

# 单 P 沟道 MOSFET

ELM529560A-S

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

## ■概要

ELM529560A-S 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

- $V_{ds}=-40V$
- $I_d=-52A$
- $R_{ds(on)} = 13m\Omega$  ( $V_{gs}=-10V$ )
- $R_{ds(on)} = 18m\Omega$  ( $V_{gs}=-4.5V$ )

## ■绝对最大额定值

如没有特别注明时,  $T_a=25^\circ C$

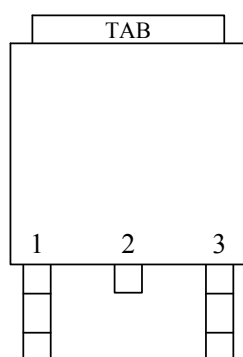
| 项目           |                  | 记号             | 规格范围      | 单位         |
|--------------|------------------|----------------|-----------|------------|
| 漏极 - 源极电压    |                  | $V_{ds}$       | -40       | V          |
| 栅极 - 源极电压    |                  | $V_{gs}$       | $\pm 20$  | V          |
| 漏极电流 (定常)    | $T_a=25^\circ C$ | $I_d$          | -52       | A          |
|              | $T_a=70^\circ C$ |                | -36       |            |
| 漏极电流 (脉冲)    |                  | $I_{dm}$       | -100      | A          |
| 崩溃电流         |                  | $I_{as}$       | -30       | A          |
| 容许功耗         | $T_c=25^\circ C$ | $P_d$          | 40        | W          |
|              | $T_c=70^\circ C$ |                | 15        |            |
| 结合部温度及保存温度范围 |                  | $T_j, T_{stg}$ | -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 | $R_{\theta ja}$ |     | 62.5 | $^\circ C/W$ |

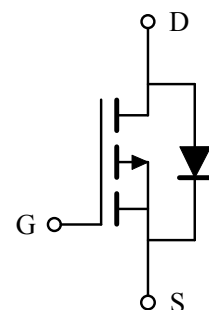
## ■引脚配置图

TO-252-3(俯视图)



| 引脚编号 | 引脚名称   |
|------|--------|
| 1    | GATE   |
| 2    | DRAIN  |
| 3    | SOURCE |

