

双 N 沟道 MOSFET

ELM54910WA-N

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

■概要

ELM54910WA-N 是 N 沟道低输入电容、低工作电压、低导通电阻的大电流 MOSFET，内藏有两个 MOSFET。

■特点

N1 沟道：

- $V_{ds}=40V$
- $I_d=10.0A$
- $R_{ds(on)} = 19m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} = 25m\Omega$ ($V_{gs}=4.5V$)

N2 沟道：

- $V_{ds}=40V$
- $I_d=10.0A$
- $R_{ds(on)} = 10m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} = 12m\Omega$ ($V_{gs}=4.5V$)

■绝对最大额定值

如没有特别注明时, $T_a=25^\circ C$

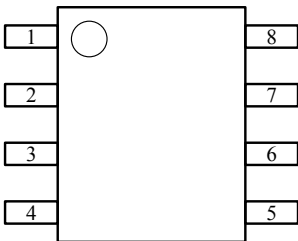
项目		记号	规格范围		单位
			N1	N2	
漏极 - 源极电压		Vds	40	40	V
栅极 - 源极电压		Vgs	± 20	± 20	V
漏极电流（定常）Tj=150℃	Ta=25℃	Id	10.0	10.0	A
	Ta=70℃		8.0	8.0	
漏极电流（脉冲）		Idm	20	30	A
崩溃电流	L=0.1mH	Ias	10	20	A
持续崩溃能量		Eas	5	10	mJ
容许功耗	Tc=25℃	Pd	2.8		W
	Tc=70℃		1.8		
动作结合部温度		Tj	150		℃
保存温度范围		Tstg	-55 ~ 150		℃

■热特性

项目	记号	典型值	最大值	单位
最大结合部 - 环境热阻	$R_{\theta ja}$		62.5	$^\circ C/W$

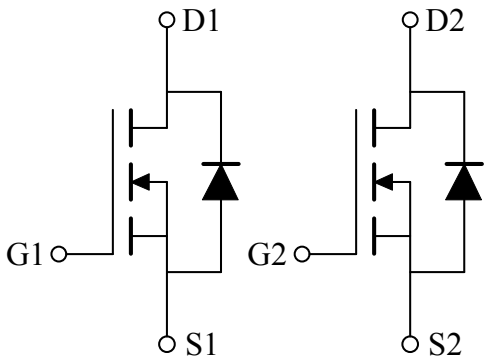
■引脚配置图

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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■ N1 电特性

