DESCRIPTION

The IS31FL3733 is a general purpose 12×16 LEDs matrix driver with 1/12 cycle rate. The device can be programmed via an I2C compatible interface. Each LED can be dimmed individually with 8-bit PWM data which allowing 256 steps of linear dimming.

IS31FL3733 features 3 Auto Breathing Modes which are noted as ABM-1, ABM-2 and ABM-3. For each Auto Breathing Mode, there are 4 timing characters which include current rising / holding / falling / off time and 3 loop characters which include Loop-Beginning / Loop-Ending / Loop-Times. Every LED can be configured to be any Auto Breathing Mode or PWM mode individually.

FEATURES

- Supply voltage range from 2.7V to 5.5V
- Programmable 12×16 (64 RGBs) matrix size with de-ghost function
- 3 Auto Breath Modes and PWM Mode
- Auto breath offers 128 steps gamma current, interrupt and state look up registers
- 256 steps global current setting
- Individual PWM control 256 steps
- Individual open and short error detect function
- QFN-48 (6mm×6mm) and eTQFP-48 packages

QUICK START

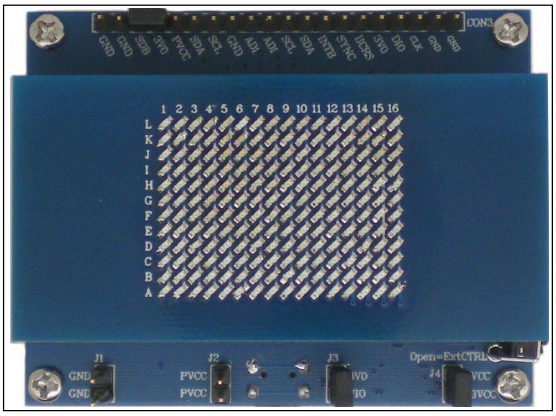

Figure 1: Photo of IS31FL3733 Evaluation Board

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 IS31FL3733 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 J3 to connect 3VO and VIO.
2) Short J4 to connect PVCC and U1VCC.
3) Connect the 5VDC power to the connector (J1&J2).
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.

ORDERING INFORMATION

Part No.	Temperature Range	Package
IS31FL3733-QFLS4-EB	-40°C to +125°C (Industrial)	QFN-48, Lead-free

Table 1: Ordering Information

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

EVALUATION BOARD OPERATION

The IS31FL3733 evaluation board has three animation display modes. Press K1 to switch configurations.

1) Firework animation
2) Heart animation
3) Angle shift animation
4) All led turn on

Note: IS31FL3733 solely controls the FxLED function on the evaluation board.

SOFTWARE CONTROL

J4 default setting is closed (short). If it is set to open, the U1 (LDO) will stop working and all the 3V, including the supply of MCU will be cut off, all the MCU's IO will be high impedance (open-drain) and external control is allowed.

The IS31FL3733 can set its I2C bus interface logic threshold based on the voltage on the VIO pin. An external VIO voltage in the range of $1.8V \le V_{IO} \le V_{CC}$ can be applied after removing (open) the J4 jumper.

The board comes with J4 default setting closed (short). If it is set to open, the user can connect an external VIO voltage supply, the external VIO voltage is recommended to equal to ex-IIC's high logic.

Follow the steps listed below for external control.

1) Open J4 to disconnect the power of U1, disable the 3V0 (3.0V).
2) Open J3 to disconnect the VIO to 3V0, and connect an external MCU VCC to VIO.
3) Pull-up the SDB to VIO.
4) Connect the 5VDC power to the connector (J1&J2).
5) 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.
6) Start external IIC control.

Caution: If J4 is closed (shorted), user can't connect the user's MCU VCC to VIO directly, otherwise the user's MCU (maybe 1.8V) will connect to evaluation bard's VIO (3.0V) and maybe damaged.

Please refer to the datasheet to get more information about IS31FL3733.

