

复合沟道 MOSFET

ELM53366CWA-N

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

■概要

ELM53366CWA-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 |
|--|--|
| • $V_{ds}=60V$ | • $V_{ds}=-60V$ |
| • $I_d=12.0A$ | • $I_d=-8.0A$ |
| • $R_{ds(on)} = 48m\Omega (V_{gs}=10V)$ | • $R_{ds(on)} = 105m\Omega (V_{gs}=-10V)$ |
| • $R_{ds(on)} = 54m\Omega (V_{gs}=4.5V)$ | • $R_{ds(on)} = 115m\Omega (V_{gs}=-4.5V)$ |

■绝对最大额定值

如没有特别注明时, $T_a=25^{\circ}C$

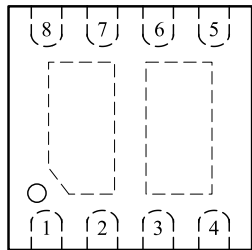
项目	记号	N 沟道 (最大值)	P 沟道 (最大值)	单位
漏极 - 源极电压	V_{ds}	60	-60	V
栅极 - 源极电压	V_{gs}	± 20	± 20	V
漏极电流 (定常) ($T_j=150^{\circ}C$)	I_d	12.0	-8.0	A
		10.0	-6.0	
漏极电流 (脉冲)	I_{dm}	30	-30	A
容许功耗	P_d	2.0	1.8	W
		1.5	1.2	
结合部温度	T_j	150	150	$^{\circ}C$
保存温度范围	T_{stg}	-55 ~ 150	-55 ~ 150	$^{\circ}C$