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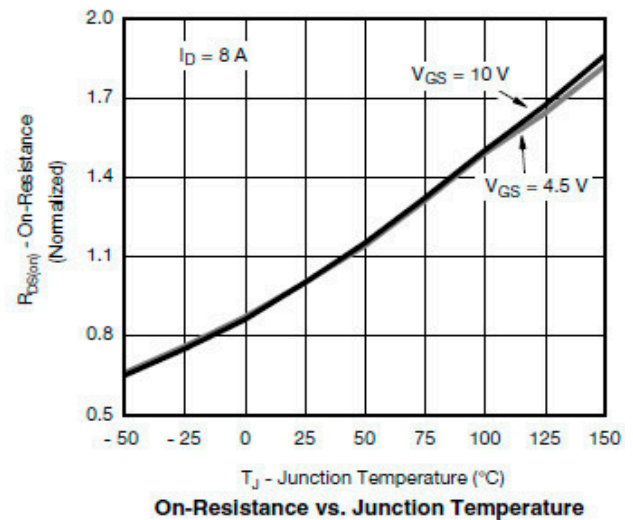
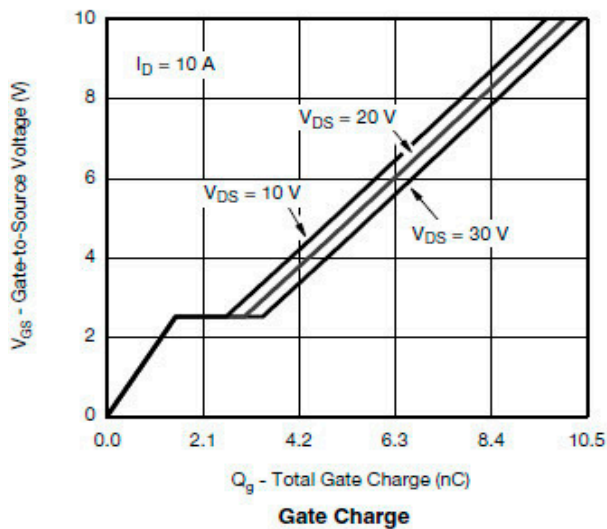
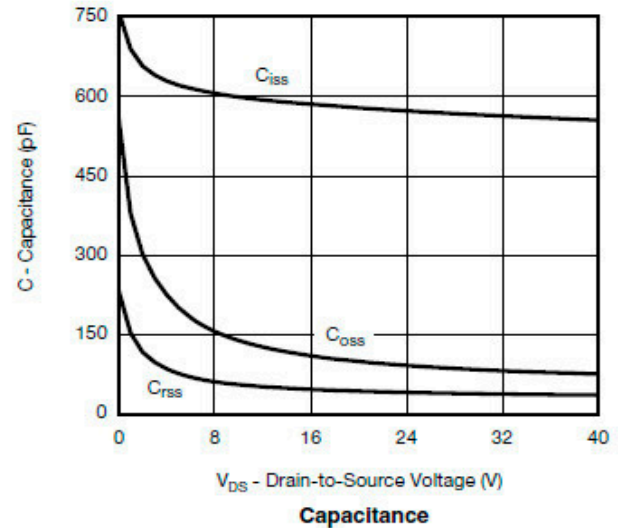
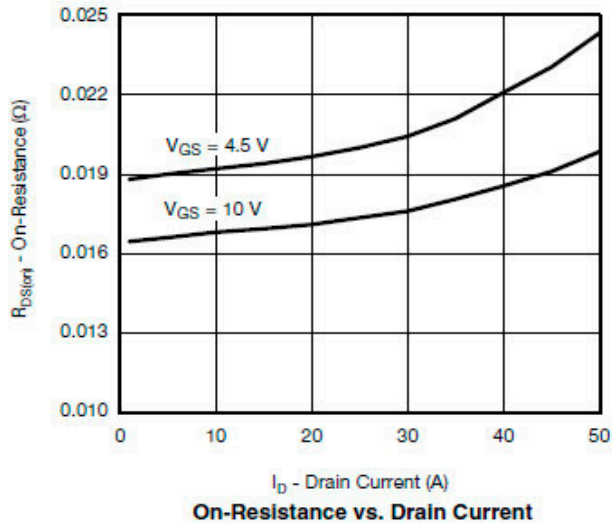
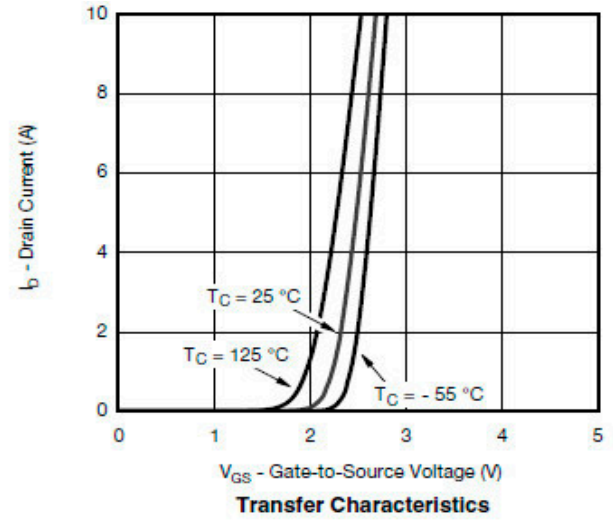
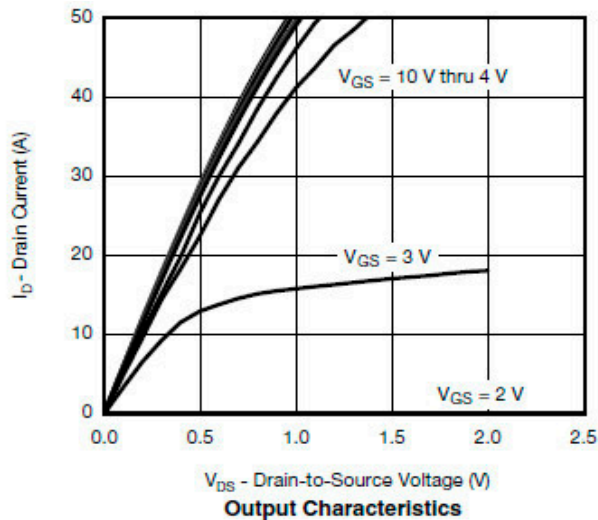
项目	记号	条件	最小值	典型值	最大值	单位
静态特性						
漏极 – 源极击穿电压	BVdss	Id=250μA, Vgs=0V	40			V
栅极接地时漏极电流	Idss	Vds=40V, Vgs=0V			1	μA
		Ta=85℃			10	
栅极漏电电流	Igss	Vds=0V, Vgs= ± 20V			± 100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250μA	1.0		3.0	V
导通时漏极电流	Id(on)	Vgs=10V, Vds≥5V	20			A
漏极 – 源极导通电阻	Rds(on)	Vgs=10V, Id=10A		15.8	19.0	mΩ
		Vgs=4.5V, Id=8A		21.5	25.0	
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				1.8	A
动态特性						
输入电容	Ciss	Vgs=0V, Vds=20V, f=1MHz		600		pF
输出电容	Coss			100		pF
反馈电容	Crss			45		pF
开关特性						
总栅极电荷	Qg	Vgs=4.5V, Vds=20V, Id=10.0A		5.0	10.0	nC
栅极 – 源极电荷	Qgs			1.5		nC
栅极 – 漏极电荷	Qgd			1.5		nC
导通延迟时间	td(on)	Vgs=10V, Vds=20V, Id=10.0A RL=2.0Ω, Rgen=1.0Ω		7	15	ns
导通上升时间	tr			9	20	ns
关闭延迟时间	td(off)			16	30	ns
关闭下降时间	tf			8	18	ns

