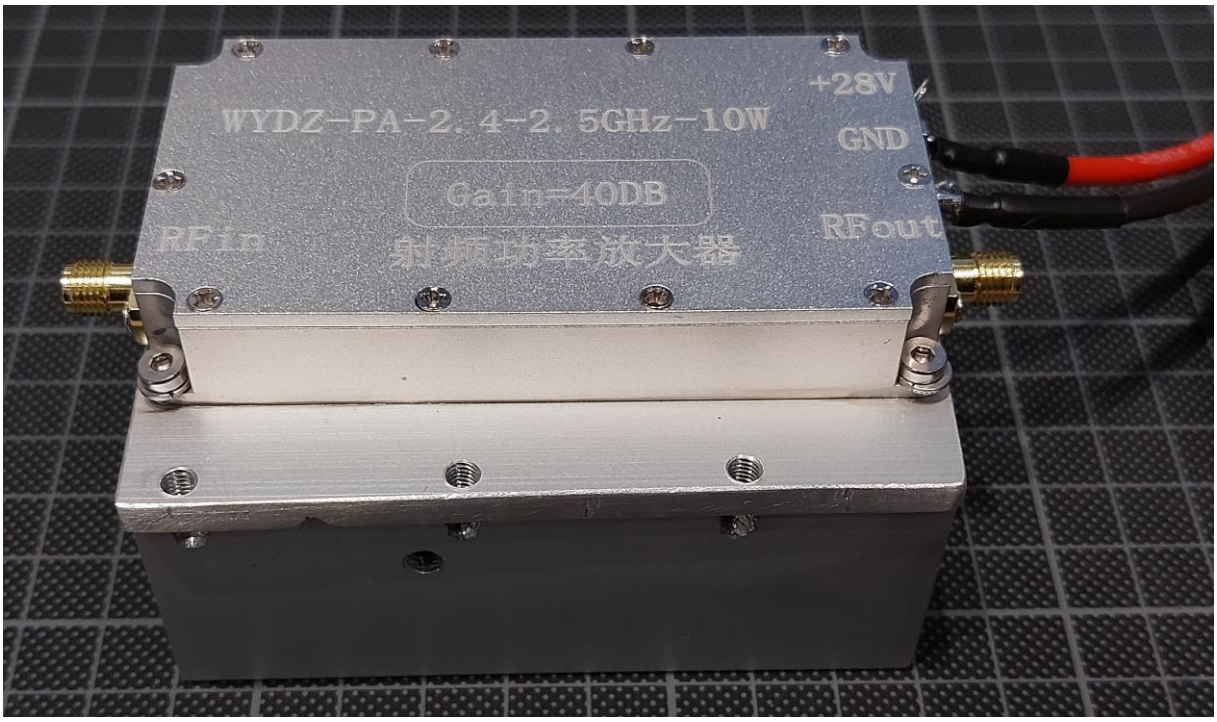
10 Watt PA for the 13 cm band WYDZ-PA-2.4G-10W

