

Description

The IS31FL3731 is a compact LED driver for 144 single LEDs. The device can be programmed via an I2C compatible interface. Additionally each of the 144 LEDs can be dimmed individually with 8-bit allowing 256 steps of linear dimming.

To reduce CPU usage up to 8 frames can be stored with individual time delays between frames to play small animations automatically. LED frames can be modulated with audio signal.

Features

- Supply voltage range from 2.7V to 5.5V
- 8 frames memory for animations
- Picture mode and animation mode
- Auto intensity breathing during the switching of different frames
- LED frames displayed can be modulated with audio signal intensity
- LED light intensity can be modulated with audio signal intensity
- QFN-28 (4mm x 4mm) package

Quick Start



Figure 1: Photo of IS31FL3731 Evaluation Board

Recommended Equipment

- 5.0V, 2A power supply
- Audio source(i.e. MP3 player, Notebook PC, etc)
- 8Ω speaker

Absolute Maximum Ratings

- ≤ 5.5V power supply

Caution: Do not exceed the conditions listed above, otherwise the board will be damaged.

Procedure

The IS31FL3731 evaluation board is fully assembled and tested. Follow the steps listed below to verify board operation.

Caution: Do not turn on the power supply until all connections are completed.

- 1) Connect an 8Ω speaker to the “SPK” connector.
- 2) Connect the audio source to the “AUDIO IN” connector.
- 3) Connect the DC power to the connector (DC IN).
- 4) Turn on the power supply and pay attention to the supply current. If the current exceeds 1A, please check for circuit fault.
- 5) Turn on the audio signal.
- 6) Modulation of the audio signal utilized to obtain better sound output performance

Evaluation Board Ordering Information

| Part No. | IC Package |
|---------------------|-------------------|
| IS31FL3731-QFLS2-EB | QFN-28, Lead-free |

Table1: Ordering Information

For pricing, delivery, and ordering information, please contacts ISSI’s analog marketing team at analog_mkt@issi.com or (408) 969-6600.

Evaluation Board Operation

The IS31FL3199 evaluation board has eight display modes. Press MODE button to switch configurations.

- 1) Firework animation
- 2) Lighting animation
- 3) Power-on animation
- 4) Water drop animation
- 5) Static graphics breathe dimming effect
- 6) Triangular music bar effect: more triangular music bars are displayed with stronger music.
- 7) Equalizer bar effect: EQ bars move up and down with music.
- 8) Multiple graphics display: different graphics change with music rhythm.

***Note:**

IS31FL3731 solely controls the FxLED function on the evaluation board.

Software Control

JP1 default setting is close circuit. If it is set to open, the on-board MCU will stop working. The I2C pins are set to High Impedance. External I2C signals can be connected to TP3 to control the IS31FL3731 LED driver.

Please refer to the datasheet to get more information about IS31FL3731.

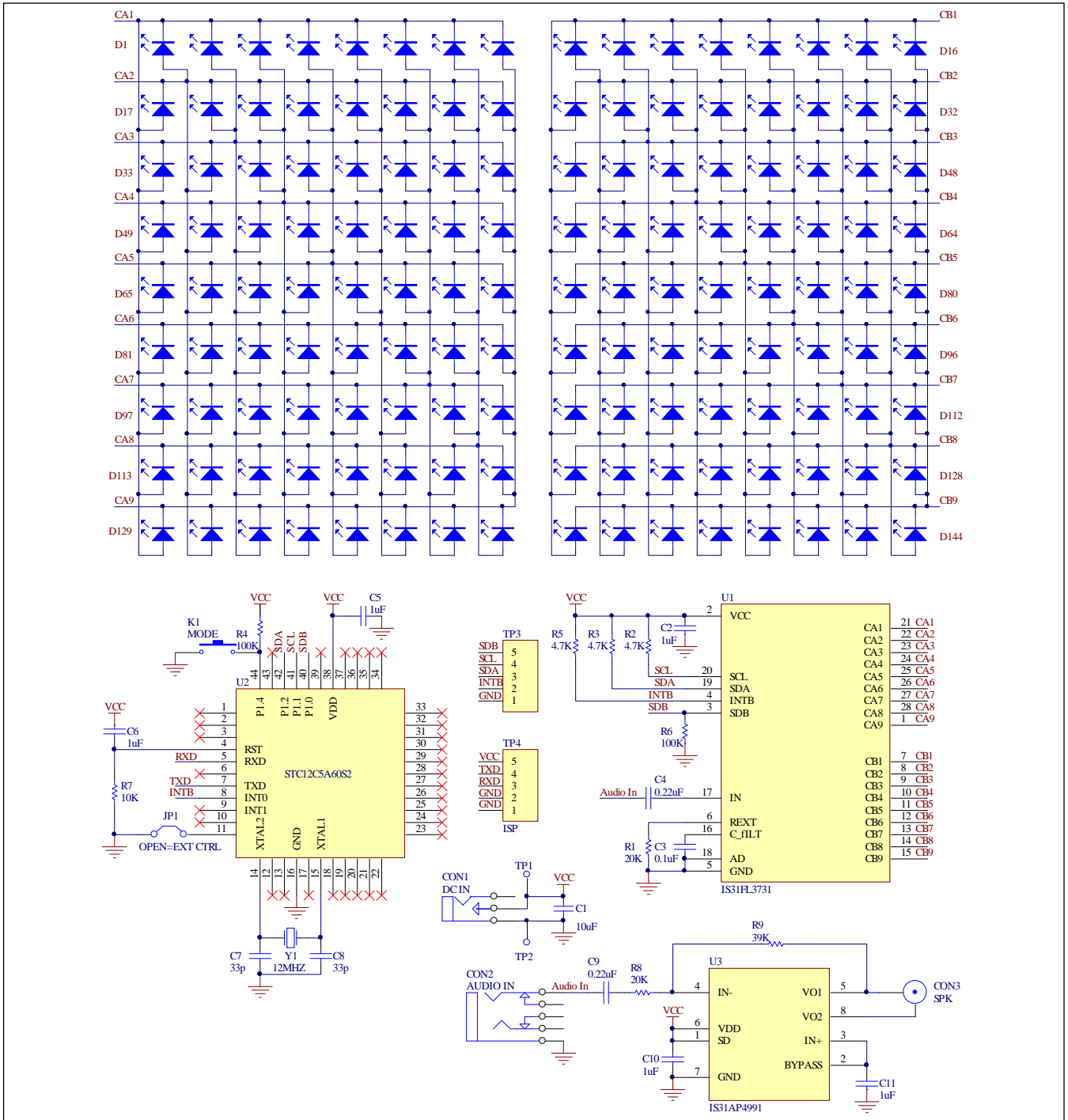


Figure 2: IS31FL3731 Application Schematic

Bill of Materials

| Name | Symbol | Description | Qty | Supplier | Part No. |
|-----------------|----------------------|---------------------------|-----|-----------|--------------------------|
| LED Driver | U1 | Matrix LED Driver | 1 | ISSI | IS31FL3731 |
| MCU | U2 | Microcontroller | 1 | NXP | STC12C5A60S2 |
| Audio Amplifier | U3 | Class- AB Audio Amplifier | 1 | ISSI | IS31AP4991 |
| Diode | D1~D144 | Diode, LED Blue, SMD | 144 | Everlight | 9-217/BHC-ZL1 M2RY/3T |
| Crystals | Y1 | Crystals, 12MHz,HC-49S | 1 | | |
| Resistors | R1,R8 | RES,20k,1/16W,±5%,SMD | 2 | | |
| Resistors | R2,R3,R5, | RES,4.7k,1/16W,±5%,SMD | 3 | | |
| Resistors | R4,R6 | RES,100k,1/16W,±5%,SMD | 2 | | |
| Resistor | R7 | RES,10k,1/16W,±5%,SMD | 1 | | |
| Resistor | R9 | RES,39k,1/16W,±5%,SMD | 1 | | |
| Capacitor | C1 | CAP,10µF,16V,±20%,SMD | 1 | | |
| Capacitors | C2,C5,C6, C10,C11 | CAP,1µF,16V,±20%,SMD | 5 | | |
| Capacitor | C3, | CAP,0.1µF,16V,±20%,SMD | 1 | | |
| Capacitors | C4,C9 | CAP,0.22µF,16V,±20%,SMD | 2 | | |
| Button | K1 | Button SMD | 1 | | |

Table 2: Bill of Materials, refer to Figure 2 above.