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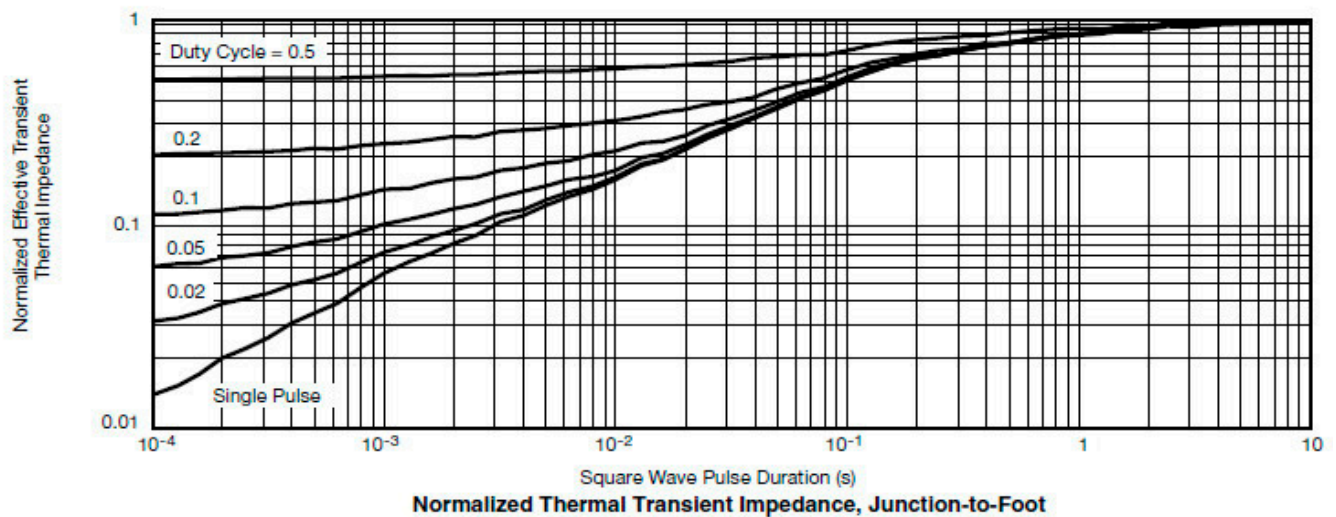
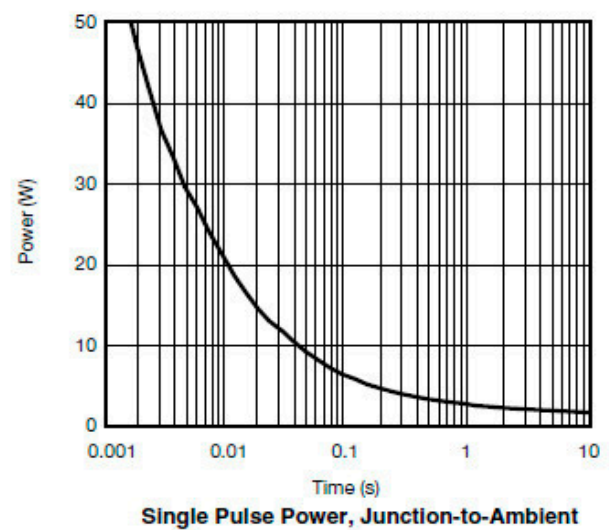
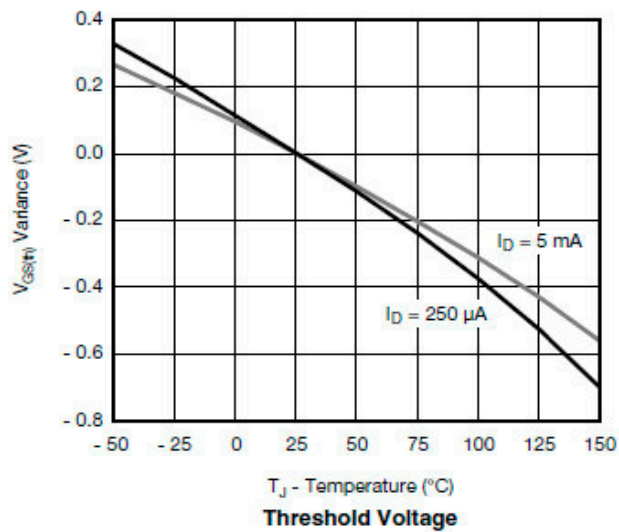
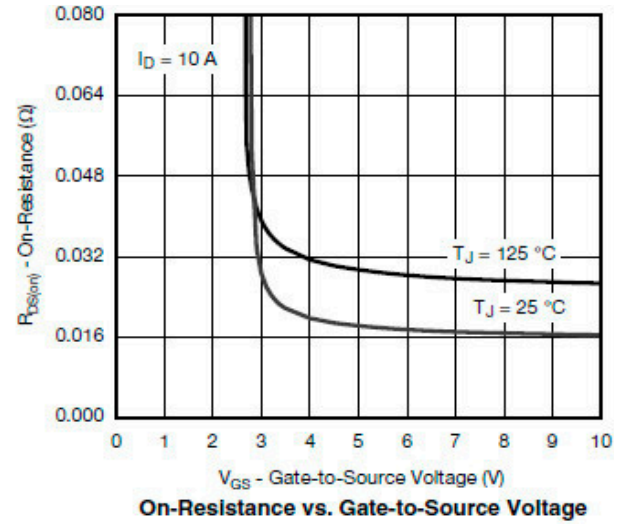
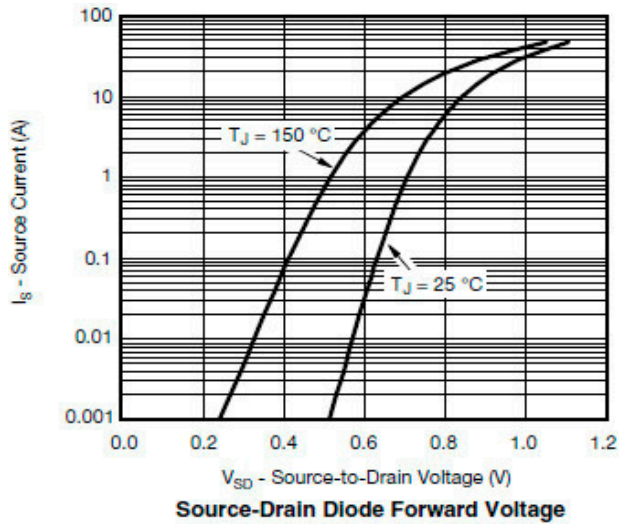
■ N1 标准特性和热特性曲线