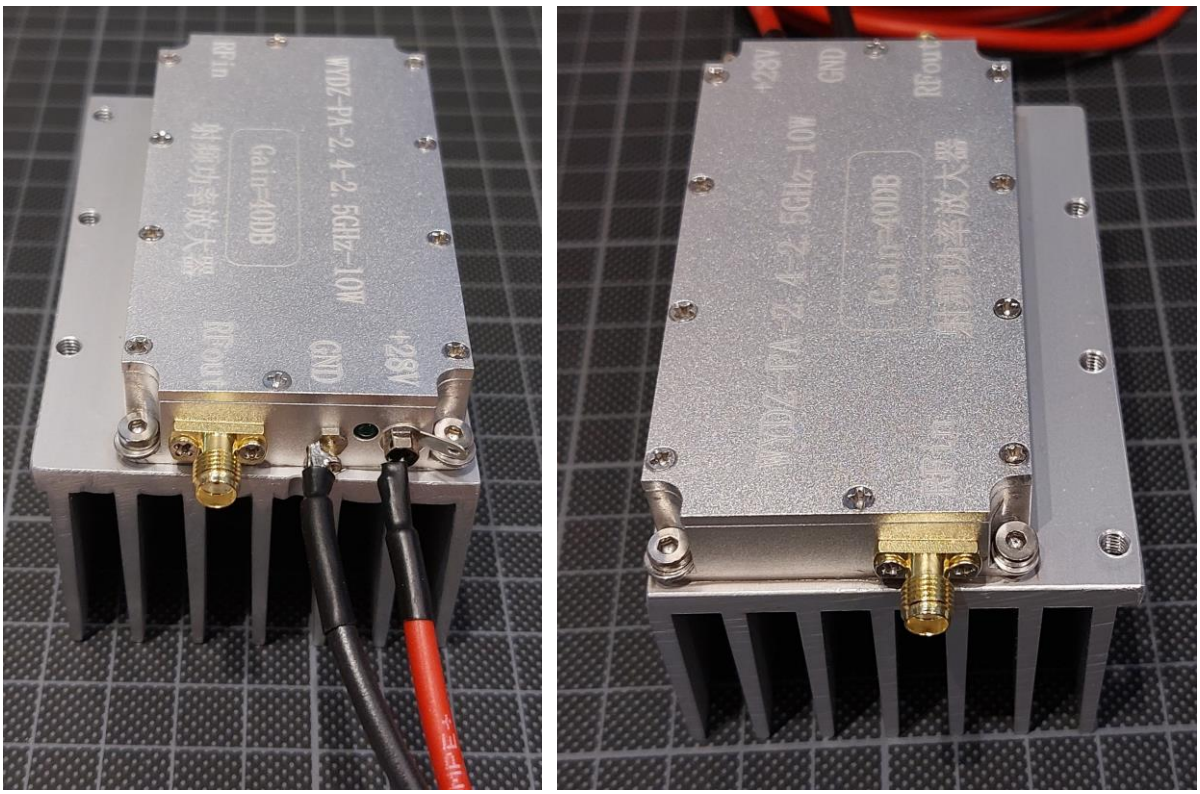
Matthias Bopp, DD1US, February 13th 2026, V4

I would like to introduce a 10-watt PA for the 13 cm amateur radio band. The Chinese online seller publishes very little data, but I found the advertised high gain of 40 dB interesting for possibly driving this PA directly with an SDR such as an ADALM Pluto. Since the price of around 60 Euro including VAT and shipping for a 10-watt PA (without heat sink) seemed quite reasonable to me, I ordered one from China to examine it.

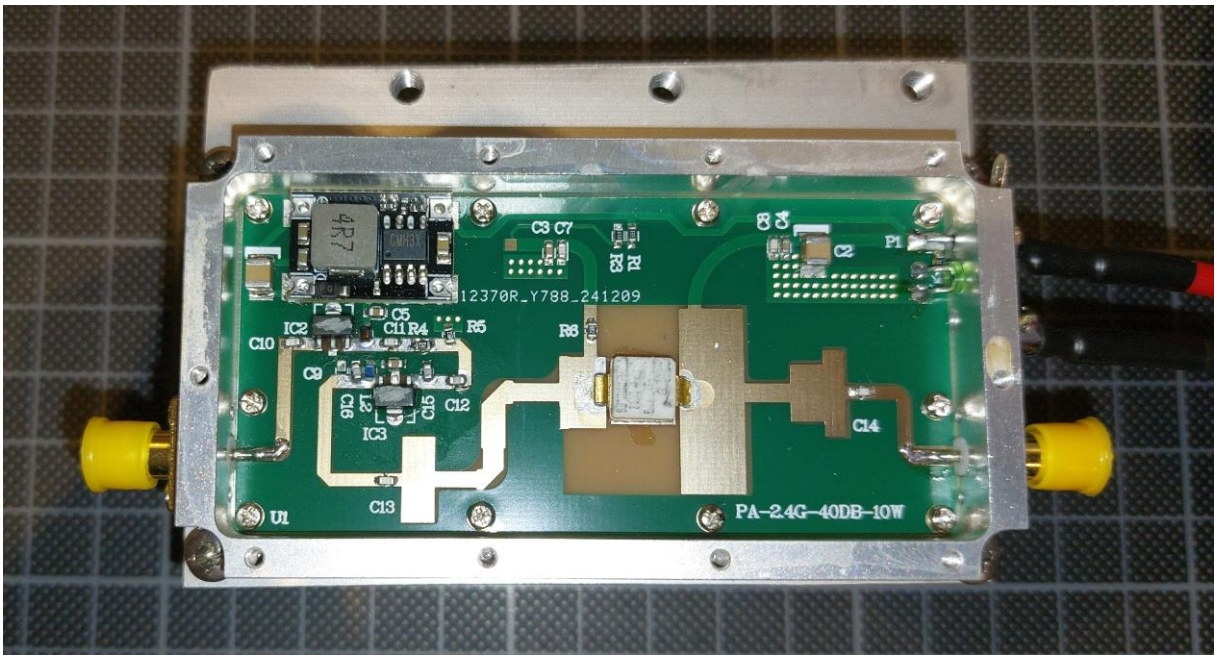
A few weeks later, the device arrived safely. The PA is housed in an aluminium casing. In addition to the two SMA sockets for the RF input and RF output, there is only a feed-through capacitor for the 28 V supply voltage. Otherwise, there is a green 3 mm LED that indicates when the supply voltage is present. A PTT switch input or detector outputs, as often found in other PAs optimised for amateur radio purposes, are not to be found here.

