

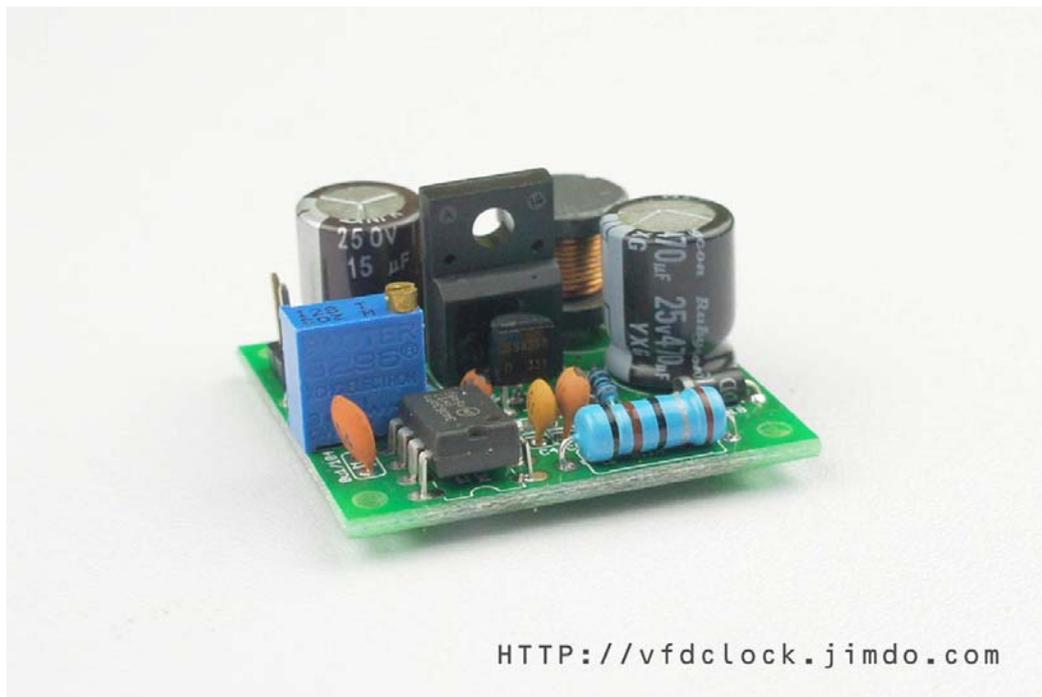
# Build a High Voltage power supply by using the MC34063 Chip DIP Version (180V)

This kit allows you to make an MC34063 based boost PSU, which can accept a 12V DC input and output ~210V DC for powering NIXIE tubes and others that require high voltage. It is a very common circuit, the key point is the selection of the Inductor and the Mosfet.

Please do **not** change any equipment of the circuit or you may not be able to get the target HV output or the module may work under the lower efficiency state.

For more info & update, please visit [HTTP://vfdclock.jimdo.com](http://vfdclock.jimdo.com)

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## How it works

The circuit is very simple, we use one of the most common switching regulators on the planet-the MC34063 chip. The circuit is based on the Step-up structure. MC34063 contains a NPN output only structure, in order to drive the Mosfet, we add a 1K pull-down resistor(R2) to get the low side signal. And because we need to convert the 12V DC input to the ~210V DC output in one step, the ration requirement is very high, so we add a speed up circuit by using a PNP transistor(Q2) and a schottky diode(D2) to speed up the drop side of the driving wave. Other part of the circuit is very simple, please check the MC34063 official PDF file by yourself.

# Building it

Well, because of the circuit is pretty simple, all you need to do is get all the component in the right position and make sure no short before you plug the power. And the kit contains NO SMD component, no need to have the skills of soldering the SMD stuffs. We show no the soldering steps, just remind the matters needing attention blow.

