

复合沟道 MOSFET

ELM56606CWA-S

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

■概要

ELM56606CWA-S 是低输入电容、低工作电压、低导通电阻的大电流 MOSFET。同时内藏有 N 沟道和 P 沟道的复合产品。

■特点

N 沟道

• $V_{ds}=60V$

• $I_d=2.8A$

• $R_{ds(on)} = 135m\Omega (V_{gs}=10V)$

• $R_{ds(on)} = 145m\Omega (V_{gs}=4.5V)$

P 沟道

• $V_{ds}=-60V$

• $I_d=-1.8A$

• $R_{ds(on)} = 310m\Omega (V_{gs}=-10V)$

• $R_{ds(on)} = 340m\Omega (V_{gs}=-4.5V)$

■绝对最大额定值

如没有特别注明时, $T_a=25^\circ C$

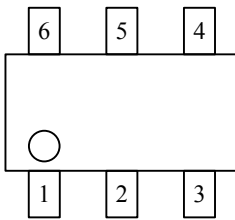
项目	记号	N 沟道 (最大值)	P 沟道 (最大值)	单位
漏极 - 源极电压	V_{ds}	60	-60	V
栅极 - 源极电压	V_{gs}	± 20	± 20	V
漏极电流 (定常) ($T_j=150^\circ C$)	I_d	2.8	-1.8	A
		2.0	-1.4	
漏极电流 (脉冲)	I_{dm}	8	-8	A
容许功耗	P_d	2.0	2.0	W
		1.3	1.3	
结合部温度	T_j	150	150	$^\circ C$
保存温度范围	T_{stg}	-55 ~ 150	-55 ~ 150	$^\circ C$

■热特性

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

■引脚配置图

SOT-26(俯视图)

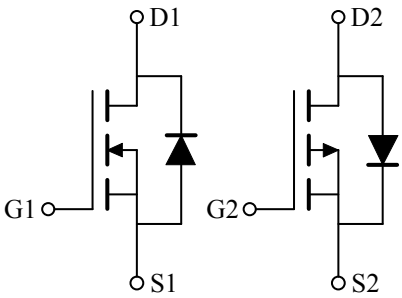


引脚编号	引脚名称
1	GATE1
2	SOURCE2
3	GATE2
4	DRAIN2
5	SOURCE1
6	DRAIN1

■电路图

• N 沟道

• P 沟道



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■电特性 (N 沟道)

