ISL97671A, ISL97672A Evaluation Board Quick Start Guide

Description

This quick start guide pertains to the ISL97671A, ISL97672A Evaluation Board Rev A-1 (Oct 2011). This board comes populated with 78 LED's in 6P13S configuration to simplify evaluation and testing. In the case of the ISL97671A evaluation board, please install the Sunlight ISL97670 GUI, which will be used to control these parts via I^2C. Please note that the slave address on the ISL97671A is hexadecimal 58; see Figure 1. Please refer to respective the ISL97671A or ISL97672A section for jumper settings and power up instructions.

ISL97671A

1. ISL97671A LED strings can be configured in 6P13S, 6P12S, 6P11S, and 6P10S with different LED jumper settings, as shown in Table 1.
2. Connect WR, JP_OUTPUT, and JPCH0-JPCH5. Leave JP1 open to use external fault protection FET (Q1).
3. For current LED configuration, connect jumper JP1A to the left and connect the power supply on J99 (IC_VIN) to deliver VIN to the IC. When there is less LED in each string and VOUT is lower than 28V, IC_VIN can be configured as the bootstrap generated from the boost output by connecting the jumper JP1A to the right
4. IC Enable is shorted to VIN by connecting jumper JP2A to the right, thereby shorting jumper JP2A to the left so that the EN is driven by J98(EN)
5. VLOGIC level for I^2C can be generated from VDC by connecting jumper JP3A to the right. VLOGIC can be driven from J97 (VLOGIC) by shorting jumper JP3A to the left.
6. The configuration of VIN (JP1A), EN (JP2A), and VLOGIC (JP3A) can be quickly found by referring to the table printed on the evaluation board, as shown in Figure 3.
7. There are 4 different operation modes for ISL97671A. The setting for each mode is shown on the other table printed on the evaluation board, as shown in Figure 3.
8. For I^2C/SMBUS and DPST mode, connect the I^2C interface board to the ISL97671A evaluation board, as shown in Figure 2.
9. For I^2C/SMBUS and DPST mode, in order to enable the board, write a hex 58 for Slave Address and write a hex 05 in register 01; writing a hex 01 in register 01 will enable DPST (see data sheet for more details); writing a hex 03 in register 01 will allow PWM dimming only.

