

复合沟道 MOSFET

ELM54599CWA-N

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

■概要

ELM54599CWA-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 |
| • Vds=40V | • Vds=-40V |
| • Id=8.0A | • Id=-7.2A |
| • Rds(on) = 22mΩ (Vgs=10V) | • Rds(on) = 42mΩ (Vgs=-10V) |
| • Rds(on) = 28mΩ (Vgs=4.5V) | • Rds(on) = 60mΩ (Vgs=-4.5V) |

■绝对最大额定值

如没有特别注明时, Ta=25℃

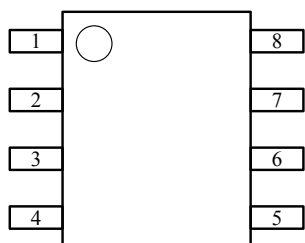
项目	记号	N 沟道 (最大值)	P 沟道 (最大值)	单位	
漏极 - 源极电压	Vds	40	-40	V	
栅极 - 源极电压	Vgs	± 20	± 20	V	
漏极电流 (定常) (Tj=150℃)	Id	Ta=25℃	8.0	-7.2	A
		Ta=70℃	6.0	-6.2	
漏极电流 (脉冲)	Idm	25	-25	A	
容许功耗	Pd	Tc=25℃	2.8	2.8	W
		Tc=70℃	1.8	1.8	
结合部温度	Tj	150	150	℃	
保存温度范围	Tstg	-55 ~ 150	-55 ~ 150	℃	

■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		62.5	℃/W
最大结合部 - 环境热阻	Rθja	P		62.5	℃/W

