

复合沟道 MOSFET

ELM56602CA-S

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

■概要

ELM56602CA-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 | P 沟道 |
| • $V_{ds}=30V$ | • $V_{ds}=-30V$ |
| • $I_d=3.5A$ | • $I_d=-2.7A$ |
| • $R_{ds(on)} = 75m\Omega (V_{gs}=10V)$ | • $R_{ds(on)} = 135m\Omega (V_{gs}=-10V)$ |
| • $R_{ds(on)} = 100m\Omega (V_{gs}=4.5V)$ | • $R_{ds(on)} = 170m\Omega (V_{gs}=-4.5V)$ |

■绝对最大额定值

如没有特别注明时, $T_a=25^\circ C$

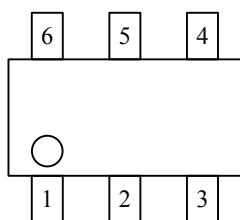
项目	记号	N 沟道 (最大值)	P 沟道 (最大值)	单位
漏极 - 源极电压	V_{ds}	30	-30	V
栅极 - 源极电压	V_{gs}	± 20	± 20	V
漏极电流 (定常) ($T_j=150^\circ C$)	Id	$T_a=25^\circ C$	-2.7	A
		$T_a=70^\circ C$	-2.1	
漏极电流 (脉冲)	I_{dm}	15	-15	A
容许功耗	Pd	$T_c=25^\circ C$	2.0	W
		$T_c=70^\circ C$	1.3	
结合部温度	T_j	150	150	$^\circ C$
保存温度范围	T_{stg}	-55 ~ 150	-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	$^\circ C/W$

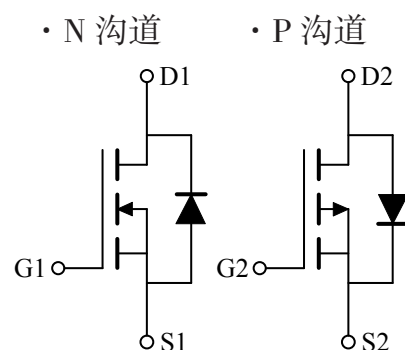
■引脚配置图

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



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■电特性 (N 沟道)

