

# **Instruction of Installation of 0-30V Stabilized Voltage Supply**

This is a high quality stabilized voltage supply with which the voltage can be regulated continuously, and the range in which to regulate the voltage is 0-30V. It even contains a current limit circuit which can effectively control the output current from 2mA to 3A with the ability to regulate the current continuously, and this unique feature makes this device an indispensably powerful tool in the circuit lab. With this feature, the current used in the laboratory could be limited within the typical maximum working range. You could turn on the power without hesitation, and never have to feel distressed about the damage of the circuit caused by high current due to device failure or installation error.

## **Technical Specifications:**

Input Voltage: 24V alternating (max)

Input Current: 3A (max)

Output Voltage: 0-30V, could be regulated continuously

Output Limit Current: 2mA-3A, could be regulated continuously

Output Voltage Ripple: 0.01% (max)

PCB size: 84\*84 mm

#### Features:

All components are in inline-pin package that is easy to install and repair.

It is easy to regulate the output voltage.

The status in which the output current is limited could be displayed through LED.

If the output current exceeds the limit the device will automatically enter into constant current mode, which provides a thorough safeguard against overload current or any possible failure.

#### List of Components:

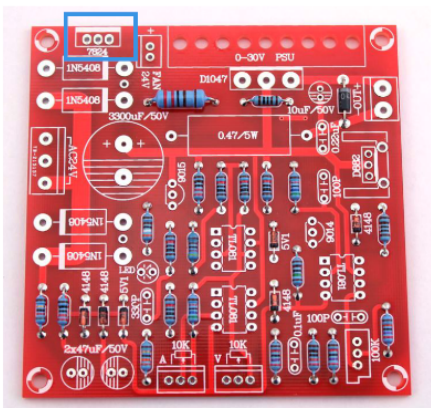
R1=2.2K 1W	C4=0.1uF(104)
R2=82R	C5=0.22uF(224)
R3=220R	C6=100P (101)
R4=4.7K	C7=10uF/50V
R5 , R6 , R13 , R20 , R21=10K	C8=330P (331)

R7=0.47R 5W	C9=100P (101)
R8, R11=27K	D1,D2,D3,D4=1N5408
R9, R19=2.2K	D5,D6=1N4148
R10=270K	D7,D8=5.1V ZD
R12, R18=56K	D9,D10=1N4148
R14=1.5K	D11=1N4004
R15,R16=1K	Q1=9014
R17=33R	Q2=2SD882
R22=3.9K	Q3=9015
RV1=100K 3296W	Q4=2SD1047
P1,P2=10K B	U1,U2,U3=TL081
C1=3300uF/50V	D12=LED
C2,C3=47uF/50V	

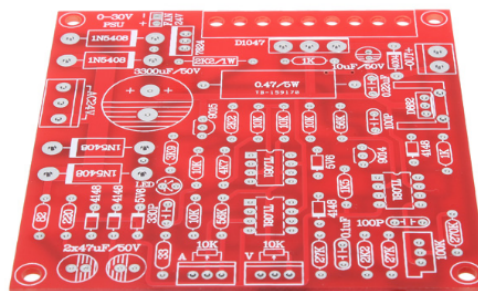
#### Installation Steps:

Please follow the sign on PCB to install resistors, diodes, etc. The resistance value should be checked by multi-meter before installation. Please also be aware of the size and installation direction of the diodes.

