

单 N 沟道 MOSFET

ELM57412A-S

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

■概要

ELM57412A-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。

■特点

- $V_{ds}=20V$
- $I_d=3.8A$
- $R_{ds(on)} = 52m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} = 56m\Omega$ ($V_{gs}=2.5V$)
- $R_{ds(on)} = 68m\Omega$ ($V_{gs}=1.8V$)

■绝对最大额定值

如没有特别注明时, $T_a=25^\circ C$

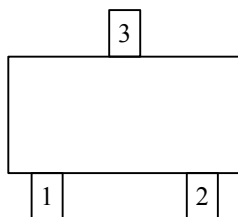
项目	记号	规格范围	单位
漏极 - 源极电压	V_{ds}	20	V
栅极 - 源极电压	V_{gs}	± 12	V
漏极电流 ($T_j=150^\circ C$)	I_d	3.8	A
		2.6	
漏极电流 (脉冲)	I_{dm}	10	A
容许功耗	P_d	0.35	W
		0.22	
动作结合部温度	T_j	150	$^\circ C$
保存温度范围	T_{stg}	$-55 \sim 150$	$^\circ C$

■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	$^\circ C/W$

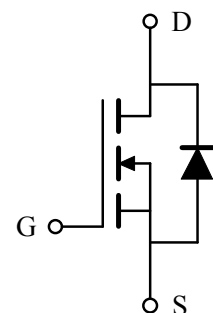
■引脚配置图

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

如没有特别注明时, Ta=25℃

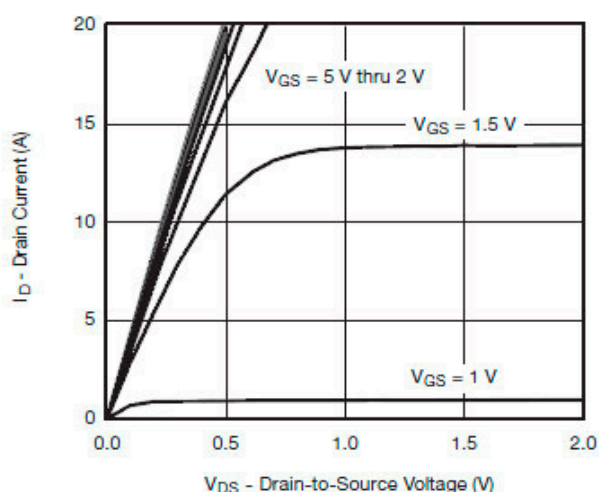
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 – 源极击穿电压	BV _{dss}	I _d =250μA, V _{gs} =0V	20			V
栅极接地时漏极电流	I _{dss}	V _{ds} =16V, V _{gs} =0V			1	μA
		V _{ds} =16V, V _{gs} =0V, T _a =85℃			10	
栅极漏电流	I _{gss}	V _{ds} =0V, V _{gs} = ± 12V			± 100	nA
栅极阈值电压	V _{gs} (th)	V _{ds} =V _{gs} , I _d =250μA	0.4		0.8	V
导通时漏极电流	I _d (on)	V _{gs} =4.5V, V _{ds} ≥5V	6			A
		V _{gs} =2.5V, V _{ds} ≥5V	4			
漏极 – 源极导通电阻	R _{ds} (on)	V _{gs} =4.5V, I _d =3.8A		48	52	mΩ
		V _{gs} =2.5V, I _d =3.2A		52	56	
		V _{gs} =1.8V, I _d =2.6A		62	68	
正向跨导	G _{fs}	V _{ds} =5V, I _d =3.6A		10		S
二极管正向压降	V _{sd}	I _s =1.6A, V _{gs} =0V		0.85	1.20	V
寄生二极管最大连续电流	I _s				1.6	A
动态特性						
输入电容	C _{iss}	V _{gs} =0V, V _{ds} =10V, f=1MHz		850		pF
输出电容	C _{oss}			120		pF
反馈电容	C _{rss}			60		pF
开关特性						
总栅极电荷	Q _g	V _{gs} =4.5V, V _{ds} =10V, I _d ≐4.0A		8.2	14.0	nC
栅极 – 源极电荷	Q _{gs}			1.2		nC
栅极 – 漏极电荷	Q _{gd}			1.0		nC
导通延迟时间	t _d (on)	V _{gs} =4.5V, V _{ds} =10V RL=2.2Ω, I _d ≐4.0A R _{gen} =1.0Ω		10	16	ns
导通上升时间	t _r			16	25	ns
关闭延迟时间	t _d (off)			31	45	ns
关闭下降时间	t _f			10	16	ns

