How to connect the ~~ 2408 MHz OSCAR 100 DATV power-amp to your system.

Connections

Cooling

Powersupply & Bias

Testing the Amplifier

Connections:

The SMA connector is the RF input of the Amplifier.

The N=connector the RF output.

On the RF input side also you have the Bias (12 Volt) connection.

At the output side there are two Drain connections, they have to be powered both.

Cooling:

Use a proper heatsink (with proper fan to keep all cool).

Use the proper heatsink compound in order to have a good heat transfer between the 10 mm copper bottom-plate and your heatsink.

My system has a 30 degrees temperature when in full action. A large fan is better than a small one due to less noise generated by the fan.

I did not installed a protective temperature alarm, but it is not a bad idea to use a protective device like a ''clickson'' temperature switch to sound an alarm when the cooling system is wrong…

Connect a piezo beeper in serie with the clickson and connect it to a powesupply.

Use a type that makes a contact above the desired temperature level. ~~ 50 of 60 degrees.

Powersupply & Bias

The feed through capacitor near the SMA input connector is the 12 Volt BIAS input.

The internal small PCB, diode protected, controls the bias voltage for the AMPLEON Power-fet.

I am using the Amplifier at a Voltage of 30 Volt.

The Power-fet is specified for 32 Volt. Personally, I go for security and @ 30 Volts it works great.

The amplifier is optimal for 30 Volt

Testing the Amplifier:

First start with a lower voltage (24 Volt DC) to test the PA.

Start with low input RF power.

POWER output vs input AMPLEON DATV PA 15-7-2020

3/4 FEC DATV stream SR333

F4VSG 30 Volt DC bias current ~~ 500 mA

input	output	Current	gain	gain
Watt	Watt	A		dB
0,698	18,3	2,85	26,22	14,2
1,14	31,9	3,7	27,98	14,5
1,72	54,4	4,71	31,63	15,0
2,26	92,6	5,95	40,97	16,1
4,16	140	7,27	33,65	15,3
6,1	171	8,24	28,03	14,5

measured with 30 dB coupler & HP powermeter
on 400 Watt SPINNER dummyload

3/4 FEC DATV stream SR333

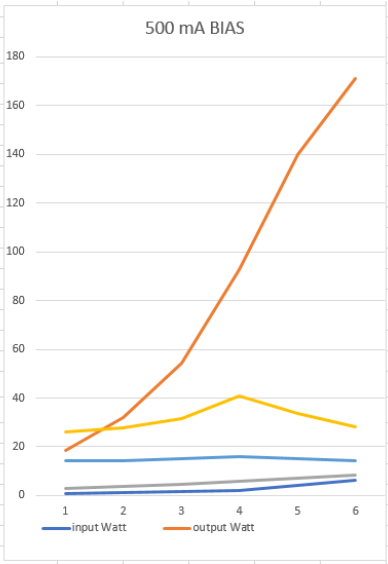
F4VSG 30 Volt DC bias current ~~ 1000 mA

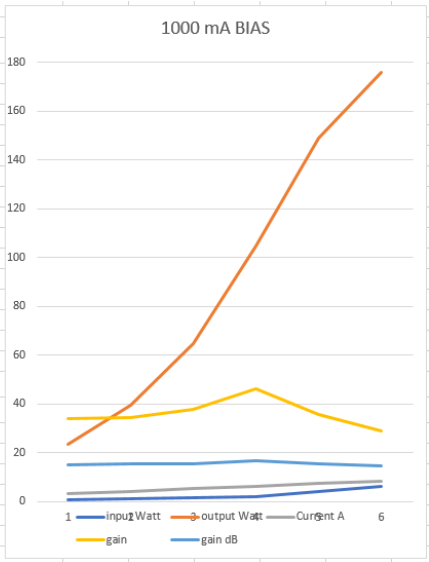
input	output	Current	gain	gain
Watt	Watt	A		dB
0,698	23,7	3,42	33,95	15,3
1,14	39,4	4,26	34,56	15,4
1,72	64,8	5,26	37,67	15,8
2,26	105	6,45	46,46	16,7
4,16	149	7,68	35,82	15,5
6,1	176	8,55	28,85	14,6

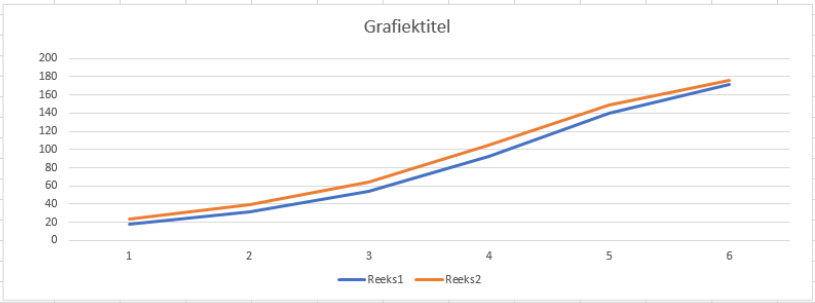
OUTPUT POWER difference

500 mA	1000 mA
18,3	23,7
31,9	39,4
54,4	64,8
92,6	105
140	149
171	176

Bias set for 500 mA @ shipment







Testing the RF output power.

