

## ■ Features

- Regulation of LED current and voltage with no Flicker
- PSR +/-5% Primary Side ,50% duty cycle, variable frequency control of resonant half-bridge
- Automatic dead time control and capacitive mode protection
- Integrated 2mA high voltage starting circuit
- Protection modes:
  - Overload
  - No-Load
  - Over-temperature
- Low output capacitance allows live LED connection
- Very low output current ripple <2%
- Power up to 200W and Eff >91%
- Integrated half-bridge drive
- THD optimization ensures low harmonic distortion (THD less than 10 percent @AC 230V)



## ■ Applications

- Single stage PFC LED drivers without flicker
- Applicable power range up to 400W

## ■ Introduction

The RSC61XXS Series is a high performance LED constant current resonant mode controller designed specially for high efficiency half-bridge LLC Converter, Maximum 150 KHz HB switching frequency and Up to 600V input voltage range.

The RSC61XX5S Series VCC power supply voltage operating range is 8V~20V and static operating current was 720uA. The chip has the function of current crossing zero detection(ZCD) which can automatically set dead time to prevent high and low output Simultaneous conduction of the MOSFET.

## ■ Typical application circuit

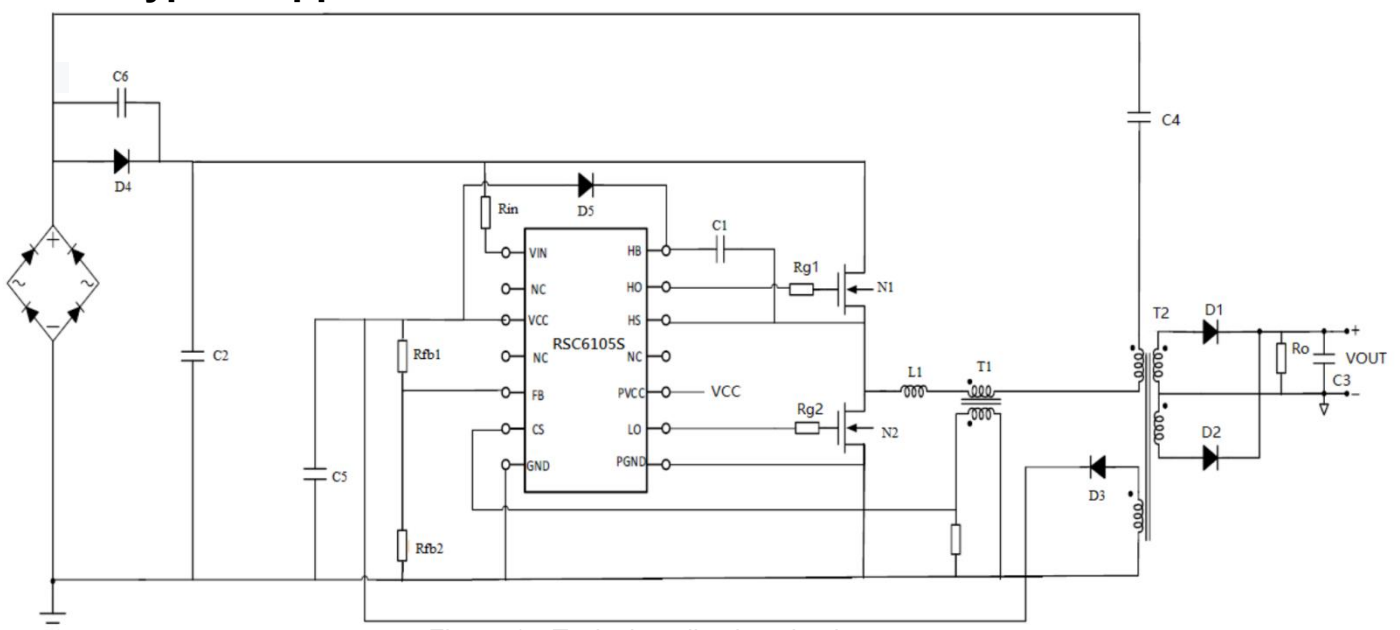


Figure 1 Typical application circuit

## ■ Pin Configuration and Functionality

### • Pin configuration with SOP-14

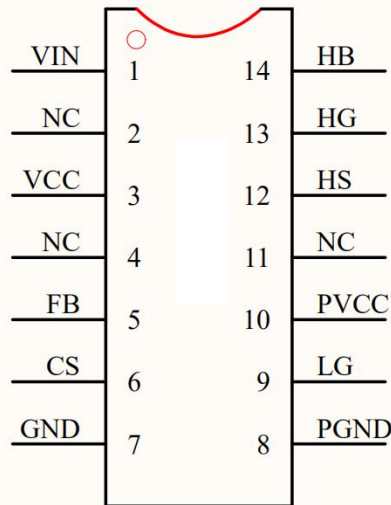


Figure 2 Pin configuration with sop-14