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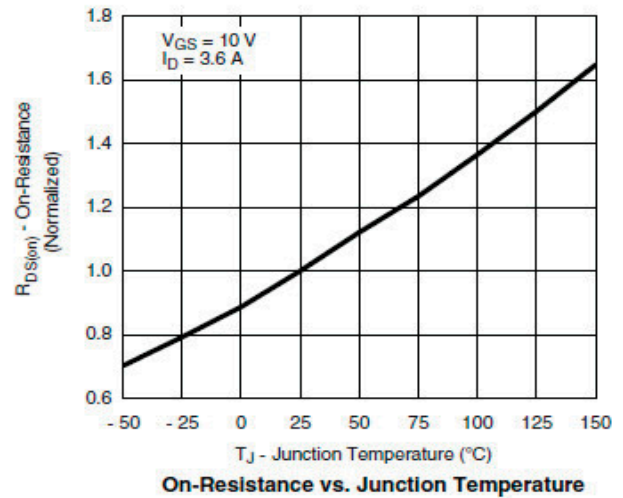
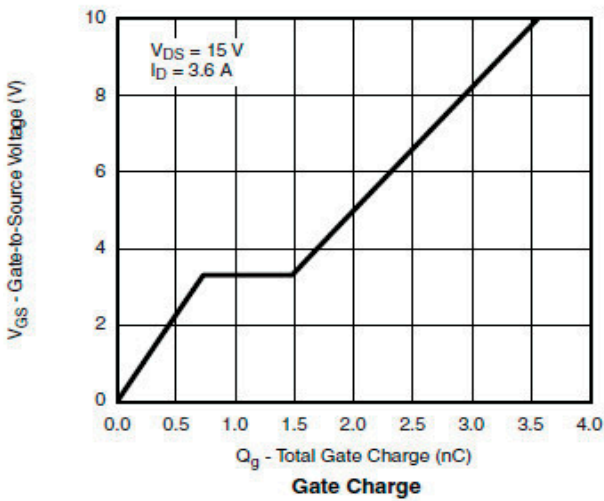
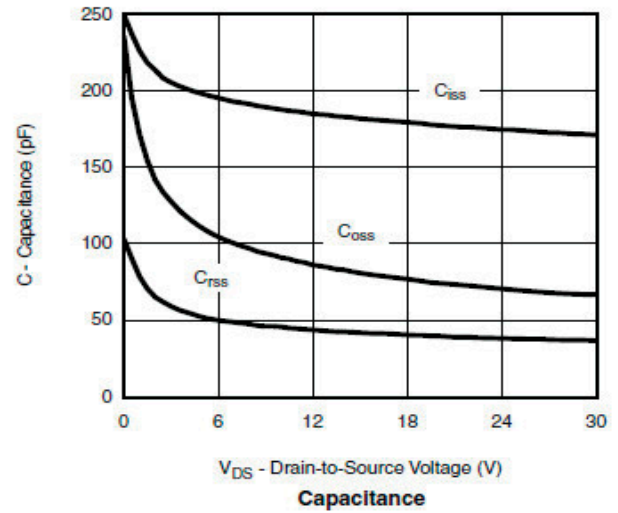
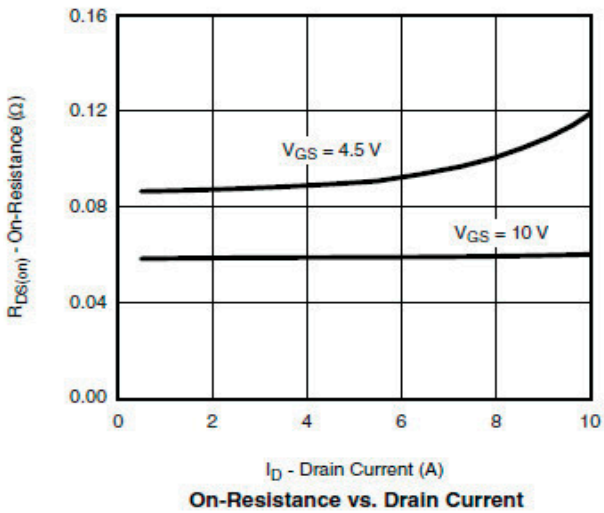
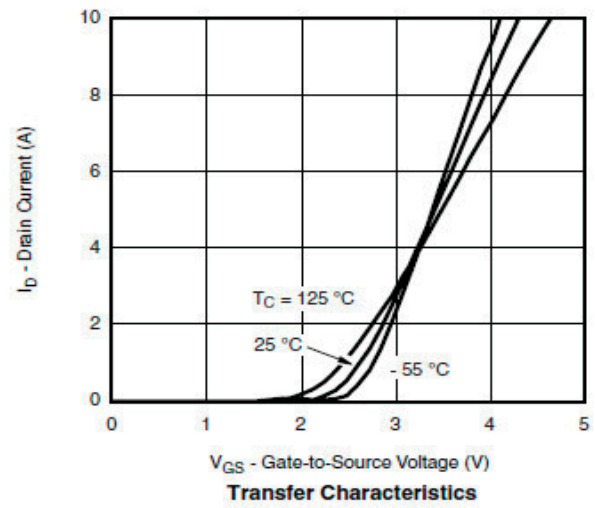
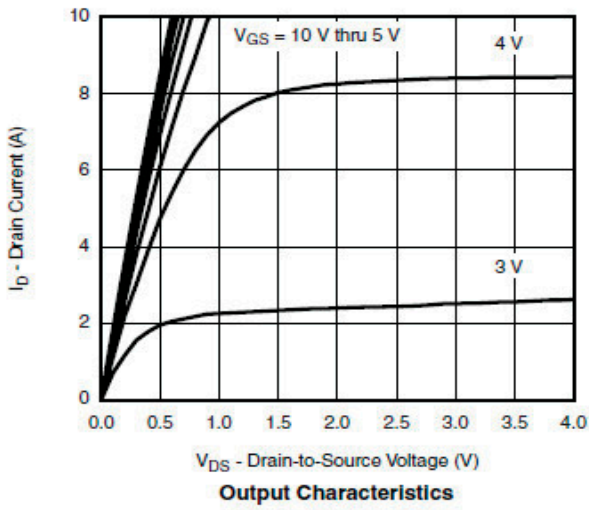
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 - 源极击穿电压	BVdss	Id=250μA, Vgs=0V	30			V
栅极接地时漏极电流	Idss	Vds=30V, Vgs=0V Ta=85℃			1	μA
					30	
栅极漏电流	Igss	Vds=0V, Vgs=±20V			±100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA	1.0		2.5	V
导通时漏极电流	Id(on)	Vgs=10V, Vds≥4.5V	6			A
漏极 - 源极导通电阻	Rds(on)	Vgs=10V, Id=3.6A		64	75	mΩ
		Vgs=4.5V, Id=2.6A		88	100	
正向跨导	Gfs	Vds=15V, Id=2.8A		11		S
二极管正向压降	Vsd	Is=2.6A, Vgs=0V		0.8	1.2	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=15V, f=1MHz		230		pF
输出电容	Coss			50		pF
反馈电容	Crss			20		pF
开关特性						
总栅极电荷	Qg	Vgs=4.5V, Vds=15V, Id≐3.0A		2.00	3.60	nC
栅极 - 源极电荷	Qgs			0.80		nC
栅极 - 漏极电荷	Qgd			0.65		nC
导通延迟时间	td(on)	Vgs=4.5V, Vds=15V, Id≐2.0A RL=5.6Ω, Rgen=1.0Ω		10	12	ns
导通上升时间	tr			45	60	ns
关闭延迟时间	td(off)			12	18	ns
关闭下降时间	tf			20	30	ns

