

复合沟道 MOSFET

ELM53346CWA-N

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■概要

ELM53346CWA-N 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 |
|--|---|
| • $V_{ds}=40V$ | • $V_{ds}=-40V$ |
| • $I_d=15.0A$ | • $I_d=-12.0A$ |
| • $R_{ds(on)} = 28m\Omega (V_{gs}=10V)$ | • $R_{ds(on)} = 45m\Omega (V_{gs}=-10V)$ |
| • $R_{ds(on)} = 38m\Omega (V_{gs}=4.5V)$ | • $R_{ds(on)} = 62m\Omega (V_{gs}=-4.5V)$ |

■绝对最大额定值

如没有特别注明时, $T_a=25^\circ C$

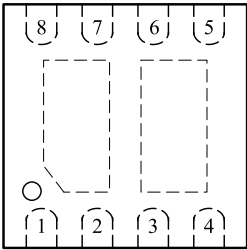
项目	记号	N 沟道 (最大值)	P 沟道 (最大值)	单位
漏极 - 源极电压	V_{ds}	40	-40	V
栅极 - 源极电压	V_{gs}	± 20	± 20	V
漏极电流 (定常) ($T_j=150^\circ C$)	I_d	15.0	-12.0	A
		12.0	-10.0	
漏极电流 (脉冲)	I_{dm}	40	-40	A
容许功耗	P_d	2.0	1.8	W
		1.5	1.2	
结合部温度	T_j	150	150	$^\circ C$
保存温度范围	T_{stg}	-55 ~ 150	-55 ~ 150	$^\circ C$

■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		56.0	$^\circ C/W$
最大结合部 - 环境热阻	$R_{\theta ja}$	P		62.5	$^\circ C/W$

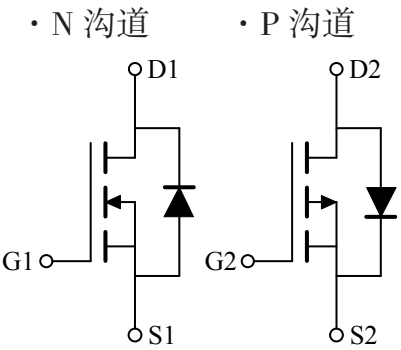
■引脚配置图

DFN8-3 × 3(俯视图)



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

■电路图



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■电特性 (N 沟道)

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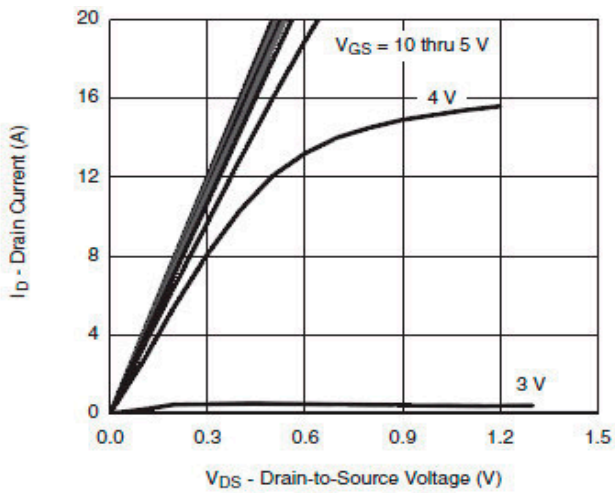
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 – 源极击穿电压	BV _{dss}	Id=250μA, Vgs=0V	40			V
栅极接地时漏极电流	Idss	Vds=32V, Vgs=0V			1	μA
		Ta=85℃			10	
栅极漏电电流	Igss	Vds=0V, Vgs= ± 20V			± 100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA	1.0		3.0	V
导通时漏极电流	Id(on)	Vgs=10V, Vds≥5V	20			A
漏极 – 源极导通电阻	Rds(on)	Vgs=10V, Id=15.0A		20	28	mΩ
		Vgs=4.5V, Id=12.0A		30	38	
正向跨导	Gfs	Vds=15V, Id=5.0A		25		S
二极管正向压降	Vsd	Is=2.0A, Vgs=0V		0.85	1.20	V
寄生二极管最大连续电流	Is				10	A
动态特性						
输入电容	Ciss	Vgs=0V, Vds=20V, f=1MHz		850		pF
输出电容	Coss			110		pF
反馈电容	Crss			75		pF
开关特性						
总栅极电荷	Qg	Vgs=4.5V, Vds=20V, Id≡5.0A		10.0	14.0	nC
栅极 – 源极电荷	Qgs			2.8		nC
栅极 – 漏极电荷	Qgd			3.2		nC
导通延迟时间	td(on)	Vgs=10V, Vds=20V, Id≡5.0A RL=4Ω, Rgen=1Ω		6	12	ns
导通上升时间	tr			10	20	ns
关闭延迟时间	td(off)			20	36	ns
关闭下降时间	tf			6	12	ns

