ISL97671/2/3/4IRZ-EVAL Quick Start Guide

This quick start guide pertains to the ISL97671/2/3/4IRZ-EVAL Evaluation Board. This board comes populated with 72 LEDs in a 6P12S configuration to simplify evaluation and testing. Please install the Sunlight ISL97670 GUI from Intersil's website, which will be used to control ISL97671/3/4 parts via I^{2}C. Note the slave address on the ISL97671, ISL97673 and ISL97674 is hexadecimal 58; see Figure 1. Please refer to "ISL97671" on page 1, "ISL97672" on page 2, "ISL97673" on page 2 and "ISL97674" on page 3, for jumper settings and power-up instructions.

ISL97671

1. Jumpers JP7B, JP8B, JP9, JP10, JP11, JP12 and JP13 should be inserted for LED's in 6P12S configuration.

2. Jumpers in line 1, plus JP14, JP15, JP16, JP17, JP18 and JP19 should be inserted for LED's in 6P10S configuration.

3. Jumper JP5A, JP3A and JP6A are inserted.

4. Connect the I^{2}C interface board to the ISL97671/2/3/4IRZ-EVAL Evaluation Board as shown in Figure 2 for I^{2}C control.
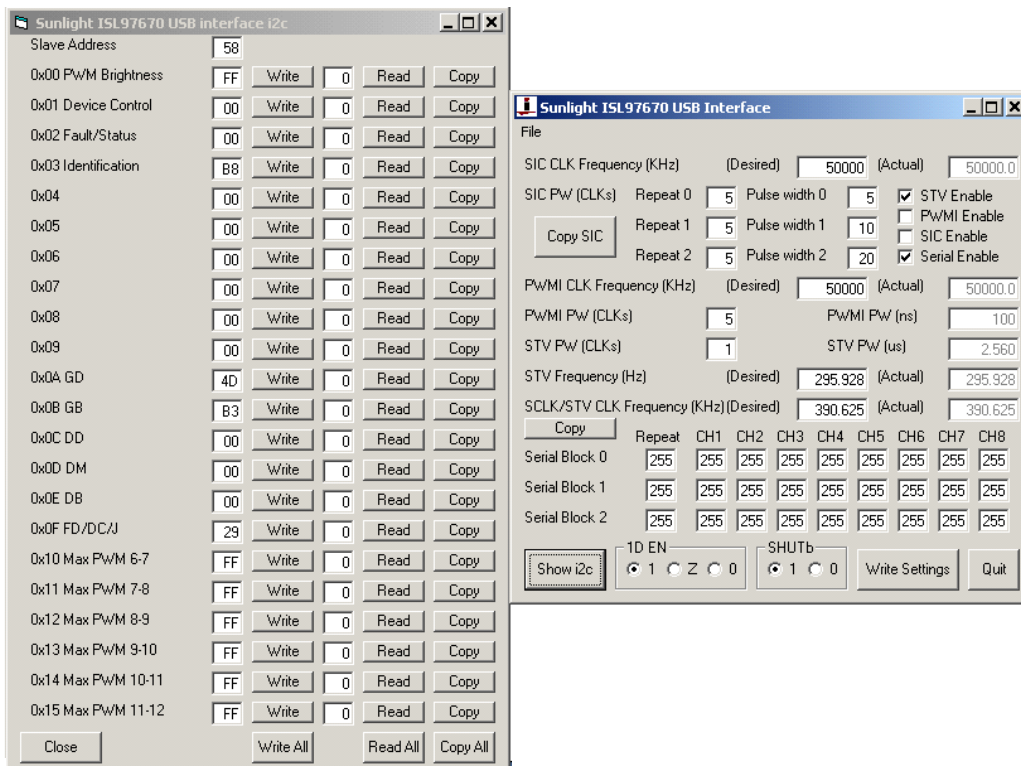