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■ N2 电特性

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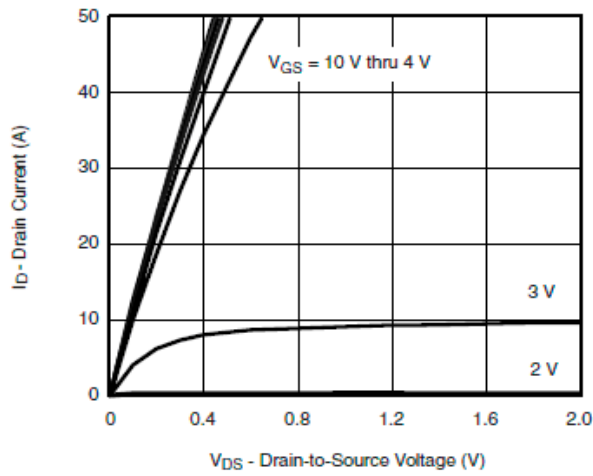
项目	记号	条件	最小值	典型值	最大值	单位		
静态特性								
漏极 – 源极击穿电压	BV _{dss}	Id=250μA, Vgs=0V		40		V		
栅极接地时漏极电流	Idss	Vds=32V, Vgs=0V			1	μA		
			Ta=85℃		10			
栅极漏电流	Igss	Vds=0V, Vgs= ± 20V			± 100	nA		
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=250 μA		1.0	3.0	V		
导通时漏极电流	Id(on)	Vgs=10V, Vds≥5V		30		A		
漏极 – 源极导通电阻	Rds(on)	Vgs=10V, Id=10A			8.8	10.0	mΩ	
		Vgs=4.5V, Id=8A			10.2	12.0		
正向跨导	Gfs	Vds=15V, Id=12.4A			56	S		
二极管正向压降	Vsd	Is=1.5A, Vgs=0V			0.85	1.20	V	
寄生二极管最大连续电流	Is				1.8	A		
动态特性								
输入电容	Ciss	Vgs=0V, Vds=20V, f=1MHz			2000		pF	
输出电容	Coss				260		pF	
反馈电容	Crss				150		pF	
开关特性								
总栅极电荷	Qg	Vgs=4.5V, Vds=10V, Id=8.0A			15.0	30.0	nC	
栅极 – 源极电荷	Qgs				6.8		nC	
栅极 – 漏极电荷	Qgd				5.2		nC	
导通延迟时间	td(on)	Vgs=10V, Vds=20V, Id=8.0A			10	20	ns	
导通上升时间	tr				15	30	ns	
关闭延迟时间	td(off)			RL=2.0Ω, Rgen=1.0Ω		30	60	ns
关闭下降时间	tf					10	20	ns

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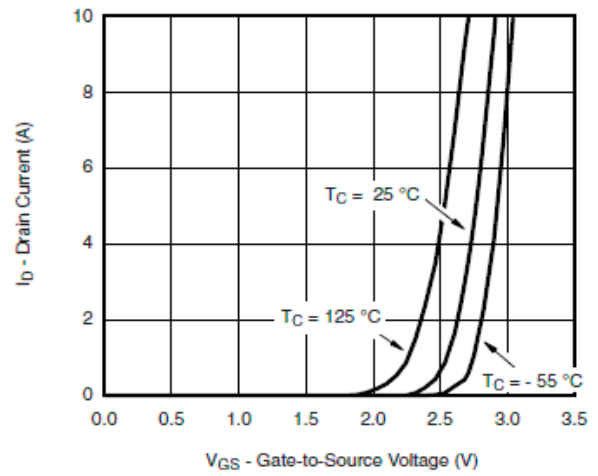
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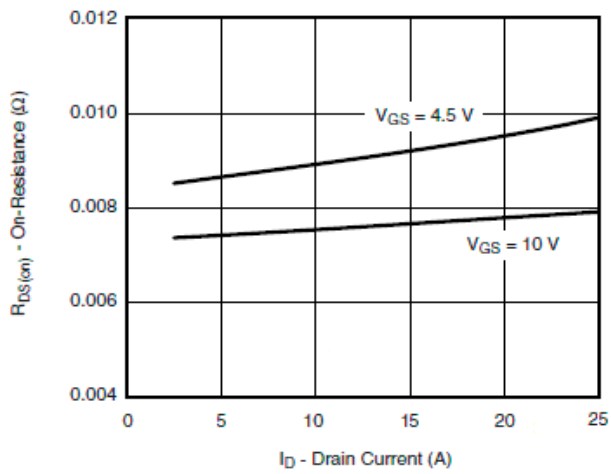
■ N2 标准特性和热特性曲线



