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# **MB39C601 LED DRIVER BOARD BULB 9W NO TRAIC DIMMING**

USER MANUAL





## Revision History

| Version | Date      | Updated by | Approved by | Modifications |
|---------|-----------|------------|-------------|---------------|
| 1.0.0   | 2012-8-17 | Denny Deng |             | First Draft   |
|         |           |            |             |               |
|         |           |            |             |               |

This manual contains 9 pages.

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# 1 Introduction

## 1.1 Purpose

This user manual describes flash operation about LED Driver solution. This can light the LED, when the LED load is connected with the output and the AC source is impressed to the input. LED load: 350mA / 6-10 pieces in series.

## 1.2 Reference Documents

MB39C601-EVB-04\_E1.0;

MB39C601\_PO\_E0.1.pdf.



## 2 Overview and Features

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### Overview and Features of System

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#### 2.1 Overview

The LED Driver use MB39C601 as controller IC. And MB39C601 is a flyback type switching regulator controller IC. The LED current is regulated by controlling the switching on-time or controlling the switching frequency, depending on the LED load. It is most suitable for the general lighting applications, for example residencial LED lighting.



## 3 System Installation

### Block and Connection of System

#### 3.1 System Block

LED driver board is shown in figure 3-1.

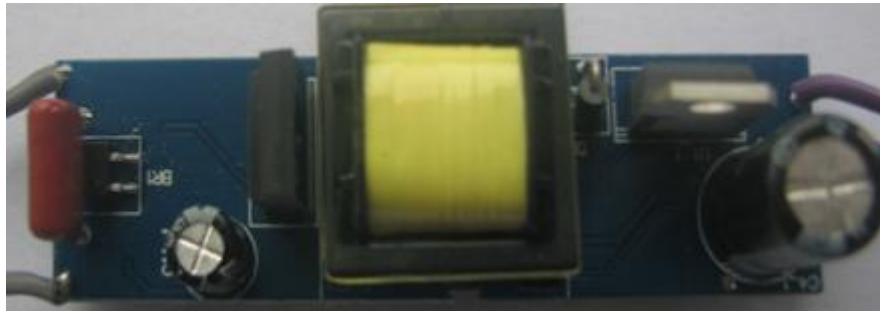


Figure 3-1 (a): Top view



Figure 3-1 (b): Bottom view

#### 3.2 System Connection

This system connection draft is shown in figure 3-2.