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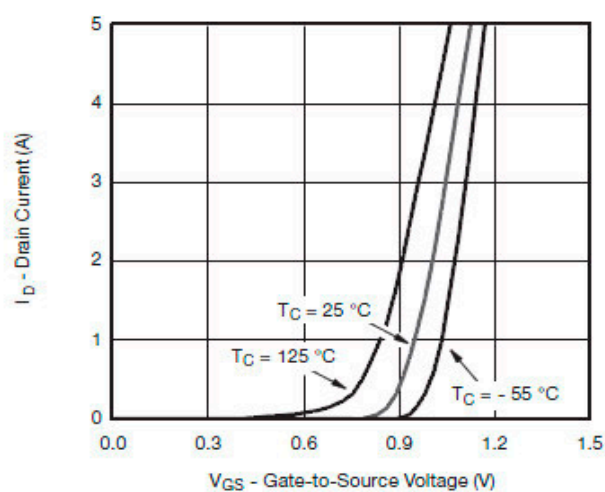
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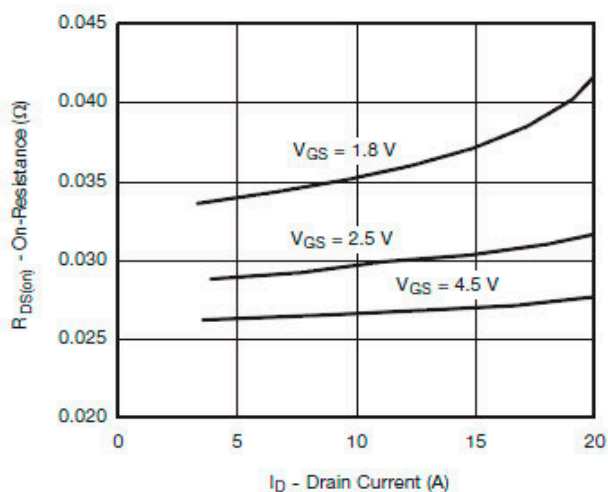
■ 标准特性和热特性曲线



