Using the ISL97631 White LED Driver Demo Board

Introduction

The complete schematic of ISL97631 white LED driver Demo Board is shown in Figure 1. It shows ISL97631 boost performance in simple and complicated control schemes. In order to test the demo board properly, it is necessary to understand the purpose and function of the onboard jumpers (JP1, JP2, JP3, JP4, JP5, JP6, and JUMP SHDNB).

The first four jumpers (JP1 to JP4) are used to disable four of the six LEDs. Without any of the jumpers placed, all six LEDs are driven by the ISL97631 boost converter. Placing jumper JP1 shorts out LED D2, JP2 shorts out D3, and so on for the four LED jumpers. If all four LED jumpers are placed, LEDs D6 and D7 will remain active.

JP5 is for PWM dimming control function. One pin of JP5 is connected with Vin and the other pin of JP5 is connected with EN pin of ISL97631 through JUMP SHDNB. For PWM dimming control, the PWM signal can be applied to the pin of JP5 to implement PWM dimming function.

JUMP SHDNB is used to enable or disable the ISL97631 chip. If JUMP SHDNB is shorted to GND, the chip is disabled.

JP6 is used to step decrease the RSET resistance. This resistance, in turn, adjusts the LED supply current. If JP6 is not placed, RSET is 10kΩ and the LED current is set to 10mA. If JP6 is placed, RESET is 5kΩ and the LED current is set to 20mA.

To test the demo board, the following procedure must be followed:

Shunt JP1~JP4. Based on the required test LED number, suitable JP1~JP4 are placed to bypass the required LED number.

Set up the required output current. Based on the required LED current, either place or remove JP6 to make the LED current equal to the required LED current.

Apply a DC power voltage source on Vin and GND pins. For ISL97631, the allowed input voltage range is from 2.7 to 5V. Due to the boost function, the input DC voltage must be lower than the output voltage in order to regulate the output LED current.

