

868 MHz bandpass filter 10B120-865-530-0 K&L Microwave

Matthias, DD1US, May 3rd 2022

Some years ago, I bought an UHF bandpass filter from K&L Microwave on a flea market. I went into the filter storage but now finally I found the time to characterize it.

The filter is a tubular bandpass filter marked as K&L Microwave Inc., 10B120-865/530-0, Serial number F930-046. It features female SMA connectors at its input and output ports.

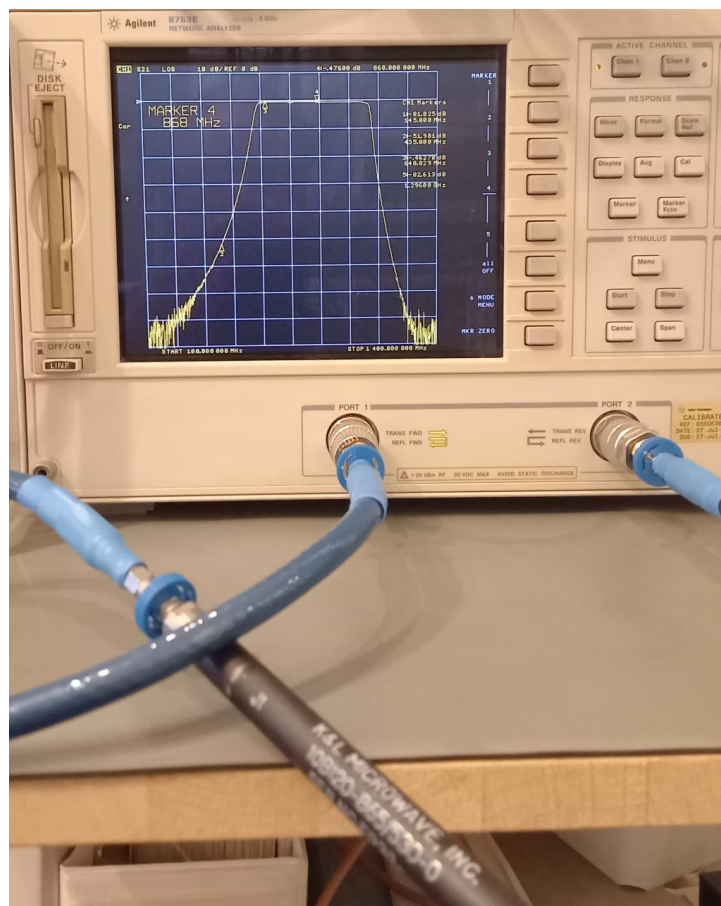
Here are some pictures of the filter:



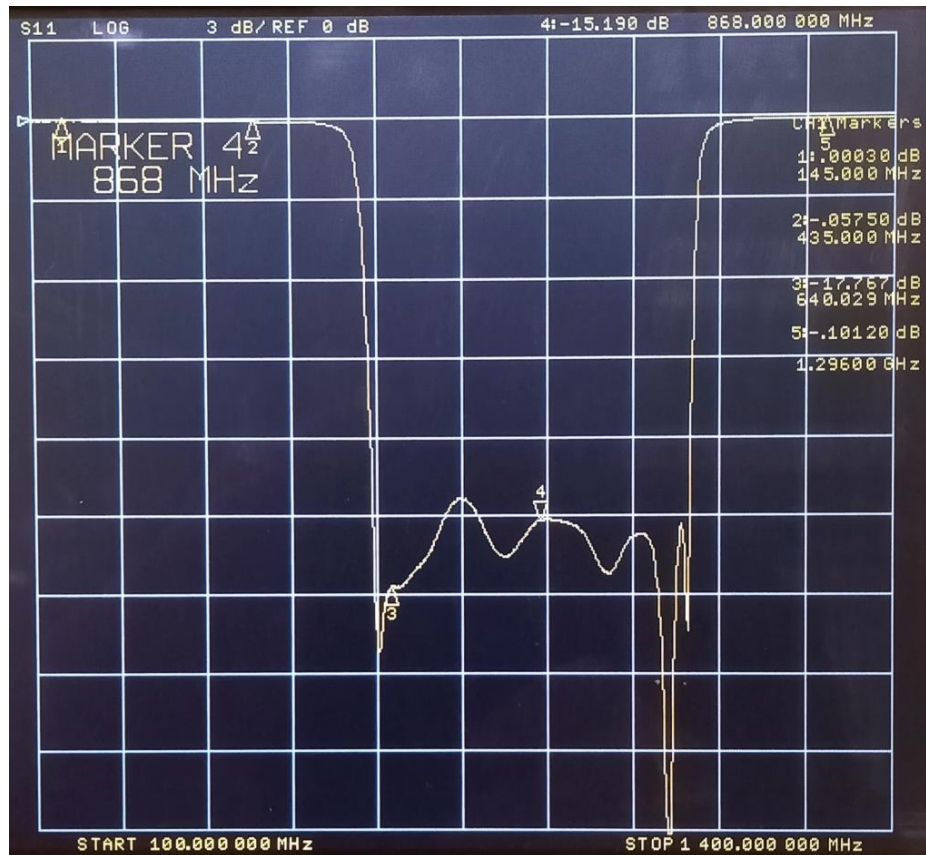


I did not find a specific datasheet for this filter but according to the nomenclature used at K&L Microwave it is a tubular bandpass filter with 10 sections, a center frequency of 868MHz, a bandwidth of 530MHz. Input and output impedance is 50 Ohms and the connectors are SMA female. The maximum average power it can handle is 18W. It seems to be an earlier model as later K&L Microwave Inc. only offered such filters with 8 section and a slightly different nomenclature.

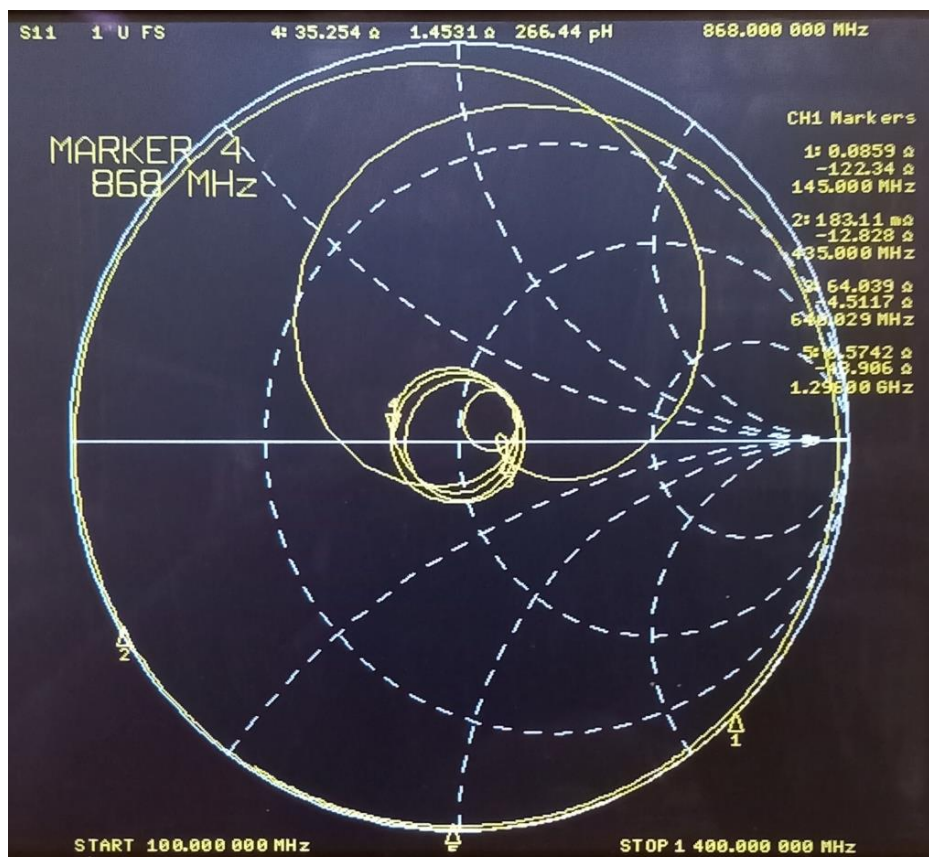
Thus, I was curious to see how the filter might perform and put in on my VNA test bench.



