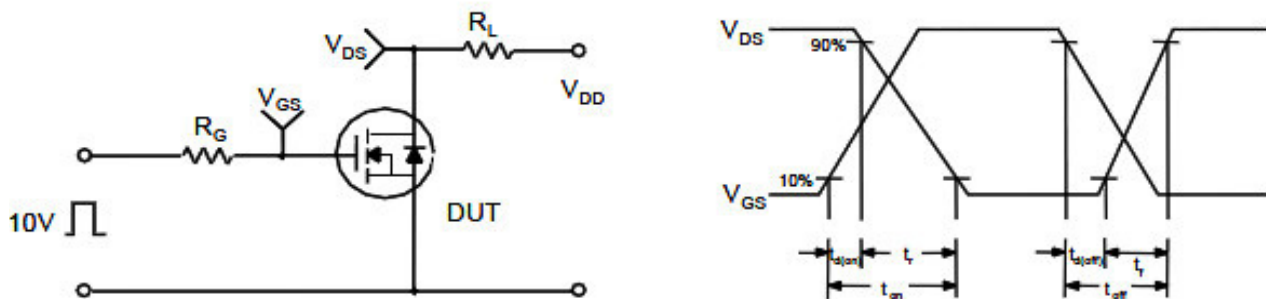
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