如没有特别注明时, Ta=25℃

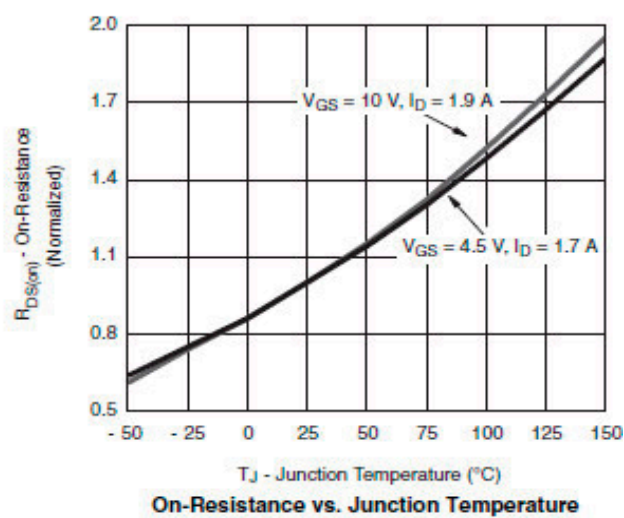
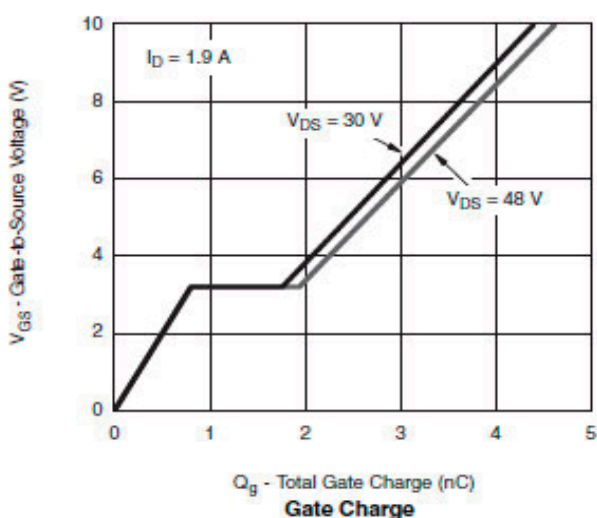
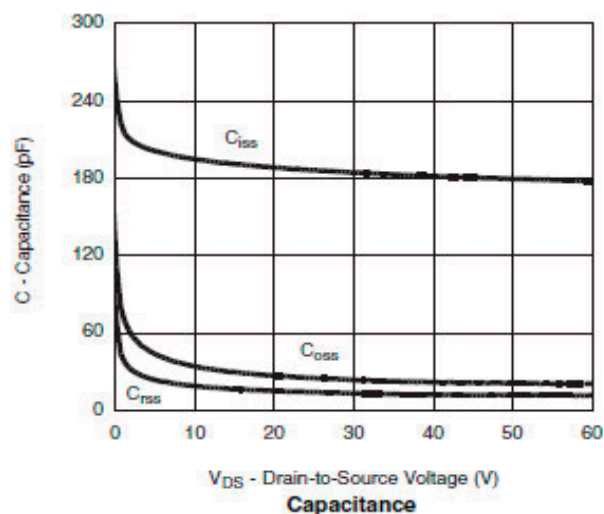
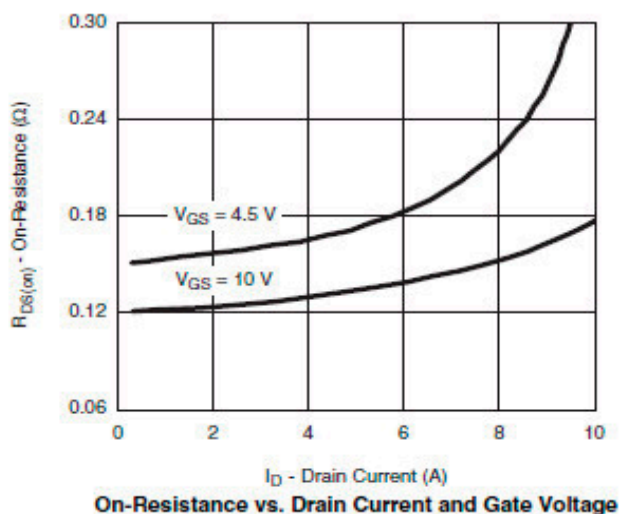
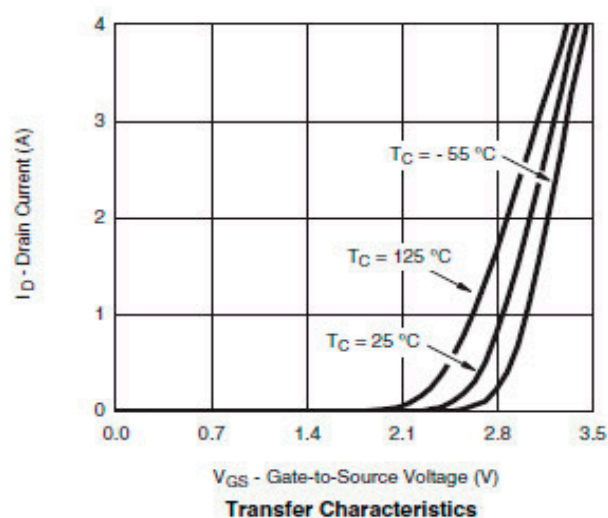
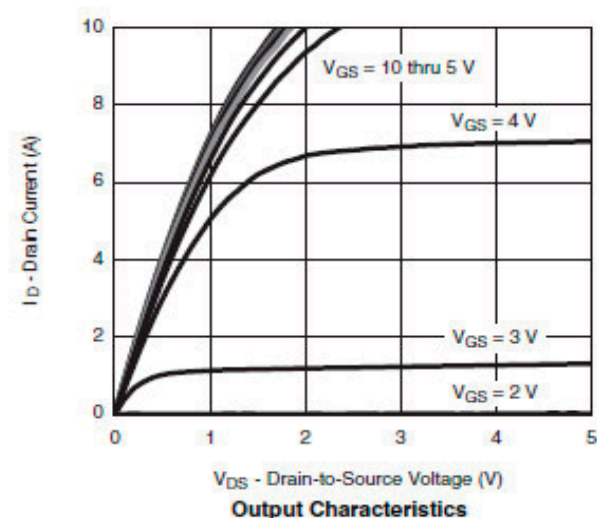
项目	记号	条件	最小值	典型值	最大值	单位	
静态特性							
漏极 – 源极击穿电压	BV _{dss}	Id=250μA, Vgs=0V		60		V	
栅极接地时漏极电流	Idss	Vds=48V, Vgs=0V			1	μA	
		Ta=85℃			10		
栅极漏电流	Igss	Vds=0V, Vgs= ± 20V			± 100	nA	
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA		0.7	2.5	V	
导通时漏极电流	Id(on)	Vgs=10V, Vds≥5V		5		A	
漏极 – 源极导通电阻	Rds(on)	Vgs=10V, Id=2.8A			115	135	mΩ
		Vgs=4.5V, Id=2.0A			125	145	
正向跨导	Gfs	Vds=15V, Id=2.0A			5	S	
二极管正向压降	Vsd	Is=2.5A, Vgs=0V			0.85	1.20	V
寄生二极管最大连续电流	Is				1.5	A	
动态特性							
输入电容	Ciss	Vgs=0V, Vds=30V, f=1MHz			200	pF	
输出电容	Coss				20	pF	
反馈电容	Crss				10	pF	
开关特性							
总栅极电荷	Qg	Vgs=4.5V, Vds=30V, Id≡2.0A			2.5	3.5	nC
栅极 – 源极电荷	Qgs				0.8	nC	
栅极 – 漏极电荷	Qgd				1.0	nC	
导通延迟时间	td(on)	Vgs=10V, Vds=30V, Id≡1.5A			4	8	ns
导通上升时间	tr				10	20	ns
关闭延迟时间	td(off)			RL=20Ω, Rgen=1Ω			10
关闭下降时间	tf				6	10	ns