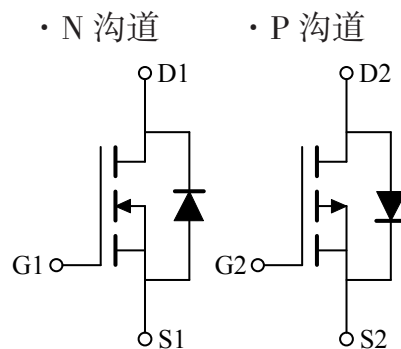
■引脚配置图

SOP-8(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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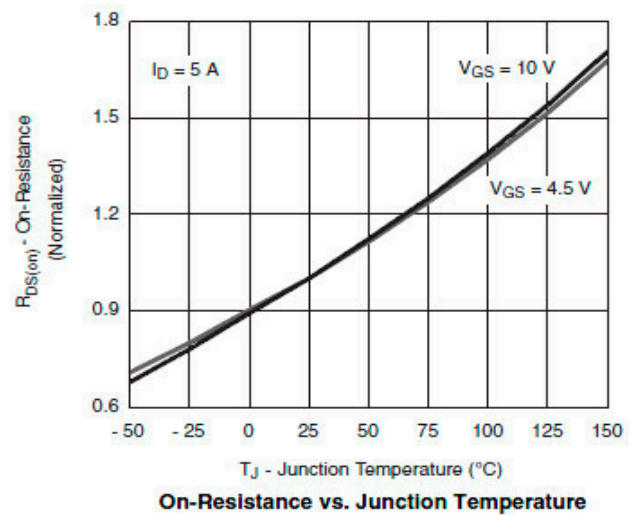
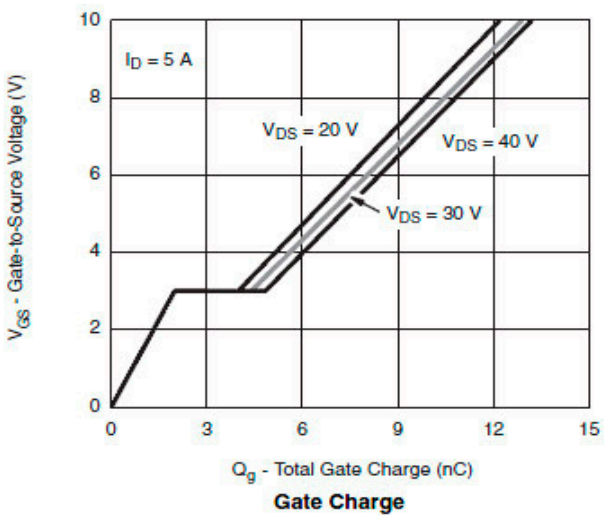
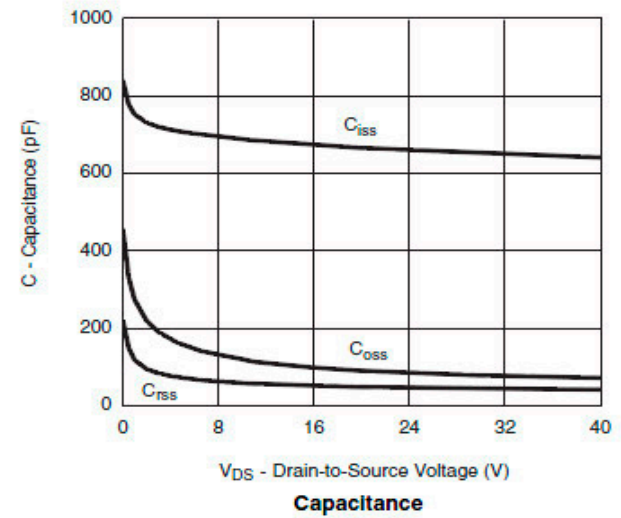
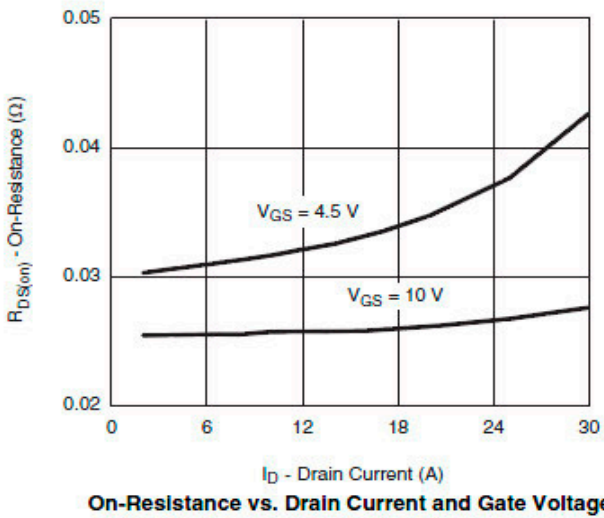
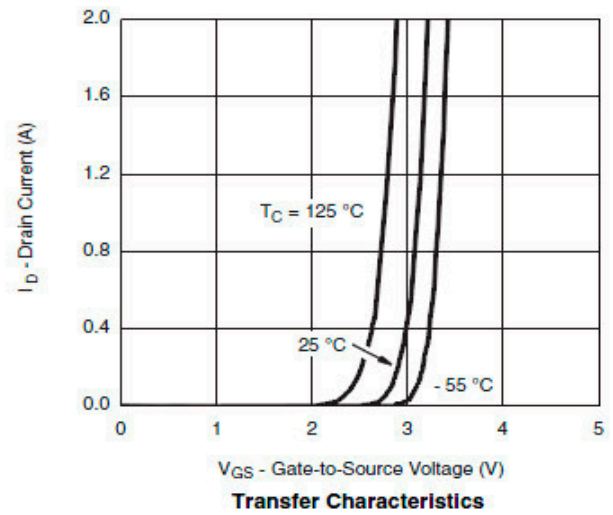
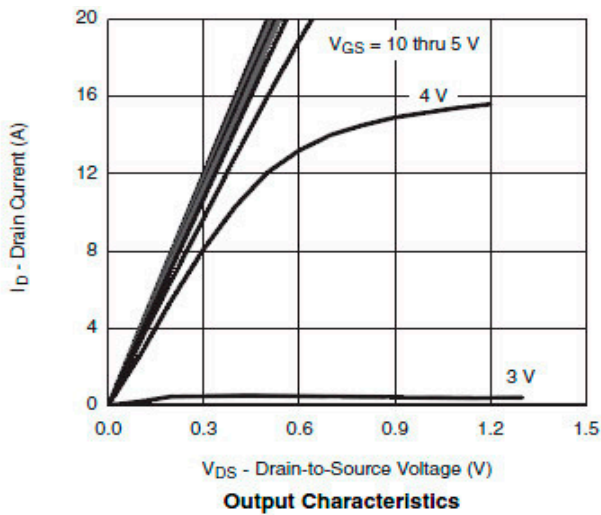
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 - 源极击穿电压	BVdss	Id=250μA, Vgs=0V	40			V
