

IS31FL3730 AUDIO MODULATED MATRIX LED DRIVER

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

- Supply voltage range from 2.7V to 5.5V
- 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

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.

ORDERING INFORMATION

Part No.	Temperature Range	Package
IS31FL3730-QFLS2-EB	-40°C to +85°C (Industrial)	QFN-24, Lead-free

Table 1: Ordering Information

For pricing, delivery, and ordering information, please contacts Lumissil's analog marketing team at [analog@Lumissil.com](mailto:analog@lumissil.com) or (408) 969-6600.

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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.

Note: IS31FL3730 solely controls the FxLED function on the evaluation board.

SOFTWARE SUPPORT

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.

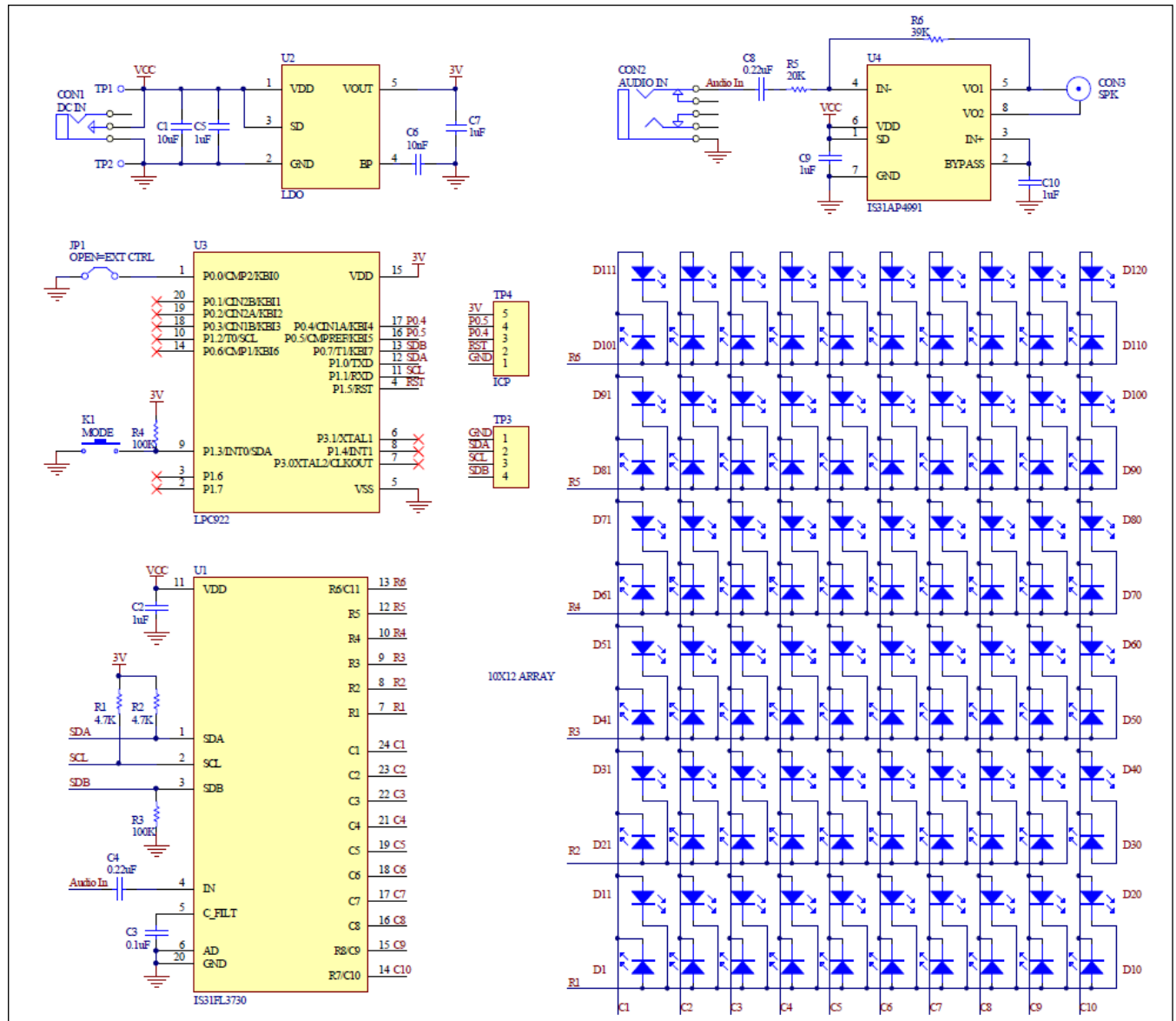