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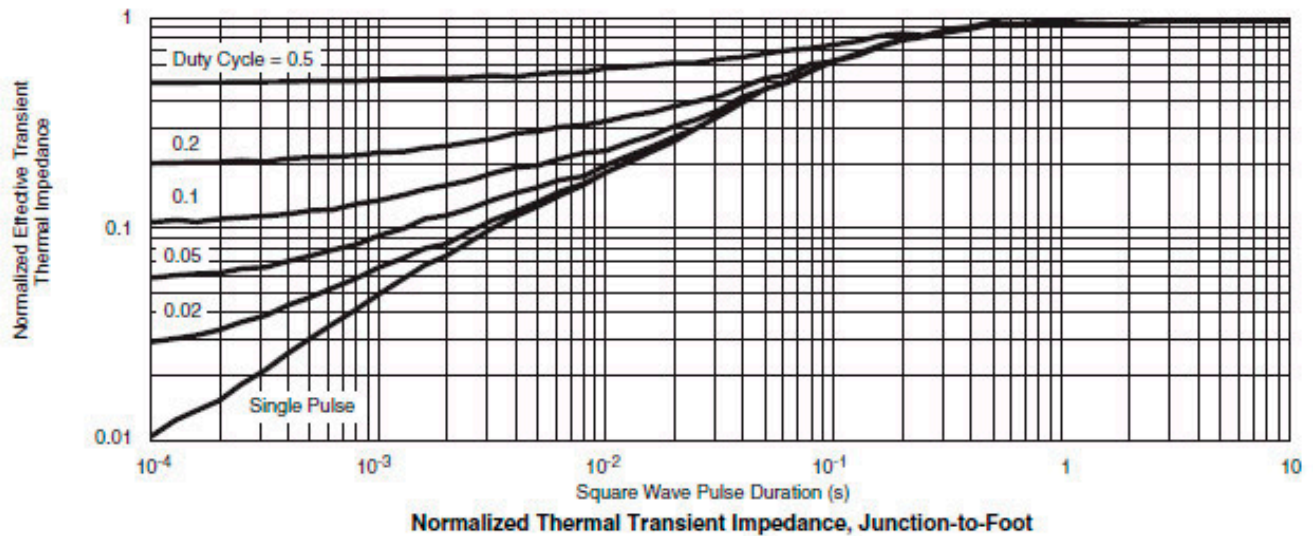
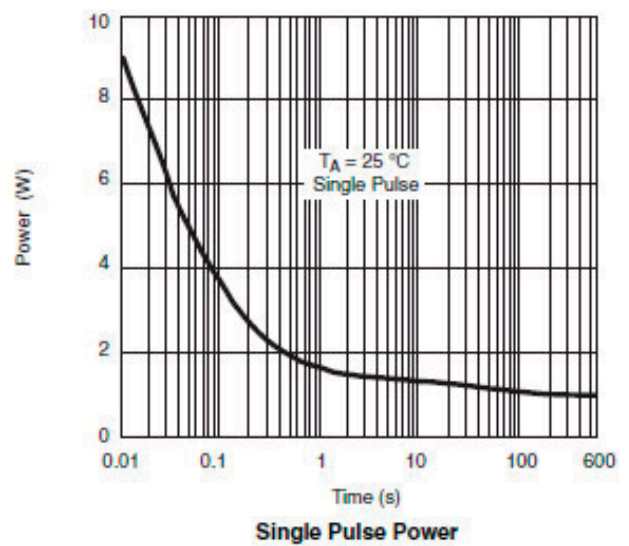
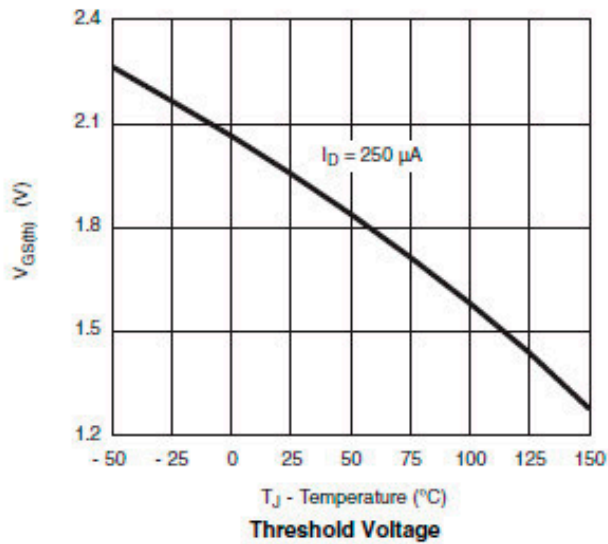
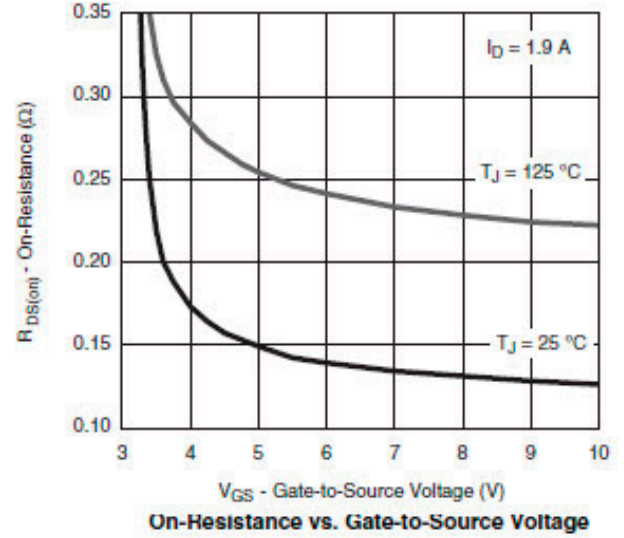
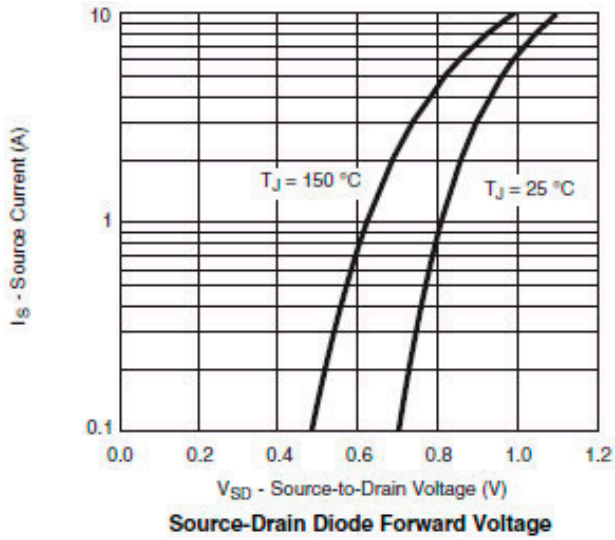
■标准特性曲线 (N 沟道)