### • Table 1 Pin names

Pin	Symbol	Function
1	VINS	High Voltage Start up
2	--	NC
3	VCC	IC power supply
4	--	NC
5	FB	PSR Feedback input for output voltage regulation. Connect to primary sense winding.
6	CS	PSR Current Sense input provides output current regulation
7	GND	IC ground
8	PGND	Power ground
9	LG	Gate logic for low side switch
10	PVCC	Power supply
11	--	NC
12	HS	Ground for floating HS driver of HB
13	HG	Gate logic for high side switch
14	HB	Power supply of the HS floating driver of HB

## ■ Product Model

NO.	Product Model	Power Range
1	RSC6105S	Applied in LED driver below 50W
2	RSC6107S	Applied in LED driver below 75W
3	RSC6112S	Applied in LED driver below 120W
4	RSC6120S	Applied in LED drive above 150W

## ■ Representative Block Diagram

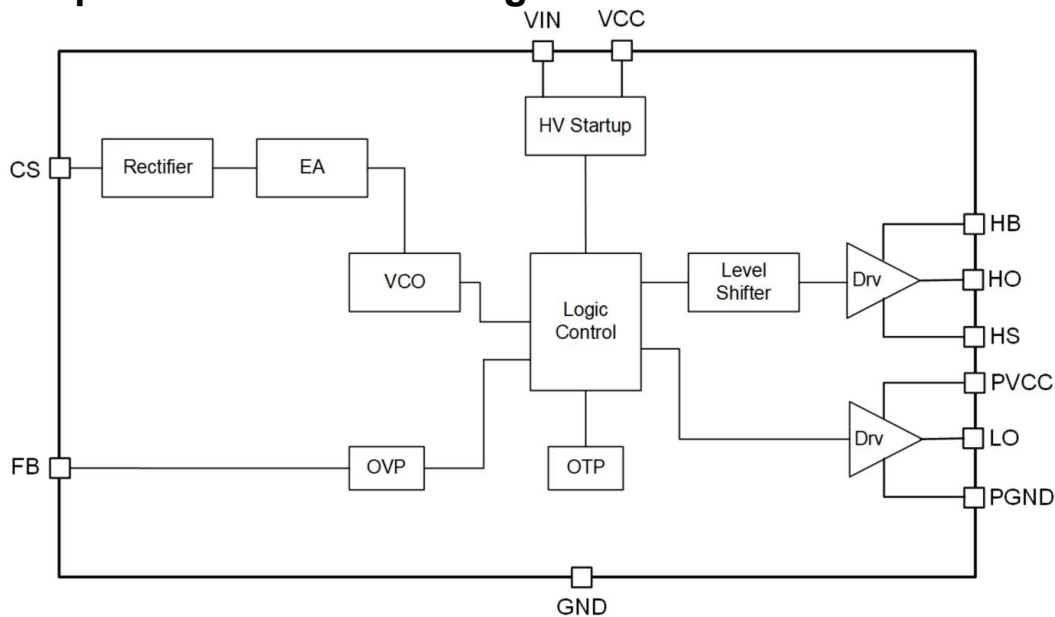


Figure 3 Representative Block Diagram

## ■ Absolute Maximum ratings

Symbol	Name	Value	Units
VIN	High Voltage Start up	150~600	V
VCC	Signal power supply	-0.3~20	V
FB	Output voltage feedback	-0.3~5	V
CS	Current sensing	-0.3~5	V
LG	Gate logic for low side switch	-0.3~VCC+0.3	V
PVCC	Power supply	-0.3~20	V
HB	Power supply of the HS floating driver of HB	-0.3~600	V
HS	Ground for floating HS driver of HB	HB-20~HB+0.3	V
HG	Gate logic for high side switch	HS-0.3~HB+0.3	V
Tstg	Storage temperature	-55 to 150	°C
Tsolder	Lead temperature	260°C, 10s	--
ESD	Human body model, JESD22-A114	2000	V

CAUTION: Permanent damage may result if a device is subjected to operating conditions at or in excess of absolute maximum ratings.