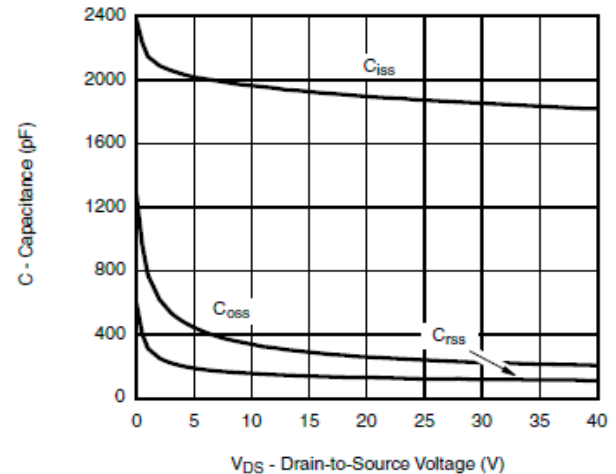
Output Characteristics



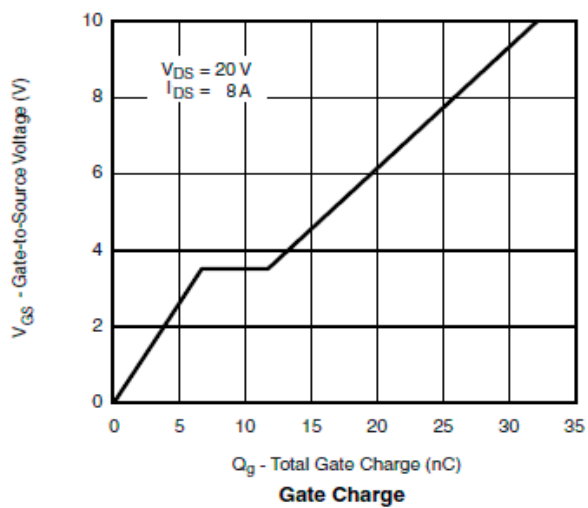
Transfer Characteristics



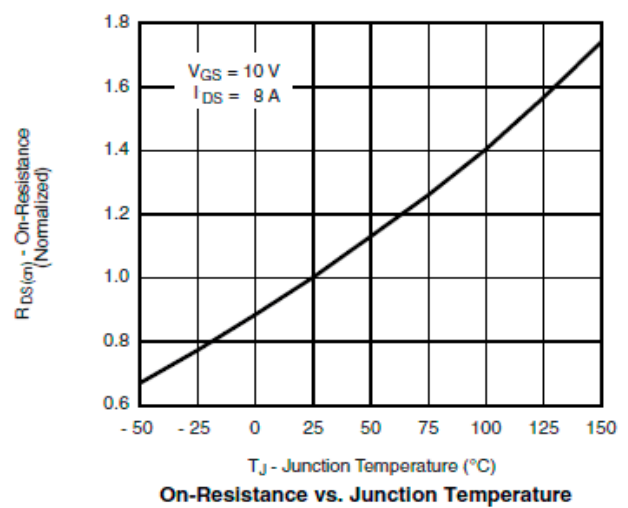
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

