

单 P 沟道 MOSFET

ELM57401SA-S

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

■概要

ELM57401SA-S 是 P 沟道低输入电容，低工作电压，低导通电阻的大电流 MOSFET。

■特点

- $V_{ds} = -30V$
- $I_d = -2.8A$
- $R_{ds(on)} = 115m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} = 150m\Omega$ ($V_{gs} = -4.5V$)
- $R_{ds(on)} = 185m\Omega$ ($V_{gs} = -2.5V$)

■绝对最大额定值

如没有特别注明时, $T_a = 25^\circ C$

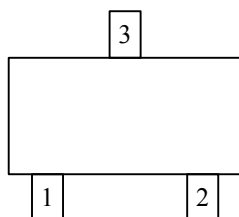
项目	记号	规格范围	单位	
漏极 - 源极电压	V_{ds}	-30	V	
栅极 - 源极电压	V_{gs}	± 12	V	
漏极电流 (定常) $T_j = 150^\circ C$	I_d	$T_a = 25^\circ C$	-2.8	A
		$T_a = 70^\circ C$	-2.1	
漏极电流 (脉冲)	I_{dm}	-8	A	
容许功耗	P_d	$T_c = 25^\circ C$	0.35	W
		$T_c = 70^\circ C$	0.22	
动作结合部温度	T_j	150	$^\circ C$	
保存温度范围	T_{stg}	-55 ~ 150	$^\circ C$	

■热特性

项目	记号	典型值	最大值	单位
最大结合部 - 环境热阻	$R_{\theta ja}$		120	$^\circ C/W$

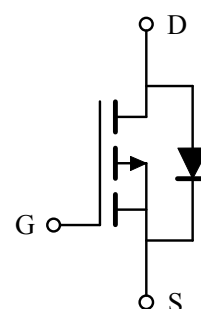
■引脚配置图

SC-70(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

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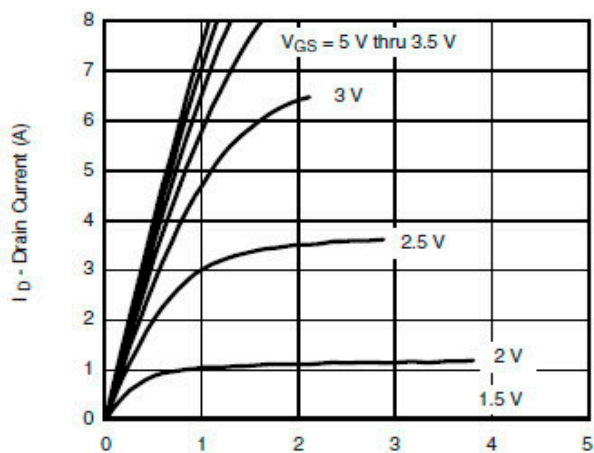
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 - 源极击穿电压	BV _{dss}	$I_d=-250\mu\text{A}, V_{gs}=0\text{V}$	-30			V
栅极接地时漏极电流	I _{dss}	$V_{ds}=-24\text{V}, V_{gs}=0\text{V}$ $T_a=85^\circ\text{C}$			-1	μA
					-30	
栅极漏电流	I _{gss}	$V_{ds}=0\text{V}, V_{gs}=\pm 12\text{V}$			± 100	nA
栅极阈值电压	V _{gs(th)}	$V_{ds}=V_{gs}, I_d=-250\mu\text{A}$	-0.6		-1.1	V
导通时漏极电流	I _{d(on)}	$V_{gs}=-10\text{V}, V_{ds}\geq -5\text{V}$	-10			A
漏极 - 源极导通电阻	R _{ds(on)}	$V_{gs}=-10\text{V}, I_d=-2.8\text{A}$		105	115	m Ω
		$V_{gs}=-4.5\text{V}, I_d=-2.5\text{A}$		135	150	
		$V_{gs}=-2.5\text{V}, I_d=-1.5\text{A}$		160	185	
正向跨导	G _{fs}	$V_{ds}=-5\text{V}, I_d=-4.0\text{A}$		10		S
二极管正向压降	V _{sd}	$I_s=-1.7\text{A}, V_{gs}=0\text{V}$		-0.7	-1.3	V
寄生二极管最大连续电流	I _s				-1.4	A
动态特性						
输入电容	C _{iss}	$V_{gs}=0\text{V}, V_{ds}=-15\text{V}, f=1\text{MHz}$		230		pF
输出电容	C _{oss}			40		pF
反馈电容	C _{rss}			25		pF
开关特性						
总栅极电荷	Q _g	$V_{gs}=-4.5\text{V}, V_{ds}=-15\text{V}$ $I_d=-2.0\text{A}$		4.0	6.0	nC
栅极 - 源极电荷	Q _{gs}			0.6		nC
栅极 - 漏极电荷	Q _{gd}			1.5		nC
导通延迟时间	t _{d(on)}	$V_{gs}=-10\text{V}, V_{ds}=-15\text{V}$ $R_L=15\Omega, I_d=-1.0\text{A}$ $R_{gen}=6.0\Omega$		5	10	ns
导通上升时间	t _r			8	15	ns
关闭延迟时间	t _{d(off)}			15	30	ns
关闭下降时间	t _f			15	30	ns