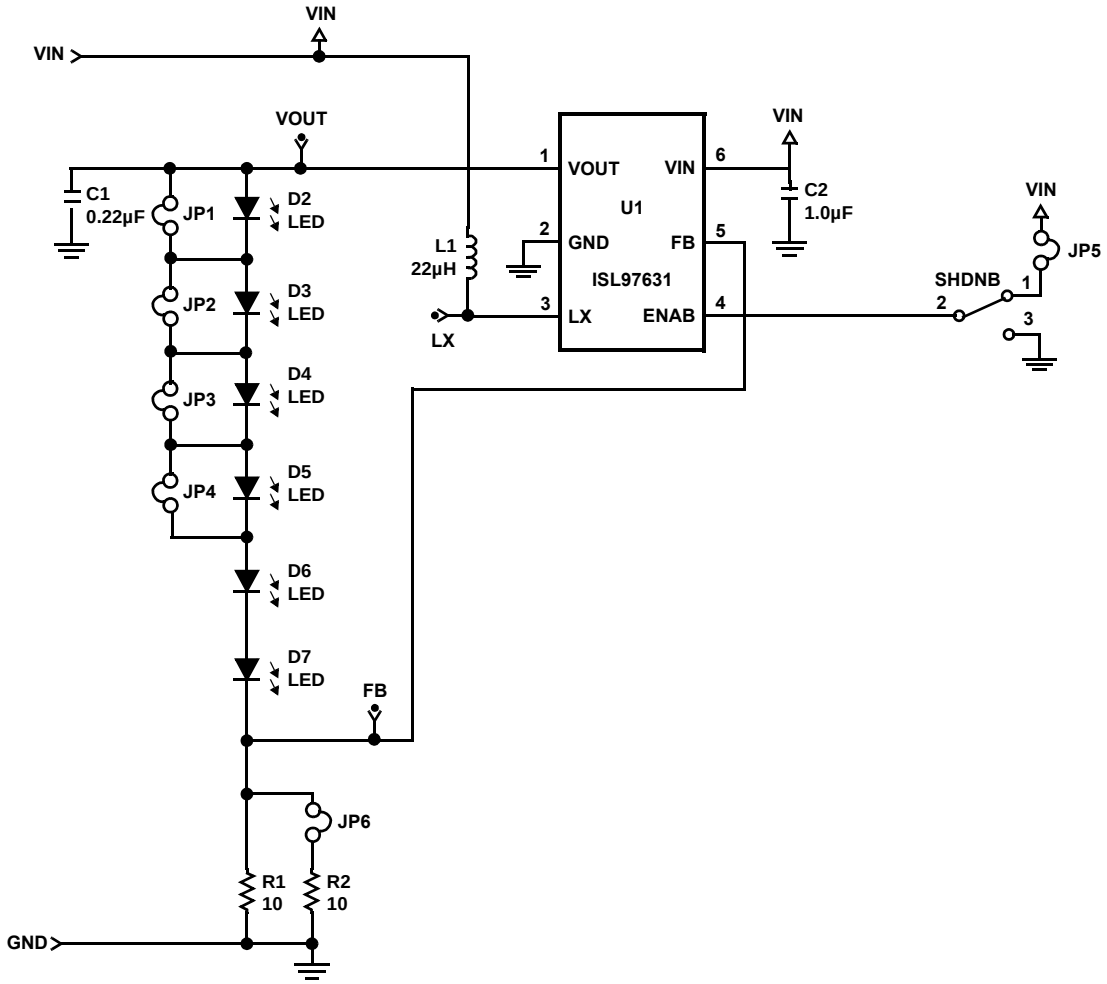

FIGURE 1. COMPLETED SCHEMATIC OF ISL97631 BOOST DEMO BOARD

ISL97631 Bill of Materials

DESIGNATOR	PART TYPE	FOOTPRINT	DESCRIPTION	MANUFACTURE
C1	0.22µF/25V	1206	Capacitor	
C2	1.0µF/10V	1206	Capacitor	
R1	10	1206	Resistor	
R2	10	1206	Resistor	
L1	22µH	DT1608		Sumida
U1	ISL97631	SOT23-6		
JP2	JUMPER	JUMPER-2PIN	Jumper	
JP1	JUMPER	JUMPER-2PIN	Jumper	
JP3	JUMPER	JUMPER-2PIN	Jumper	
JP5	JUMPER	JUMPER-2PIN	Jumper	
JP4	JUMPER	JUMPER-2PIN	Jumper	
JP6	JUMPER	JUMPER-2PIN	Jumper	
D7	LED	LED-2832		Vishay
D2	LED	LED-2832		
D6	LED	LED-2832		
D3	LED	LED-2832		
D4	LED	LED-2832		
D5	LED	LED-2832		
VIN	POWER POST	POWERPOST		
GND	POWER POST	POWERPOST		
LX	TEST POINT	TESTPOINT		
FB	TEST POINT	TESTPOINT		
VOUT	TEST POINT	TESTPOINT		