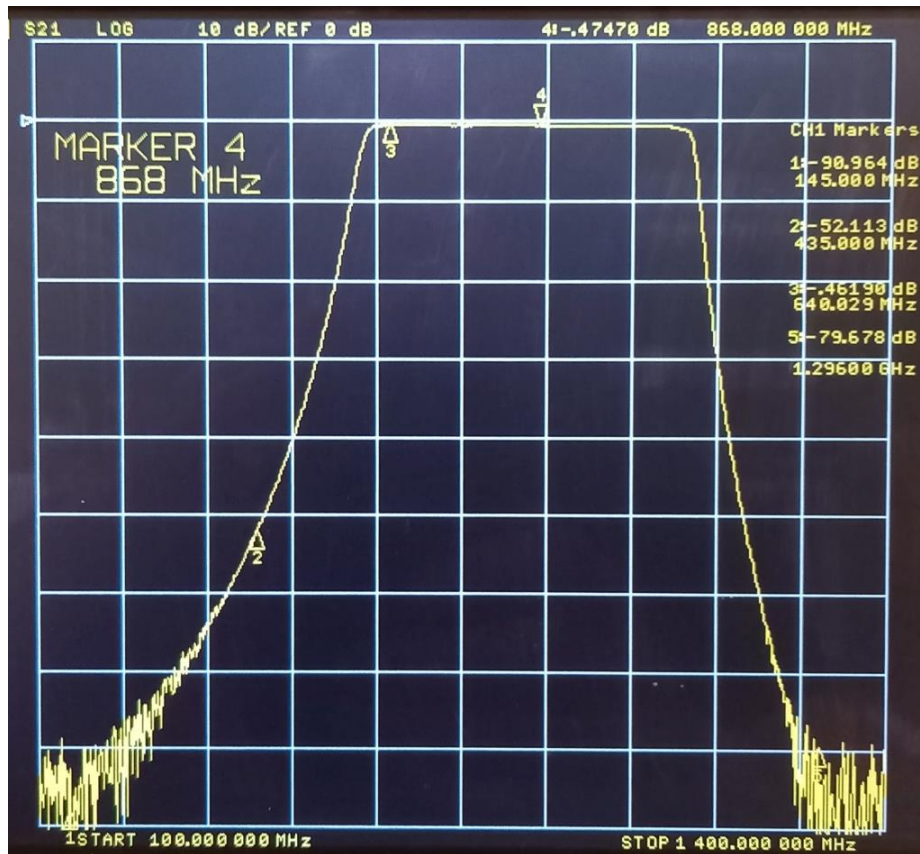
On the next pages you can find the measurement results of the filter measured in a frequency range from 100MHz to 1400MHz.



