

## Be careful with 88-108 MHz Band Reject Filter

Matthias, DD1US, Updated July 7<sup>th</sup> 2024

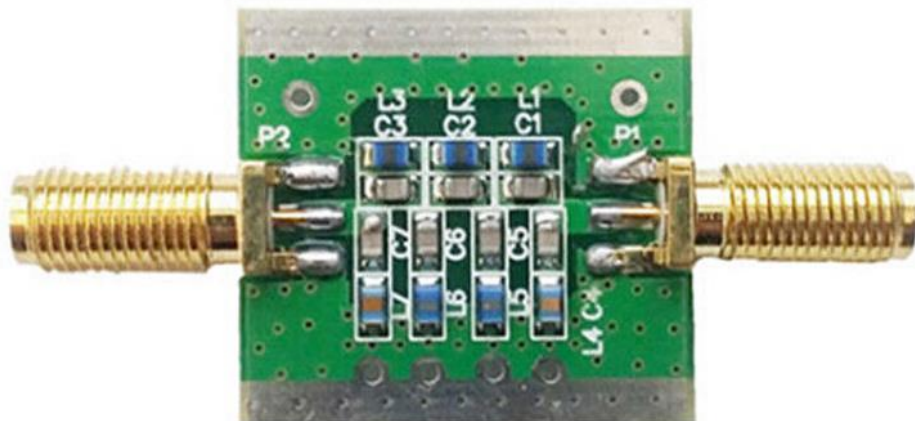
For some of my SDR receivers I wanted to try out an 88-108 MHz band reject filter to suppress unwanted blocking and intermodulation from strong broadcast radio stations.

I ordered a cheap filter from a Chinese vendor on Ebay and was interested to see how it will perform. The filter is approximately 3cmx3cmx1cm small and uses SMA connectors at the input and output port. Here are some pictures I took from the unit which I received:

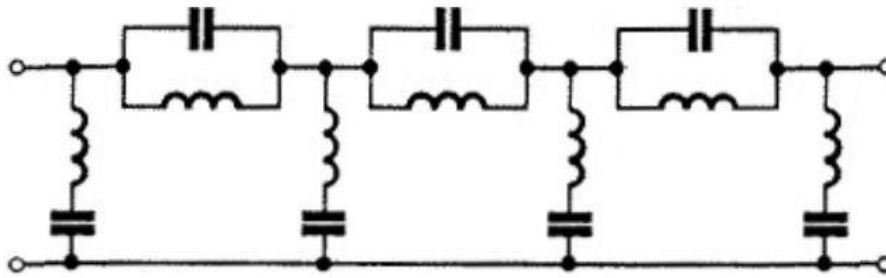




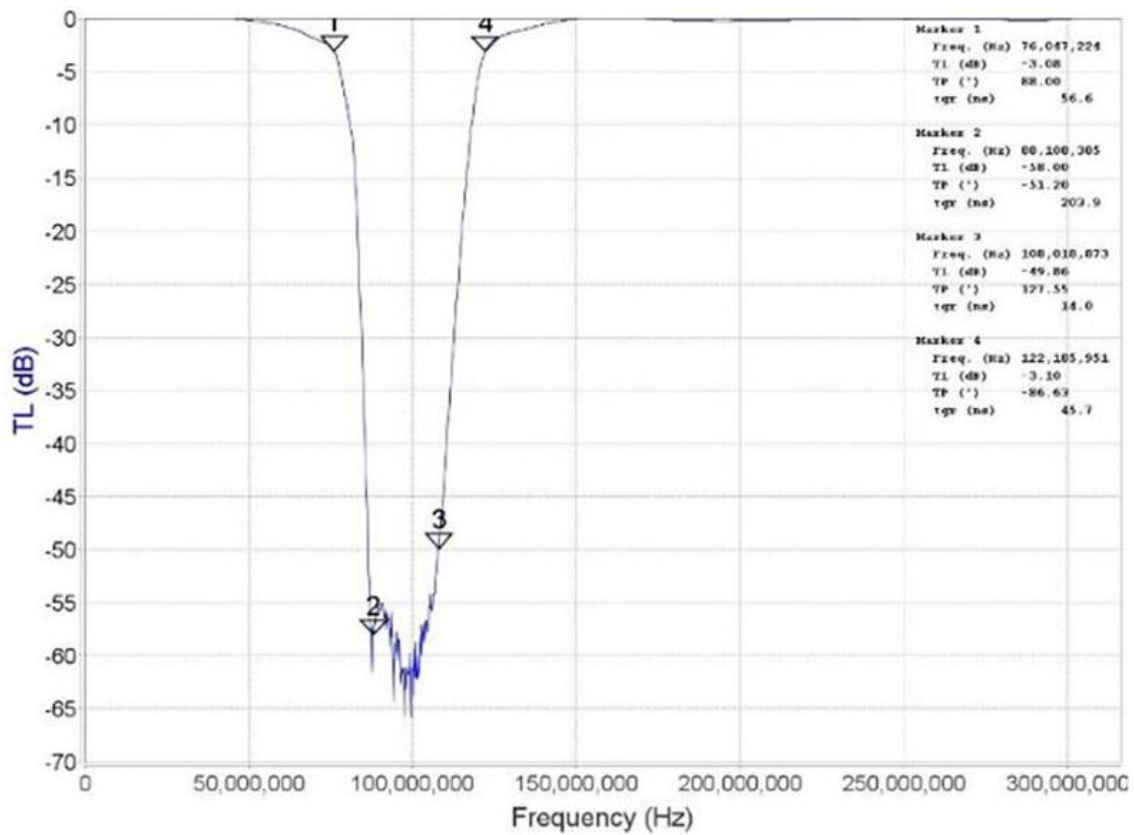
Here is a picture of the inside of the filter provided by the seller:



The band reject filter is comprised of 4x LC series resonance and 3x LC parallel resonance sections.



