

# 单 P 沟道 MOSFET

ELM52431WSA-N

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## ■概要

ELM52431WSA-N 是 P 沟道低输入电容，低工作电压，低导通电阻的大电流 MOSFET。

## ■特点

- $V_{ds} = -20V$
- $I_d = -9.6A$
- $R_{ds(on)} = 25m\Omega$  ( $V_{gs} = -4.5V$ )
- $R_{ds(on)} = 33m\Omega$  ( $V_{gs} = -2.5V$ )
- $R_{ds(on)} = 42m\Omega$  ( $V_{gs} = -1.8V$ )

## ■绝对最大额定值

如没有特别注明时,  $T_a = 25^\circ C$

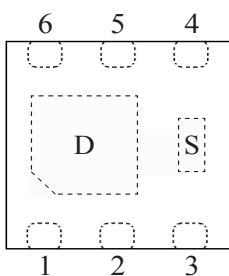
项目	记号	规格范围	单位
漏极 - 源极电压	$V_{ds}$	-20	V
栅极 - 源极电压	$V_{gs}$	$\pm 12$	V
漏极电流 (定常) $T_j = 150^\circ C$	Id	$T_a = 25^\circ C$	-9.6
		$T_a = 70^\circ C$	-7.7
漏极电流 (脉冲)	$I_{dm}$	-30	A
容许功耗	Pd	$T_c = 25^\circ C$	2.5
		$T_c = 70^\circ C$	2.2
动作结合部温度	$T_j$	150	$^\circ C$
保存温度范围	$T_{stg}$	-55 ~ 150	$^\circ C$

## ■热特性

项目	记号	典型值	最大值	单位
最大结合部 - 环境热阻	$R\theta_{ja}$		36	$^\circ C/W$

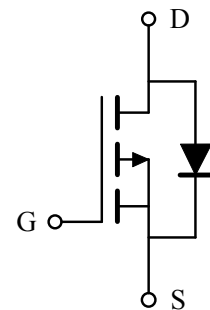
## ■引脚配置图

DFN6-2 × 2 (俯视图)



引脚编号	引脚名称
1	DRAIN
2	DRAIN
3	GATE
4	SOURCE
5	DRAIN
6	DRAIN

## ■电路图



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## ■电特性

如没有特别注明时, Ta=25℃

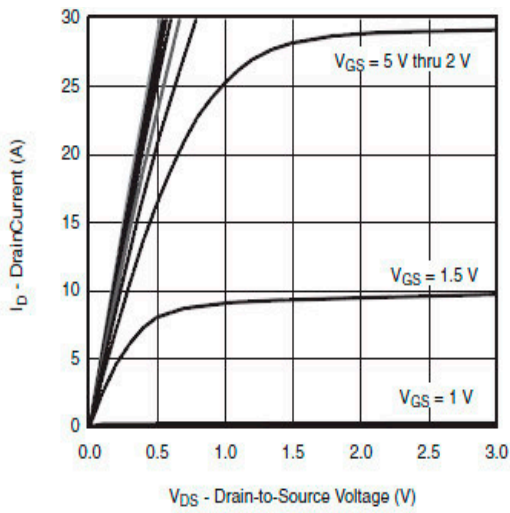
项目	记号	条件	最小值	典型值	最大值	单位
<b>静态特性</b>						
漏极 - 源极击穿电压	BVdss	Id=-250μA, Vgs=0V	-20			V
栅极接地时漏极电流	Idss	Vds=-16V			-1	μA
		Vgs=0V		Ta=85℃	-30	
栅极漏电流	Igss	Vds=0V, Vgs=±12V			±100	nA
栅极阈值电压	Vgs(th)	Vds=Vgs, Id=-250μA	-0.4		-0.7	V
导通时漏极电流	Id(on)	Vgs=-4.5V, Vds≥-5V	-20			A
漏极 - 源极导通电阻	Rds(on)	Vgs=-4.5V, Id=-3.0A		19	25	mΩ
		Vgs=-2.5V, Id=-3.0A		25	33	
		Vgs=-1.8V, Id=-2.5A		34	42	
正向跨导	Gfs	Vds=-10V, Id=-6.5A		31		S
二极管正向压降	Vsd	Is=-1.0A, Vgs=0V		-0.75	-1.30	V
寄生二极管最大连续电流	Is				-2.9	A
<b>动态特性</b>						
输入电容	Ciss	Vgs=0V, Vds=-10V, f=1MHz		1700		pF
输出电容	Coss			350		pF
反馈电容	Crss			250		pF
<b>开关特性</b>						
总栅极电荷	Qg	Vgs=-4.5V, Vds=-10V Id≡-9.6A		24	50	nC
栅极 - 源极电荷	Qgs			3		nC
栅极 - 漏极电荷	Qgd			6		nC
导通延迟时间	td(on)	Vgs=-4.5V, Vds=-10V RL=1.3Ω, Id≡-7.7A		25	45	ns
导通上升时间	tr			30	55	ns
关闭延迟时间	td(off)	Rgen=1.0Ω		60	100	ns
关闭下降时间	tf			25	40	ns