## ■ ELECTRICAL CHARACTERISTICS

(Vin=VCC=PVCC=12V, Cin=1uF Temp=25°C, VFB=0, Cload=1nF)

Parameter	Symbol	Conditions	Min.	Type.	Max.	Units
High voltage starting current	I <sub>IN</sub>	VIN=100V VCC=14V	1	1.7	--	mA
Vcc turn-on threshold	VCC <sub>On</sub>	--	14.25	15	17.25	V
Vcc turn-off threshold	VCC <sub>Off</sub>	--	8	8.7	9.5	V
Supply Current	ICC <sub>UV</sub>	VCC:0V to 12V	--	90	--	uA
	ICC <sub>ON</sub>	VCC: 16V to 12V VCS=300mV (AC)	--	0.8	1.5	mA
	IDD <sub>error</sub>	VCC=0V->16V->12V VCS=0	--	720	--	uA
VFB threshold voltage	V <sub>FB</sub>	--	1.15	1.20	1.25	V
Over voltage recovery voltage	V <sub>FBH</sub>	--	--	1.08	--	V
Current crossing zero detection	V <sub>ZCD</sub>	CS_Input sinusoidal signal	--	154	--	mV
Over current protection threshold	V <sub>OCP</sub>	CS_Input sinusoidal signal	480	500	520	mV
LG Rise Time	T <sub>LR</sub>	Clload=1nF	--	60	--	nS
LG Fall Time	T <sub>LF</sub>	Clload=1nF	--	35	--	nS
HG Rise Time	T <sub>HR</sub>	Clload=1nF	--	30	--	nS
HG Fall Time	T <sub>HF</sub>	Clload=1nF	--	35	--	nS
LG Peak (Source)Current HG Peak (Source)Current	I <sub>LG_source</sub> I <sub>HG_source</sub>	RSC6105S	--	350	--	mA
		RSC6107S	--	400	--	mA
		RSC6112S	--	450	--	mA
		RSC6120S	--	500	--	mA
LG Peak (Sink)Current HG Peak (Sink)Current	I <sub>LG_sink</sub> I <sub>HG_sink</sub>	RSC6105S	--	800	--	mA
		RSC6107S	--	850	--	mA
		RSC6112S	--	900	--	mA
		RSC6120S	--	1000	--	mA
Initial pulse width	T <sub>Start</sub>	Clload=1nF	--	2	--	uS
Over temperature protection threshold	OTP	--	--	130	--	°C
Over temperature protection reset hysteresis	OTP <sub>HYS</sub>	--	--	15	--	°C