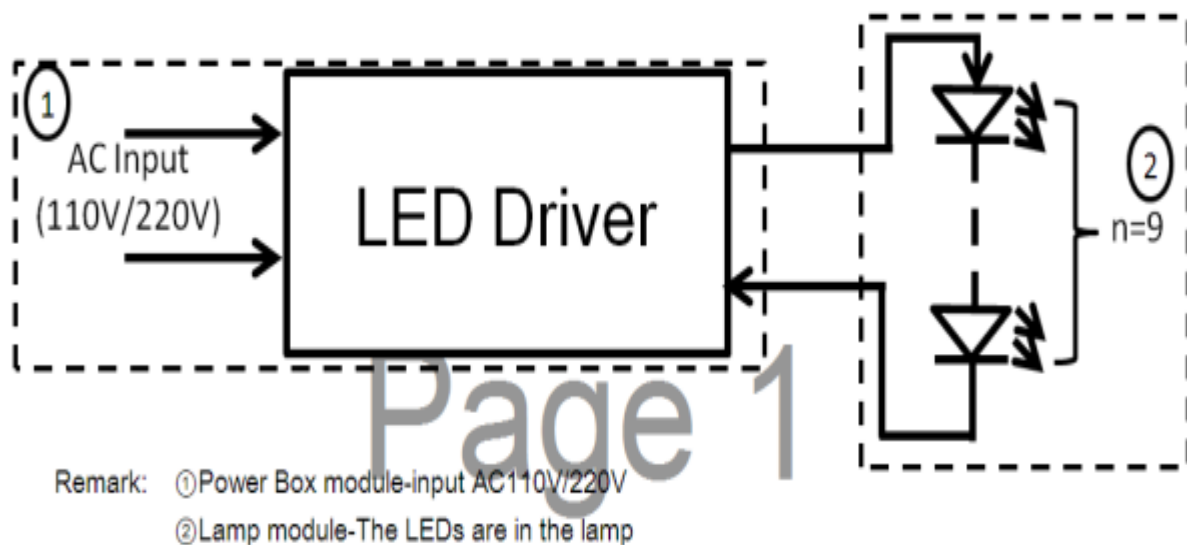


Figure 3-2: System Connection



### 3.2.1 Step 1

Connect the output of the board to LEDs, shown in figure 3-3.

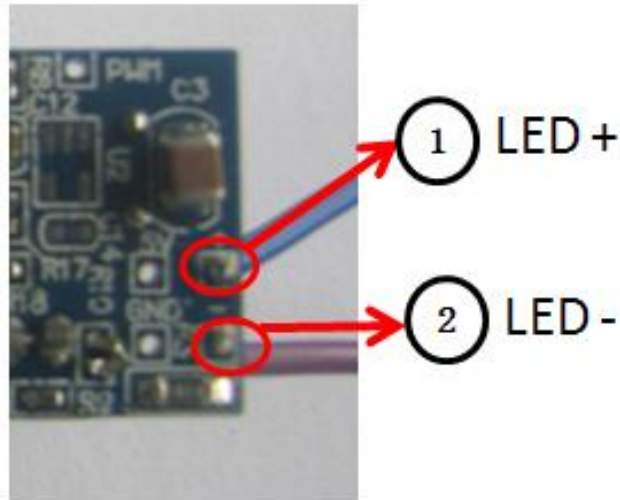


Figure 3-3: step 1- Connect LEDs

### 3.2.2 Step 2

Give 220V/AC at the input of the board, the connection is shown in figure 3-4.

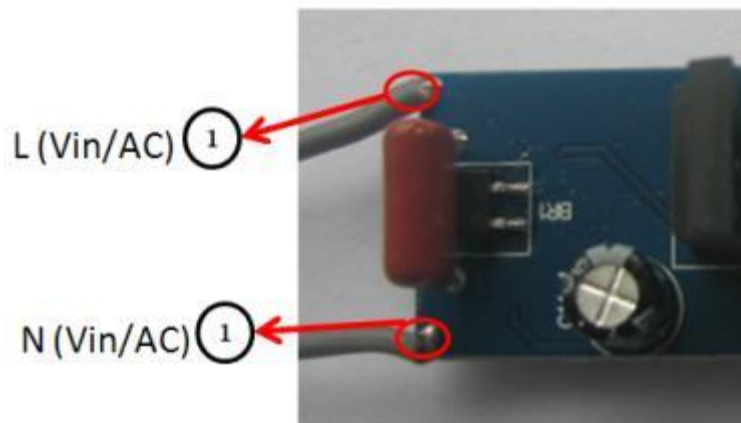


Figure 3-4: step 2-Connect 220V/AC

### 3.2.3 Step 3

Power on the switch, the bulb is lighting. See it in figure 3-5.

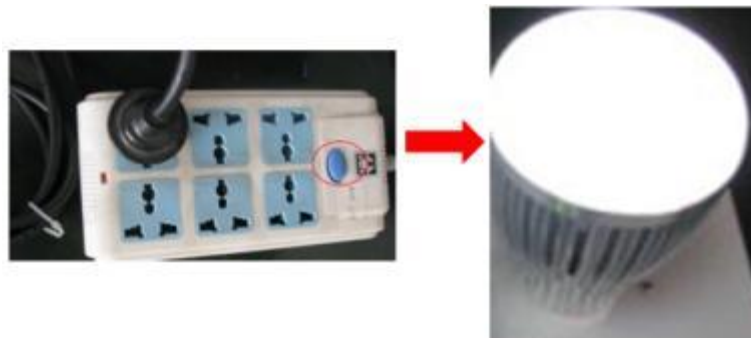


Figure 3-5: step 3-Power on



## 4 Operation Description

### Operation Introduce

#### 4.1 Board Caution

The board is made up two parts, high voltage part and low voltage part. See it in figure 3-6.