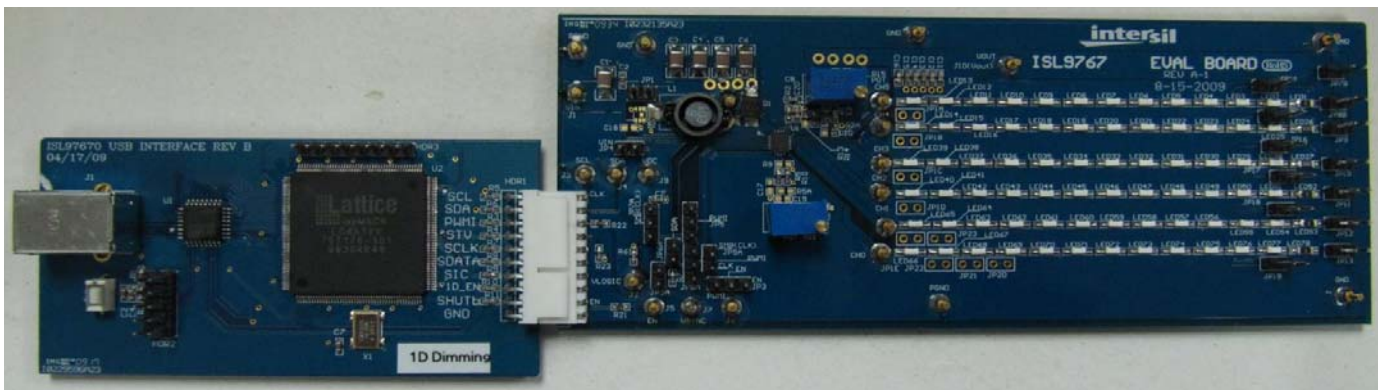FIGURE 1. EXAMPLE OF GUI INTERFACE

FIGURE 2. I^{2}C INTERFACE BOARD CONNECTED TO ISL97671IRZ-EVAL EVALUATION BOARD

5. JP1 should be inserted only if the input fault MOSFET Q1 is not used.

6. Apply input voltage to the V_{IN} and GND post on the top left corner of the ISL97671IRZ-EVAL Evaluation Board.

7. Jumper JP3 should be in the right position and EN signal from a 2.5V/3.3V logic supply connected to the EN jumper, J5.

8. Jumper JP8A should be in the top position and PWM signal from a function generator connected to the PWMI jumper, J6.

9. Insert JP5A, JP6A and J3A.

10. To enable the board in SMBus mode, write a hex 05 in register 01; by writing a hex 01 in register 01 will enable DPST (see data sheet [FN7631](#) for more details); writing a hex 03 in register 01 will allow PWM dimming only.

11. For non-I^{2}C control of ISL97671, remove the I^{2}C interface board, JP3A and ground J3(SCL post) and J4 (SDA post). The board can now be controlled via the EN and PWMI signal.

12. The LED current is calibrated to 20mA/channel, which can be changed by measuring current across JP7B and varying POT R_{15} by Equation 1:

$$I_{LED} = 401.8 / R_{15} \qquad \text{(EQ. 1)}$$

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

13. The PWM dimming frequency is calibrated to 200Hz on this evaluation board but can be adjusted by varying POT R_{11} by Equation 2:

$$F_{SW} = (6.66 \times 10^7) / R_{11} \qquad \text{(EQ. 2)}$$

14. ISL97671IRZ-EVAL Evaluation Board should be powering 6P10S or 6P12S LED's.

ISL97672

1. Jumpers JP7B, JP8B, JP9, JP10, JP11, JP12 and JP13 should be inserted for LED's in 6P12S configuration.

2. Jumpers in line 1, plus JP14, JP15, JP16, JP17, JP18 and JP19 should be inserted for LED's in 6P10S configuration.

3. Jumper JP8A inserted in top position.

4. Jumper JP3 should be in the right position.

5. JP1 should be inserted only if the input fault MOSFET Q1 is not used.

6. Apply input voltage to the V_{IN} and GND post on the top left corner of the ISL97672IRZ-EVAL Evaluation Board.

7. Apply a 2.5/3.3V signal to EN jumper, J5.

8. Apply a PWM signal from a function generator to PWMI jumper, J6.

9. The LED current is calibrated to 20mA/channel which can be changed by measuring current across JP7B and varying POT R_{15} by Equation 3:

$$I_{LED} = 401.8 / R_{15} \qquad \text{(EQ. 3)}$$

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

10. The boost switching frequency is calibrated to 600kHz on this evaluation board but can be adjusted by varying POT R_{11} by Equation 4:

$$F_{SW} = (5 \times 10^{10}) / R_{11} \qquad \text{(EQ. 4)}$$

11. At this point, the ISL97672IRZ-EVAL Evaluation Board should be powering 6P10S or 6P12S LED's.

ISL97673

1. Jumpers JP7B, JP8B, JP9, JP10, JP11, JP12 and JP13 should be inserted for LED's in 6P12S configuration.

2. Jumpers in line 1, plus JP14, JP15, JP16, JP17, JP18 and JP19 should be inserted for LED's in 6P10S configuration.

3. Jumpers JP3A, JP5A and JP6A are inserted.

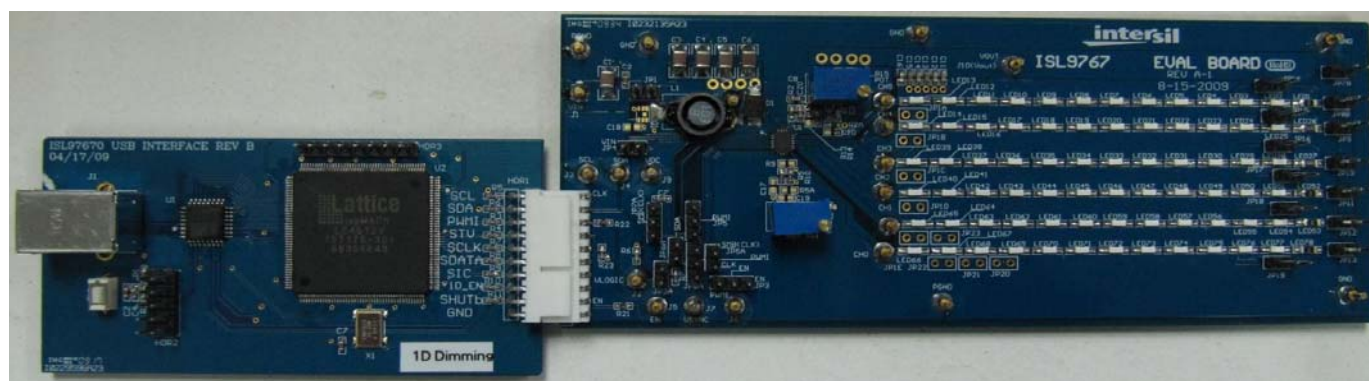4. Connect the I^{2}C interface board to the ISL97673/4IRZ-EVAL Evaluation Board, as shown in Figure 3.

FIGURE 3. I^{2}C INTERFACE BOARD CONNECTED TO ISL97673IRZ-EVAL EVALUATION BOARD

5. JP1 should be inserted only if the input fault MOSFET Q1 is not used.

6. Apply input voltage to the V_{IN} and GND post on the top left corner of the ISL97673IRZ-EVAL Evaluation Board.

   For PWMI dimming, only go to Step 7; for SMBus dimming go to Step 8; for direct PWM go to Step 9; for DC current adjustment go to Step 10.

7. JP7A in the bottom position corresponds to SEL2 pin being high, which corresponds to fixed delay; floating JP7A corresponds to float on SEL2 pin, which corresponds to equal phase shift; inserting JP7A in the top position, corresponds to no delay.

8. JP5 inserted in the bottom position

9. Insert JP5A in top position and JP7A in the top position.

10. Insert JP5 in the top position

11. Jumper JP3 should be in the left position and EN/PWM signal from function generator connected to PWMI jumper, J6.

12. To enable the board in SMBUS dimming, write a hex 05 in register 01; writing a hex 01 in register 01 will enable DPST (see data sheet [FN7633](#) for more detail); writing a hex 03 in register 01 will only allow external PWM signal for dimming.

13. The LED current is calibrated to 20mA/channel which can be changed by measuring current across JP7B and varying POT R_{15} by Equation 5:

$$I_{LED} = 401.8/R_{15} \tag{EQ. 5}$$

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

14. The PWM dimming frequency is calibrated to 200Hz on this evaluation board but can be adjusted by varying POT R_{11} by Equation 6:

$$F_{SW} = (6.66 \times 10^7)/R_{11} \tag{EQ. 6}$$

15. At this point, the ISL97673IRZ-EVAL Evaluation Board should be powering 6P10S or 6P12S LED's.

ISL97674

1. Jumpers JP7B, JP8B, JP9, JP10, JP11, JP12 and JP13 should be inserted for LED's in 6P12S configuration.

2. Jumpers in line 1, plus JP14, JP15, JP16, JP17, JP18 and JP19 should be inserted for LED's in 6P10S configuration.

3. Insert jumpers JP3A, JP5A and JP6A.

4. Connect the I^2C interface board to the ISL97674IRZ-EVAL Evaluation Board, as shown in Figure 4.

FIGURE 4. I^{2}C INTERFACE BOARD CONNECTED TO ISL97674IRZ-EVAL EVALUATION BOARD

5. Jumper JP3 should be in the left position and En/PWM signal from function generator connected to PWMI jumper, J6.

6. JP1 should be inserted only if the input fault MOSFET Q1 is not used.

7. Apply input voltage to the V$_{IN}$ and GND post on the top left corner of the ISL97674IRZ-EVAL Evaluation Board.

8. Insert JP8A in the bottom position and apply a 60Hz V$_{SYNC}$ signal to V$_{SYNC}$ post, J7.

9. To enable the board in SMBUS control dimming, write a hex 05 in register 01; for PWM dimming control, write a hex 03 in register 01.