■ Shows a typical LED driver application using RSC6105S with LLC topology

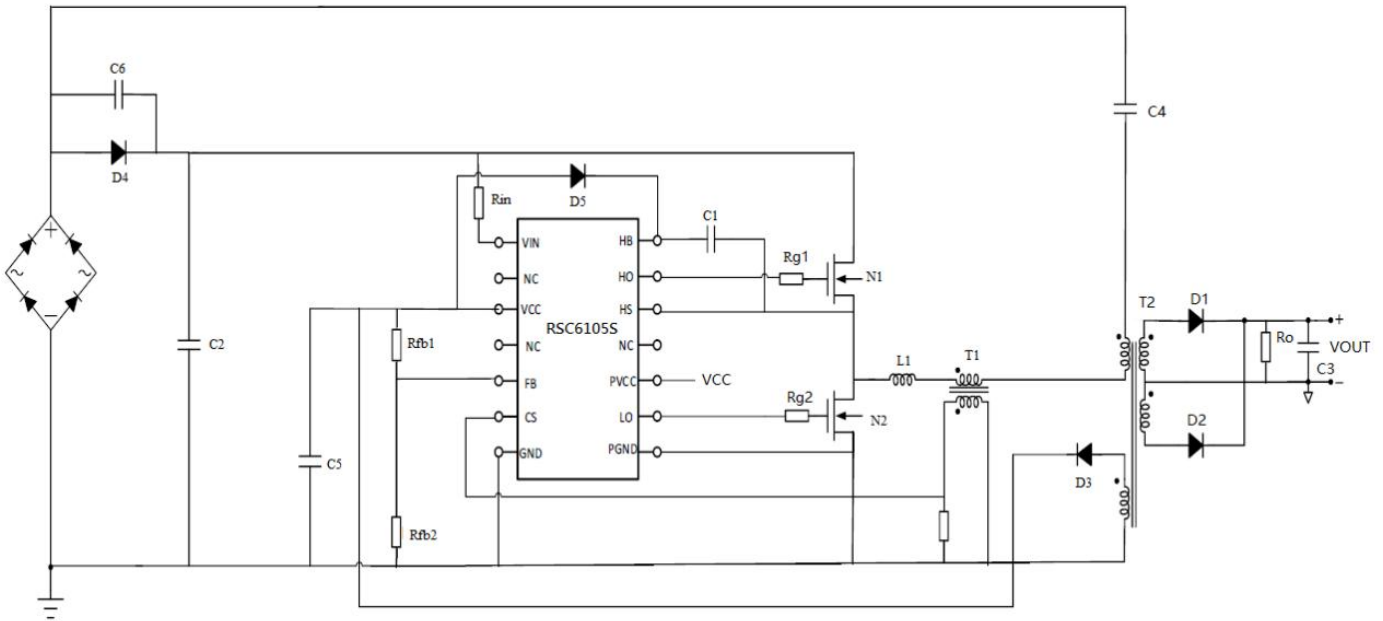


Figure 4 Typical application circuit

■ **Creating the PCB**

There are a few key areas that are important to layout correctly in order to have a good design. Please follow these guidelines:

1. Put the filter capacitors and Bootstrap capacitors to the corresponding pins as closely as possible ;
2. Keep the track connected to the PIN( LG、HG) and MOSFET (Gate) as short as possible;
3. Keep the bootstrap capacitors part running as short as possible for more stable working;

■ **Package Dimensions**

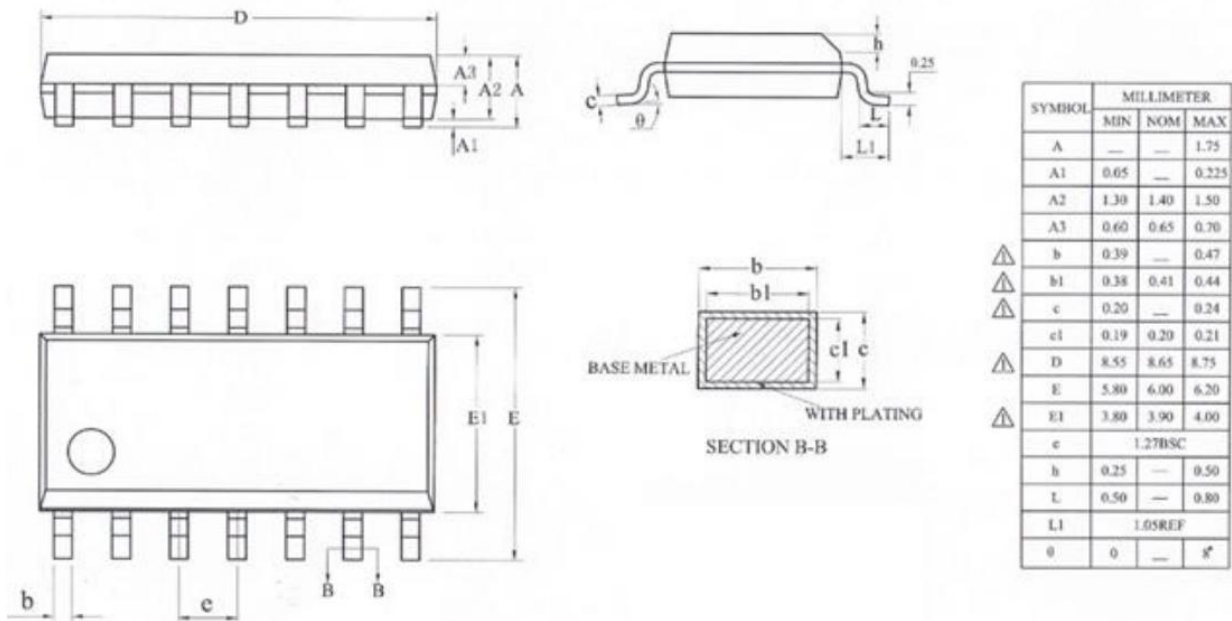


Figure 5 Package Dimensions

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