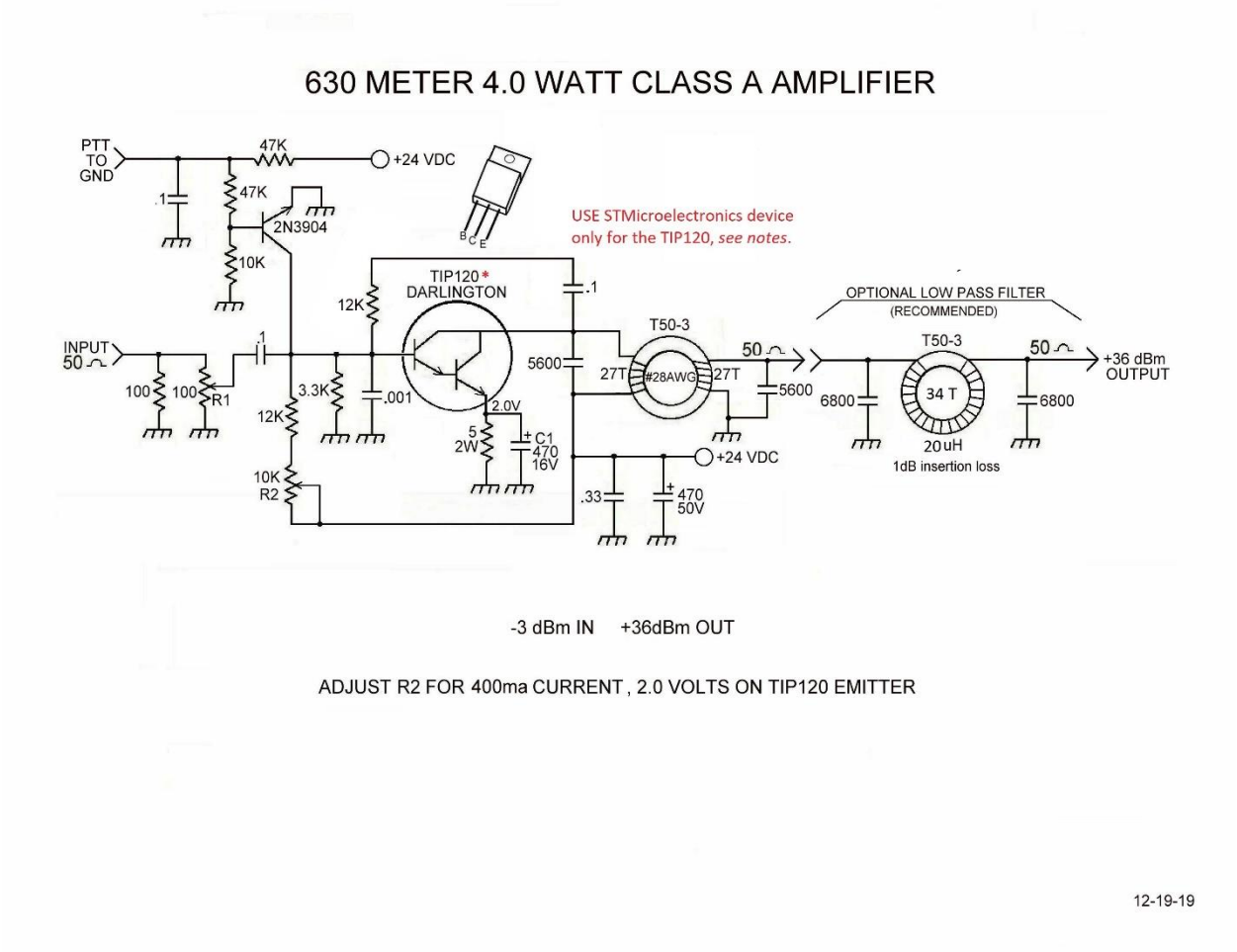


The amplifier is very reliable but as a Class A amplifier it's not efficient at around 50%. This is not a problem as I have run the amplifier key-down for over two hours with no reduction in power and no heating problem. The circuit has a PTT bias switch to cutoff the amplifier when not transmitting. With the supply voltage at 24V and the bias set for 400ma current gives around 50-ohm collector impedance. This makes for a 1 to 1 match on the output transformer. Even though the output transformer acts as a band-pass filter I recommend using the low pass filter. The two T50-3 cores were selected for efficiency and ease of construction, available from http://www.kitsandparts.com

The input voltage works good from around 22-25vdc and set the 400ma current at the voltage you are using. A regulated supply is best but not necessary. This power supply is what I'm using, and I don't detect any RF interference from the switching supply. Amazon…ALITOVE 24V 1A 24W DC Power Supply.

https://www.amazon.com/ALITOVE-Supply-Adapter-100-240V-Converter/dp/B07VL8W6MQ/ref=sr_1_1_sspa

When driving the amp do not overdrive as the output will get trashy. I have the input pot set for maximum output at 0dbm input. The maximum output of my transmitter is 0dbm. The output can be verified with a spectrum analyzer or a scope. If using a scope, the sinewave will start to wiggle when overdriven, back down the drive until it clears up. This usually happens at 2dbm overdrive.

When winding the output transformer, the primary and secondary (27turns) will each take up one half of the core. When finished the core will be full with two opposing windings.

The low pass filter is 34 turns, and will take up the entire core. This core can be wound with 24 or 26 gauge wire.