The PA should definitely be mounted on a heat sink. Thus, I screwed it onto a small heat sink to test it. Here are some pictures of my setup.

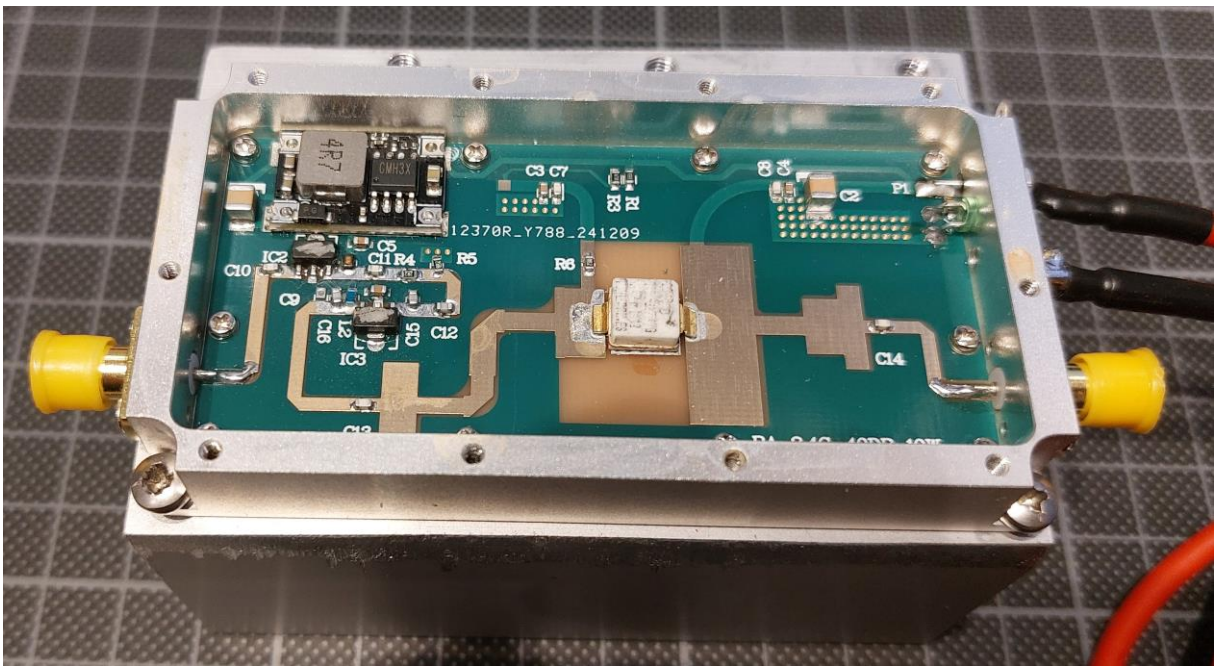




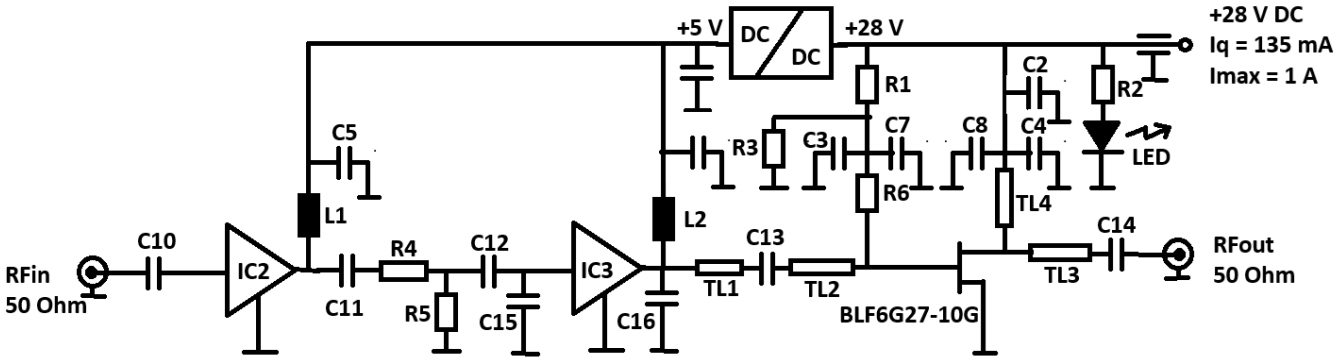
Of course, I couldn't resist taking a look inside before I put the PA into operation.



The output stage consists of a 3-stage amplifier. The type designations on the two MMICs and the power