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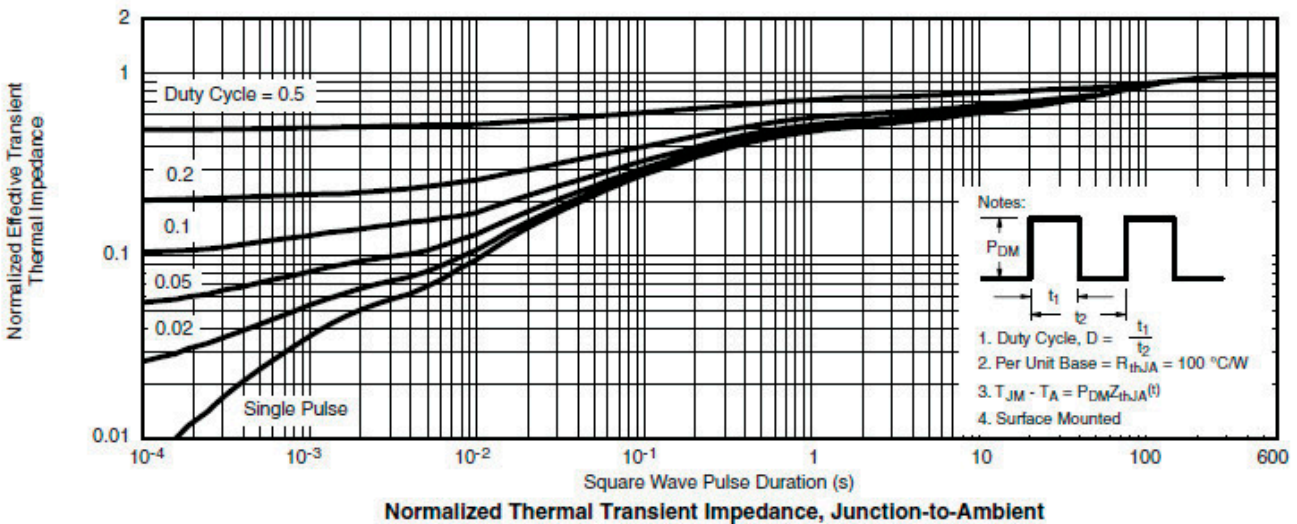
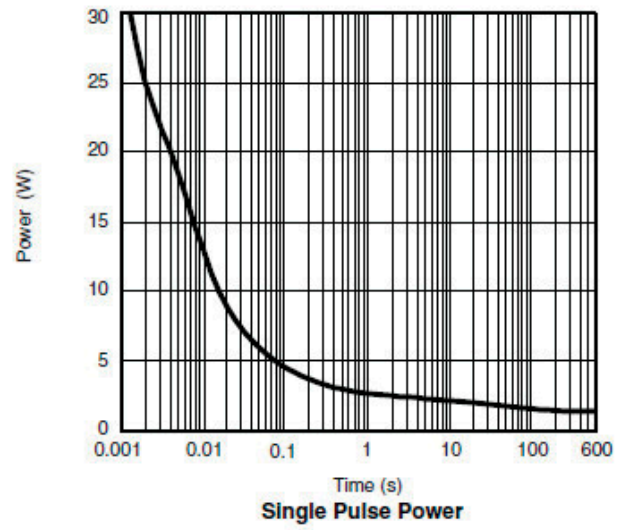
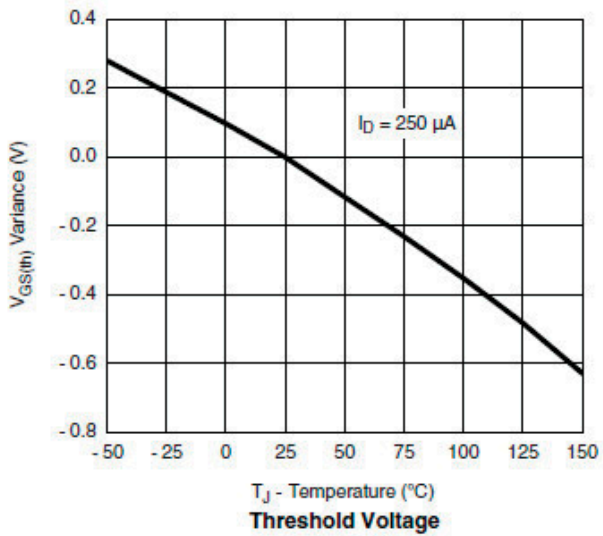
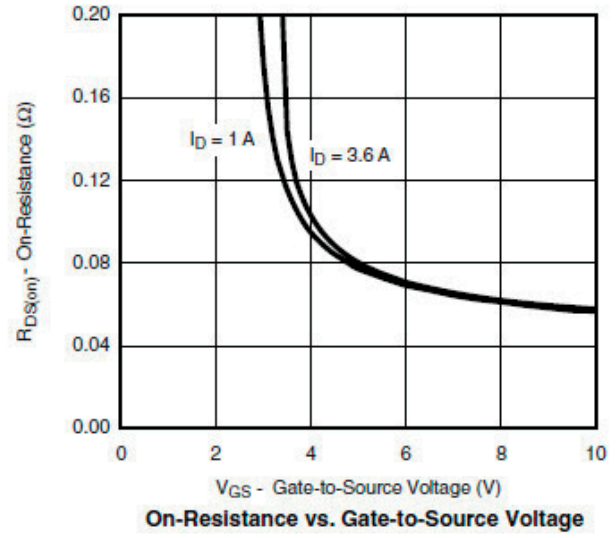
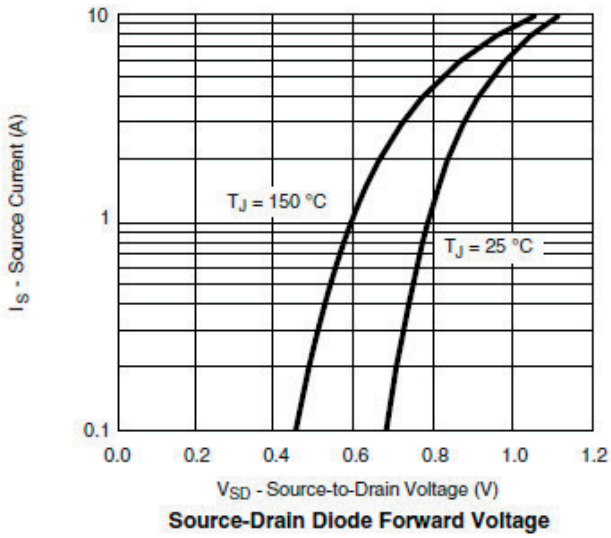
■ 标准特性曲线 (N 沟道)