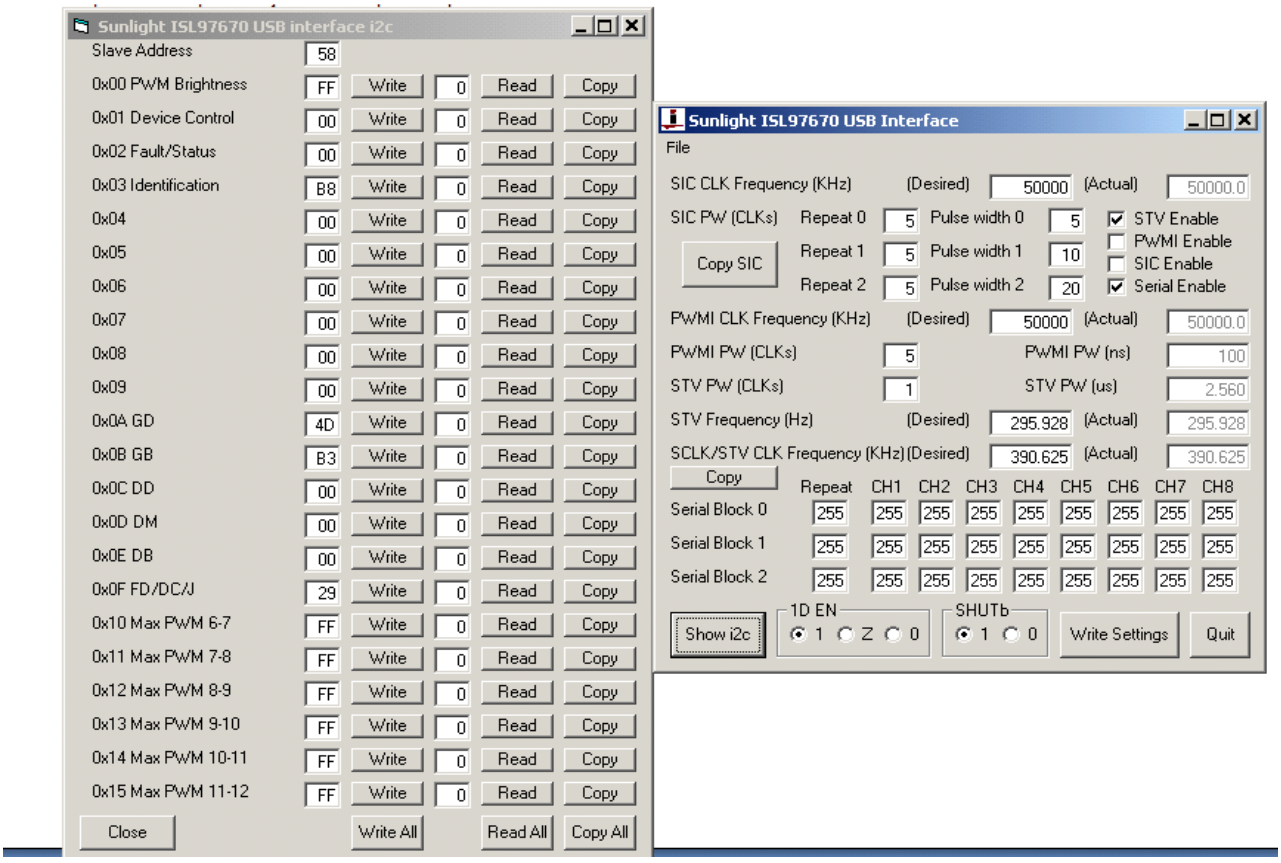


FIGURE 1. EXAMPLE OF GUI INTERFACE

TABLE 1. LED STRINGS CONFIGURATIONS WITH DIFFERENT JUMPER SETTINGS

LED CONFIGUATRION	6P13S	6P12S	6P11S	6P10S
JP_OUTPUT	Short			
JP_CH0	Short			
JP_CH1				
JP_CH2				
JP_CH3				
JP_CH4				
JP_CH5				
SH1_LED0	Open	Short	Open	Short
SH1_LED1				
SH1_LED2				
SH1_LED3				
SH1_LED4				
SH1_LED5				
SH2_LED0	Open	Open	Short	Short
SH2_LED1				
SH2_LED2				
SH2_LED3				
SH2_LED4				
SH2_LED5				

10. The LED current can be programmed by varying POT R15 using the following equation:

$$ILED = 410.5/(R15 + R16) = 410.5/R13 \quad \text{(EQ. 1)}$$

The measured current divided by six is the LED current per channel. For example, 120mA measured current will correspond to 20mA/channel.

11. The PWM dimming frequency can be adjusted by varying pot R11 using the following equation:

$$F_{PWM} = 6.66 \times 10^7/(R11 + R12) \quad \text{(EQ. 2)}$$

ISL97672A

1. ISL 97672A LED strings can be configured in 6P13S, 6P12S, 6P11S, and 6P10S with different LED jumper settings, as shown in Table 1.
2. Connect WR, JP_OUTPUT, and JPCH0-JPCH5. Leave JP1 open to use external fault protection FET (Q1).
3. For current LED configuration, connect jumper JP1A to the left and connect the power supply on J99 (IC_VIN) to deliver VIN to the IC. When there is less LED in each string and VOUT is lower than 28V, IC VIN can be configured as the bootstrap generated from the boost output by connecting the jumper JP1A to the right.
4. IC Enable is shorted to VIN by connecting jumper JP2A to the right, thereby shorting jumper JP2A to the left so that EN is driven by J98 (EN).
5. VLOGIC level can be generated from VDC by connecting jumper JP3A to the right. VLOGIC can be driven from J97 (VLOGIC) by shorting jumper JP3A to the left.
6. Configuration of VIN (JP1A), EN (JP2A), and VLOGIC (JP3A) can be quickly found by referring to the table printed on the evaluation board, as shown in Figure 3.
7. There is only one operation mode for ISL97672A, and the settings for JP4A, JP5A, J81, JP91, R10, and JP92 need to follow the table printed on the evaluation board, as shown in Figure 3.
8. The boost switching frequency can be adjusted by varying pot R11 using the following equation:

$$F_{sw} = (5 \times 10^{10})/(R11 + R12) \quad \text{(EQ. 3)}$$

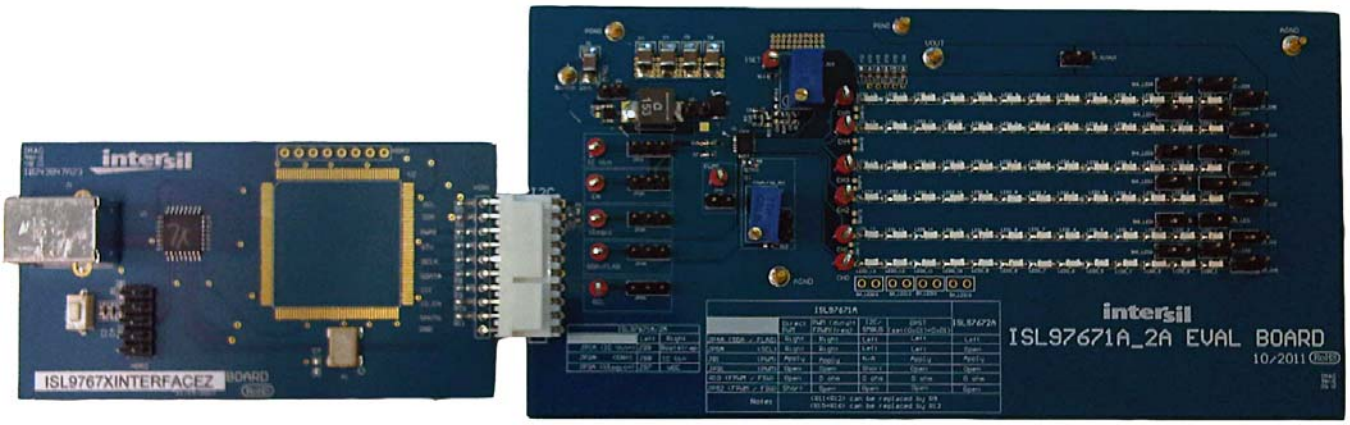
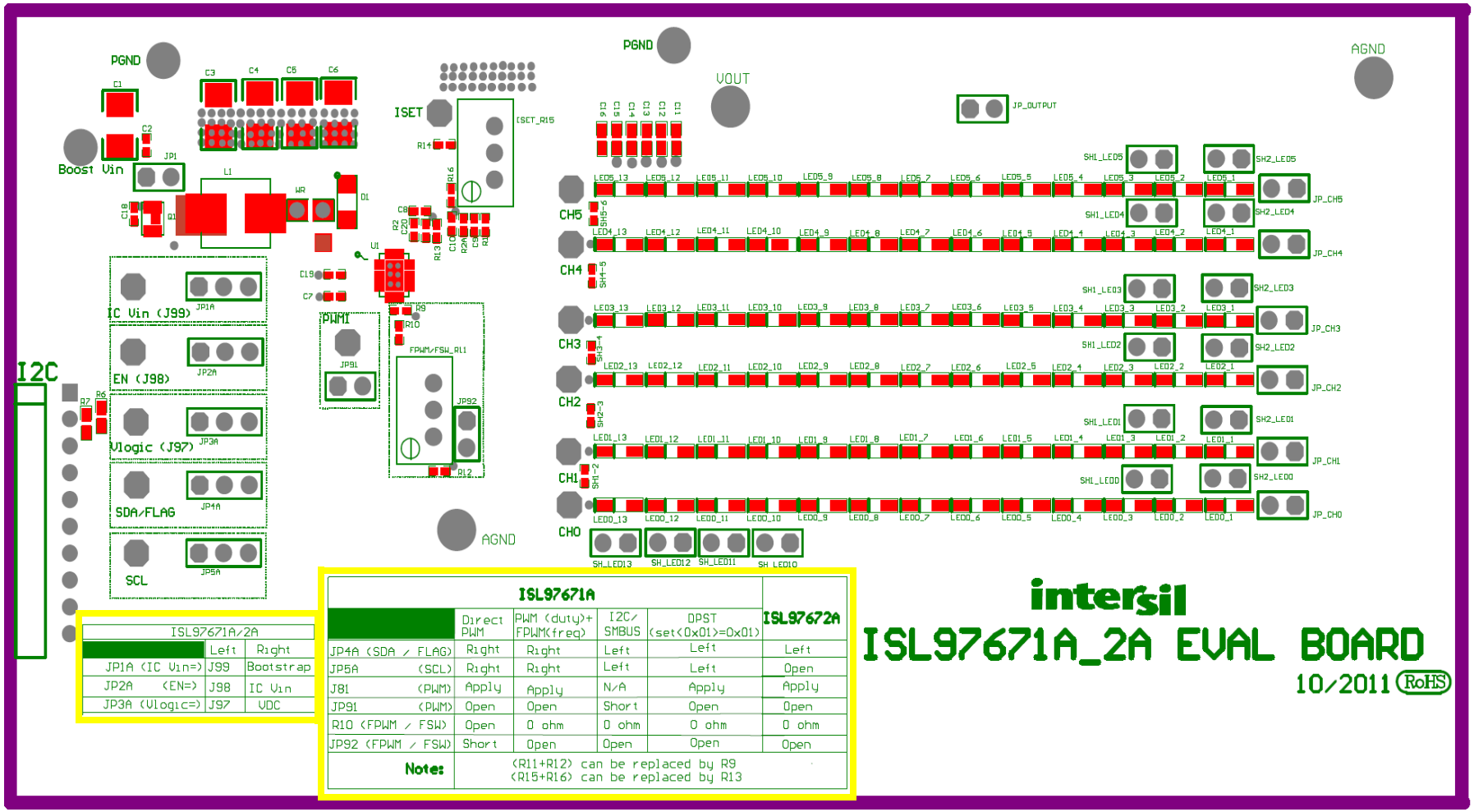