栅极接地时漏极电流	Idss	Vds=32V, Vgs=0V Ta=85℃			1	μA
					10	
栅极漏电电流	Igss	Vds=0V, Vgs=±20V			±100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA	1.0		3.0	V
导通时漏极电流	Id(on)	Vgs=10V, Vds≥5V	20			A
漏极 - 源极导通电阻	Rds(on)	Vgs=10V, Id=8.0A		16	22	mΩ
		Vgs=4.5V, Id=6.0A		20	28	
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				1.5	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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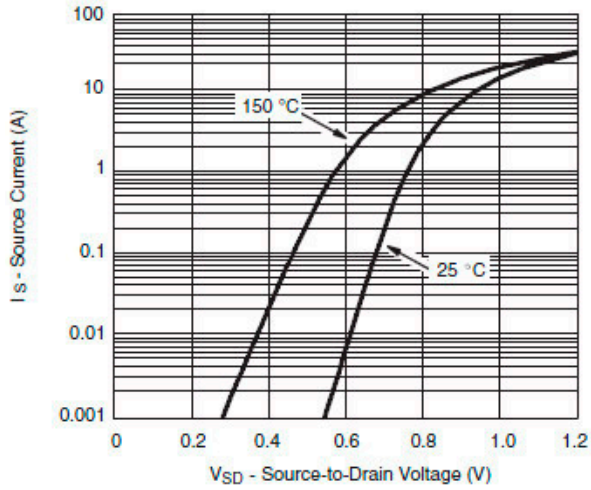
标准特性曲线 (N 沟道)



