复合沟道 MOSFET

ELM56610CWA-S

■概要

ELM56610CWA-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
- Vds=100V
- Id=2.3A
- Rds(on) = 310mΩ(Vgs=10V)
- Rds(on) = 320mΩ(Vgs=4.5V)

P 沟道
- Vds=-100V
- Id=-1.0A
- Rds(on) = 650mΩ(Vgs=-10V)
- Rds(on) = 700mΩ(Vgs=-4.5V)

■绝对最大额定值

如没有特别注明时, Ta=25℃

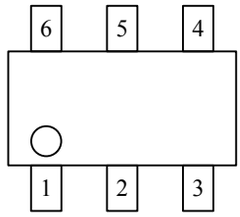
项目		记号	N 沟道 (最大值)	P 沟道 (最大值)	单位
漏极 – 源极电压		Vds	100	-100	V
栅极 – 源极电压		Vgs	± 20	± 20	V
漏极电流 (定常) (Tj=150℃)	Ta=25℃	Id	2.3	-1.0	A
	Ta=70℃		1.8	-0.5	
漏极电流 (脉冲)		Idm	4	-4	A
容许功耗	Tc=25℃	Pd	2.0	2.0	W
	Tc=70℃		1.3	1.3	
结合部温度		Tj	150	150	℃
保存温度范围		Tstg	-55 ~ 150	-55 ~ 150	℃

■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	Rθja	N		120	℃/W
最大结合部 – 环境热阻	Rθja	P		120	℃/W

■引脚配置图

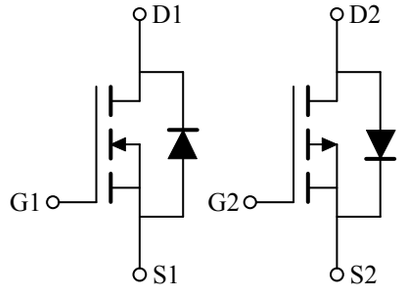
SOT-26(俯视图)



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

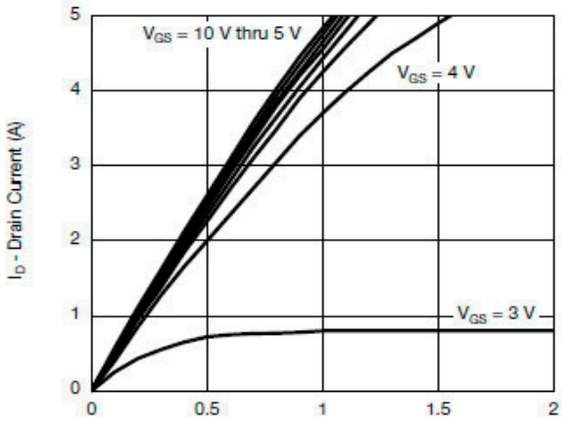


■电特性 (N 沟道)

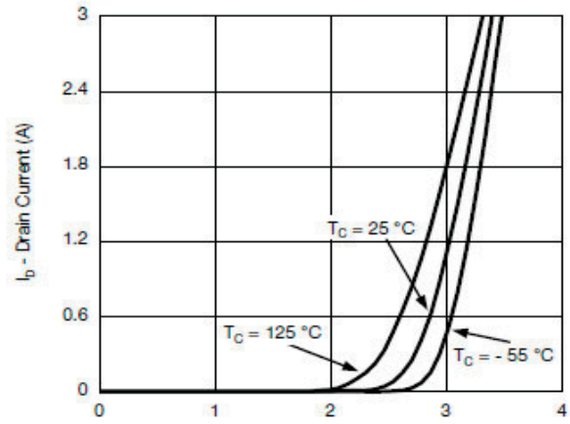
如没有特别注明时, Ta=25℃

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	BVdss	Id=250μA, Vgs=0V		100			V
栅极接地时漏极电流	Idss	Vds=80V, Vgs=0V				1	μA
			Ta=85℃			10	
栅极漏电电流	Igss	Vds=0V, Vgs= ± 20V				± 100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA		1.0		2.0	V
导通时漏极电流	Id(on)	Vgs=4.5V, Vds≧5V		5			A
漏极 – 源极导通电阻	Rds(on)	Vgs=10V, Id=2.3A				310	mΩ
		Vgs=4.5V, Id=1.8A				320	
正向跨导	Gfs	Vds=20V, Id=1.5A			2		S
二极管正向压降	Vsd	Is=1.3A, 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=50V, f=1MHz			200		pF
输出电容	Coss				22		pF
反馈电容	Crss				13		pF
开关特性							
总栅极电荷	Qg	Vgs=4.5V, Vds=50V, Id≡1.6A			2.80	5.80	nC
栅极 – 源极电荷	Qgs				0.75		nC
栅极 – 漏极电荷	Qgd				1.40		nC
导通延迟时间	td(on)	Vgs=4.5V, Vds=50V, Id≡1.3A RL=39Ω, Rgen=1Ω			25	50	ns
导通上升时间	tr				20	50	ns
关闭延迟时间	td(off)				15	30	ns
关闭下降时间	tf				10	25	ns