S11 log mag: return loss 15dB @868 MHz

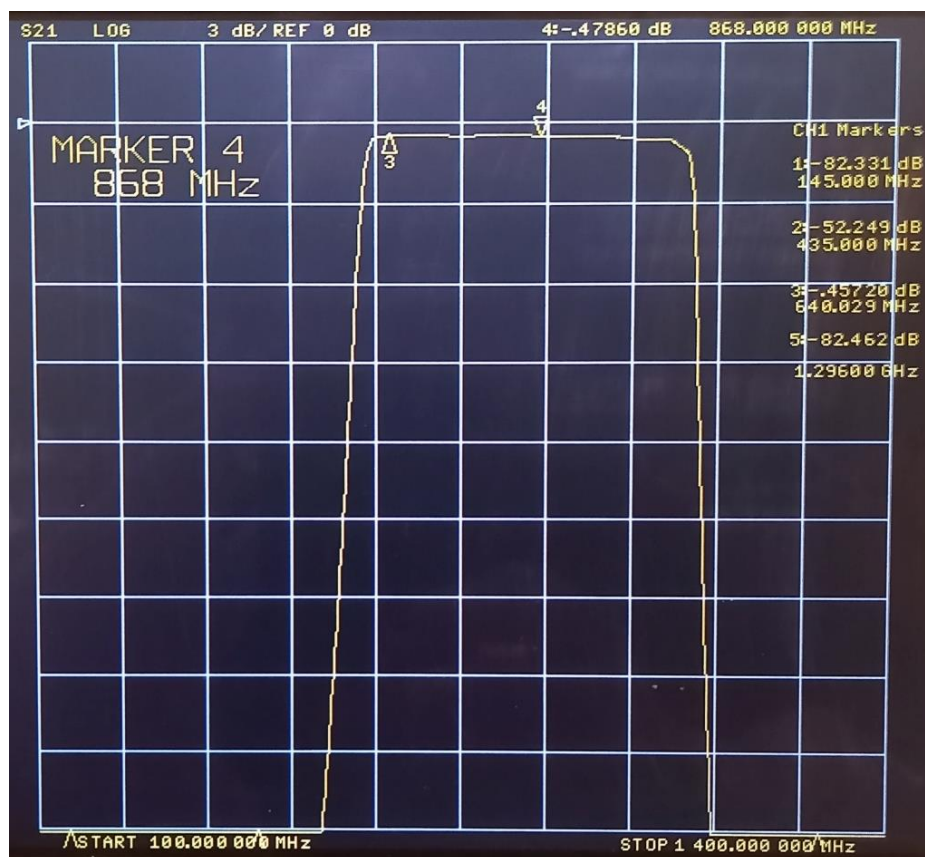


S11 Smith Chart

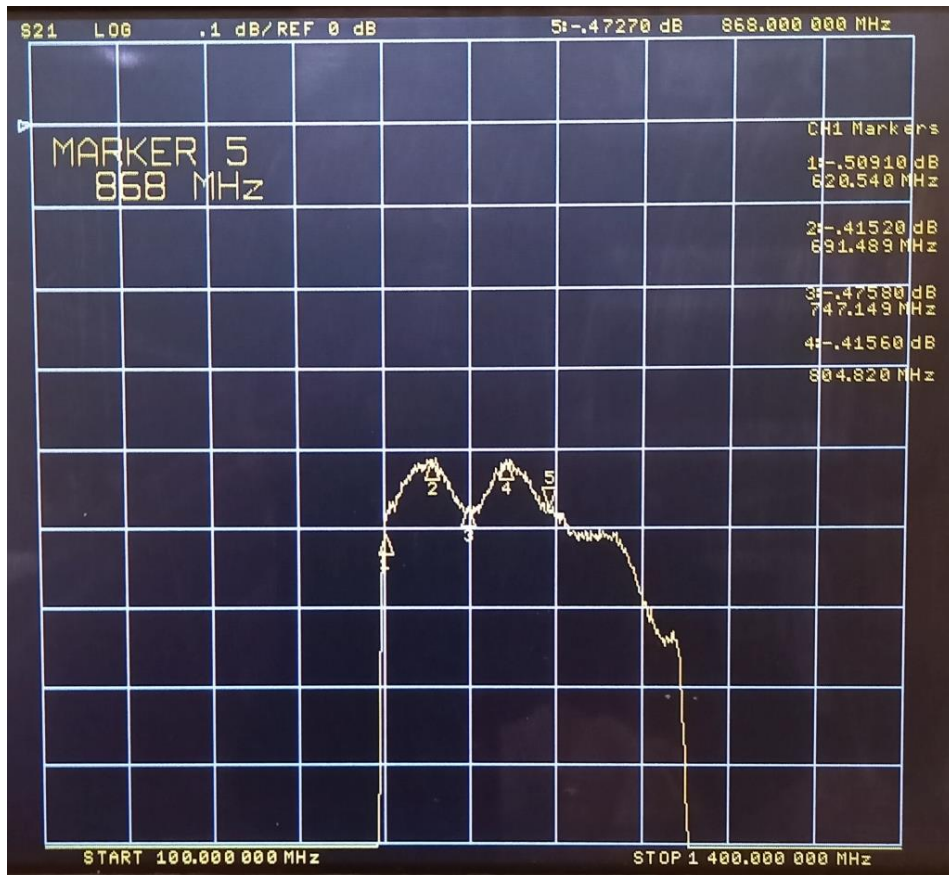


S21 log mag 10dB/div: insertion loss about 0.5dB @868 MHz

