

单 P 沟道 MOSFET

ELM51013A-S

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

■概要

ELM51013A-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

- $V_{ds} = -20V$
- $I_d = -0.7A$
- $R_{ds(on)} = 620m\Omega$ ($V_{gs} = -4.5V$)
- $R_{ds(on)} = 860m\Omega$ ($V_{gs} = -2.5V$)
- $R_{ds(on)} = 1450m\Omega$ ($V_{gs} = -1.8V$)

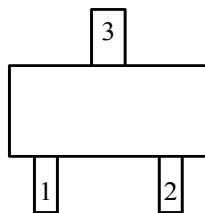
■绝对最大额定值

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}	-20	V
栅极 - 源极电压		V_{gs}	± 12	V
漏极电流 (定常) ($T_j = 150^\circ C$)	$T_a = 25^\circ C$	I_d	-0.7	A
	$T_a = 70^\circ C$		-0.4	
漏极电流 (脉冲)		I_{dm}	-1.0	A
容许功耗	$T_c = 25^\circ C$	P_d	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 to 150	$^\circ C$

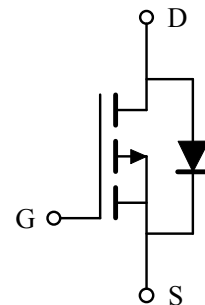
■引脚配置图

SOT-523(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℃

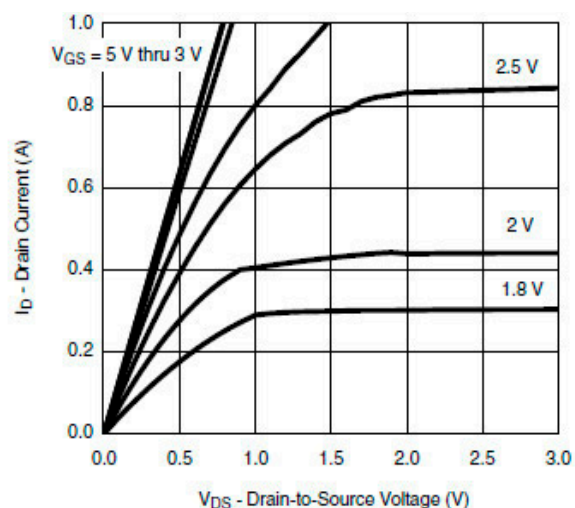
项目	记号	条件	最小值	典型值	最大值	单位	
静态特性							
漏极 – 源极击穿电压	BV _{dss}	I _d =-250μA, V _{gs} =0V		-20		V	
栅极接地时漏极电流	I _{dss}	V _{ds} =-20V V _{gs} =0V			-1	μA	
		T _a =85℃			-5		
栅极漏电电流	I _{gss}	V _{ds} =0V, V _{gs} = ± 12V			± 100	nA	
栅极阈值电压	V _{gs} (th)	V _{ds} =V _{gs} , I _d =-250μA		-0.4	-1.0	V	
导通时漏极电流	I _d (on)	V _{gs} =-4.5V, V _{ds} ≥-5V		-0.7		A	
漏极 – 源极导通电阻	R _{ds} (on)	V _{gs} =-4.5V, I _d =-0.6A			500	620	mΩ
		V _{gs} =-2.5V, I _d =-0.5A			700	860	
		V _{gs} =-1.8V, I _d =-0.4A			1000	1450	
正向跨导	G _{fs}	V _{ds} =-10V, I _d =-0.4A			1	S	
二极管正向压降	V _{sd}	I _s =-0.15A, V _{gs} =0V			-0.65	-1.20	V
寄生二极管最大连续电流	I _s					-0.3	A
动态特性							
输入电容	C _{iss}	V _{gs} =0V, V _{ds} =-10V, f=1MHz			70	100	pF
输出电容	C _{oss}				20		pF
反馈电容	C _{rss}				10		pF
开关特性							
总栅极电荷	Q _g	V _{gs} =-4.5V, V _{ds} =-10V I _d ≡-0.25A			1.0	1.3	nC
栅极 – 源极电荷	Q _{gs}				0.1		nC
栅极 – 漏极电荷	Q _{gd}				0.3		nC
导通延迟时间	t _d (on)	V _{gs} =-4.5V, V _{ds} =-10V R _L =30Ω, I _d ≡-0.2A R _{gen} =10Ω			10	15	ns
导通上升时间	t _r				10	15	ns
关闭延迟时间	t _d (off)				40	60	ns
关闭下降时间	t _f				30	50	ns