■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	$^{\circ}C/W$

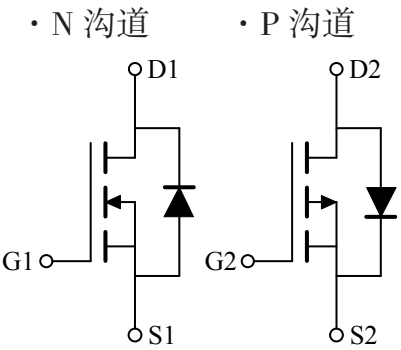
■引脚配置图

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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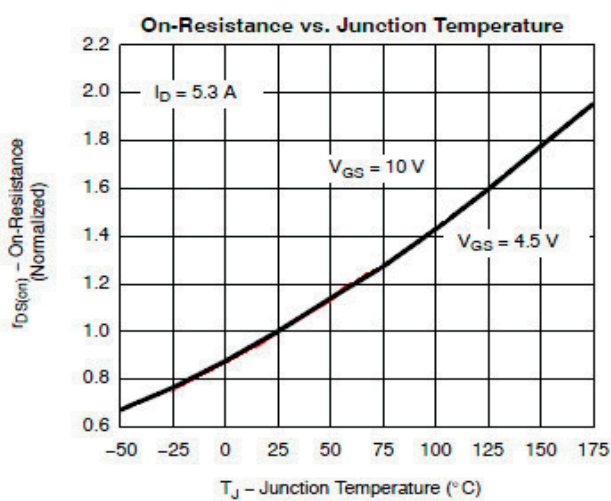
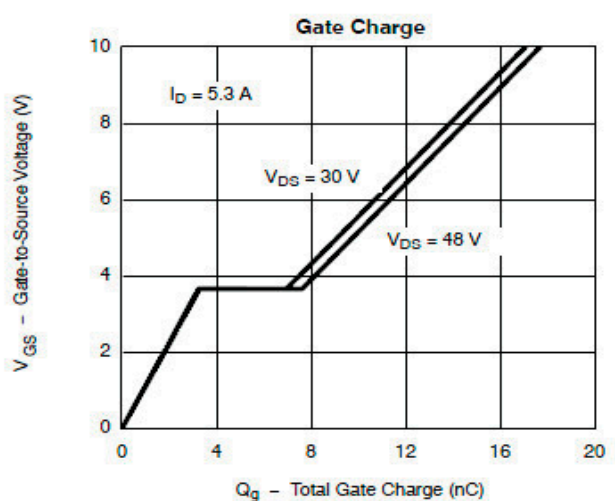
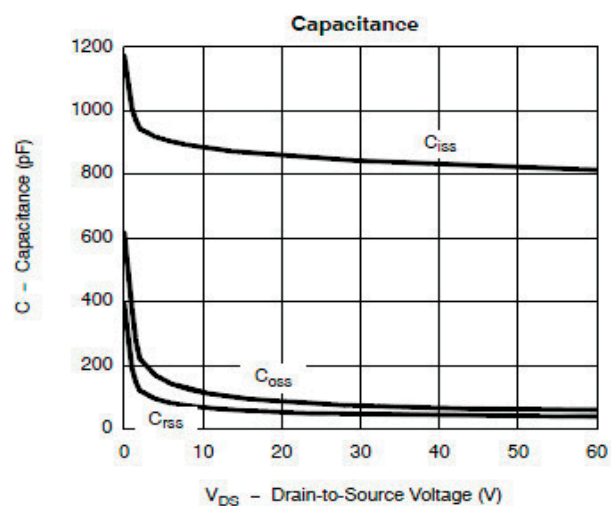
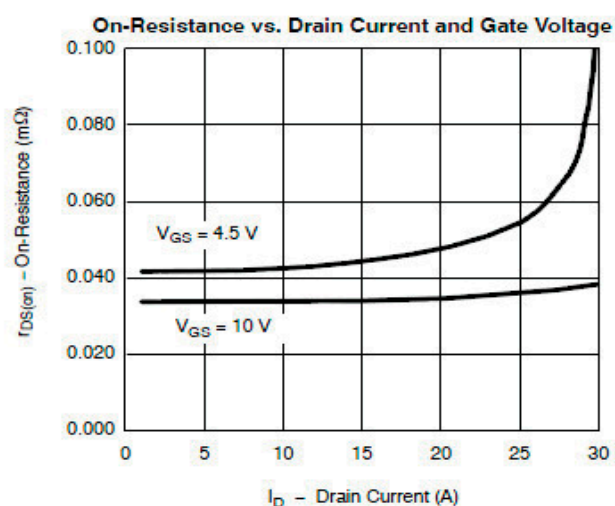
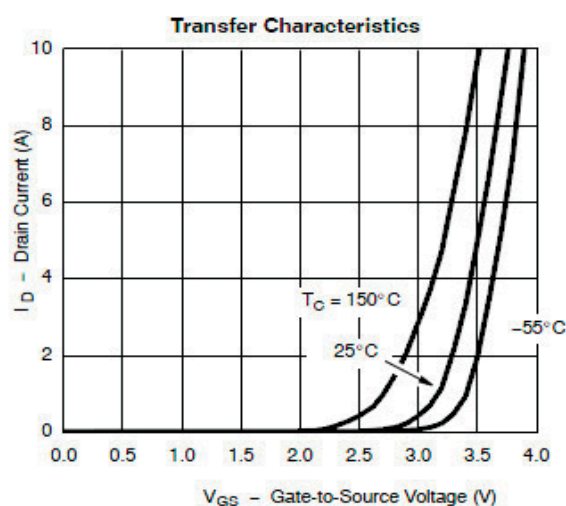
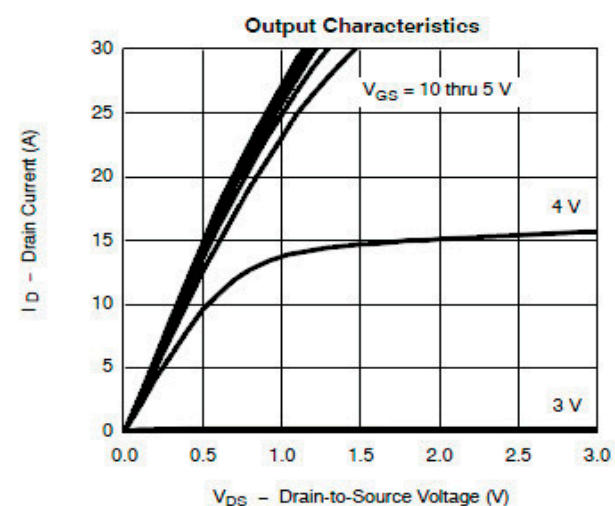
项目	记号	条件	最小值	典型值	最大值	单位	
静态特性							
漏极 – 源极击穿电压	BV _{dss}	Id=250μA, Vgs=0V		60		V	
栅极接地时漏极电流	Idss	Vds=48V, Vgs=0V			1	μA	
		Ta=85℃			5		
栅极漏电流	Igss	Vds=0V, Vgs= ± 20V			± 100	nA	
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA		0.8	2.5	V	
导通时漏极电流	Id(on)	Vgs=4.5V, Vds≥5V		30		A	
漏极 – 源极导通电阻	Rds(on)	Vgs=10V, Id=12.0A			40	48	mΩ
		Vgs=4.5V, Id=10.0A			44	54	
正向跨导	Gfs	Vds=15V, Id=5.3A			24	S	
二极管正向压降	Vsd	Is=2.0A, Vgs=0V			0.8	1.2	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=30V, f=1MHz			890	pF	
输出电容	Coss				85	pF	
反馈电容	Crss				48	pF	
开关特性							
总栅极电荷	Qg	Vgs=5V, Vds=30V, Id≐5.6A			10.0	15.0	nC
栅极 – 源极电荷	Qgs				3.5	nC	
栅极 – 漏极电荷	Qgd				3.6	nC	
导通延迟时间	td(on)	Vgs=4.5V, Vds=30V, Id≐5.0A RL=6.8Ω, Rgen=6Ω			10	15	ns
导通上升时间	tr				12	20	ns
关闭延迟时间	td(off)				25	35	ns
关闭下降时间	tf				10	15	ns

