

## Description

The IS31FL3216 is a fun light LED controller with an audio modulation mode. It can store data of 8 frames with internal RAM to play small animations automatically.

IS31FL3216 can sample the input signal to modulate the intensity of LEDs, or control 8 frames playing by internal ADC block.

The LED current of each channel can be set in 256 steps by adjusting the PWM duty cycle through an I2C interface.

## Features

- Supply voltage range from 2.7V to 5.5V
- I2C interface, automatic address increment function
- Internal RAM
- Modulate LED brightness with 256 steps PWM
- Each channel can be controlled independently
- Auto Frame Play Mode with 8 frames
- 8 frames memory for animations
- Audio Frame Mode with 8 frames
- 8 of 16 outputs not used as LED drivers can be used as GPIO ports
- QFN-28 (4mm x 4mm) package

## Quick Start



Figure 1: Photo of IS31FL3216 Evaluation Board

## Recommended Equipment

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

## Absolute Maximum Ratings

- $\leq 5.5V$  power supply

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

## Procedure

The IS31FL3216 evaluation board is fully assembled and tested. Follow the steps to operate.

**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) Adjust the input audio signal to obtain best sound output performance

## Evaluation Board Ordering Information

Part No.	IC Package
IS31FL3216-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.**

## **Evaluation Board Operation**

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The IS31FL3216 evaluation board has nine display modes. Press MODE button to switch configurations.

- 1) Music mode: blue LEDs flash from middle to two sides according to the musical strength.
- 2) Music mode: blue LEDs flash from left to right; more strong music, more LEDs on right side will be turned on.
- 3) Music mode: blue LEDs flash from right to left with 5 LEDs in one group. Stronger music will make LEDs move to left.
- 4) Music mode: the color bars change color according to the strength of music. Color change from Blue to Green to Red when music change from weak to strong.
- 5) Music mode with AGC disabled: the color bars flash left to right and right to left, longer with stronger music. Color change every 6 seconds.
- 6) Music mode with 6dB gain AGC: color bars flash left to right and right to left, longer with stronger music. Color change every 6 seconds.
- 7) Blue LEDs turn on from right to left with a tailing visual effect.
- 8) Blue LEDs turn on from middle to two sides.
- 9) Push button mode: OUT9~OUT16 as input. OUT1~OUT8 as output to driver 8 LEDs. Default is 8 LEDs all on. Press the button on the left will turn of each corresponding LED.

