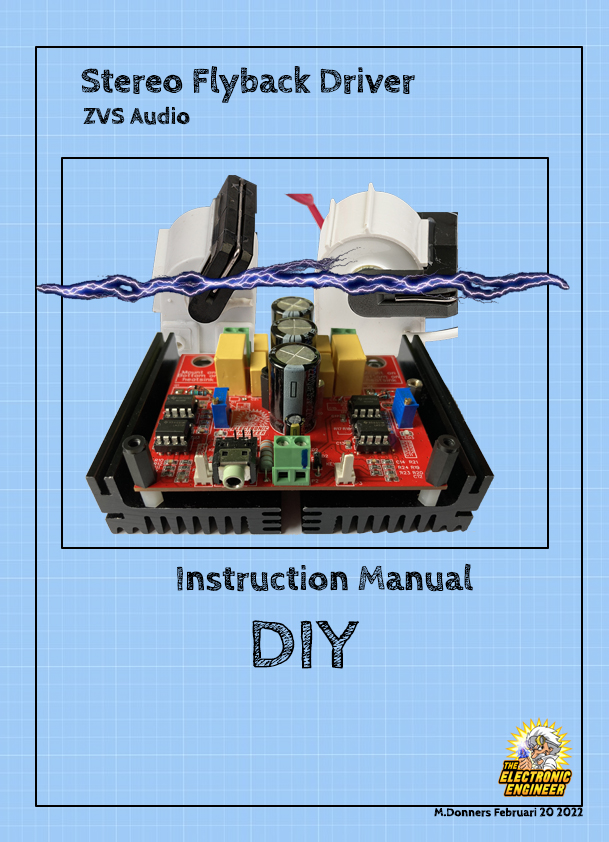
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**Disclaimer:**

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**Disclaimer short version:**

This is a DIY project, use any provided information and/or materials at your own risk! I am not responsible for what you do with it!



**Make sure that you know what you are doing! High voltage can kill!**

**Diagram, schematic

Description automatically generated**

You can get the PCB for this design here:

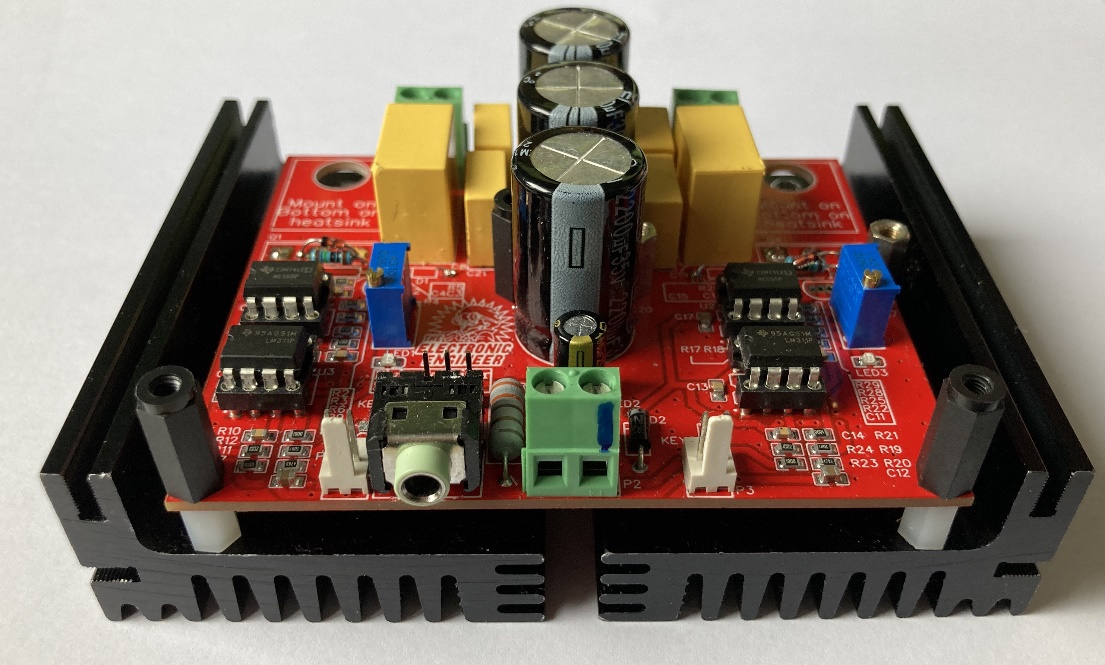
[www.tindie.com](http://www.tindie.com)

The pcb is available “as is” or with pre-assembled components. If you buy the pcb with pre-assembled components, Heatsinks, U1, U2, U3, U6, Q1, Q4, D1 and D3 are NOT included!

