

Dual N-channel MOSFET

ELM57002LDSA-S

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

■General description

ELM57002LDSA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and operation with gate voltages as low as 1.8V and internal ESD protection.

■Features

- $V_{ds}=60V$
- $I_d=0.64A$
- $R_{ds(on)} = 2.4\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} = 3.0\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} = 6.5\Omega$ ($V_{gs}=2.5V$)
- $R_{ds(on)} = 9.0\Omega$ ($V_{gs}=1.8V$)
- ESD protected

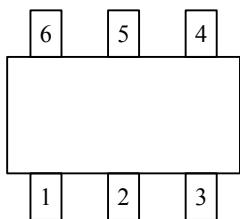
■Maximum absolute ratings

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

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{ds}	60	V
Gate-source voltage	V_{gs}	± 20	V
Continuous drain current($T_j=150^\circ C$)	I_d	0.64	A
$T_a=70^\circ C$		0.35	
Pulsed drain current	I_{dm}	0.8	A
Power dissipation	P_d	0.3	W
$T_c=70^\circ C$		0.2	
Operating junction temperature	T_j	- 55 to 150	°C
Storage temperature range	T_{stg}	- 55 to 150	°C

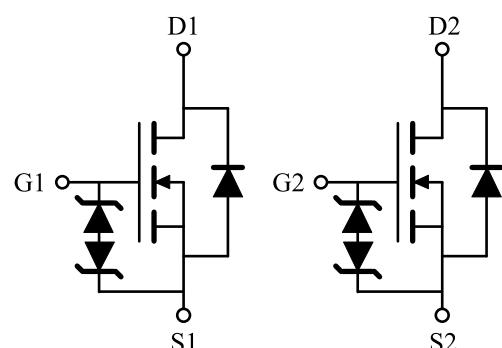
■Pin configuration

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

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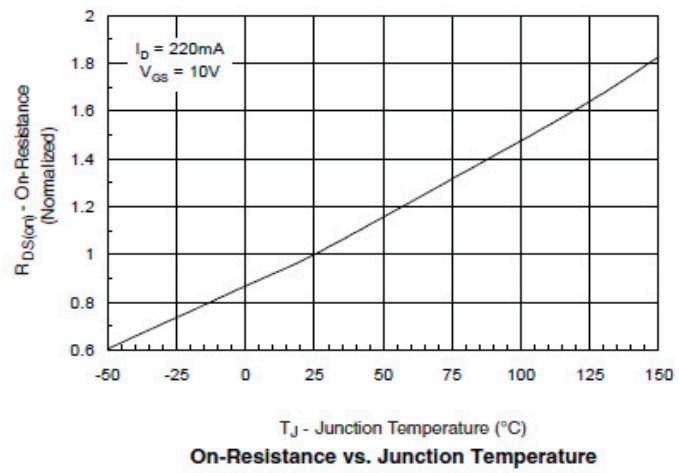
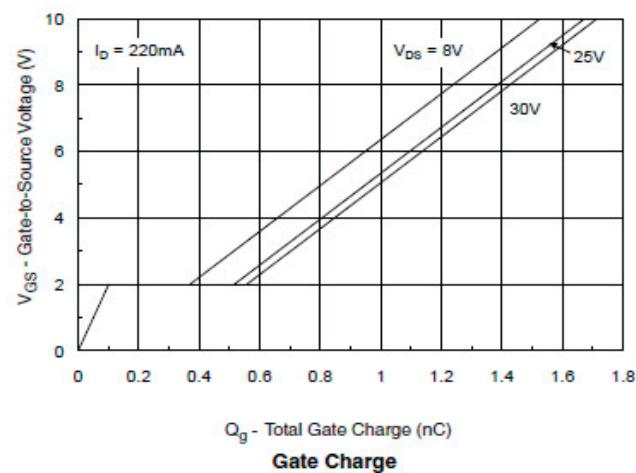
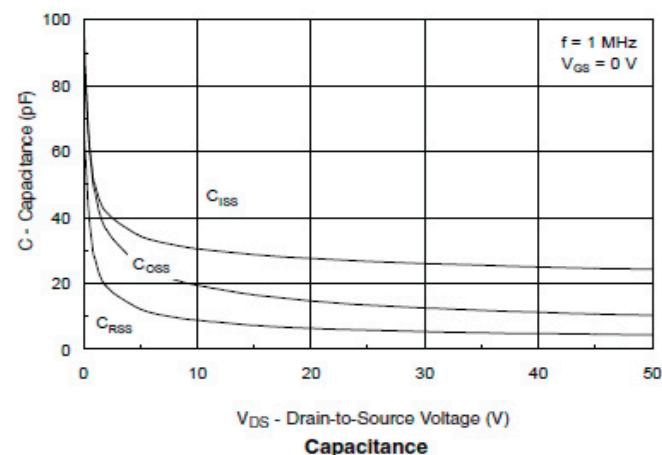
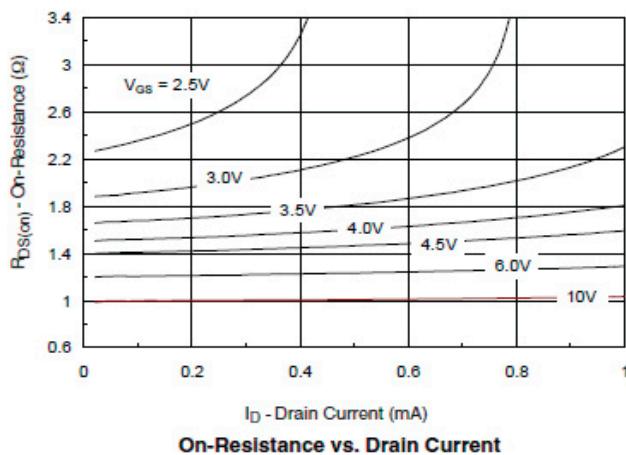