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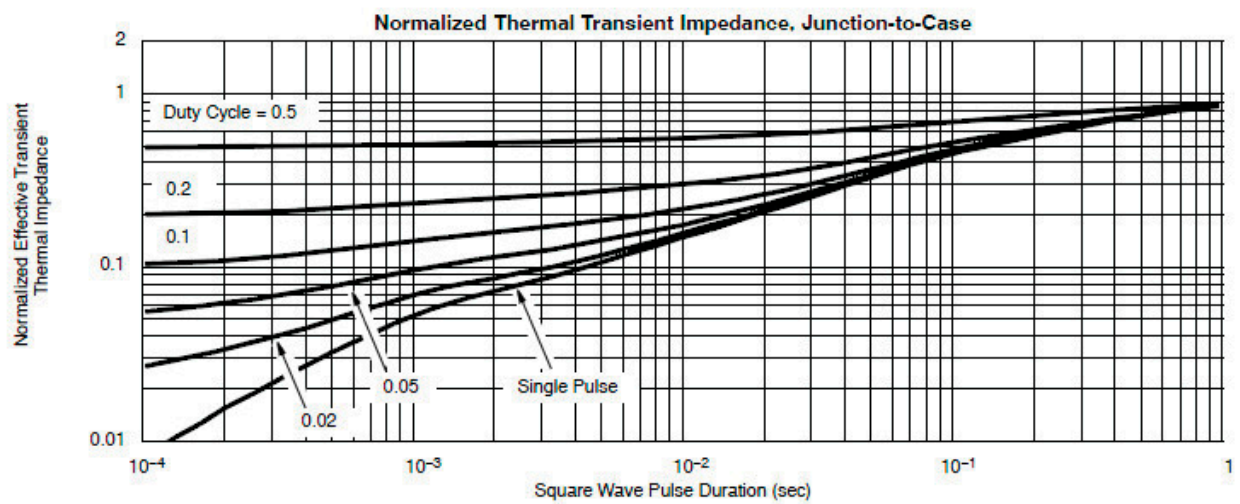
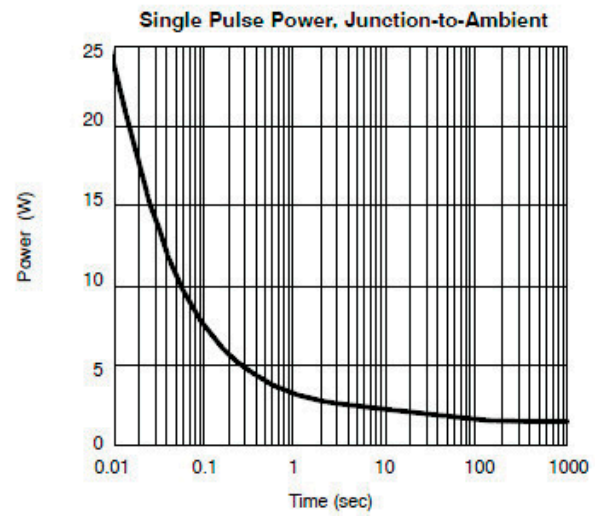
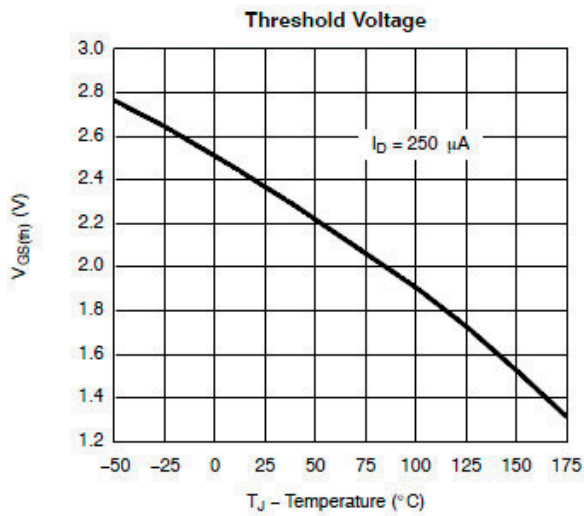
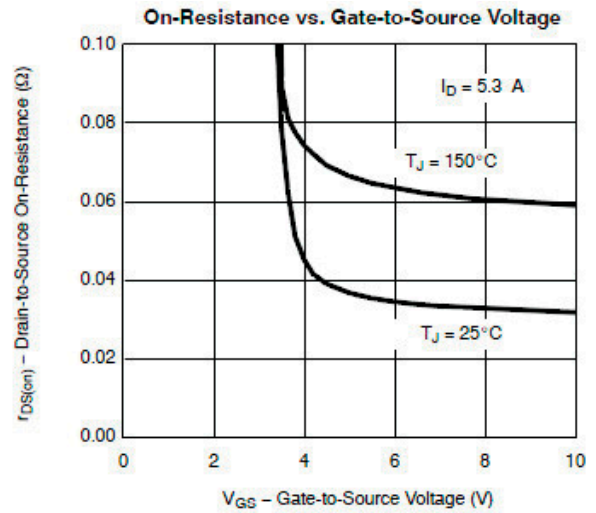
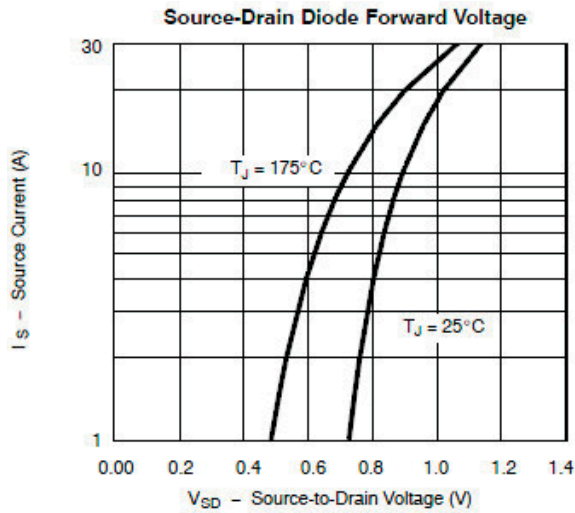
■标准特性曲线 (N 沟道)