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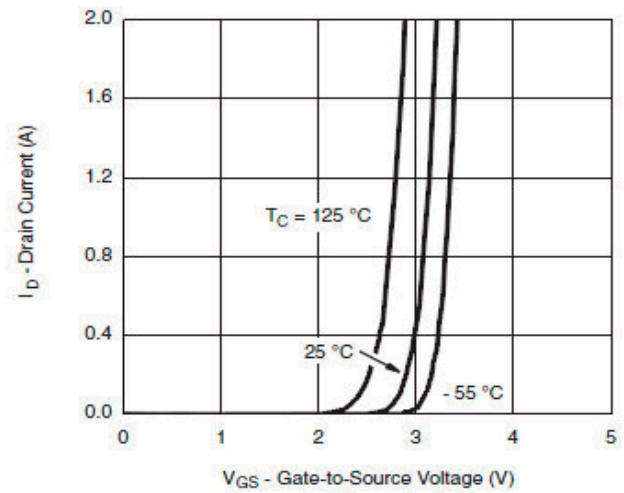
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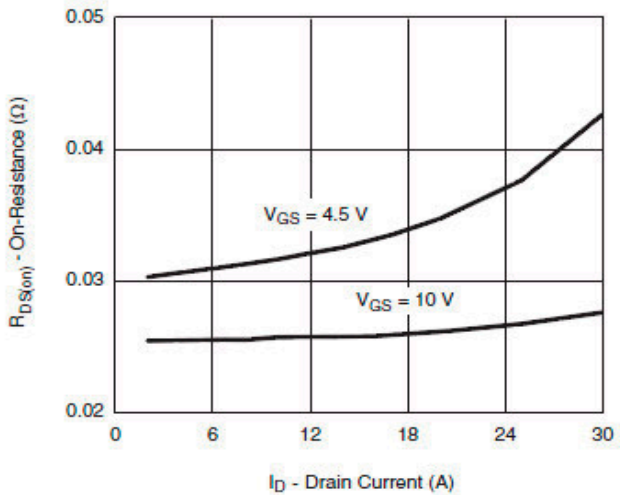
■ 标准特性曲线 (N 沟道)