**\*Note:**

***IS31FL3216 solely controls the FxLED function on the evaluation board.***

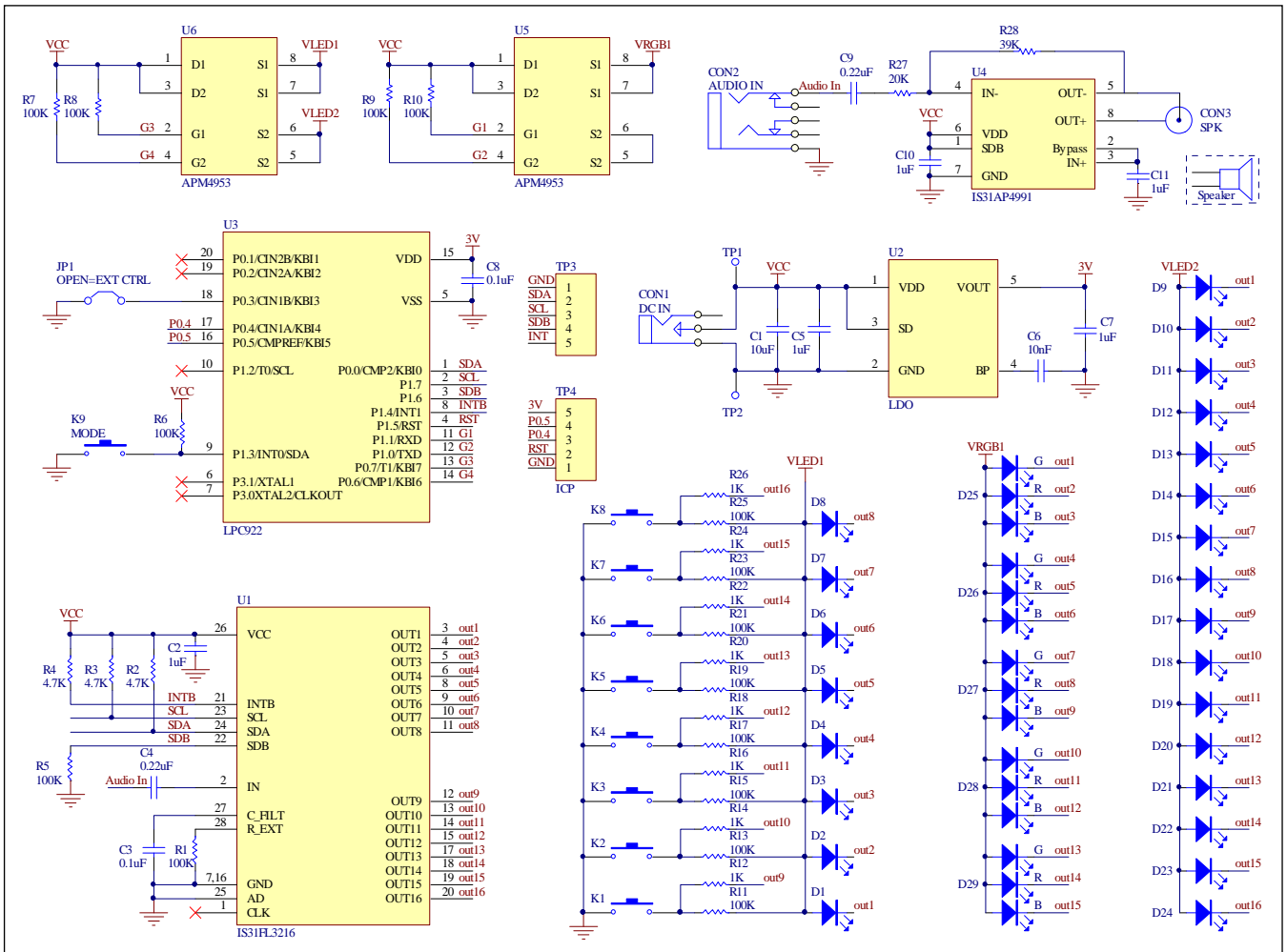
## **Software Control**

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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 IS31FL3216 LED driver.

***Please refer to the datasheet for how to control the IS31FL3216.***

# IS31FL3216 16 Channels LED Driver Evaluation Board Guide



**Bill of Materials**

Name	Symbol	Description	Qty	Supplier	Part No.
LED Driver	U1	16CH FxLED Driver	1	ISSI	IS31FL3216
LDO	U2	Low-dropout Regulator	1	PAM	PAM3101
MCU	U3	Microcontroller	1	NXP	LPC922
Audio Amplifier	U4	Class-AB Audio Amplifier	1	ISSI	IS31AP4991
PMOS	U5,U6	Dual PMOS	2	ANPEC	APM4953
Diodes	D1~D24	Diode, LED Blue, SMD	24	Everlight	19-217/BHC-ZL 1M2RY/3T
Diodes	D25~D29	Diode, LED RGB, SMD	5	Everlight	99-235/RGBC/T R8
Resistors	R1,R5~R11	RES,100k,1/16W,±5%,SMD	8		
Resistors	R2~R4	RES,4.7k,1/16W,±5%,SMD	3		
Resistors	R12,R14,R16,R18	RES,1k,1/16W,±5%,SMD	4		
Resistors	R13,R15,R17,R19	RES,100k,1/16W,±5%,SMD	4		
Resistors	R20,R22,R24,R26	RES,1k,1/16W,±5%,SMD	4		
Resistors	R21,R23,R25	RES,100k,1/16W,±5%,SMD	3		
Capacitor	C1	CAP,10µF,16V,±20%,SMD	1		
Capacitors	C3,C8	CAP, 0.1µF,16V,±20%,SMD	2		
Capacitors	C2,C5,C7,C10, C11	CAP,1µF,16V,±20%,SMD	5		
Capacitor	C6	CAP,10nF,16V,±20%,SMD	1		
Capacitors	C4,C9	CAP, 0.22µF,16V,±20%,SMD	2		
Buttons	K1~K8	Button SMD	8		