## ■电路图



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## ■电特性

如没有特别注明时, Ta=25℃

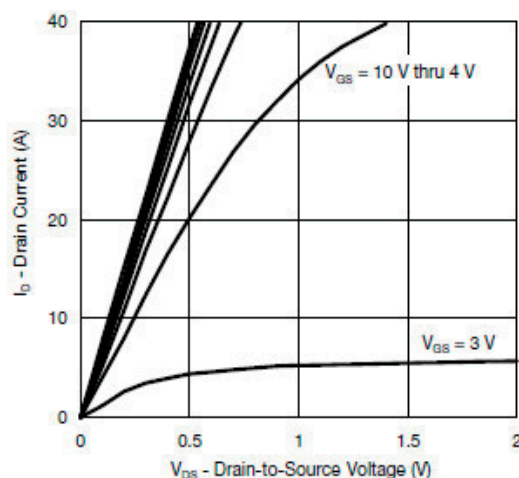
| 项目          | 记号                   | 条件                                                                                                             | 最小值  | 典型值  | 最大值  | 单位 |
|-------------|----------------------|----------------------------------------------------------------------------------------------------------------|------|------|------|----|
| 静态特性        |                      |                                                                                                                |      |      |      |    |
| 漏极 – 源极击穿电压 | BV <sub>dss</sub>    | V <sub>gs</sub> =0V, I <sub>d</sub> =-250μA                                                                    | -40  |      |      | V  |
| 栅极接地时漏极电流   | I <sub>dss</sub>     | V <sub>ds</sub> =-32V, V <sub>gs</sub> =0V                                                                     |      |      | -1   | μA |
|             |                      | V <sub>ds</sub> =-32V, V <sub>gs</sub> =0V, T <sub>a</sub> =85℃                                                |      |      | -20  |    |
| 栅极漏电流       | I <sub>gss</sub>     | V <sub>ds</sub> =0V, V <sub>gs</sub> =±20V                                                                     |      |      | ±100 | nA |
| 栅极阈值电压      | V <sub>gs</sub> (th) | V <sub>ds</sub> =V <sub>gs</sub> , I <sub>d</sub> =-250μA                                                      | -1.0 |      | -2.0 | V  |
| 导通时漏极电流     | I <sub>d</sub> (on)  | V <sub>gs</sub> =-10V, V <sub>ds</sub> ≥-10V                                                                   | -50  |      |      | A  |
| 漏极 – 源极导通电阻 | R <sub>ds</sub> (on) | V <sub>gs</sub> =-10V, I <sub>d</sub> =-14A                                                                    |      | 10   | 13   | mΩ |
|             |                      | V <sub>gs</sub> =-4.5V, I <sub>d</sub> =-12A                                                                   |      | 14   | 18   |    |
| 正向跨导        | G <sub>fs</sub>      | V <sub>ds</sub> =-20V, I <sub>d</sub> =-14A                                                                    |      | 40   |      | S  |
| 二极管正向压降     | V <sub>sd</sub>      | I <sub>s</sub> =-1A, V <sub>gs</sub> =0V                                                                       |      | -0.8 | -1.3 | V  |