The vendor had promoted the filter with the following S21 transfer characteristic:

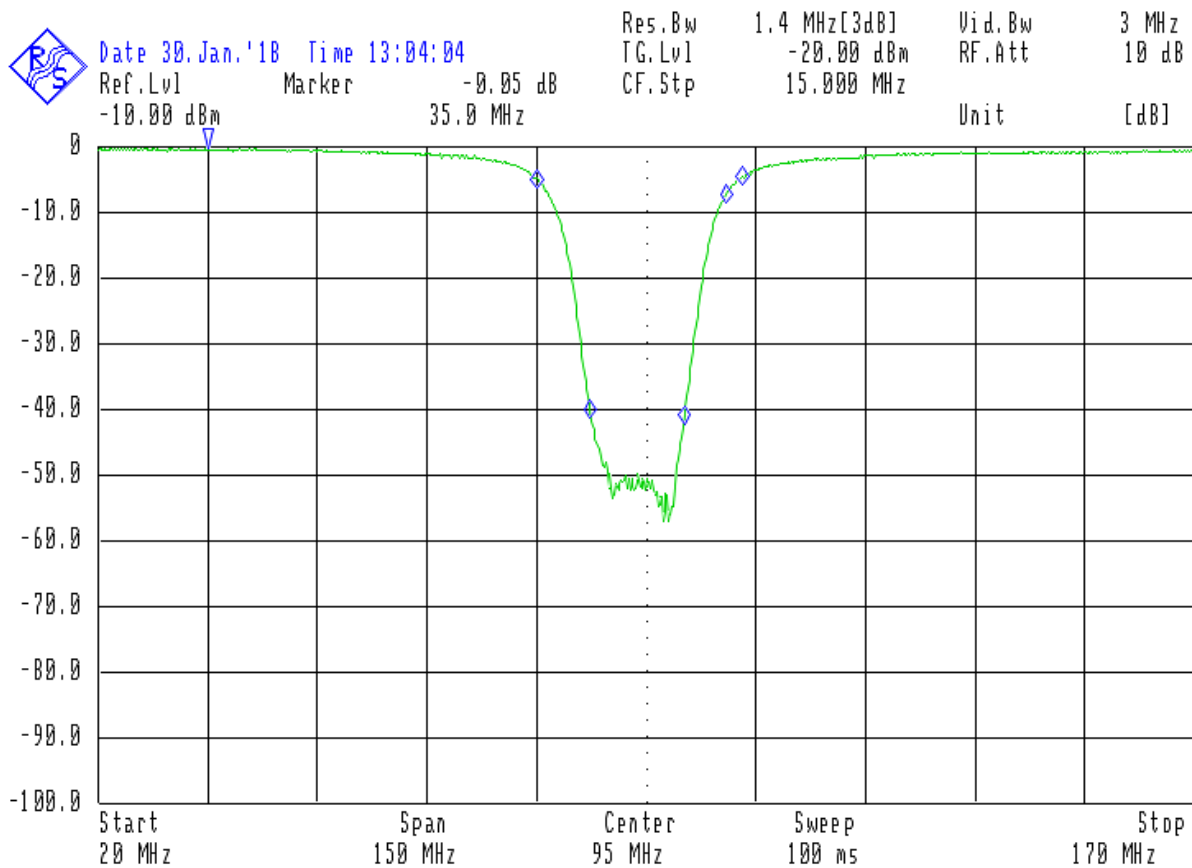


Here are the values associated with the shown markers:

Marker	Frequency /MHz	Insertion loss /dB
1	76,0	3,08
2	88,1	38,0
3	108,0	49,9
4	122,1	3,1

The maximum insertion loss in the broadcast band is shown to exceed 60dB.

When I received the filter I also measured the S21 transfer characteristics:



Here are the values associated with the shown markers:

Frequency /MHz	Insertion loss /dB
80	-4.8dB
87.3	-40.8
100.1	-40.5dB
106.0	-7.0dB
108.1	-4.5dB

The maximum insertion loss in the broadcast band is approximately 55dB. However, the filter is not covering the advertised frequency range 88-108 MHz as the stopband already ends within the broadcast band. At 100 MHz the insertion loss is about 40dB but then quickly degrades to only 7 dB at 106 MHz. Thus, it is not useful at least in Europe.

I do not know whether I received a unique poor device, possibly caused by tolerances of the components, or whether all such filters may show such a poor behaviour. If you buy such a filter then I recommend to check it carefully. Meanwhile I got feedback from another user who bought two of such filters and measured them. Both are about the same as mine thus probably all those filters do not cover the whole FM band in Europe and thus will not very useful without modifications.

If you have successfully modified such a filter, I will be grateful to get the information which changes are needed. If I find the time, I might eventually also optimize my filter. Also comments and questions are always welcome. Please send them to the Email address given below.

Best regards

Matthias DD1US

Email: [DD1US@AMSAT.ORG](mailto:DD1US@AMSAT.ORG) Homepage: <http://www.dd1us.de>