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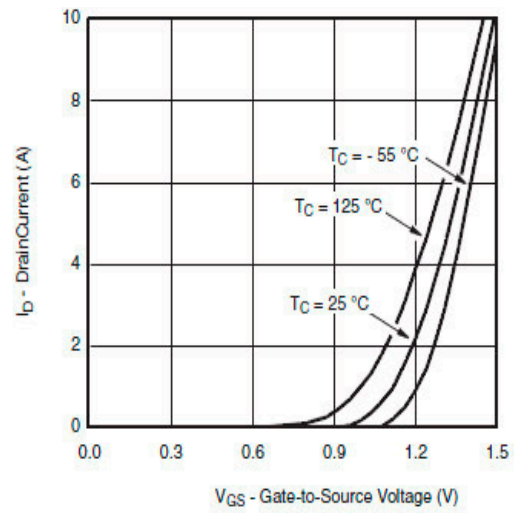
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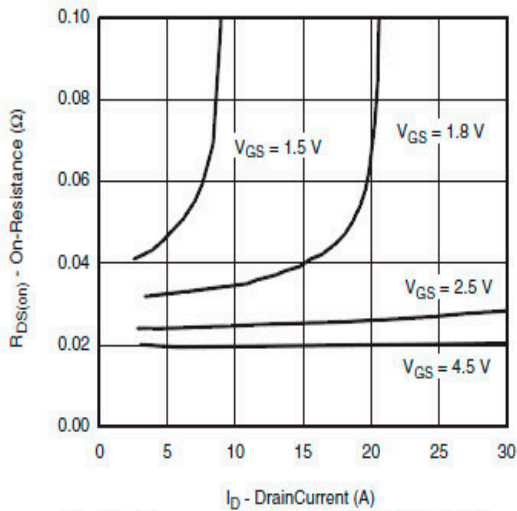
## ■ 标准特性和热特性曲线



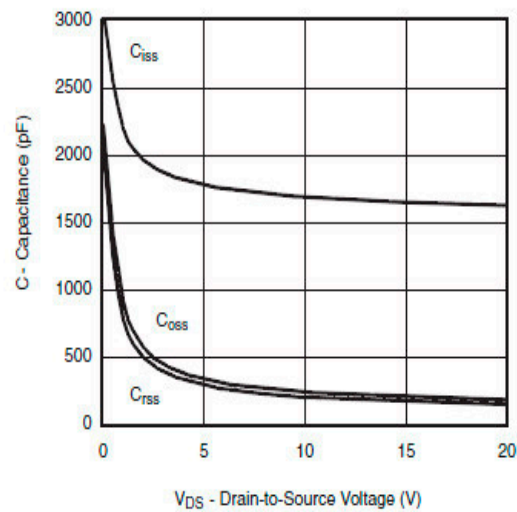
Output Characteristics



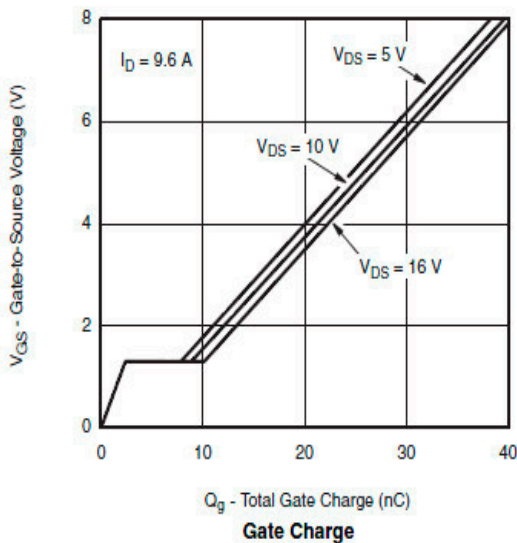
Transfer Characteristics



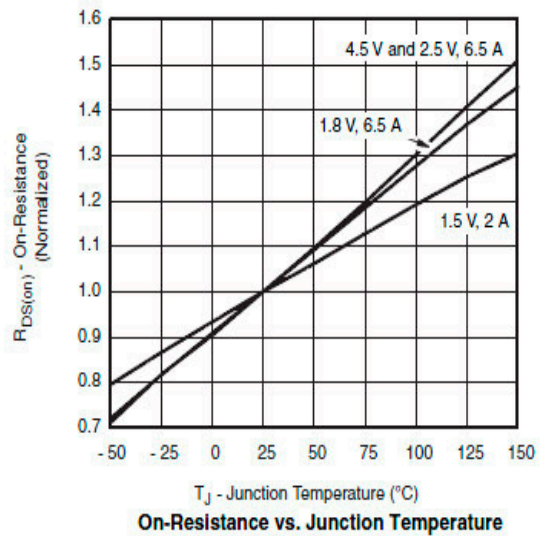
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge

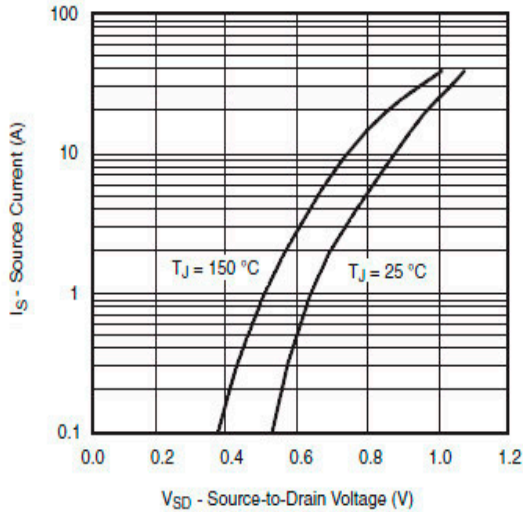


On-Resistance vs. Junction Temperature

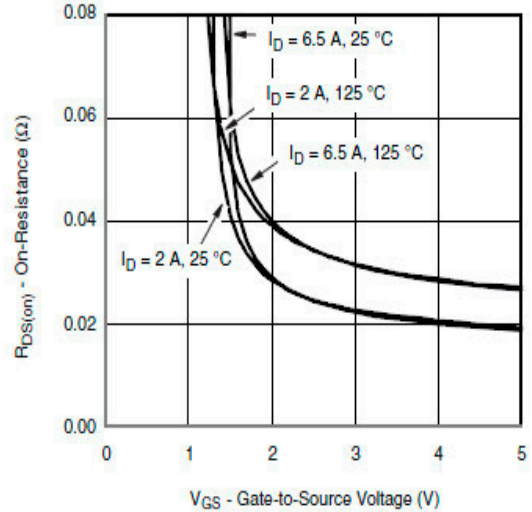
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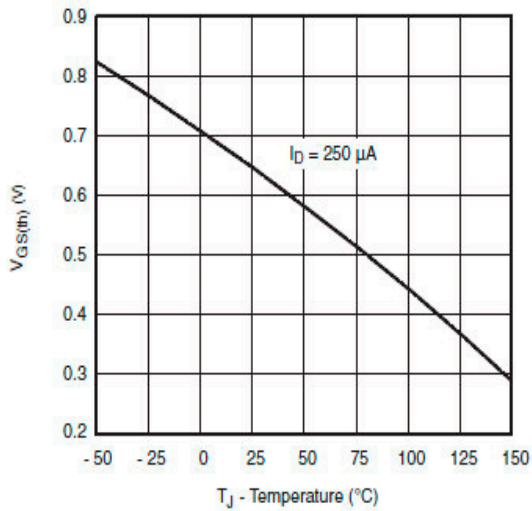
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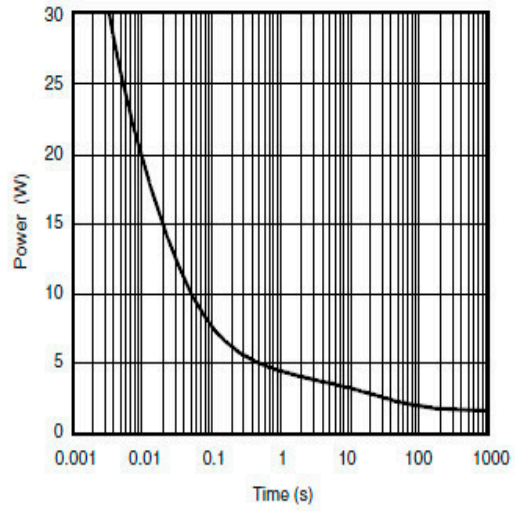
Source-Drain Diode Forward Voltage



