

# 单 N 沟道 MOSFET

ELM54048WSA-N

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

## ■概要

ELM54048WSA-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。

## ■特点

- $V_{ds}=30V$
- $I_d=15A$
- $R_{ds(on)} = 8m\Omega$  ( $V_{gs}=10V$ )
- $R_{ds(on)} = 10m\Omega$  ( $V_{gs}=4.5V$ )

## ■绝对最大额定值

如没有特别注明时,  $T_a=25^\circ C$

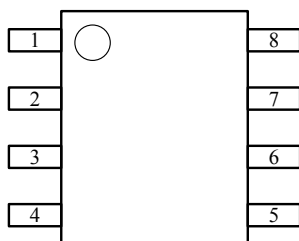
| 项目                         | 记号        | 规格范围            | 单位         |
|----------------------------|-----------|-----------------|------------|
| 漏极 - 源极电压                  | $V_{ds}$  | 30              | V          |
| 栅极 - 源极电压                  | $V_{gs}$  | $\pm 20$        | V          |
| 漏极电流 ( $T_j=150^\circ C$ ) | $I_d$     | 15              | A          |
|                            |           | 10              |            |
| 漏极电流 (脉冲)                  | $I_{dm}$  | 50              | A          |
| 容许功耗                       | $P_d$     | 2.8             | W          |
|                            |           | 1.8             |            |
| 动作结合部温度                    | $T_j$     | 150             | $^\circ C$ |
| 保存温度范围                     | $T_{stg}$ | $- 55 \sim 150$ | $^\circ C$ |

## ■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 | $^\circ C/W$ |

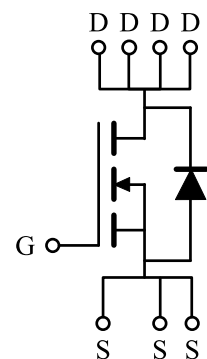
## ■引脚配置图

SOP-8(俯视图)



| 引脚编号 | 引脚名称   |
|------|--------|
| 1    | SOURCE |
| 2    | SOURCE |
| 3    | SOURCE |
| 4    | GATE   |
| 5    | DRAIN  |
| 6    | DRAIN  |
| 7    | DRAIN  |
| 8    | DRAIN  |

## ■电路图



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## ■电特性

如没有特别注明时, Ta=25℃

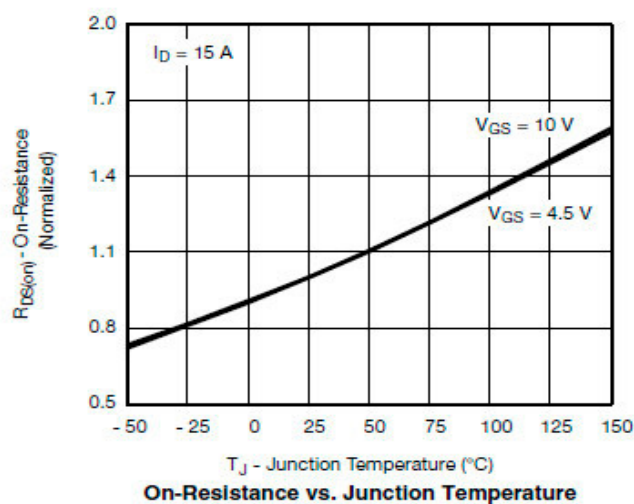
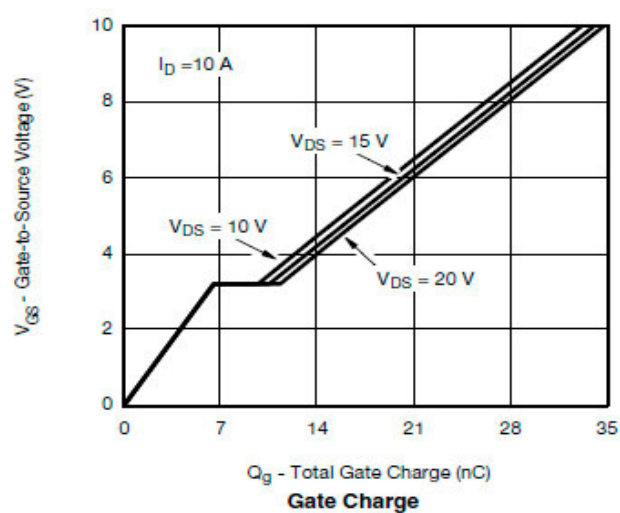
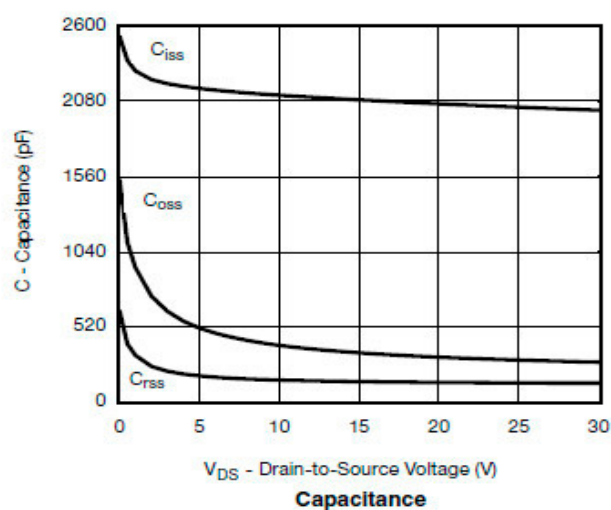
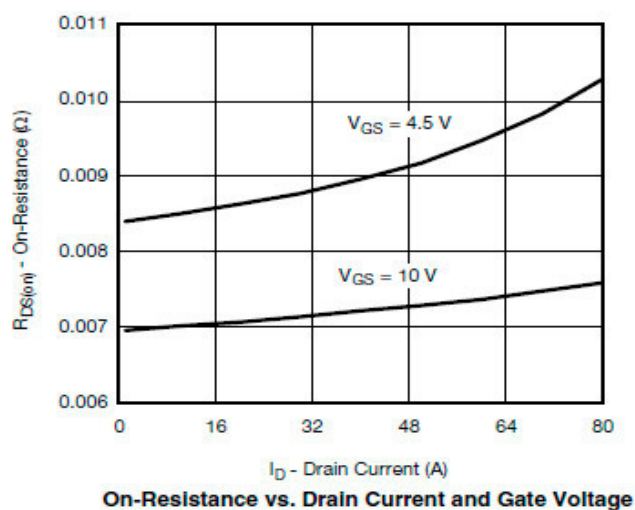
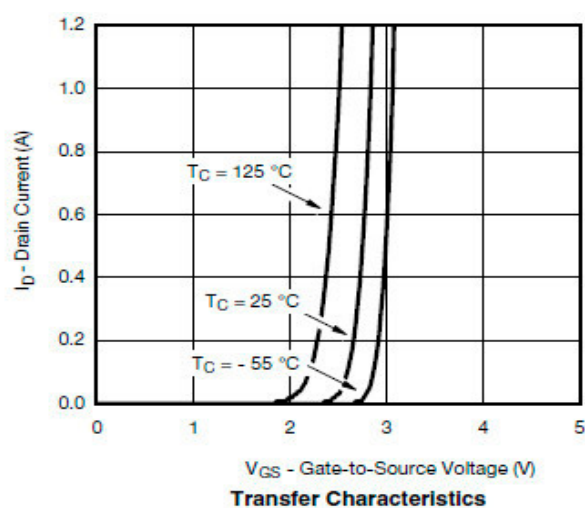
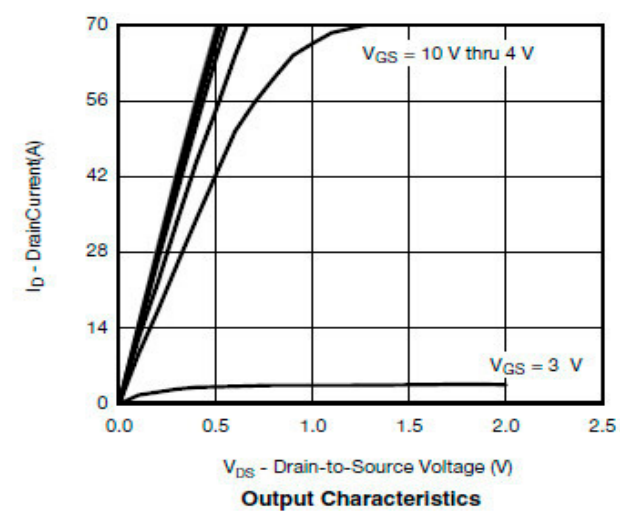
| 项目          | 记号                  | 条件                                                                                                                 | 最小值 | 典型值  | 最大值   | 单位 |
|-------------|---------------------|--------------------------------------------------------------------------------------------------------------------|-----|------|-------|----|
| 静态特性        |                     |                                                                                                                    |     |      |       |    |
| 漏极 – 源极击穿电压 | BV <sub>dss</sub>   | I <sub>d</sub> =250μA, V <sub>gs</sub> =0V                                                                         | 30  |      |       | V  |
| 栅极接地时漏极电流   | I <sub>dss</sub>    | V <sub>ds</sub> =24V, V <sub>gs</sub> =0V                                                                          |     |      | 1     | μA |
|             |                     | V <sub>ds</sub> =24V, V <sub>gs</sub> =0V, Ta=85℃                                                                  |     |      | 10    |    |
| 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(th)</sub> | V <sub>ds</sub> =V <sub>gs</sub> , I <sub>d</sub> =250 μA                                                          | 1.0 |      | 2.0   | V  |
| 导通时漏极电流     | I <sub>d(on)</sub>  | V <sub>gs</sub> =10V, V <sub>ds</sub> ≥ 5V                                                                         | 15  |      |       | A  |
| 漏极 – 源极导通电阻 | R <sub>ds(on)</sub> | V <sub>gs</sub> =10V, I <sub>d</sub> =15A                                                                          |     | 6    | 8     | mΩ |
|             |                     | V <sub>gs</sub> =4.5V, I <sub>d</sub> =10A                                                                         |     | 8    | 10    |    |
| 正向跨导        | G <sub>fs</sub>     | V <sub>ds</sub> =15V, I <sub>d</sub> =10A                                                                          |     | 32   |       | S  |
| 二极管正向压降     | V <sub>sd</sub>     | I <sub>s</sub> =4.0A, 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>      |                                                                                                                    |     |      | 3.8   | A  |
| 动态特性        |                     |                                                                                                                    |     |      |       |    |
| 输入电容        | C <sub>iss</sub>    | V <sub>gs</sub> =0V, V <sub>ds</sub> =15V, f=1MHz                                                                  |     | 1850 |       | pF |
| 输出电容        | C <sub>oss</sub>    |                                                                                                                    |     | 300  |       | pF |
| 反馈电容        | C <sub>rss</sub>    |                                                                                                                    |     | 150  |       | pF |
| 开关特性        |                     |                                                                                                                    |     |      |       |    |
| 总栅极电荷       | Q <sub>g</sub>      | V <sub>gs</sub> =4.5V, V <sub>ds</sub> =15V, I <sub>d</sub> ≡ 10A                                                  |     | 15   | 25    | nC |
| 栅极 – 源极电荷   | Q <sub>gs</sub>     |                                                                                                                    |     | 7    |       | nC |
| 栅极 – 漏极电荷   | Q <sub>gd</sub>     |                                                                                                                    |     | 4    |       | nC |
| 导通延迟时间      | t <sub>d(on)</sub>  | V <sub>gs</sub> =10V, V <sub>ds</sub> =15V<br>R <sub>L</sub> =15 Ω , I <sub>d</sub> ≡ 10A<br>R <sub>gen</sub> =1 Ω |     | 10   | 20    | ns |
| 导通上升时间      | t <sub>r</sub>      |                                                                                                                    |     | 10   | 20    | ns |
| 关闭延迟时间      | t <sub>d(off)</sub> |                                                                                                                    |     | 25   | 40    | ns |
| 关闭下降时间      | t <sub>f</sub>      |                                                                                                                    |     | 10   | 20    | ns |

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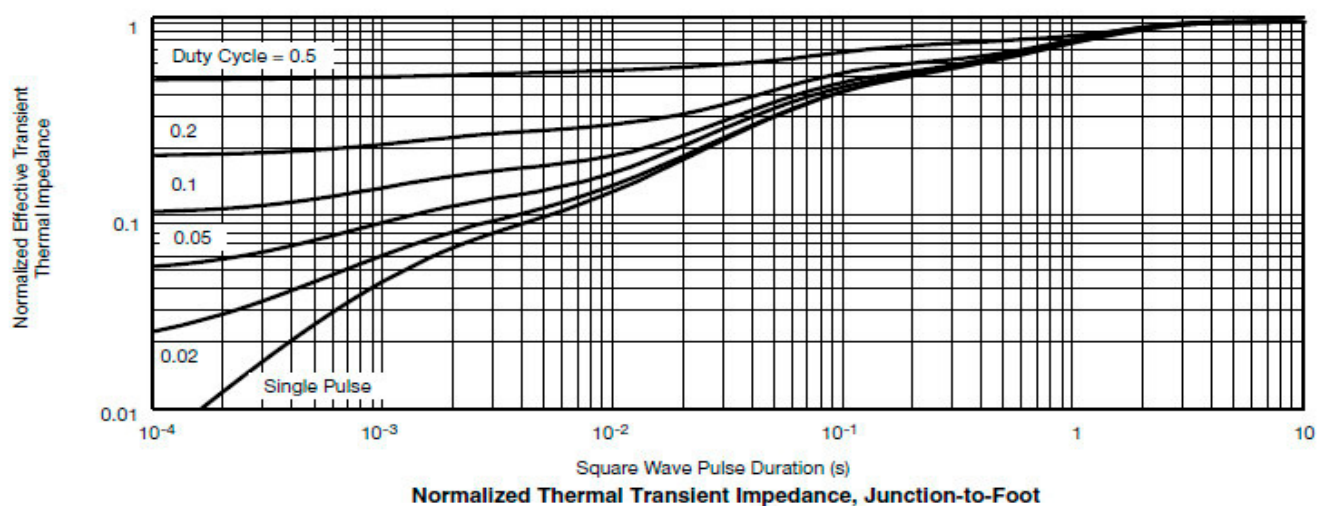
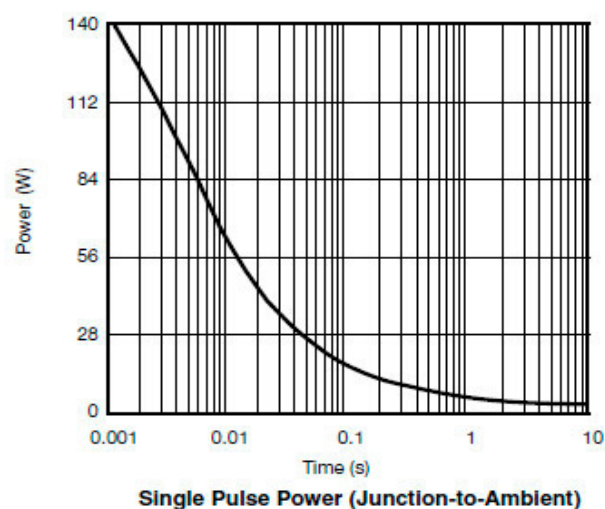
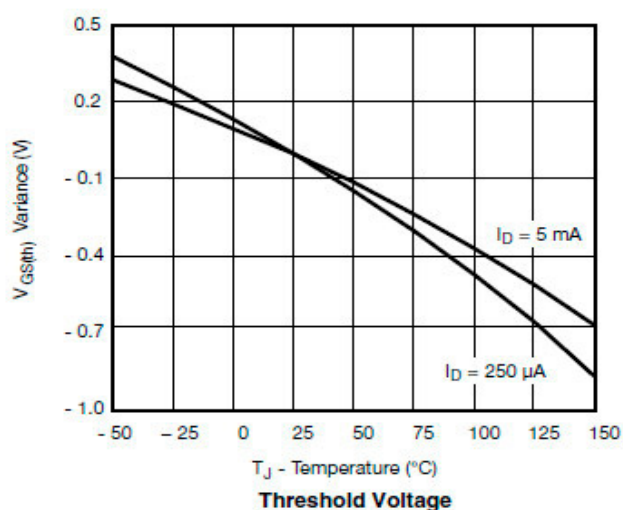
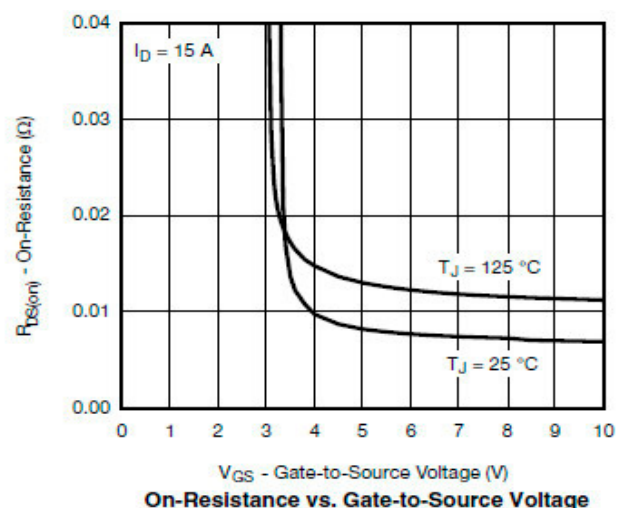
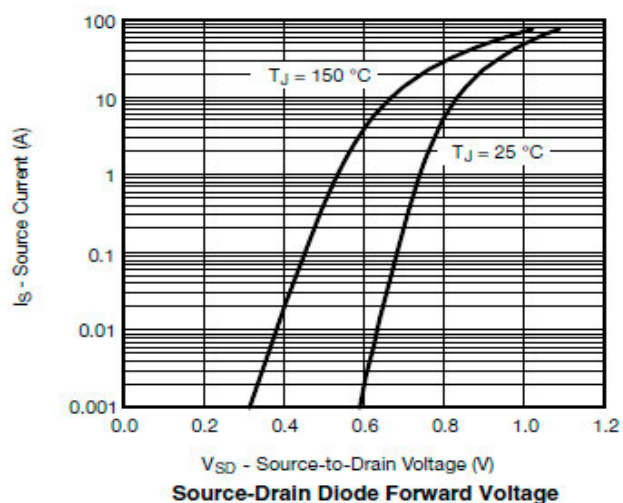
## ■ 标准特性和热特性曲线



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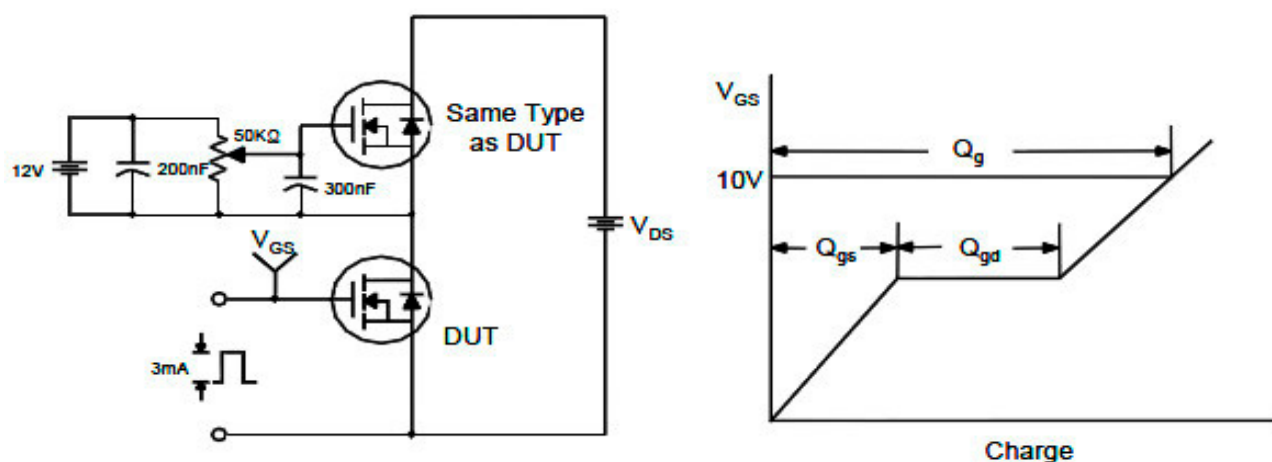
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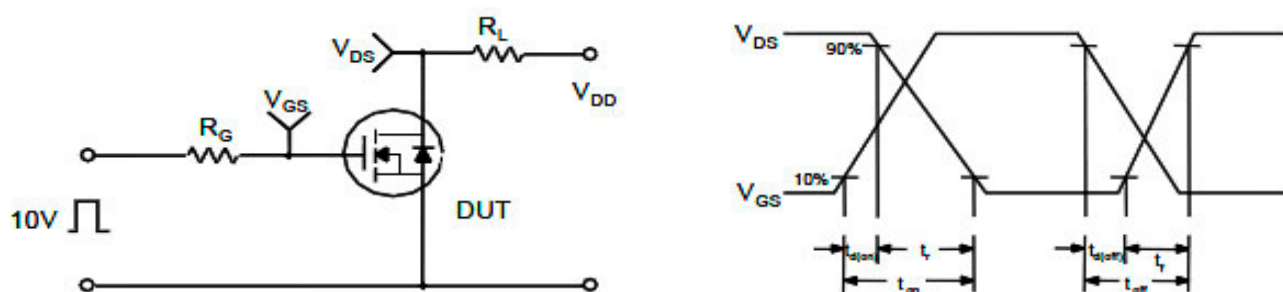
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## ■测试电路和波形

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