

Pre-flight test

OK at this stage I am assuming you have populated all of the PCB except Q8 and the main output stage devices IRFP240's and IRFP9240's

Pre-flight test continued

It is important to test the function of the amplifier at this point in time so as to make sure it is working properly. This is achieved by soldering a 10-Ohm $\frac{1}{4}$ watt resistor from the output of the amplifier PCB to one side of the 330-Ohm 1W resistor found at R38 On the screen-printed side of the PCB. What this does is to connect the feedback resistor R37 to the output of the buffer stage. In doing so it bypasses the output stage and turns it into a very low powered amplifier, which can be tested without damaging the expensive output stage. Assuming you have connected the resistor from o/p to the buffer stage. It is now time too connect the +-90 volt supply to it and power it up. Be sure to have 4k7 Ohm 5-watt bleeder resistors across the power supply capacitors. Now assuming that there was no smoke, with a multimeter on volts. Measure the following voltage drops across these resistors locations marked in blue and if they match to within +-10% then you can be sure that the amplifier is OK. When you have done the checks, be sure to power down and remove the 10 Ohm resistor.

R1~1.6 volts

R2~1.6 volts

R3~1.0 volts

R55~500mv

R56~500mv

Offset voltage at R37 should be close to 0 volts, but can be as high as 100mv.

Completing the Module

Now we have come to the soldering in of the output devices. It is assumed at this point that you have all ready matched the output stage devices as outlined in the accompanying document on [How to match output devices](#).

If this is already done then you can proceed by getting the PCB and flipping it over so the copper side of the board is facing you.

Now identify which is the positive supply side of the PCB and start soldering the IRFP240 devices face down on the appropriate pads so the metal tabs on the back of the power MOSFET's are facing you.

Once all of the N-channel devices are done proceed with the IRFP9240 P-channel devices, in the same way

After completing this task the module for the most part is completed.

The only other thing you will need to decide is wether to use PCB stakes to solder the external wiring too or solder the cable directly into the PCB pads.

Now there is one device that requires some special attention. This is Q8 and this device is the VGS multiplier or bias compensation device, which needs to be mounted off board on a strip of 10cm x 2cm x 4mm thick piece of aluminium and it is this piece of aluminium that will clamp down the output stage. Q8 will need to be insulated with a TO-220 mica-washer kit from this piece of metal and flying leads need to be soldered from the Gate,

Source and Drain pins of the IRF610 to the appropriately marked pads on the PCB shown as Q8.

One other thing that needs to be done is to mount some 3mm high rubber feet on copper side of the front and back of the PCB. This is to hold the PCB off the heat sink, so as not to allow the PCB to touch the heat sink in any way.

Completing the Module Continued

Now having completed the power module and tested the Error, VAS and Buffer stages and you are confident that it is working OK. Now its time to bolt it down to a suitable heat sink. Remember that all of the o/p devices must be insulated with either silicon rubber washers or mica -washers and heat sink compound. The type, size and shape of heat sink are left up to you and the local availability of heat sinks. But be sure to have a heat sink rated at 0.2 degrees/watt or 0.5 degrees/watt with fan cooling.

Testing the module

So we have come to the point where we need to do a full test on the amplifier module. There are a few checks that need to be done first.

- The Drain pins on all the o/p devices need to be checked for S/C to the heat sink.
- The power supply wiring has been checked for correct polarity to the PCB.
- The Multi-turn pot P1 has been turned back to 0 Ohms, so that a measurement of approximately 4.7k is measured across the Gate and Drain pins of Q8 IRF610.
- When wiring up the power supply, be sure to have 8 amp fuses inserted on each of the supply lines.
- Connect a multimeter on DC volt range to the o/p of the amplifier.

Ok now that you are happy that the module is setup correctly apply power via a VARIAC if you have access to one, otherwise just power the amplifier up.

Looking at the voltmeter you should get from 1mv to 50mv offset voltage.

If this is not the case then power the amplifier down and check your work.

Assuming all is well then power the amplifier down and find a small flat blade screwdriver so you can be ready to adjust P1 for the biasing of the o/p stage.

But first connect the voltmeter across one of the o/p stage Source resistors using Alligator leads.

Now reapply power to the amplifier and slowly adjust P1 while watching the voltmeter, for a reading of 18mv.

Now check across the rest of the Source resistors and find the one, which has the highest reading, and adjust P1 till 18mv is read.

Now connect a load and signal source to the amplifier and with a CRO if you have access to one observe that the waveform is clean and free from noise and distortion.

If you don't have a CRO and Signal generator, connect a pre-amp and loudspeaker and have a good listen. The sound should be very clean and dynamic.

Congratulations, the amplifier is complete.

Best Regards

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www.aussieamplifiers.com

Specifications for the AV800 MOSFET Amplifier

All measurements were taken at an AC Mains input of 240 volts.
And with a 2kva Toroidal Transformer powering the Amplifier module.
Filtering with only 10,000uf per voltage rail
One channel only was been driven.

Frequency response 10hz to 100khz
THD measured at 100 watts into 8 Ohms 0.01% @1khz
Power Output into 8 Ohms = 450 Watts RMS
Power Output into 4 Ohms = 820 Watts RMS
Damping Factor = 400

Notes and Errata

It has been shown on the first batch of PCBs sold that Q3 and Q4 silkscreen overlay has an error.

The B C E markings are in the incorrect place. They should have the same orientation as Q25 and Q25.

This error has now been corrected on the latest PCB version 1.0.5