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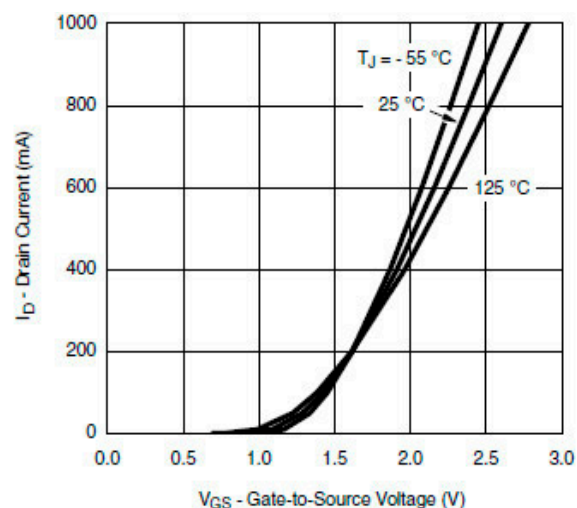
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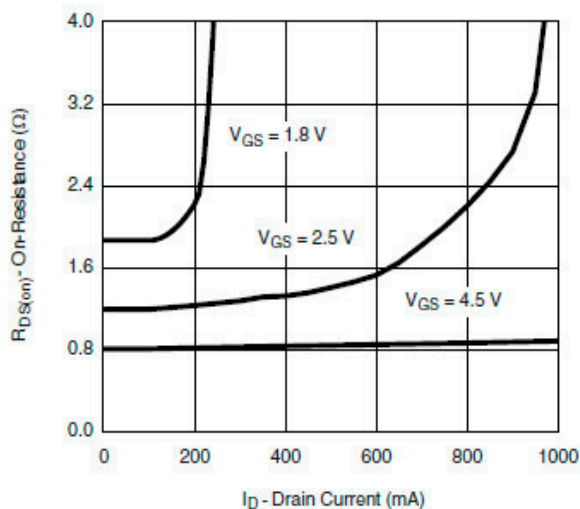
■ 标准特性和热特性曲线