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

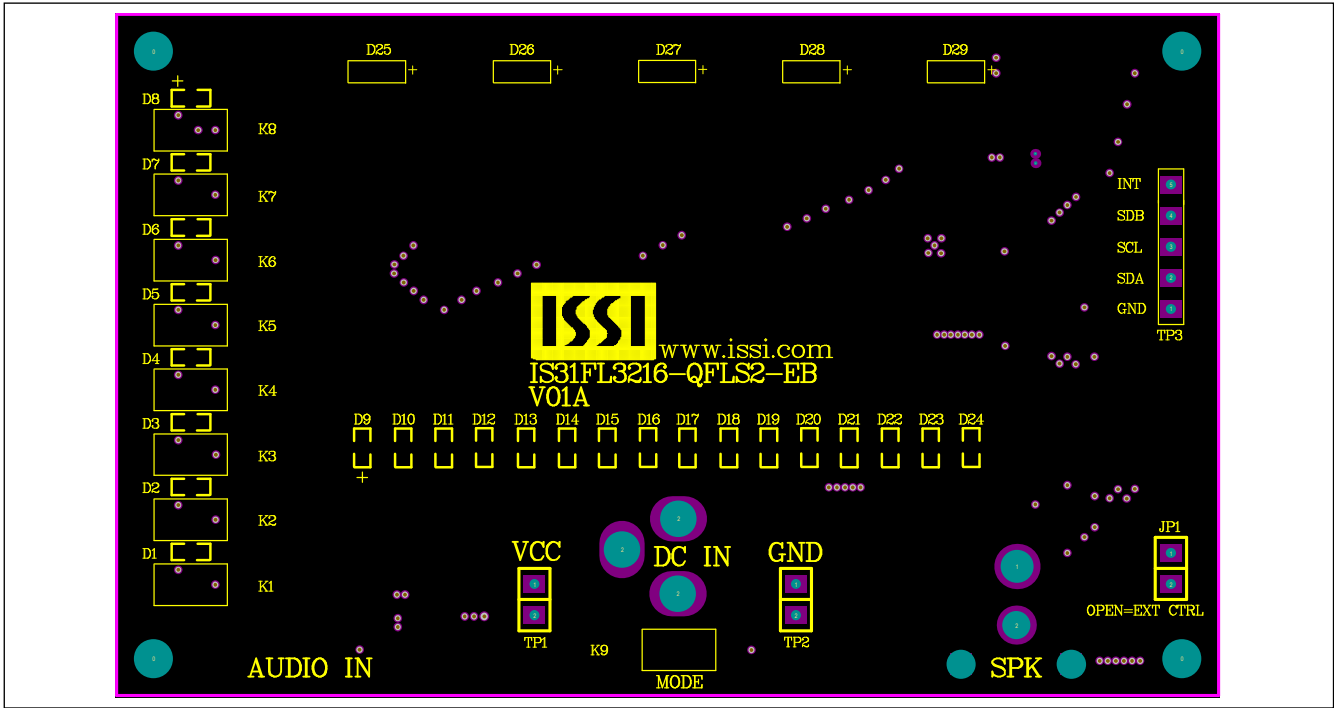


Figure 3: Board Component Placement Guide -Top Layer

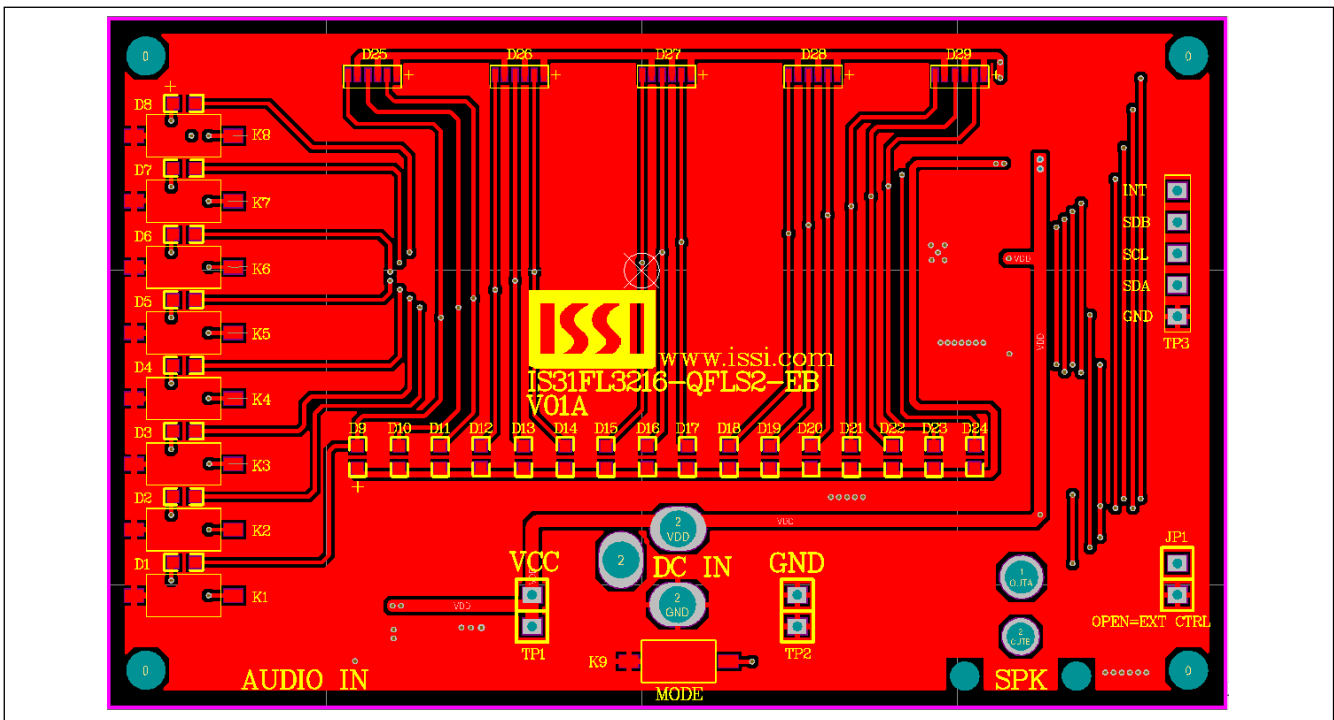


