

Front end

(4) C3, C1, C10, C5 - Wima MKP 2 1.0 uF 63 VDC

<https://www.mouser.com/ProductDetail/505-MKP2C0411NMN>

MKP2C041001N00MN00 - Optional for bypassing the 1000uF-1500uF caps

(4) C40, C8, C9, C11 - Wima 1000pF 100V 10%

<https://www.mouser.com/ProductDetail/505-FKP21000-100-10>

FKP2D011001D00KSSD - Should help oscillation if needed. Optional. I am not using them currently.

(4) C4, C2, C10, C5 - Radial 35VDC 1500uF 12x30mm LS: 5mm

<https://www.mouser.com/ProductDetail/667-EEU-FR1V152L>

EEU-FR1V152L - Anything above 1000uF will do.

J1, J3, J7, J8 / J2, J4, J5, J6

<https://diyaudiostore.com/products/matched-jfets?variant=39335247085641>

2SK170/2SJ74 - Get two quads 8mA or below IDSS. DIYAudio store or Punkydawg on Ebay.

(2) R17, R27 - 44ohm 2w

<https://www.mouser.com/ProductDetail/71-CPF3-D-43.2>

CPF343R200DKB14 - If skipping the 10ohm JFET source resistors

(2) R17, R27 - 40 ohm 2W

<https://www.mouser.com/ProductDetail/71-CCF02-F-40.2>

CCF0240R2FKR36 - If using the 10 ohm source resistors

(8) R9, R10, R11, R12, R29, R30, R31, R32 - 1/8watt 10ohms 1% 50ppm

<https://www.mouser.com/ProductDetail/71-RN55C-F-10>

RN55C10R0FB14 - to pair with 40ohm for R17, R27

(4) R15, R16, R35, R36 - 1/4watt 10Kohms .5% 50ppm

<https://www.mouser.com/ProductDetail/71-RN60C1002DTR>

RN60C1002DRE6

(4) R13, R14, R33, R34 - 1/4watt 47Kohms 1% 100ppm

<https://www.mouser.com/ProductDetail/71-RN60D4702FTR>

RN60D4702FRE6

(8) R1, R2, R3, R4, R21, R22, R23, R24 - Through Hole 1/4watt 1.5Kohms 1% 100ppm

<https://www.mouser.com/ProductDetail/71-RN60D-F-1.5K>

(8) P1, P2, P3, P4, P5, P6, P7, P8 - Straight pins 2Kohms Sealed Vertical Adjust

<https://www.mouser.com/ProductDetail/Bourns/3296W-1-202LF?qs=4IMUa6xHmlqkuL3XP8CD4w%3D%3D>
3296W-1-202LF

(4) R5, R7, R25, R27 - 3watts 270ohms 5%

<https://www.mouser.com/ProductDetail/Vishay-BC-Components/PR03000202700JAC00?qs=LCMWAU1DZcw3xiRchmcRyA%3D%3D>
PR03000202700JAC00

(3) R40, R41, R43 - 100ohm 3w

<https://www.mouser.com/ProductDetail/TE-Connectivity-Holsworthy/RR03J100RTB?qs=8G8kQhBkhGjyTbztPnPMWg%3D%3D>
RR03J100RTB

*If you are skipping the 10ohm resistors, just use left over cut off leads to populate those positions. If you want to be fancy, you can use a 0ohm resistor.

*I tested both with and without the 10ohms. It is fun to play with both variations and is a cheap experiment. adding the source resistors will limit the biasing capabilities of the trimmer pot range. I think the 1.5k resistor should be fine but if needed, you can try a 1.75k or 2k resistor in place of the 1.5k

*different feedback ranges have a different sound. Lower feedback tends to make sounds float a bit more, lowers the damping factor of the amp and makes it a bit more relaxed at the cost of detail. So try a bit lower, say 300-320 in those positions. Maybe grab a 1000ohm resistor to try in parallel with the 270 to see how the sound changes. You can simply add a bit of solder to the extra feedback footprint pads and tack different resistors in place for experimentation.

Output stage

(8/16) R1-R8 OR47 3w resistors.

<https://www.mouser.com/ProductDetail/Vishay-Draloric/AC03000004707JAC00?qs=R4%2FAj8xQbdVOC8DmYbsqLA%3D%3D>
AC03000004707JAC00 - The standard spec for the standard F5m

(8/16) R1-R8 OR36 3w resistors.