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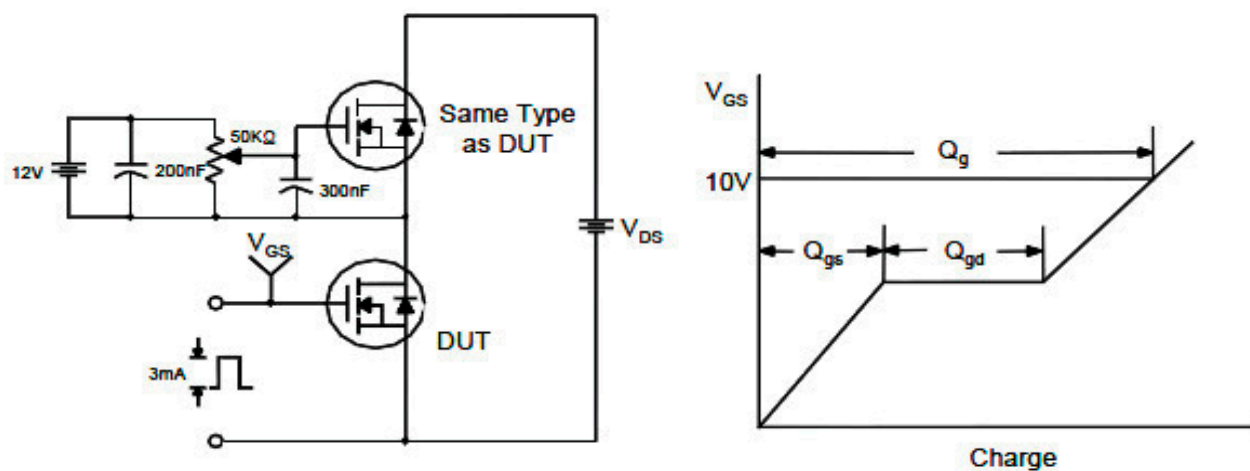
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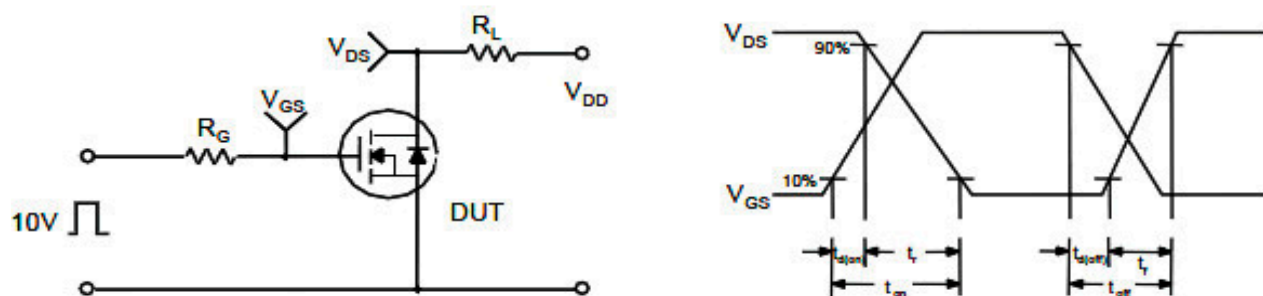
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■测试电路和波形 (N 沟道)