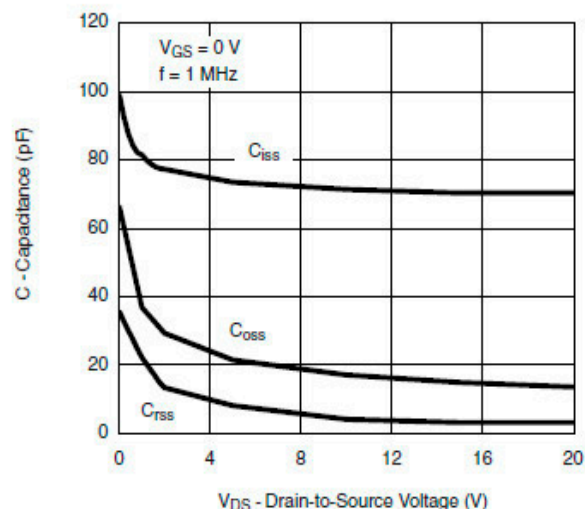
Output Characteristics



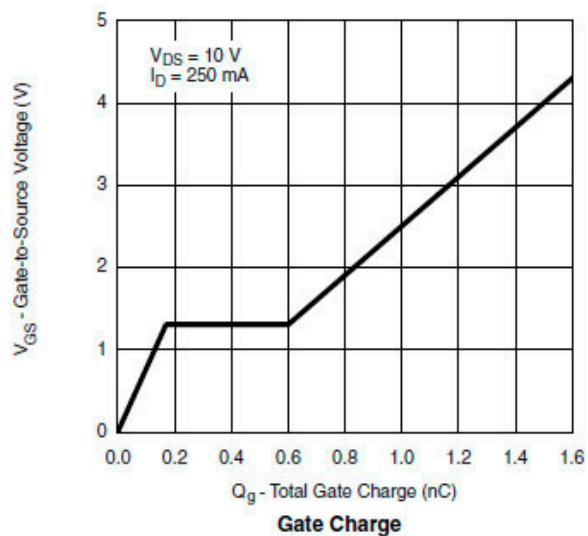
Transfer Characteristics



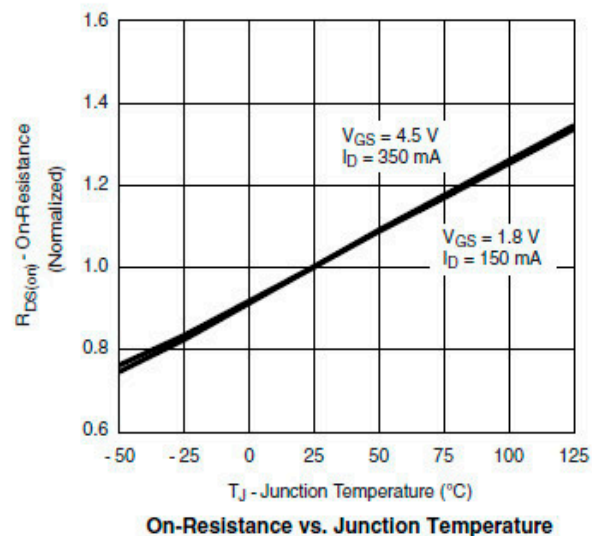
On-Resistance vs. Drain Current



Capacitance



Gate Charge

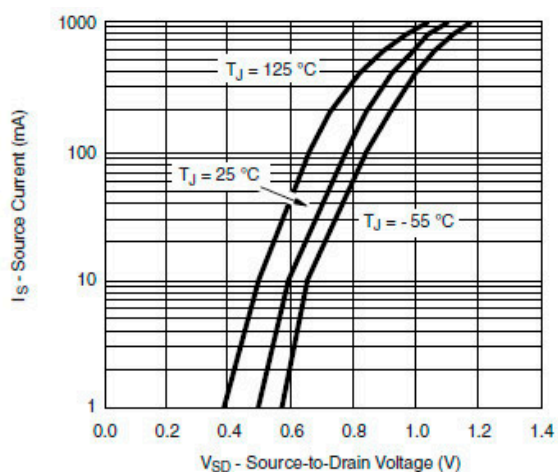


On-Resistance vs. Junction Temperature

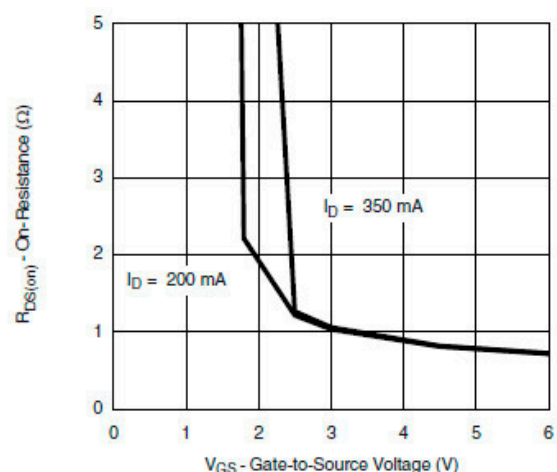
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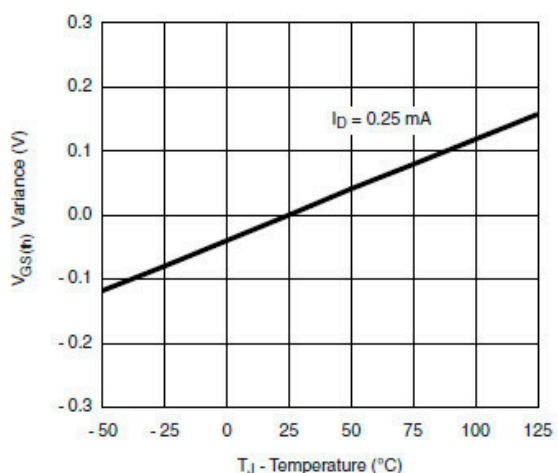
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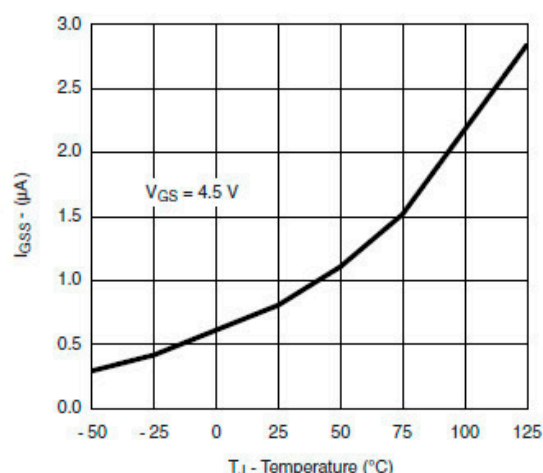
Source-Drain Diode Forward Voltage