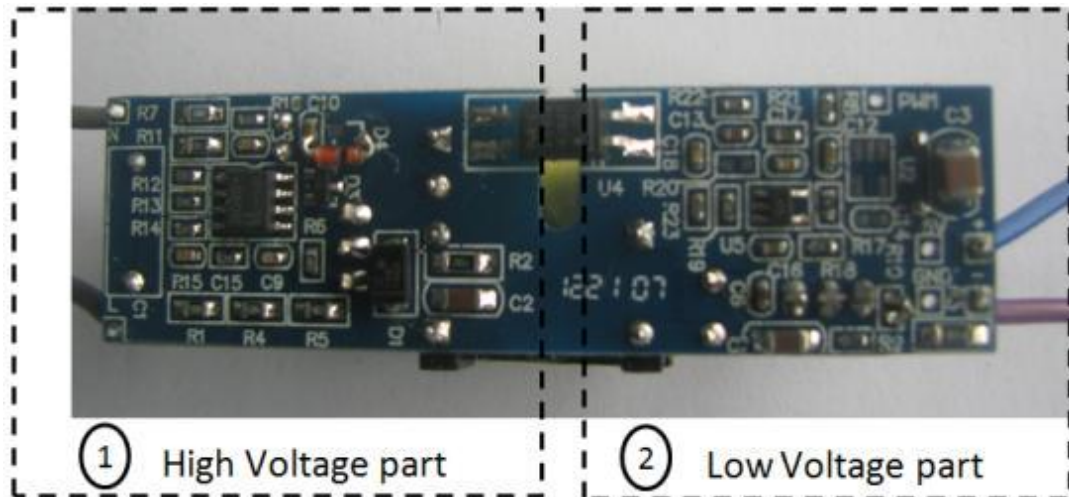


Figure 3-6

Before assembly/disassembly any components for the board, please make sure that the power is off because for its high input voltage.

#### 4.2 Input Voltage

Terminal A and terminal B is the input of the board, it can be measured AC input voltage between the two terminals. See it in figure 3-7.

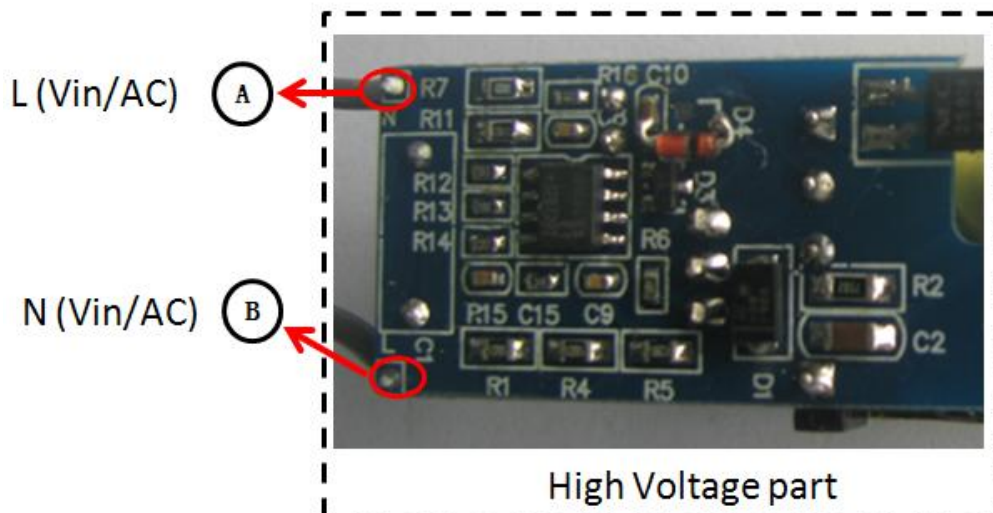


Figure 3-7: input voltage

#### 4.3 Input Current

And also, it can be measured input current between terminal A and terminal B.



