

单 N 沟道 MOSFET

ELM57002ESA-S

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

■概要

ELM57002ESA-S 是 N 沟道低输入电容，低工作电压，低导通电阻的大电流 MOSFET。另外、此芯片还内藏 ESD 保护电路。

■特点

- $V_{ds}=60V$
- $I_d=0.115A$
- $R_{ds(on)} = 2.4\Omega (V_{gs}=10V)$
- $R_{ds(on)} = 3.0\Omega (V_{gs}=4.5V)$
- ESD 规格：2KV

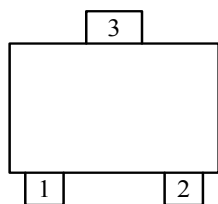
■绝对最大额定值

如没有特别注明时, $T_a=25^\circ C$

项目	记号	规格范围	单位	
漏极 - 源极电压	V_{ds}	60	V	
栅极 - 源极电压	V_{gs}	± 20	V	
漏极电流 (定常)	I_d	$T_a=25^\circ C$	0.115	A
		$T_a=70^\circ C$	0.075	
漏极电流 (脉冲)	I_{dm}	0.8	A	
容许功耗	P_d	$T_c=25^\circ C$	0.27	W
		$T_c=70^\circ C$	0.16	
结合部温度及保存温度范围	T_j, T_{stg}	$-55 \sim 150$	$^\circ C$	

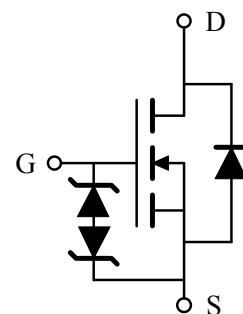
■引脚配置图

SOT-723(俯视图)



引脚编号	引脚名称
1	GATE
2	SOURCE
3	DRAIN

■电路图



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■电特性

如没有特别注明时, Ta=25℃

项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 - 源极击穿电压	BVdss	Id=250μA, Vgs=0V	60			V
栅极接地时漏极电流	Idss	Vds=60V Vgs=0V			1	μA
		Ta=85℃			10	
栅极漏电流	Igss	Vds=0V, Vgs=±20V			3	μA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA	1.0		2.0	V
漏极 - 源极导通电阻	Rds(on)	Vgs=10V, Id=0.5A		1.2	2.4	Ω
		Vgs=4.5V, Id=0.05A		1.6	3.0	
正向跨导	Gfs	Vds=10V, Id=0.2A		0.2		S
二极管正向压降	Vsd	Is=0.2A, Vgs=0V		0.75	1.40	V
寄生二极管最大连续电流	Is				0.3	A
动态特性						
输入电容	Ciss	Vgs=0V, Vds=25V, f=1MHz		30		pF
输出电容	Coss			8		pF
反馈电容	Crss			5		pF
开关特性						
总栅极电荷	Qg	Vgs=4.5V, Vds=10V, Id≐0.25A		500		pC
栅极 - 源极电荷	Qgs			100		pC
栅极 - 漏极电荷	Qgd			150		pC
导通延迟时间	td(on)	Vgs=4.5V, Vds=30V RL=150Ω, Id≐0.2A Rgen=10Ω		10	20	ns
导通上升时间	tr			35	50	ns
关闭延迟时间	td(off)			20	30	ns
关闭下降时间	tf			40	60	ns