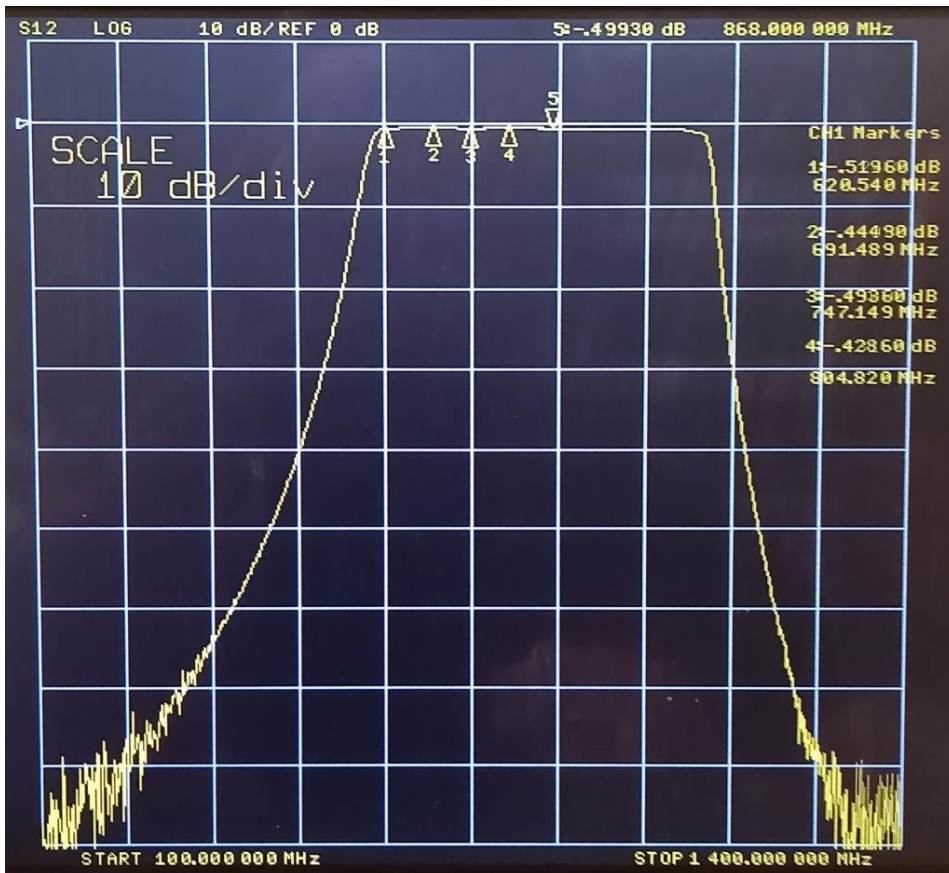
As can be seen the filter shows a rejection at 145MHz (2m ham radio band) of about 90dB, at 435MHz (70cm ham radio band) of about 52dB and at 1296MHz (23cm ham radio band) of about 80dB.