FIGURE 2. I²C INTERFACE BOARD CONNECTED TO THE ISL97671A EVALUATION BOARD



ISL97671A/2A		
	Left	Right
JP1A (IC Vin=)	J99	Bootstrap
JP2A (EN=)	J98	IC Vin
JP3A (Vlogic=)	J97	VDC

	ISL97671A				ISL97672A
	Direct PWM	PWM (duty)+ FPWM(freq)	I2C/ SMBUS	DPST (set<0x01>=0x01)	
JP4A (SDA / FLAG)	Right	Right	Left	Left	Left
JP5A (SCL)	Right	Right	Left	Left	Open
J81 (PWM)	Apply	Apply	N/A	Apply	Apply
JP91 (PWM)	Open	Open	Short	Open	Open
R10 (FPWM / FSW)	Open	0 ohm	0 ohm	0 ohm	0 ohm
JP92 (FPWM / FSW)	Short	Open	Open	Open	Open
Note:	(R11+R12) can be replaced by R9 (R15+R16) can be replaced by R13				

FIGURE 3. SETTINGS OF IC VIN, ENABLE, AND VLOGIC ARE SHOWN ON PCB IN YELLOW RECTANGE ON THE LEFT-HAND SIDE. CONFIGURATIONS OF 4 DIFFERENT OPERATION MODES ARE LISTED ON PCB IN YELLOW RECTANGE ON THE RIGHT-HAND SIDE.