10. The LED current is calibrated to 20mA/channel which can be changed by measuring current across JP7B and varying POT R$_{15}$ by Equation 7:

$$I_{LED} = 401.8/R_{15} \qquad \text{(EQ. 7)}$$

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

11. The boost switching frequency can be programmed to either 600kHz or 1.2MHz by writing a '1' or a '0' in hex register 08, Bit 2. See ISL97674 data sheet, FN7634, Table 2B for more details.

12. At this point, the ISL97674IRZ-EVAL Evaluation Board should be powering 6P10S or 6P12S LED's.

ISL97671/2/3/4IRZ-EVAL Evaluation Board Schematic
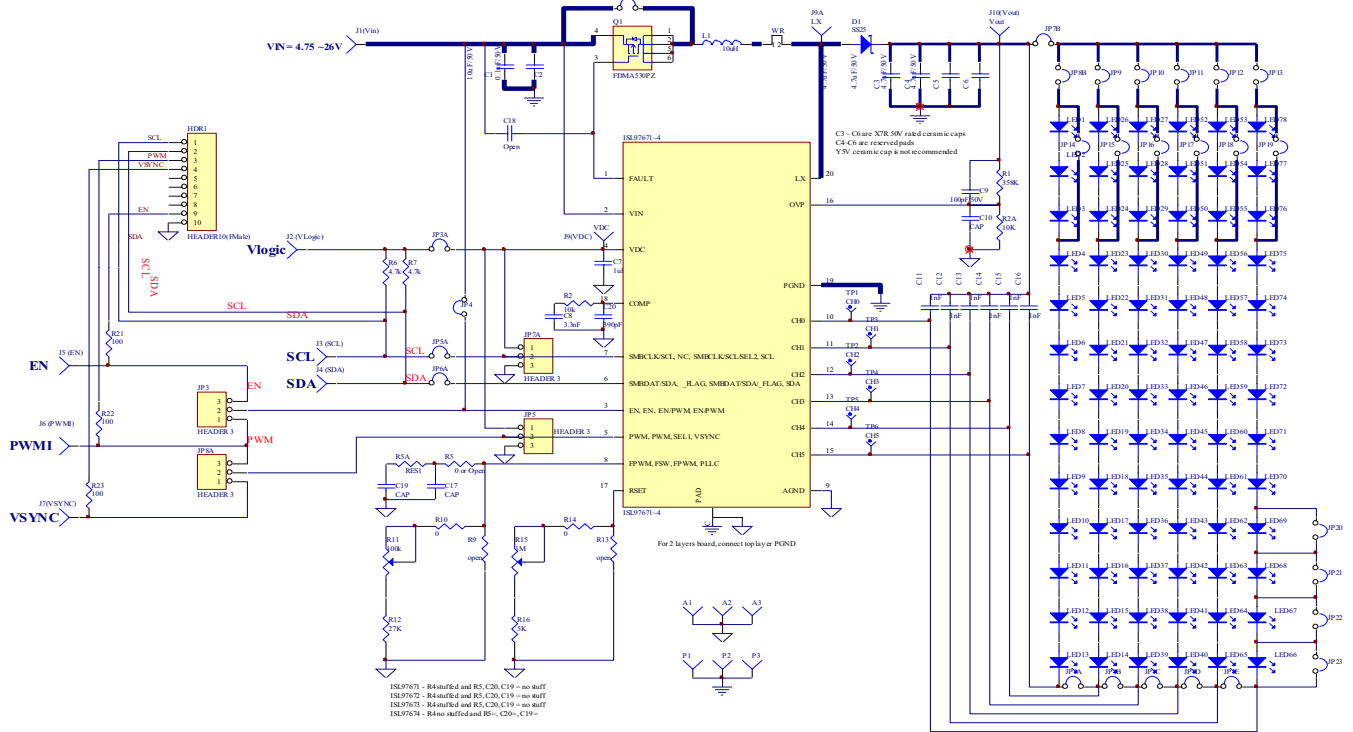
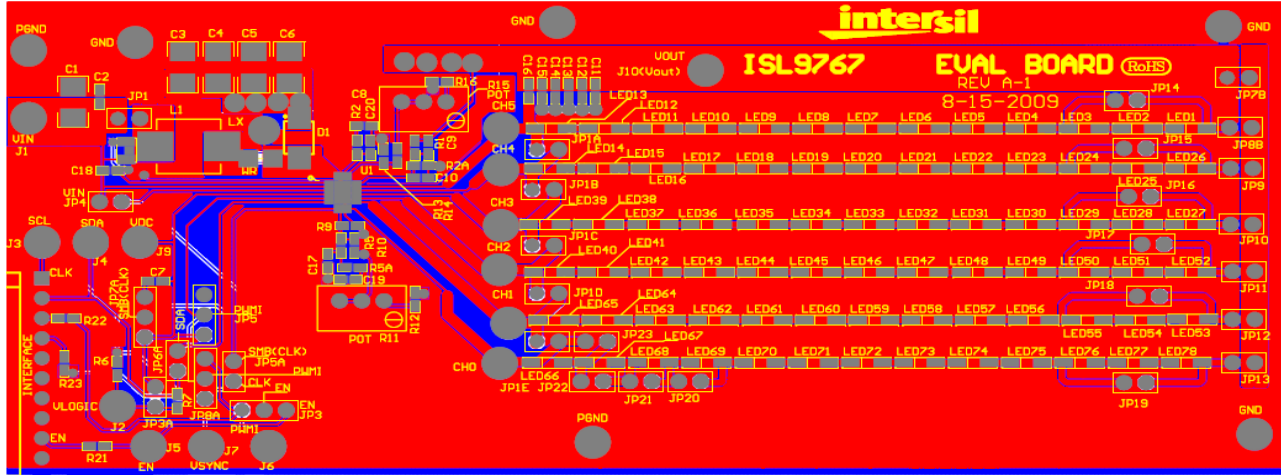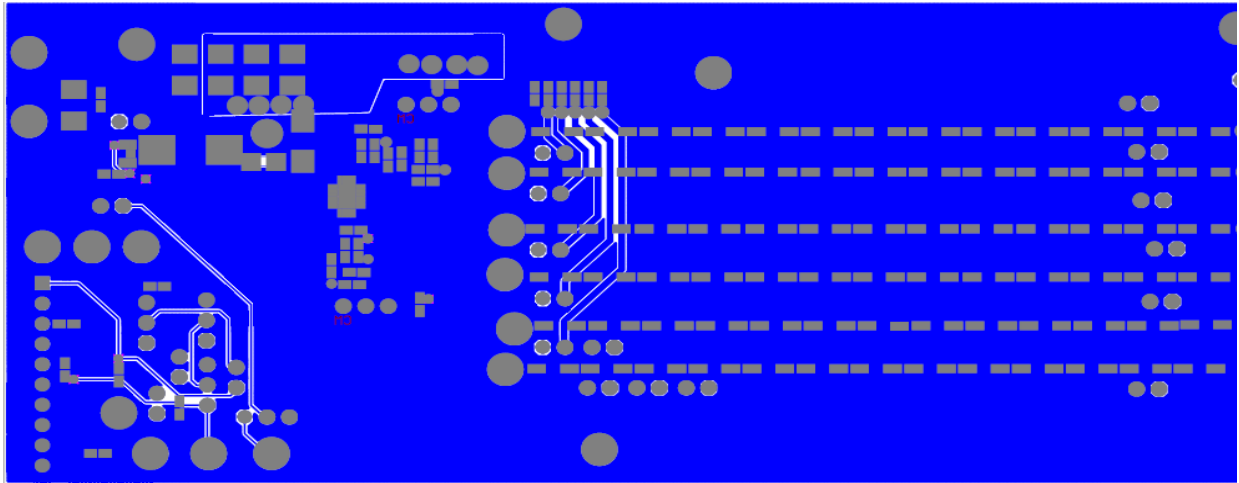# ISL97671/2/3/4IRZ-EVAL Evaluation Board Layout

FIGURE 5. TOP LAYER

ISL97671/2/3/4IRZ-EVAL Evaluation Board Layout (Continued)

FIGURE 6. BOTTOM LAYER

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