

## Description

IS31FL3730 is a LED matrix driver which features an audio modulation display mode and a general LED dot matrix display mode. The default configuration of IS31FL3730 is to drive a single 8x8 LED matrix. However, IS31FL3730 may be configured to drive either one or two 8x8, 7x9, 6x10, or 5x11 dot matrix display(s). The intensity of any matrix picture can be modulated by an audio signal.

In the general purpose mode, the ON or OFF condition of each individual LED in the display matrix is programmed via an I2C interface.

## Features

- 2.7V to 5.5V supply
- I2C interface, automatic address increment function
- One-time programming, internal scan
- Audio modulated display intensity with digitally programmable input gain
- Internal registers to digitally adjust display intensity
- Modulate LED brightness with 128 different items in PWM
- One address pin with 4 logic levels to allow four I2C slave addresses
- QFN-24 (4mm x 4mm) package

## Quick Start



Figure 1: Photo of IS31FL3730 Evaluation Board

## Evaluation Board Ordering Information

| Part No.            | IC Package        |
|---------------------|-------------------|
| IS31FL3730-QFLS2-EB | QFN-20, Lead-free |

Table1: Ordering Information

**For pricing, delivery, and ordering information, please contacts ISSI's analog marketing team at [analog\\_mkt@issi.com](mailto:analog_mkt@issi.com) or (408) 969-6600.**

## 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 IS31FL3730 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 Operation

The IS31FL3730 evaluation board has six display modes. Press MODE button to switch configurations.

- 1) (Default Mode) A little man is dancing and change postures according to music rhythm.
- 2) Display Chinese characters ‘赵, 钱, 孙, 李’, etc one by one, then move to left to display more characters.
- 3) Display Hart shape, Butterfly, Lock, Little Man, etc graphics with breathing dimming effect.
- 4) Flying butterfly.
- 5) Hart shape animation.
- 6) Combined shapes animation.