#### 4.4 Output Current

After have connected the Load to the output of the board (it means, the output terminal C and D have connected to LEDs), it can be measured the output current between terminal A and terminal B. See it in figure 3-9.

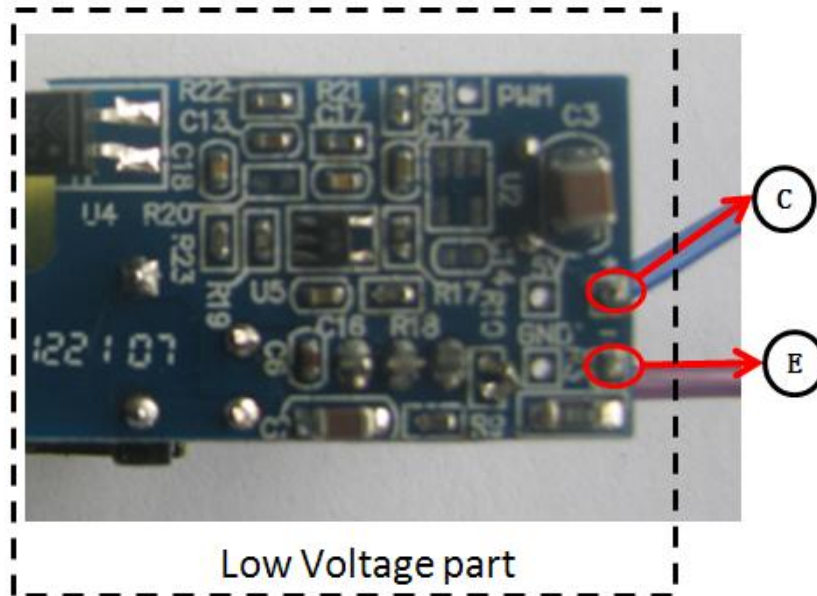


Figure 3-9: Output current measure

And also, you can the measure the voltage of loads (LEDs) between terminal A and terminal B.

#### 4.5 Output Voltage

Terminal C is the output of the board, and the terminal D is the GND of low voltage part. See it in figure 3-8. It can be measured output voltage between the two terminals.