| 寄生二极管最大连续电流 | I <sub>s</sub>       |                                                                                                                |      |      | -8   | A  |
| 动态特性        |                      |                                                                                                                |      |      |      |    |
| 输入电容        | C <sub>iss</sub>     | V <sub>gs</sub> =0V, V <sub>ds</sub> =-20V, f=1MHz                                                             |      | 3150 |      | pF |
| 输出电容        | C <sub>oss</sub>     |                                                                                                                |      | 345  |      | pF |
| 反馈电容        | C <sub>rss</sub>     |                                                                                                                |      | 300  |      | pF |
| 开关特性        |                      |                                                                                                                |      |      |      |    |
| 总栅极电荷       | Q <sub>g</sub>       | V <sub>gs</sub> =-10V, V <sub>ds</sub> =-20V<br>I <sub>d</sub> =-14A                                           |      | 50   | 100  | nC |
| 栅极 – 源极电荷   | Q <sub>gs</sub>      |                                                                                                                |      | 15   |      | nC |
| 栅极 – 漏极电荷   | Q <sub>gd</sub>      |                                                                                                                |      | 15   |      | nC |
| 导通延迟时间      | t <sub>d</sub> (on)  | V <sub>gs</sub> =-10V, V <sub>ds</sub> =-20V<br>I <sub>d</sub> =-10A, R <sub>L</sub> =2Ω, R <sub>gen</sub> =1Ω |      | 10   | 20   | ns |
| 导通上升时间      | t <sub>r</sub>       |                                                                                                                |      | 12   | 25   | ns |
| 关闭延迟时间      | t <sub>d</sub> (off) |                                                                                                                |      | 45   | 80   | ns |
| 关闭下降时间      | t <sub>f</sub>       |                                                                                                                |      | 12   | 25   | ns |

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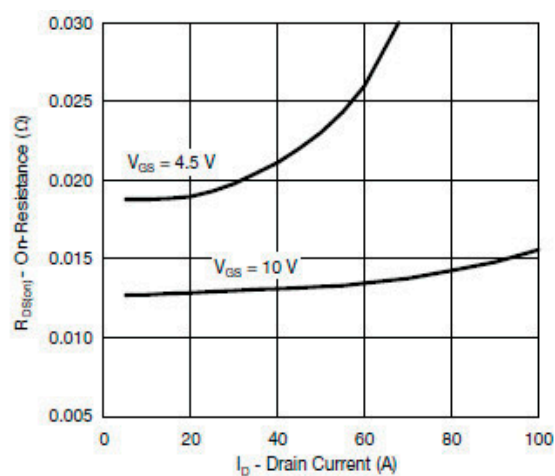
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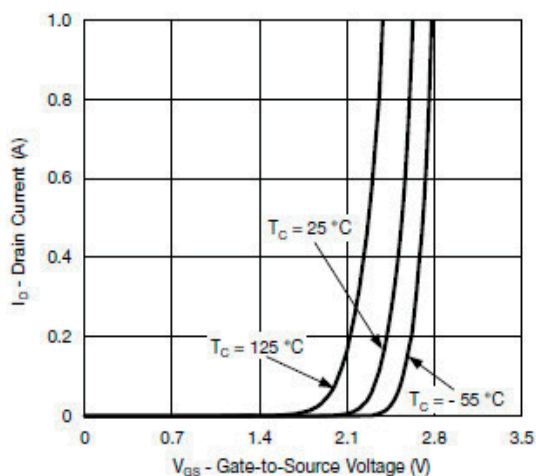
## ■ 标准特性和热特性曲线