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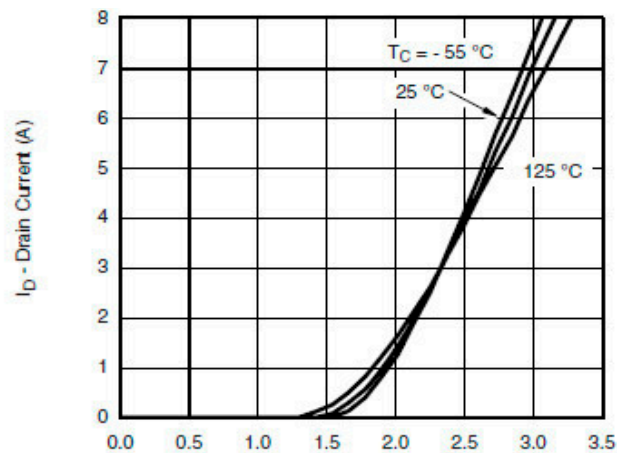
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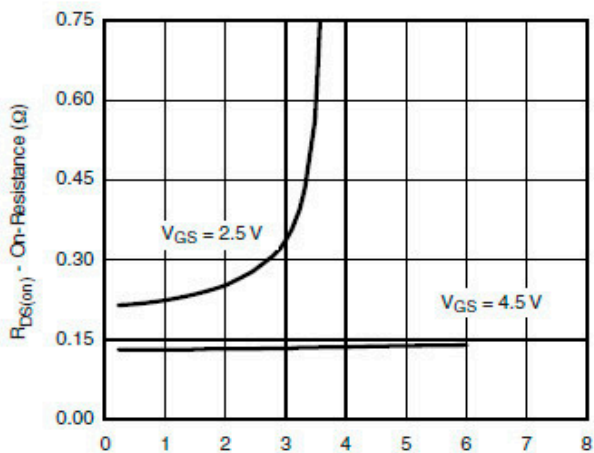
标准特性和热特性曲线



