23cm 2 Element Yagi Antenna on PCB from SG-Labs

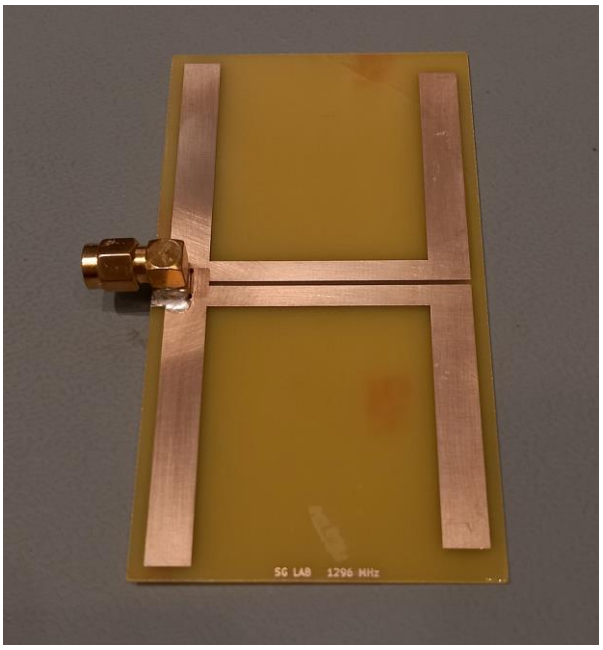
Matthias, DD1US, November 22nd2020, Rev 1.1

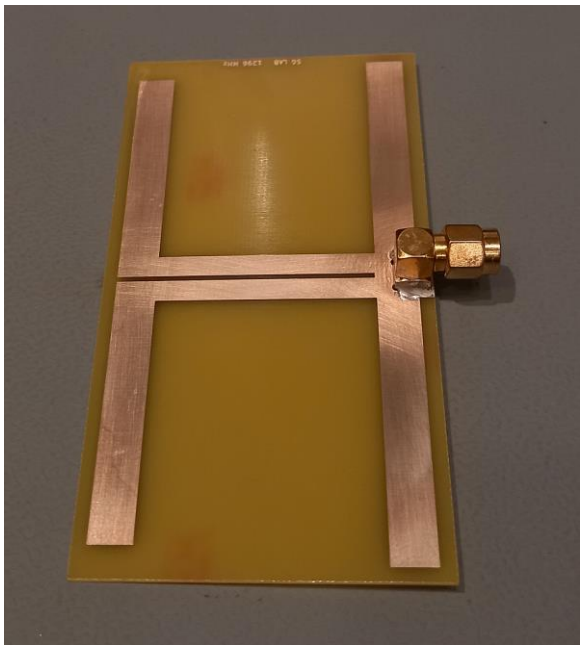
Some time ago a friend sent me a 23cm Yagi which he had received from SG-Labs when buying a 23cm power amplifier from them.

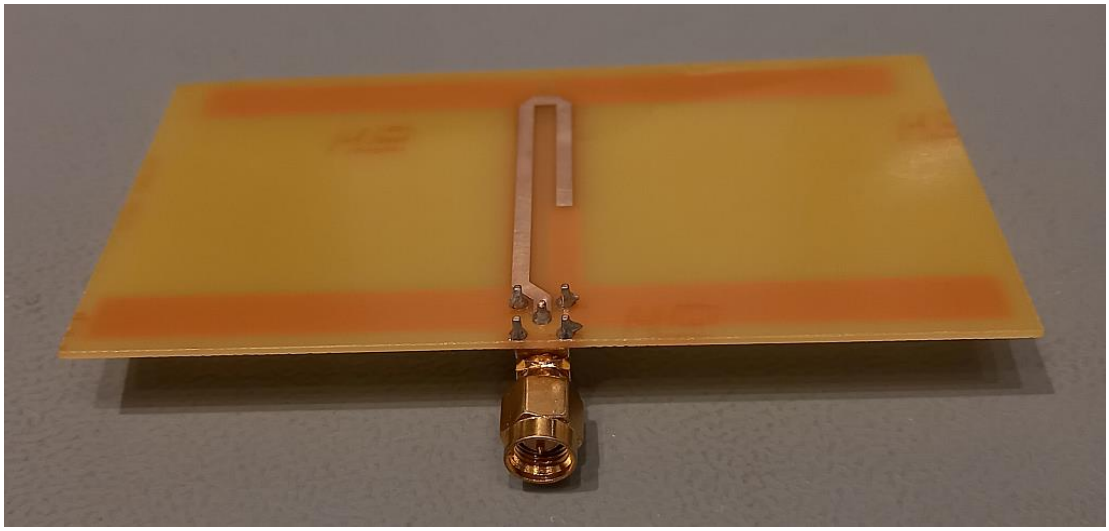
The 2 Element Yagi antenna is printed on what seems to be standard FR4 board. A good quality SMA-Angle-Plug is soldered on the PCB. The antenna has no tuning elements.