Figure 2: IS31FL3730 Application Schematic

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BILL OF MATERIALS

Name	Symbol	Description	Qty	Supplier	Part No.
LED Driver	U1	Array FxLED Driver	1	Lumissil	IS31FL3730
LDO	U2	Low-dropout Regulator	1	PAM	PAM3101
MCU	U3	Microcontroller	1	NXP	LPC922
Audio Amplifier	U4	Class-AB Audio Amplifier	1	Lumissil	IS31AP4991
Diode	D1~D120	Diode, LED Blue, SMD	120	Everlight	19-217/BHC-ZL1M2RY/3T
Resistor	R1,R2	RES,4.7k,1/16W,±5%,SMD	2		
Resistor	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		
Capacitor	C2,C5,C7, C9,C10	CAP, 1µF,16V,±20%,SMD	5		
Capacitor	C3	CAP, 0.1µF,16V,±20%,SMD	1		
Capacitor	C4,C8	CAP, 0.22µF,16V,±20%,SMD	2		
Capacitor	C6	CAP,10nF,16V,±20%,SMD	1		
Button	K1	Button SMD	1		

Bill of Materials, refer to Figure 2 above.

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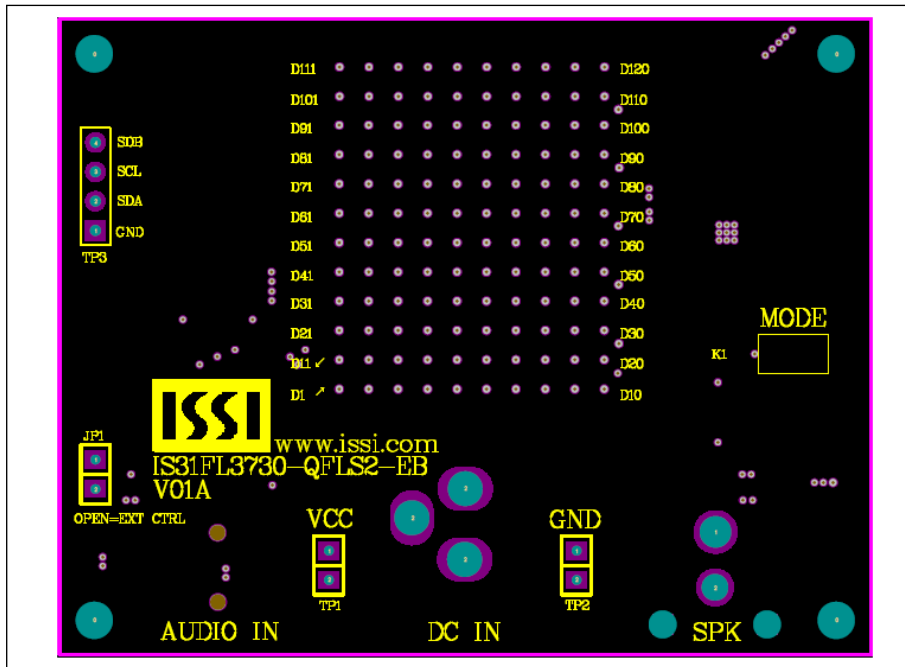