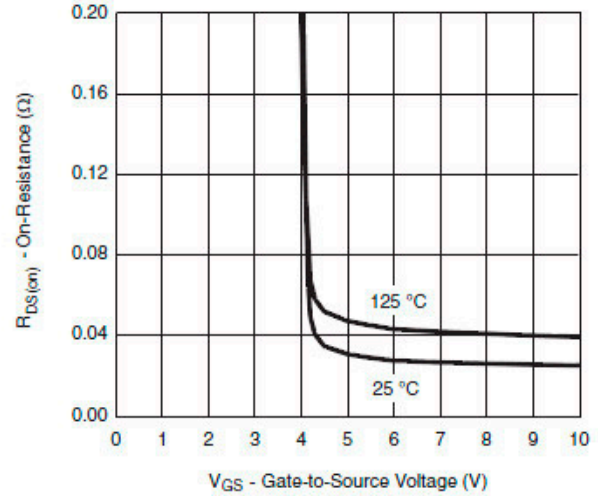
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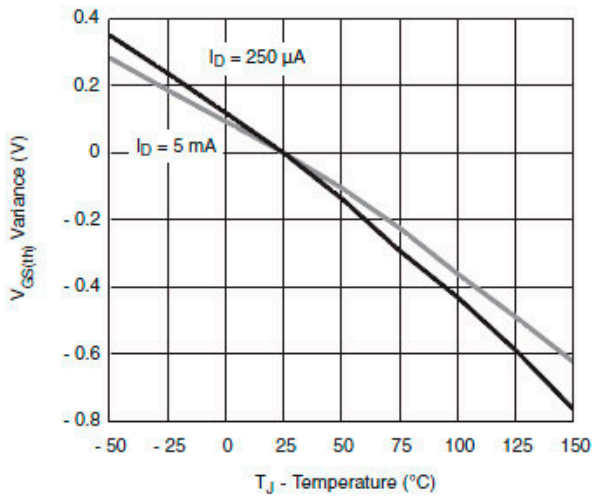
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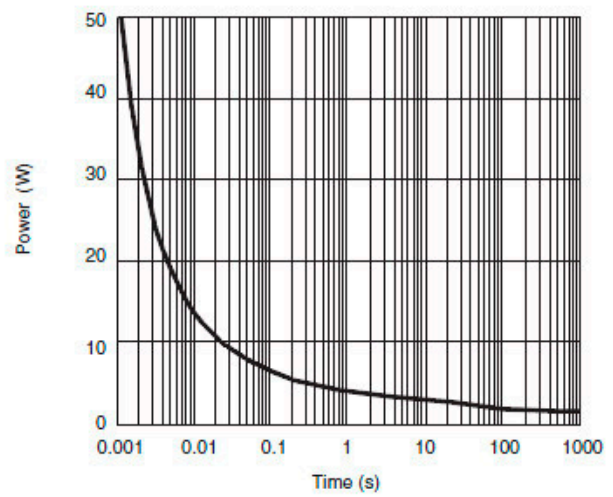
Source-Drain Diode Forward Voltage