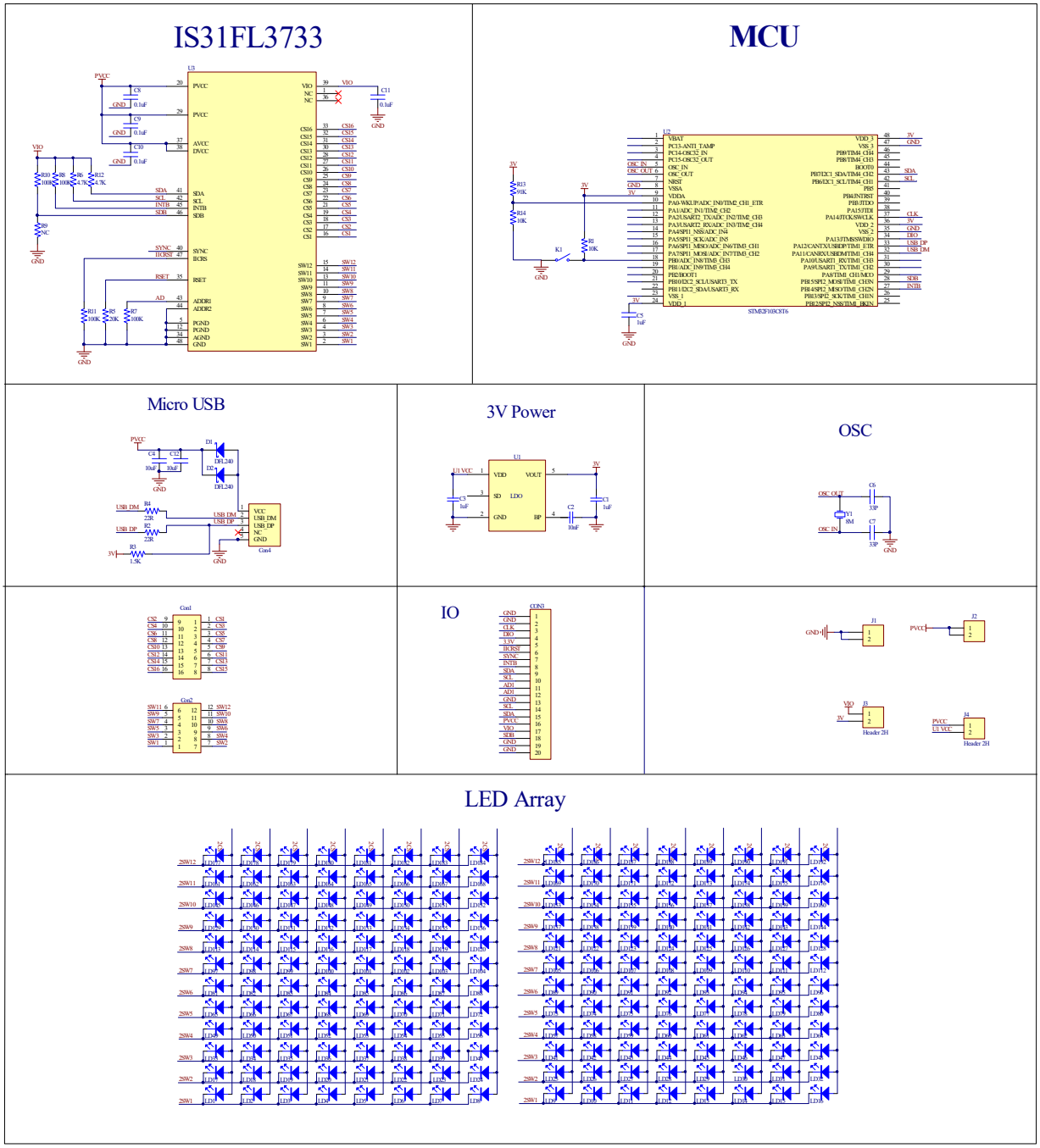

Figure 2: IS31FL3733 Application Schematic

BILL OF MATERIALS

Name	Symbol	Description	Qty	Supplier	Part No.
LDO	U1	Reduced voltage	1	SGMICRO	SGM2019-3.3V
MCU	U2	Microcontroller	1	STM	STM32F103C8T6
LED Driver	U3	Matrix LED Driver	1	ISSI	IS31FL3733
Diode	LD1~LD192	Blue LED, SMD	192	Everlight	9-217/BHC-ZL1M2RY/3T
Diode	D1,D2	Diode, SMD	2	DIODES	DFLS240
Crystal	Y1	Crystal, 8MHz	1	JB	HC-49S
Resistor	R1,R7,R8, R9,R11	RES,100k,1/16W,±5%,SMD	5	Yageo	RC0603JR-07100KL
Resistor	R2,R4	RES,22R,1/16W,±5%,SMD	2	Yageo	RC0603JR-0722RL
Resistor	R3	RES,1.5k,1/16W,±5%,SMD	1	Yageo	RC0603JR-071K5L
Resistor	R5	RES,20k,1/16W,±5%,SMD	1	Yageo	RC0603JR-0720KL
Resistor	R6,R12	RES,1k,1/16W,±5%,SMD	2	Yageo	RC0603JR-0701KL
Resistor	R13	RES,10k,1/16W,±5%,SMD	1	Yageo	RC0603JR-0710KL
Resistor	R14	RES,91k,1/16W,±5%,SMD	1	Yageo	RC0603JR-0791KL
Resistor	R10	NC	1		
Capacitor	C1,C3,C5	CAP,1μF,16V,±20%,SMD	3	Yageo	CC0603KKX7R9BB105
Capacitor	C2	CAP,10pF,16V,±20%,SMD	1	Yageo	CC0603KKX7R9BB100
Capacitor	C4,12	CAP,10uF,16V, ±20%,SMD	2	Yageo	CC0603KKX7R9BB106
Capacitor	C6,C7	CAP,33pF,16V,±20%,SMD	2	Yageo	CC0603KKX7R9BB330
Capacitor	C8,C9,C10	CAP,0.1μF,16V,±20%,SMD	3	Yageo	CC0603KKX7R9BB104
Button	K1	Button SMD	1		

Bill of Materials, refer to Figure 2 above.