1. Please print out the PCB installation diagram by yourself, the Circuit diagram is no need for soldering job, print it or not depends on you;
2. Check all the component in the kit bag, make sure nothing is missing (You can do it on a A4 white copy paper);
3. We recommend using a soldering station and small soldering tip for soldering this kit (we use F2 or CF2 type tip). we recommend using  $\sim 180^{\circ}\text{C}$  soldering tin for this job. Please do not use the high temperature soldering tin in this project, you may damage the PCB or component;
4. The PCB has 2-side, so solder on which side depend on your choice and also depends on the component;

Tips:

1. Take care of the C1 and C2 (Aluminum Electrolytic Capacitor), it has polarity, do not install it in invert direction;
2. The main HV mosfet (Q1), if the mosfet in the kit is the TO220 package, you just need to plug it in the place, then cut the legs short and solder it, if the package is the TO263 package, band left&right legs straight by using needle-nose pliers or other tools; The mosfet's mark surface must be face the frond side of the PCB (face the MC34063 chip side). Double check the mosfet part after soldering, make sure it contains no short, it is very important!
3. Recommend do not wash the trimmer or may damaged the trimmer, also do not wash the Inductor or may cause the sound when MC34063 works under ON/OFF mode. If the inductor has been washed, recommend to re-coat it with the Plasticote (We use CRC-70);

## The smoke test

Put the circuit board on an insulating surface, connect no loader to the output side, connect the input pin to a 9~12V DC source. If you have a current limited supply that will be perfect. Or you can try to use a 9V small home using MN1604 (6LF22) battery to prevent to burn something at the first time.

If all fine, the max output usually can go up to  $\sim 210\text{V}$  with no problem.

The whole circuit is pretty easy, no need to adjust.

# Identifying the parts of your power supply kit

The following guide should help you to identify the parts and assemble it successfully

## **Resistors**

All the resistors contains color mark on it's surface. The 0R1 is the biggest one ,and the 1M is the big one, easy to identify. Others may have the same size, if can't read via the color rings, measure it.

## **Diode**

The diodes will be marked with HER105/SF-16/SF-18 (black one), 1N5819 (black one), and 1N4148 (the small glass one), the cathode side contains a black or white mark.

## **Capacitors**

Kit contains 4 small capacitors, All with the number on its' surface. And for the Aluminum Electrolytic Capacitor, usually the longer lead is positive, or if both leads are the same, the negative is clearly marked with a big line or minus symbol running down the side of the case.

## **The MOSFET**

The MOSFET will be marked 27N25/45N25 or other numbers, please note the mosfet marks surface must be installed face to the MC34063 chip side.

## **The MC34063 chip**

MC34063 chip in this kit is DIP8 package, make sure it is installed the correct way around, just follow the chip direction shown on the PCB.

# Partlist

Assembly variant:

Qty	Value	Device	Parts	Mark
Resistors				
1	R100=0R1	R-EU_0411/12	R1	The Biggest One
1	1M 1/4W 250V	R-EU_0207/10	R4	The Big One
1	1k0	R-EU_0204/6	R2	
1	33k	R-EU_0204/5	R3	
1	5k6	R-EU_0204/6	R6	
Capacitors				
1	0u1F(100nF)	C-EU025-024X044	C3	104
1	560pf	C-EU025-024X044	C4	391
1	No need to install	/	C5	/
1	300pF	C-EU025-024X044	C6	301
Diode and Trans				
1	PNP 8550	TRANSISTOR_PNPT092	Q2	8550
1	HER105/SF-16/SF-18	DIODE-D041-6.5	D1	HER105 SF16 SF18
1	IN4148	DIODE-D041-7.6	D2	Glass diode
1	1N5819	DIODE-D041-7.6	D3	1N5819
Mosfet/IC/Others				
1	100uH	INDUCTANCE_US11X11PLUG	L1	
1	330uF/35V	CPOL-EUE5-10.5	C1	220~470uF
1	10uF/250V	CPOL-EUE5-10.5	C2	10~15uF
1	MC34063-DIL	MC34063-DIL	IC1	MC34063
1	MOSFET-n	MOSFET-NCHANNELT0220V-BH	Q1	T0220/T0263
1	20k	R-TRIMM3296W	R5	Blue Trimmer
PINS				
2		M02PTH	HV, VIN	

exported from MC34063HV-05D-KIT

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