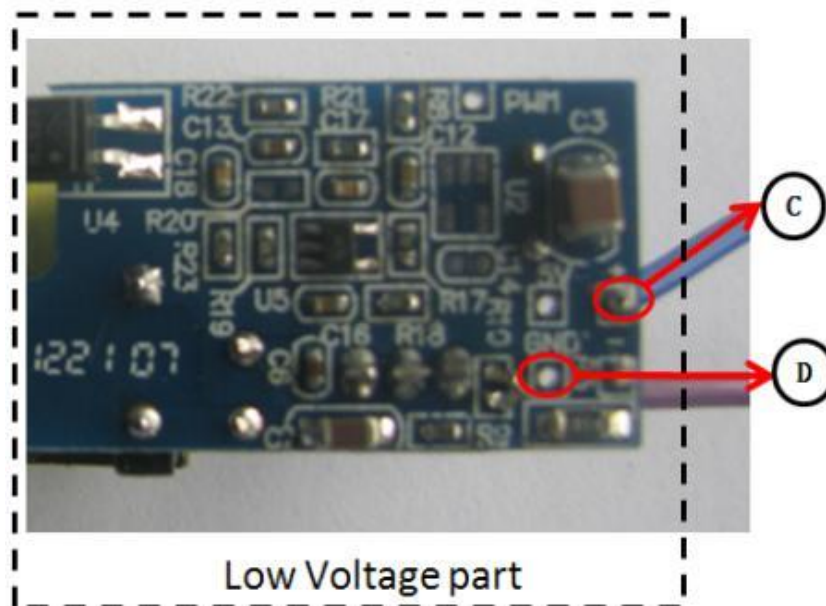


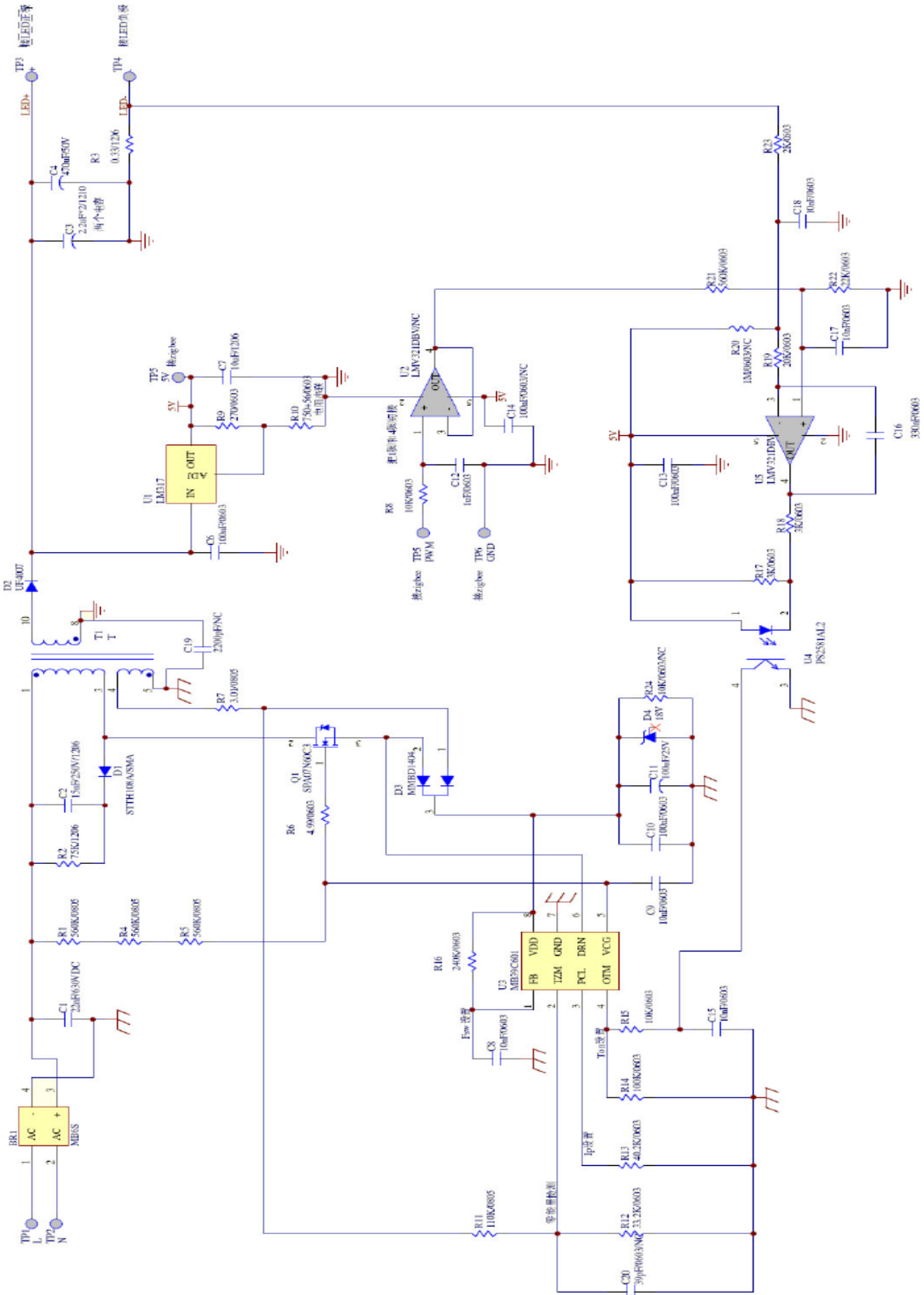
Figure 3-8: Output voltage



## 5 Reference Data

Schematic, bomlist and layout

### 5.1 Schematic





## 5.2 Bomlist

Here is the bomlist for LED Driver board.