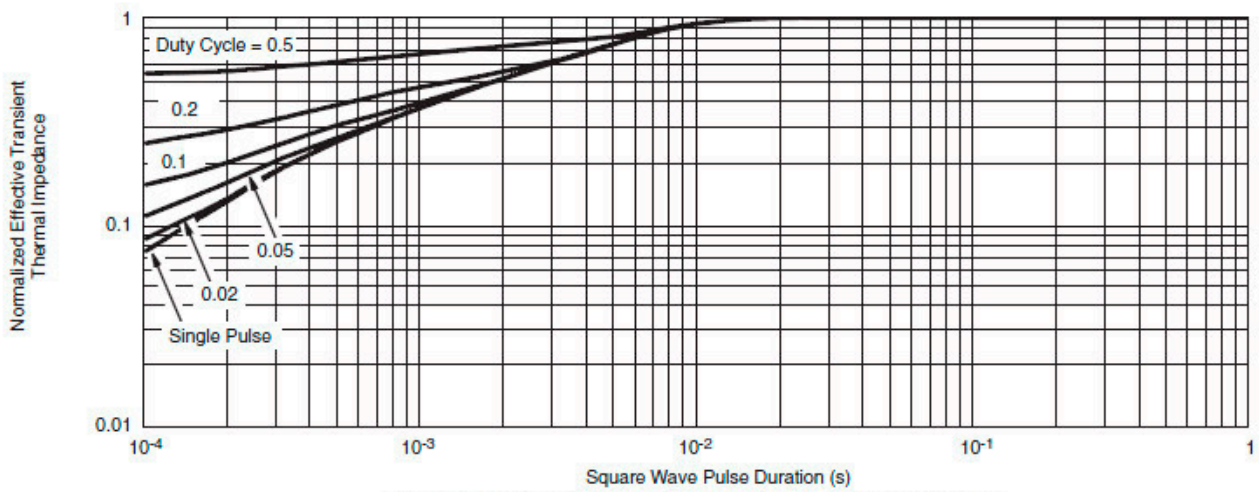
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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■电特性 (P 沟道)