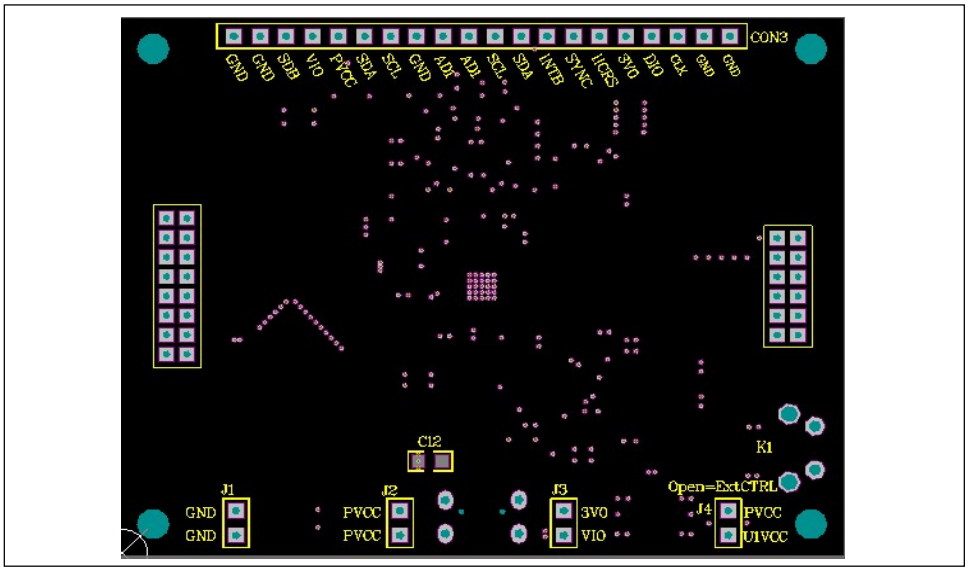

Figure 3: Board Component Placement Guide - Top Layer

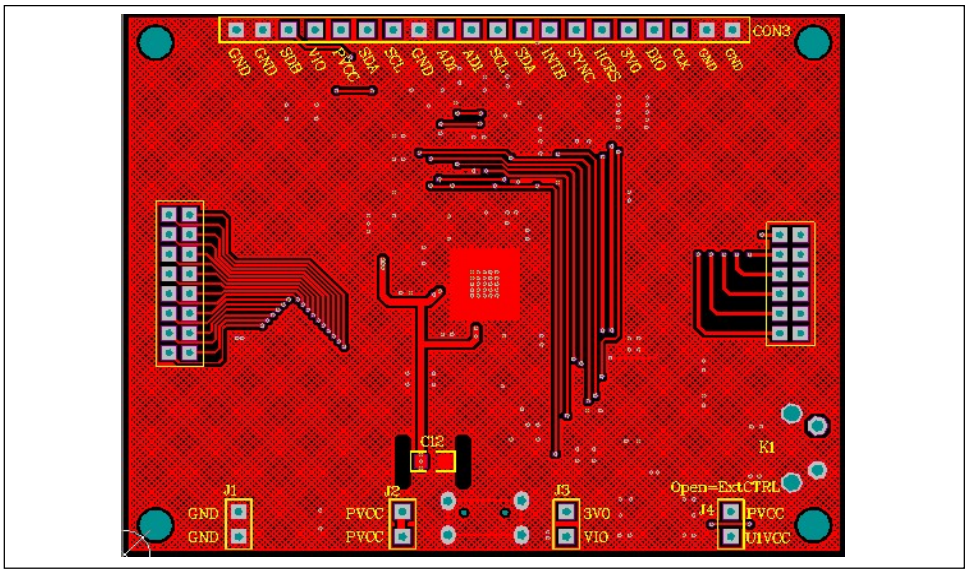

Figure 4: Board PCB Layout - Top Layer

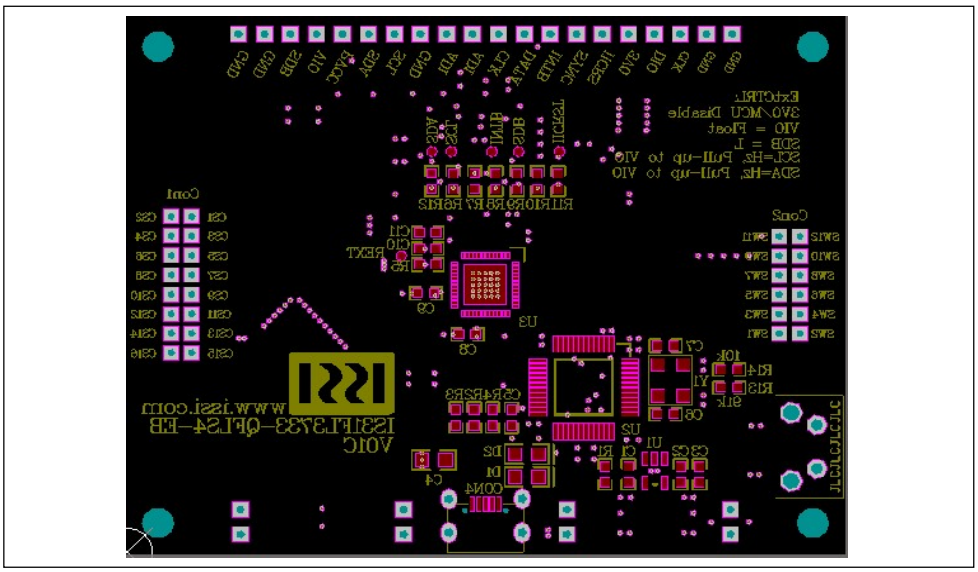

Figure 5: Board Component Placement Guide - Bottom Layer

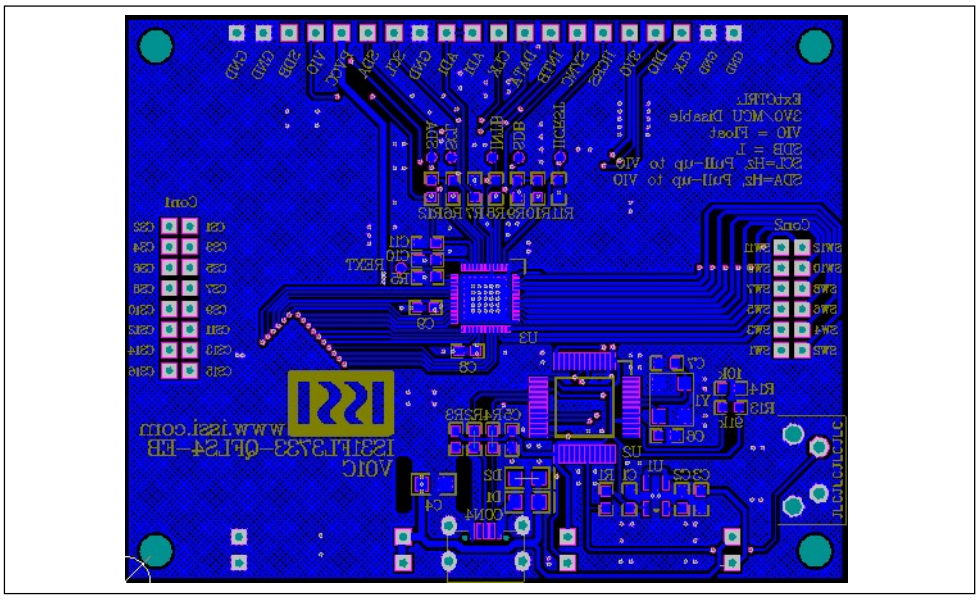

