Description

IS31FL3199 is a 9-channel light effect LED driver which features two-dimensional auto breathing mode and an audio modulated display mode. It has One Shot Programming mode and PWM Control mode for RGB lighting effects. The maximum output current can be adjusted in 8 levels (5mA~40mA).

The IS31FL3199 includes an audio modulated display mode, wherein the brightness of LED can be modulated by audio signal. There is a cascade pin for the synchronization of two chips.

Features

- Supply voltage range from 3.0V to 5.5V
- I2C interface, automatic address increment function
- Three groups RGB, single color LED breathing system-free pre-established pattern
- 9 independently controlled automatic and semiautomatic breathing system-free pre-established pattern
- 9 independently controlled outputs of 256 PWM steps
- 8 levels programmable output current
- Audio mode with AGC function
- Package: QFN-20, 3mm × 3mm

Quick Start

Figure 1: Photo of IS31FL3199 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 above conditions; otherwise the board will be damaged.

Procedure

The IS31FL3199 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 ground terminal of the power supply to the GND and the positive terminal to the VCC. Or 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
IS31FL3199-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 or (408) 969-6600.

Evaluation Board Operation

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

1) Default Mode: 9 LEDs perform breath dimming effect.
2) 3 LEDs in one group: Single color breathing dimming. Each group performs dimming one by one, then three groups dim together.
3) 3 LEDs in one group: auto color changing following the rhythm of the input music.
4) 9 LEDs breathing dimming one followed by the other.
5) Breath dimming synchronized with the rhythm of the input music.

Note:

IS31FL3199 solely controls the FxLED function on the evaluation board.

Software Control

Please refer to the integrated program.

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 IS31FL3199 LED driver.

Please refer to the datasheet for how to control the IS31FL3199.