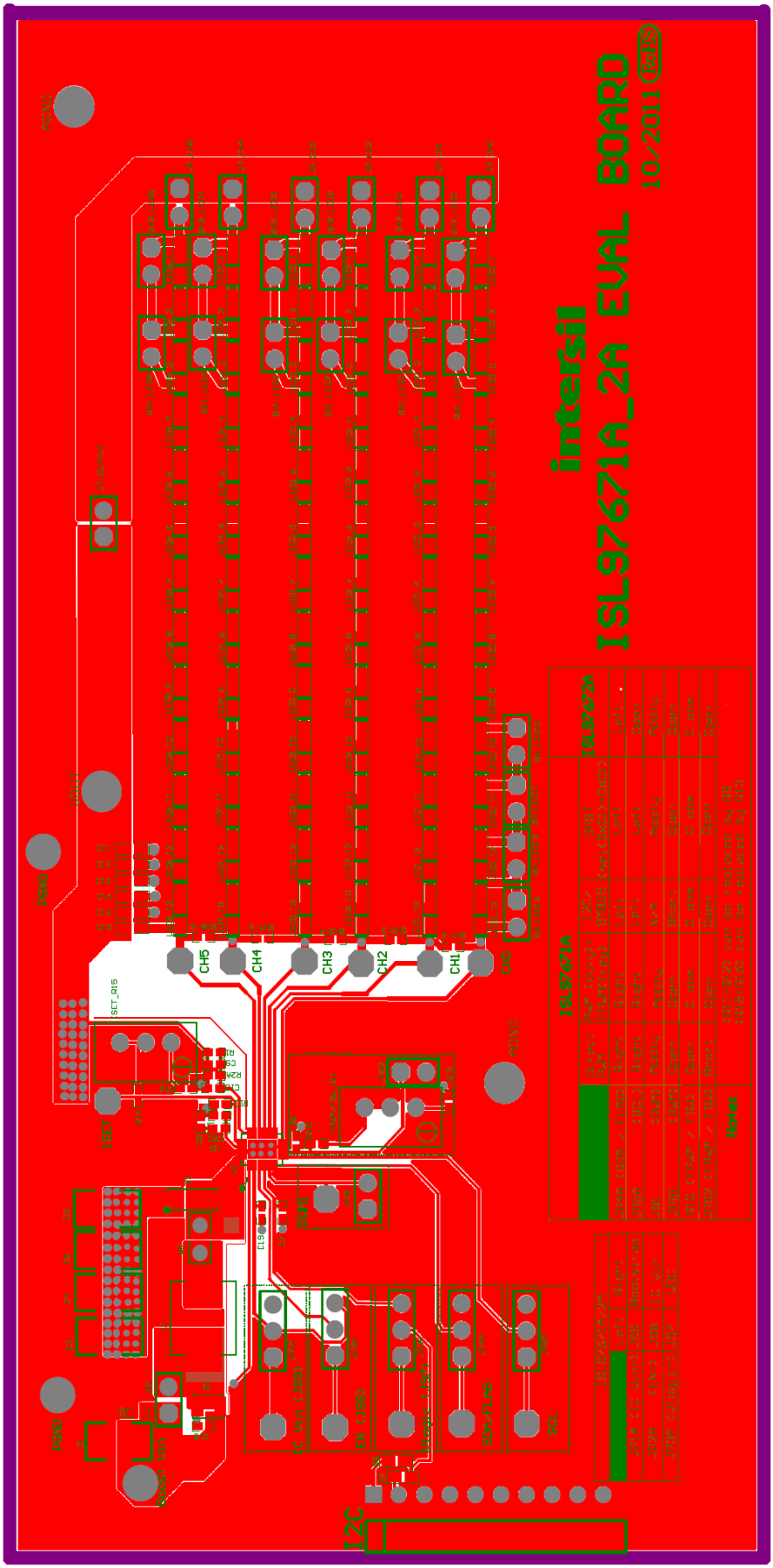


FIGURE 4. TOP VIEW OF ISL97671A/ISL97672A EVALUATION BOARD

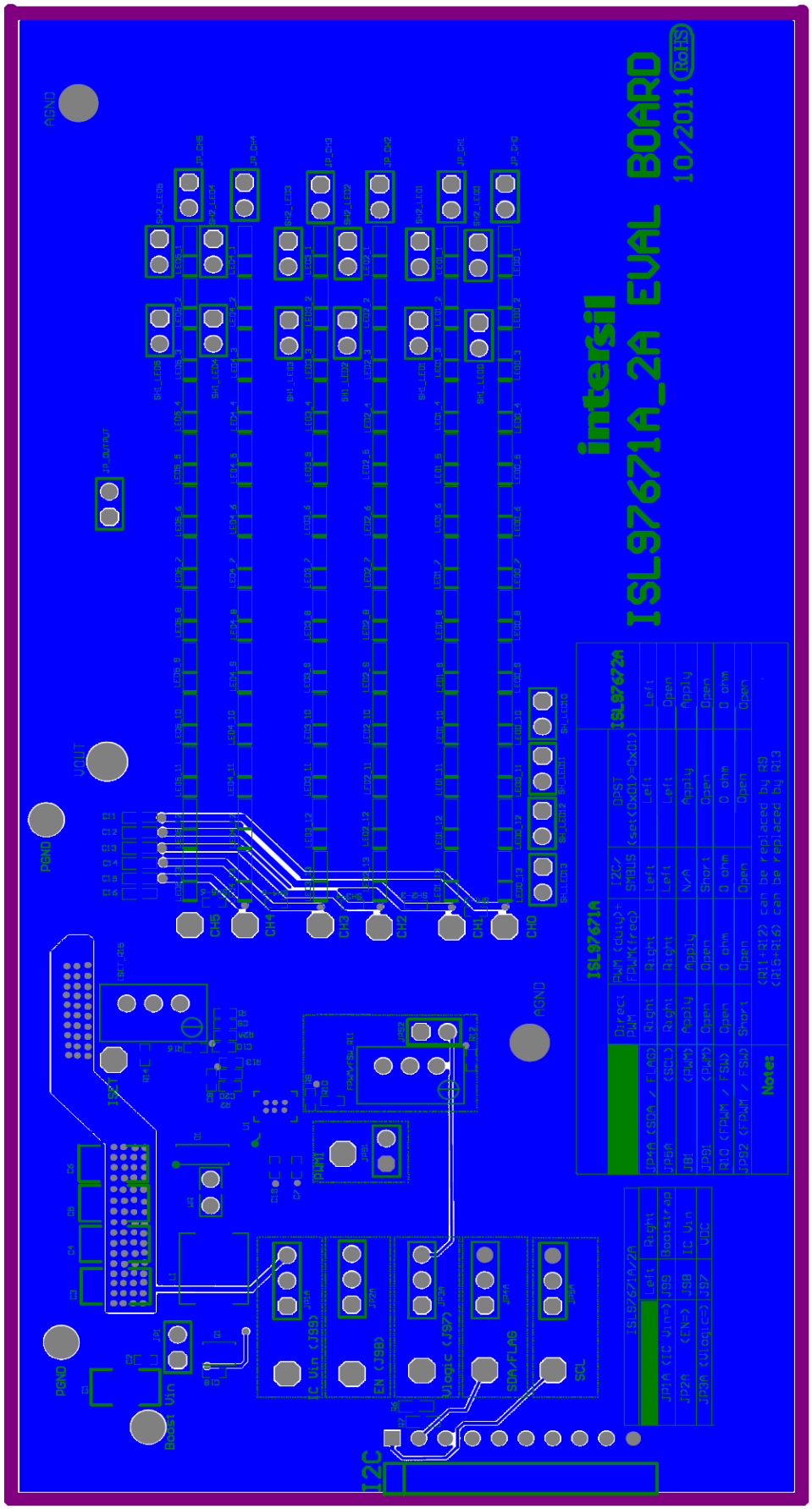


FIGURE 5. BOTTOM VIEW OF ISL97671A/ISL97672A EVALUATION BOARD

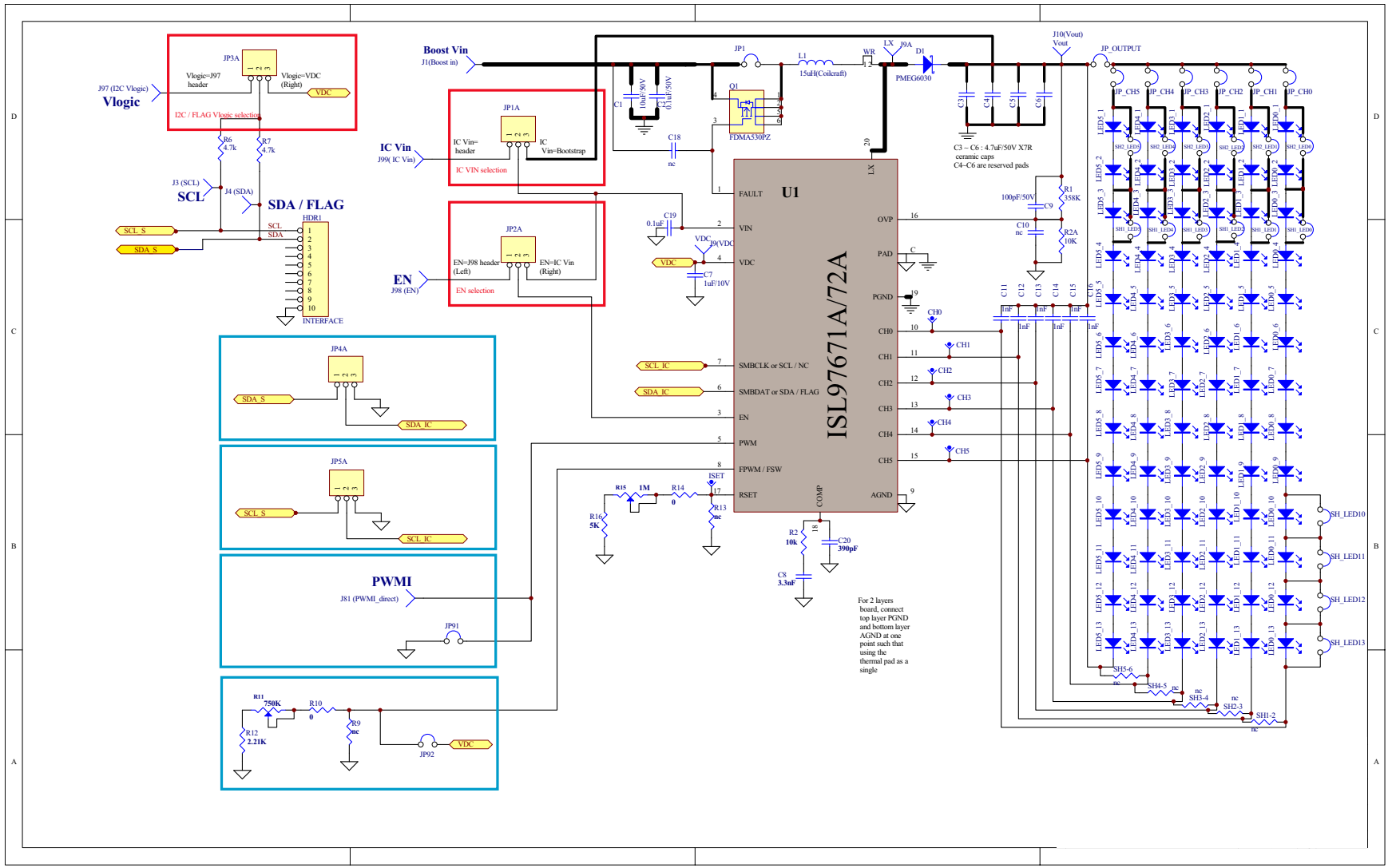


FIGURE 6. SCHEMATIC OF ISL97671A ISL97672A EVALUATION BOARD

TABLE 1. BOM FOR ISL97671A/ISL97672A EVALUATION BOARD