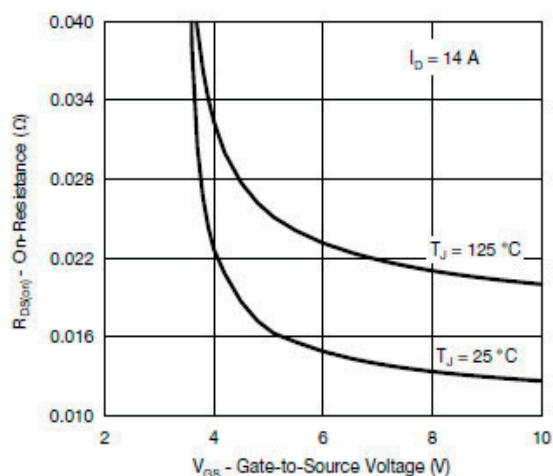
Output Characteristics



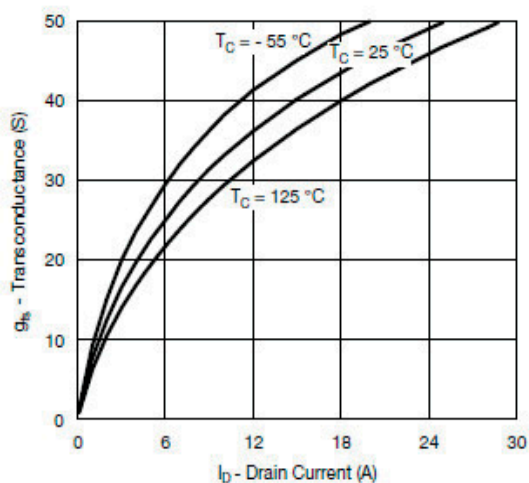
On-Resistance vs. Drain Current



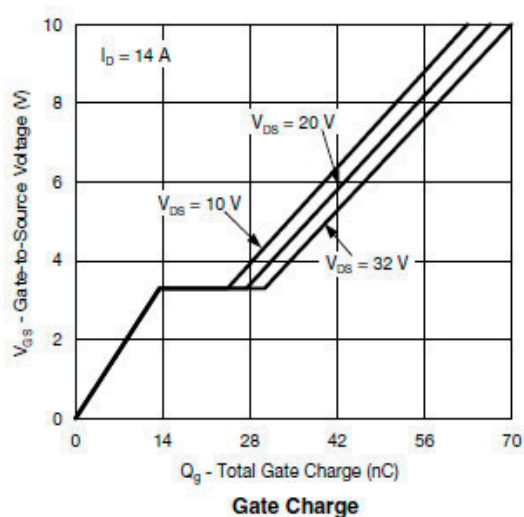
Transfer Characteristics



On-Resistance vs. Gate-to-Source Voltage



Transconductance

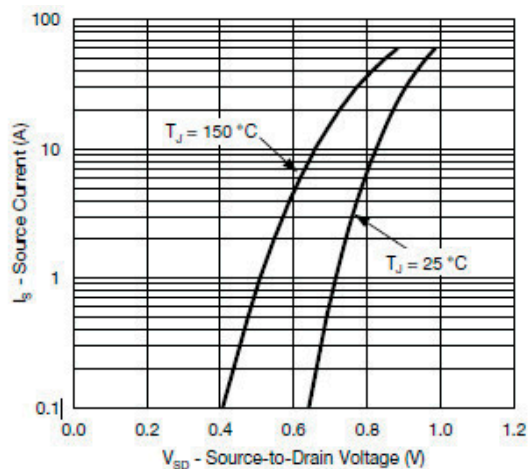


Gate Charge

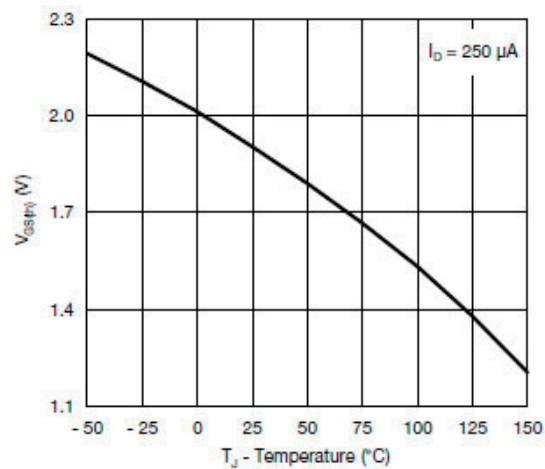
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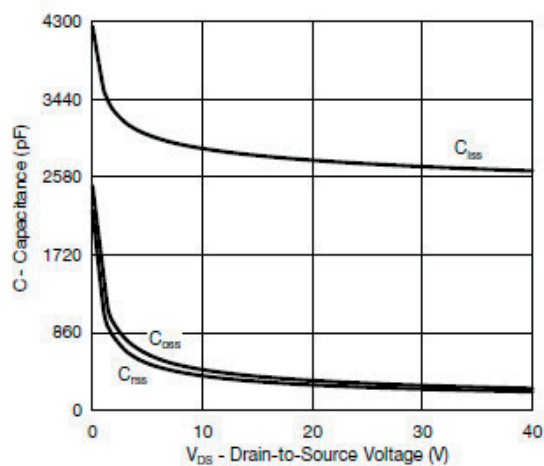
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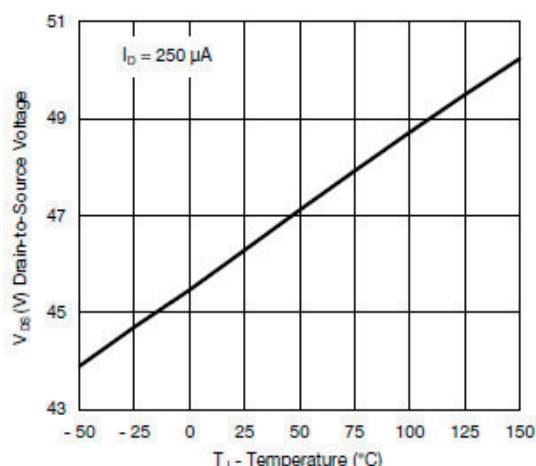
Source-Drain Diode Forward Voltage