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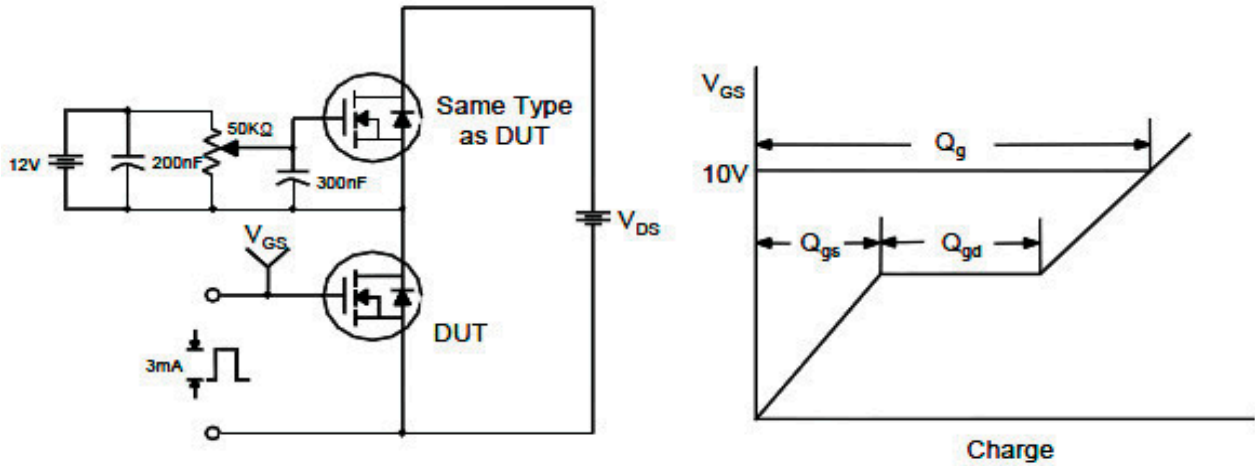
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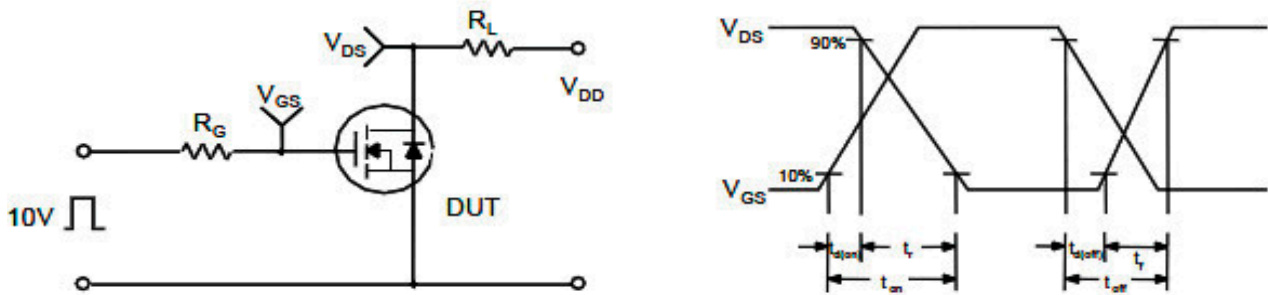
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测试电路和波形 (N 沟道)