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■ 标准特性和热特性曲线

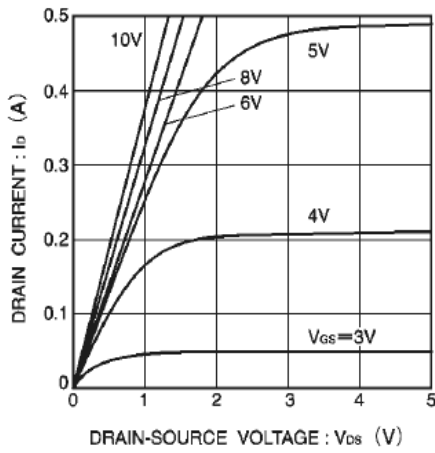


Fig.1 Typical output characteristics

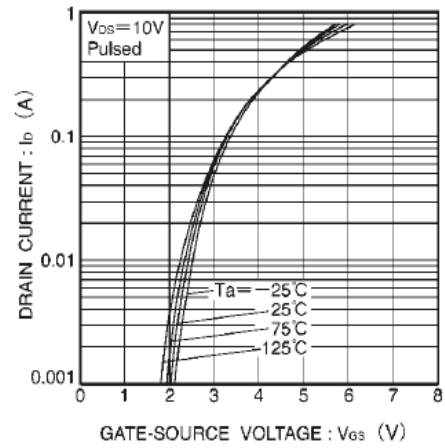


Fig.2 Typical transfer characteristics

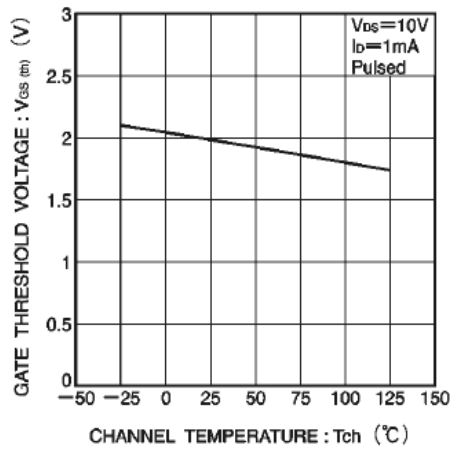


Fig.3 Gate threshold voltage vs. channel temperature

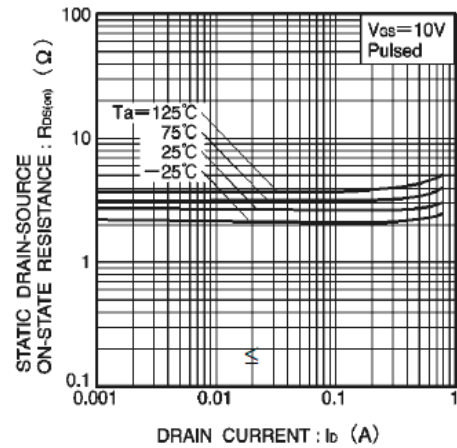


Fig.4 Static drain-source on-state resistance vs. drain current

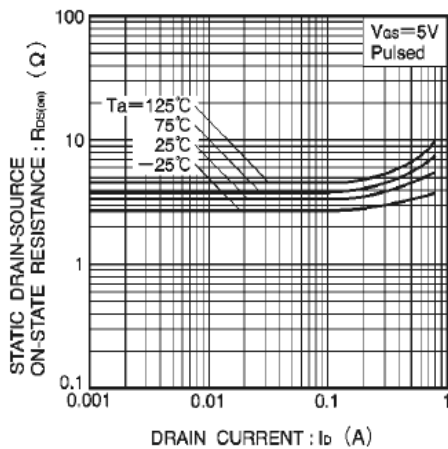


Fig.5 Static drain-source on-state resistance vs. drain current

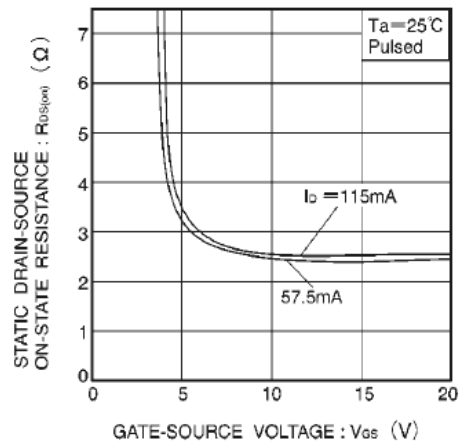


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

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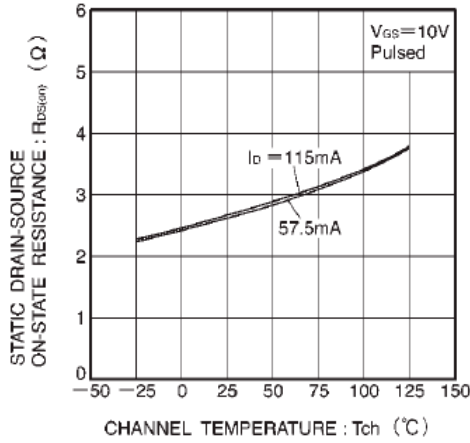