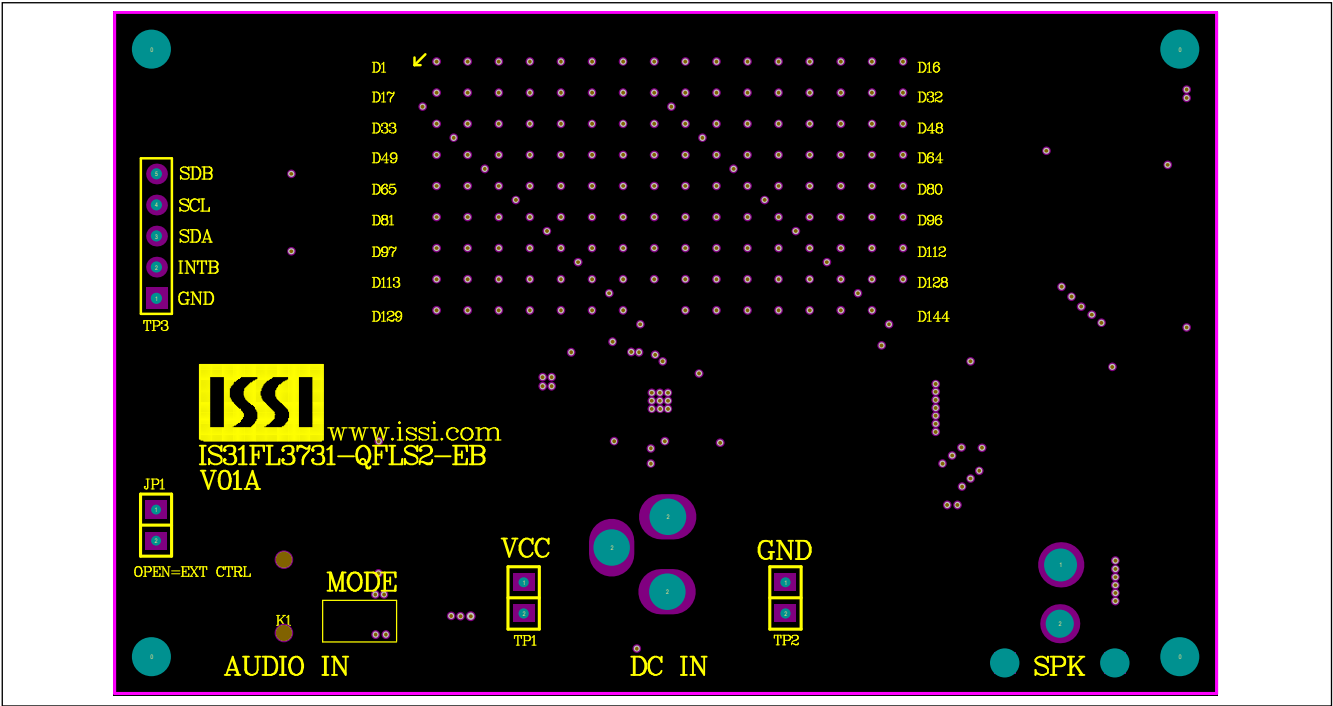


Figure 3: Board Component Placement Guide -Top Layer

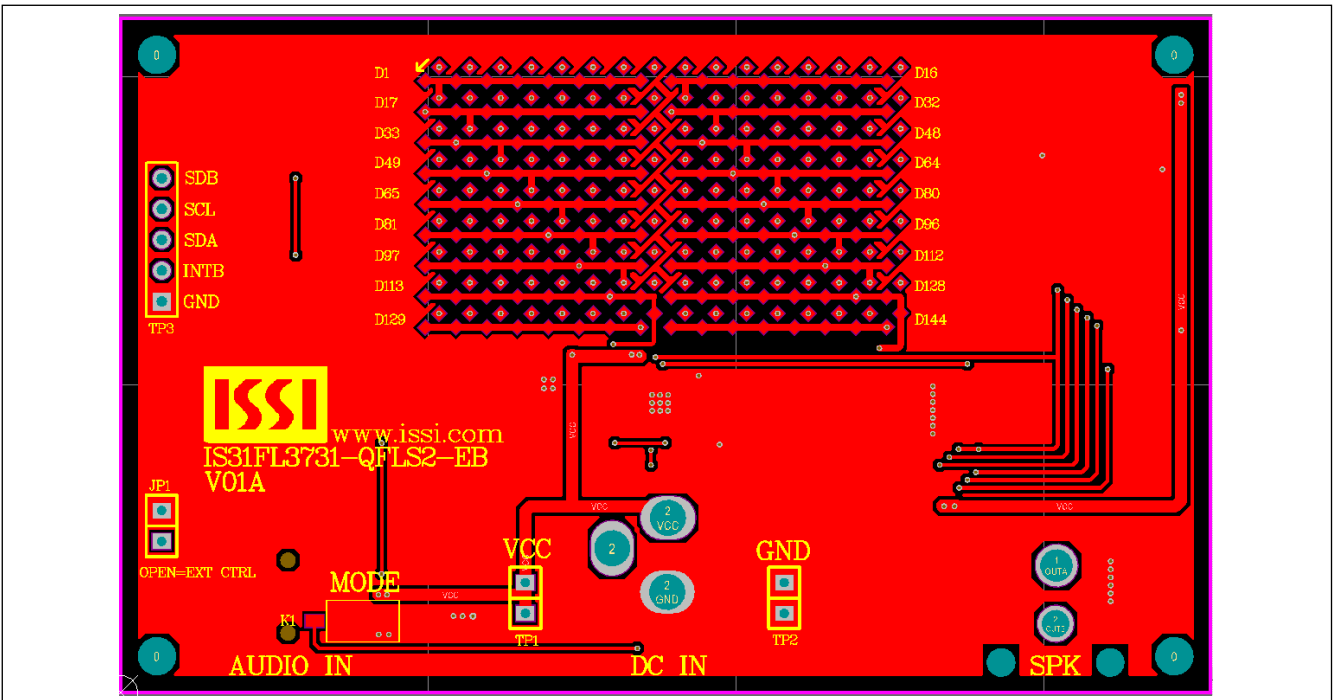


Figure 4: Board PCB Layout- Top Layer