Figure 4: Board PCB Layout- Top Layer

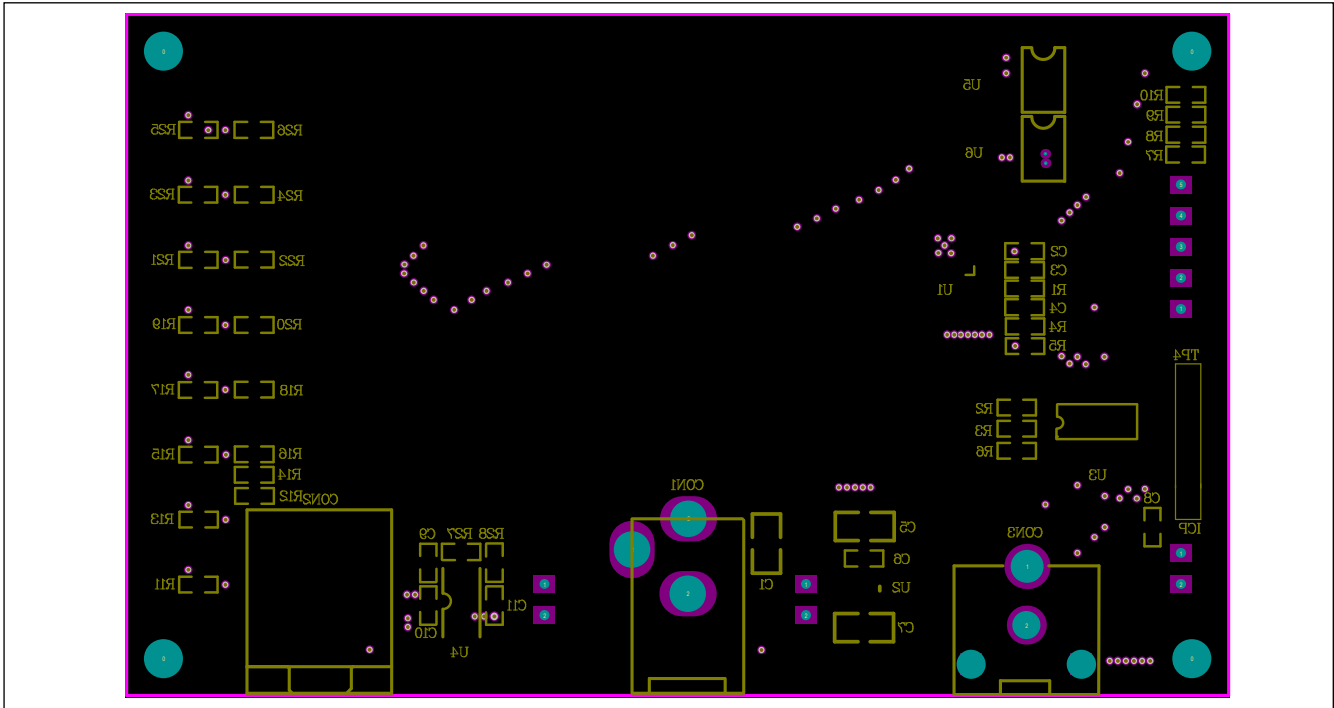


Figure 5: Board Component Placement Guide -Bottom Layer

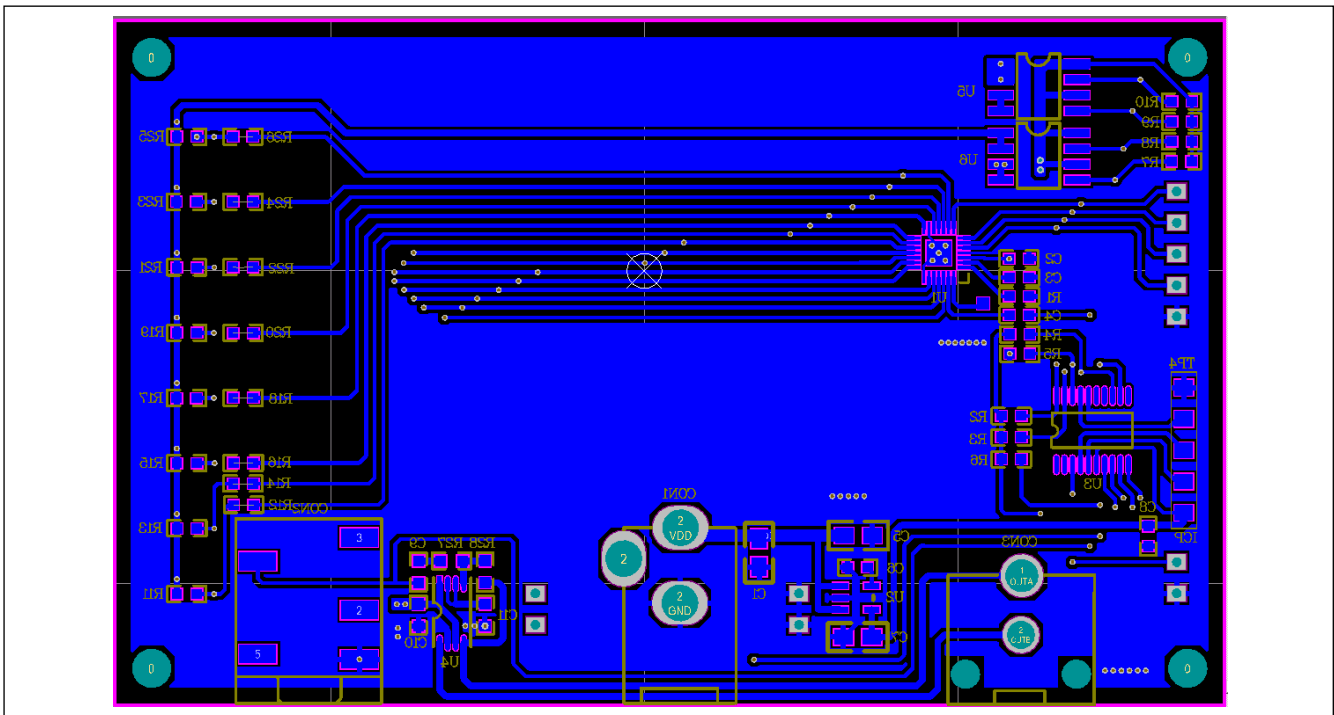


Figure 6: Board PCB Layout-Bottom Layer



## IS31FL3216 16 Channels LED Driver Evaluation Board Guide

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