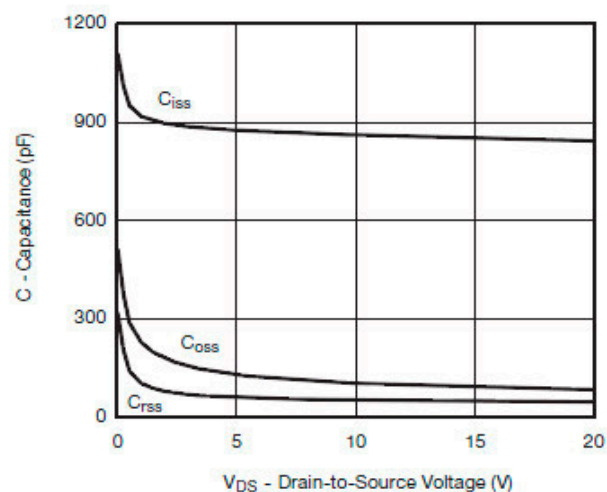
Output Characteristics



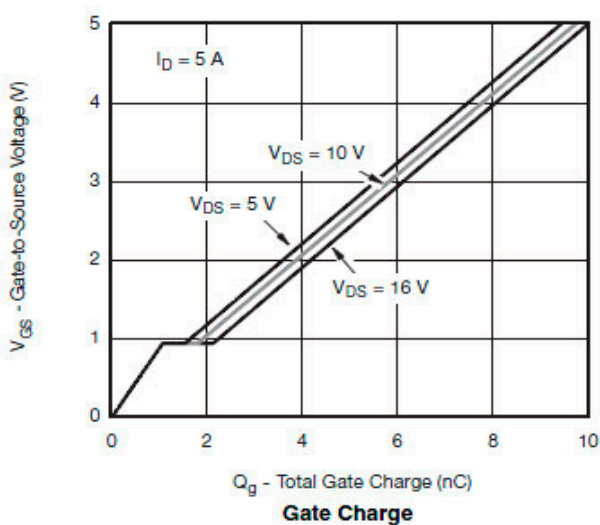
Transfer Characteristics



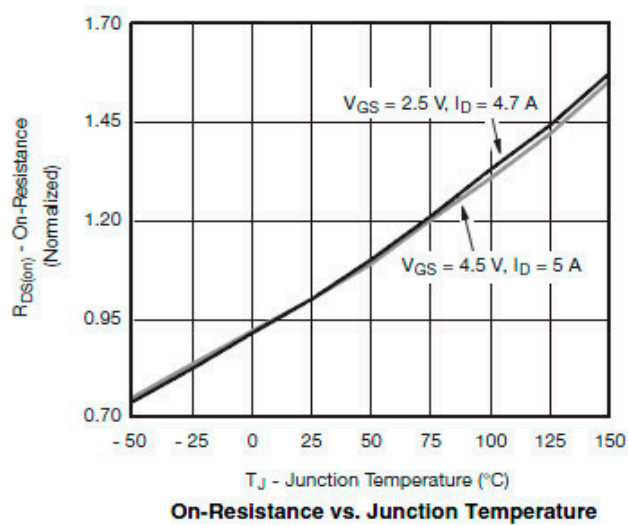
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