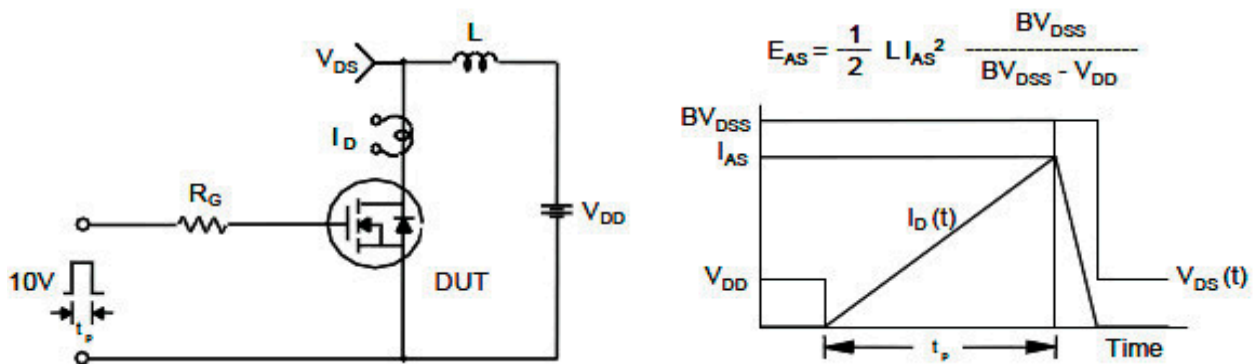
Gate Charge Test Circuit & Waveform



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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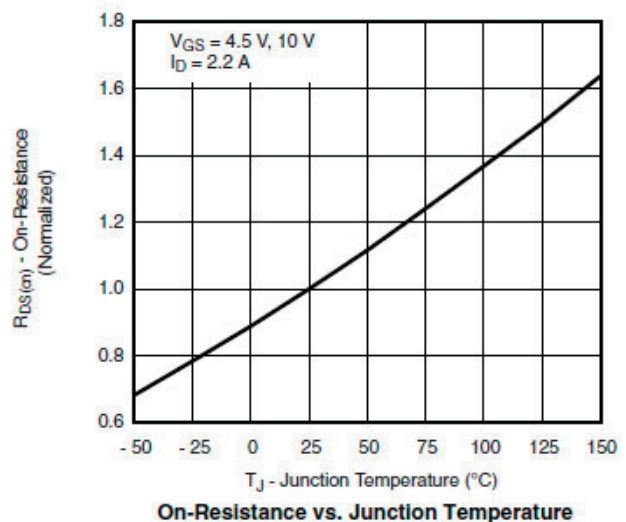
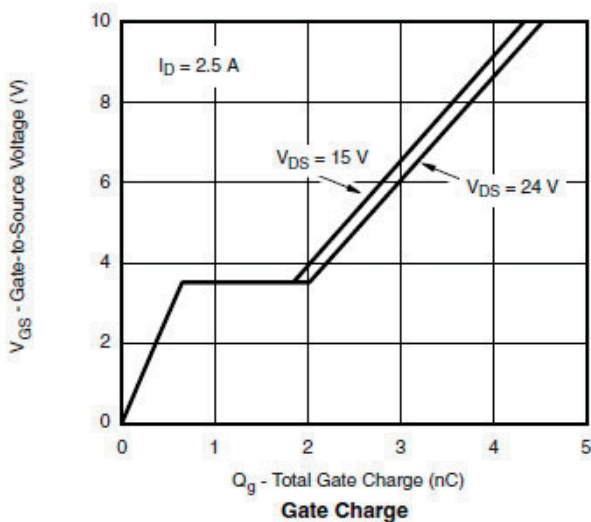
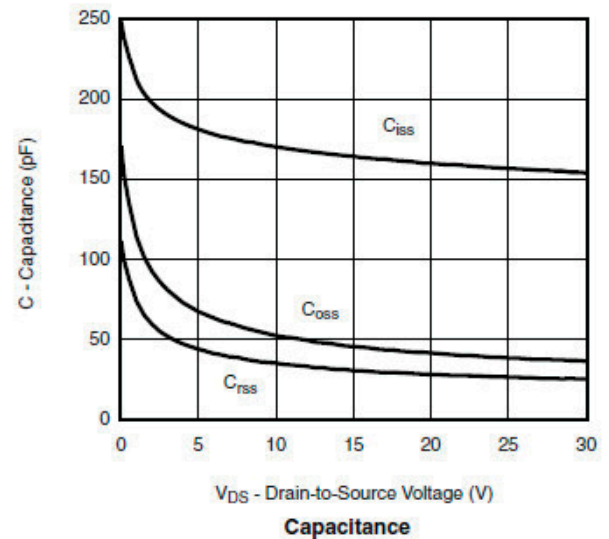
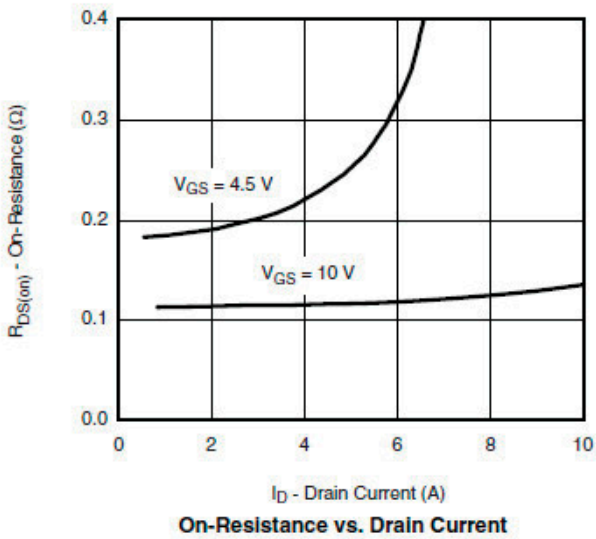
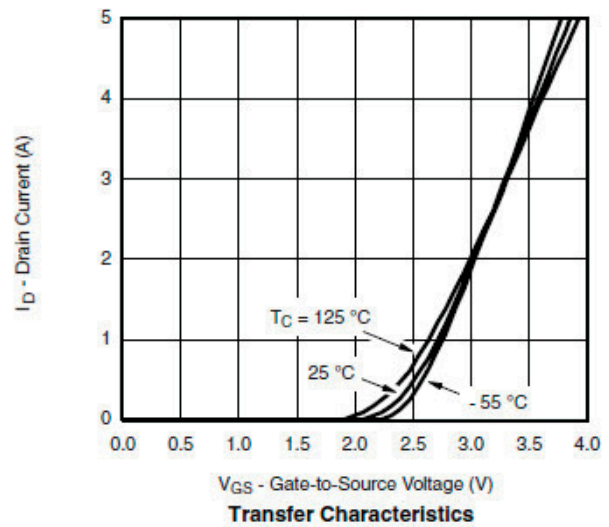
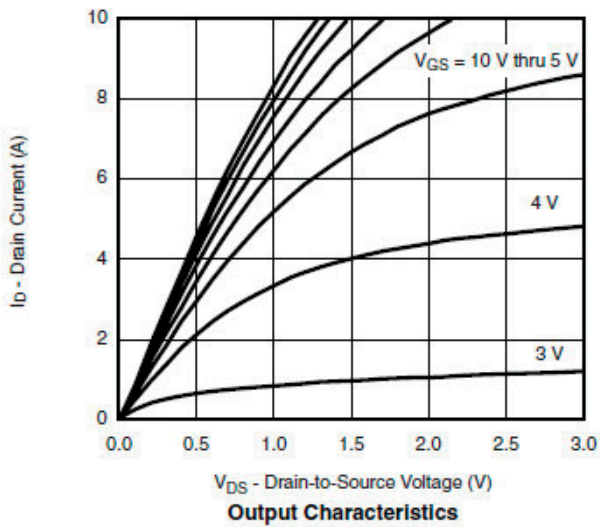
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 - 源极击穿电压	BVdss	Id=-250μA, Vgs=0V	-30			V
栅极接地时漏极电流	Idss	Vds=-24V, Vgs=0V Ta=85℃			-1	μA
					-30	
栅极漏电电流	Igss	Vds=0V, Vgs=±20V			±100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-2.5	V
导通时漏极电流	Id(on)	Vgs=-10V, Vds≥-5V	-10			A
漏极 - 源极导通电阻	Rds(on)	Vgs=-10V, Id=-2.7A		115	135	mΩ
		Vgs=-4.5V, Id=-2.1A		150	170	
正向跨导	Gfs	Vds=-5V, Id=-1.6A		10		S
二极管正向压降	Vsd	Is=-1.7A, Vgs=0V		-0.7	-1.3	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=-15V, f=1MHz		170		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=-4.5V, Vds=-15V Id≡-1.6A		2.5		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=-15V Id≡-1.6A, RL=7.5Ω		5	10	ns
导通上升时间	tr			10	16	ns
关闭延迟时间	td(off)	Rgen=1.0Ω		10	16	ns
关闭下降时间	tf			5	10	ns