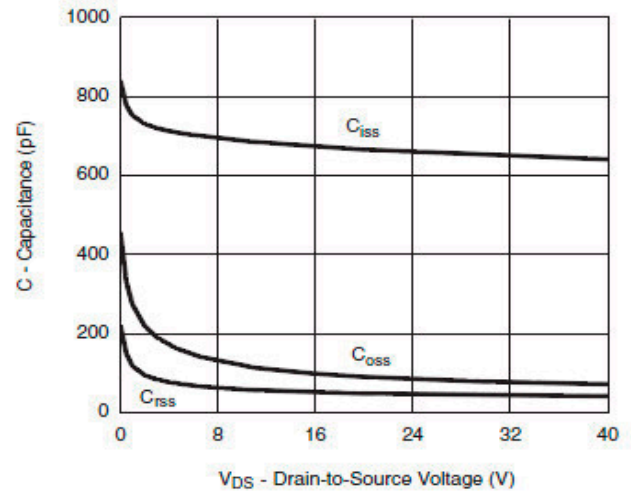
Output Characteristics



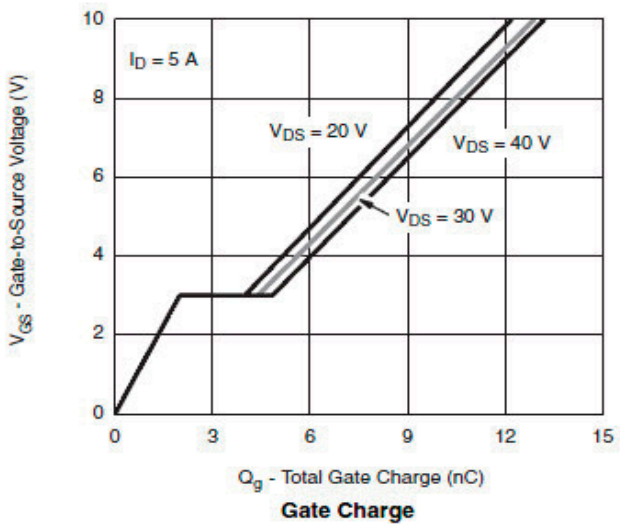
Transfer Characteristics



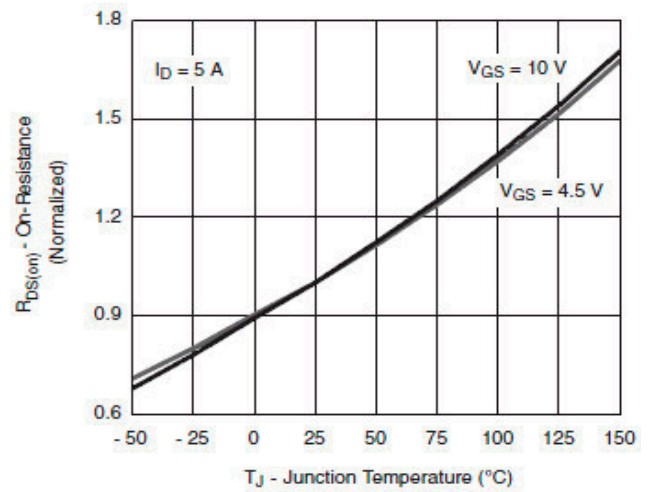
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