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■电特性 (P 沟道)

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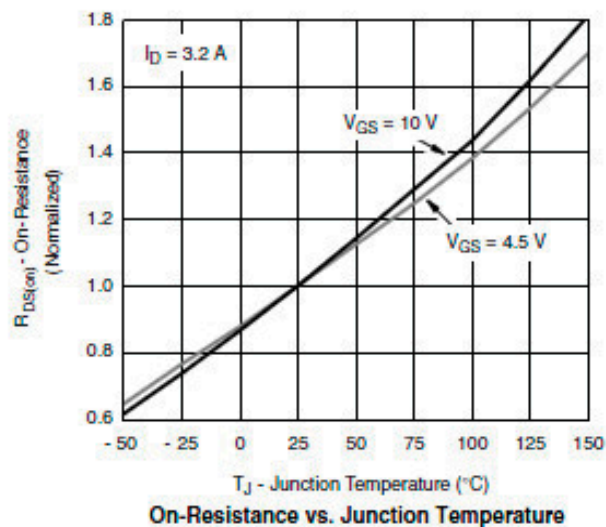
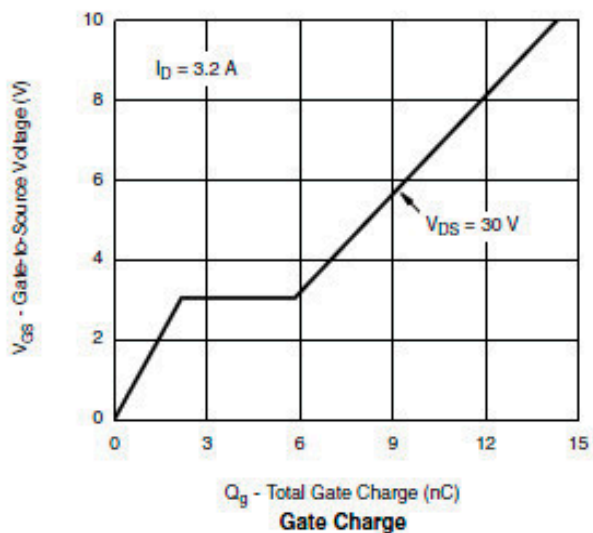
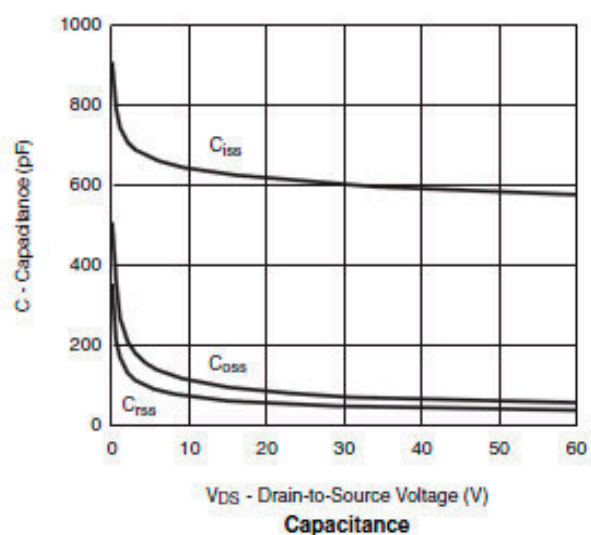
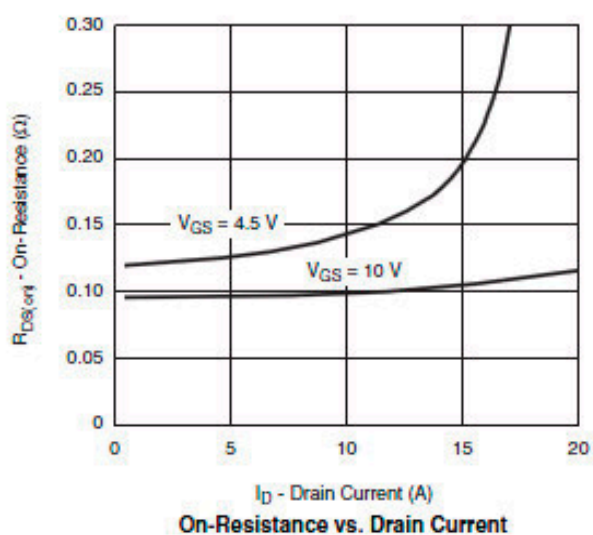
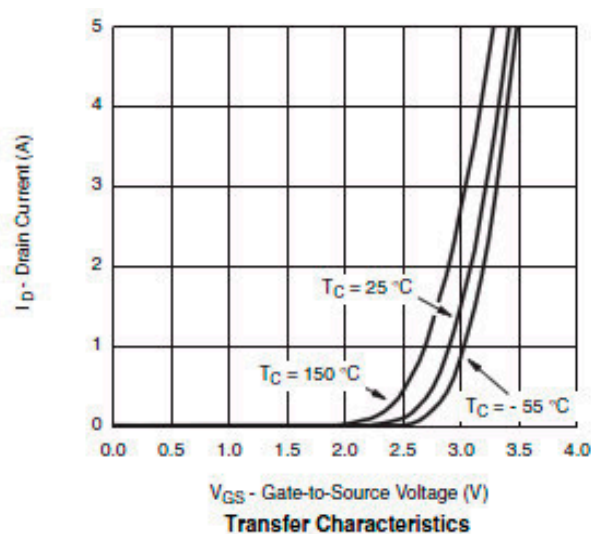
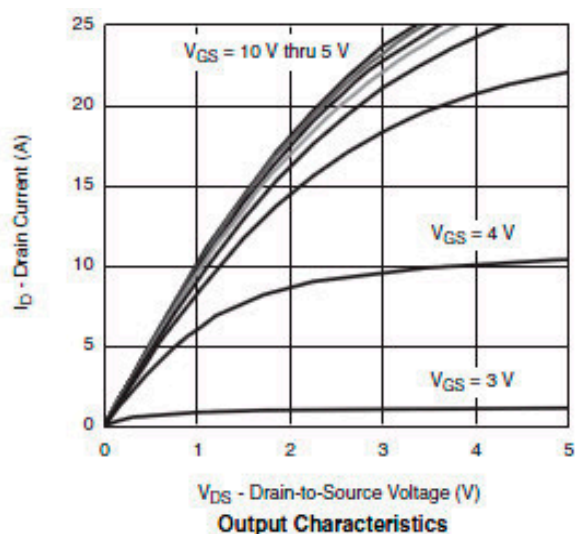
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 - 源极击穿电压	BV _{dss}	Id=-250μA, Vgs=0V		-60		V
栅极接地时漏极电流	Idss	Vds=-48V, Vgs=0V			-1	μA
		Ta=85℃			-20	
栅极漏电流	Igss	Vds=0V, Vgs= ± 20V			± 100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=-250μA		-0.8	-2.5	V
导通时漏极电流	Id(on)	Vgs=-10V, Vds≥-5V		-20		A
漏极 - 源极导通电阻	Rds(on)	Vgs=-10V, Id=-8A			96	mΩ
		Vgs=-4.5V, Id=-6A			104	
正向跨导	Gfs	Vds=-15V, Id=-3.2A			12	S
二极管正向压降	Vsd	Is=-2.0A, Vgs=0V			-0.8	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=-30V, f=1MHz		900		pF
输出电容	Coss			90		pF
反馈电容	Crss			40		pF
开关特性						
总栅极电荷	Qg	Vgs=-10V, Vds=-30V, Id≡-4.0A		12.0	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=-30V Id≡-3.0A, RL=7.5Ω Rgen=3.0Ω		10	20	ns
导通上升时间	tr			6	10	ns
关闭延迟时间	td(off)			30	45	ns
关闭下降时间	tf			12	25	ns