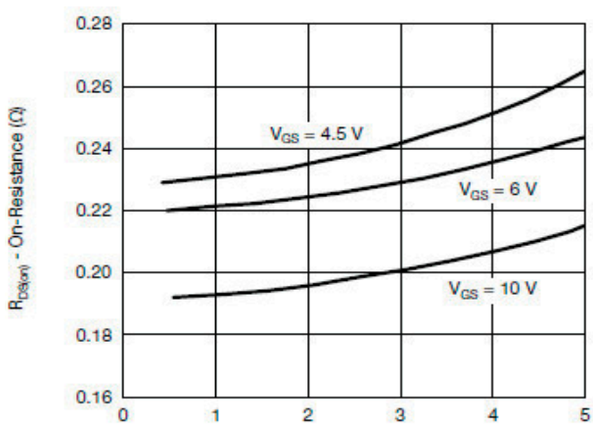
■标准特性曲线 (N 沟道)



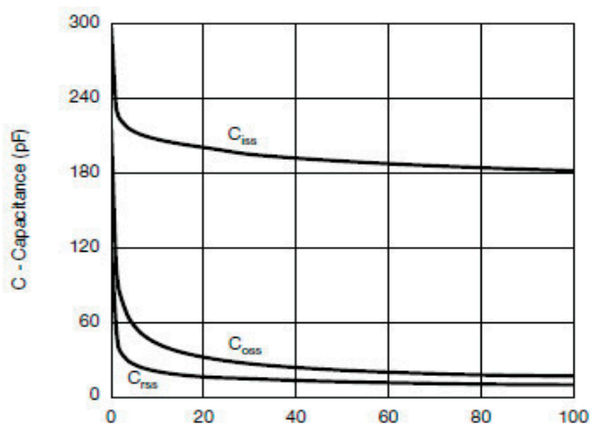
Output Characteristics



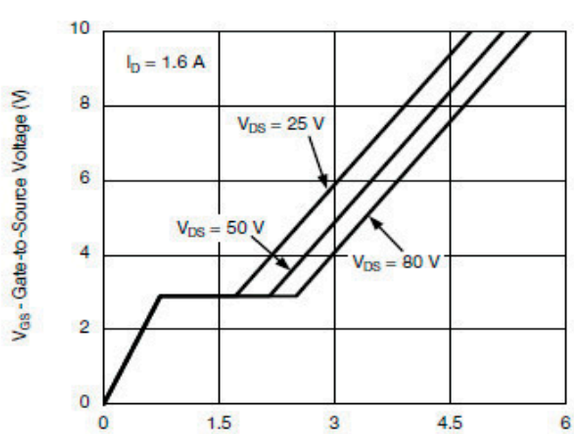
Transfer Characteristics



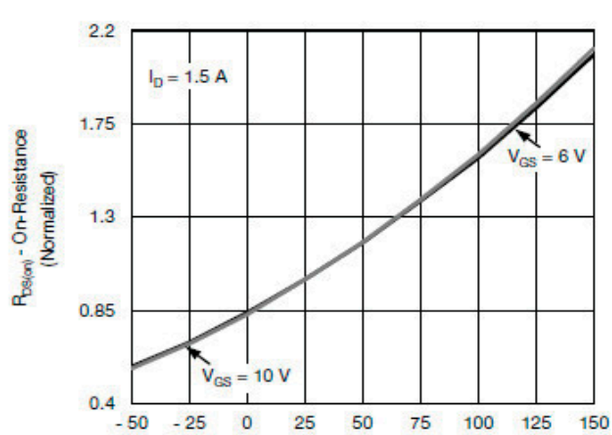
On-Resistance vs. Drain Current and Gate Voltage