Fig.7 Static drain-source on-state resistance vs. channel temperature

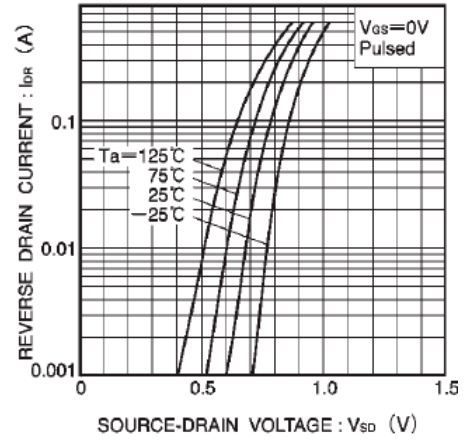


Fig.8 Reverse drain current vs. source-drain voltage

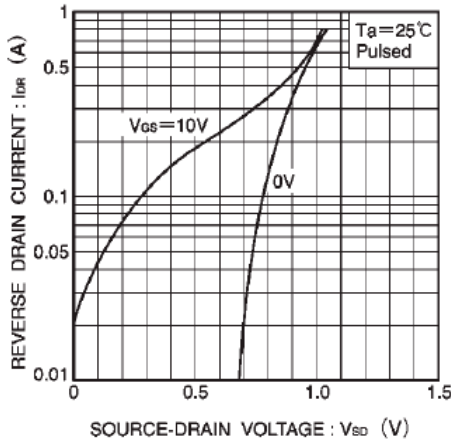


Fig.9 Reverse drain current vs. source-drain voltage

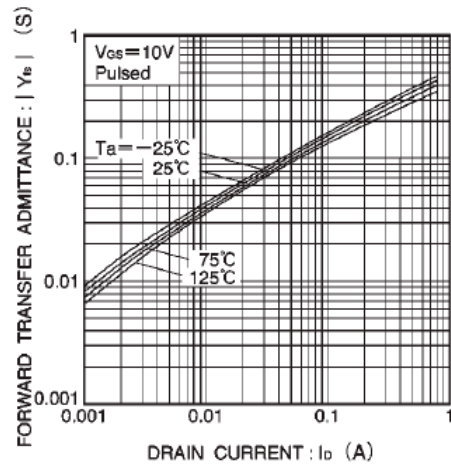


Fig.10 Forward transfer admittance vs. drain current

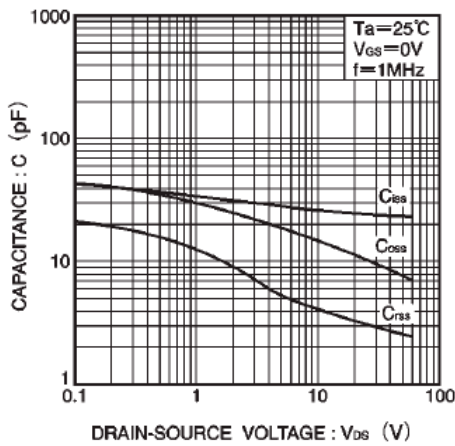