## 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 IS31FL3730 LED driver.

*Please refer to the datasheet to get more information about IS31FL3730.*

**\*Note:**

**IS31FL3730 solely controls the FxLED function on the evaluation board.**

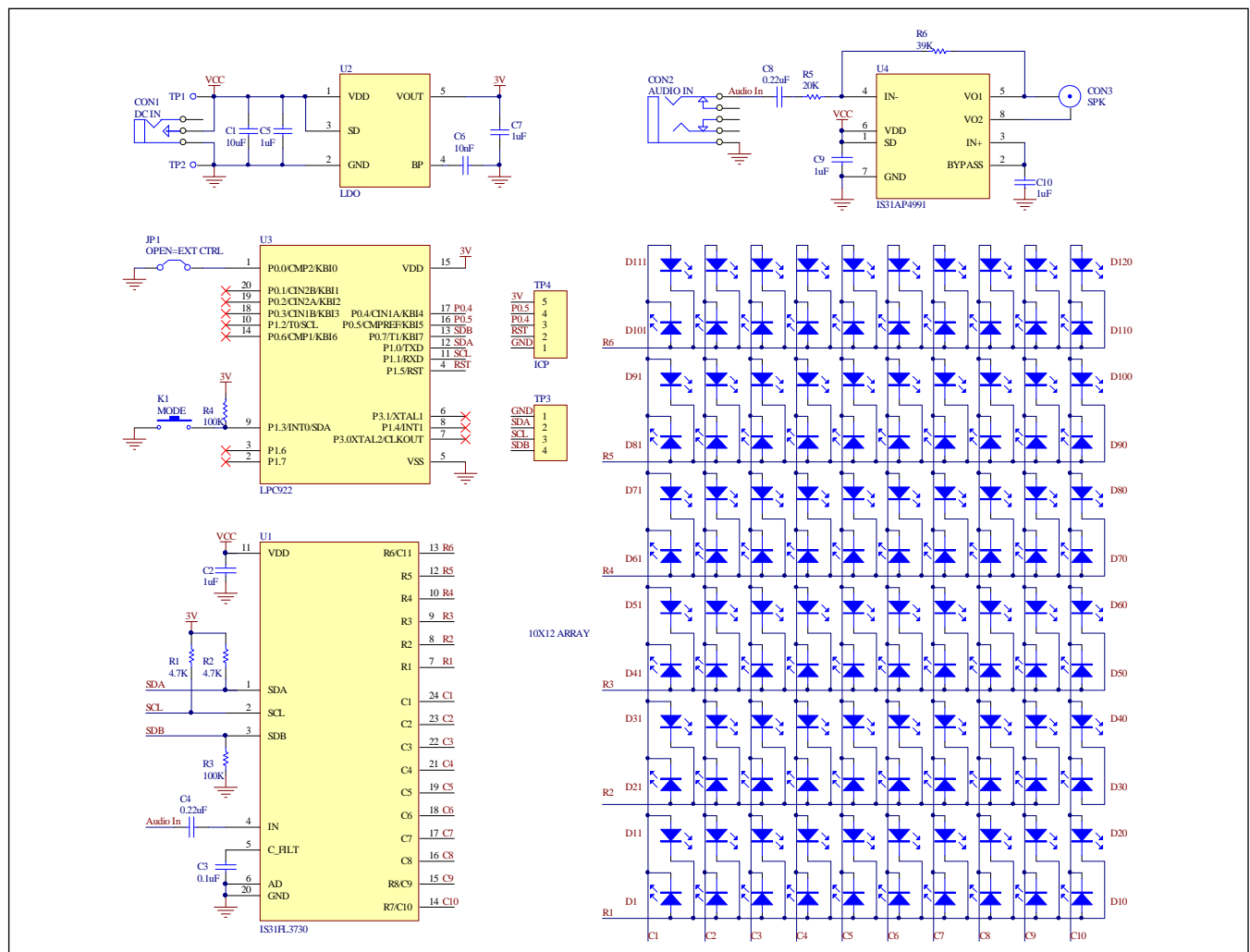


Figure 2: IS31FL3730 Application Schematic

**Bill of Materials**

| Name            | Symbol              | Description              | Qty | Supplier  | Part No.                  |
|-----------------|---------------------|--------------------------|-----|-----------|---------------------------|
| LED Driver      | U1                  | Array FxLED Driver       | 1   | ISSI      | IS31FL3730                |
| LDO             | U2                  | Low-dropout Regulator    | 1   | PAM       | PAM3101                   |
| MCU             | U3                  | Microcontroller          | 1   | NXP       | LPC922                    |
| Audio Amplifier | U4                  | Class-AB Audio Amplifier | 1   | ISSI      | IS31AP4991                |
| Diodes          | D1~D120             | Diode, LED Blue, SMD     | 120 | Everlight | 19-217/BHC-ZL<br>1M2RY/3T |
| Resistors       | R1,R2               | RES,4.7k,1/16W,±5%,SMD   | 2   |           |                           |
| Resistors       | R3,R4               | RES,100k,1/16W,±5%,SMD   | 2   |           |                           |
| Resistor        | R5                  | RES,20k,1/16W,±5%,SMD    | 1   |           |                           |
| Resistor        | R6                  | RES,39k,1/16W,±5%,SMD    | 1   |           |                           |
| Capacitor       | C1                  | CAP,10µF,16V,±20%,SMD    | 1   |           |                           |
| Capacitors      | C2,C5,C7,C9,<br>C10 | CAP, 1µF,16V,±20%,SMD    | 5   |           |                           |
| Capacitor       | C3                  | CAP, 0.1µF,16V,±20%,SMD  | 1   |           |                           |
| Capacitors      | C4,C8               | CAP, 0.22µF,16V,±20%,SMD | 2   |           |                           |
| Capacitor       | C6                  | CAP,10nF,16V,±20%,SMD    | 1   |           |                           |
| Button          | K1                  | Button SMD               | 1   |           |                           |