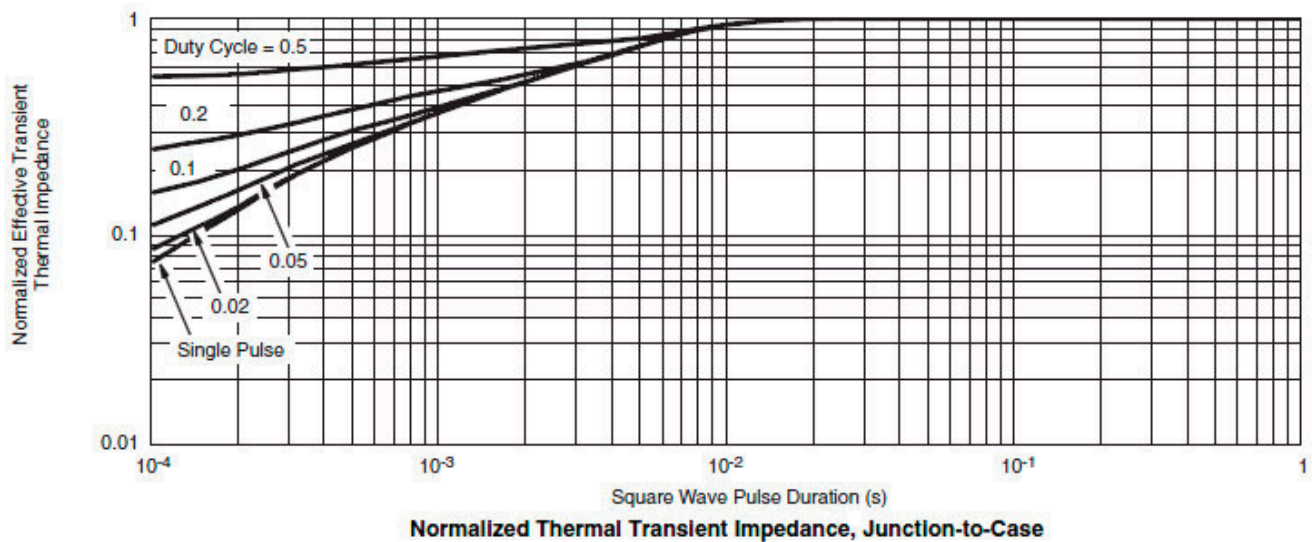
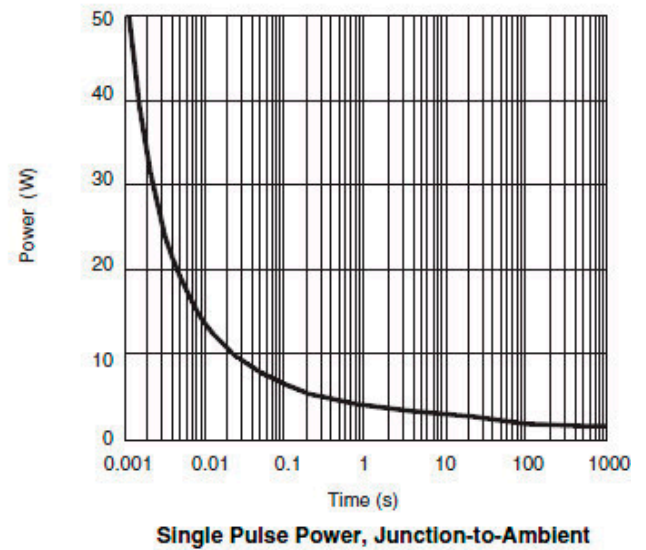
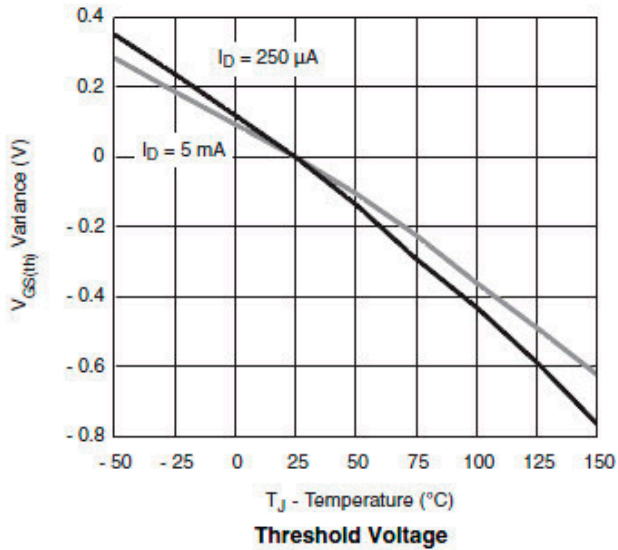
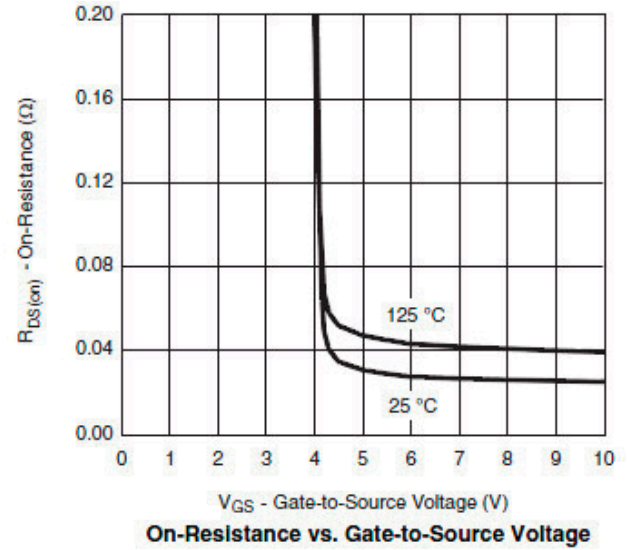
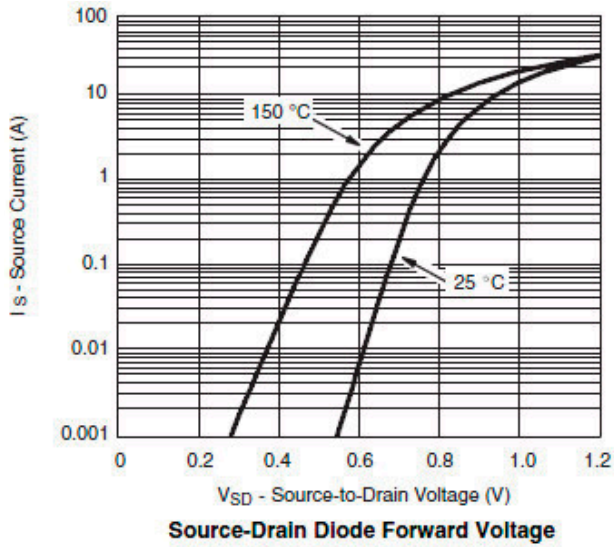


On-Resistance vs. Junction Temperature

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■电特性 (P 沟道)