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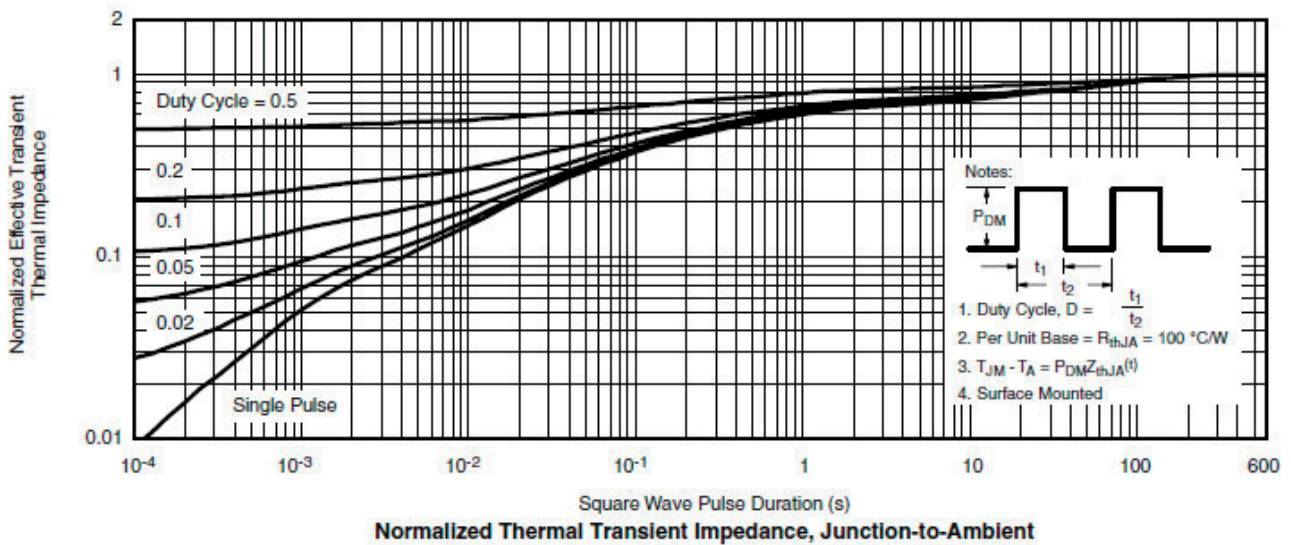
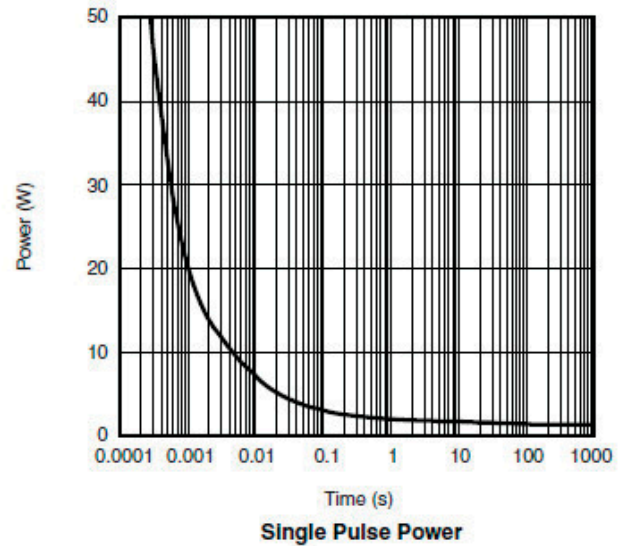
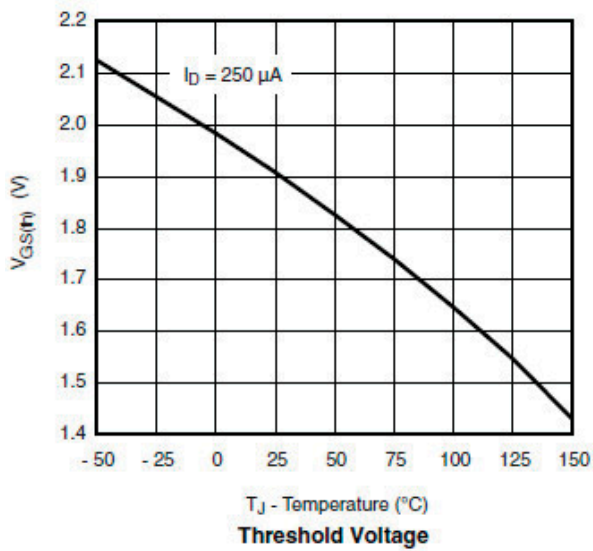
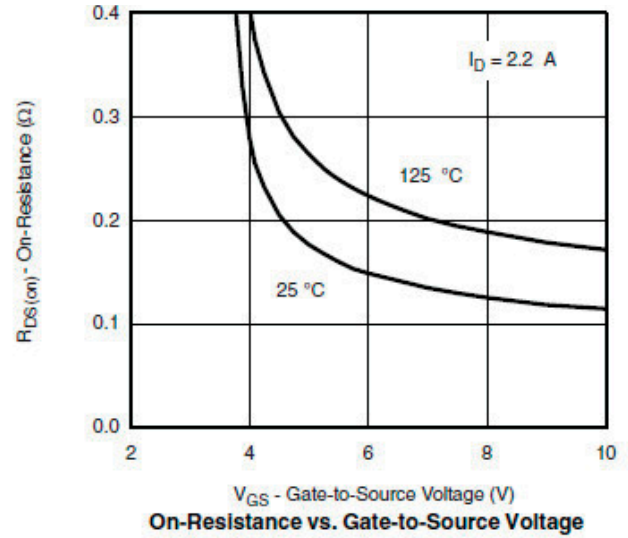
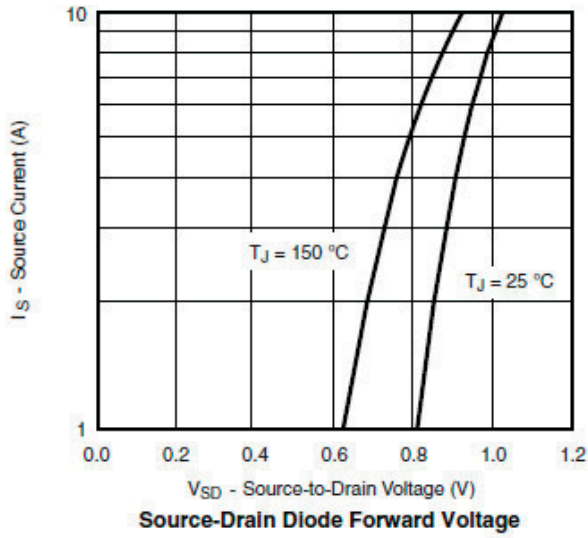
■ 标准特性曲线 (P 沟道)