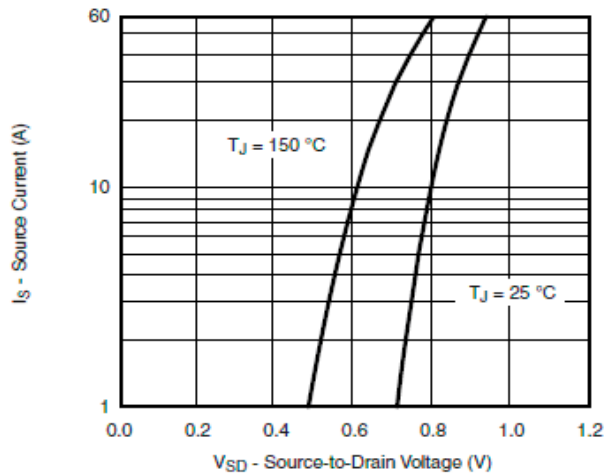


On-Resistance vs. Junction Temperature

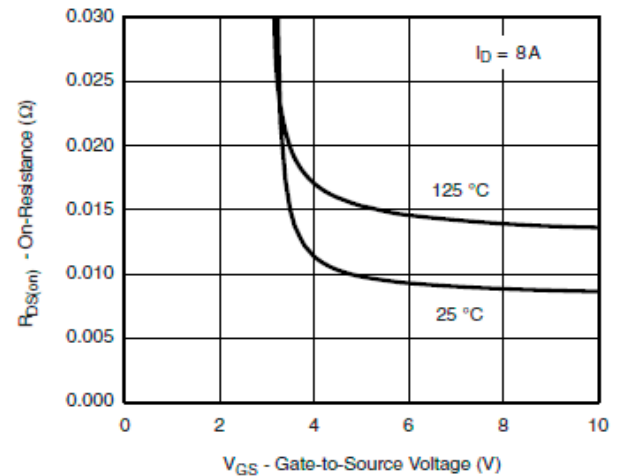
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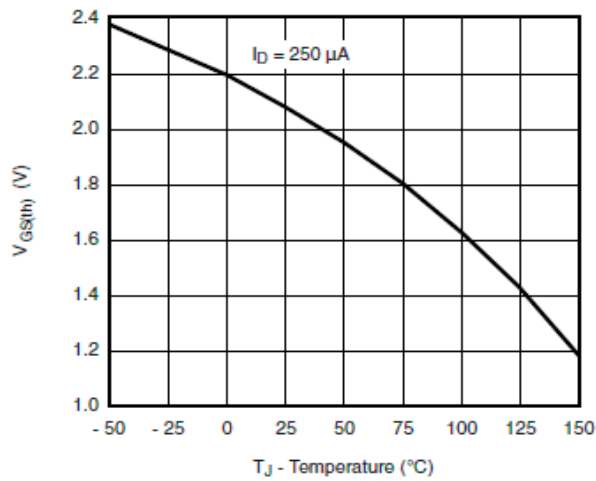
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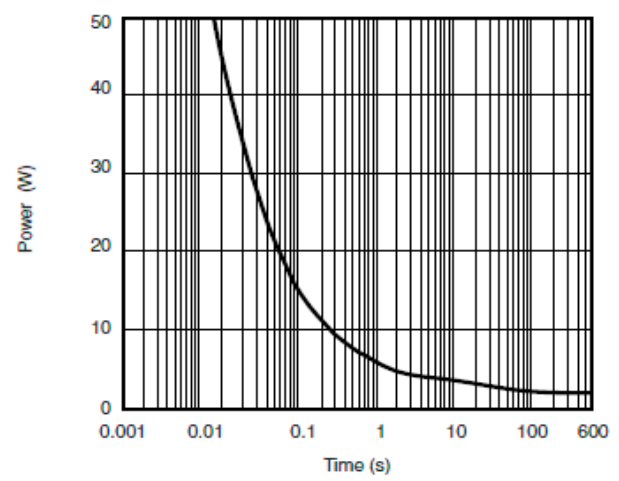
Source-Drain Diode Forward Voltage