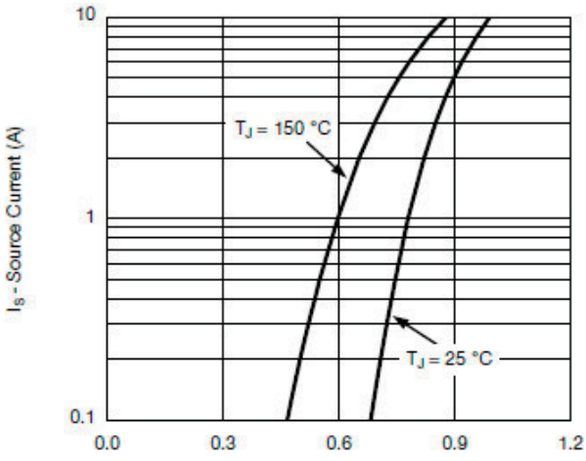
Capacitance



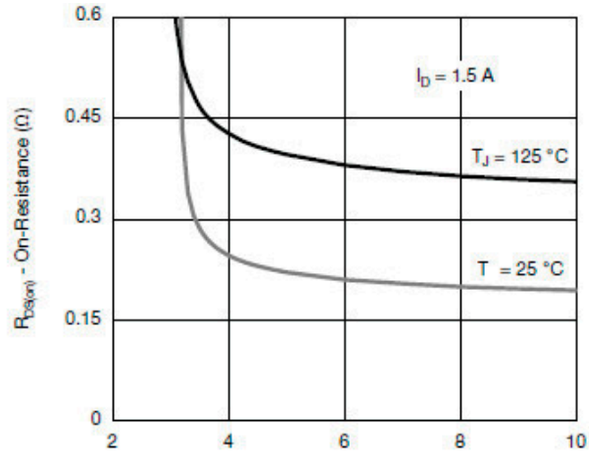
Gate Charge



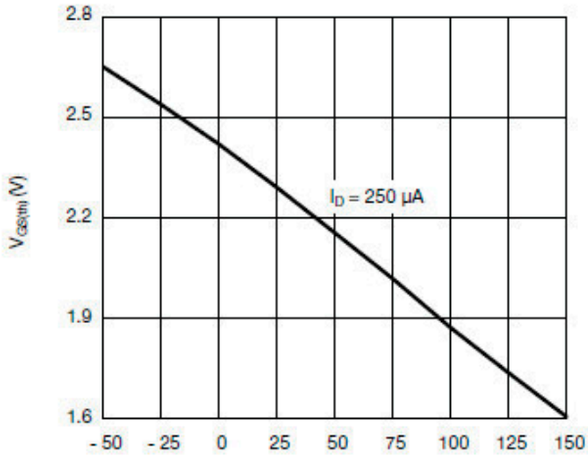
On-Resistance vs. Junction Temperature



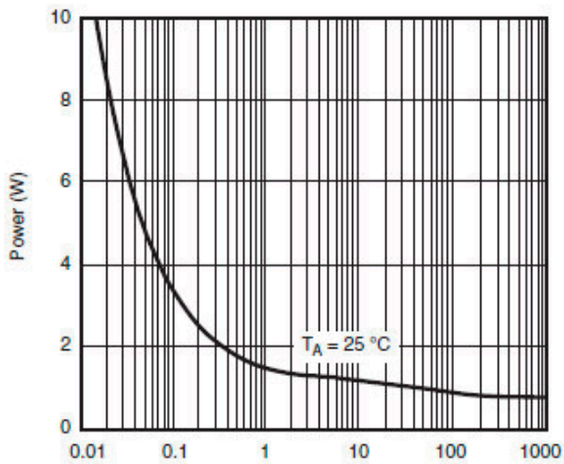
Source-Drain Diode Forward Voltage