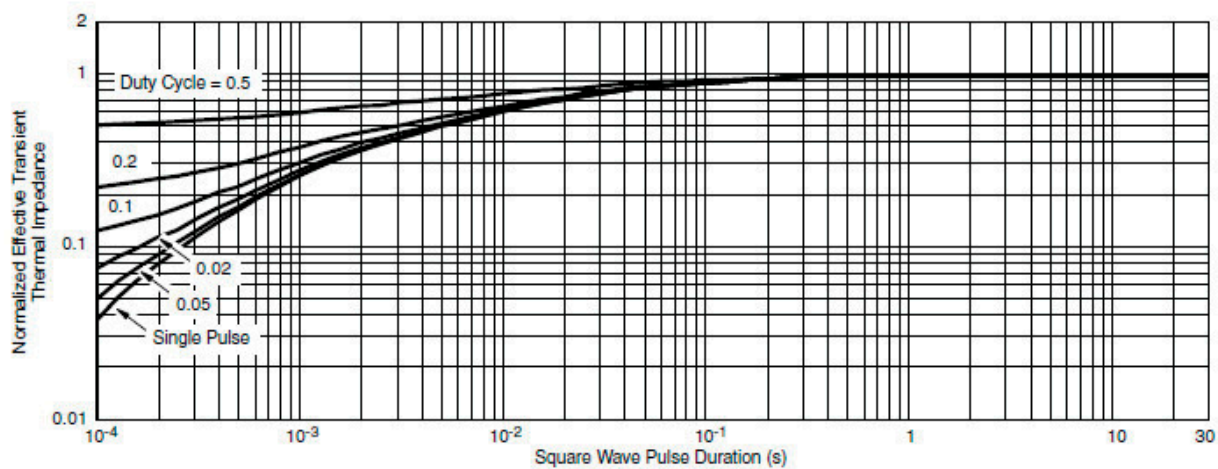
Threshold Voltage



Capacitance



Drain Source Breakdown vs. Junction Temperature



Normalized Thermal Transient Impedance, Junction-to-Case

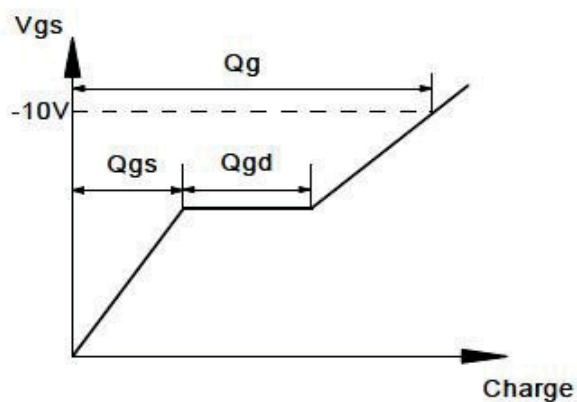
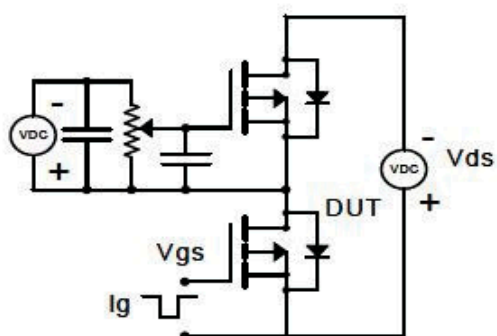
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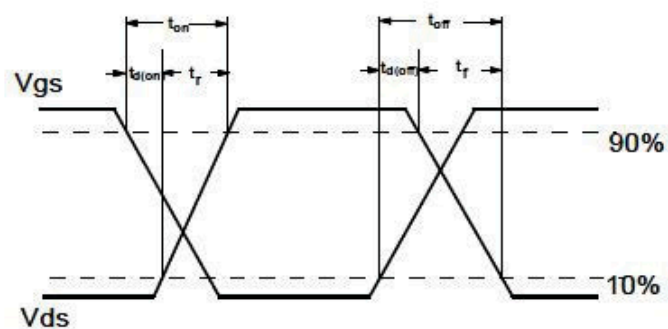
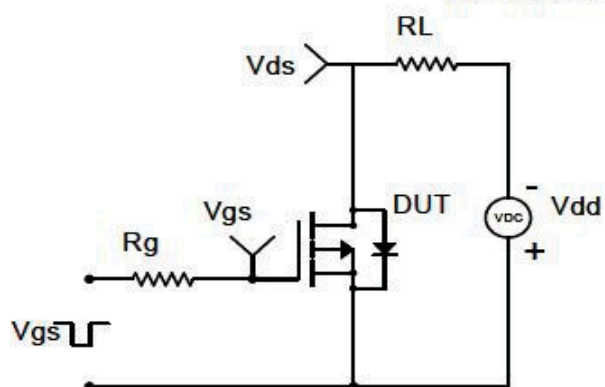
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## ■测试电路和波形

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