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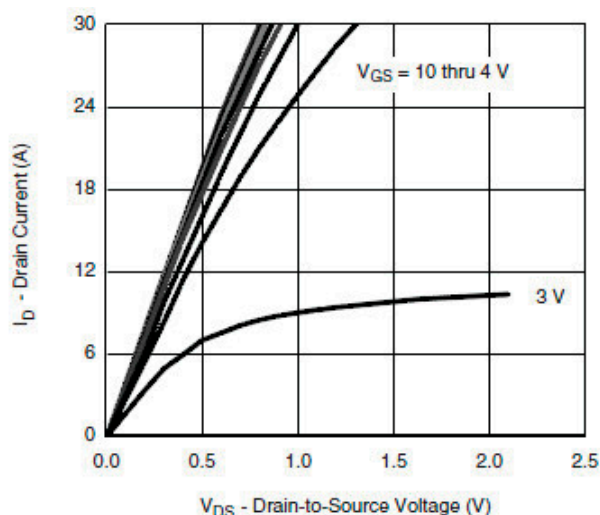
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 – 源极击穿电压	BV _{dss}	I _d =-250μA, V _{gs} =0V	-40			V
栅极接地时漏极电流	I _{dss}	V _{ds} =-32V, V _{gs} =0V			-1	μA
		Ta=85℃			-20	
栅极漏电电流	I _{gss}	V _{ds} =0V, V _{gs} = ± 20V			± 100	nA
栅极阈值电压	V _{gs(th)}	V _{ds} =V _{gs} , I _d =-250μA	-1.0		-3.0	V
导通时漏极电流	I _{d(on)}	V _{gs} =-10V, V _{ds} ≥-5V	-20			A
漏极 – 源极导通电阻	R _{ds(on)}	V _{gs} =-10V, I _d =-12A		34	45	mΩ
		V _{gs} =-4.5V, I _d =-10A		48	62	
正向跨导	G _{fs}	V _{ds} =-15V, I _d =-5.0A		20		S
二极管正向压降	V _{sd}	I _s =-2.0A, V _{gs} =0V		-0.8	-1.2	V
寄生二极管最大连续电流	I _s				-10	A
动态特性						
输入电容	C _{iss}	V _{gs} =0V, V _{ds} =-20V, f=1MHz		1100		pF
输出电容	C _{oss}			145		pF
反馈电容	C _{rss}			115		pF
开关特性						
总栅极电荷	Q _g	V _{gs} =-4.5V, V _{ds} =-20V I _d ≡-5.0A		13.0	20.0	nC
栅极 – 源极电荷	Q _{gs}			4.5		nC
栅极 – 漏极电荷	Q _{gd}			6.5		nC
导通延迟时间	t _{d(on)}	V _{gs} =-4.5V, V _{ds} =-20V I _d ≡-5.0A, R _L =4.0Ω R _{gen} =1.0Ω		40	80	ns
导通上升时间	t _r			55	100	ns
关闭延迟时间	t _{d(off)}			30	60	ns
关闭下降时间	t _f			12	20	ns

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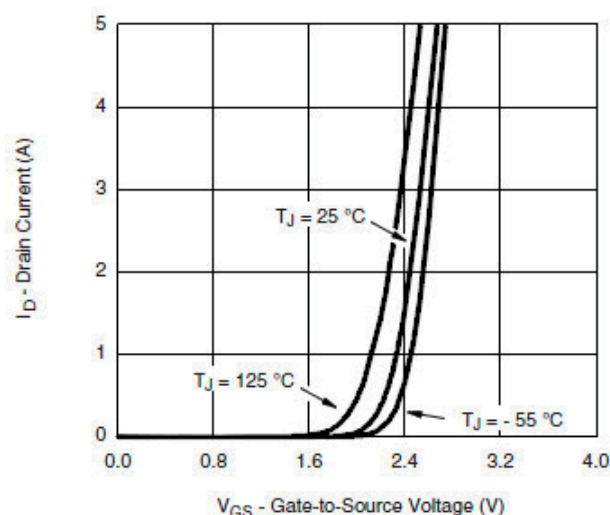
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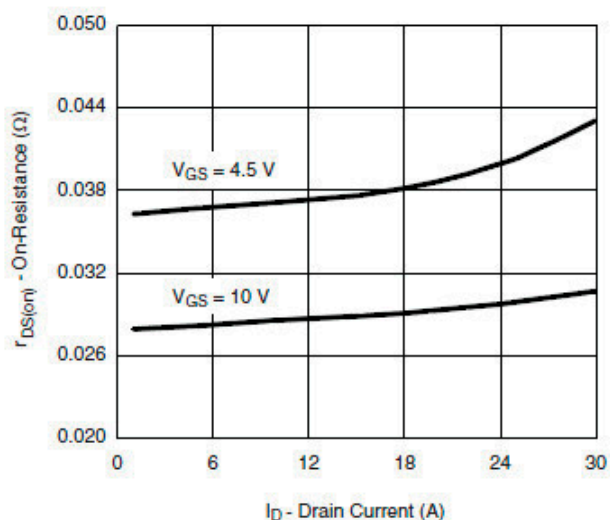
■ 标准特性曲线 (P 沟道)