<https://www.mouser.com/ProductDetail/279-RR03JR36TB>
RR03JR36TB - OR36 as an option to replace the OR47

(4/8) Q1, Q2, Q5, Q6

<https://www.mouser.com/ProductDetail/844-IRFP140PBF>
IRFP140PBF - You can populate two or 4 positions. (one or two per phase) All four positions requires matches mosfets

(4/8) Q3, Q4, Q7, Q8

<https://www.mouser.com/ProductDetail/942-IRFP9140NPBF>

IRFP9140NPBF - You can populate two or 4 positions. (one or two per phase) All four positions requires matched mosfets

(8) R39, R40, R41, R42 - Through Hole 1/8watt 2.21Kohms 1% 100ppm

<https://www.mouser.com/ProductDetail/71-RN55D-F-2.21K-R>

RN55D2211FRE6

(8) R35, R36, R37, R38 - THERM NTC 4.7KOHM 3977K BEAD

[https://www.mouser.com/ProductDetail/Vishay-BC-Components/NTCLE100E3472GB0A?](https://www.mouser.com/ProductDetail/Vishay-BC-Components/NTCLE100E3472GB0A?qs=vLWxofP3U2ysYau6b14drw%3D%3D)

qs=vLWxofP3U2ysYau6b14drw%3D%3D

NTCLE100E3472GB0A

(8/16) R11, R12, R13, R14, R15, R16, R17, R18 - 1/4watt 100ohms 1%

[https://www.mouser.com/ProductDetail/Vishay-Dale/RN60C1000FB14?](https://www.mouser.com/ProductDetail/Vishay-Dale/RN60C1000FB14?qs=sGAEpiMZZMsPqMdJzcrNwIT9AI70gOmaAvR%2Flcc1T2o%3D)

qs=sGAEpiMZZMsPqMdJzcrNwIT9AI70gOmaAvR%2Flcc1T2o%3D

RN60C1000FB14

(20) R9, R10, R25, R26, R27, R28, R30, R31, R32, R33 - Through Hole 2.2 kOhms 3 W 5 % Axial

[https://www.mouser.com/ProductDetail/YAGEO/FMP300JT-73-2K2?qs=%252BdQmOuGyFcGKP](https://www.mouser.com/ProductDetail/YAGEO/FMP300JT-73-2K2?qs=%252BdQmOuGyFcGKP%2FXAXLIAUw%3D%3D)

%2FXAXLIAUw%3D%3D

FMP300JT-73-2K2 - I populated 4 of the 5 positions. Feel free to populate all 5 and lift a lead of one or two per quadrant to listen to the difference.

*Per channel I have 2, 4, and 6 pairs of IRFP240/9240 mosfets. I have also tested 2 pairs of IRFP140/9140. The 9140/140 seems to behave very nicely and sounds great. I could see 4 pairs of them being interesting. The sound could be a bit more dynamic leaning towards a more full bodied sound at the expense of a bit of speed. I intend to test 4 pairs eventually. You can populate all the mosfet positions and simply lift one end of the gate and source resistors of the mosfets you want to disable. That would be a quick way of testing things. I also am running 0R36 ohm resistors but my quad is matched. My amps DC offset and bias is very stable.

*I have not tested the thermistors on the board yet. I will soon (today is 1/3/2025). My intention was to face them towards the heatsink at an angle so that they touch the heatsink. I figured this is a pretty safe solution. The other option is to face them towards the open air space in the chassis and mount them so they are close to the PCB. Maybe the PCB temperature would track well with the mosfet temperature.

Power Supply

(2) D1, D2 - Bridge Rectifiers 600 V - 15 A

<https://www.mouser.com/ProductDetail/GeneSiC-Semiconductor/KBPC1510T?qs=PqIQM5sBnRXlyvJdi%2FZN%2Fg%3D%3D>
KBPC1510T

(2) RS1, RS2 - 8.2 OHM 1%

<https://www.mouser.com/ProductDetail/Vishay-BC-Components/MRS25000C8208FCT00?qs=sGAEpiMZZMsPqMdJzcrNwoMVoLRhO46JVvz7EtPohWpo%2FRdQGtQsyA%3D%3D>
MRS25000C8208FCT00 - The result I got for using my Quasimodo came up with 6.5ohms. 8.2 should be a safe bet.

(2) CX1, CX2 - Film Capacitor 0.01uF

<https://www.mouser.com/ProductDetail/EPCOS-TDK/B32529C3103J189?qs=Cvel%2FUwZDBKSKo%252B5vSMdtA%3D%3D>
B32529C3103J189

(2) CS1, CS2 - Film Capacitor 0.15uF

<https://www.mouser.com/ProductDetail/EPCOS-TDK/B32529C3154K189?qs=Cvel%2FUwZDBKsrelfyW4VLA%3D%3D>
B32529C3154K189

(1) RT1 - CL-60

<https://www.mouser.com/ProductDetail/Amphenol-Advanced-Sensors/CL-60?qs=w3gjcs3NwciEQjXGFRAAAA%3D%3D>
CL-60

(4) R1, R2, R3, R4 - 5W, 0.1 ohm, 5% AXIAL

<https://www.mouser.com/ProductDetail/SEI-Stackpole/MPR5JBR100?qs=FESYatJ8odJV9y10aFz8oA%3D%3D>
MPR5JBR100

(24) C1-C24 - CAP ALUM 10000UF 35V SNAP

<https://www.mouser.com/ProductDetail/EPCOS-TDK/B41231A7109M000?qs=f4aWRLuQiuwkvI3euBnYVg%3D%3D>
B41231A7109M000