Take care of a well adjusted antenna feed. (having a good SWR/VSWR !!)

Used equipment for measurements.

A variable power supply of 28 Volt (Meanwell) or equivalent is a good choice. Great to have a build in current meter. If not connect a proper current meter. By adjusting the voltage potentiometer you can set it to give 30 Volt output Voltage.

Specially for setting the correct Bias current use a proper Amperemeter .

In my case I set the bias current on 500 milli Ampere when the voltage is 30 Volt.

But recent measurements are made also with 1000 mA Bias current.

Depending of the temperature-rise during TX the bias current will be a little larger, but that is normal.

The drain connection feed through capacitors are located near the N-connector (output side) of the amplifier.

During testing the Power amplifier bias current, it is already aligned to a proper level.

When no input of 12 Volt, there is no DC current at the drain.

Measuring the RF output level.

Nice to have is a BIRD RF powermeter with the proper RF SLUG. But hard to find (and expensive) for these frequencies and the powerlevel.

I am using RF-couplers 400-2500 MHz as found on E-bay.

https://www.ebay.nl/itm/Mobiltelefon-RF-Koaxial-Richtkoppler-800-2500-MHz-200W-105dB-40dB/193149037612

This is a cheap way of measuring RF levels with a low power RF power meter. I use a 40 or 30 dB coupler.

When reversing the coupler it is possible to measure the reflected power from the antenna.

Be sure that your antenna feed is OK.

If not RF energy returns to the PA so the efficiency drops.

Do not overload the input with larger input power then in the table.

When using DATV, I never like to go than 50 % of the specified RF power of the AMPLEON specs.

Do not overload, it will kill your linearity , essential for a nice DATV signal and could harm the AMPLEON power-fet.

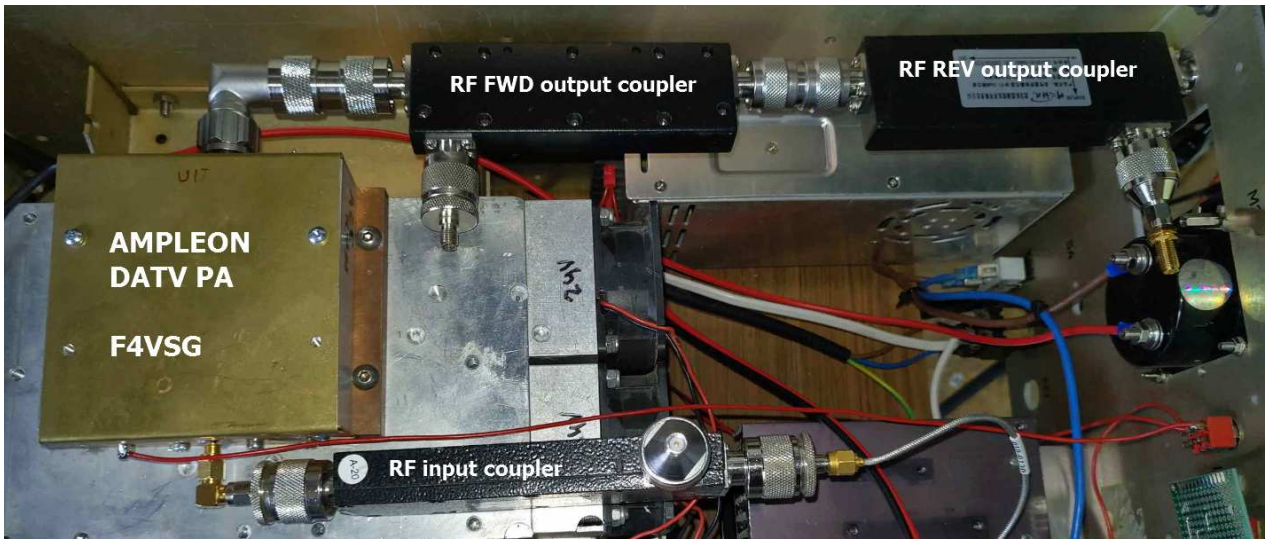
I am also using the same RF power-fet for my SSB 2320 MHz system. It works great perfect linearity for the SSB input signal !!.

When you have questions do not be ''stupid'' but ask me. 😊

Using calibrated couplers, I have been testing recently the performance.

All tests are made using 30 Volt.

Testing the DATV amplifier with a SR 333 DATV stream:



I am using one input coupler and 2 output couplers. FWD & REV.

Tip: use good quality N-connector adapters. (not the cheap ‘’fake’’ brand ones 😋)

HAPPY TESTING