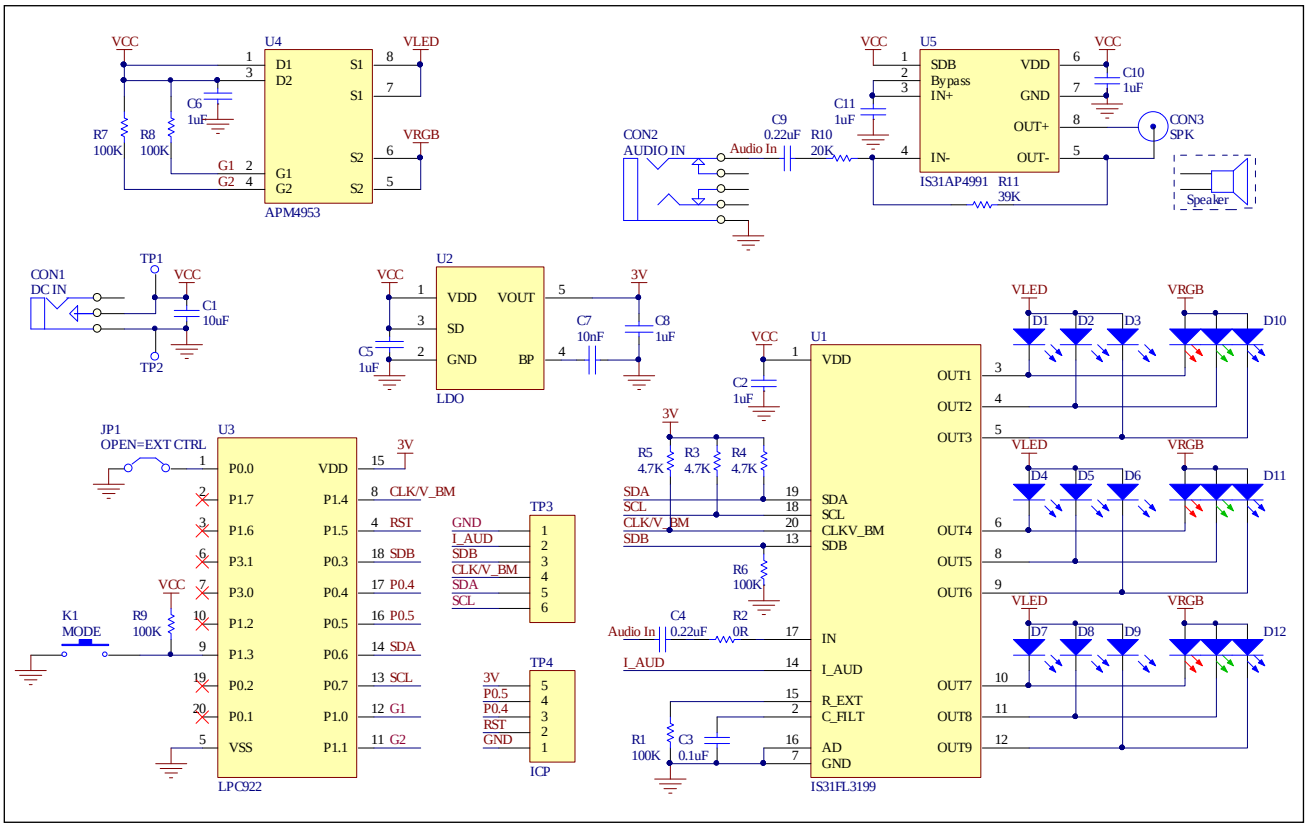

Figure 2:IS31FL3199 Application Schematic

Bill of Materials

Name	Symbol	Description	Qty	Supplier	Part No.
LED Driver	U1	9CH FxLED Driver	1	ISSI	IS31FL3199
LDO	U2	Low-dropout Regulator	1	PAM	PAM3101
MCU	U3	Microcontroller	1	NXP	LPC922
PMOS	U4	Dual PMOS	1	ANPEC	APM4953
Audio Amplifier	U5	Class AB Audio Amplifier	1	ISSI	IS31AP4991
Diodes	D1,D5,D8	Diode, LED Blue, SMD	3	Everlight	19-217/BHC-ZL 1M2RY/3T
Diodes	D2,D9	Diode, LED Red, SMD	2	Everlight	19-217/BHC-ZL 1M2RY/3T
Diodes	D3,D6	Diode, LED Green, SMD	2	Everlight	19-217/BHC-ZL 1M2RY/3T
Diodes	D4,D7	Diode, LED White, SMD	2	Everlight	19-217/BHC-ZL 1M2RY/3T
Diodes	D10~D12	Diode, LED RGB, SMD	3	Everlight	99-235/RGBC/TR8
Resistors	R1,R6,R7,R8,R9	RES,100k,1/16W,±5%,SMD	5		
Resistor	R2	RES,0R,1/16W,±5%,SMD	1		
Resistors	R3~R5	RES,4.7k,1/16W,±5%,SMD	3		
Resistor	R10	RES,20k,1/16W,±5%,SMD	1		
Resistor	R11	RES,39k,1/16W,±5%,SMD	1		
Capacitor	C1	CAP,10μF,16V,±20%,SMD	1		
Capacitors	C2,C5,C6,C8,C10, C11	CAP, 1μF,16V,±20%,SMD	6		
Capacitors	C3	CAP,0.1μF,16V,±20%,SMD	1		
Capacitor	C4	CAP,0.22μF,16V,±20%,SMD	1		
Capacitor	C7	CAP,10nF,16V,±20%,SMD	1		
Button	K1	Button SMD	1		