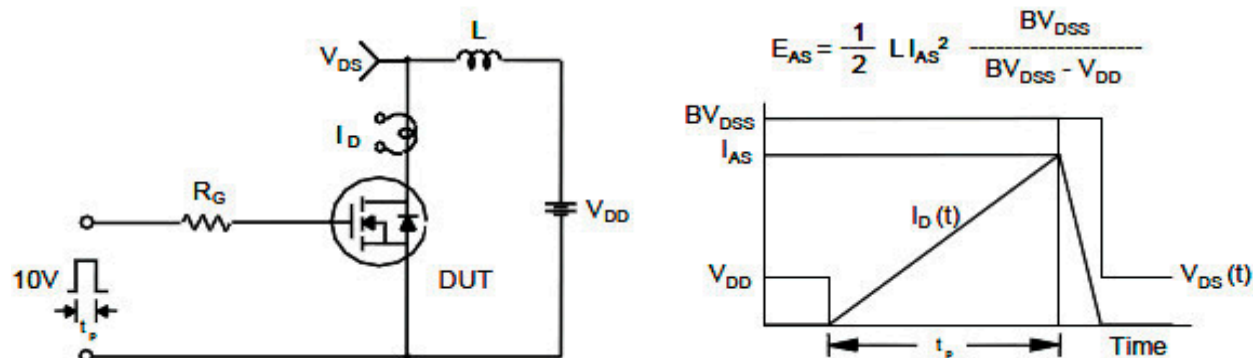
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



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■电特性 (P 沟道)

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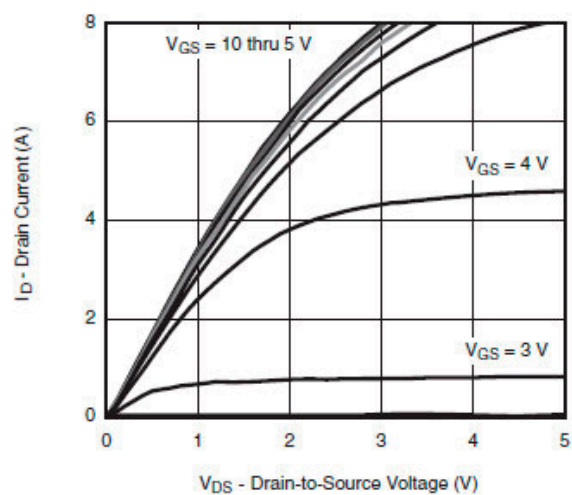
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 – 源极击穿电压	BV _{dss}	I _d =-250μA, V _{gs} =0V	-60			V
栅极接地时漏极电流	I _{dss}	V _{ds} =-48V, V _{gs} =0V			-1	μA
		Ta=85℃			-30	
栅极漏电流	I _{gss}	V _{ds} =0V, V _{gs} = ± 12V			± 100	nA
栅极阈值电压	V _{gs(th)}	V _{ds} =V _{gs} , I _d =-250μA	-1.0		-2.0	V
导通时漏极电流	I _{d(on)}	V _{gs} =-10V, V _{ds} ≥-5V	-6			A
漏极 – 源极导通电阻	R _{ds(on)}	V _{gs} =-10V, I _d =-1.8A		280	310	mΩ
		V _{gs} =-4.5V, I _d =-1.4A		295	340	
正向跨导	G _{fs}	V _{ds} =-10V, I _d =-1.0A		2.8		S
二极管正向压降	V _{sd}	I _s =-1.0A, V _{gs} =0V		-0.75	-1.30	V
寄生二极管最大连续电流	I _s				-1.5	A
动态特性						
输入电容	C _{iss}	V _{gs} =0V, V _{ds} =-30V, f=1MHz		210		pF
输出电容	C _{oss}			25		pF
反馈电容	C _{rss}			18		pF
开关特性						
总栅极电荷	Q _g	V _{gs} =-4.5V, V _{ds} =-30V I _d ≡-1.25A		2.7	4.5	nC
栅极 – 源极电荷	Q _{gs}			0.7		nC
栅极 – 漏极电荷	Q _{gd}			1.2		nC
导通延迟时间	t _{d(on)}	V _{gs} =-10V, V _{ds} =-30V I _d ≡-1.0A, R _L =30Ω R _{gen} =1Ω		5	10	ns
导通上升时间	t _r			10	20	ns
关闭延迟时间	t _{d(off)}			15	30	ns
关闭下降时间	t _f			10	20	ns

