

## 6-CHANNEL LIGHT EFFECT LED DRIVER

### DESCRIPTION

IS31FL3196/IS31FL3196A is a 6-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).

### FEATURES

- Supply voltage range from 2.7V to 5.5V
- Two groups RGB, single color LED breathing system-free pre-established pattern
- 6 independently controlled automatic and semiautomatic breathing system-free pre-established pattern
- 6 independently controlled outputs of 256 PWM steps
- 8 levels programmable output current
- Audio mode with AGC function
- Cascade for the synchronization of chips
- QFN-20 (3mm × 3mm) package

### QUICK START



Figure 1: Photo of IS31FL3196/IS31FL3196A Evaluation Board

### RECOMMENDED EQUIPMENT

- 5.0V, 2A power supply

### ABSOLUTE MAXIMUM RATINGS

- ≤ 5.5V power supply

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

### PROCEDURE

The IS31FL3196/IS31FL3196A 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) Short JP1 to connect by board MCU.
- 2) Connect the 5VDC power to the connector (TP1&TP2).
- 3) Turn on the power supply/Plug in the Micro USB Pay attention to the supply current. If the current exceeds 1A, please check for circuit fault.

### EVALUATION BOARD OPERATION

The IS31FL3196/IS31FL3196A evaluation board has five display modes. Press K1 to switch configurations.

- 1) 6 lamps breathe at the same time
- 2) The RGB monochromatic breathes
- 3) RGB audio mode
- 4) 6 lamps breathe one by one
- 5) 6 lamps audio mode

**Note:** IS31FL3196/IS31FL3196A solely controls the FxLED function on the evaluation board.

### SOFTWARE CONTROL

J1 default setting is closed (short). If it is set to open, the MCU's SDB, SCL, SDA and CLK pin will be high impedance (open-drain) and external control is allowed.

Follow the steps listed below for external control.

- 1) Open J1 to enable external control
- 2) Pull-up the SDB to VCC.
- 3) Connect the 5VDC power to the connector (TP1&TP2).
- 4) Turn on the power supply/Plug in the Micro USB Pay attention to the supply current. If the current exceeds 1A, please check for circuit fault.
- 5) Start external IIC control.

**Caution:** If J1 is closed (shorted), user can't connect the user's MCU, otherwise the user's MCU (maybe 1.8V) will connect to evaluation board's MCU (3.0V) and maybe damaged.

Please refer to the datasheet to get more information about IS31FL3196/IS31FL3196A.

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## ORDERING INFORMATION

Part No.	Temperature Range	Package
IS31FL3196-QFLS2-EB	-40°C ~ +85°C (Industrial)	QFN-20, Lead-free
IS31FL3196A-QFLS2-EB	-40°C ~ +85°C (Industrial)	QFN-20, Lead-free