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

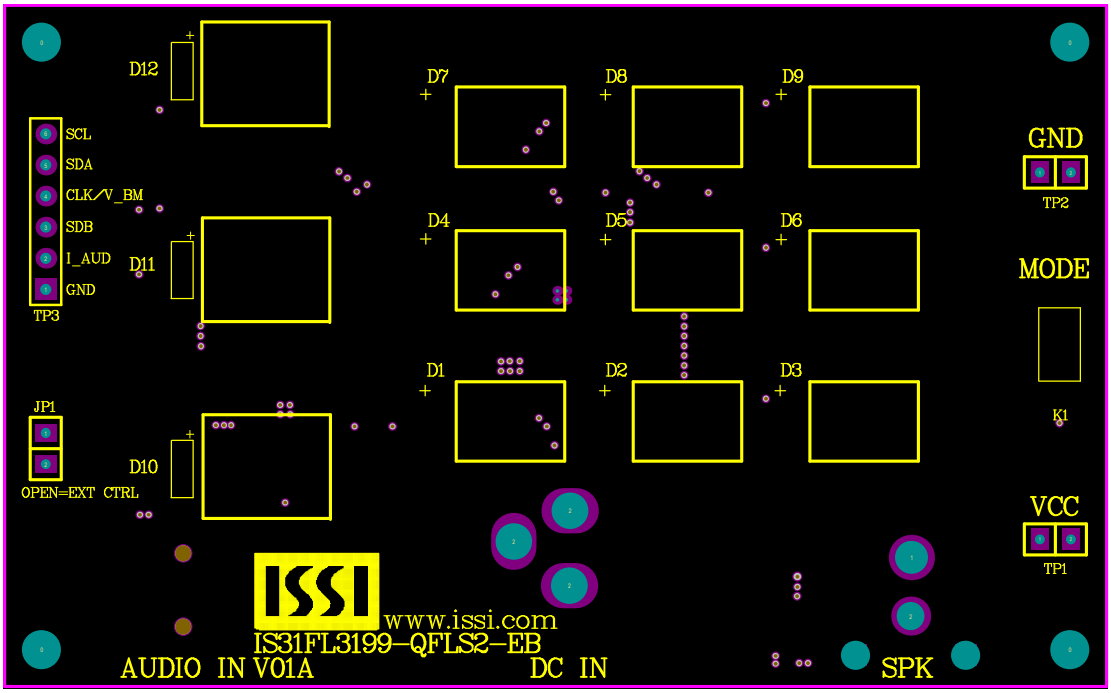

Figure 3: Board Component Placement Guide -Top Layer

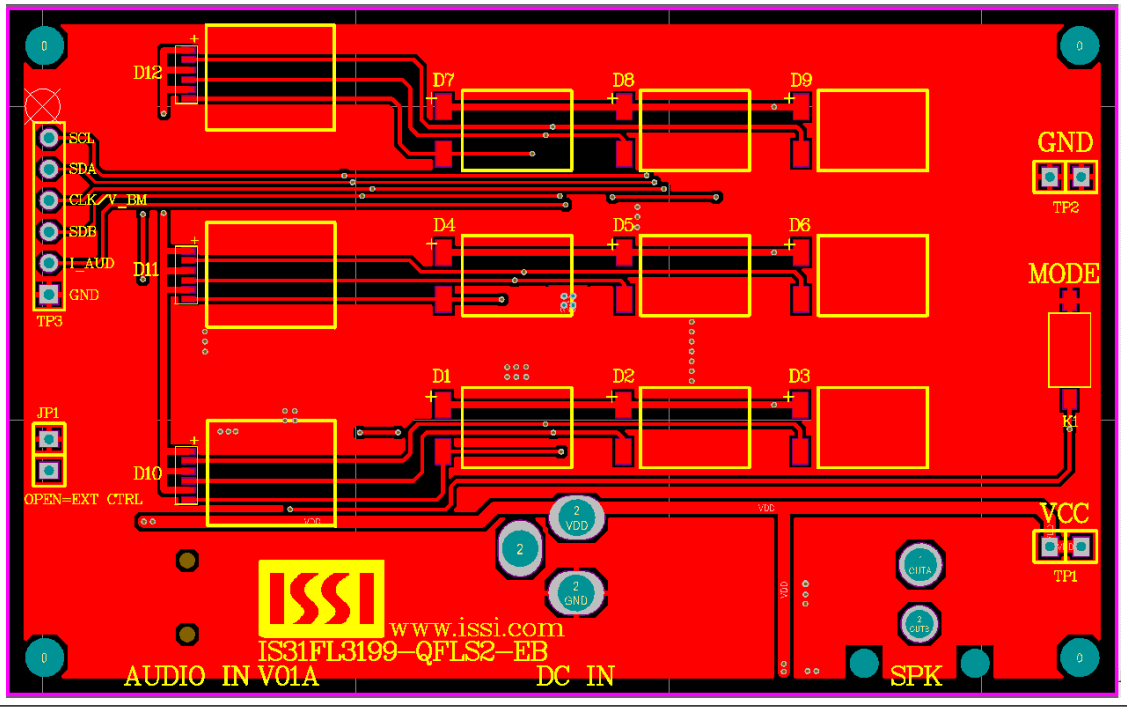

Figure 4: Board PCB Layout- Top Layer