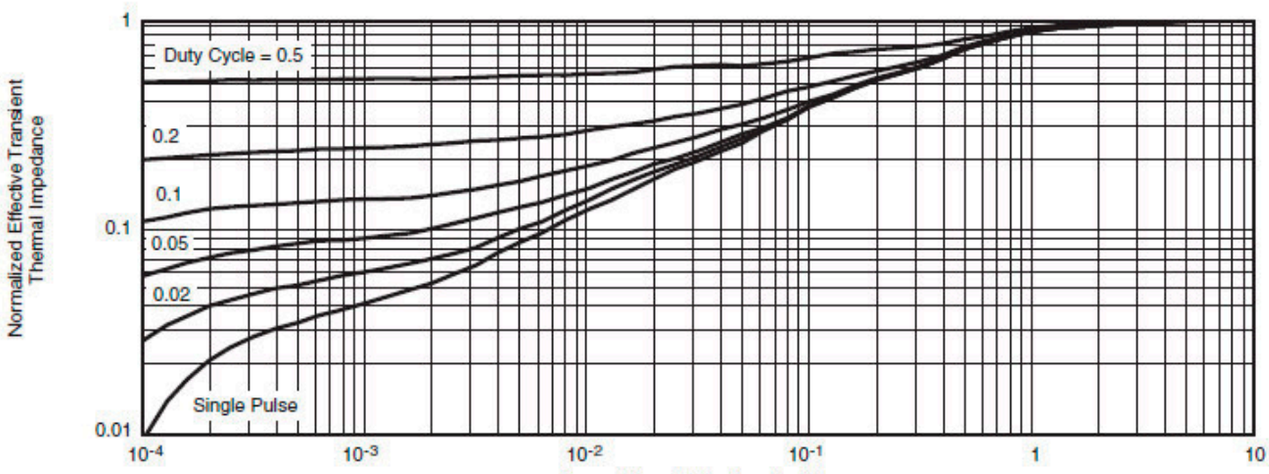
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



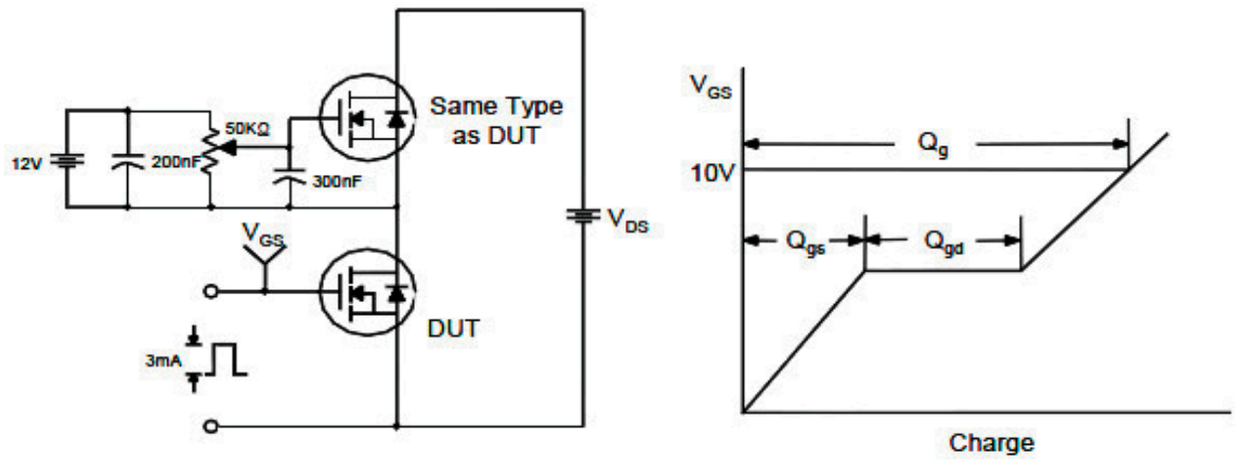
Single Pulse Power



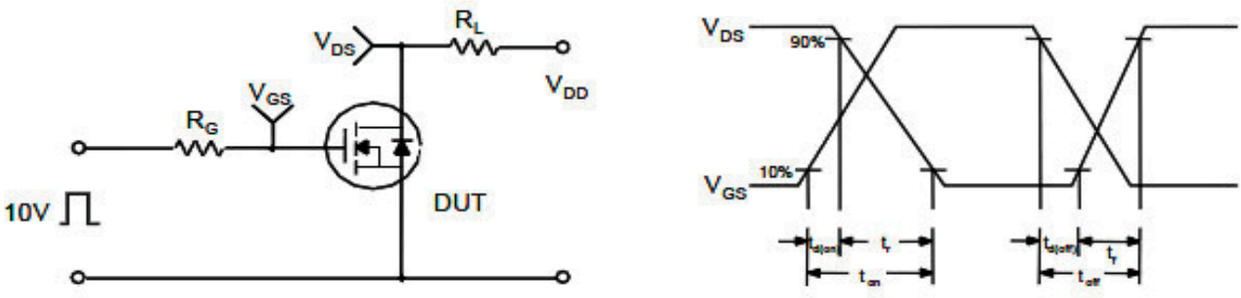
Normalized Thermal Transient Impedance, Junction-to-Foot

■测试电路和波形 (N 沟道)