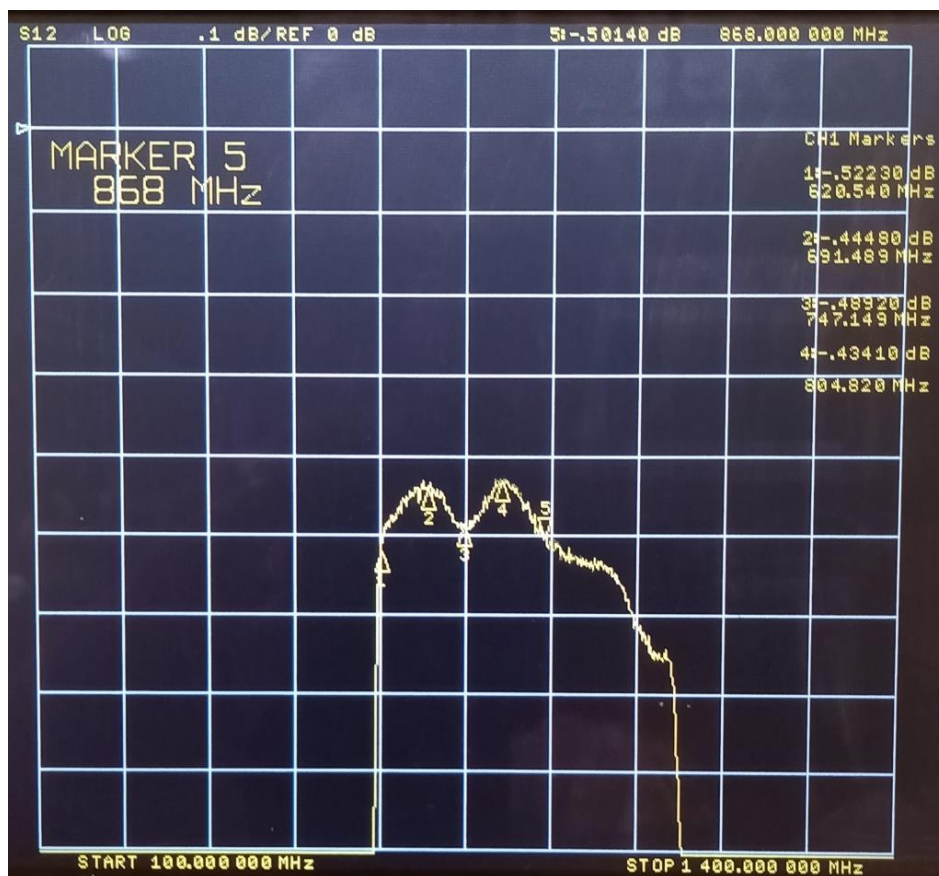
S21 log mag 3dB/div: insertion loss about 0.5dB @868 MHz



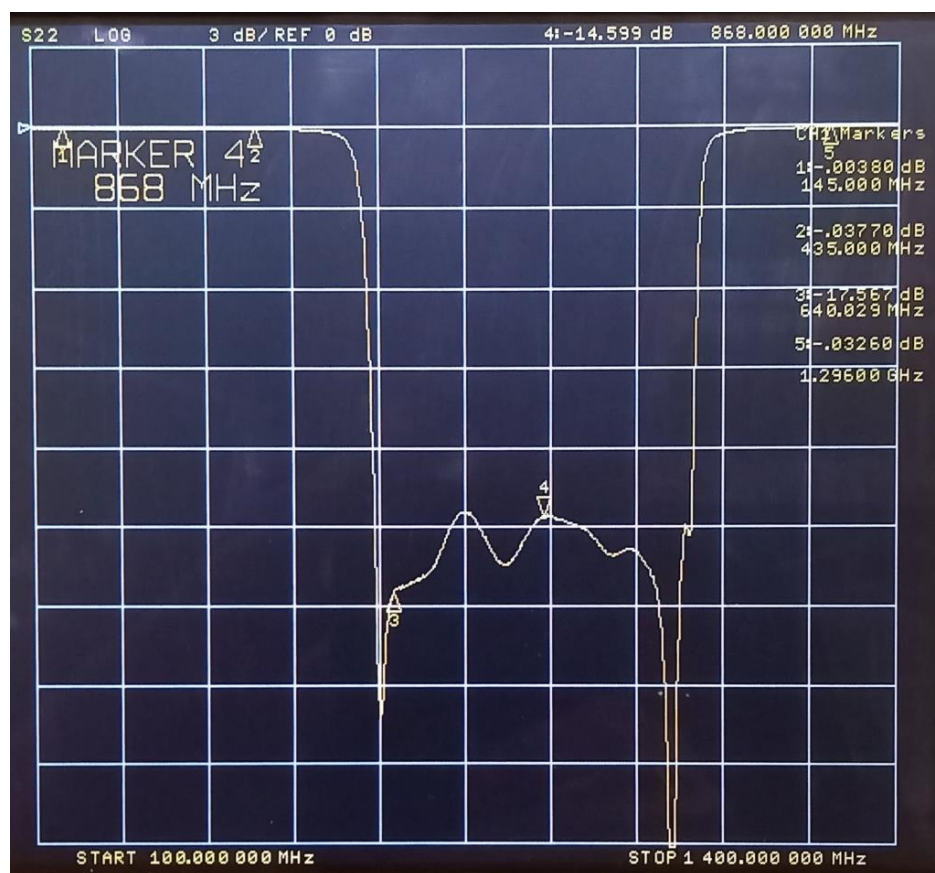
S21 log mag 0.1dB/div: insertion loss about 0.5dB @868 MHz