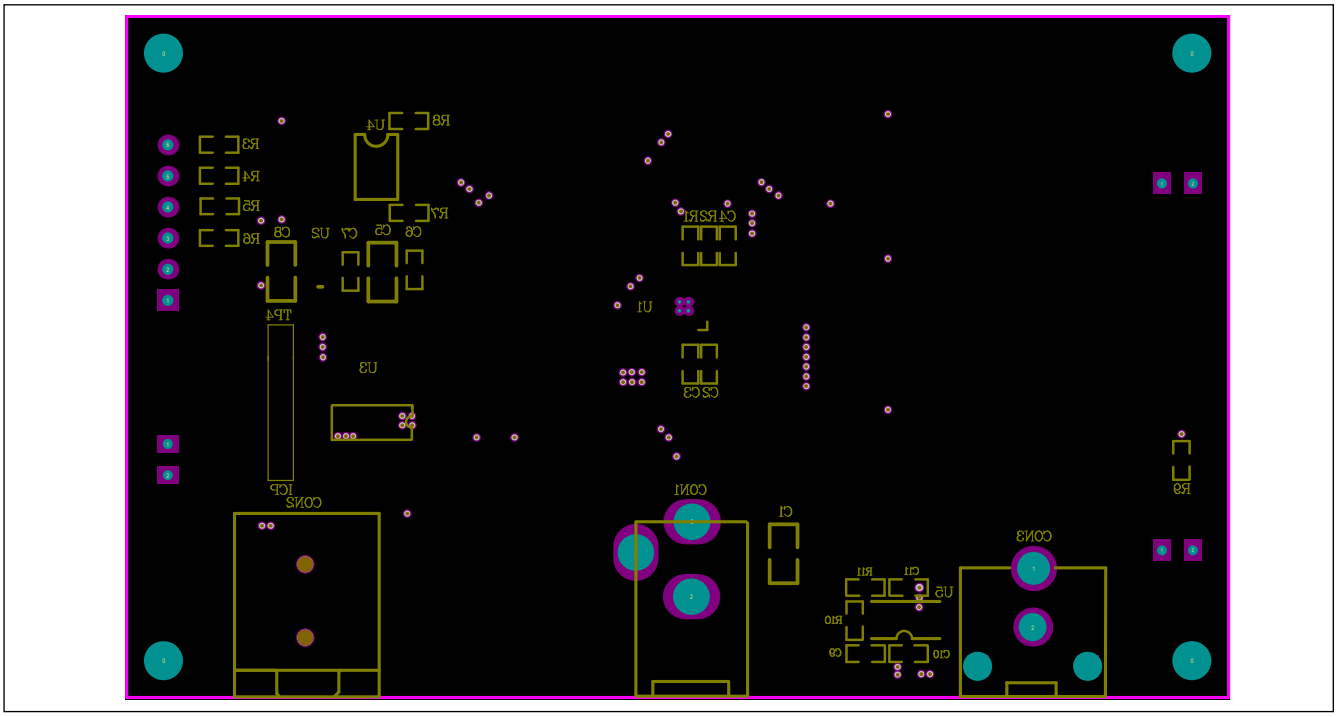

Figure 5: Board Component Placement Guide -Bottom Layer

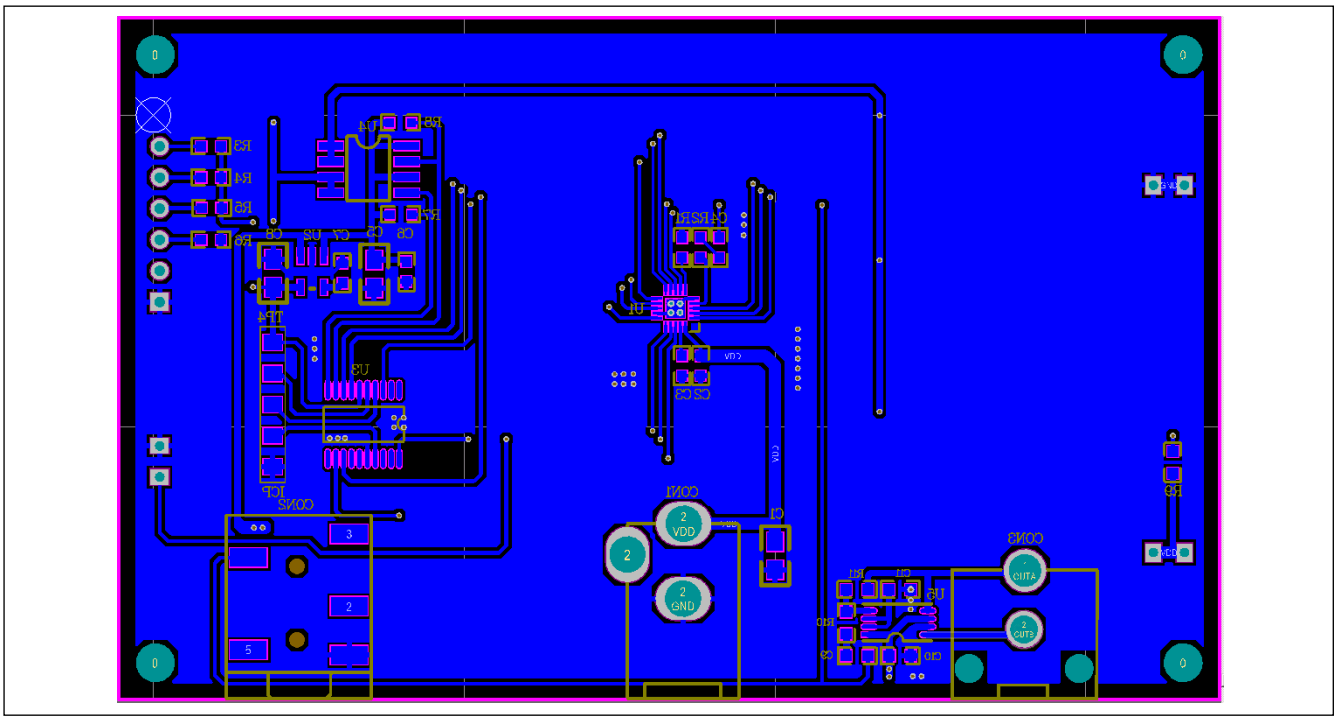

Figure 6: Board PCB Layout-Bottom Layer

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