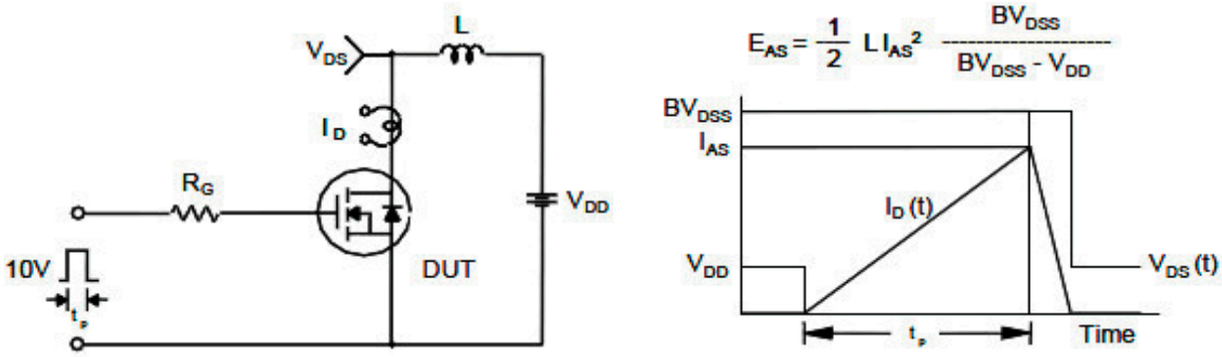
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

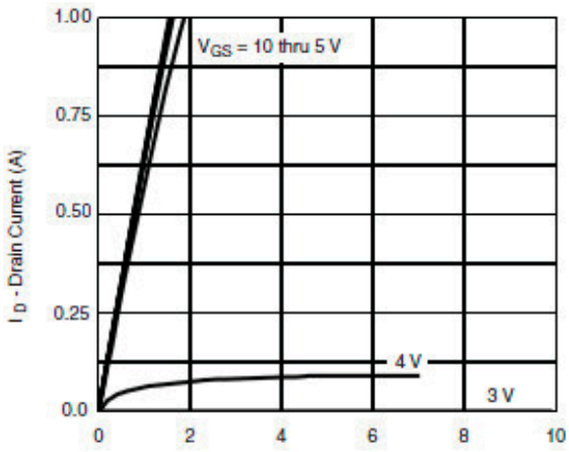


■电特性 (P 沟道)

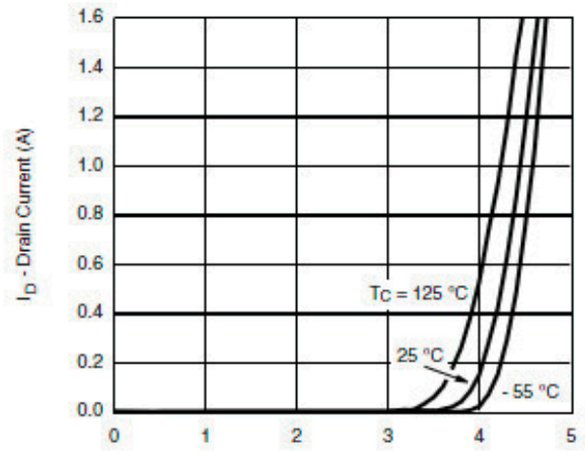
如没有特别注明时, Ta=25℃

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	BVdss	Id=–250μA, Vgs=0V		–100			V
栅极接地时漏极电流	Idss	Vds=–80V, Vgs=0V				–1	μA
			Ta=85℃			–30	
栅极漏电电流	Igss	Vds=0V, Vgs= ± 12V				± 100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=–250μA		–1.0		–2.5	V
导通时漏极电流	Id(on)	Vgs=–10V, Vds≧–15V		–1.6			A
漏极 – 源极导通电阻	Rds(on)	Vgs=–10V, Id=–1.0A			600	650	mΩ
		Vgs=–4.5V, Id=–0.5A			620	700	
正向跨导	Gfs	Vds=–15V, Id=–0.5A			2.8		S
二极管正向压降	Vsd	Is=–0.5A, Vgs=0V			–0.75	–1.30	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=–25V, f=1MHz			450	650	pF
输出电容	Coss				50		pF
反馈电容	Crss				30		pF
开关特性							
总栅极电荷	Qg	Vgs=–10V, Vds=–75V, Id≡–0.5A			9.0	20.0	nC
栅极 – 源极电荷	Qgs				2.5		nC
栅极 – 漏极电荷	Qgd				3.5		nC
导通延迟时间	td(on)	Vgs=–10V, Vds=–75V Id≡–1.0A, RL=75Ω, Rgen=6Ω			10	20	ns
导通上升时间	tr				15	30	ns
关闭延迟时间	td(off)				20	40	ns
关闭下降时间	tf				15	30	ns