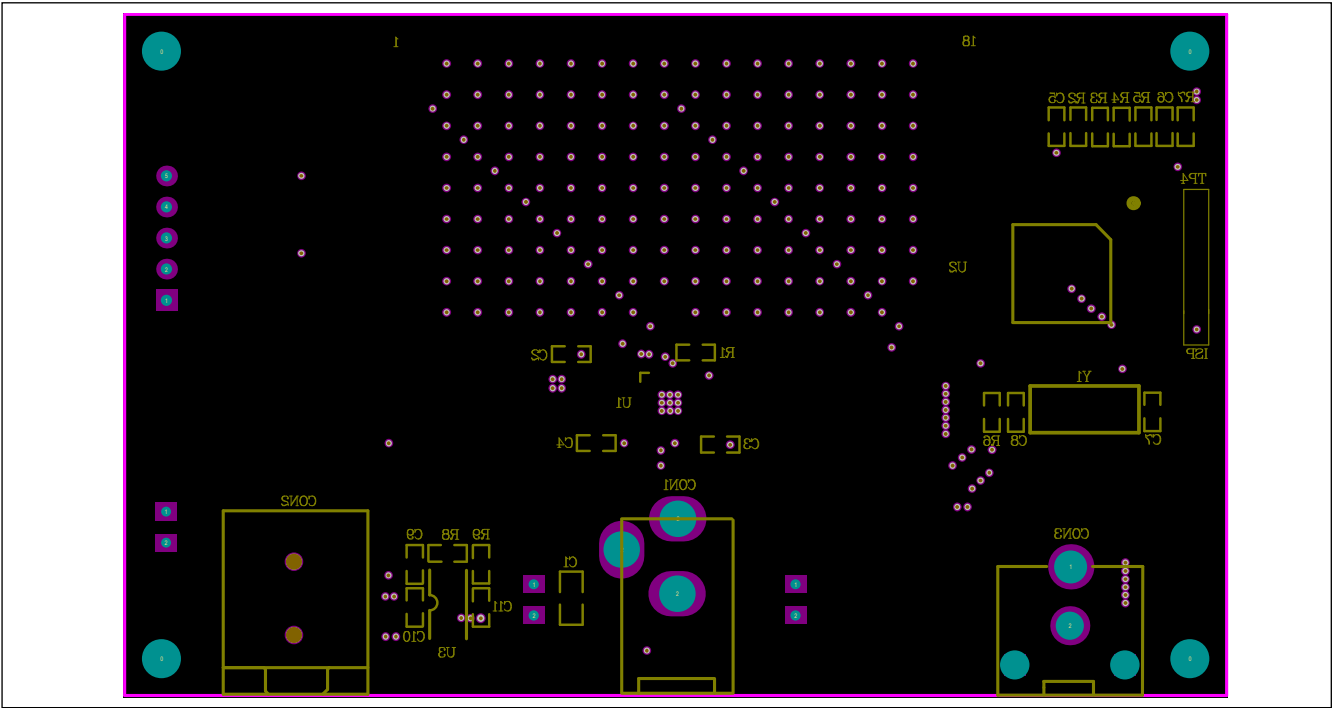


Figure 5: Board Component Placement Guide -Bottom Layer

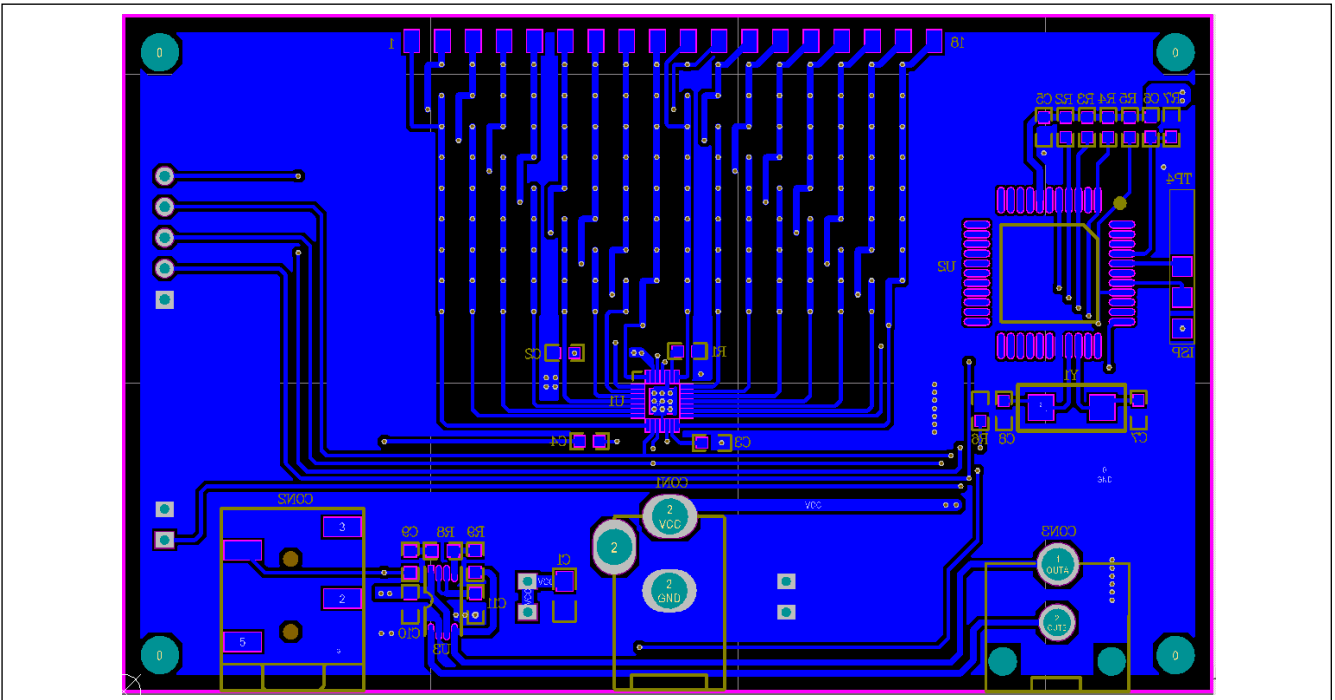


Figure 6: Board PCB Layout-Bottom Layer



IS31FL3731 Audio Modulated Matrix LED Driver Evaluation Board Guide

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