Figure 6: Board PCB Layout - Bottom Layer

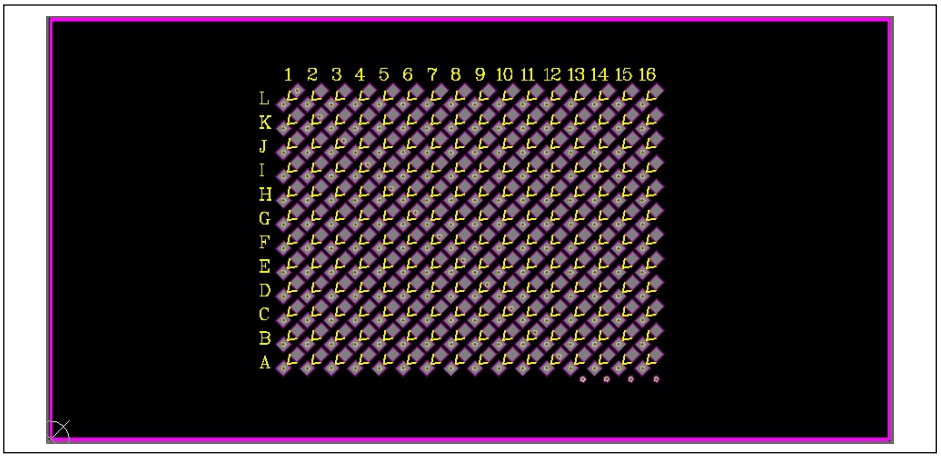

Figure 7: LED Board Component Placement Guide - Top Layer

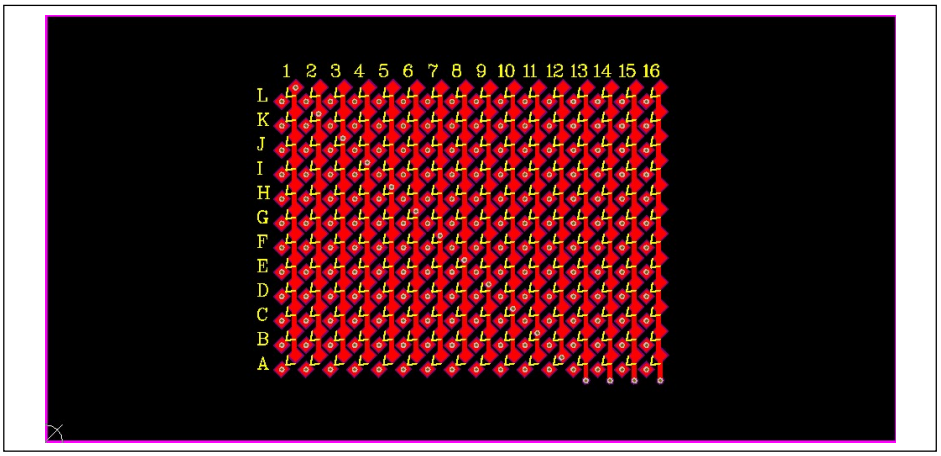

Figure 8: LED Board PCB Layout - Top Layer

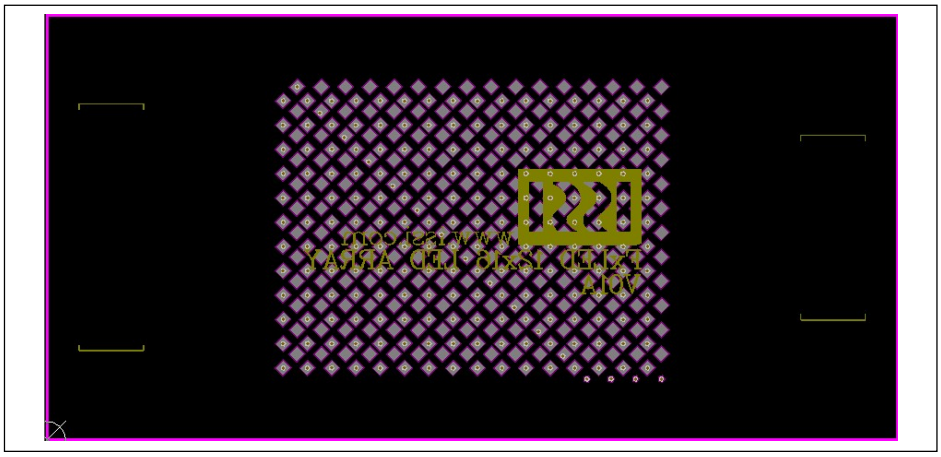

Figure 9: LED Board Component Placement Guide - Bottom Layer