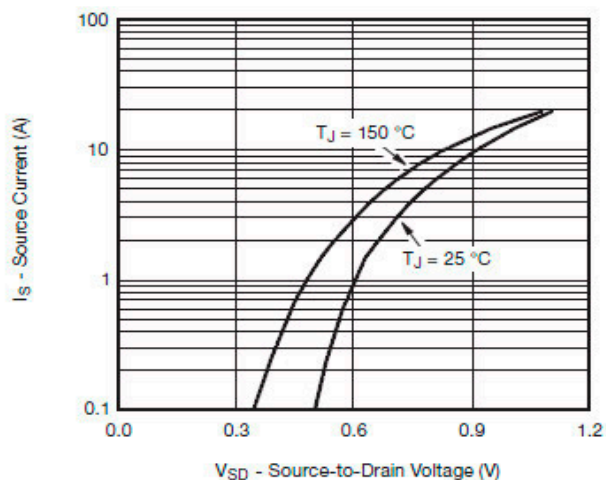


On-Resistance vs. Junction Temperature

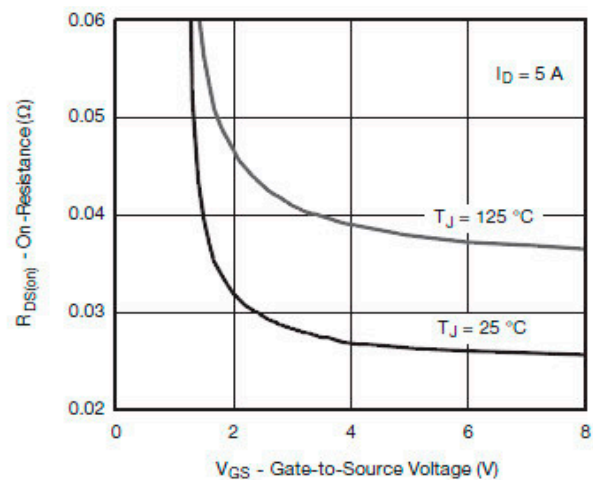
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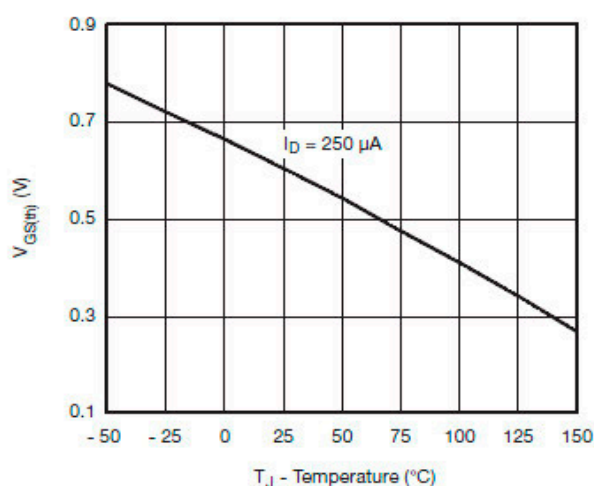
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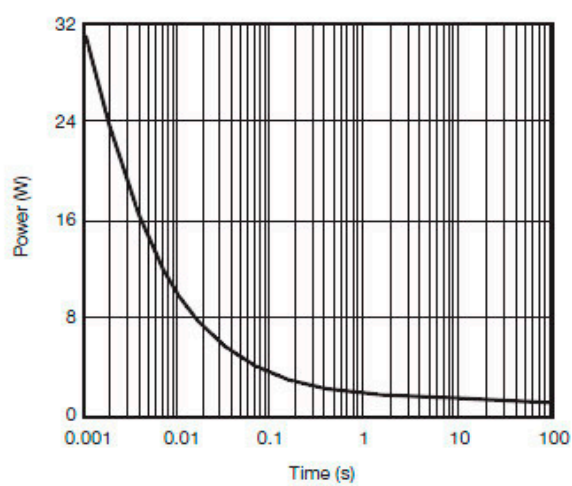
Source-Drain Diode Forward Voltage



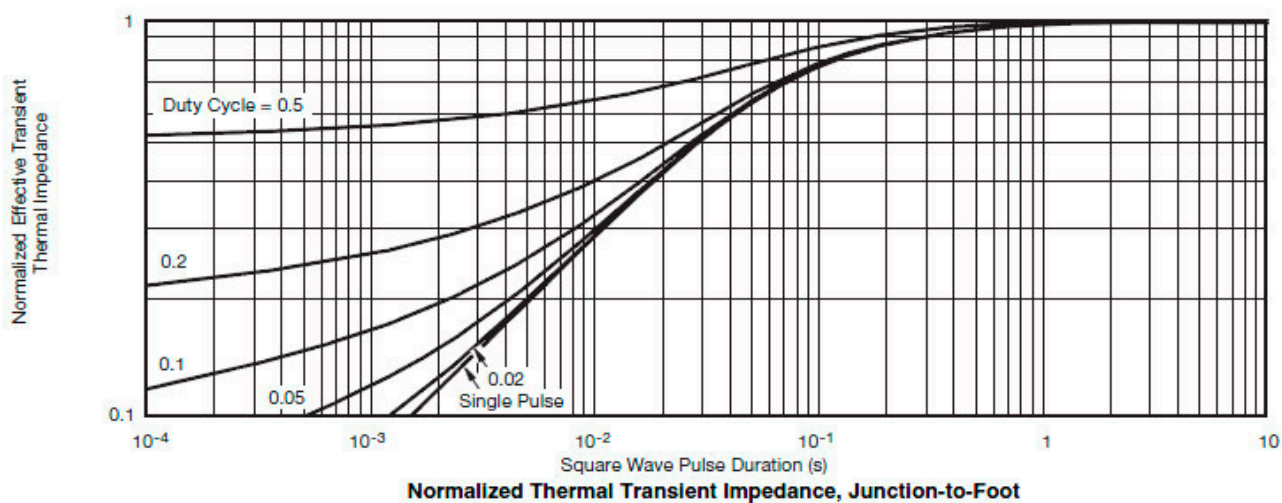
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power (Junction-to-Ambient)