amplifier transistor in the ceramic housing have been removed by the manufacturer.



Here is a sketch of the circuit diagram:

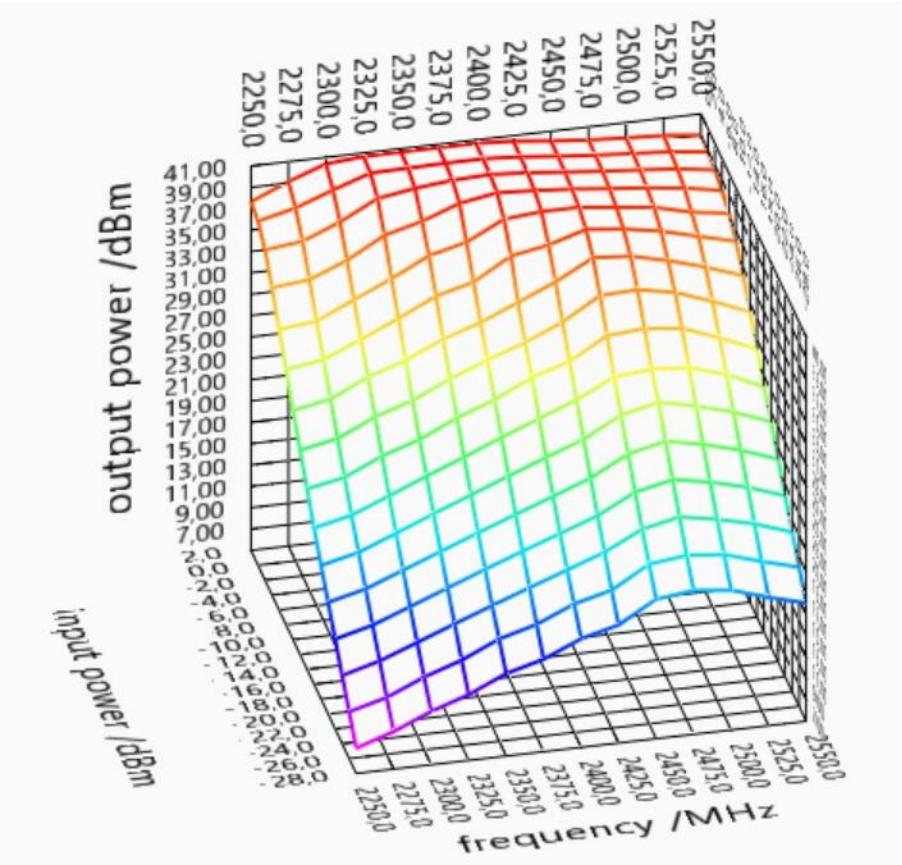


The 28 V supply voltage is applied directly to the drain of the output transistor. The supply voltage for the two driver stages is generated by a DC-DC converter module. This is soldered onto the main board and provides the stabilised 5 V output voltage.

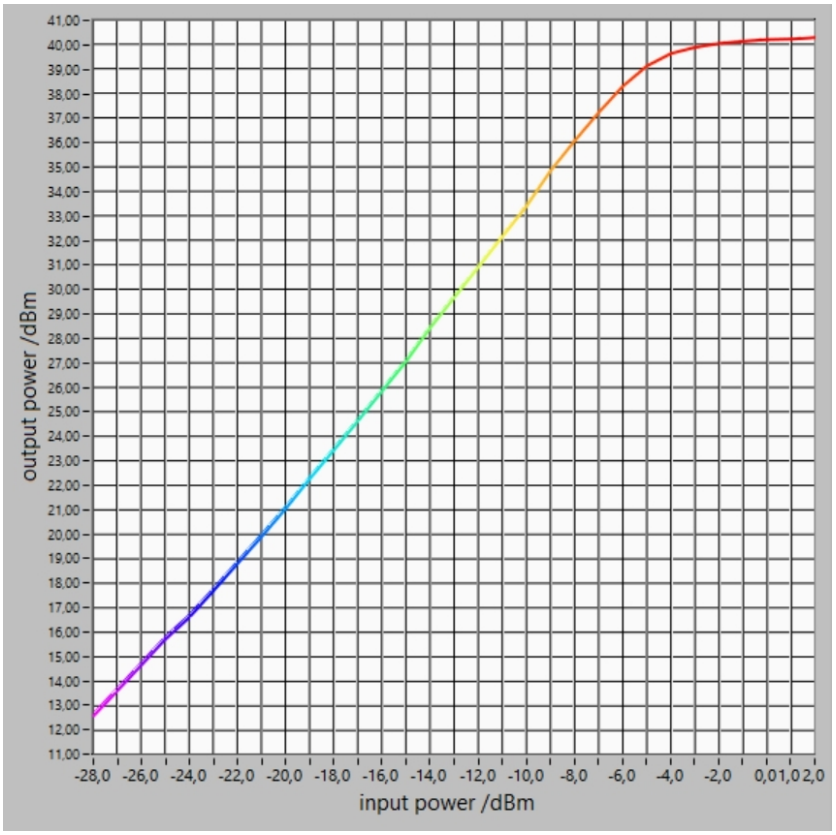
The housing and the comparison of the subsequent measurement results with the manufacturer's data sheets suggest that the output stage transistor is probably a BLF6G27-10G LDMOS transistor from Ampleon. The layout of the circuit board also appears to be based on Ampleon's reference design. However, I'm not entirely sure. It could also be a replica or a similar type.

Next, I took a few series of measurements with my now automated measuring station.

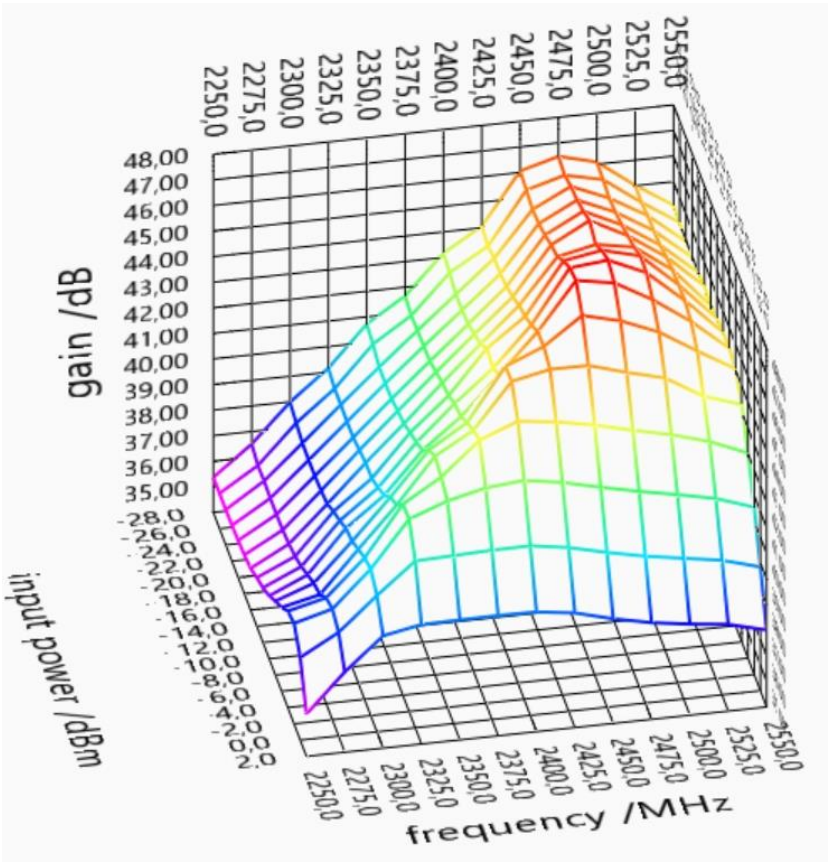
Specifically, I measured its output power, gain and power added efficiency (PAE) as a function of frequency and input power.



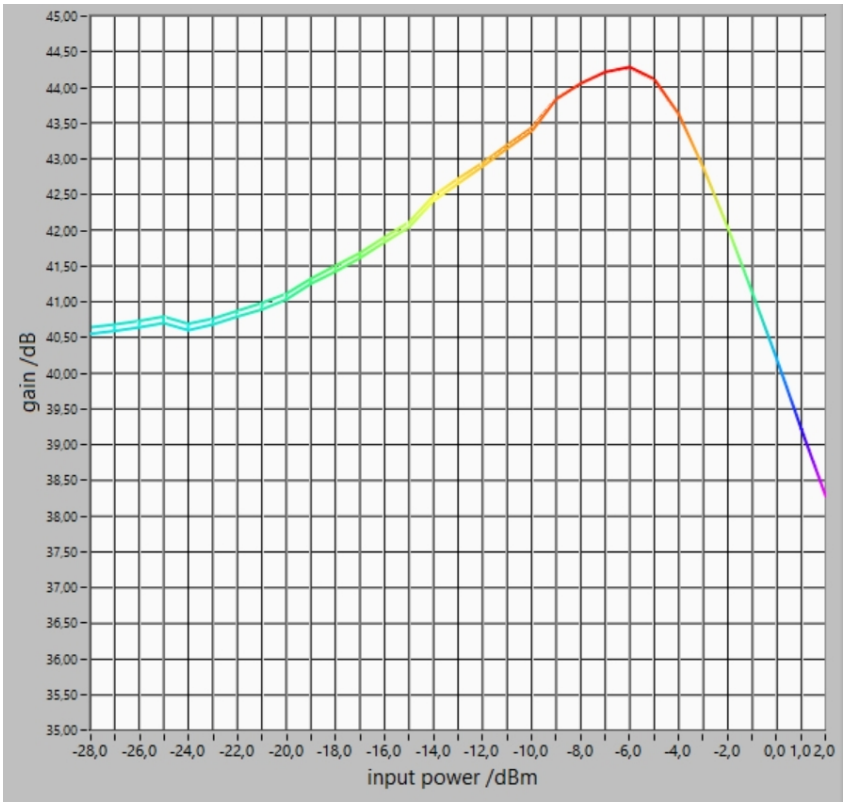
Output power /dBm as a function of input power /dBm and frequency /MHz



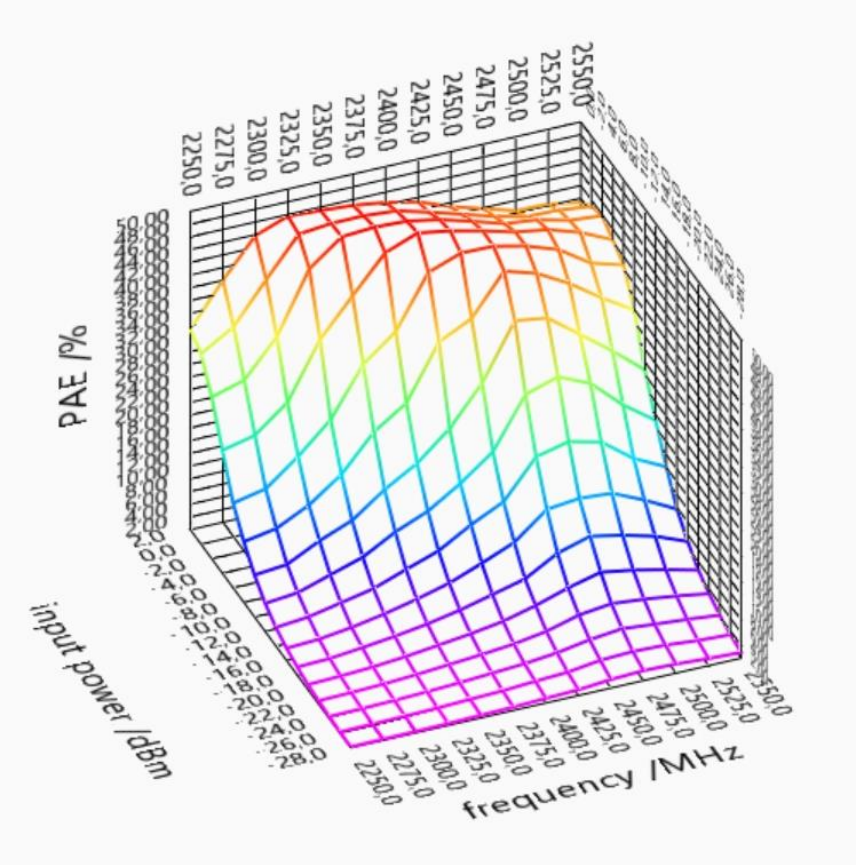
Output power /dBm as a function of input power /dBm measured at 2400 MHz



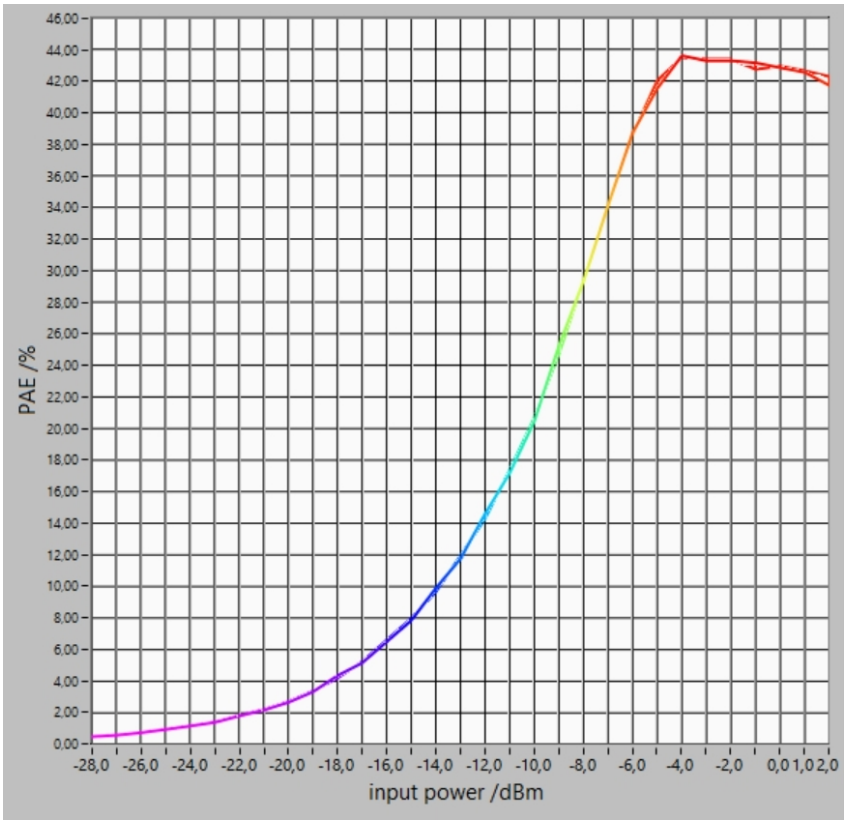
Gain /dB as a function of input power /dBm and frequency /MHz



Gain /dB as a function of input power /dBm measured at 2400 MHz



Power Added Efficiency /% as a function of input power /dBm and frequency /MHz



Power Added Efficiency /% as a function of input power /dBm measured at 2400 MHz

To summarise, this small 10 Watt PA really does deliver what the manufacturer promises.

With a saturation power of 11 W and a small signal gain of more than 40 dB, it is well suited to be driven by an SDR transceiver such as the ADALM-Pluto or a Lime-SDR.

The quiescent current of the PA is 130 mA. The maximum current consumption is 950 mA. This PA exhibits a remarkably high overall power added efficiency of 44% in saturation mode.

What is not so nice is the increase in gain before it saturates. This non-linear behaviour will probably have an effect on the signal quality. I suspect that this should not be a noticeable problem with CW and SSB, but this PA is certainly not suitable as a driver stage for DATV.

I plan to carry out intermodulation measurements at some point and optimise the operating point of the last stage.

I expect that this will make the gain curve as a function of input power flatter.

I am always happy to receive feedback and am also happy to answer questions. My e-mail address can be found on my homepage.

Best regards

Matthias DD1US

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