The assembled PCB will look like this:

A picture containing text

Description automatically generated

You will have to add: Heatsinks, U1, U2, U3, U6, Q1, Q4, D1 and D3. After you do, it will look like something like this:

Here is the full component list ( BOM ) The components with Yellow highlight, are the only once’s you need to add if you buy a pre-assembled PCB

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Designator** | **Name** | **Footprint** | **Quantity** | **Manufacturer Part** | **Manufacturer** | **Supplier** | **Supplier Part** |
| C21,C22,C23,C24 | 100nF | CAP-TH | 4 | MKP104K275A17 | Jimson | LCSC | C434192 |
| J1 | PJ-3062-G | AUDIO-TH | 1 | PJ-3062-G | XKB Enterprise | LCSC | C381120 |
| P1,P3 | KF2510-2A | CONN-TH | 2 | KF2510-2A | BOOMELE | LCSC | C27543 |
| C1,C18,C20 | 2200uF | CAP-TH | 3 | 2200uF 35V 16X25 | ValuePro | LCSC | C2763 |
| C11,C14,C16, C3,C5,C9 | 10nF | C0805 | 6 | CL21B103KBANNNC | SAMSUNG | LCSC | C1710 |
| C12,C7 | 10uF | C0805 | 2 | CL21A106KAYNNNE | SAMSUNG | LCSC | C15850 |
| C13,C17,C2,C6 | 100nF | C0805 | 4 | CC0805KRX7R9BB104 | YAGEO | LCSC | C49678 |
| C15,C4 | 4.7nF | C0805 | 2 | 0805B472K500NT | FH | LCSC | C1744 |
| C8,C19 | 330nF | CAP-TH | 2 | MKP334K310A01 | Jimson | LCSC | C434224 |
| C10 | 100uF | CAP-TH | 1 | 100uF 25V | ValuePro | LCSC | C44601 |
| D1,D3 | 1N4148 | DO-35 | 2 | 1N4148 | FMS | LCSC | C163750 |
| JP1 | JUMPER | JUMPER\_1X3/2.54 | 1 |  |  |  |  |
| KEY1,KEY2 | Switch3x4x2 | SW-SMD | 2 | Switch3x4x2 | ReliaPro | LCSC | C26638 |
| LED1,LED2,LED3 | XL-0805QBC | LED0805-RD | 3 | XL-0805QBC | KENTO | LCSC | C2293 |
| P2,P4,P20 | 1715721 | CONN-TH\_P5.08 | 3 | 1715721 | Phoenix Contact | LCSC | C480516 |
| Q1,Q4 | IRFP260NPBF | TO-247AC | 2 | IRFP260NPBF | IR | LCSC | C2678 |
| Q2,Q3 | BC327B | TO-92-3 | 2 | BC327B | CJ | LCSC | C16826 |
| R1,R30 | 270 | RES-TH | 2 | MFR0W4F2700A50 | UniOhm | LCSC | C58658 |
| R16 | 2.2K | R0805 | 1 | 0805W8F2201T5E | UniOhm | LCSC | C17520 |
| R17,R19,R25, R6,R12,R14 | 1K | R0805 | 6 | 0805W8F1001T5E | UniOhm | LCSC | C17513 |
| R18,R13 | 220 | R0805 | 2 | 0805W8F2200T5E | UniOhm | LCSC | C17557 |
| R20,R2,R29,R11 | 470 | R0805 | 4 | 0805W8F4700T5E | UniOhm | LCSC | C17710 |
| R21,R23,R8,R10 | 100 | R0805 | 4 | 0805W8F1000T5E | UniOhm | LCSC | C17408 |
| R22,R24,R7,R9 | 10K | R0805 | 4 | 0805W8F1002T5E | UniOhm | LCSC | C17414 |
| R26,R5 | 33K | R0805 | 2 | 0805W8F3302T5E | UniOhm | LCSC | C17633 |
| R28,R3 | 3.3K | R0805 | 2 | 0805W8F3301T5E | UniOhm | LCSC | C26010 |
| R4,R27 | 5K | TH\_3296W | 2 | 3296W-1-502LF | BOURNS | LCSC | C60620 |
| R15 | 330 | RES-TH | 1 | EWWR0001J330RT9 | ResistorToday | LCSC | C348842 |
| U1,U3 | LM311N | DIP-8 | 2 | LM311N | HGSEMI | LCSC | C434572 |
| U6,U2 | NE555P | DIP-8 | 2 | NE555P | TI | LCSC | C46749 |
| D2 | 1N4742A | DO-41 | 1 | 1N4742A | PANJIT Int. | LCSC | C304040 |
| Heatsinks of  your choice |  |  | 2 |  |  |  |  |