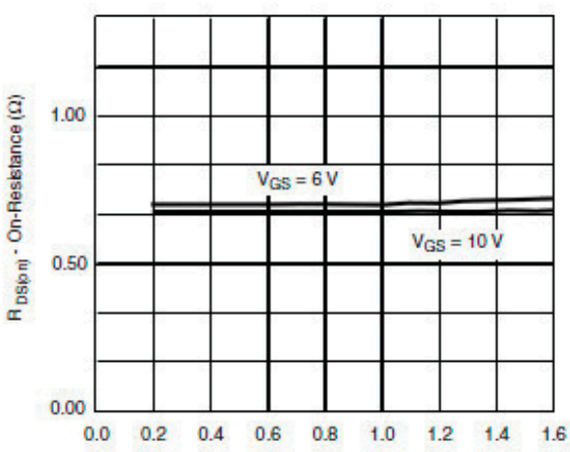
■标准特性曲线 (P 沟道)



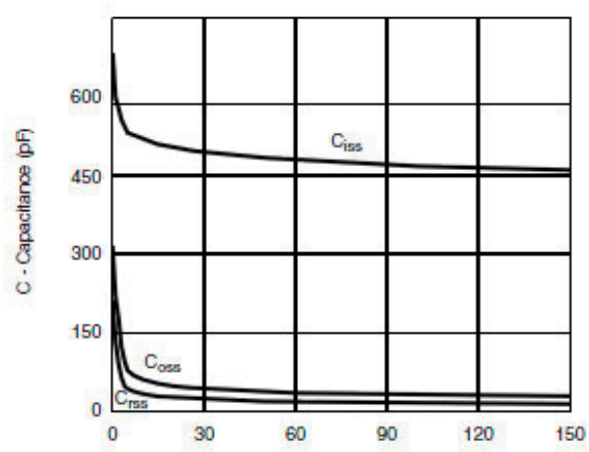
Output Characteristics



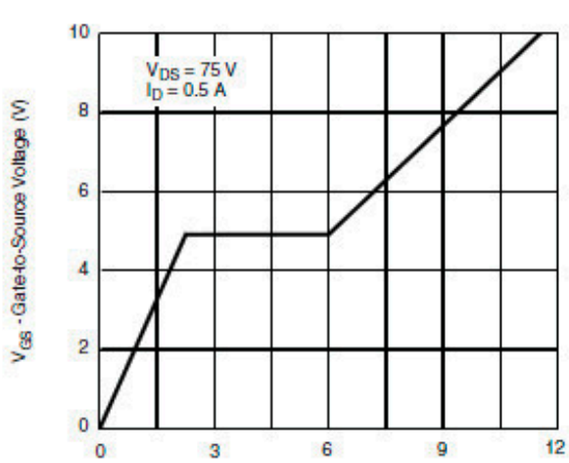
Transfer Characteristics



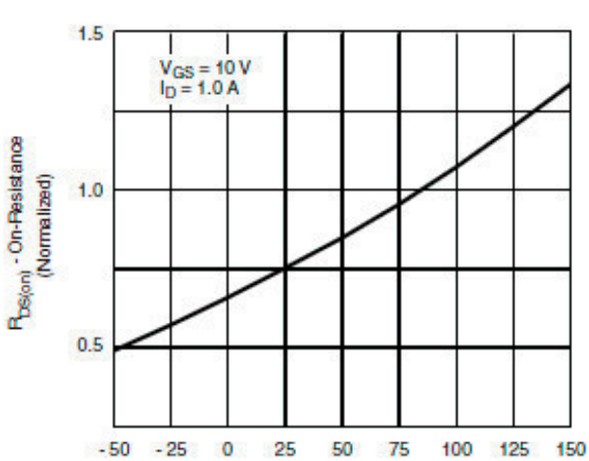
On-Resistance vs. Drain Current



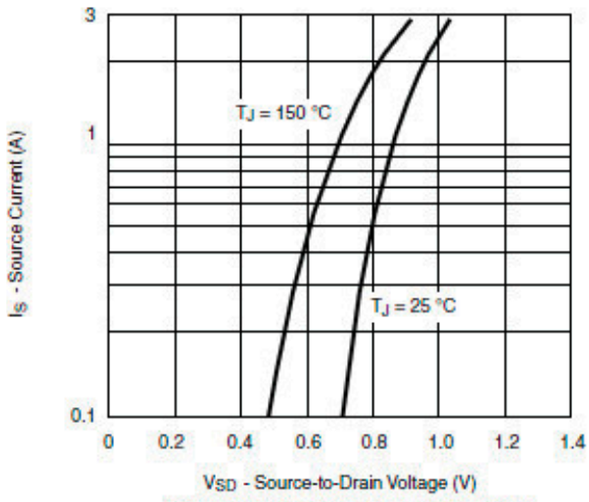
Capacitance