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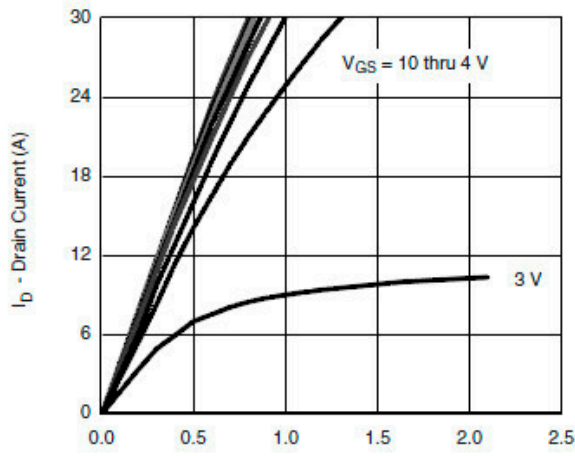
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 - 源极击穿电压	BVdss	Id=-250μA, Vgs=0V	-40			V
栅极接地时漏极电流	Idss	Vds=-32V, Vgs=0V Ta=85℃			-1	μA
					-20	
栅极漏电流	Igss	Vds=0V, Vgs=±20V			±100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-3.0	V
导通时漏极电流	Id(on)	Vgs=-10V, Vds≥-5V	-20			A
漏极 - 源极导通电阻	Rds(on)	Vgs=-10V, Id=-7.2A		34	42	mΩ
		Vgs=-4.5V, Id=-6.2A		50	60	
正向跨导	Gfs	Vds=-15V, Id=-5.0A		20		S
二极管正向压降	Vsd	Is=-2A, Vgs=0V		-0.8	-1.2	V
寄生二极管最大连续电流	Is				-1.7	A
动态特性						
输入电容	Ciss	Vgs=0V, Vds=-20V, f=1MHz		1100		pF
输出电容	Coss			145		pF
反馈电容	Crss			115		pF
开关特性						
总栅极电荷	Qg	Vgs=-4.5V, Vds=-20V, Id≐-5A		13.0	20.0	nC
栅极 - 源极电荷	Qgs			4.5		nC
栅极 - 漏极电荷	Qgd			6.5		nC
导通延迟时间	td(on)	Vgs=-4.5V, Vds=-20V Id≐-5A, RL=4Ω		40	80	ns
导通上升时间	tr			55	100	ns
关闭延迟时间	td(off)	Rgen=1Ω		30	60	ns
关闭下降时间	tf			12	20	ns

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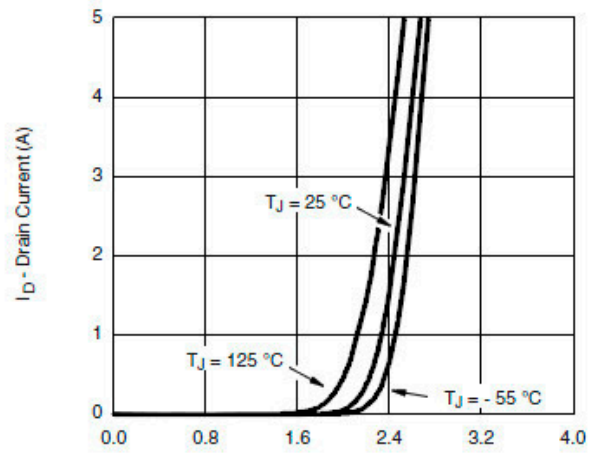
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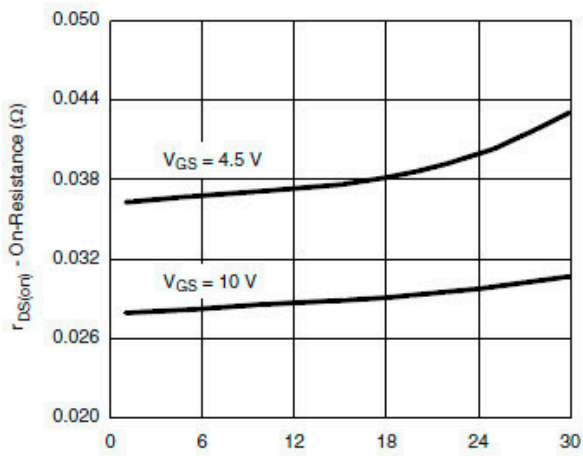
■ 标准特性曲线 (P 沟道)