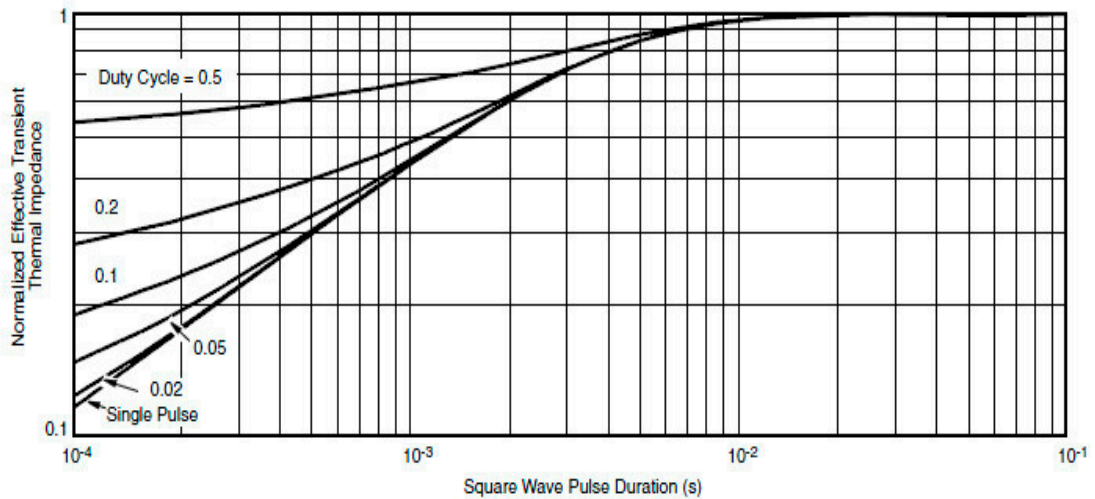
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

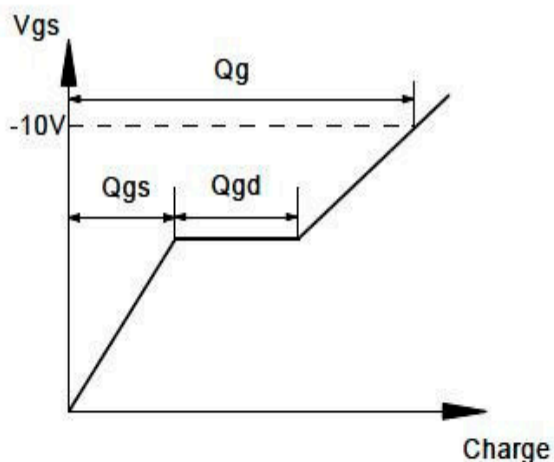
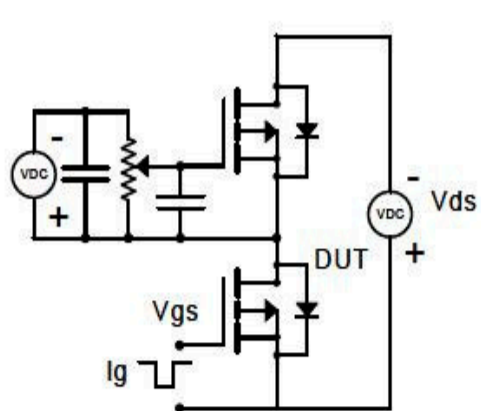
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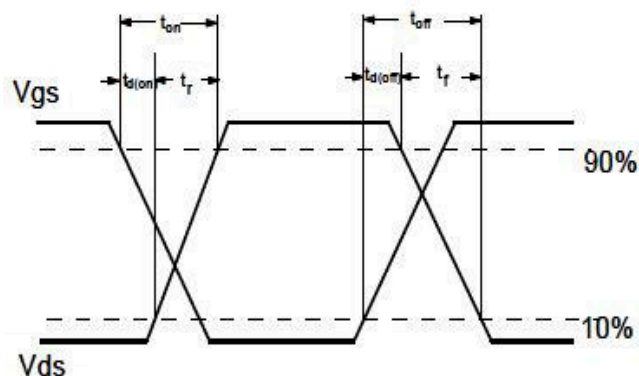
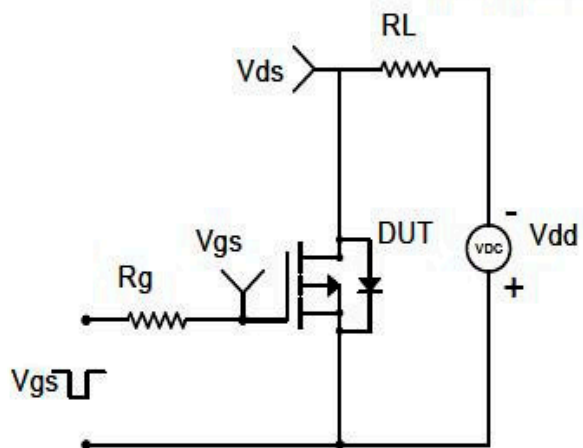
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## 测试电路和波形

### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms



### Diode Recovery Test Circuit & Waveforms