before change



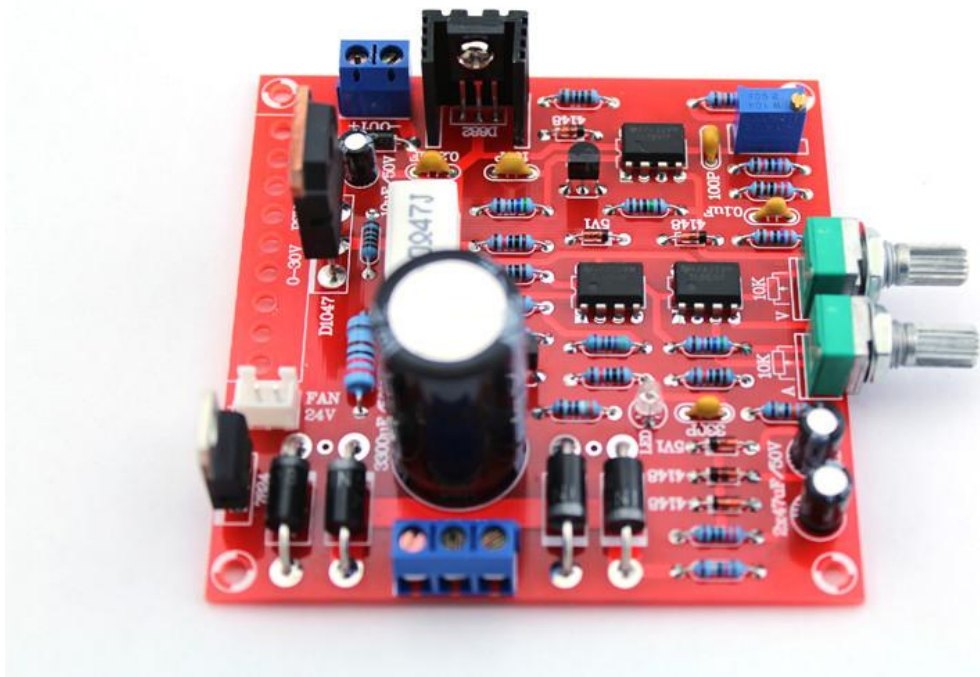
After component position changes



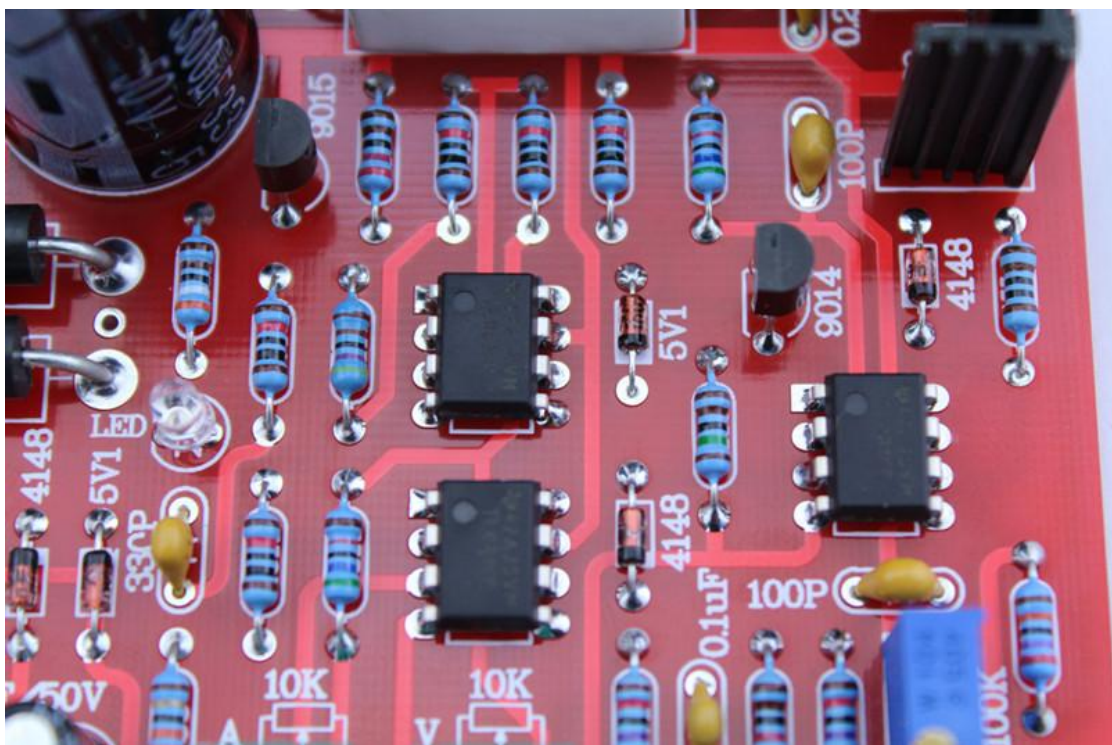
Please pay attention to the difference, please change the position yourself in the following introduction



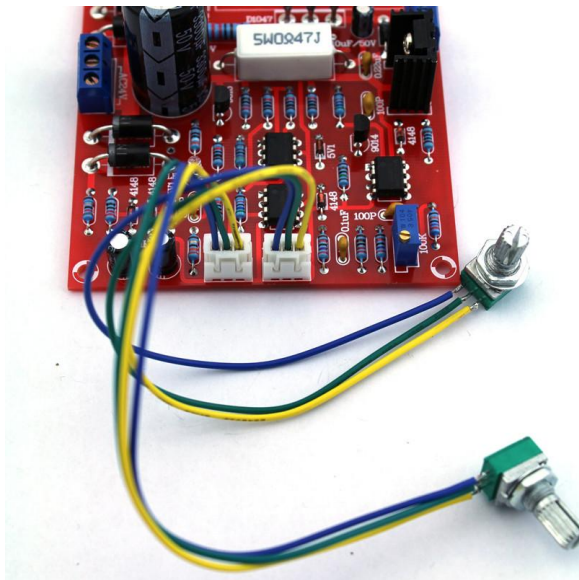




Please pay attention to the direction in which to install the integrated circuit.



The potentiometer could be placed directly onto PCB, and could also be lined onto the board through its socket and wires. Potentiometer tagged with *A* is the current limit potentiometer and *V* is the voltage potentiometer. The voltage potentiometer could be substituted by 10K multi turn wire-wound potentiometer at your own will, with which you could adjust in a more accurate way.