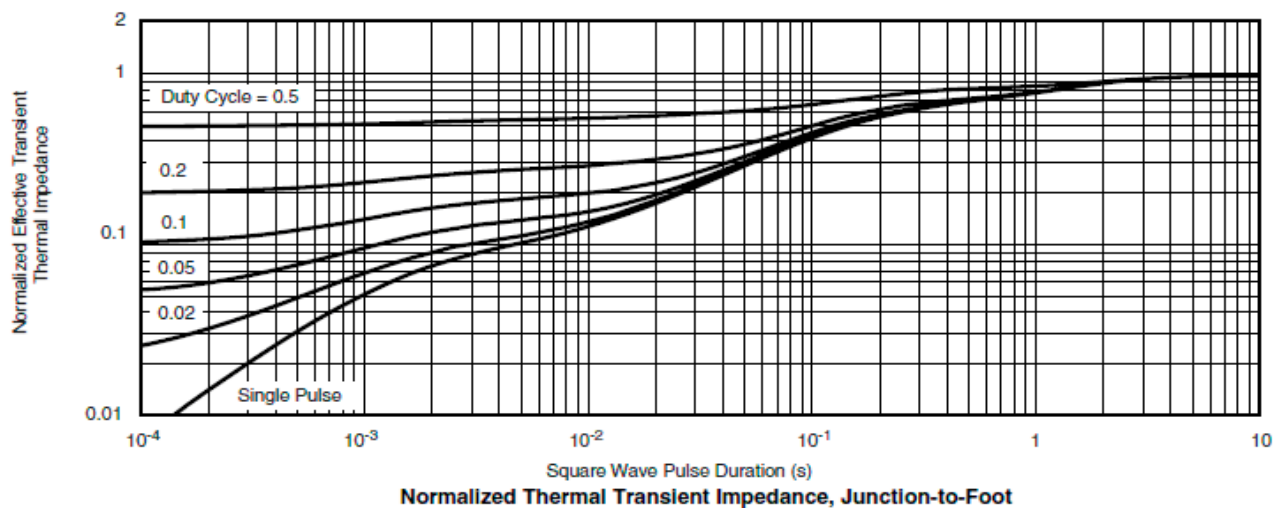
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power (Junction-to-Ambient)



Normalized Thermal Transient Impedance, Junction-to-Foot

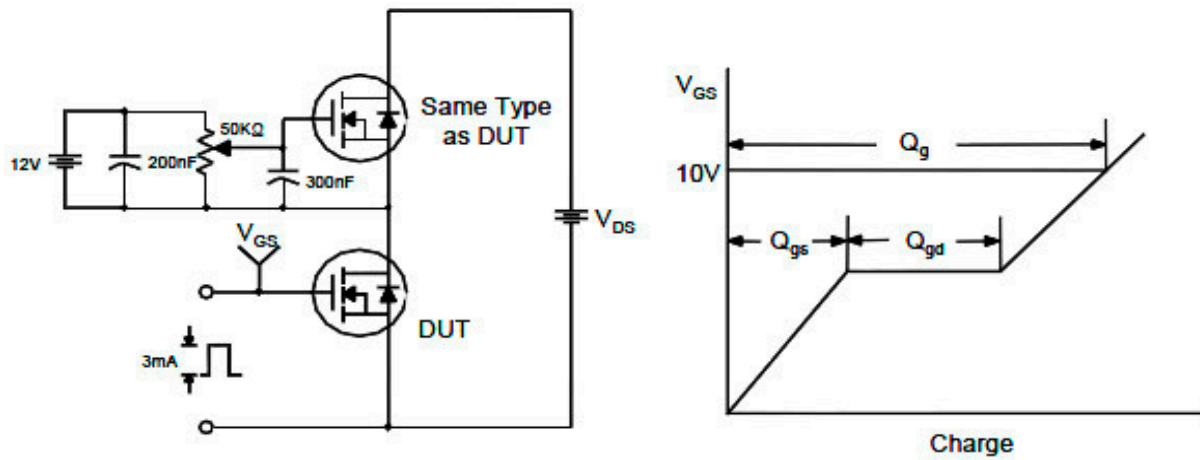
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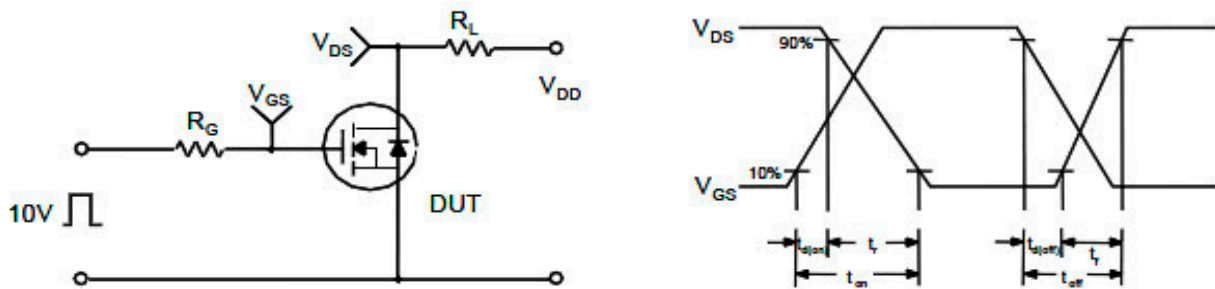
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■测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