| 数量 | 器件                    | 规格书              | 器件值       | 封装       | 器件编号       | 类型说明    |
|----|-----------------------|------------------|-----------|----------|------------|---------|
| 1  | U1                    | LDO              | LM317     | TO-220F  | LM317      | 线性稳压调制器 |
| 1  | U3                    | 电源管理芯片           | MB39C601  | SOP-8    | MB39C601   | 电源芯片    |
| 1  | U4                    | 光耦               | PS2581L2  | PS2581L2 | PS2581L2   | 光耦      |
| 1  | U5                    | 运算放大器            | LMV321DBV | SOT-235  | LMV321DBV  | 运算放大器   |
| 1  | BR1                   | 整流桥              | —         | —        | MB6S       | 整流桥     |
| 1  | C1                    | 22nF, 630V DC    | 22nF      |          |            | 电容      |
| 1  | C2                    | 15nF, 250V, 1206 | 15nF      | 1206     |            | 电容      |
| 2  | C3 (两个并联)             | 2.2uF, 50V, 1210 | 2.2uF     | 1210     |            | 电容      |
| 1  | C4                    | 470uF, 50V, 1210 | 2.2uF     | RB.2/4   |            | 电解电容    |
| 3  | C6, C10, C13          | 100nF, 50V, 0603 | 100nF     | 0603     |            | 电容      |
| 1  | C7                    | 10uF, 25V, 1206  | 10uF      | 1206     |            | 电容      |
| 5  | C8, C9, C15, C17, C18 | 10nF, 50V, 0603  | 10nF      | 0603     |            | 电容      |
| 1  | C11                   | 100uF, 25V       | 100uF     | DIP      |            | 电解电容    |
| 1  | C12                   | 1uF, 50V, 0603   | 1uF       | 0603     |            | 电容      |
| 1  | C16                   | 330nF, 50V, 0603 | 330nF     | 0603     |            | 电容      |
| 1  | D1                    | 二极管              | -         | SMA      | STTH108A   | 二极管     |
| 1  | D2                    | 二极管              | -         | DO-41    | UF4007     | 二极管     |
| 1  | D3                    | 二极管              | -         | SOT-23   | MMBD1404   | 二极管     |
| 1  | D4                    | 稳压管              |           | SOT-23   |            | 稳压管     |
| 1  | T1                    | 变压器              | -         | 20x20    | -          | 变压器     |
| 1  | Q1                    | 开关管              | -         | TO-220F  | SPA07N60C3 | 开关管     |
| 3  | R1, R4, R5            | 电阻, 1%           | 560K      | 0805     |            | 电阻      |
| 1  | R2                    | 电阻, 1%           | 75K       | 1206     |            | 电阻      |
| 1  | R3                    | 电阻, 1%           | 0.33R     | 1206     |            | 电阻      |
| 1  | R6                    | 电阻, 1%           | 4.99R     | 0603     |            | 电阻      |
| 1  | R7                    | 电阻, 1%           | 3.01R     | 0805     |            | 电阻      |
| 2  | R8, R15               | 电阻, 1%           | 10K       | 0603     |            |         |
| 1  | R9                    | 电阻, 1%           | 270R      | 0805     |            | 电阻      |
| 1  | R10 (串联)              | 电阻, 1%           | 750R      | 0805     |            | 电阻      |
| 1  |                       | 电阻, 1%           | 56R       | 0805     |            | 电阻      |
| 1  | R11                   | 电阻, 1%           | 110K      | 0805     |            | 电阻      |
| 1  | R12                   | 电阻, 1%           | 33.2K     | 0603     |            | 电阻      |
| 1  | R13                   | 电阻, 1%           | 40.2K     | 0603     |            |         |
| 1  | R14                   | 电阻, 1%           | 100K      | 0603     |            |         |
| 1  | R16                   | 电阻, 1%           | 240K      | 0603     |            | 电阻      |
| 2  | R17, R18              | 电阻, 1%           | 3K        | 0603     |            | 电阻      |
| 1  | R19                   | 电阻, 1%           | 20K       | 0603     |            | 电阻      |
| 1  | R21                   | 电阻, 1%           | 560K      | 0603     |            | 电阻      |
| 1  | R22                   | 电阻, 1%           | 22K       | 0603     |            | 电阻      |
| 1  | R23                   | 电阻, 1%           | 2K        | 0603     |            | 电阻      |