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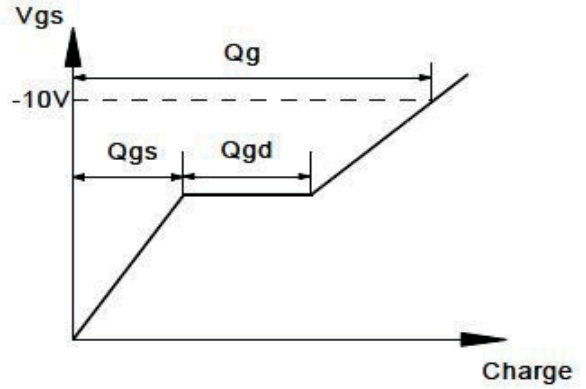
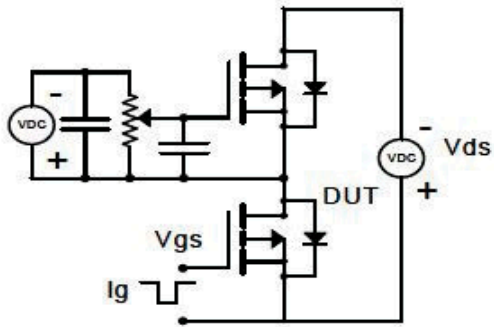
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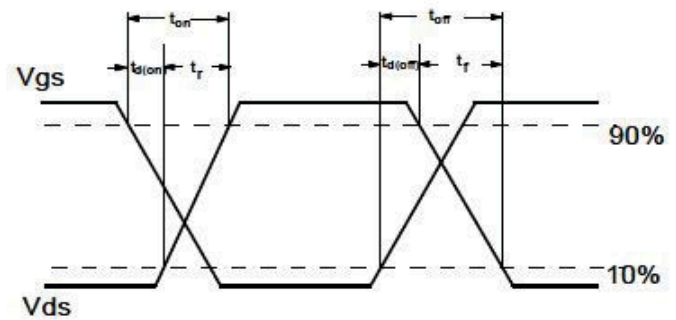
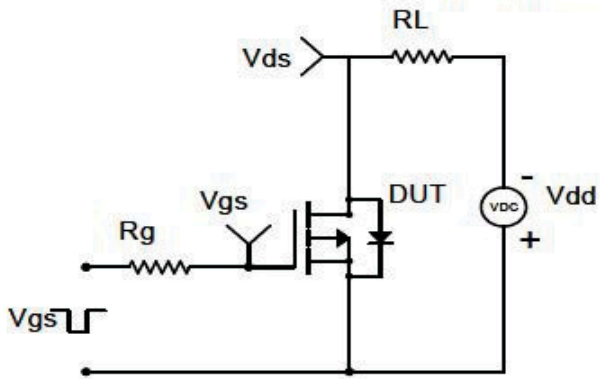
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■测试电路和波形 (P 沟道)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