If you are assembling this PCB yourself, make sure you start with all the small components. Also Take not of how to solder Q1 and Q4. I soldered them at the bottom of the PCb but I made sure that the connection of the pins is still correct.



Next, I place the PCb on top and solder the pins of the mosfets. Take not how I used isolated spacers! Also, make sure that the heatsinks don’t touch! The left and right channel have to stay separated. If you are using 1 heatsink and not two, you will have to isolate the mosfet from the heatsink using thermal pads.

**Powersupply**

The powersupply of this unit should be 24V / 16A. That 16A current might seem a lot but it is needed for the inrush current everytime a spark starts up. I actually used two fully charged Lead-Acid rechargeable batteries in series that I harvest from an absolute UPS unit.

**Audio**

This unit works best with square wave audio. I actually transformed a midi file using FL Studio. I hooked up a VST square wave generator plugin to the channel I want to use and saved it as MP3. So in the end I got a two channel square wave audio in MP3 format.

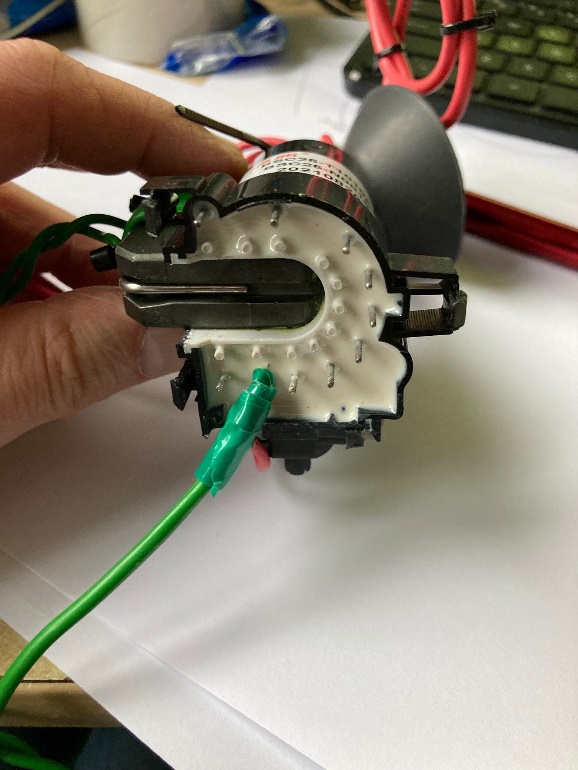
**Flyback transformer**

I used two flyback transformers that I bought at Aliexpress. Look for BCS25T1010A if sumular.

I wraps 8 turns of wire ( 1mm2 core) on the ferrite core to be used as a primary inductor.



I soldered the ground wire, ( where the spark from the high voltage output will jump to) and added some extra isolation. It doesn’t look pretty, I know, but it did what it needed to do. 😊



**Remember: While experimenting: Stay Safe!**