Figure 3: Board Component Placement Guide - Top Layer

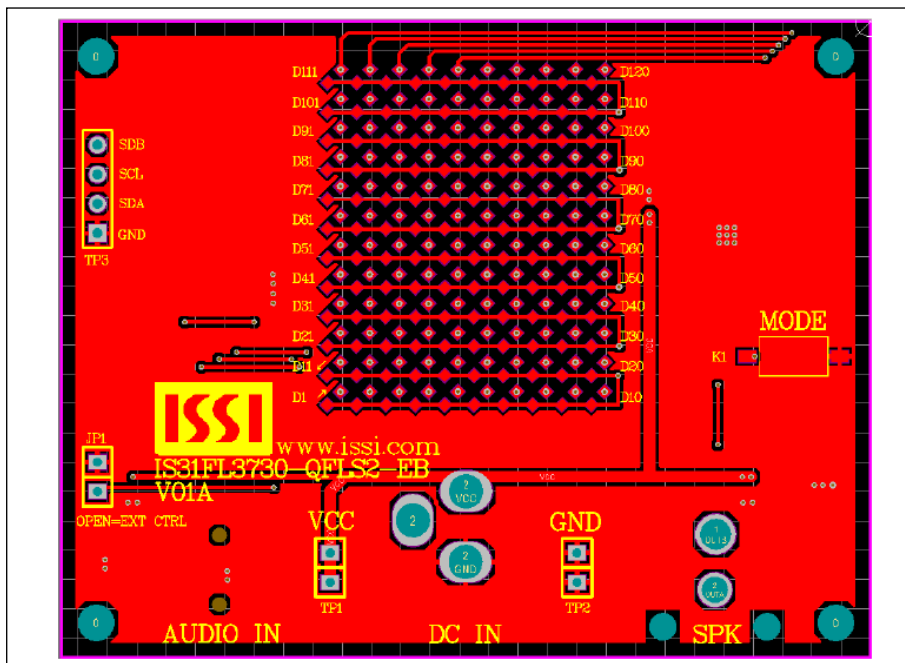


Figure 4: Board PCB Layout - Top Layer

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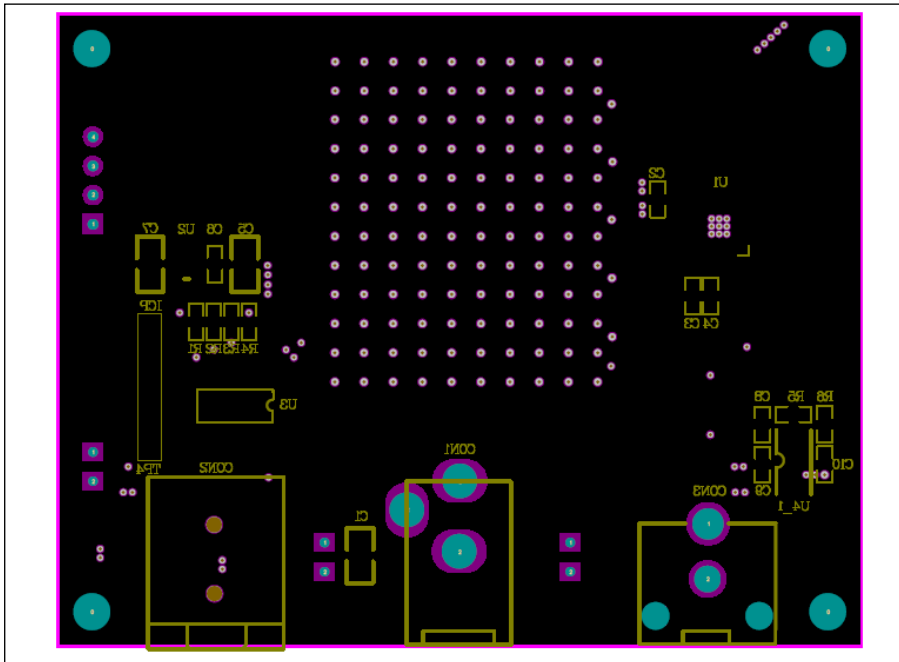


Figure 5: Board Component Placement Guide - Bottom Layer

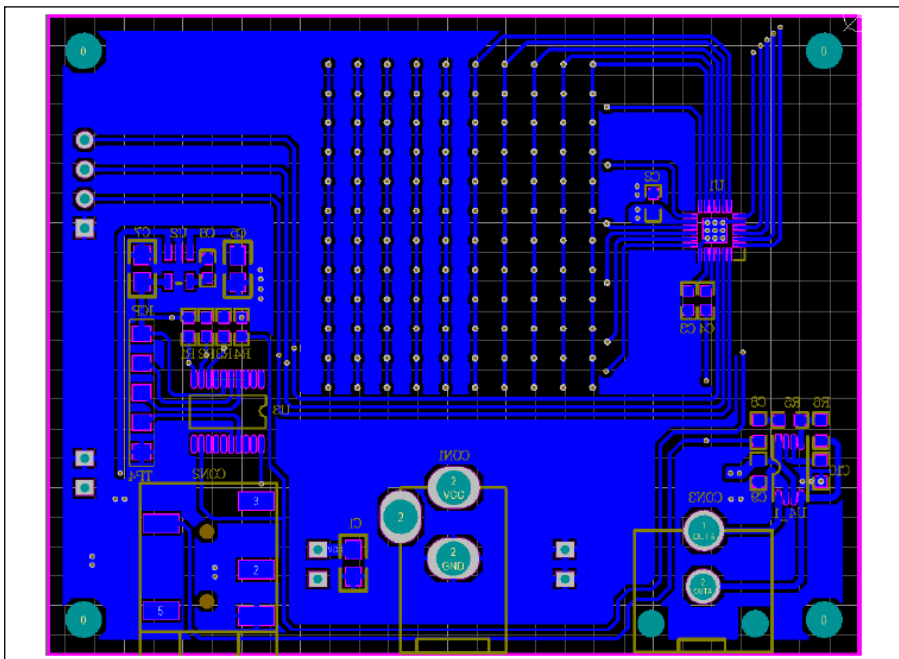


Figure 6: Board PCB Layout - Bottom Layer

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