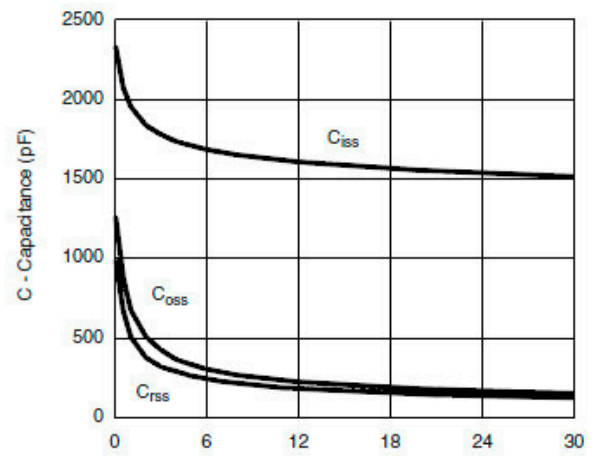
Output Characteristics



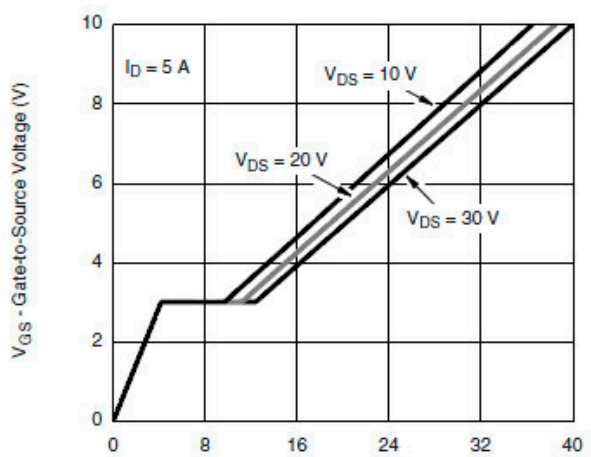
Transfer Characteristics



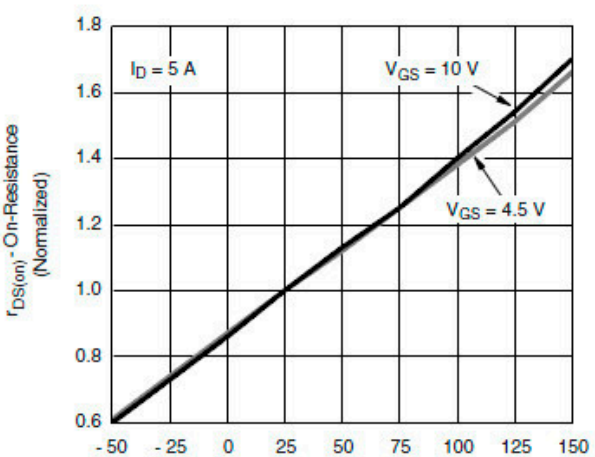
On-Resistance vs. Drain Current



Capacitance



Gate Charge

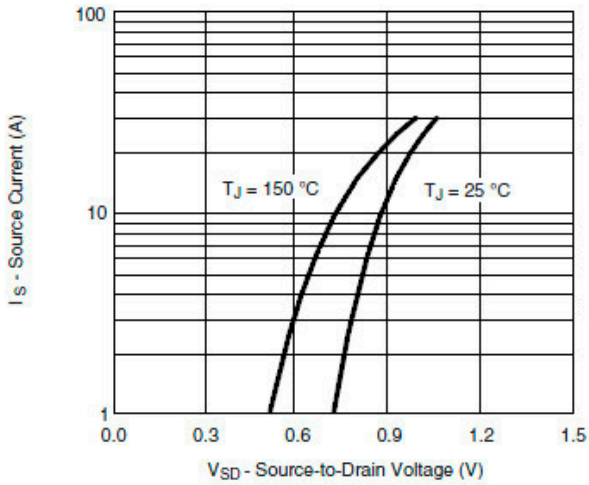


On-Resistance vs. Junction Temperature

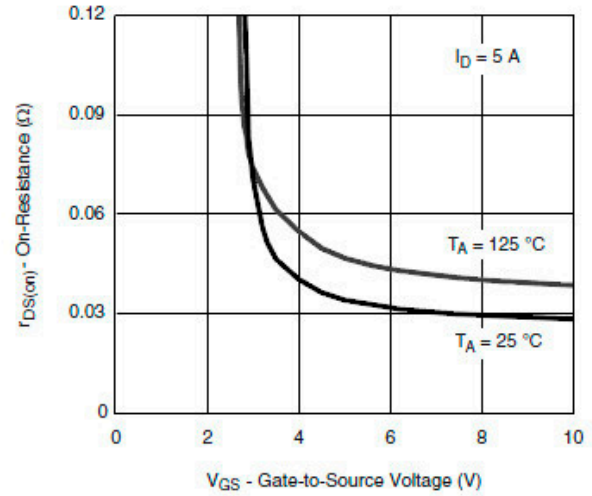
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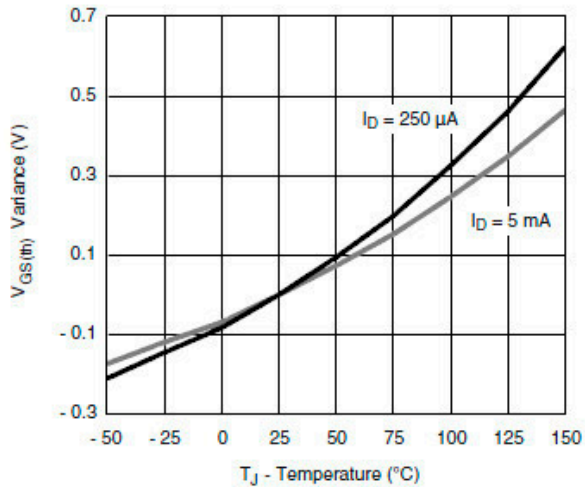
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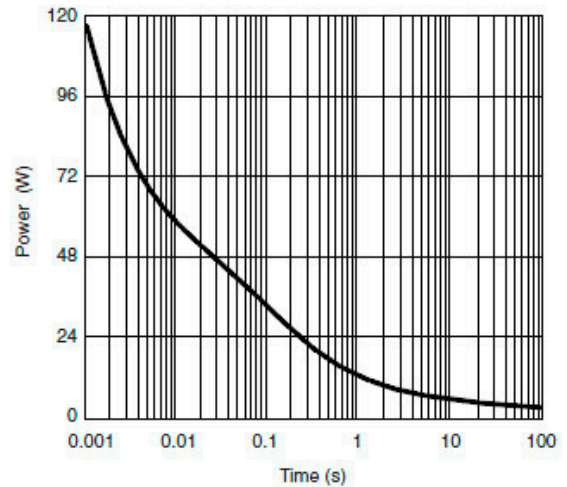
Source-Drain Diode Forward Voltage



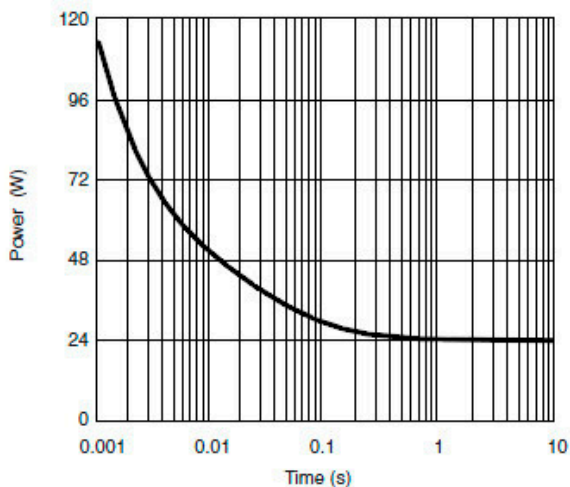
On-Resistance vs. Gate-to-Source Voltage