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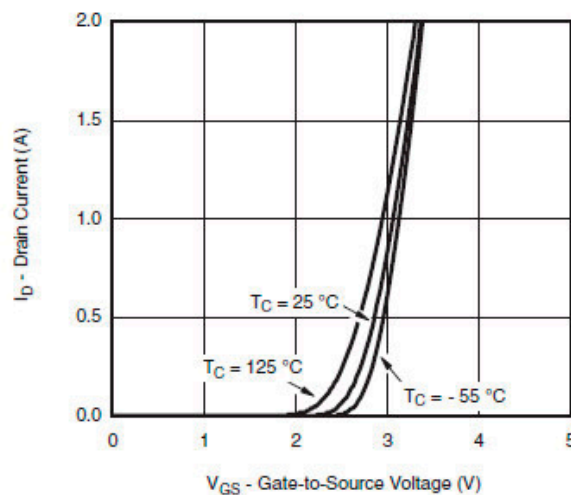
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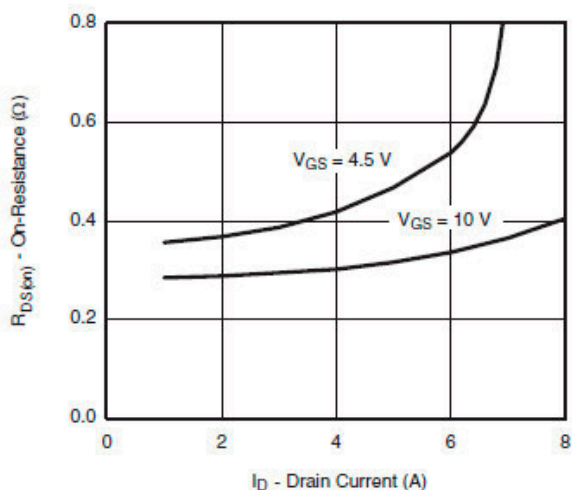
■标准特性曲线 (P 沟道)



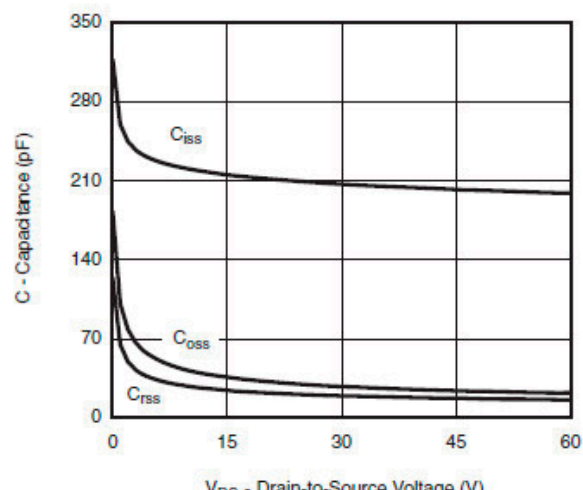
Output Characteristics



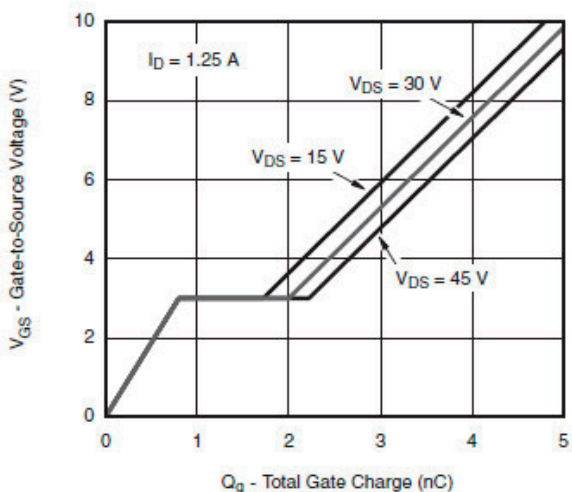
Transfer Characteristics



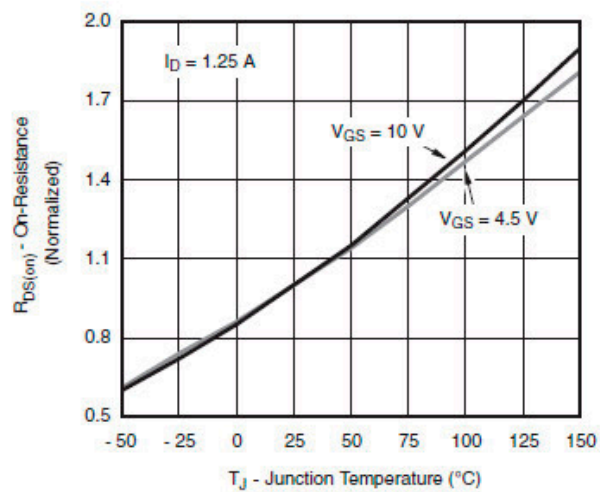
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