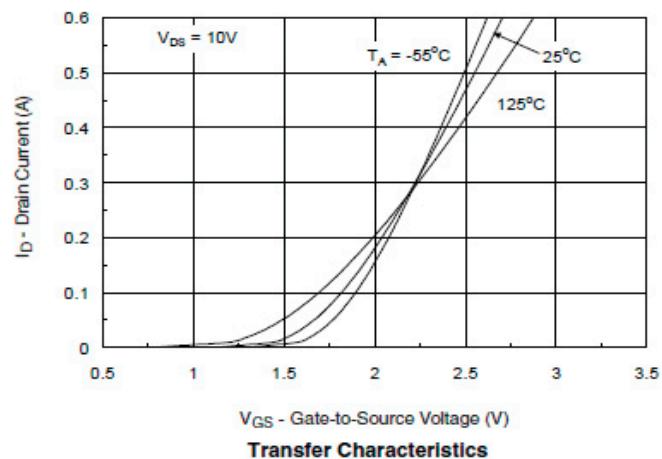
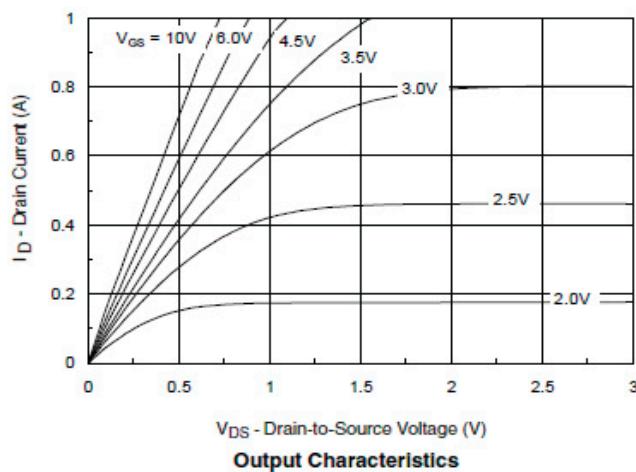
Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BV _{dss}	Id=250μA, V _{gs} =0V		60			V
Zero gate voltage drain current	Id _{ss}	V _{ds} =48V, V _{gs} =0V			1		μA
			T _a =85°C			10	
Gate-source leakage current	I _{gss}	V _{ds} =0V, V _{gs} =±20V				5	μA
Gate threshold voltage	V _{gs(th)}	V _{ds} =V _{gs} , Id=250μA		0.7	1.1	1.5	V
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, Id=0.5A			1.05	2.40	Ω
		V _{gs} =4.5V, Id=0.4A			1.35	3.00	
		V _{gs} =2.5V, Id=0.3A			3.52	6.50	
		V _{gs} =1.8V, Id=0.2A			7.56	9.00	
Forward transconductance	G _{fs}	V _{ds} =10V, Id=0.2A			0.2		S
Diode forward voltage	V _{sd}	I _s =0.2A, V _{gs} =0V			0.75	1.40	V
Max. body-diode continuous current	I _s					0.8	A
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =25V, f=1MHz			28		pF
Output capacitance	C _{oss}				10		pF
Reverse transfer capacitance	C _{rss}				5		pF
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =10V, V _{ds} =30V, Id=0.25A			1.5	2.5	pC
Gate-source charge	Q _{gs}				0.2		pC
Gate-drain charge	Q _{gd}				0.5		pC
Turn-on delay time	t _{d(on)}	V _{gs} =10V, V _{ds} =30V Id=0.25A, R _{gen} =6.0Ω			3	7	ns
Turn-on rise time	t _r				12	30	ns
Turn-off delay time	t _{d(off)}				18	40	ns
Turn-off fall time	t _f				8	15	ns