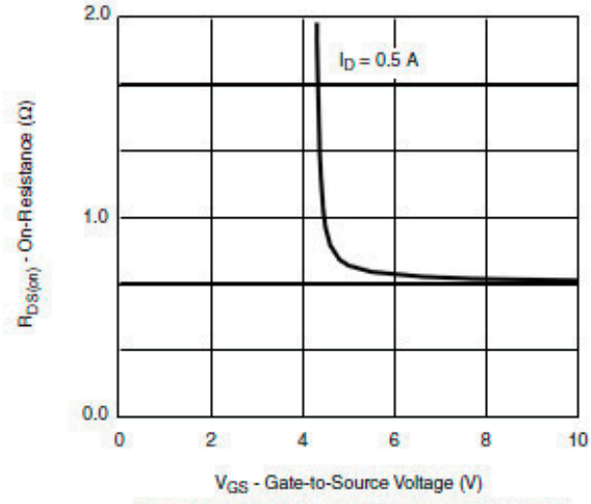
Gate Charge



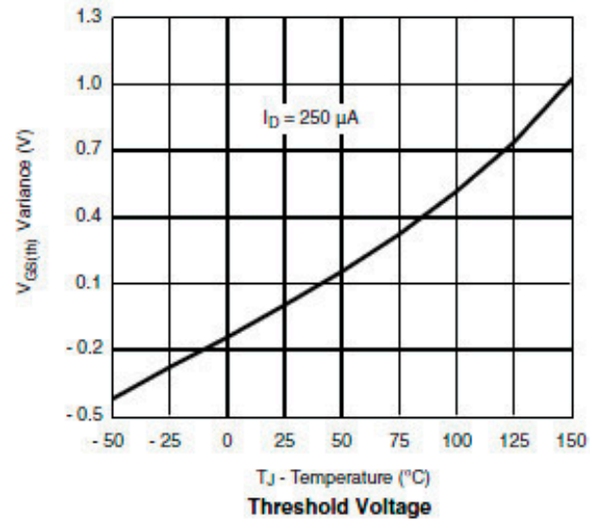
On-Resistance vs. Junction Temperature



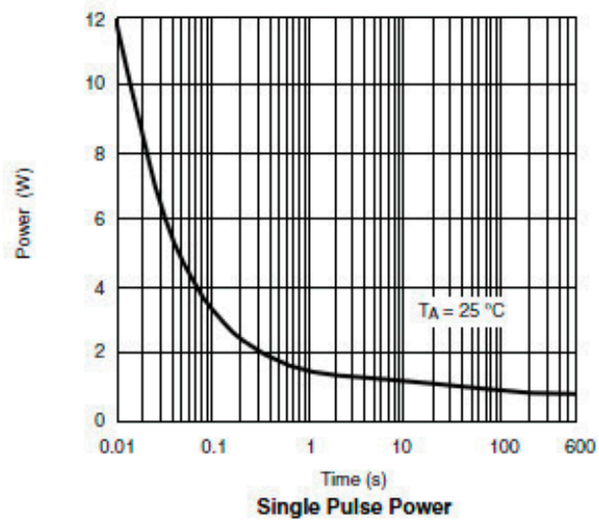
Source-Drain Diode Forward Voltage



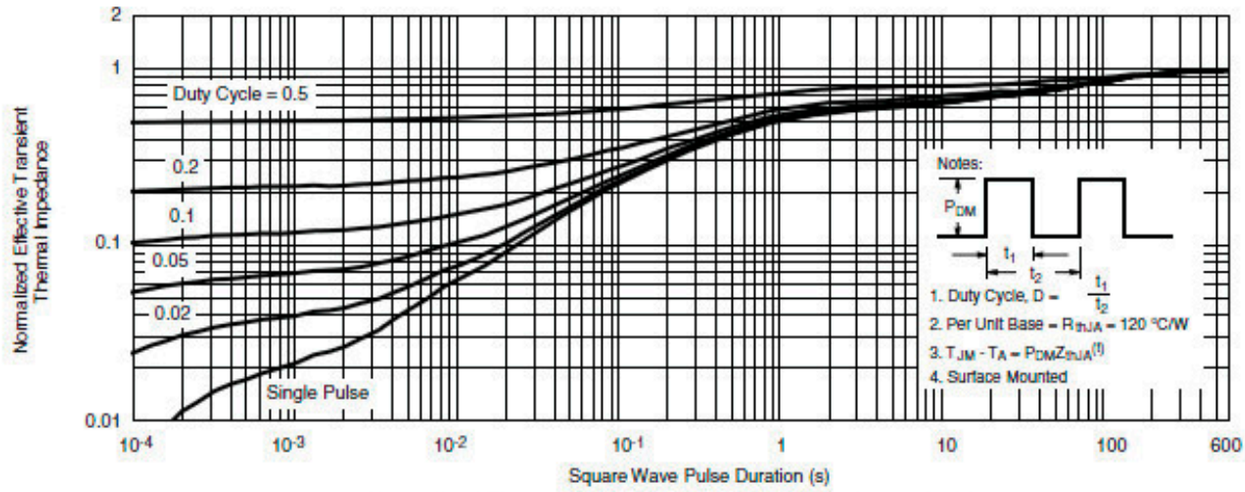
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



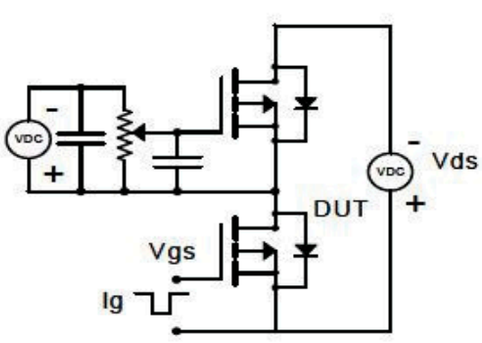