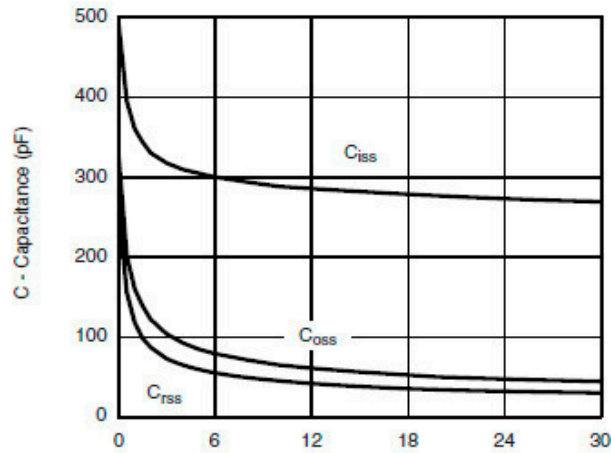
Output Characteristics



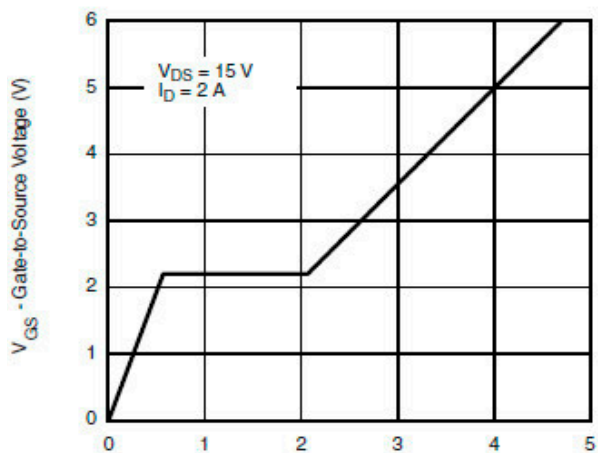
Transfer Characteristics



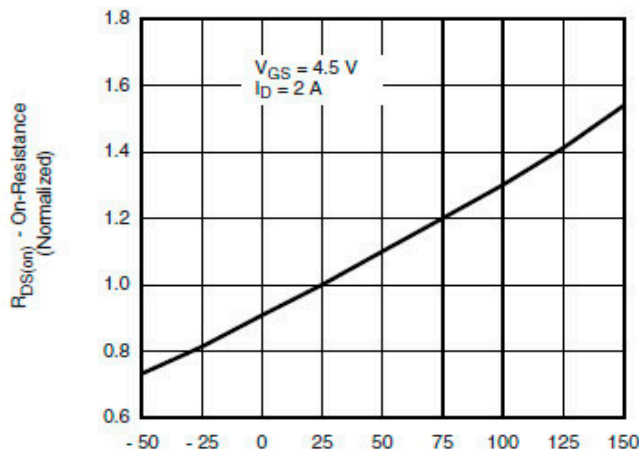
On-Resistance vs. Drain Current



Capacitance