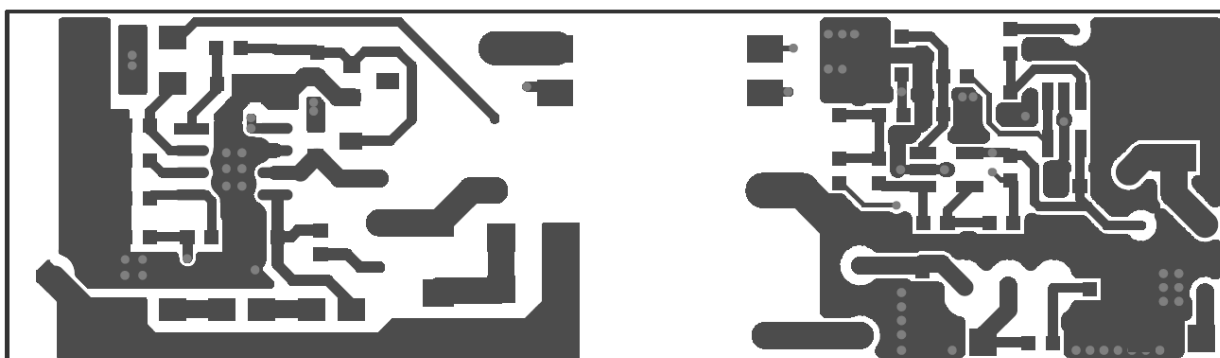


(Continued)

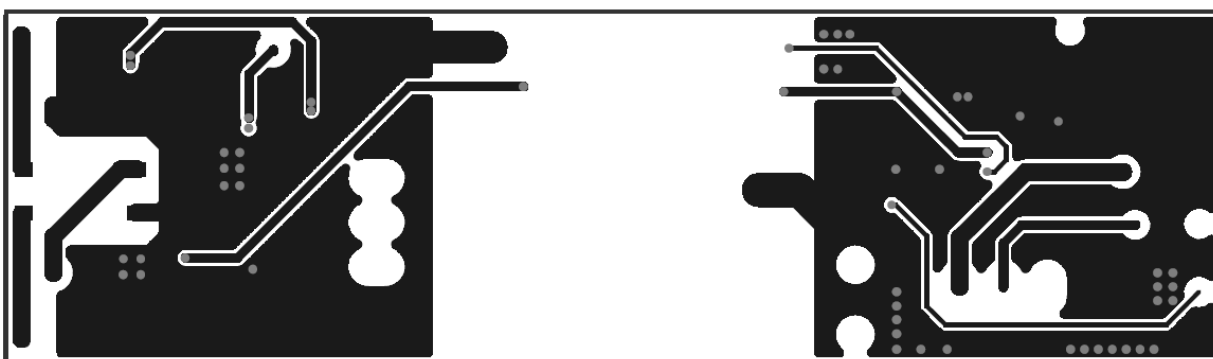
| 数量  | 器件                           | 规格书              | 器件值       | 封装      | 器件编号      | 类型说明  |
|-----|------------------------------|------------------|-----------|---------|-----------|-------|
| 6   | TP1, TP2, TP3, TP4, TP5, TP6 | 测试端子             | -         | -       | -         | 测试端子  |
| 不焊接 | U2                           | 运算放大器            | LMV321DBV | SOT-235 | LMV321DBV | 运算放大器 |
|     | C20                          | 39pF, 50V, 0603  | 39pF      | 0603    |           | 电容    |
|     | C19                          | 2200pF, NC       | 2200pF    |         |           |       |
|     | C14                          | 100nF, 50V, 0603 | 100nF     | 0603    |           | 电容    |
|     | R20                          | 电阻, 1%           | 1M        | 0603    |           | 电阻    |
|     | R24                          | 电阻, 1%           | 10K       | 0603    |           | 电阻    |

### 5.3 PCB layout

Top view



Bottom view



END