Heatsink the TIP120. I used a 1" aluminum angle 4" long mounted to the inside case, but just mounting to the case should be good enough. Keep the leads from the circuit to the TIP120 short, mine are about 1.5" long.

See Picture.

In the picture you can see a 150uh choke in series with the DC input. This made no difference, I just left it in the circuit anyway.

The two 10 ohm resistors that are in parallel, are to make up the 5 ohm that is needed for the circuit.

Some of the components are hard to see as I had some surface mount resistors that I used (100 and 47K).

Power out at different supply voltage. Set current for the values listed for the voltage.

12V 1 Watt out, 150ma.

13.8V 1.5 Watts, 200ma

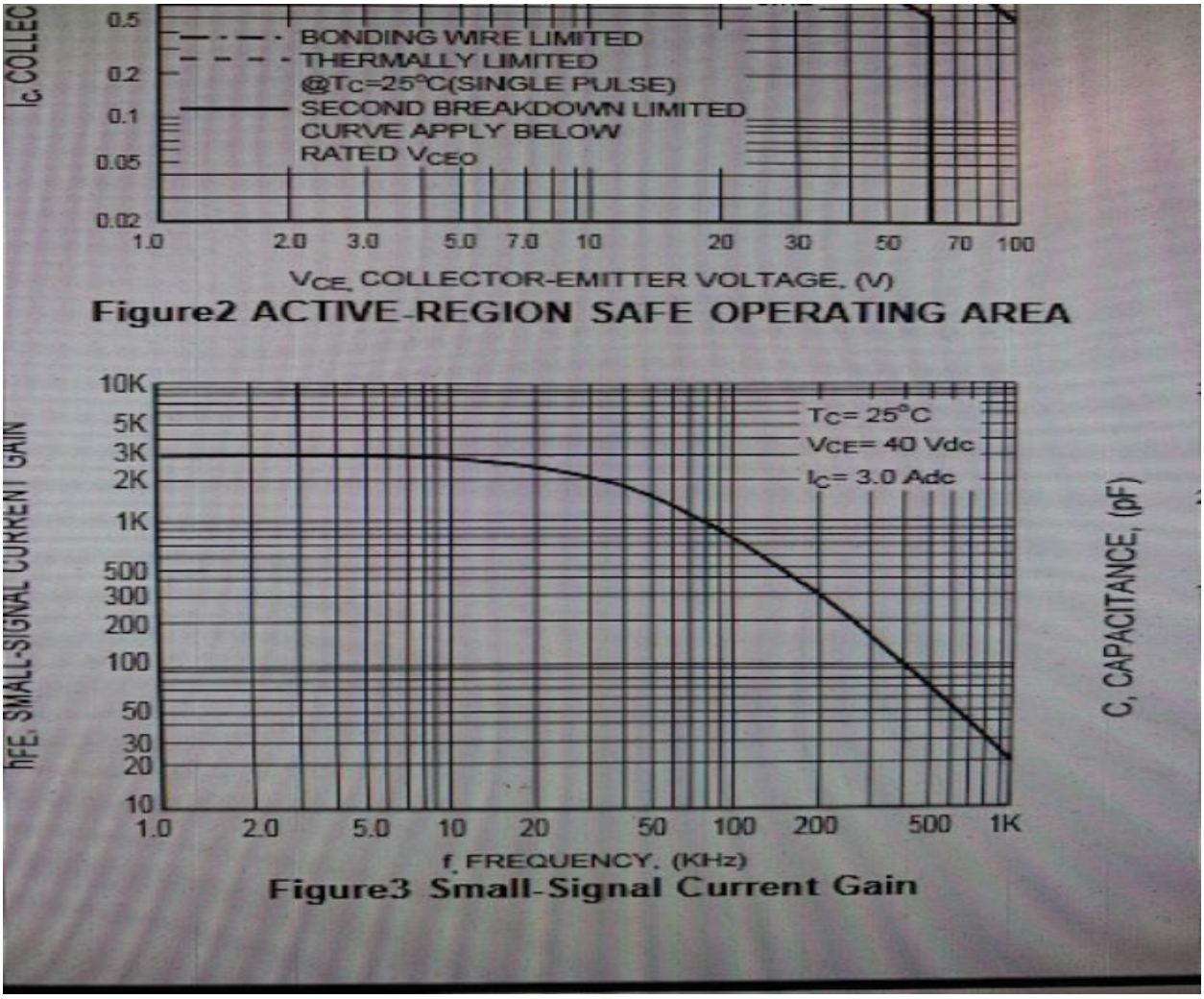
15V 1.8 Watts, 200ma

20V 3 Watts, 300ma

24V 4 Watts, 400ma

The circuit is not designed to go above 24vdc.

Email me with questions or check my web page (www.wb4jwm.com) for updates to this project.



As you can see from the TIP120 frequency chart the gain starts to drop off at 50khz. At 475khz the gain is around 70. If trying to use another power Darlington transistor this is an important factor. Some want even work at 475khz; here is a list of devices that I found that worked. The one major factor I have found is ST STMicroelectronics devices work, and the others I tested did not.

TIP120 +36dbm out, *STMicroelectronics*

TIP102 +35dbm out, *STMicroelectronics*

BDX33C +36.5dbm out, *STMicroelectronics*

TIP142 +34dbm out, *STMicroelectronics*

Mouser has the *STMicroelectronics* TIP120, and others. Please verify its STMicroelectronics.