PART TYPE	DESIGNATOR	FOOTPRINT
0	R14	402
0	R10	402
0.1uF	C19	402
0.1µF/50V	C2	402
1M	R15	VRES
1nF	C11	603
1nF	C14	603
1nF	C16	603
1nF	C13	603
1nF	C12	603
1nF	C15	603
1µF/10V	C7	402
2.21k	R12	402
3.3nF	C8	402
4.7k	R6	603
4.7k	R7	603
4.7µF/50V	C5	1210
4.7µF/50V	C6	1210
4.7µF/50V	C3	1210
4.7µF/50V	C4	1210
5k	R16	402
10k	R2A	402
10k	R2	402
10µF/50V	C1	1210
15µH (Coilcraft)	L1	XAL6060-153MEB
100pF/50V	C9	402
358K	R1	402
390pF	C20	402
750k	R11	VRES
FDMA530PZ	Q1	microFET2x2
INTERFACE	HDR1	MOLEX22-05-3101
ISL97671A/72A	U1	LPP20.3X4
LED-SMT	ALL LEDs	LW_Y87C
PMEG6030	D1	SOD-123W
nc	SH4-5	402
nc	C10	402
nc	R13	402
nc	C18	402
nc	R9	402
nc	SH3-4	402

TABLE 1. BOM FOR ISL97671A/ISL97672A EVALUATION BOARD (Continued)

PART TYPE	DESIGNATOR	FOOTPRINT
nc	SH5-6	402
nc	SH1-2	402
nc	SH2-3	402