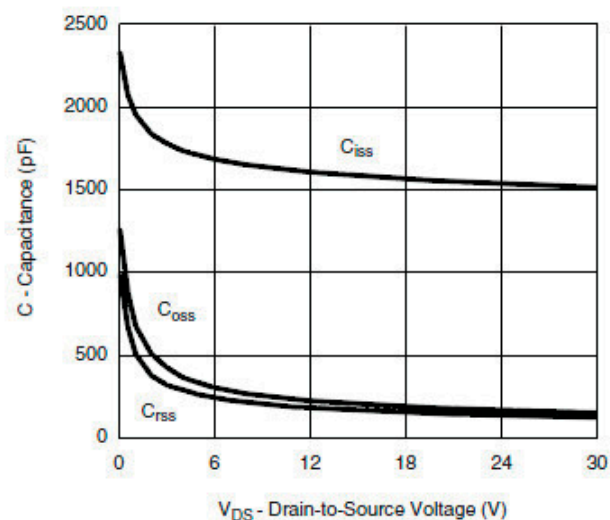
Output Characteristics



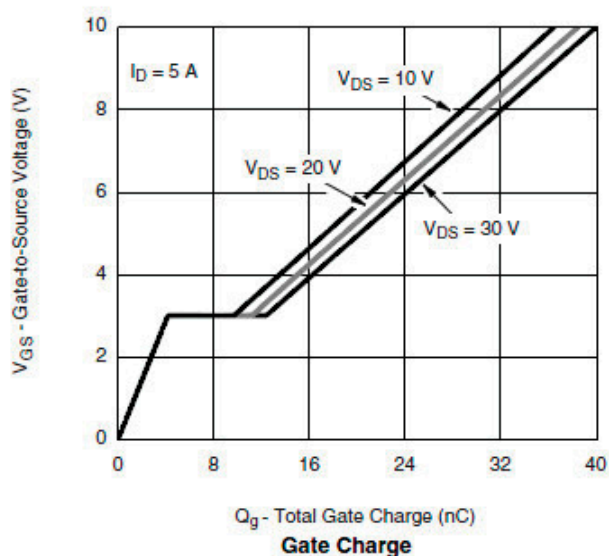
Transfer Characteristics



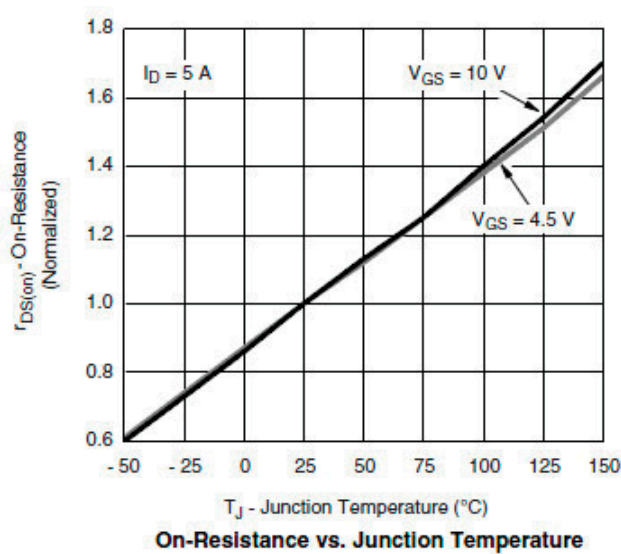
On-Resistance vs. Drain Current



Capacitance



Gate Charge

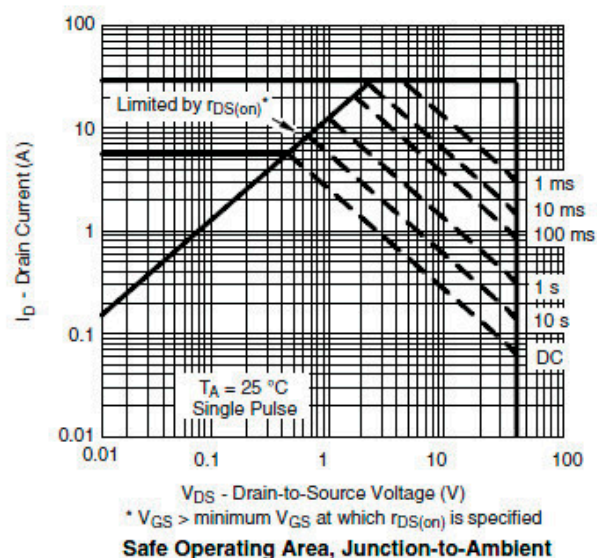
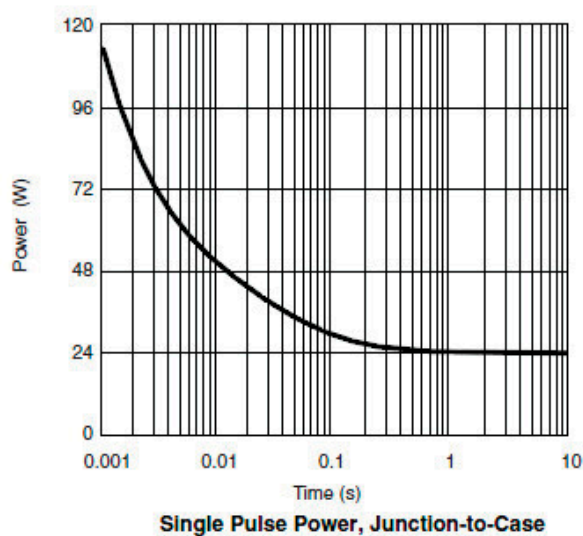
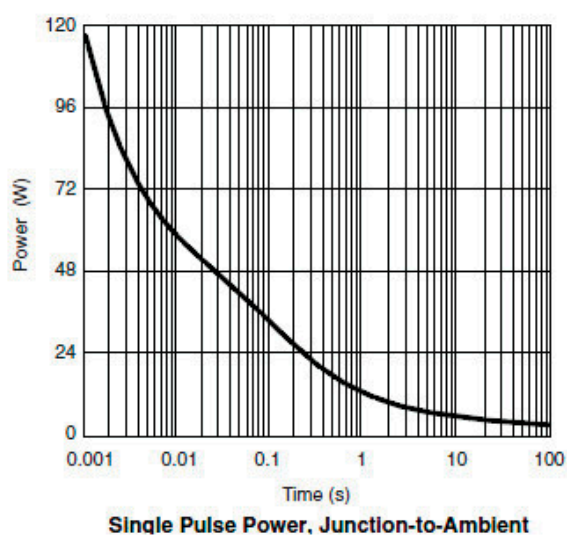
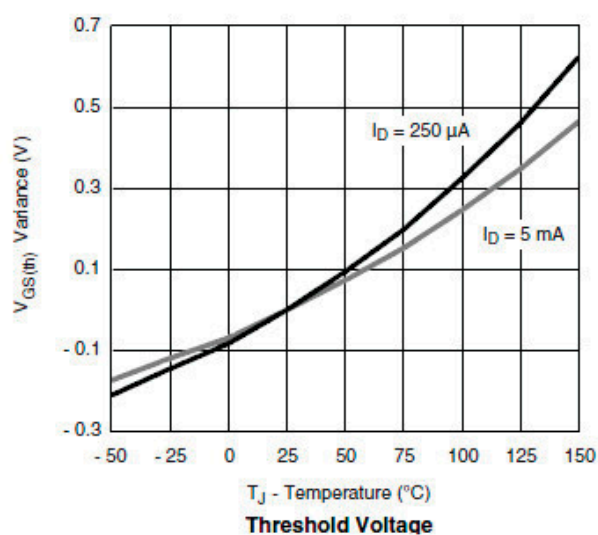
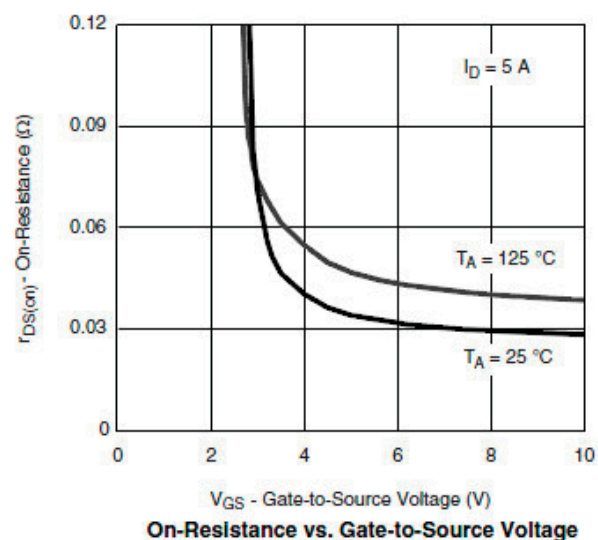
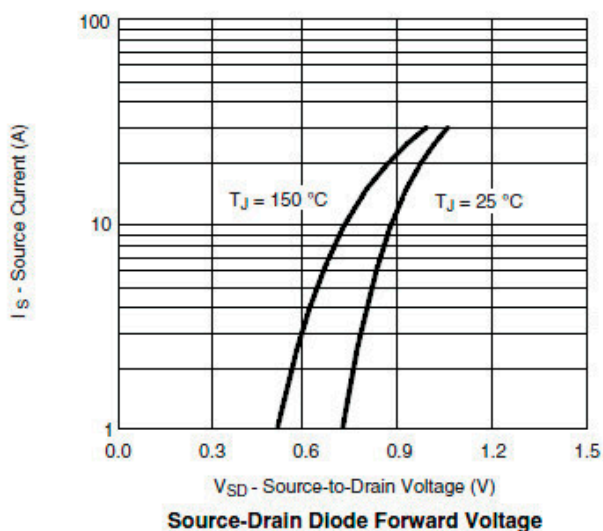


