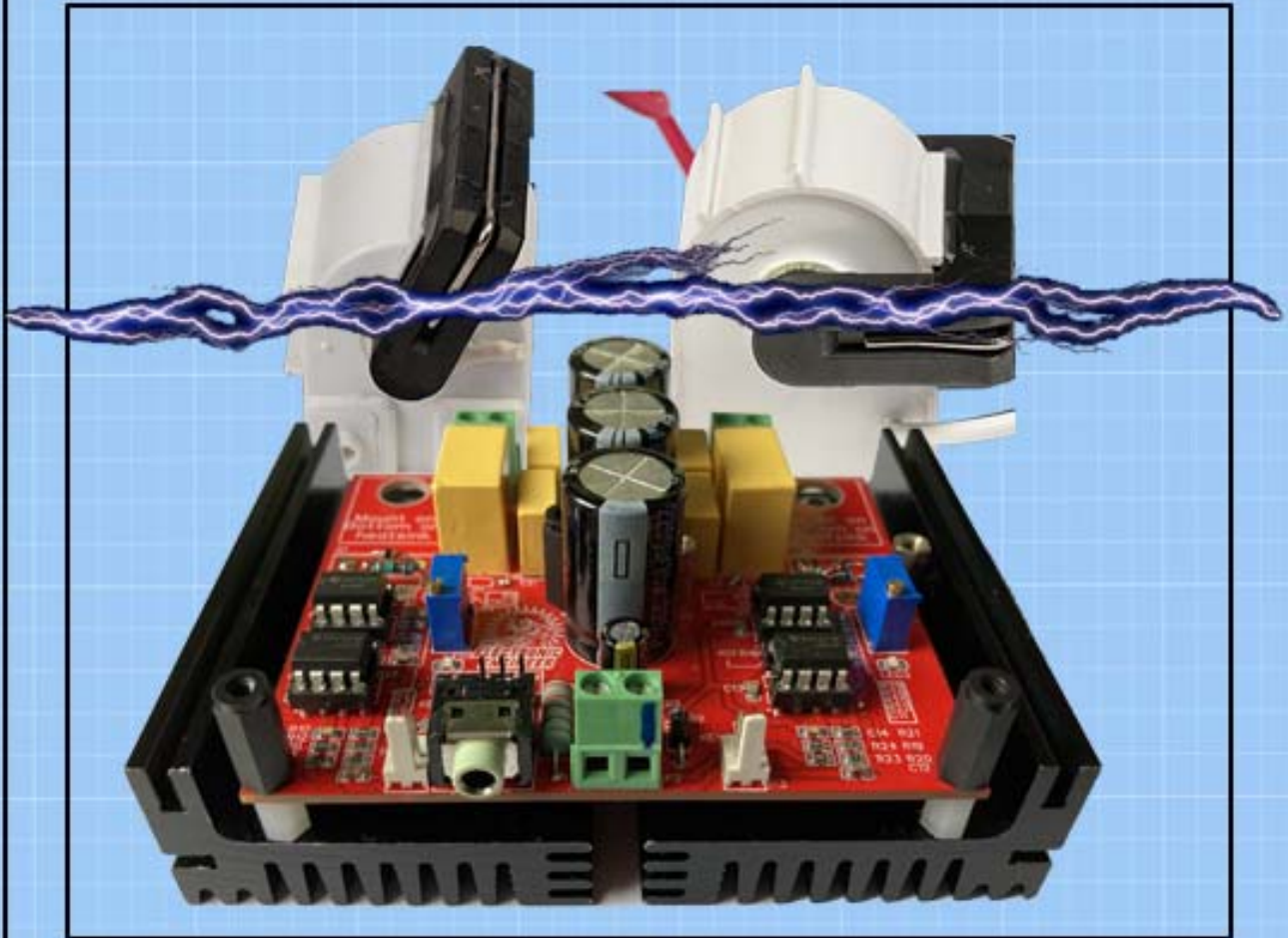


Stereo Flyback Driver

ZVS Audio



Instruction Manual

DIY



M. Donners Februari 20 2022



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Disclaimer short version:

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

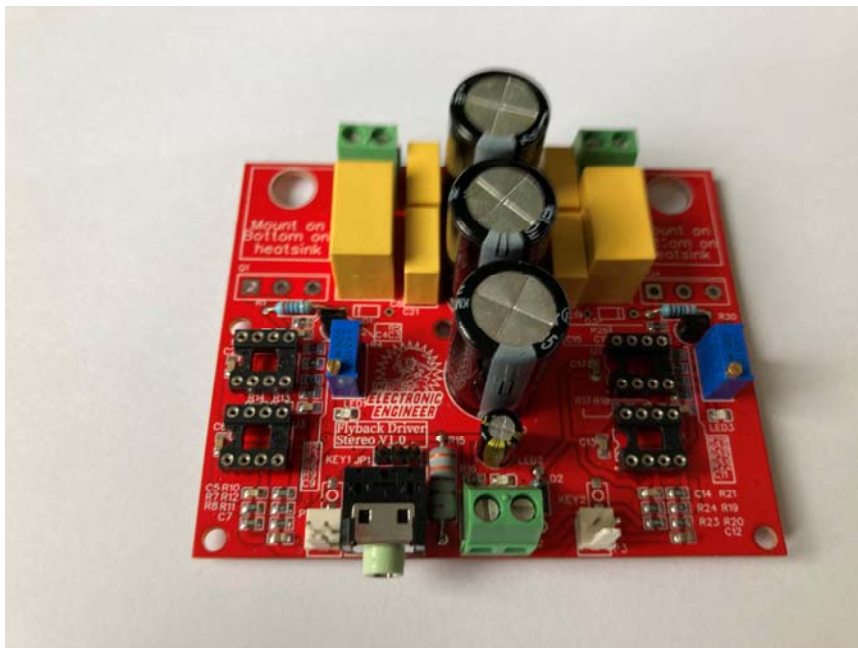


You can get the PCB for this design here:

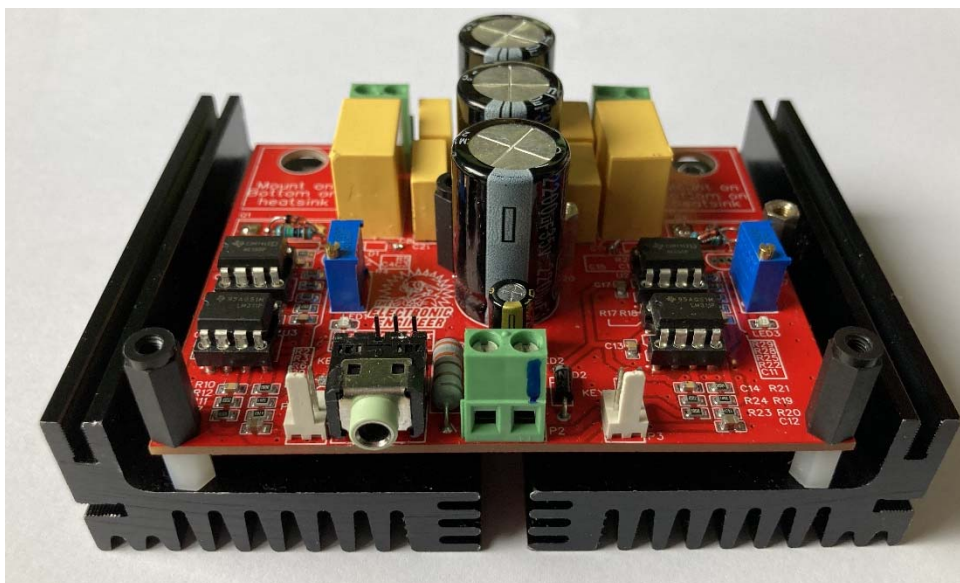
www.tindie.com

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:



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:



www.TheElectronicEngineer.nl

Document version: 1.1

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.



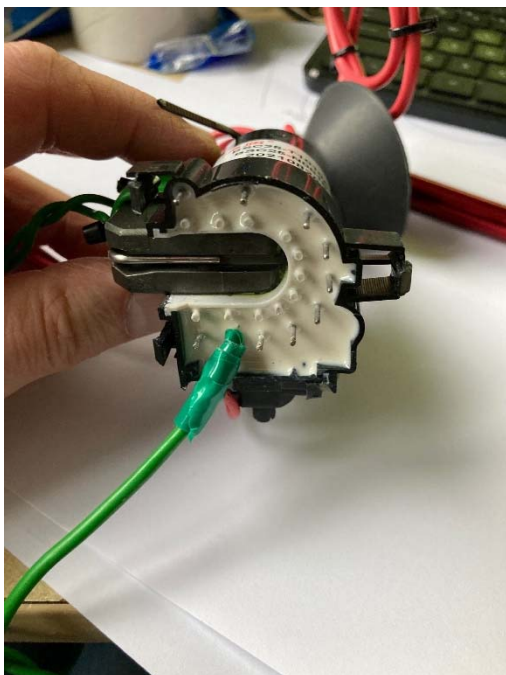
Flyback transformer

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

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!