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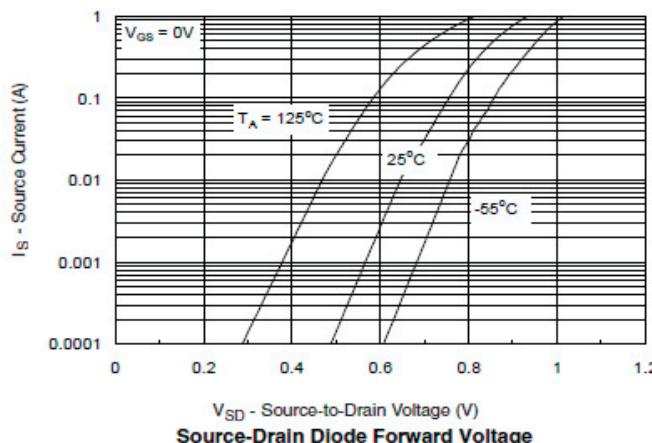
■ Typical electrical and thermal characteristics



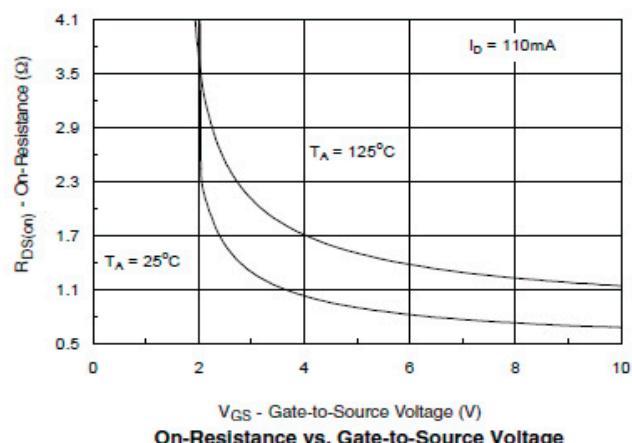
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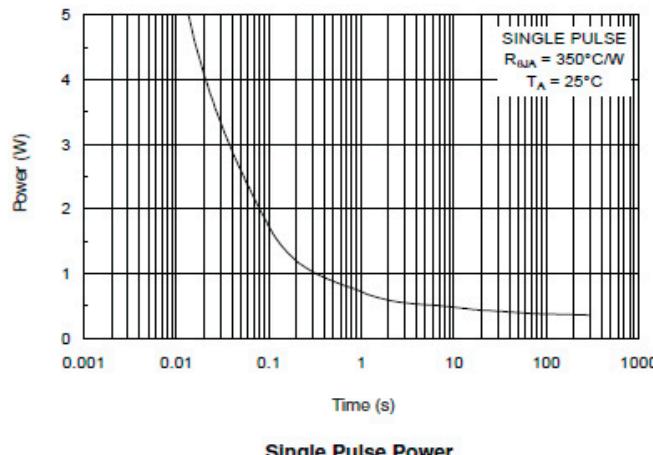
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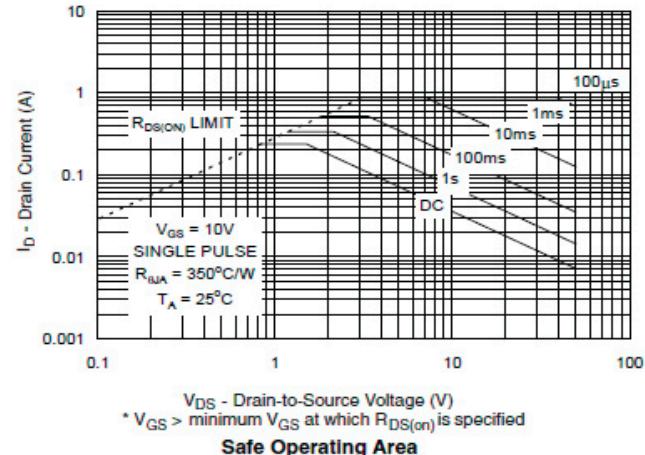
Source-Drain Diode Forward Voltage