On-Resistance vs. Junction Temperature

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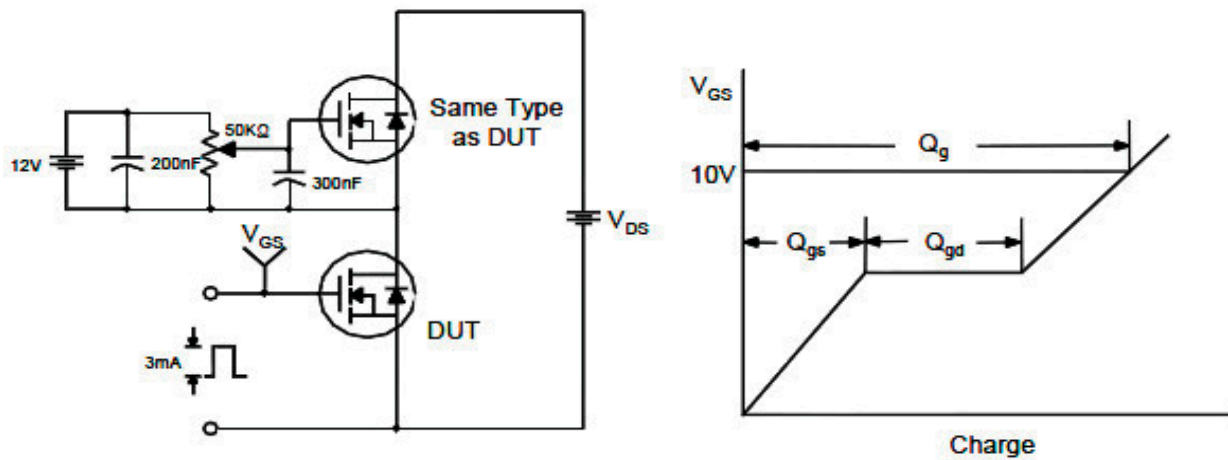
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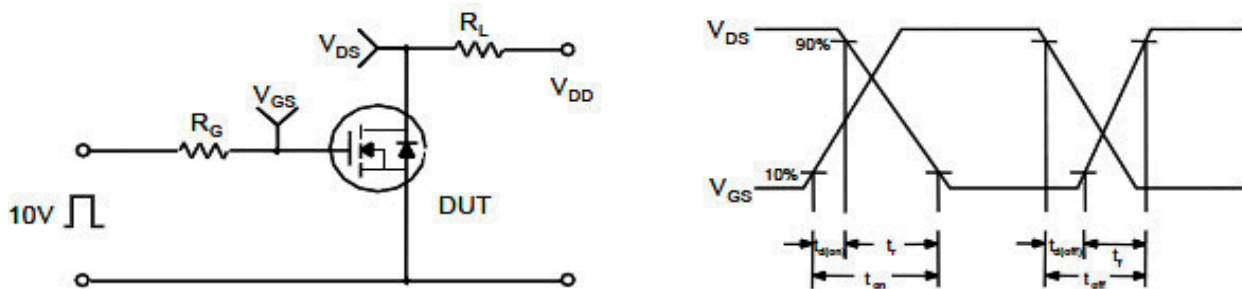
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■测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