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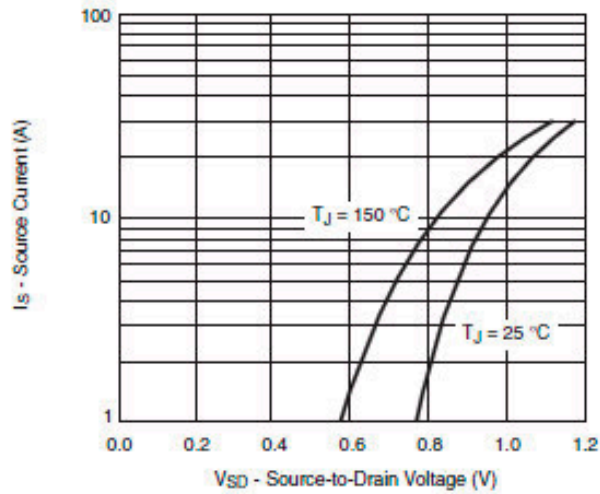
■标准特性曲线 (P 沟道)



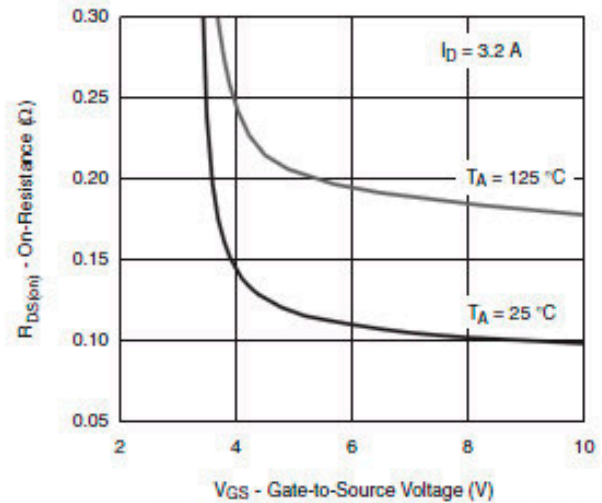
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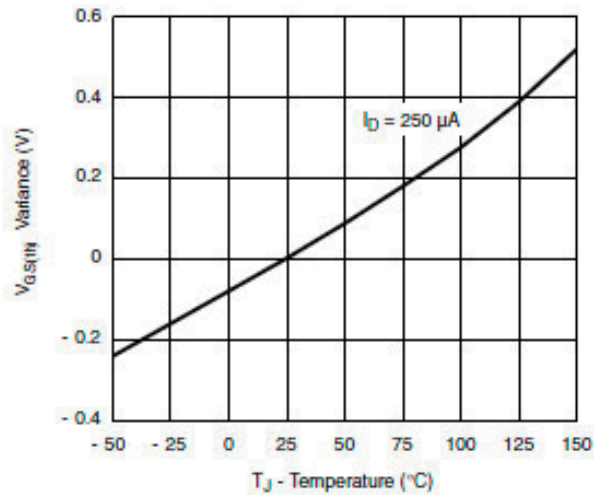
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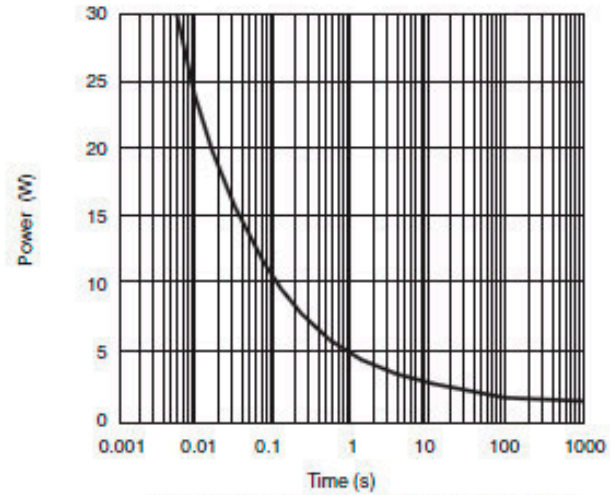
Source-Drain Diode Forward Voltage



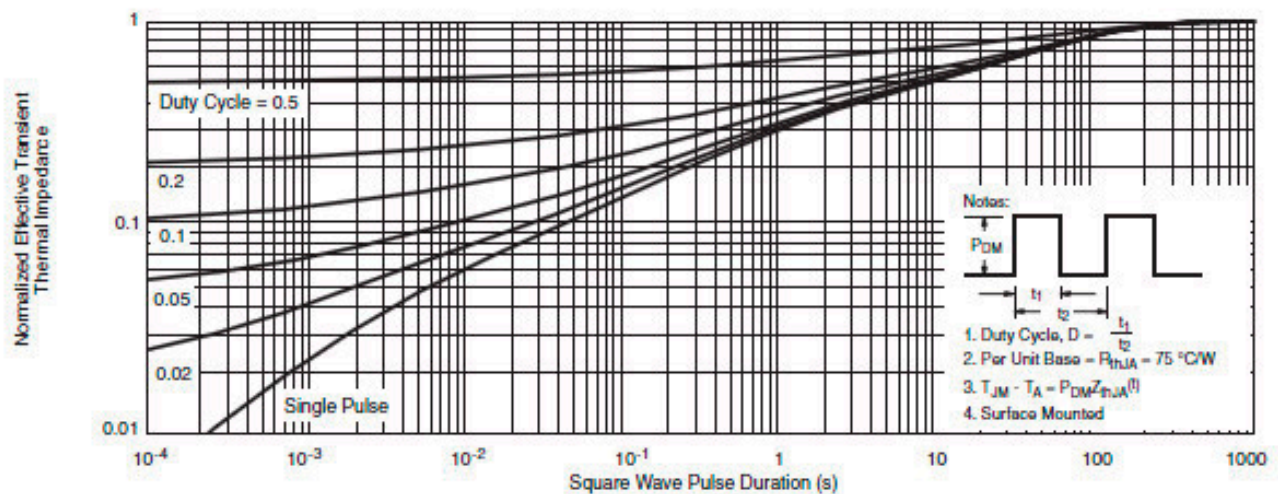
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