Normalized Thermal Transient Impedance, Junction-to-Foot

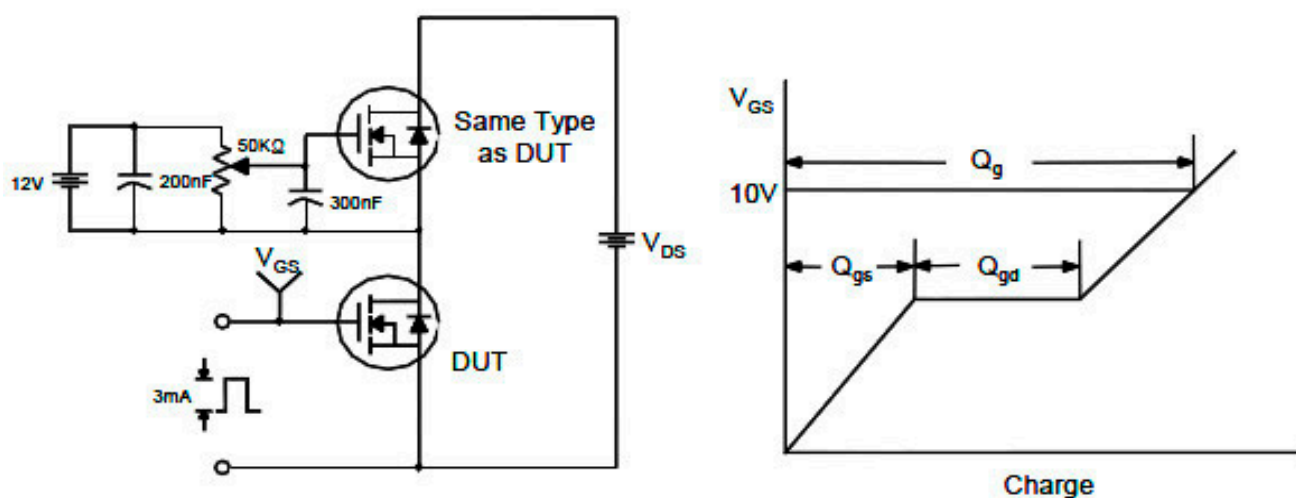
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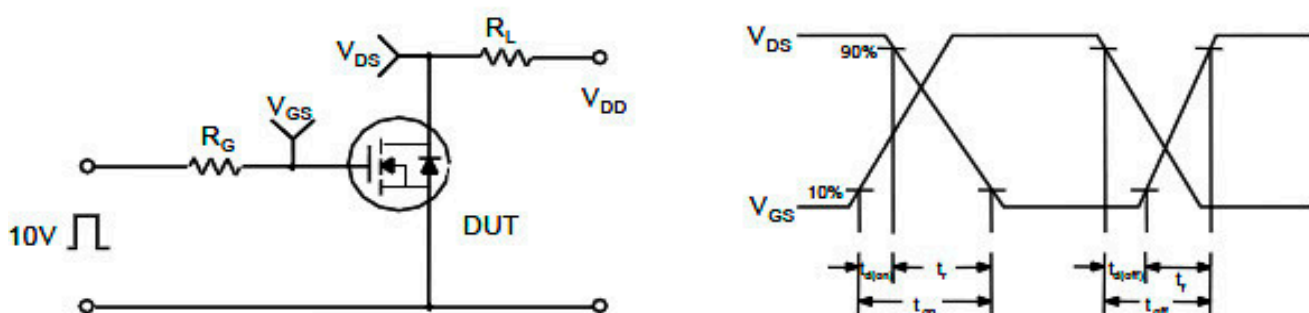
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■测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