Table 1: Ordering Information

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

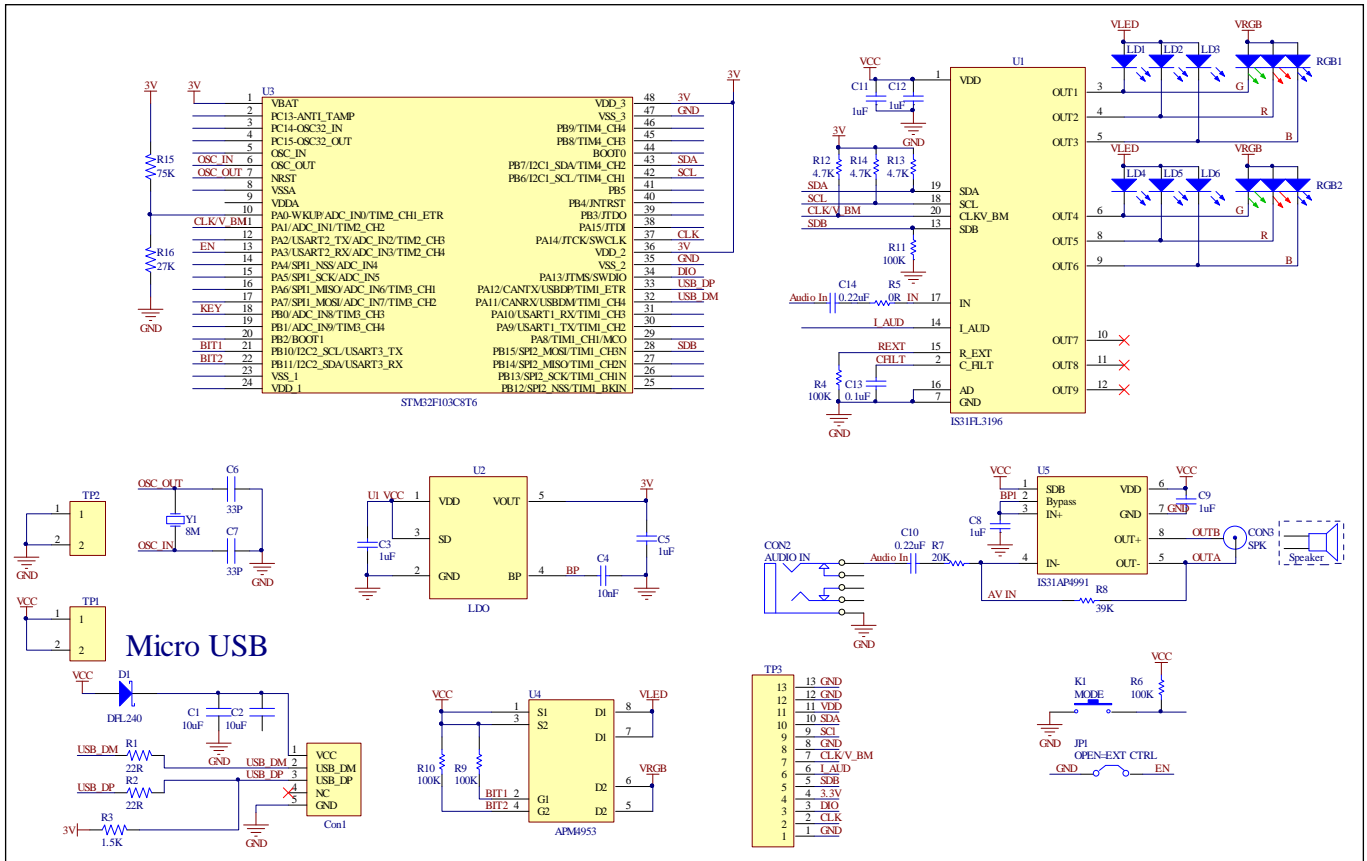


Figure 2: IS31FL3196/IS31FL3196A Application Schematic

## 6-CHANNEL LIGHT EFFECT LED DRIVER

### BILL OF MATERIALS

Name	Symbol	Description	Qty	Supplier	Part No.
LED Driver	U1	Matrix LED Driver	1	ISSI	IS31FL3196/ IS31FL3196A
LDO	U2	3.0V LDO	1	SGMICRO	SGM2019-3.0YN5G
MCU	U3	Microcontroller	1	STM	STM32F103C8T6
PMOS	U4	PMOS	1	ANPEC	APM4953
AMP	U5	Audio power amplifier	1	ISSI	IS31AP4991
LED	LD1~LD6	Blue LED,SMD	6	Everlight	9-217/BHC-ZL1M2RY/3T
LED	RGB1,RGB2	RGB LED,SMD	2	Everlight	99-235/RGBC/TR8
Diode	D1	Diode,SMD	1	Diodes In	DFLS240
Crystal	Y1	Crystal,8MHz	1	HLX	HC-49S
Resistor	R1,R2	RES,22R,1/16W,±5%,SMD	2	Yageo	RC0603JR-0722RL
Resistor	R3	RES,1.5k,1/16W,±5%,SMD	1	Yageo	RC0603JR-071K5L
Resistor	R4,R6,R9, R10,R11	RES,100k,1/16W,±5%,SMD	5	Yageo	RC0603JR-07100KL
Resistor	R5	RES,0R,1/16W,±5%,SMD	1	Yageo	RC0603JR-07000KL
Resistor	R7	RES,20k,1/16W,±5%,SMD	1	Yageo	RC0603JR-0720KL
Resistor	R8	RES,39k,1/16W,±5%,SMD	1	Yageo	RC0603JR-0739KL
Resistor	R12,R13,R14	RES,4.7k,1/16W,±5%,SMD	3	Yageo	RC0603JR-0704K7L
Resistor	R15	RES,75k,1/16W,±5%,SMD	1	Yageo	RC0603JR-0775KL
Resistor	R16	RES,27k,1/16W,±5%,SMD	1	Yageo	RC0603JR-0727KL
Capacitor	C1,C2	CAP,10µF,16V,±20%,SMD	2	Yageo	CC0603KKX7R9BB106
Capacitor	C3,C5,C8, C9,C11	CAP,1µF,16V,±20%,SMD	6	Yageo	CC0603KKX7R9BB105
Capacitor	C4	CAP,10nF,16V,±20%,SMD	1	Yageo	CC0603KKX7R9BB103
Capacitor	C6,C7	CAP,33pF,16V,±20%,SMD	2	Yageo	CC0603KKX7R9BB330
Capacitor	C10,C14	CAP,0.22µF,16V,±20%,SMD	2	Yageo	CC0603KKX7R9BB224
Capacitor	C12,C13	CAP,0.1µF,16V,±20%,SMD	2	Yageo	CC0603KKX7R9BB104
Button	K1	Button SMD	1		

Bill of Materials, refer to Figure 2 above.