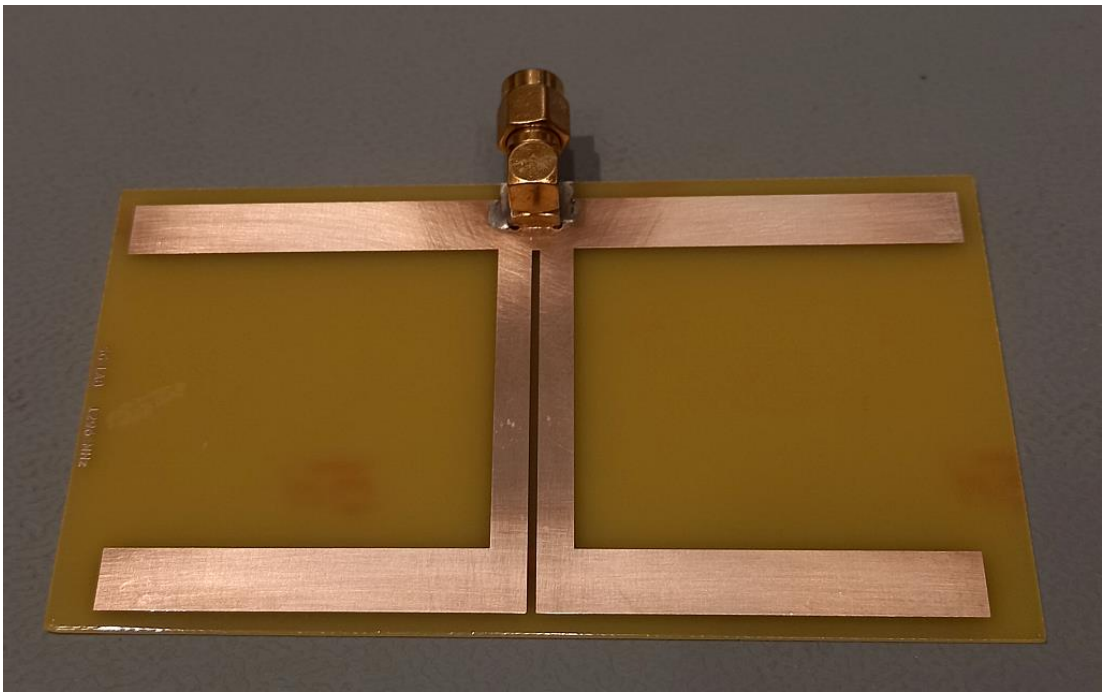
As the copper traces were already starting to oxidize, I silver plated them and protected the PCB with a thin coat of polyurethane.

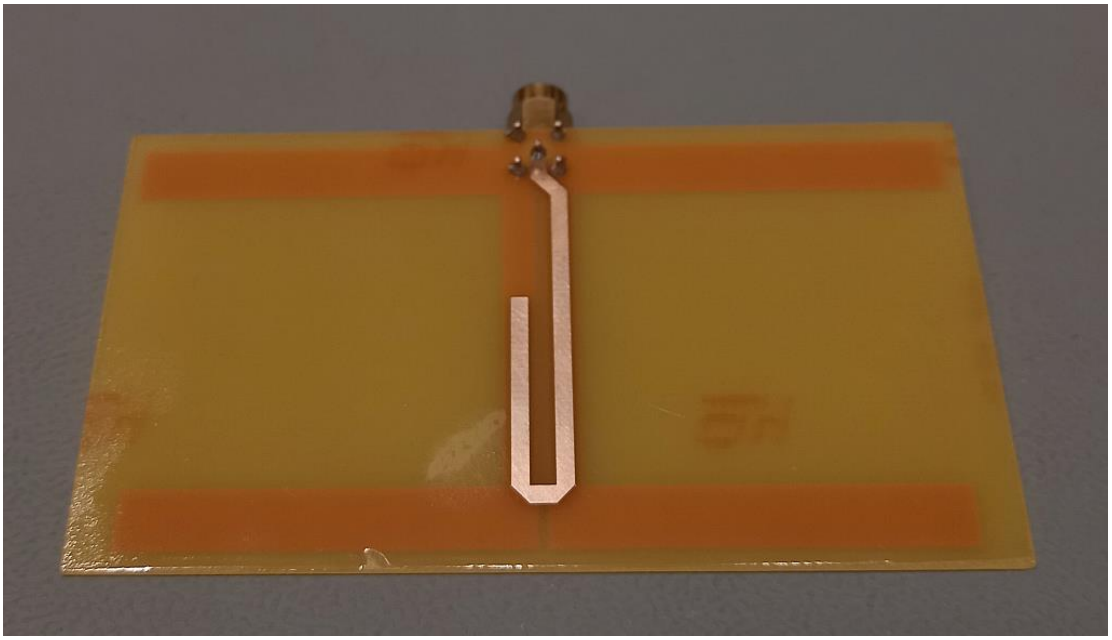
Here are some pictures of the antenna:



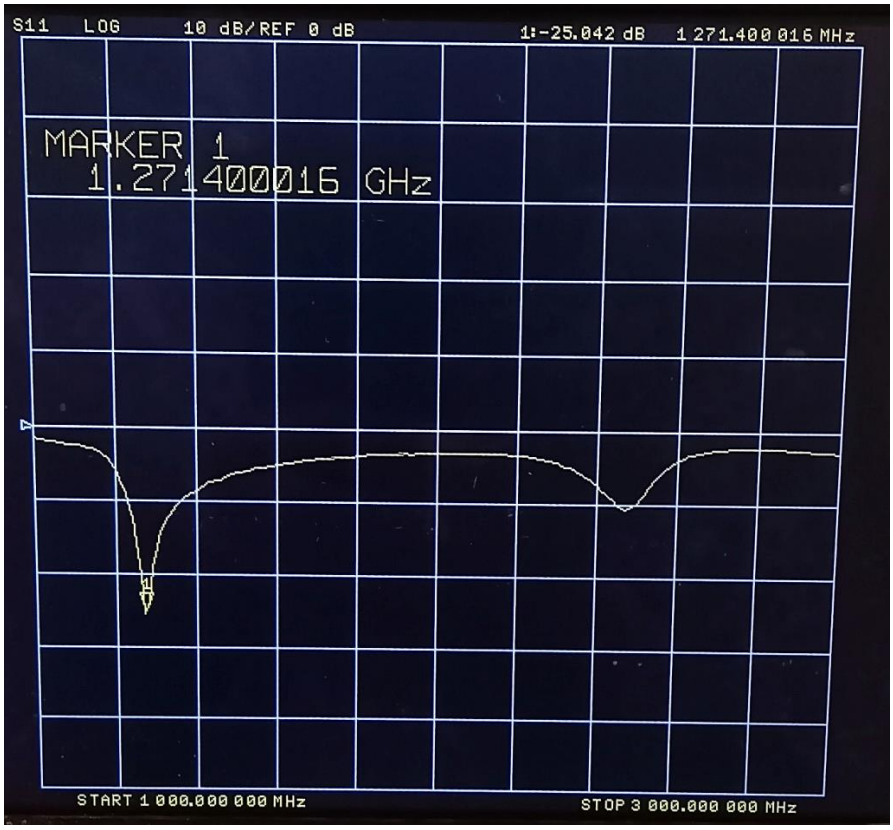




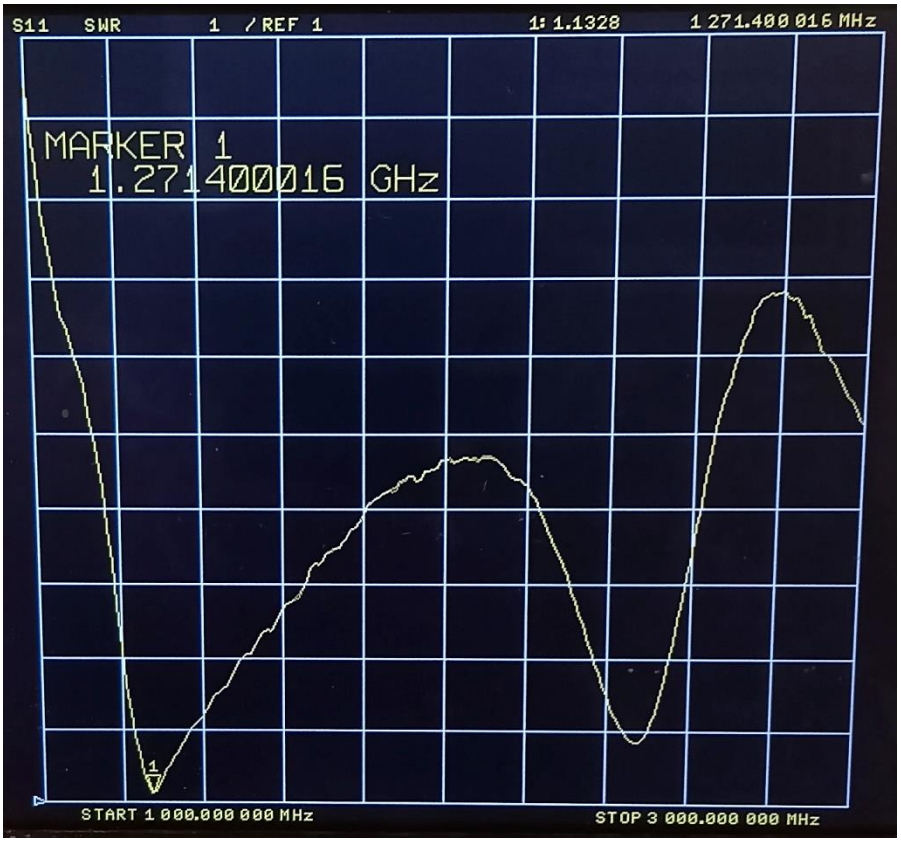




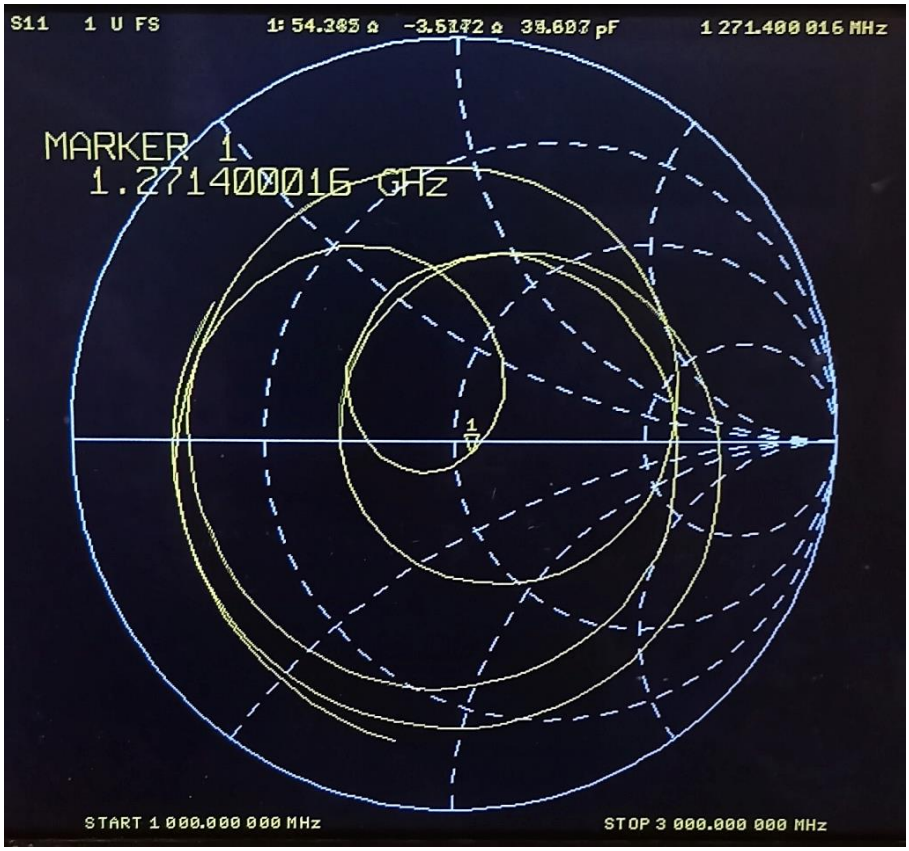
First, I measured the input impedance and matching of the antenna in a wide frequency range of 1-3 GHz.



S11 log mag: the antenna shows a nice resonance in the center of the 23cm Ham Radio band.
The return loss at 1271 MHz is 25dB.