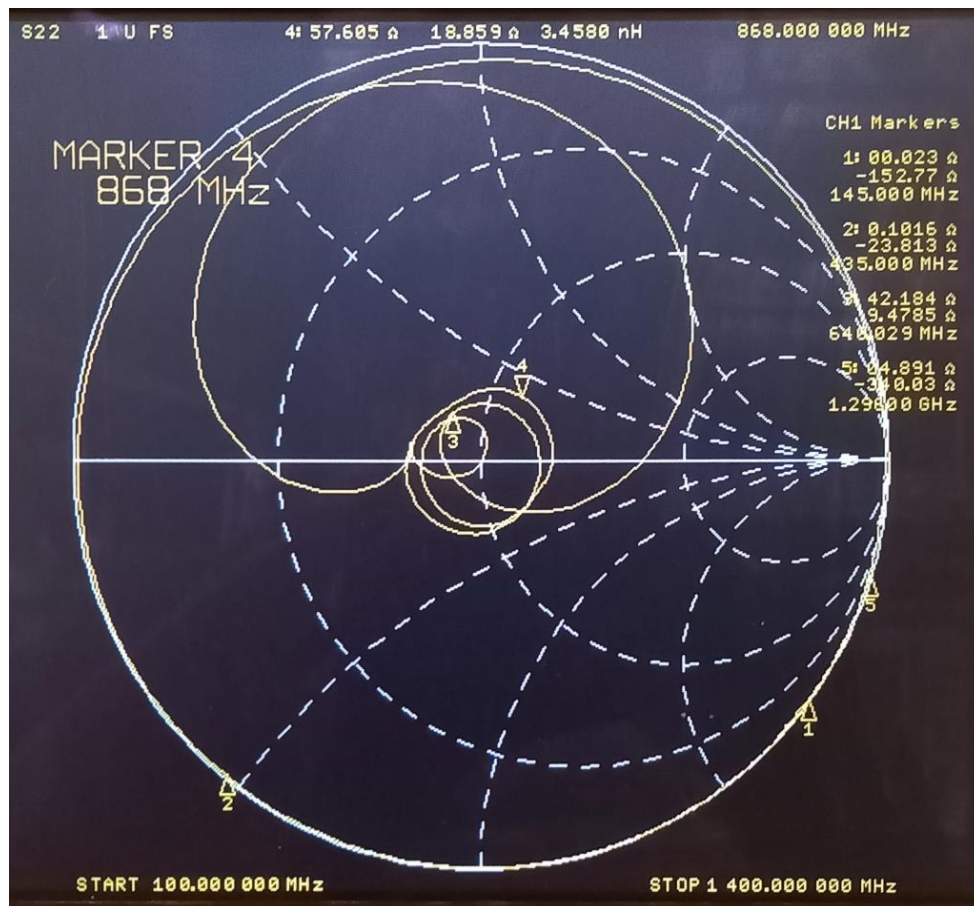
S12 log mag 10dB/div: essentially the same as S21



S12 log mag 0.1dB/div: essentially the same as S21



S22 log mag: return loss 15dB @868 MHz



S22 Smith Chart

In summary this filter makes a nice RF filter for 868MHz. Given its wide bandwidth the passband ripple is amazing low and the insertion loss of only about 0.5dB as well.

Rejection in the next ham radio bands (2m, 70cm and 23cm) is 90dB, 52dB and 80dB.

I always appreciate feedback and will be happy to answer questions. Please send them to the Email address given below. Many thanks in advance.

Best regards

Matthias DD1US

Email: DD1US@AMSAT.ORG

Homepage: <http://www.dd1us.de>