Gate Charge

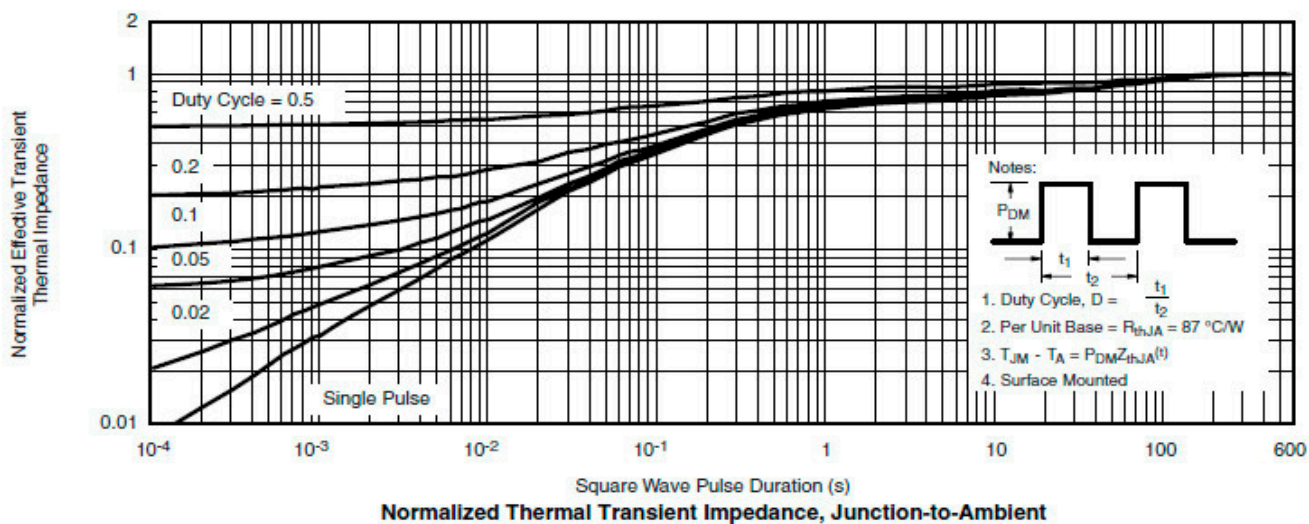
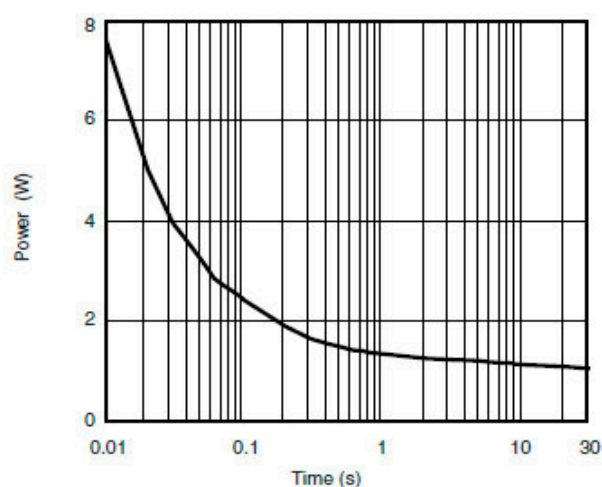
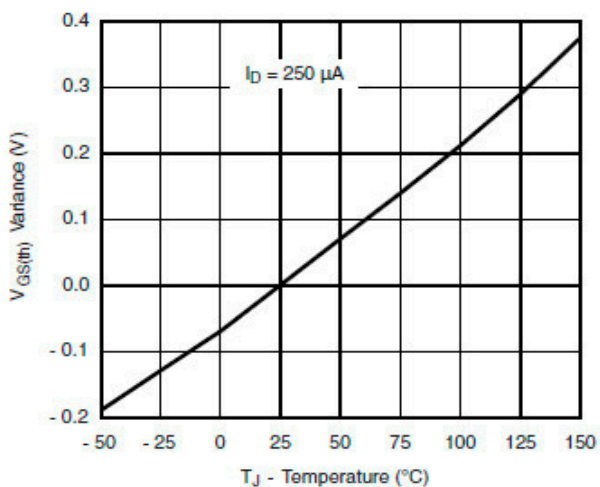
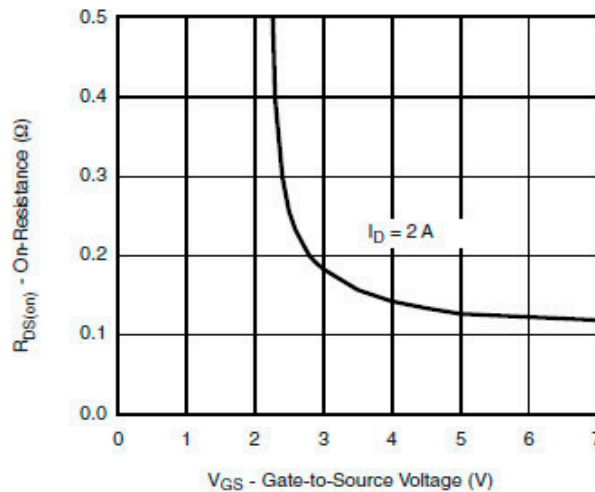
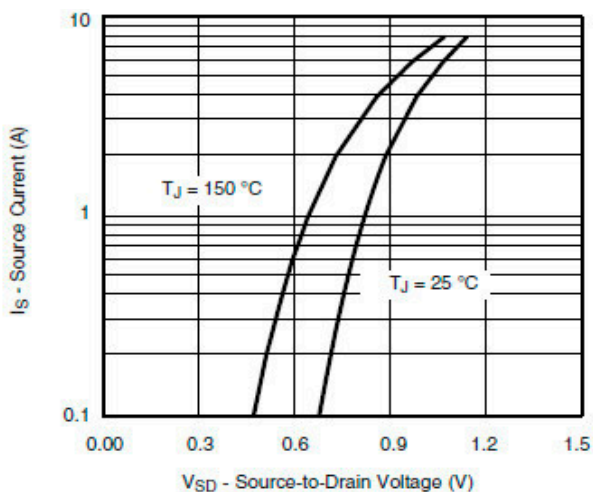