Fig.11 Typical capacitance vs. drain-source voltage

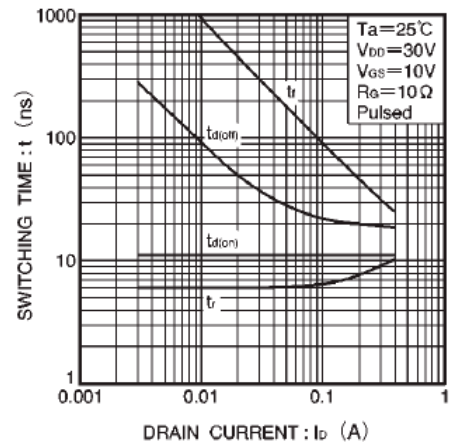


Fig. Switching characteristics

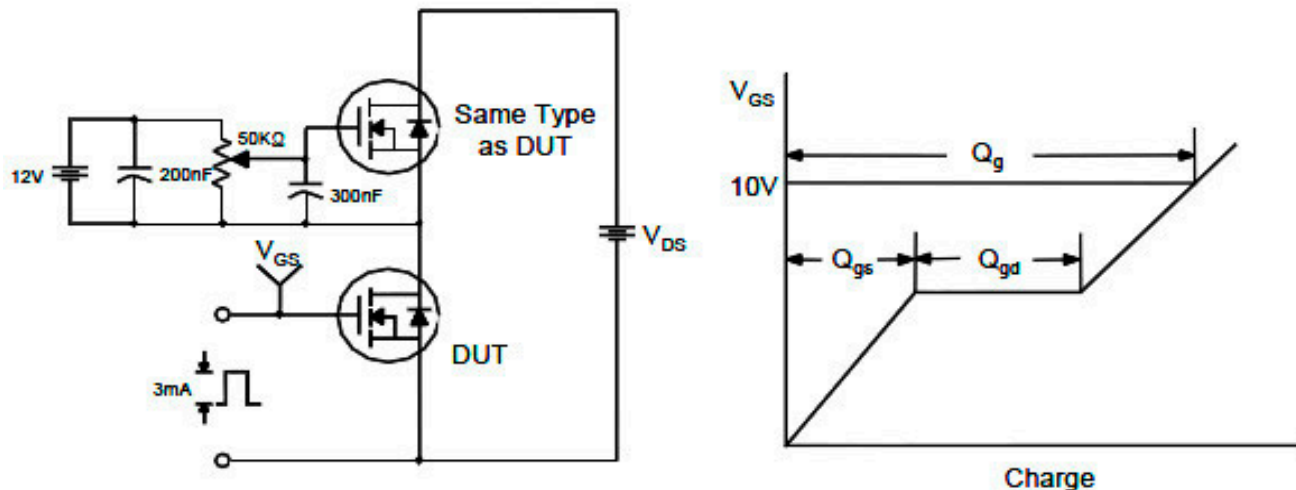
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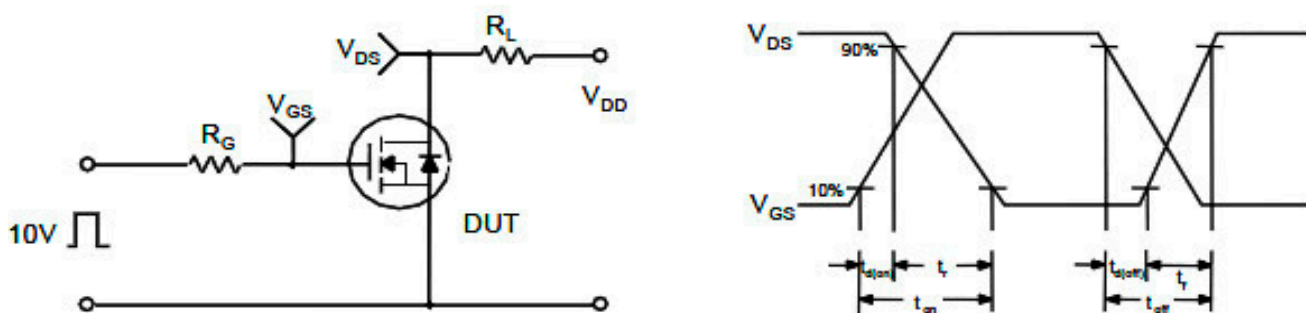
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■测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

