

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## MSIRS21867STRPBF

Product specification

## 产品概述

MSIRS21867STRPBF 是一款半桥架构栅极驱动专用电路，用于大功率 MOS 管、IGBT 管栅极驱动。IC 内部集成了逻辑信号处理电路、死区时间控制电路、欠压保护电路、电平位移电路、脉冲滤波电路及输出驱动电路，可用于无刷电机控制器驱动、电动车控制器驱动。

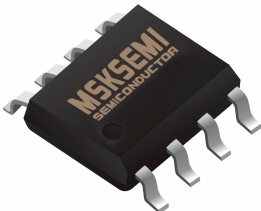
## 主要特点

- 高端悬浮自举电源，耐压 600V
- 适应 5V, 3.3V 输入电压
- 输出电流能力  $I_{O+/-}$  为 7.0A/7.0A
- 栅极驱动电源范围为 6.8~20V
- 上下桥延时匹配
- 逻辑地/功率地可耐  $\pm 5V$  偏离
- 上下桥电源欠压保护

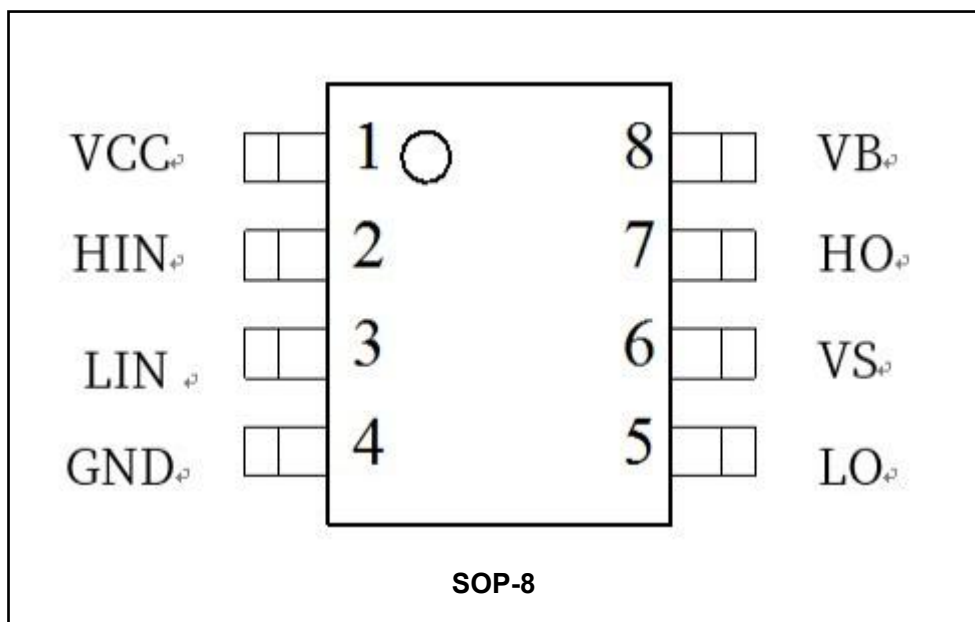
## 典型应用

- 无刷电机驱动器
- 工业应用和驱动器
- 电动车控制器

## 封装信息

| SOP-8                                                                               | 管体标记                                                                                  |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |

## 引脚排列



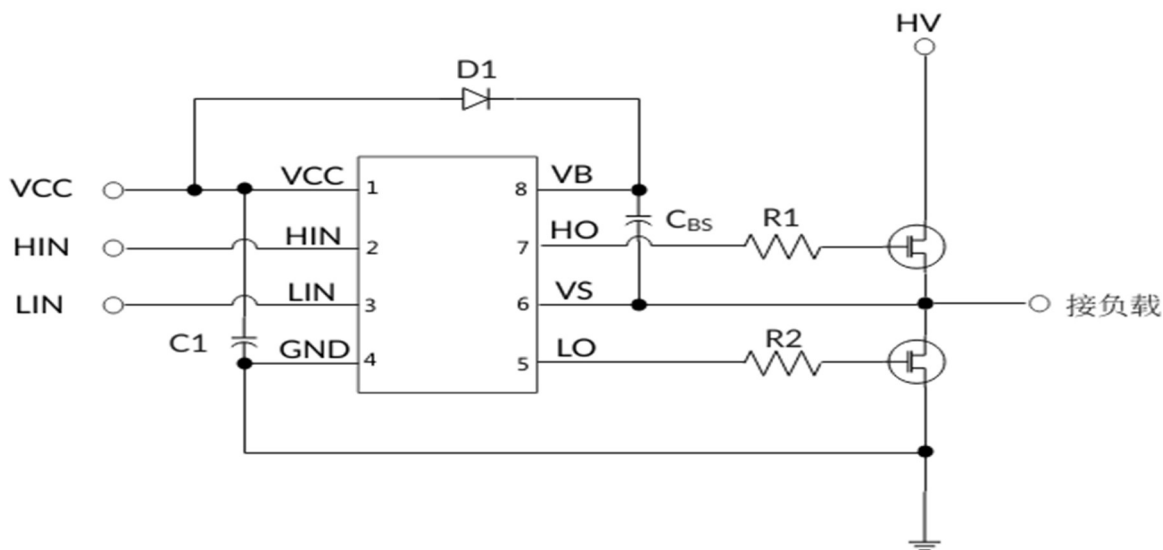
## 引出端功能

| 序号 | 符号  | 功能描述      | 序号 | 符号 | 功能描述    |
|----|-----|-----------|----|----|---------|
| 1  | VCC | 电源        | 5  | LO | 下桥端输出   |
| 2  | HIN | 上桥端逻辑信号输入 | 6  | VS | 上桥端悬浮地  |
| 3  | LIN | 下桥端逻辑信号输入 | 7  | HO | 上桥端输出   |
| 4  | GND | 地         | 8  | VB | 上桥端自举电源 |

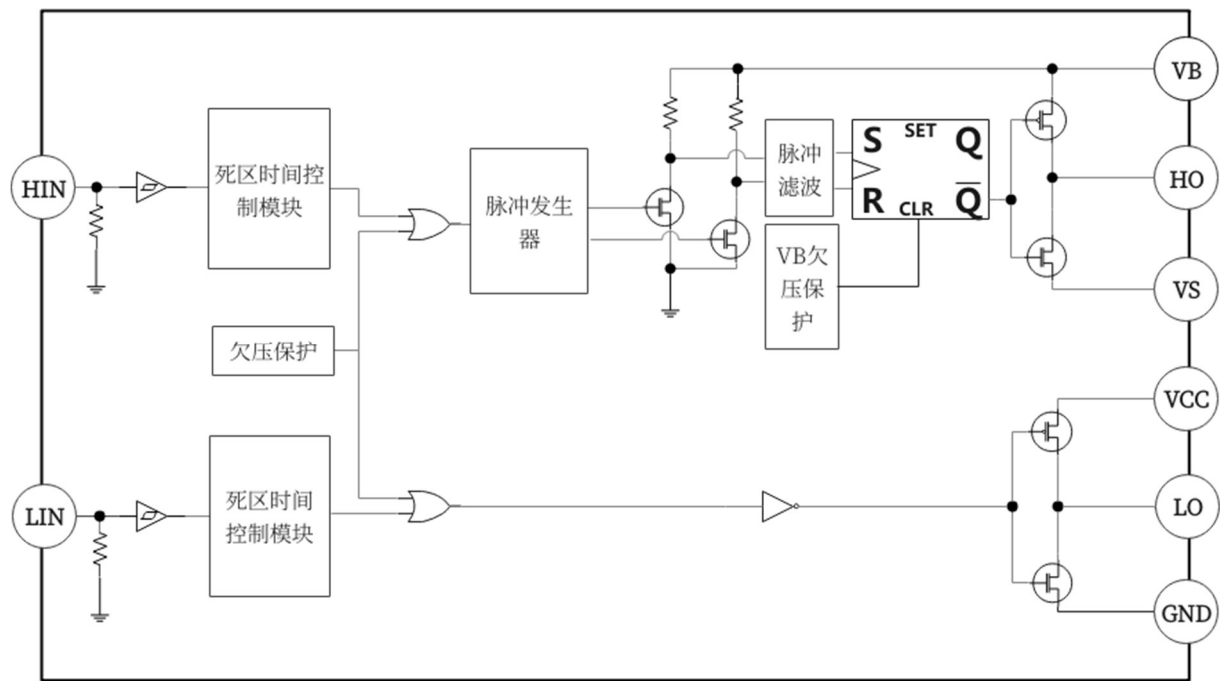
## 订货信息

| 型号               | 封装形式  | QTY     |
|------------------|-------|---------|
| MSIRS21867STRPBF | SOP-8 | 4000PCS |

## 应用电路



电路方框图



| VCC      | VCCUV+/UV- | 输入逻辑     | VBUV+/UV- | Io+/Io-   |
|----------|------------|----------|-----------|-----------|
| 6.8V~20V | 6.3V/5.6V  | HIN, LIN | 6.3V/5.6V | 7.0A/7.0A |

最大额定值（无特别说明情况下，TA=25℃）

| 项目名称          | 符号               | 最小值     | 最大值     | 单位   |
|---------------|------------------|---------|---------|------|
| 上桥自举电源        | VB               | -0.3    | 625     | V    |
| 上桥悬浮端         | VS               | VB-25   | VB+0.3  | V    |
| 上桥输出电压        | V <sub>HO</sub>  | VS-0.3  | VB+0.3  | V    |
| 电源            | VCC              | -0.3    | 25      | V    |
| 下桥输出电压        | V <sub>LO</sub>  | -0.3    | VCC+0.3 | V    |
| 输入电压（HIN/LIN） | V <sub>IN</sub>  | GND-0.3 | VCC+0.3 | V    |
| VS瞬态变化        | dVs/dt           | -       | 50      | V/ns |
| 最大功耗          | P <sub>D</sub>   | -       | 625     | mW   |
| 工作结温范围        | T <sub>J</sub>   | -       | 150     | ℃    |
| 储存温度范围        | T <sub>STG</sub> | -50     | 150     | ℃    |
| ESD(人体模型)     |                  | 2000    | -       | V    |

注意：

(1) 如果器件运行条件超过上述各项最大额定值，可能对器件造成永久性损坏。上述参数仅是运行条件的极大值，我们不建议器件在该规范范围外运行。如果器件长时间工作在最大极限条件下，其稳定性可能会受到影响。

(2) 无特殊说明，所有的电压以 GND 作为参考。

推荐工作范围（无特别说明情况下，TA=25℃）

| 参数名称      | 符号             | 推荐值   |    |       | 单位 |
|-----------|----------------|-------|----|-------|----|
|           |                | 最小    | 典型 | 最大    |    |
| 电源        | VCC            | 6.8   |    | 20    | V  |
| 上桥臂悬浮端    | VS             | -5    |    | 600   | V  |
| 上桥臂自举电源   | VB             | VS+10 |    | VS+20 | V  |
| 上、下桥臂负载电容 | CL             | -     |    | 22    | nF |
| 上、下桥臂输入电平 | VIN            | 0     |    | VCC   | V  |
| 工作温度      | T <sub>J</sub> | -40   |    | 125   | ℃  |

静态电气参数（无特别说明情况下，VCC=15V，VS=0V，VB=15V+VS，TA=25℃）

| 参数说明      | 符号                 | 测试条件                                                               | CSC21867 |     |     |    |
|-----------|--------------------|--------------------------------------------------------------------|----------|-----|-----|----|
|           |                    |                                                                    | 最小值      | 典型值 | 最大值 | 单位 |
| VCC静态电流   | I <sub>QCC</sub>   | V <sub>in</sub> =0V or 5V                                          |          | 65  | 250 | μA |
| 上桥臂VB静态电流 | I <sub>QBS</sub>   | V <sub>in</sub> =0V or 5V                                          |          | 45  | 100 | μA |
| 输入端高电平    | V <sub>IH</sub>    |                                                                    | 2.5      |     |     | V  |
| 输入端低电平    | V <sub>IL</sub>    |                                                                    |          |     | 0.8 | V  |
| 输出高电平     | V <sub>HOH</sub>   | 与 VB 或 VCC 差值，<br>I <sub>o+</sub> =20mA                            |          |     | 1.8 | V  |
| 输出低电平     | V <sub>HOL</sub>   | 与 VS 或 GND 差值，I <sub>o-</sub><br>=20mA                             |          |     | 0.1 | V  |
| VCC欠压保护电压 | VCC <sub>UV+</sub> | VCC正向抬升阈值                                                          |          | 6.3 |     | V  |
|           | VCC <sub>UV-</sub> | VCC负向跌落阈值                                                          |          | 5.6 |     |    |
| VB欠压保护电压  | VB <sub>UV+</sub>  | VB正向抬升阈值                                                           |          | 6.3 |     | V  |
|           | VB <sub>UV-</sub>  | VB负向跌落阈值                                                           |          | 5.6 |     |    |
| 输入电流      | I <sub>IN1</sub>   | HIN=5V 或者 LIN=5V                                                   |          | 250 |     | μA |
|           | I <sub>IN2</sub>   | HIN=0V 或者 LIN=0V                                                   |          |     | 5   | μA |
| 输出灌电流     | I <sub>O+</sub>    | V <sub>O</sub> =0V，V <sub>IN</sub> =V <sub>IH</sub><br>PW ≤ 10 μS  |          | 7.0 |     | A  |
| 输出拉电流     | I <sub>O-</sub>    | V <sub>O</sub> =15V，V <sub>IN</sub> =V <sub>IL</sub><br>PW ≤ 10 μS |          | 7.0 |     | A  |

输入输出逻辑真值表

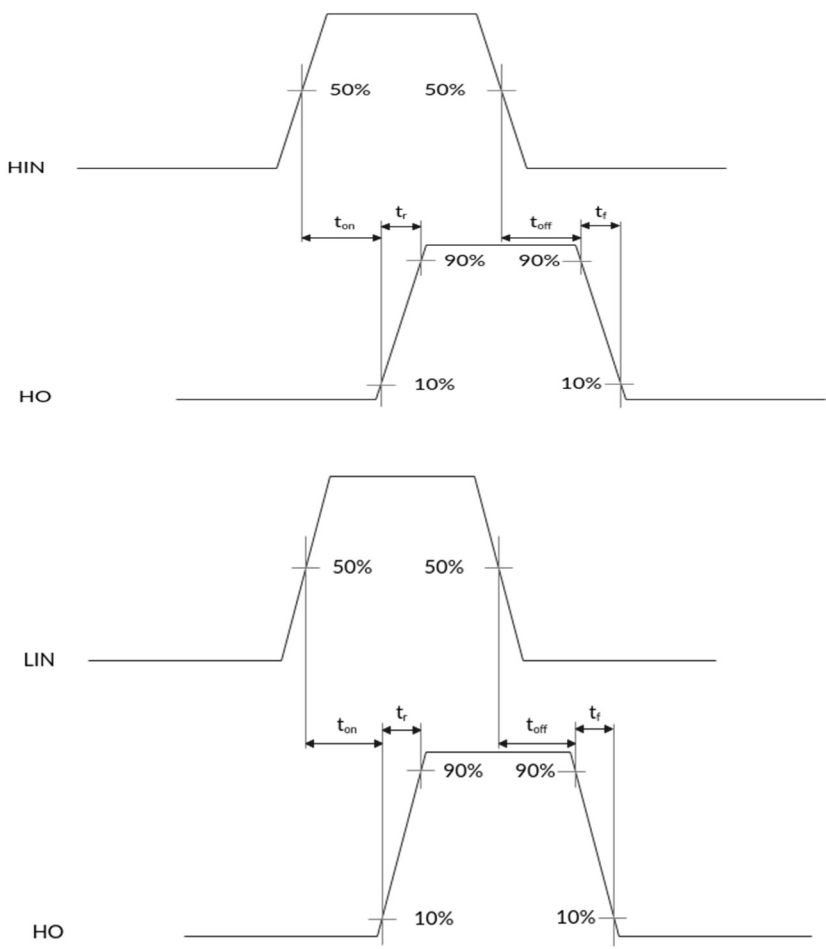
| 输入端 |     | 输出端 |     |
|-----|-----|-----|-----|
| HIN | LIN | HO  | LO  |
| 低电平 | 低电平 | 低电平 | 低电平 |
| 低电平 | 高电平 | 低电平 | 高电平 |
| 高电平 | 低电平 | 高电平 | 低电平 |
| 高电平 | 高电平 | 低电平 | 低电平 |

动态电气参数（无特别说明情况下， VCC=15V，VB=15V，VS=0V，CL=1000pF，TA=25℃）

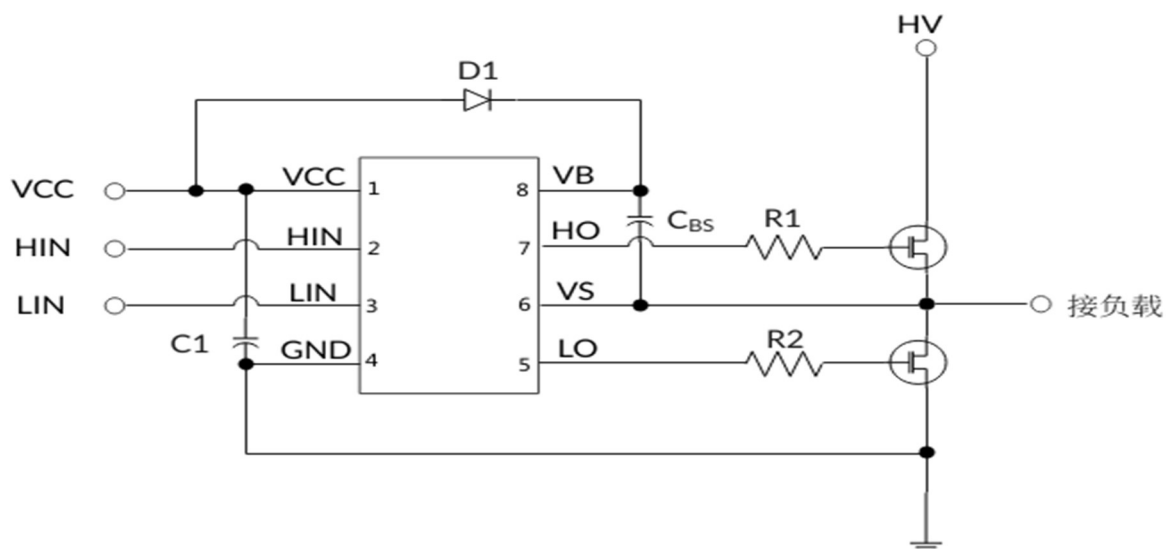
| 参数说明            | 符号               | 测试条件 | MSIRS21867STRPBF |     |     |    |
|-----------------|------------------|------|------------------|-----|-----|----|
|                 |                  |      | 最小值              | 典型值 | 最大值 | 单位 |
| 输出 H0/L0 开关时间特性 |                  |      |                  |     |     |    |
| 上升延时            | t <sub>on</sub>  |      |                  | 160 | 250 | ns |
| 下降延时            | t <sub>off</sub> |      |                  | 160 | 250 | ns |
| 上升下降延时时间差值      |                  |      |                  |     | 35  | ns |
| 上升时间            | t <sub>r</sub>   |      |                  | 10  |     | ns |
| 下降时间            | t <sub>f</sub>   |      |                  | 8   |     | ns |

注：H0/L0 的死区时间由 HIN/LIN 输入给定。

开关动作波形示意图



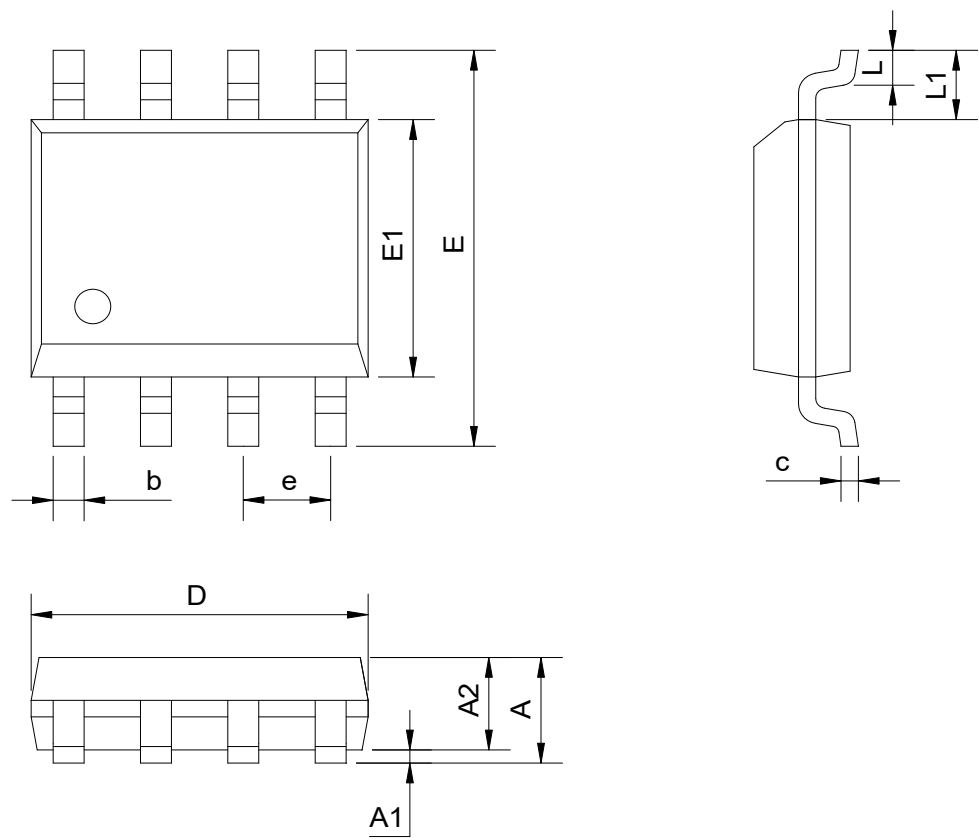
## 应用电路





封装外形图和尺寸

SOP-8



| SYMBOL | mm      |      |
|--------|---------|------|
|        | min     | max  |
| A      |         | 1.75 |
| A1     | 0.05    | 0.23 |
| A2     | 1.30    | 1.50 |
| b      | 0.35    | 0.45 |
| c      | 0.18    | 0.25 |
| D      | 4.70    | 5.10 |
| E      | 5.80    | 6.20 |
| E1     | 3.70    | 4.10 |
| e      | 1.27BSC |      |
| L      | 0.40    | 0.80 |
| L1     | 1.05BSC |      |

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