On-Resistance vs. Junction Temperature

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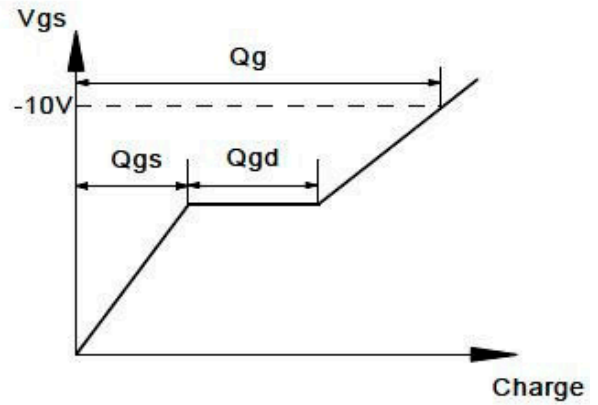
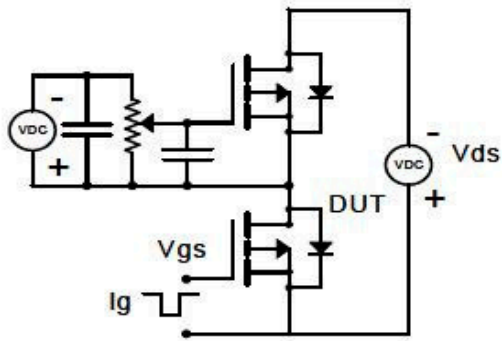
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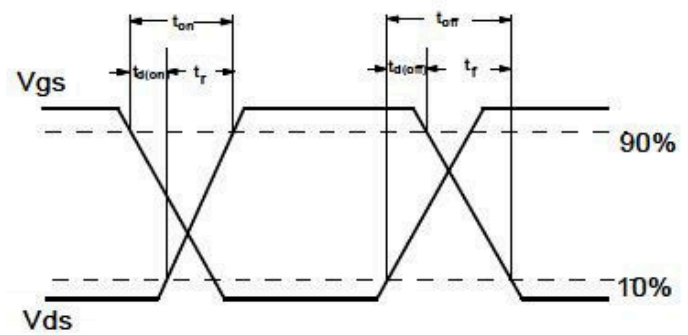
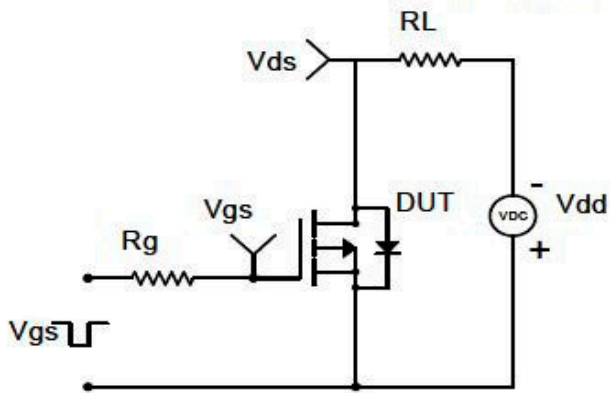
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测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