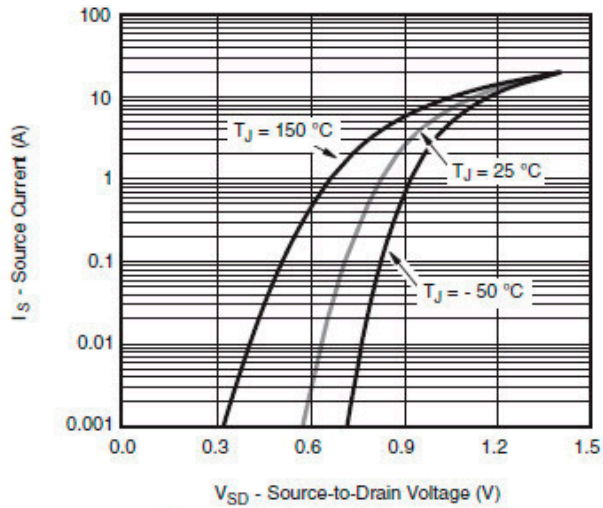


On-Resistance vs. Junction Temperature

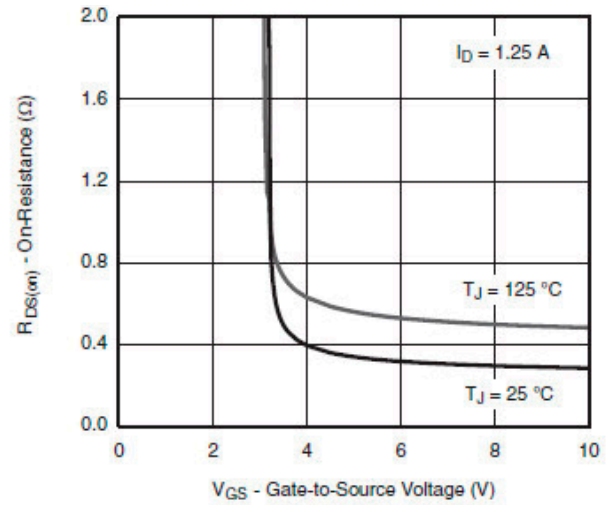
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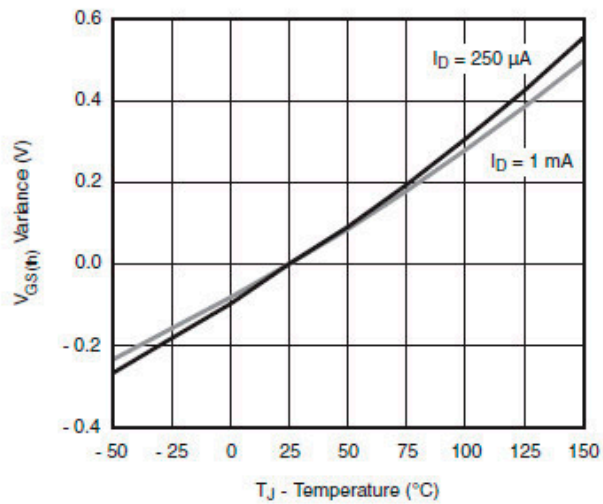
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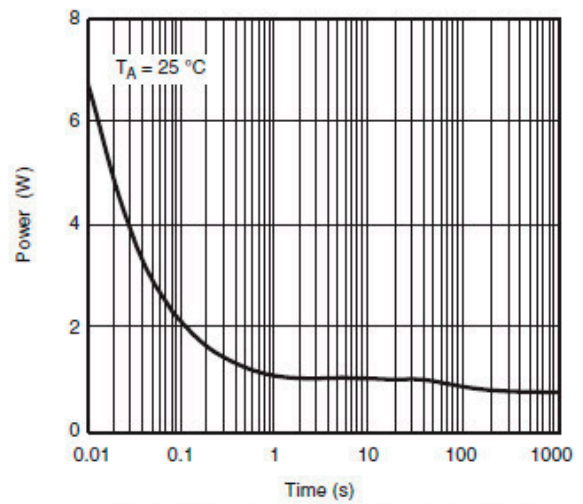
Source-Drain Diode Forward Voltage