Demo Board Layout

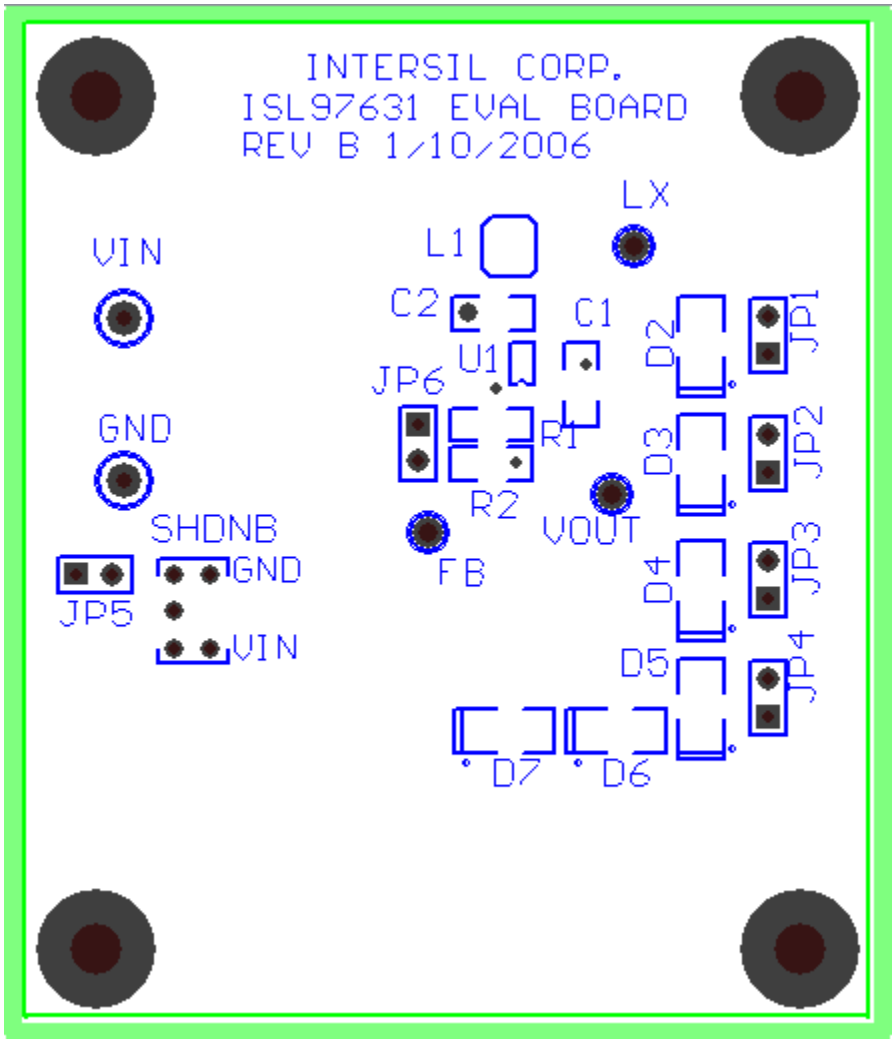

FIGURE 2. TOP SILKSCREEN OF ISL97631 BOOST DEMO BOARD

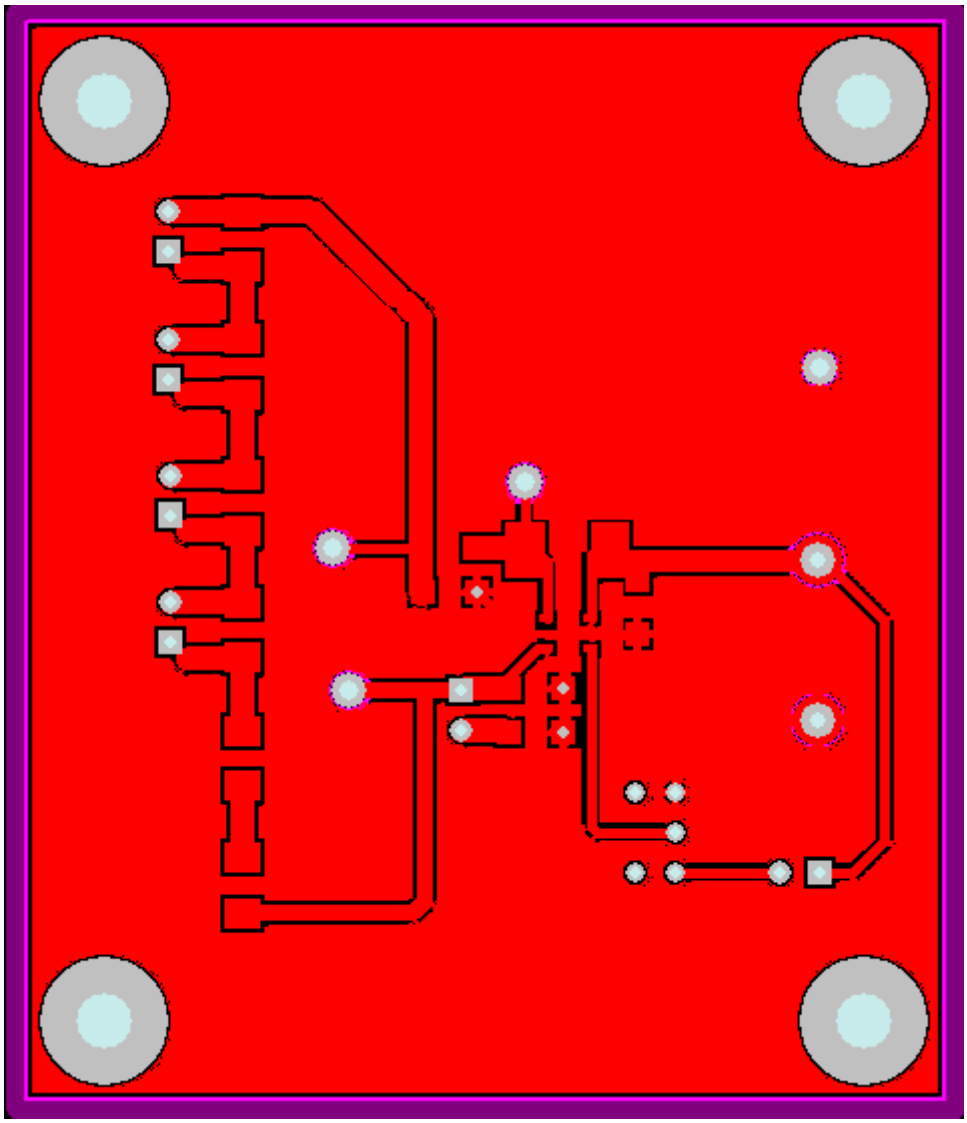