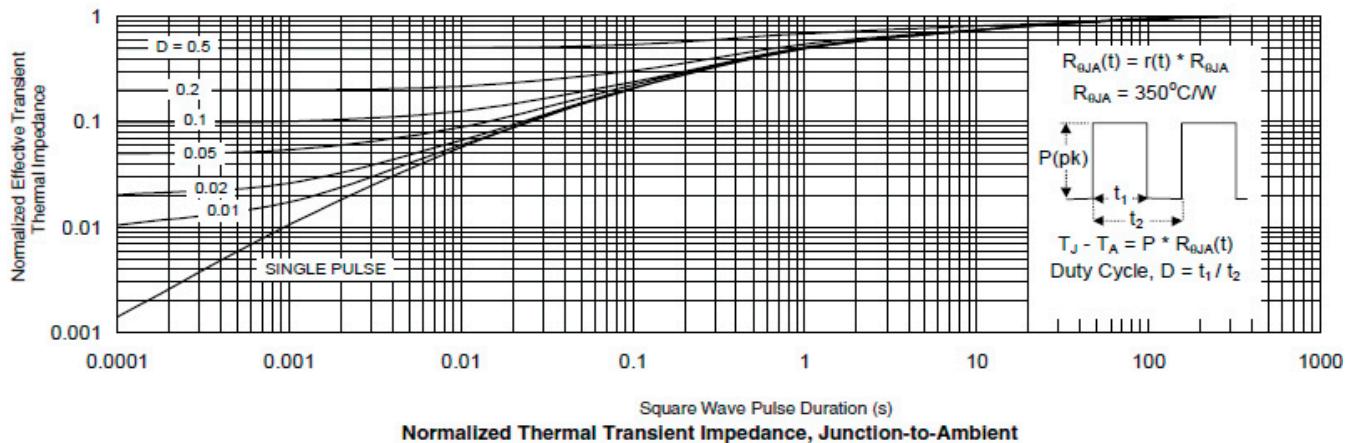
On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power



Safe Operating Area



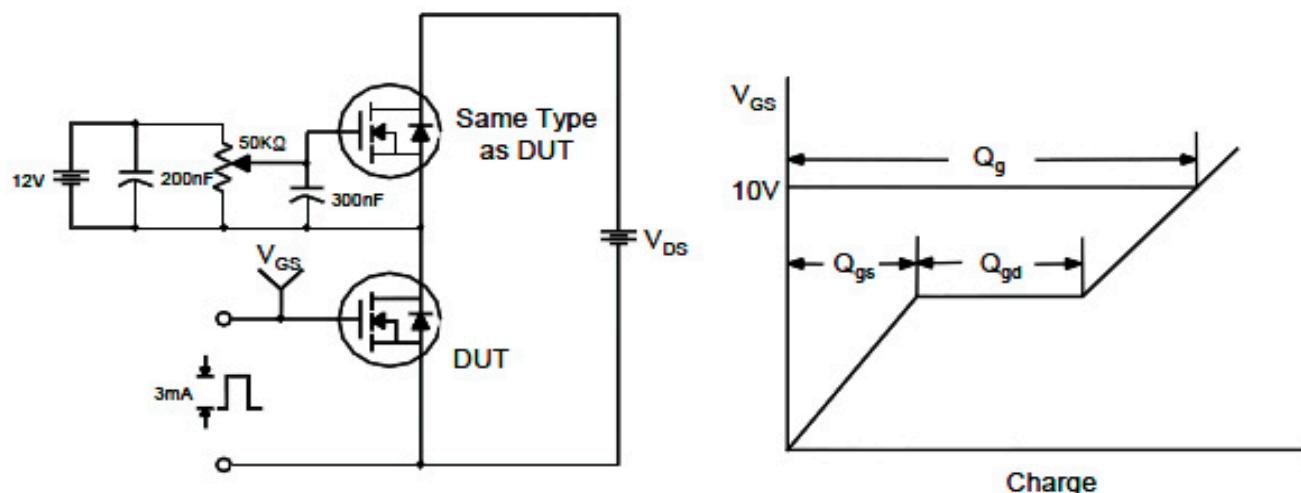
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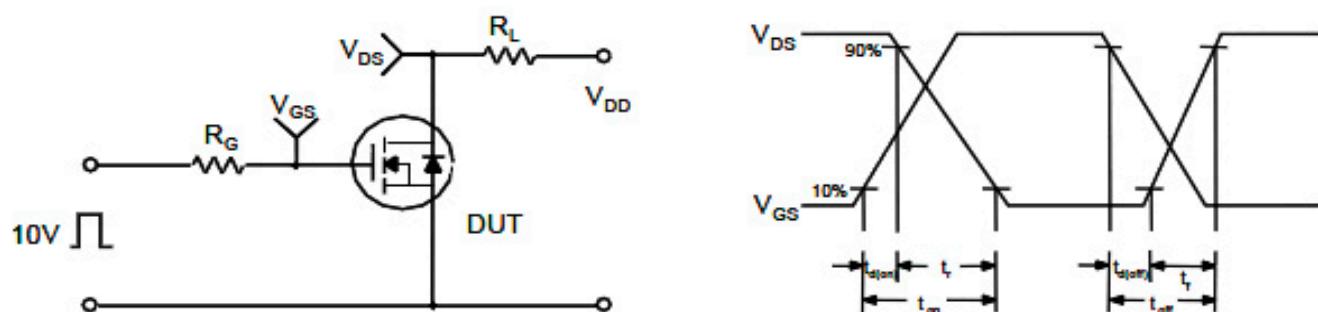
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