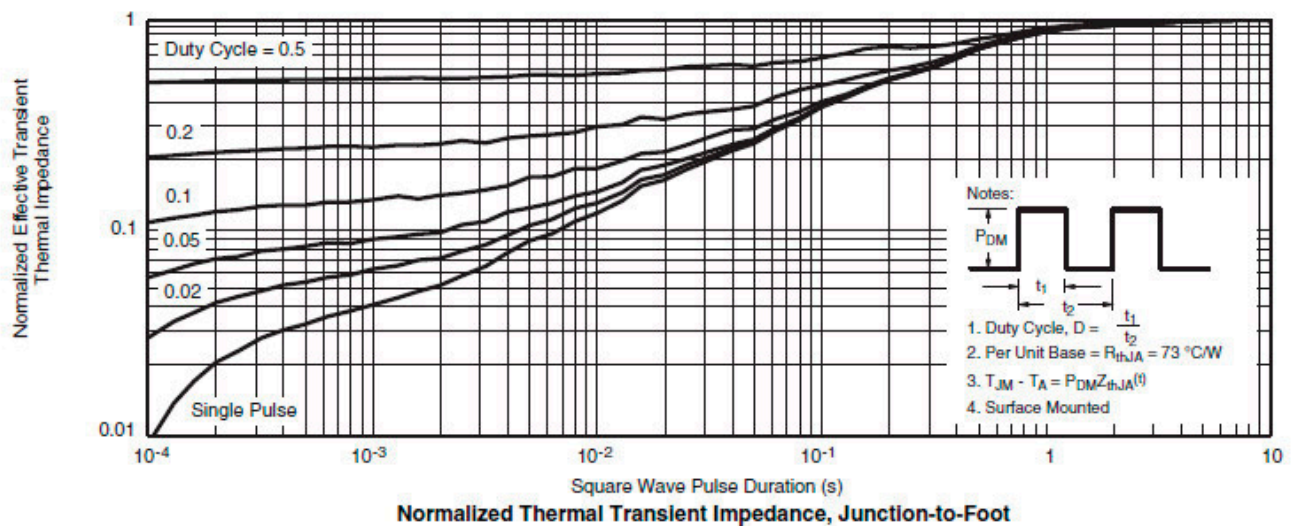
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

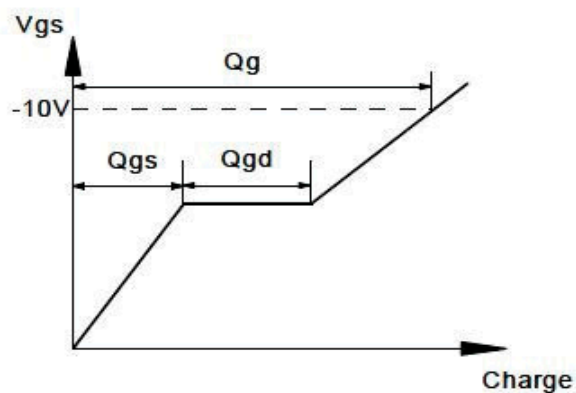
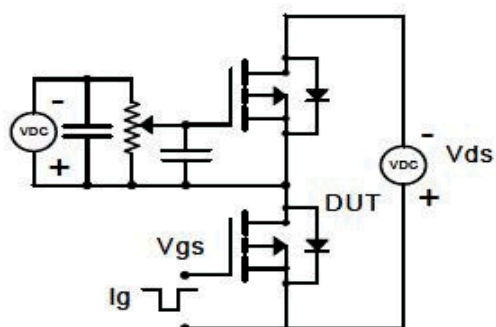
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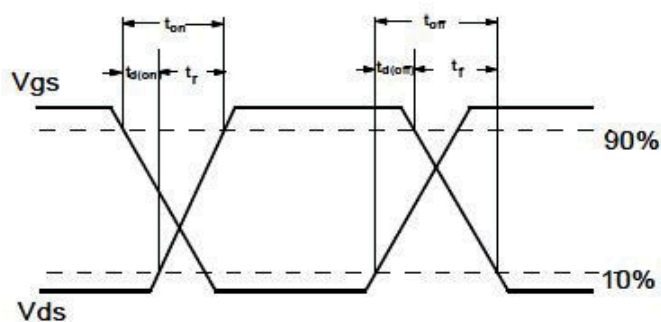
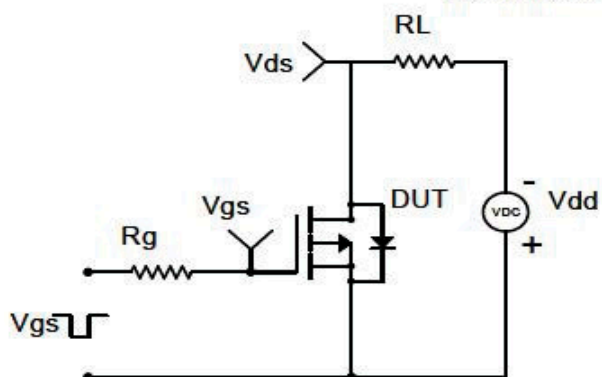
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■测试电路和波形 (P 沟道)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