FIGURE 3. TOP LAYER OF ISL97631 BOOST DEMO BOARD

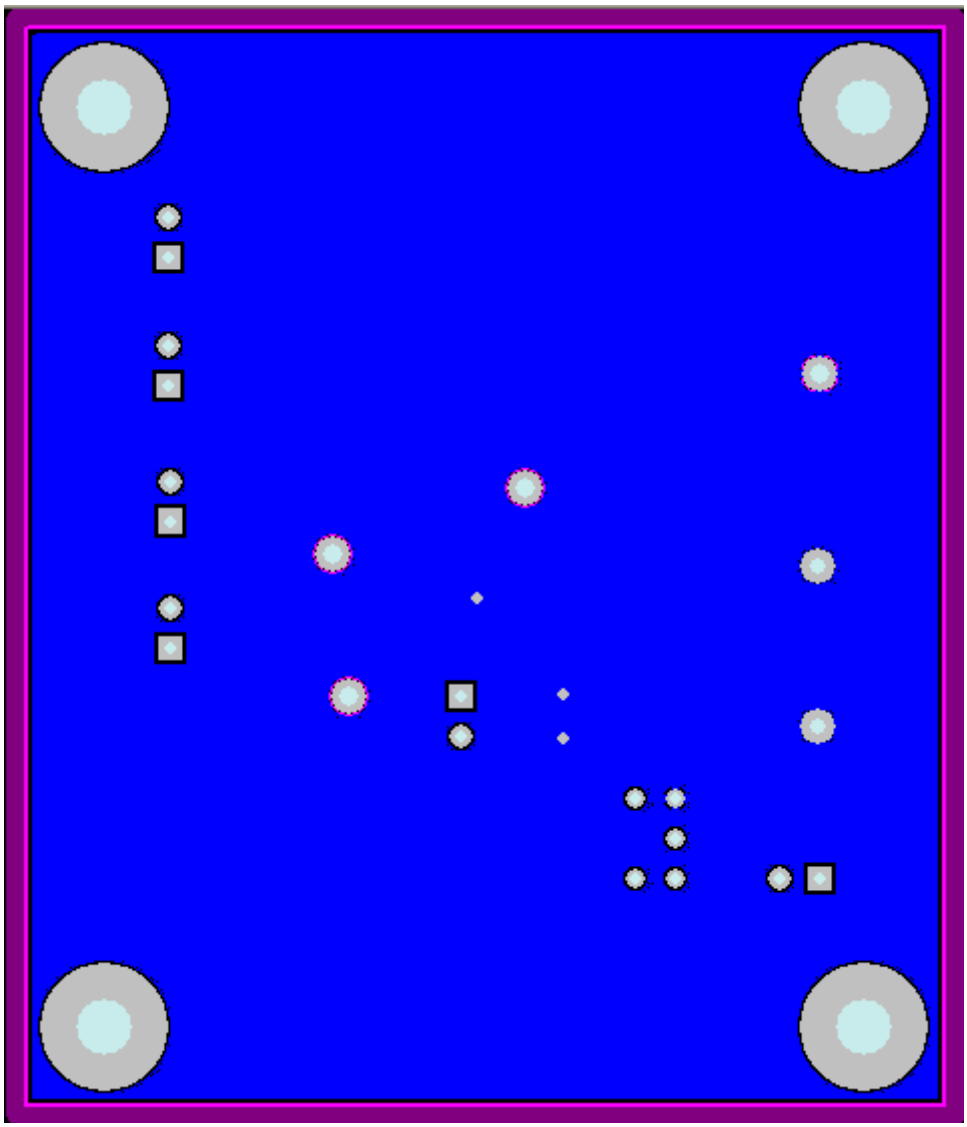

FIGURE 5. BOTTOM LAYER OF ISL97631 BOOST DEMO BOARD