(2) U1, U3 - Film 500V 70 uF 4 Pin LS=37.5 mm

<https://www.mouser.com/ProductDetail/80-C4AQLBW5700A3LK>
C4AQLBW5700A3LK

*You don't necessarily need to use 10,000uF caps. You can use a smaller value. The objective is to have a lot in parallel to make the power supply fast. Since this is a bridged amp tied at it's feedback, it is less susceptible to power supply artifacts. So we shoot for a fast power supply hence the 24 caps and the

70uF films. Also, caps that are 20mm-25mm are fairly cheap! :)

Soft Start

(2) C1, C2 - Safety Capacitors 440VAC 0.0033uF

<https://www.mouser.com/ProductDetail/KEMET/C771U332MSWDBA7317?qs=DPoM0jnrROV%2Fc3uVs3RfSQ%3D%3DC771U332MSWDBA7317>

(2) TH - CL-60

<https://www.mouser.com/ProductDetail/Amphenol-Advanced-Sensors/CL-60?qs=w3gjcs3NwciEQjXGFRAAAA%3D%3DCL-60>

*Feel free to use different thermistors. Maybe even CL-30 or some SL-22 variant. CL-60 seems to be working fine for my build.

Hardware

(4) Ribbon Cable Socket

<https://www.mouser.com/ProductDetail/Wurth-Elektronik/61201621621?qs=ZtY9WdtwX55qFf4n3EFuaA%3D%3D61201621621>

61201621621 - I haven't tested this one but it looks nice. I got mine from Amazon and those are listed below. I listed this in the BOM in case someone wants to try to order as much from Mouser as possible.

(1) uxcell 25 Pcs 16-Pin Double Row Straight Shrouded Connector Pitch 2.54mm

https://www.amazon.com/dp/B01N8XTFB5?ref=ppx_yo2ov_dt_b_fed_asin_title

(1) Antrader 30CM 16-Pin IDC Connector Flat Ribbon Cable with Black 2.54mm FC Dual Row Female to Female Sockets, 6 Pieces

https://www.amazon.com/dp/B07FZWH9S6?ref=ppx_yo2ov_dt_b_fed_asin_title

I ordered these and had to shorten them. It is not incredibly difficult. You lose the top clip as that has to be broken off but it works great regardless. It would be nice if I could find this in say a 5"-6" length. You end up with extras so it is not a huge deal.

(4) 3 1/4" standoffs 6-32 thread. For the PS to front end

<https://www.mouser.com/ProductDetail/RAF-Electronic-Hardware/4567-632-AL?qs=1mbolxNpo8fcqL%252BomDN9NQ%3D%3D>

I buy mine on ebay as they are a lot cheaper that way. I have not ordered this particular one but the specs suggest that it should work

(4) 0.44" or ~11mm standoffs.

Option 1

<https://www.mouser.com/ProductDetail/RAF-Electronic-Hardware/4533-632-AL?qs=UkDUCjYnTB0NwUFHBH%2FH%252BQ%3D%3D4533-632-AL>

Option 2

<https://www.mouser.com/ProductDetail/RAF-Electronic-Hardware/4533-632-AL-7?qs=dwkm%252BGAHGA3a8wbUBd6Bfg%3D%3D4533-632-AL-7>

Mosfet Thermal Insulator

<https://www.mouser.com/ProductDetail/Aavid/4180G?qs=2v7q0MSBcBMwt5GBytMENg%3D%3D4180G> - You will need thermal grease with this.

Thermal Grease

https://www.amazon.com/dp/B01M0TE8WJ/ref=sspa_dk_detail_1?pd_rd_i=B01M0TE8WJ&pd_rd_w=k8r1R&content-id=amzn1.sym.386c274b-4bfe-4421-9052-a1a56db557ab&pf_rd_p=386c274b-4bfe-4421-9052-a1a56db557ab&pf_rd_r=6RDHC1YRWJ5J43MGXPDM&pd_rd_wg=9w80f&pd_rd_r=3d8dc609-150a-4d6b-86c5-3d90d94a20ef&s=pc&sp_csd=d2lkZ2V0TmFtZT1zcF9kZXRhaWxhdGhlfWF0aWM&th=1762360725152 - There are other solutions. This just happens to be a good value.

*The bridge rectifier is 0.44" tall. If you want to, you can use 1/2" standoffs. I would recommend bolting the PCB in with the standoffs and the bridge rectifiers all in place in the chassis. With 1/2" or taller standoffs, the PCB will not be sitting flush on the bridge rectifier but that is alright. Just solder the rectifier spades and that will secure the PCB. Also, if you wanted to only use the rear most standoffs and the bridges to mount the power supply, that would probably be fine as well.

*Also, I don't remember if the holes on the perforated bottom plate for the DIY chassis can handle 6-32 thread. If it cannot, simply drill the holes that you intend to use a little larger to accommodate.