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

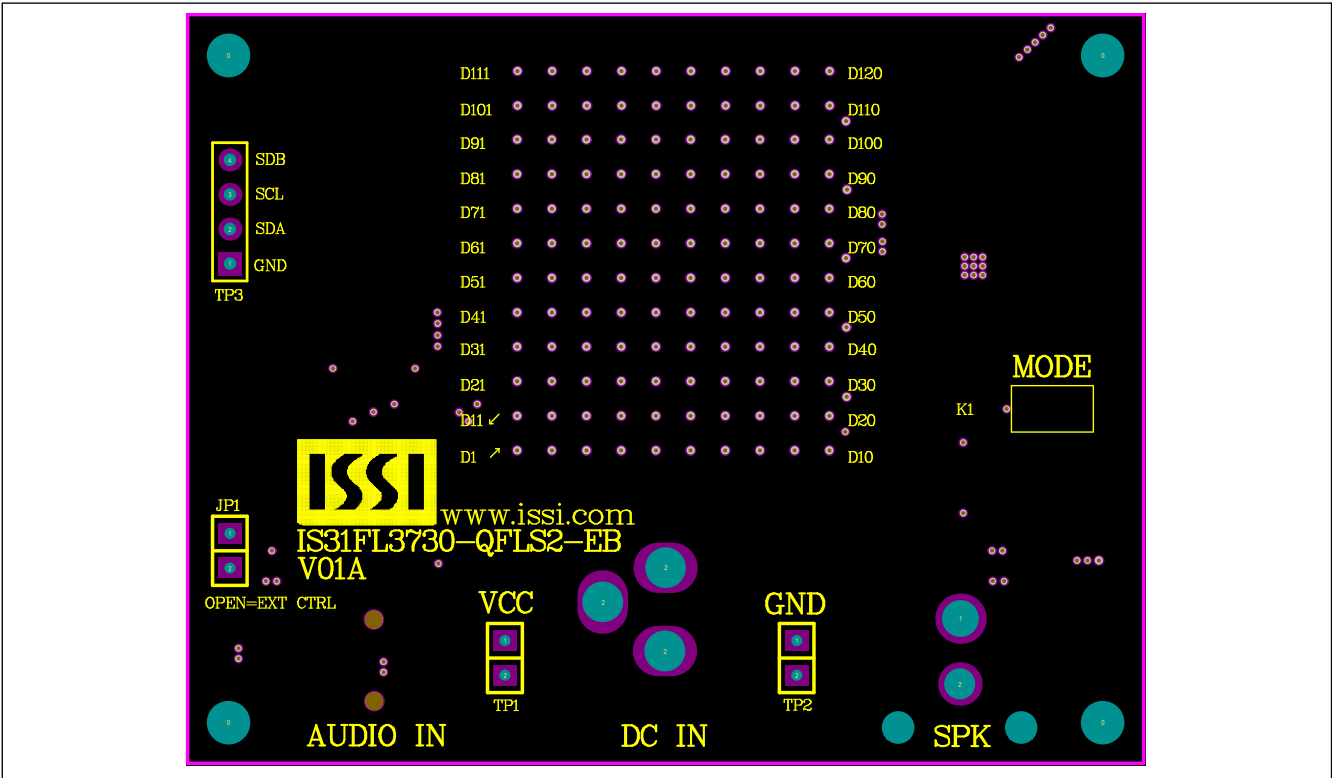


Figure 3: Board Component Placement Guide -Top Layer

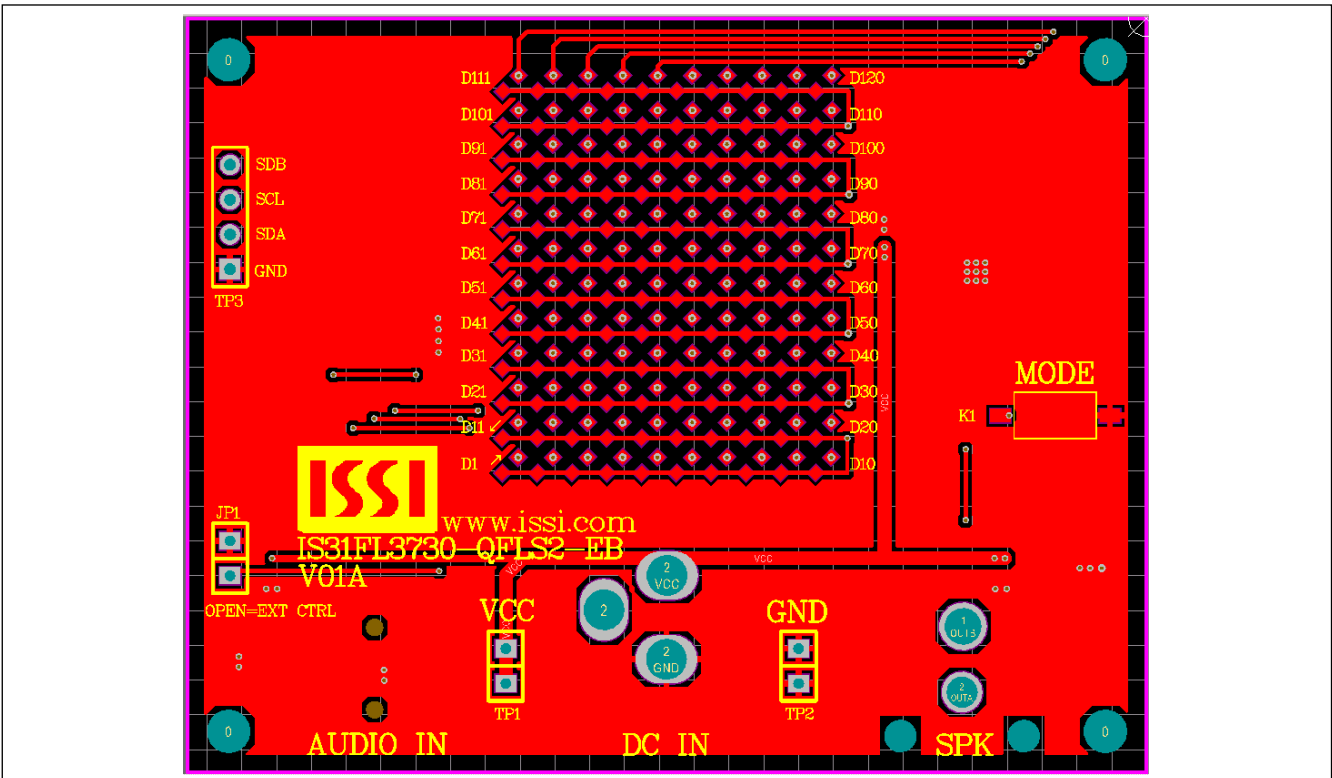


Figure 4: Board PCB Layout- Top Layer

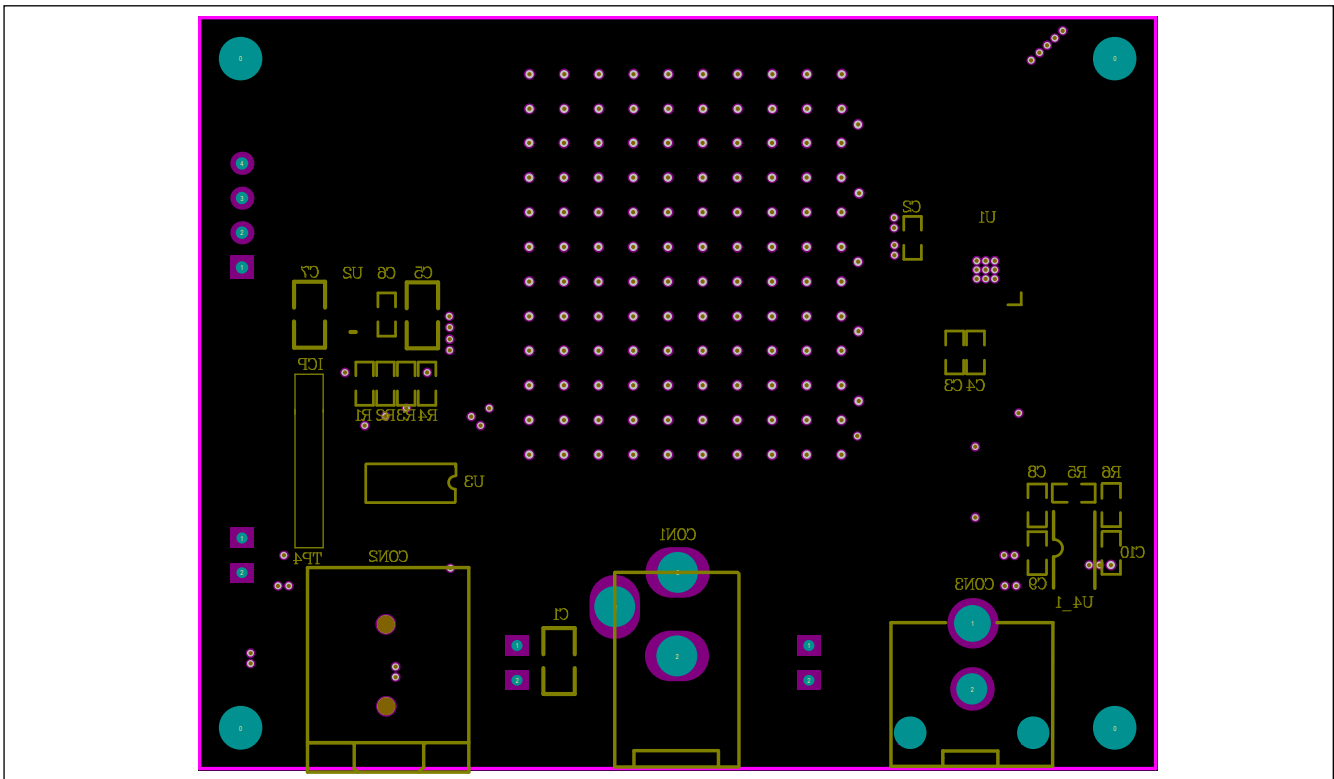


Figure 5: Board Component Placement Guide -Bottom Layer

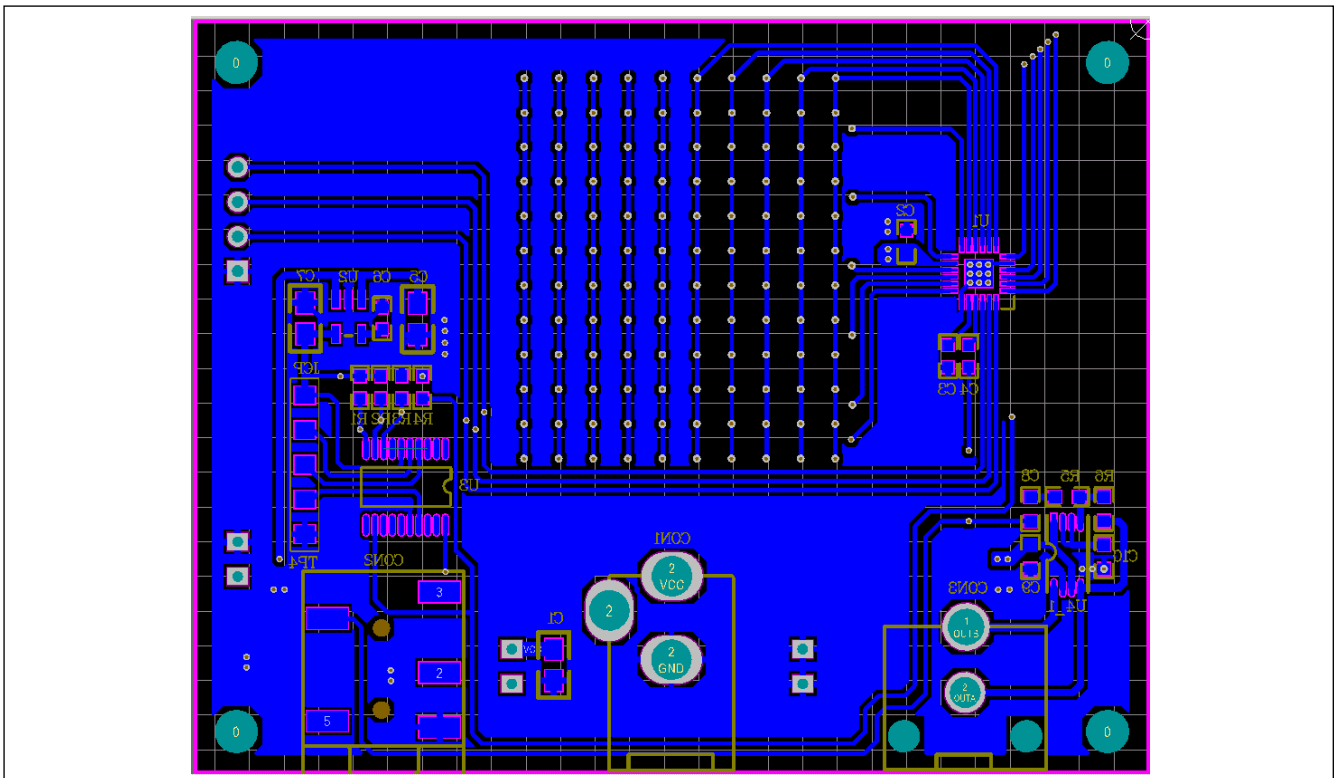


Figure 6: Board PCB Layout-Bottom Layer



## IS31FL3730 Audio Modulated Matrix LED Driver Evaluation Board Guide

---

Copyright © 2011 Integrated Silicon Solution, Inc. All rights reserved. ISSI reserves the right to make changes to this specification and its products at any time without notice. ISSI assumes no liability arising out of the application or use of any information, products or services described herein. Customers are advised to obtain the latest version of this device specification before relying on any published information and before placing orders for products.

Integrated Silicon Solution, Inc. does not recommend the use of any of its products in life support applications where the failure or malfunction of the product can reasonably be expected to cause failure of the life support system or to significantly affect its safety or effectiveness. Products are not authorized for use in such applications unless Integrated Silicon Solution, Inc. receives written assurance to its satisfaction, that:

- a.) the risk of injury or damage has been minimized;
- b.) the user assume all such risks; and
- c.) potential liability of Integrated Silicon Solution, Inc is adequately protected under the circumstances