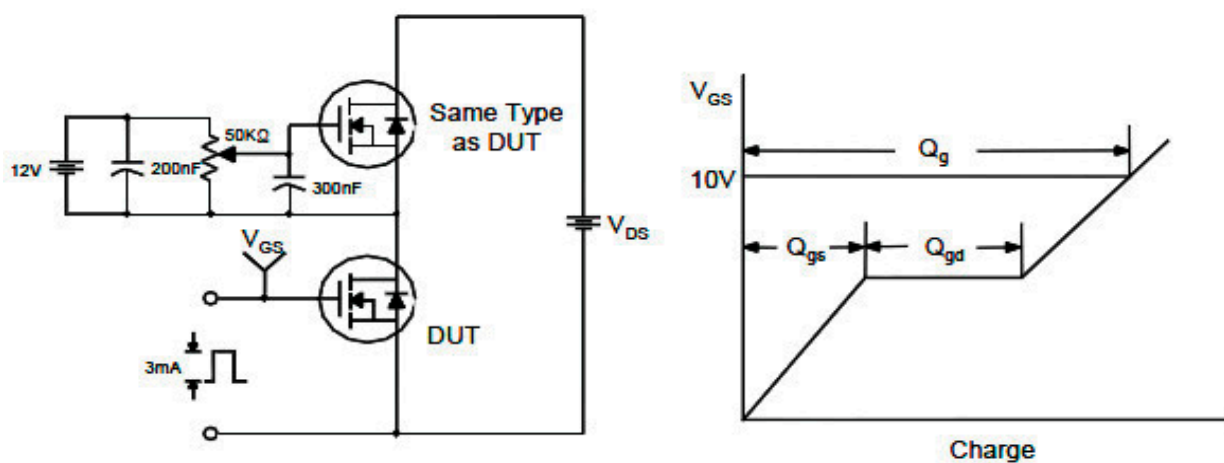
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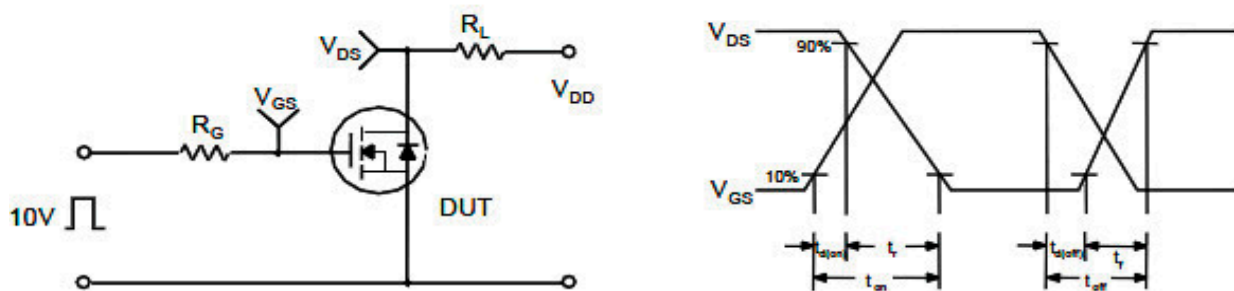
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■测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