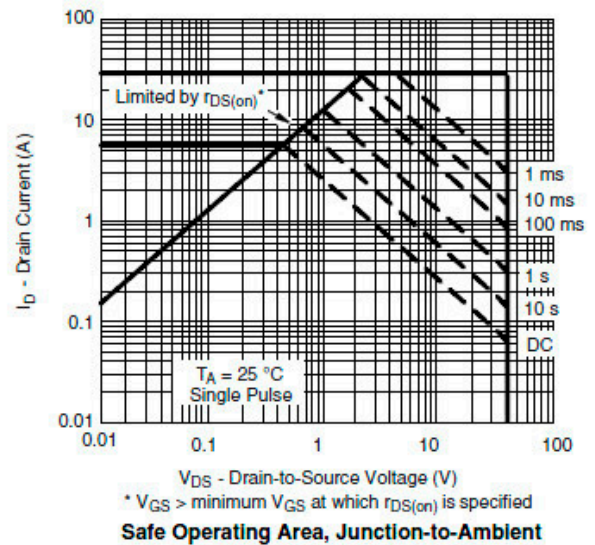
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Single Pulse Power, Junction-to-Case



Safe Operating Area, Junction-to-Ambient

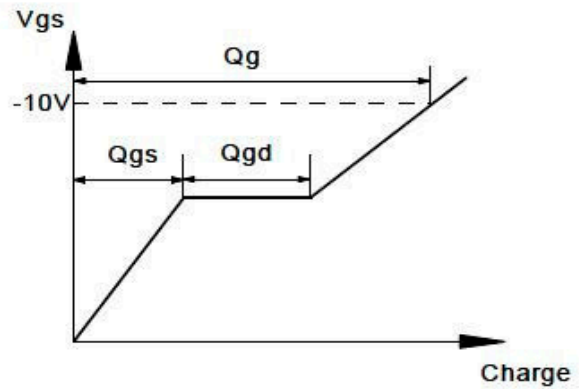
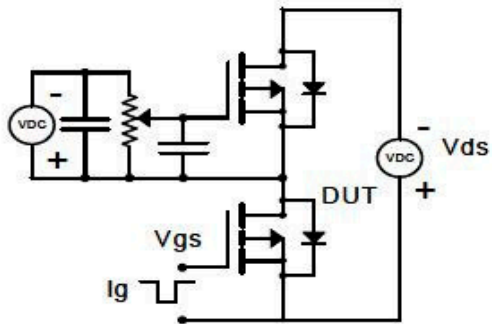
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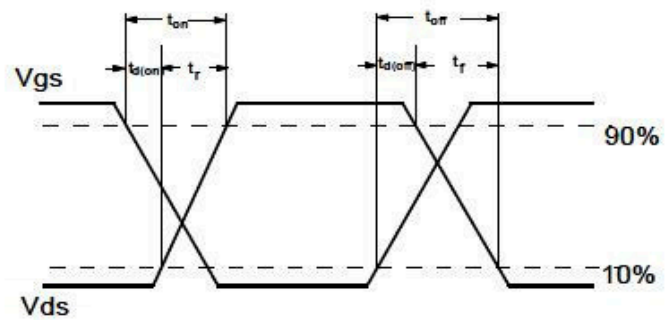
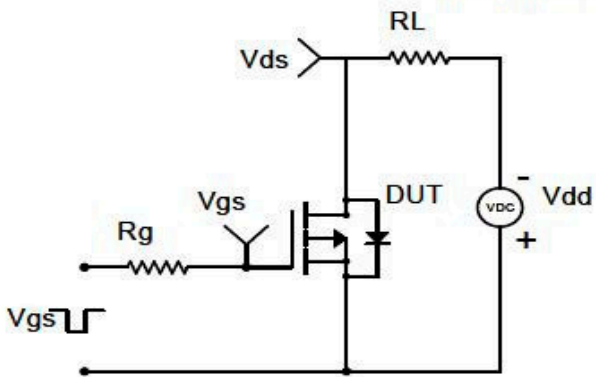
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测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