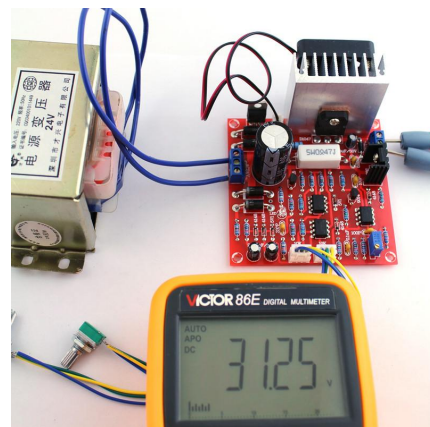
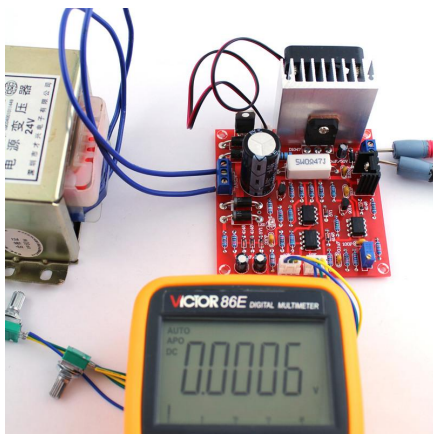
After the installation, please double check that everything is in its place, and then you can start the power and test the device. Please make sure that you have installed cooling fin of considerable size on Q4 (D1047) before starting the power, and the cooling fin should be insulated from the circuit. If the cooling fin is not sizable enough, the cooling fan is thus a must, for which a 24V socket has been kept for this purpose on the

board.



## Circuit Conditioning

1. Set the voltage potentiometer (a 10K potentiometer tagged V) at its minimum position (rotate counter clock-wisely to the min), adjust RV1 (100K rheostat) and make the output voltage to 0V (you may come across negative voltage when adjusting, so please use digital multi-meter). There is no need to adjust the max output voltage, and the max output voltage is around 31V when input with 24V alternating power.

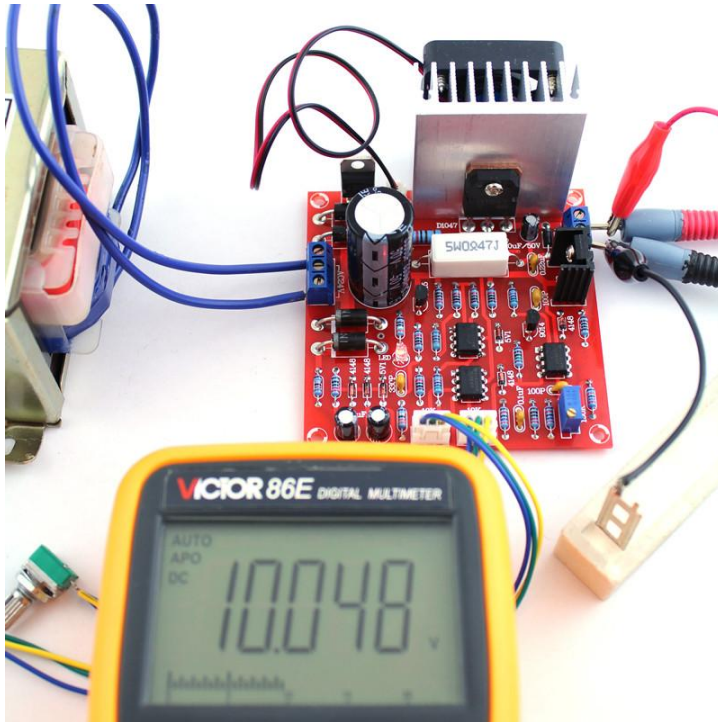


## 2.Current Calibration

Connect the load resistance to the output point, for example,  $10\Omega$  (make sure there is enough power), and the current potentiometer set at its max and the voltage potentiometer at its min, turn on the device, build up the voltage to 1V slowly, rotate the current potentiometer counterclockwise till the LED begin to emit light, at which point the current of the circuit is limited at 0.1A and the position could be marked. Adjust to 2V, 5V, 10V, 20V,30V successively, and you could calibrate different input current, the formula is:  $I=U/R$ . For example, if the load of  $10\Omega$  is used, and U at 30V,  $I=3A$ (max output). You could substitute other load resistance with different values, but please make sure there is enough power and cooling.

As the picture shown below, the voltage is 10V, load resistance is  $10\Omega$ , LED is on, and now the current potentiometer is at the position of 1A, the circuit turns into the constant current mode, if you adjust the voltage potentiometer at this point, you will see that the voltage will not increase and the current will be limited at 1A.





Attentions:

1.The output of the transformer is single 24V or dual 12V (same as 24V), and the power could be determined according to your need. If a full load output (30V3A) is needed, the power of the transformer should be greater than 90W.

The circuit must be connected to 24V alternating current power, and direct current is forbidden.

2.Please make sure that the cooling fin is insulated from the circuit when it is installed on Q4 (D1047). The circuit is of a linear stabilized electricity power, and the power dissipation of Q4 is at a relatively high level, thus please

ensure that D1047 has a good cooling effect.

3. Making of a power supply involves high current and high voltage. Any error in installation could lead to unexpected danger, so please double check the component type and install correctly.

Circuit diagram:

