

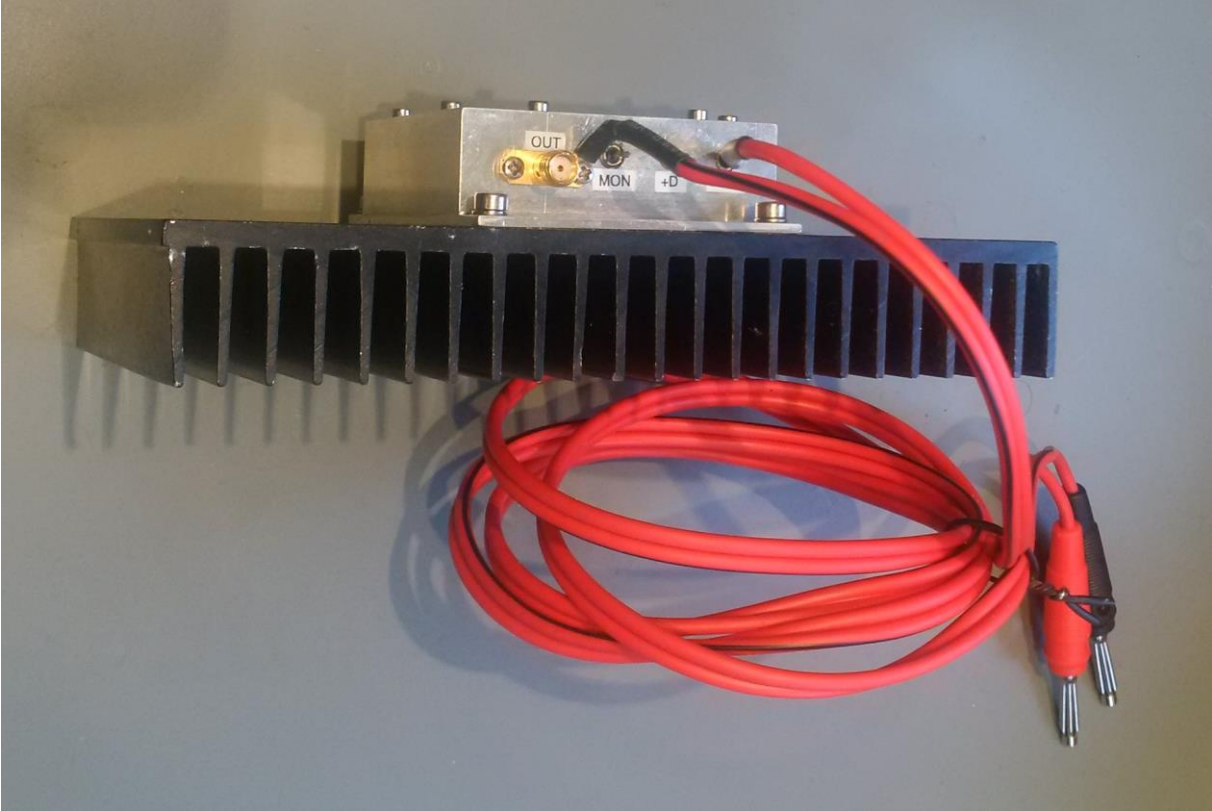
2.4 GHz power amplifier KUHNE MKU231XL

Matthias, DD1US, January 22nd 2020

Some time ago a friend gave me a KUHNE MKU231XL amplifier which was not working well. The gain of my unit was initially only 6dB and the maximum output power was about 3W.

I replaced the input and output capacitors and got it now working reasonably well. The nice thing is that it runs from a 12V DC power supply and thus I intend to use it for my portable setup for the QO-100 narrowband transponder. Here are some pictures of the amplifier which I have mounted on a heatsink:

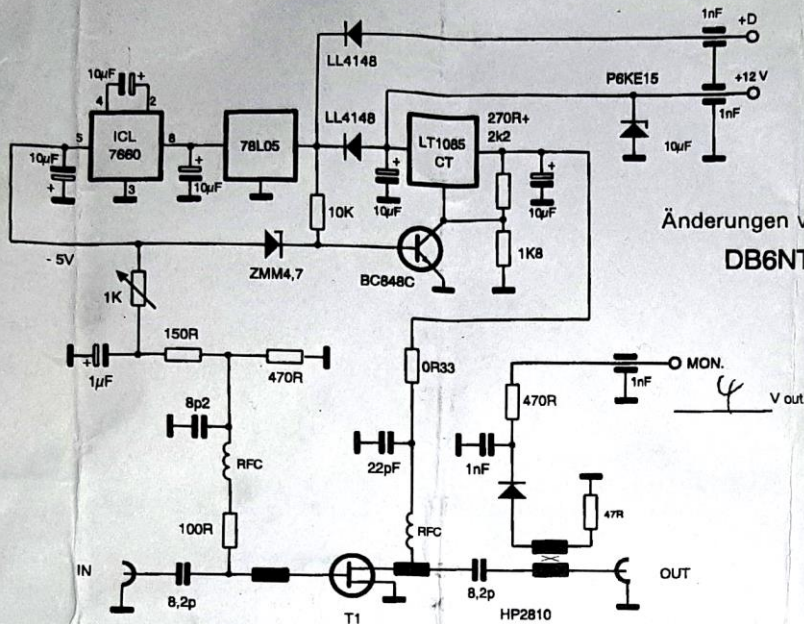




This PA is supposed to give a saturated output power of 12W at a supply voltage of 12V. Here is a description of the PA probably given by the supplier with that unit when it was shipped:

Leistungsverstärker für das 13cm Band MKU 231 XL

Produktinformation



Änderungen vorbehalten.
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Gehäuse auf Kühlkörper oder Chassis montieren!
Case should be mounted on heat sink or chassis!