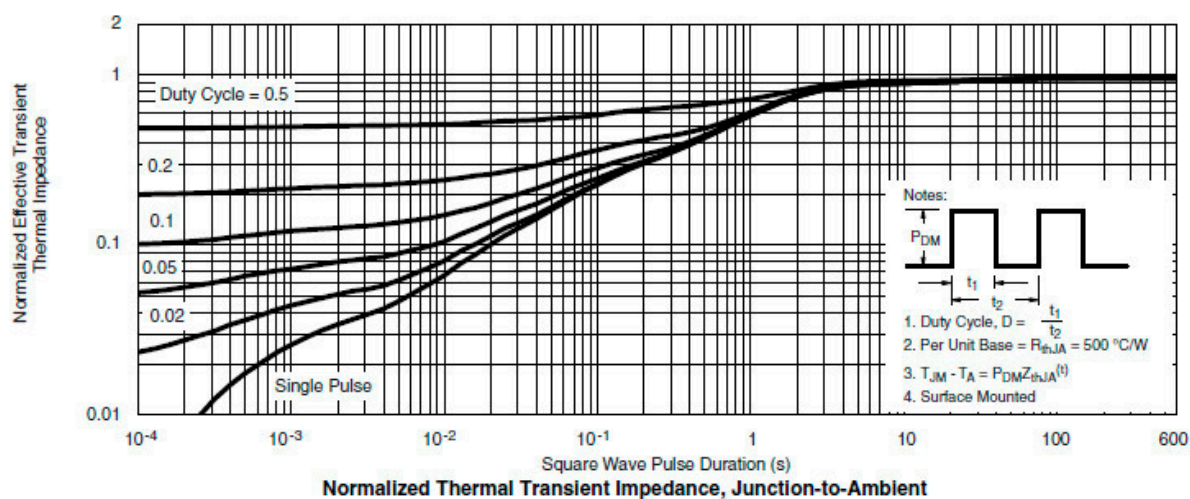
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage Variance vs. Temperature



I_{GSS} vs. Temperature



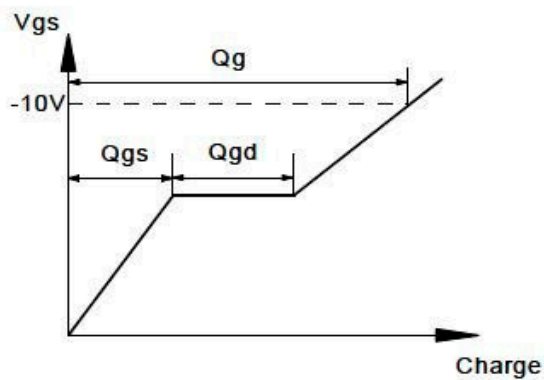
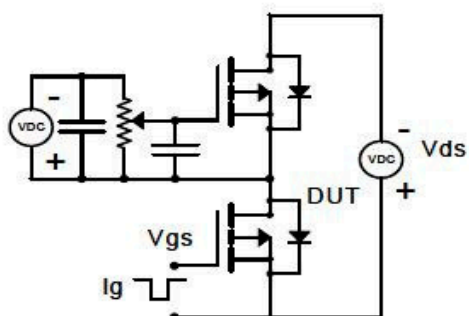
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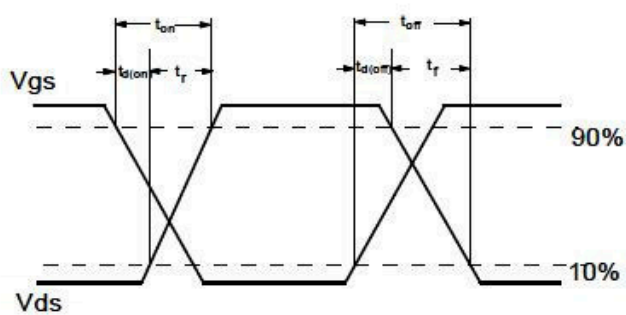
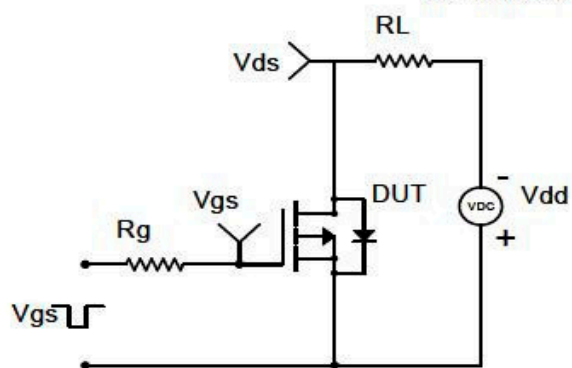
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■测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