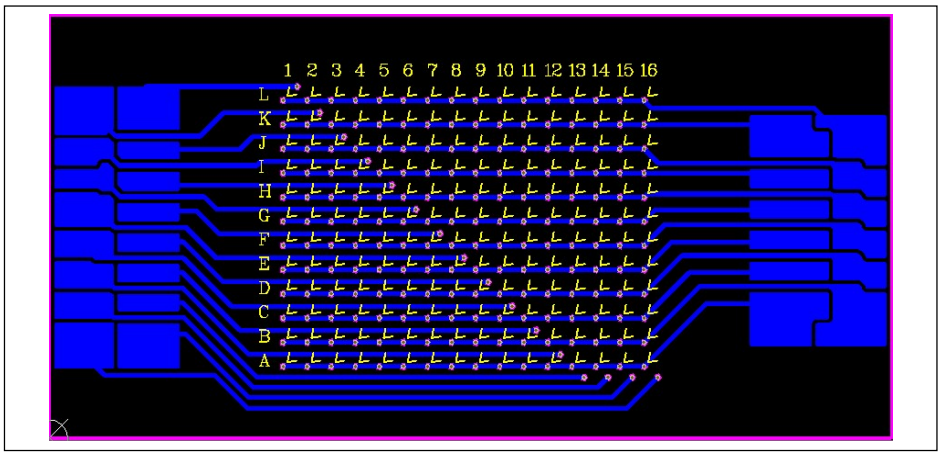

Figure 10: LED Board PCB Layout - Bottom Layer

REVISION HISTORY

Revision	Detail Information	Date
A	Initial release	2016.07.26
B	Correct some mistakes in schematic.	2017.01.20

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
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