**6-CHANNEL LIGHT EFFECT LED DRIVER**

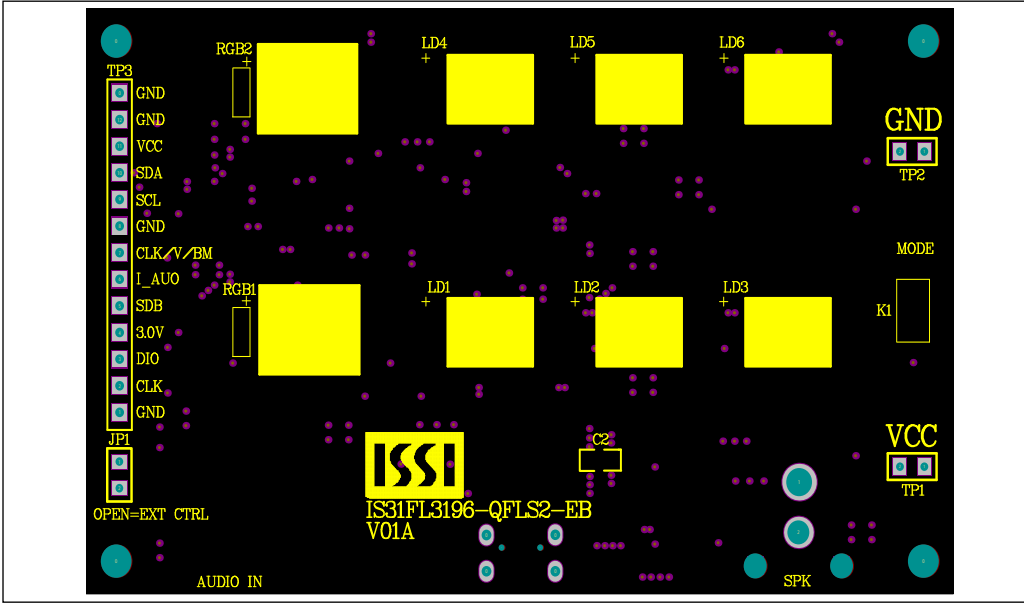


Figure 3: Board Component Placement Guide - Top Layer

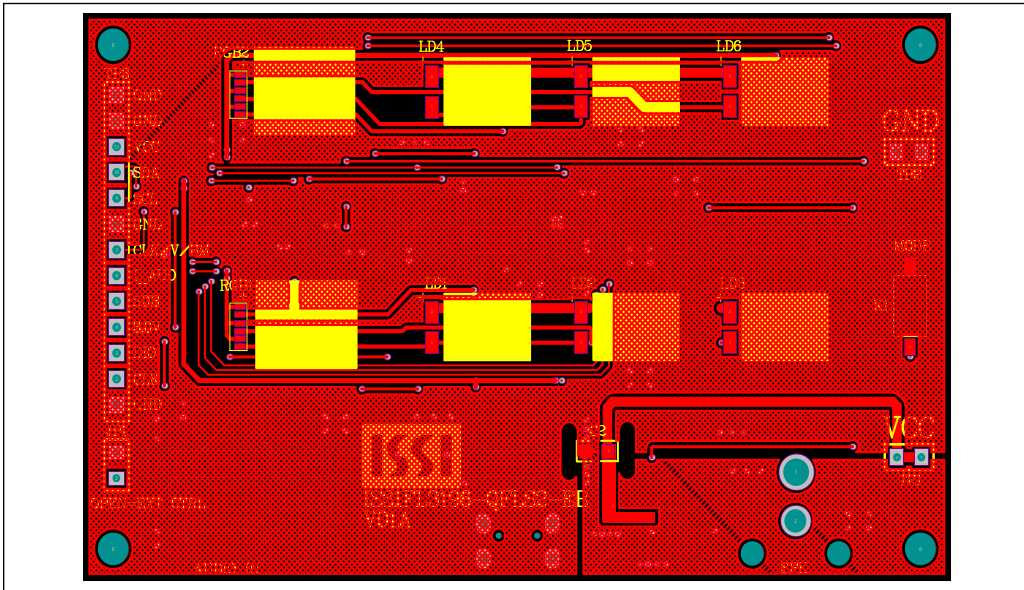
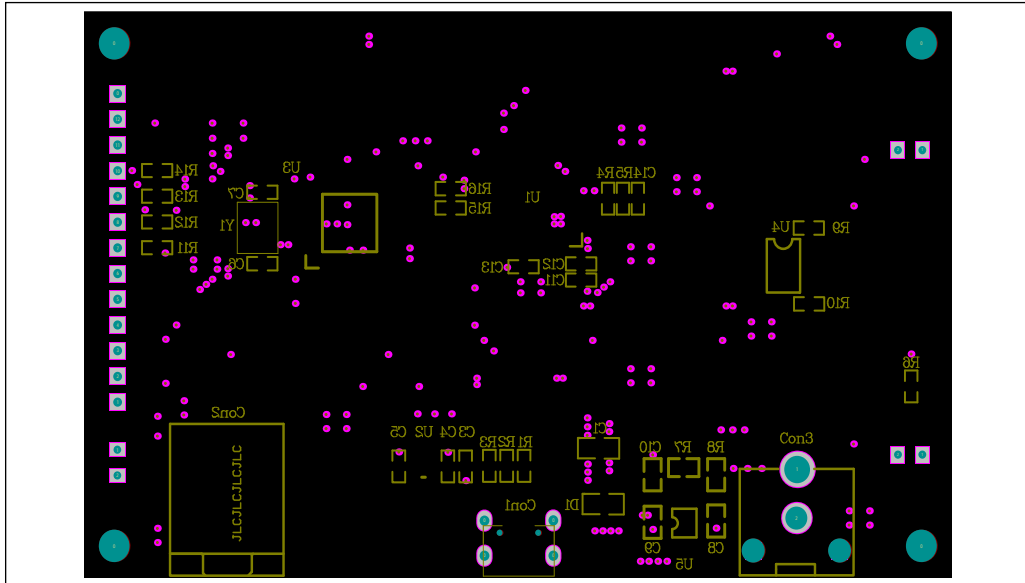
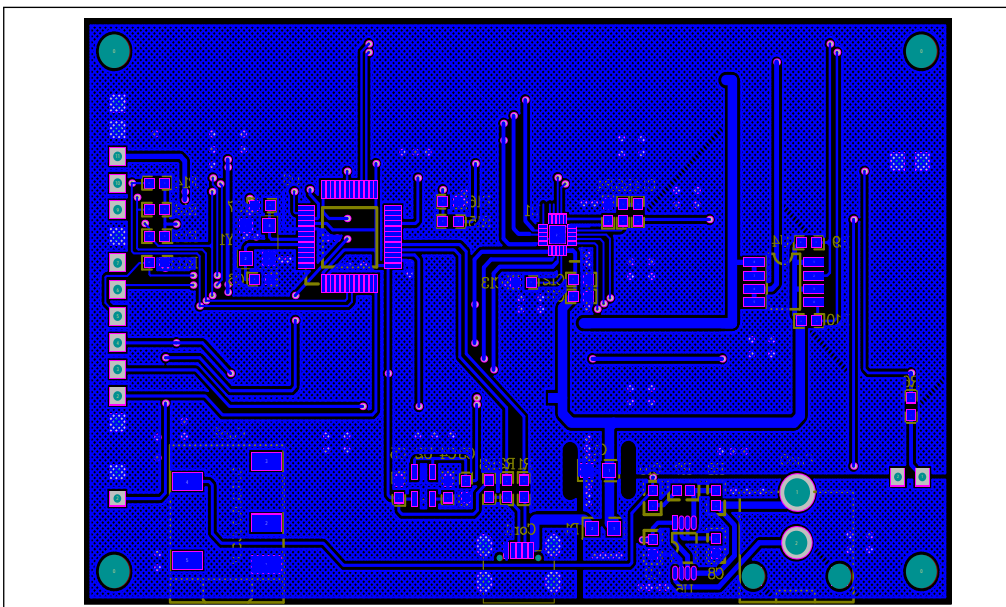


Figure 4: Board PCB Layout - Top Layer



**Figure 5: Board Component Placement Guide - Bottom Layer**



**Figure 6: Board PCB Layout - Bottom Layer**

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