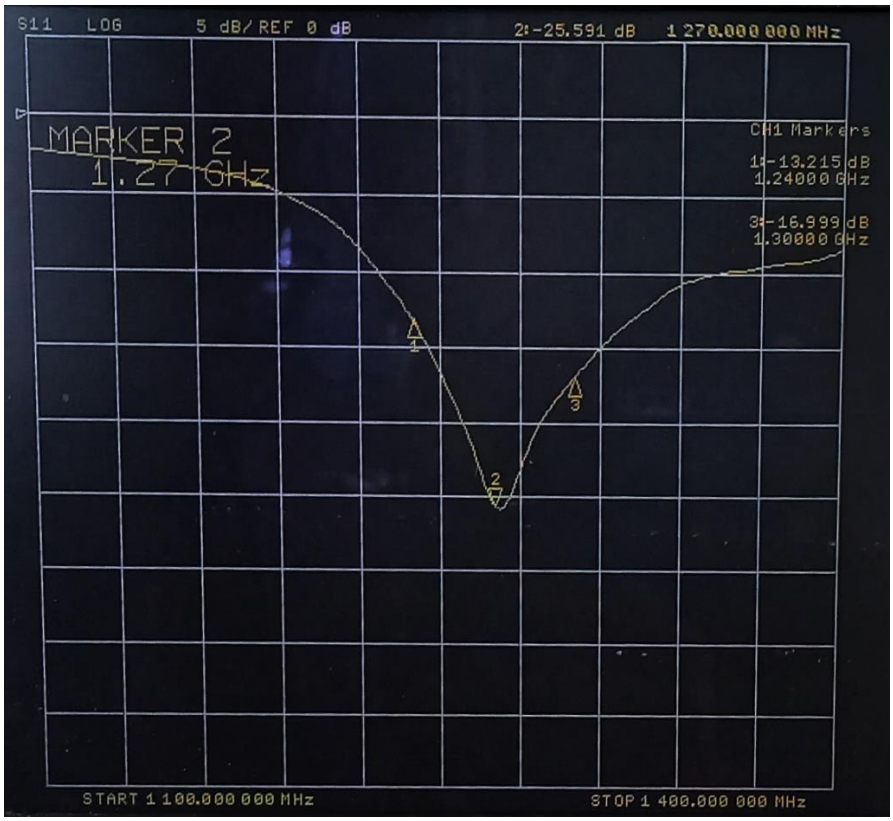


S11 SWR: the corresponding SWR is 1.13:1 at 1271MHz

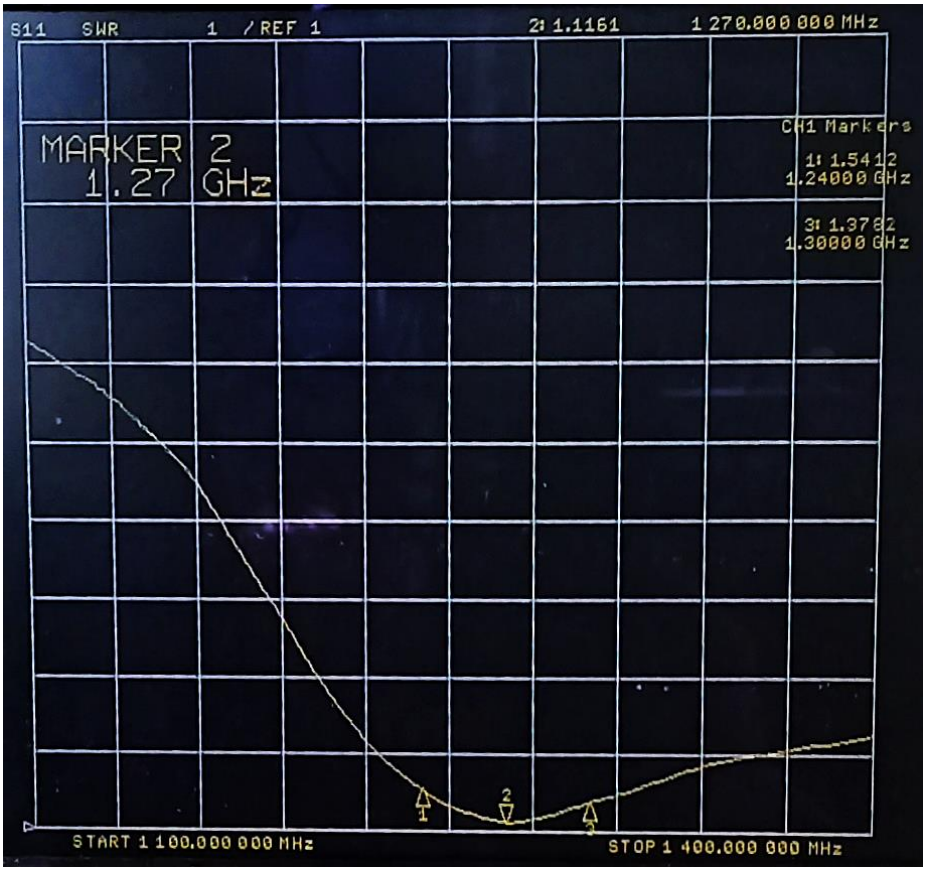


S11 Smith Chart

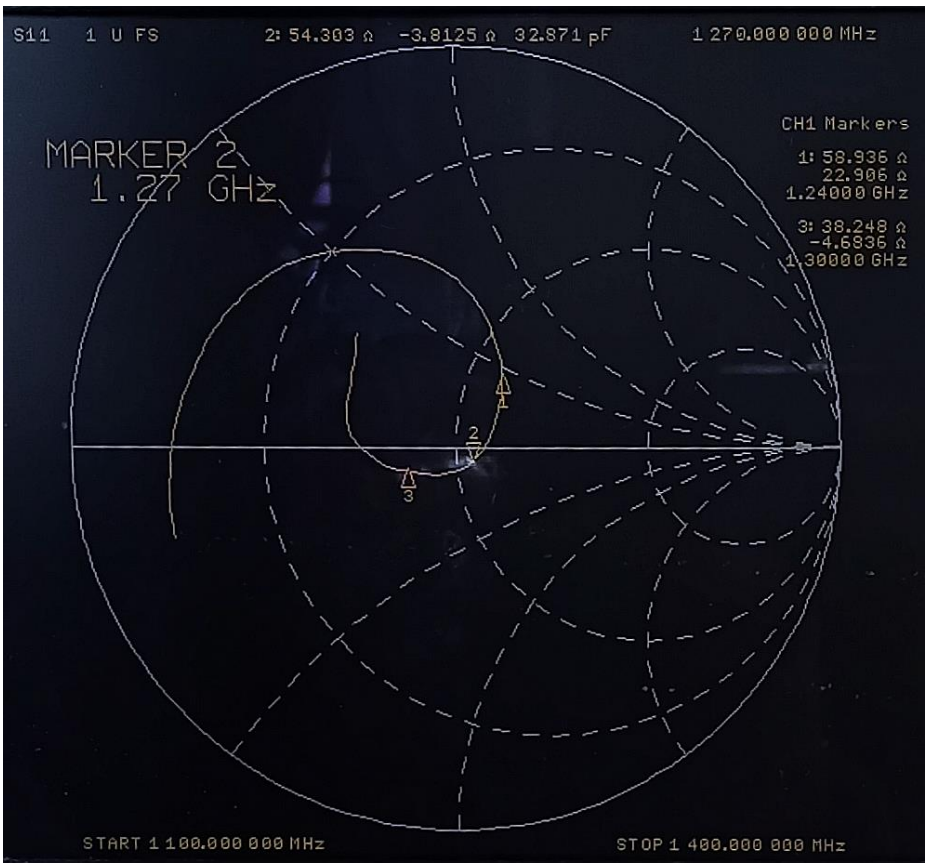
Next, I performed the same measurement in a smaller frequency range 1100-1400 MHz:



S11 log mag: the antenna shows a nice resonance in the center of the 23cm Ham Radio band. The return loss at 1240 MHz is 13dB, at 1270 MHz it is 26dB, at 1300 MHz it is 17dB.



S11 SWR: the SWR is 1.54@1240 MHz, 1.12@1270MHz and 1.38@1300MHz



S11 Smith Chart

This 2 element Yagi design is well centered in the 23cm Ham Radio band and with a return loss of 25dB it is very well matched. I wonder what the maximum power handling capability of this antenna is but would guess that at least 20 Watts should be no problem.

I have not yet been able to measure the antenna pattern of this antenna.

If someone might have additional information please send it to me. Many thanks in advance.

If you have any questions or comments please send them to the Email address which you will find below.

Best regards

Matthias DD1US

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