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Messprotokoll / Test certificate

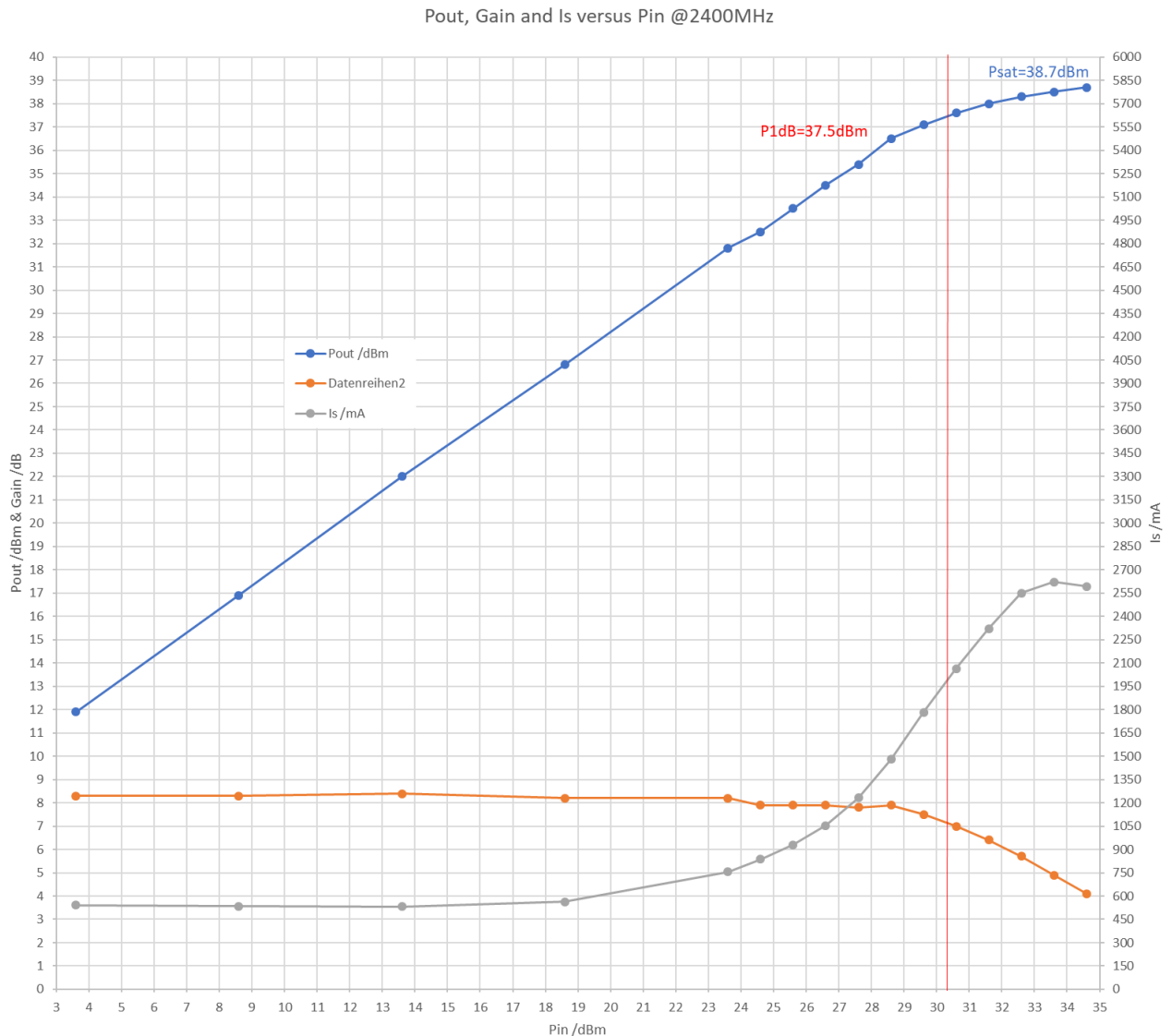
Frequency: 2320 - 2360 MHz
 Output (Saturation): 12,5 W
 SWR of load better min. 1.8 = 10 dB RL
 P in: 1 W. >>> P out: > 10 W
 P in: _____ W. >>> P out: _____ W
 Harmonic wave suppression typ. -30 dBc
 Operating voltage 12,0...15V DC. I max: 3 A

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[Signature]
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Für den Betrieb der Hochfrequenzmodule sind die entsprechenden gesetzlichen Vorschriften zu beachten.
 Diese Erzeugnisse dürfen nur an lizenzierte Funkamateure oder andere EMV-fachkundige Betriebe verkauft werden.

The products are only to be sold to radio amateurs with a licence or to competent

I adjusted the quiescent current to about 550mA and measured output power and gain as a function of input power. Please note that the driver amplifier which I was using has a $P_{1dB}=31,2\text{dBm}$ or 1.3W. Therefore, the measurement of the output power and gain of the MKU231XL above $P_{1dB}=37.5\text{dBm}$ or 5.6W is certainly distorted by the driver.



As mentioned, I had replaced the RF input and RF output capacitors which were supposed to be 8.2pF by ATC capacitors. This helped to improve the gain by about 2.5dB and double the output power. I checked different values and ended up using a 10pF ATC 100A100JT150Xt at the input and a 7.5pF ATC100A7R58T150XT at the output.

In summary the PA is still not meeting the specification values which are 10dB power gain and a saturated output power of 12,5W. I measured a gain of 8.3dB and a saturated output power of 7.4W. If anyone has ideas how to improve the amplifier any further please let me know. I have been considering to exchange the transistor but have not tried yet.

I am always grateful to get feedback and will be happy to answer questions.

Please direct them to the Email address which you will find below.

Best regards

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