Single Pulse Power

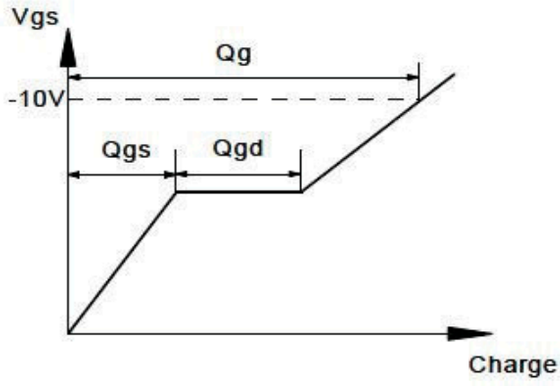


Normalized Thermal Transient Impedance, Junction-to-Ambient

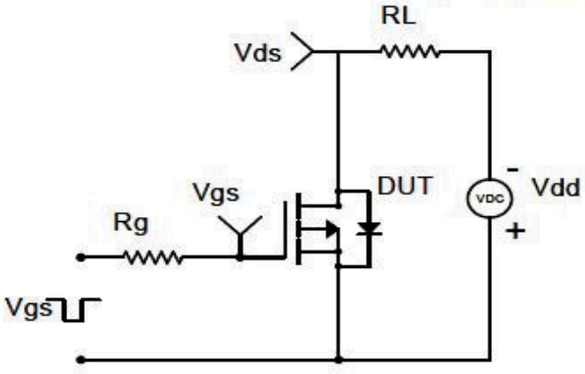
■测试电路和波形 (P 沟道)

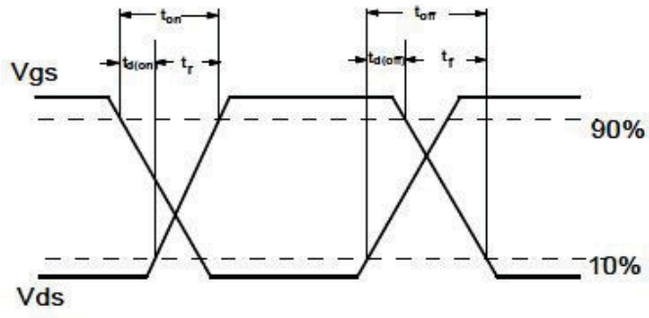
Gate Charge Test Circuit & Waveform





Resistive Switching Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms