

## ■ 描述

RSC61XXS 系列芯片是一款带有半桥驱动的 LED 恒流控制电路,可用于 LLC 谐振拓扑。电路工作频率可达 130KHz, 输入电压范围高达 600V 以上。

RSC61XXS 内部集成了逻辑输入信号处理电路、欠压检测电路、过压保护电路、过温保护电路、CS 反馈信号整流电路、误差放大器电路、压控振荡电路、电流过零检测电路、电平位移电路、半桥驱动电路等模块。

RSC61XXS VCC 电源电压工作范围为 8V~20V, 静态工作电流为 720uA。该芯片具有电流过零检测功能 (ZCD), 可自动设置死区时间, 防止高端和低端输出功率管的同时导通。

## ■ 特点

- 无频闪恒流调节
- 集成半桥驱动的LLC拓扑
- 自动死区时间控制
- 集成2mA高压启动电路
- 极低输出电流纹波<2%
- 输出功率可达400W
- 短路保护
- 开路保护
- 过温保护
- SOP-14封装

## ■ 应用领域

- LED恒流驱动
- LLC谐振控制



## ■ 典型应用电路

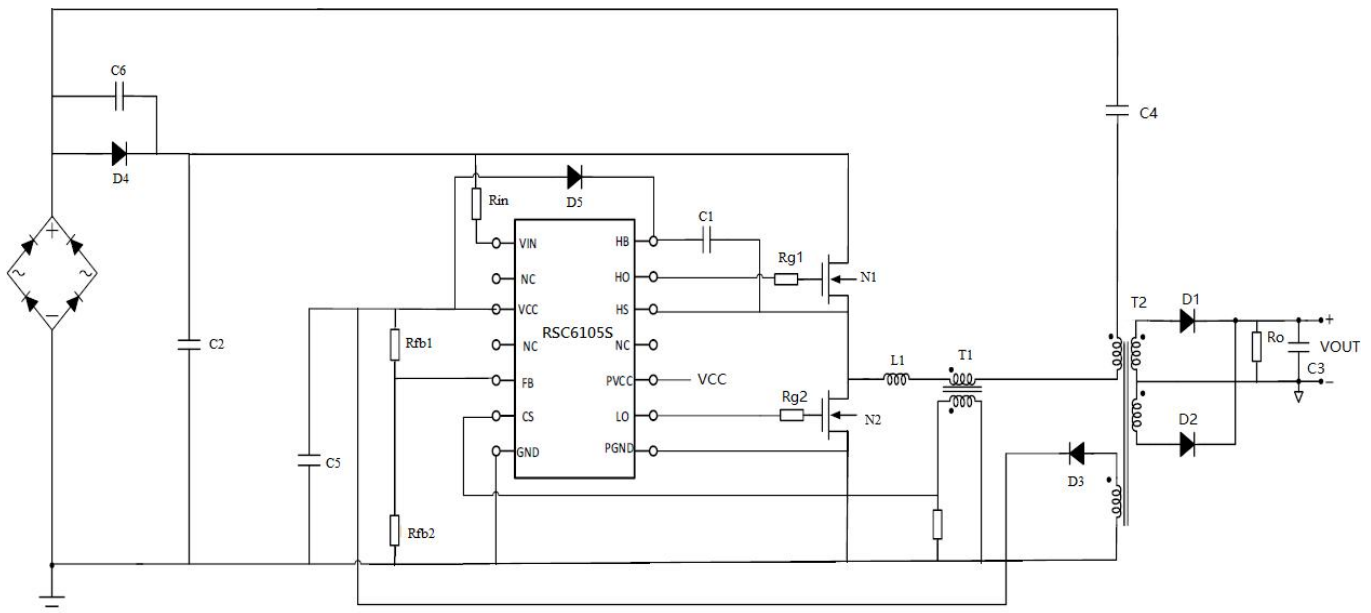
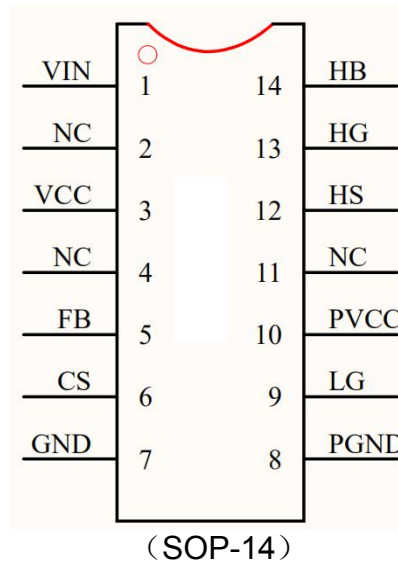


图 1: 典型应用图

**■ 封装形式及引脚定义**


| NO. | Name | Function   |
|-----|------|------------|
| 1   | VIN  | 高压启动输入     |
| 2   | NC   | 空脚         |
| 3   | VCC  | 电源         |
| 4   | NC   | 空脚         |
| 5   | FB   | 电压反馈输入     |
| 6   | CS   | 电流采样输入     |
| 7   | GND  | 地          |
| 8   | PGND | 功率地        |
| 9   | LO   | 半桥驱动低边栅极输出 |
| 10  | PVCC | 功率电源       |
| 11  | NC   | 空脚         |
| 12  | HS   | 半桥驱动高边地    |
| 13  | HO   | 半桥驱动高边栅极输出 |
| 14  | HB   | 半桥驱动高边电源   |

## ■ 功能框图

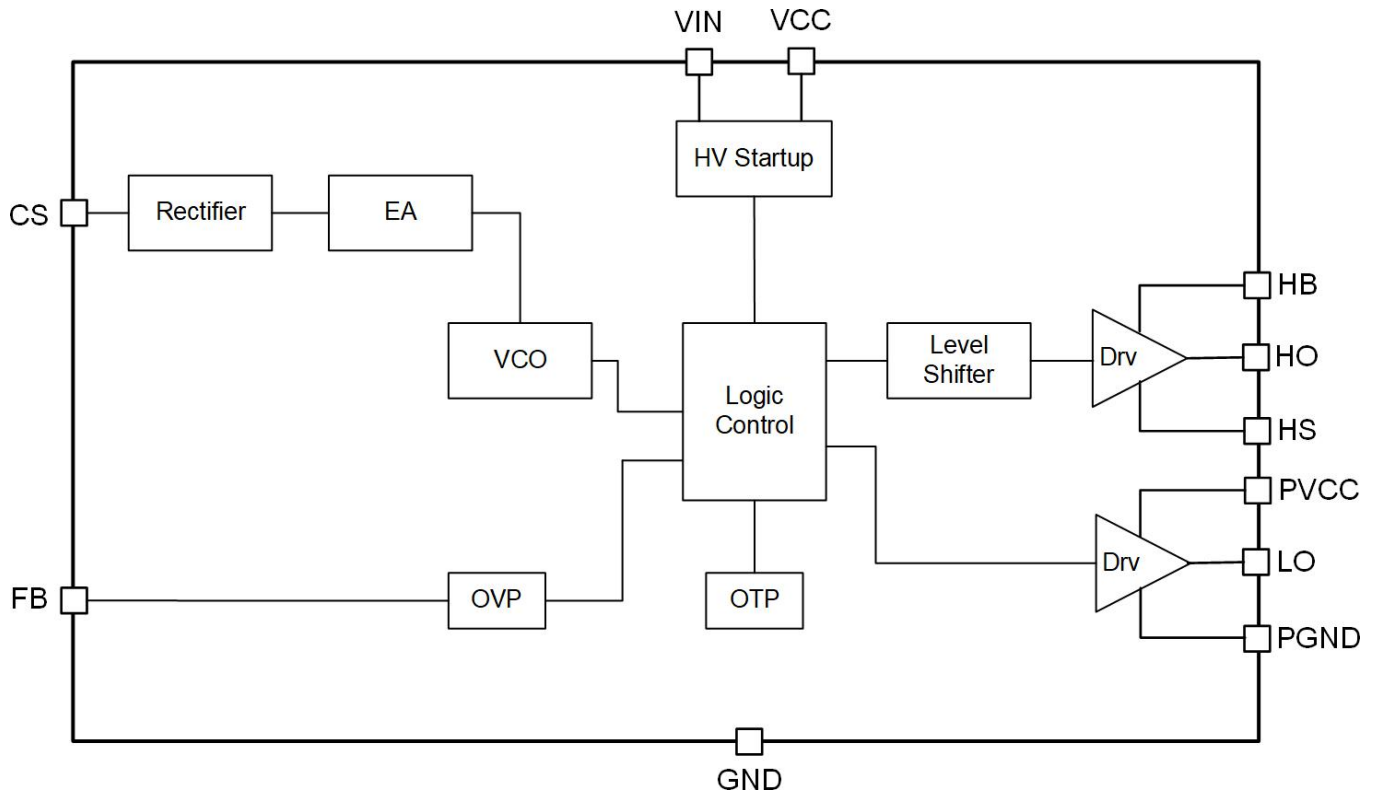


图 2 功能框图

## ■ 绝对最大额定参数

| Symbol  | Name       | Value         | Units |
|---------|------------|---------------|-------|
| VIN     | 高压启动输入     | 150~600       | V     |
| VCC     | 信号电源       | -0.3~20       | V     |
| FB      | 电压反馈输入     | -0.3~5        | V     |
| CS      | 电流采样输入     | -0.3~5        | V     |
| LO      | 半桥驱动低边栅极输出 | -0.3~VCC+0.3  | V     |
| PVCC    | 功率电源       | -0.3~20       | V     |
| HB      | 半桥驱动高边电源   | -0.3~600      | V     |
| HS      | 半桥驱动高边地    | HB-20~HB+0.3  | V     |
| HO      | 半桥驱动高边栅极输出 | HS-0.3~HB+0.3 | V     |
| Tstg    | 存储温度       | -55 to 150    | °C    |
| Tsolder | 焊接温度       | 260°C, 10s    |       |
| ESD     | 人体模式       | 2000          | V     |

注：超过额定参数所规定的范围将对芯片造成损害，无法预料芯片在额定参数范围外的工作状态，而且若长时间工作在额定参数范围外，可能影响芯片的可靠性。

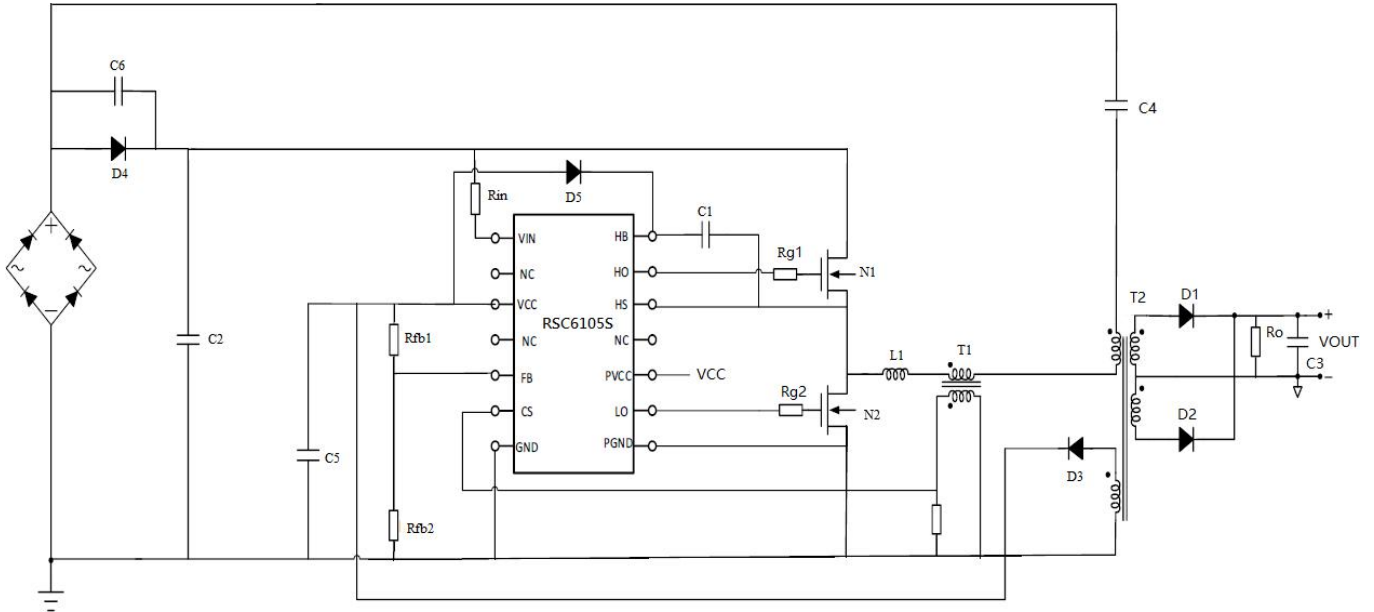
**■ 产品系列型号**

| NO. | 产品型号     | 功率范围        |
|-----|----------|-------------|
| 1   | RSC6105S | 单级适应于50W以下  |
| 2   | RSC6107S | 单级适用于 75W以下 |
| 3   | RSC6112S | 单级适用于120W以下 |
| 4   | RSC6120S | 单级适用于150W以上 |

**■ 电气参数**(若无其它说明,  $V_{in}=V_{CC}=P_{VCC}=12V, C_{in}=1\mu F, Temp=25^{\circ}C, V_{FB}=0, C_{load}=1nF$ )

| Parameter                            | Symbol   | Conditions   | Min.  | Type. | Max.  | Units |
|--------------------------------------|--|--|-------|-------|-------|-------|
| 高压启动电流                               | I <sub>IN</sub>                                  | V <sub>IN</sub> =100V V <sub>CC</sub> =14V                     | 1     | 1.7   | --    | mA    |
| 电源电压                                 | V <sub>CC_On</sub>                               | --   | 14.25 | 15    | 17.25 | V     |
|                                      | V <sub>CC_Off</sub>                              | --   | 8     | 8.7   | 9.5   | V     |
| 电源电流                                 | I <sub>CC_UV</sub>                               | V <sub>CC</sub> :0V to 12V                                     | --    | 90    | --    | uA    |
|                                      | I <sub>CC_ON</sub>                               | V <sub>CC</sub> 升到 16V 后再降到 12V<br>V <sub>CS</sub> =300mV (AC) | --    | 0.8   | 1.5   | mA    |
|                                      | I <sub>DD_error</sub>                            | V <sub>CC</sub> =0V->16V->12V<br>V <sub>CS</sub> =0            | --    | 720   | --    | uA    |
| 过压保护电压                               | V <sub>FB</sub>                                  | --   | 1.15  | 1.20  | 1.25  | V     |
| 过压恢复电压                               | V <sub>FBH</sub>                                 | --   | --    | 1.08  | --    | V     |
| 电流过零检测                               | V <sub>ZCD</sub>                                 | CS输入正弦波信号  | --    | 154   | --    | mV    |
| 过流保护阈值                               | V <sub>OCP</sub>                                 | CS输入正弦波信号  | 480   | 500   | 520   | mV    |
| LO 上升沿时间                             | T <sub>LR</sub>                                  | C <sub>load</sub> =1nF   | --    | 60    | --    | nS    |
| LO 下降沿时间                             | T <sub>LF</sub>                                  | C <sub>load</sub> =1nF   | --    | 35    | --    | nS    |
| HO 上升沿时间                             | T <sub>HR</sub>                                  | C <sub>load</sub> =1nF   | --    | 30    | --    | nS    |
| HO 下降沿时间                             | T <sub>HF</sub>                                  | C <sub>load</sub> =1nF   | --    | 35    | --    | nS    |
| LO 峰值电流 (source)<br>HG 峰值电流 (source) | I <sub>LG_source</sub><br>I <sub>HG_source</sub> | RSC6105S   | --    | 300   | --    | mA    |
|                                      |  | RSC6107S   | --    | 360   | --    | mA    |
|                                      |  | RSC6112S   | --    | 450   | --    | mA    |
|                                      |  | RSC6120S   | --    | 550   | --    | mA    |
| LO 峰值电流 (sink)<br>HG 峰值电流 (sink)     | I <sub>LG_sink</sub><br>I <sub>HG_sink</sub>     | RSC6105S   | --    | 700   | --    | mA    |
|                                      |  | RSC6107S   | --    | 800   | --    | mA    |
|                                      |  | RSC6112S   | --    | 900   | --    | mA    |
|                                      |  | RSC6120S   | --    | 1000  | --    | mA    |
| 起始脉冲宽度                               | T <sub>Start</sub>                               | C <sub>load</sub> =1nF   | --    | 2     | --    | uS    |
| 过温保护阈值                               | OTP  | --   | --    | 130   | --    | °C    |
| 过温保护复位迟滞                             | OTP <sub>HYS</sub>                               | --   | --    | 15    | --    | °C    |

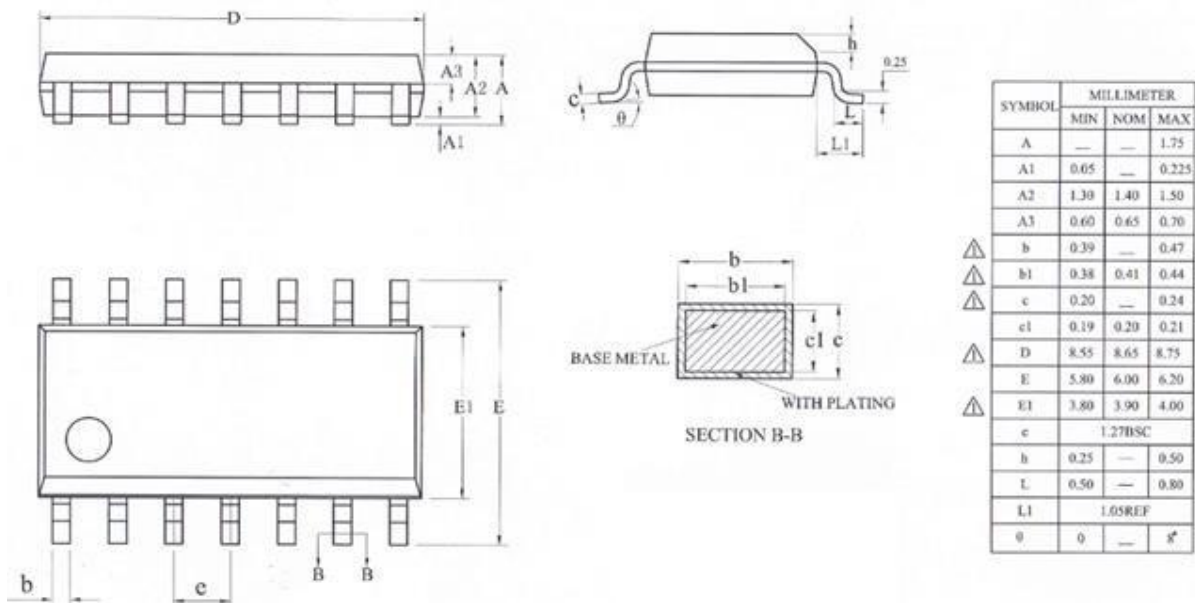
## 应用信息



### ■ PCB 布板指南

- 1、滤波电容和自举电容尽可能靠近芯片对应管脚。
- 2、驱动端到 MOSFET 的距离尽可能小。
- 3、尽可能减短自举部分走线，可以使线路更稳定的工作。

### ■ 封装外形尺寸



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