

Lowpass Filters

The low pass filters block provides harmonics filtering. There are four filters that are switched based on currently selected band.

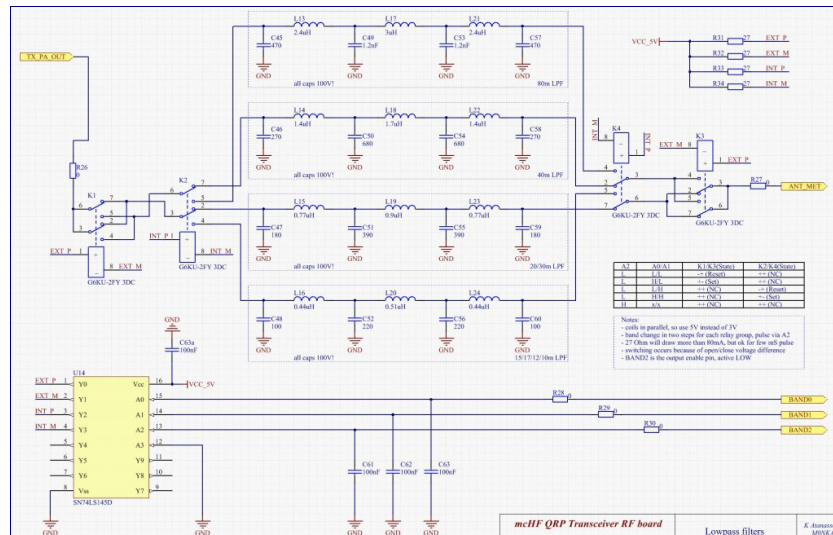


Fig1: LPF schematics(click for a larger view)

The design of this filter is selected to minimize the relay count, so four relays switch four different filters. Also latch relays are used to minimize thermal strain on the contacts plus much simple driver is able to control them. In this case 74LC145 decoder with 80mA open collector outputs provides ideal. The same two switching signals that control the BPF are used, but with extra BAND2 signal that is used to pulse the relays. The operation is pretty evident from the truth table, available in the module schematics.

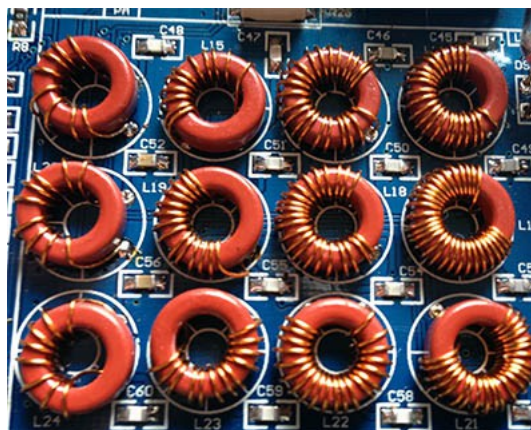


Fig2: Turns spacing can vary the filter response as 1-2 Mhz

LPF filter inductors will require careful adjusting, as cutoff frequencies are quite critical, due to pairing of bands, to save on components. Please use the table at Fig3 as reference guide.

Band	Base Frequency	Harmonics	Cutoff Range	Overlap
80m	3.5 Mhz	7/10.5 Mhz	4 - 6 Mhz	5 Mhz
60m	5.0 Mhz	10/15 Mhz	6 - 9 Mhz	8 Mhz
40m	7.0 Mhz	14/21 Mhz	8 - 12 Mhz	
30m	10 Mhz	20/30 Mhz	12 - 18 Mhz	16 Mhz
20m	14 Mhz	28/42 Mhz	16 - 26 Mhz	
17m	18 Mhz	36/54 Mhz	20 - 34 Mhz	33 Mhz
15m	21 Mhz	42/63 Mhz	23 - 60 Mhz	
12m	24 Mhz	48/72 Mhz	26 - 70 Mhz	
10m	28 Mhz	56/84 Mhz	30 - 80 Mhz	

Fig3: Filter cutoff frequencies

And here some good filter response after careful adjustment of the inductors turns spacing.

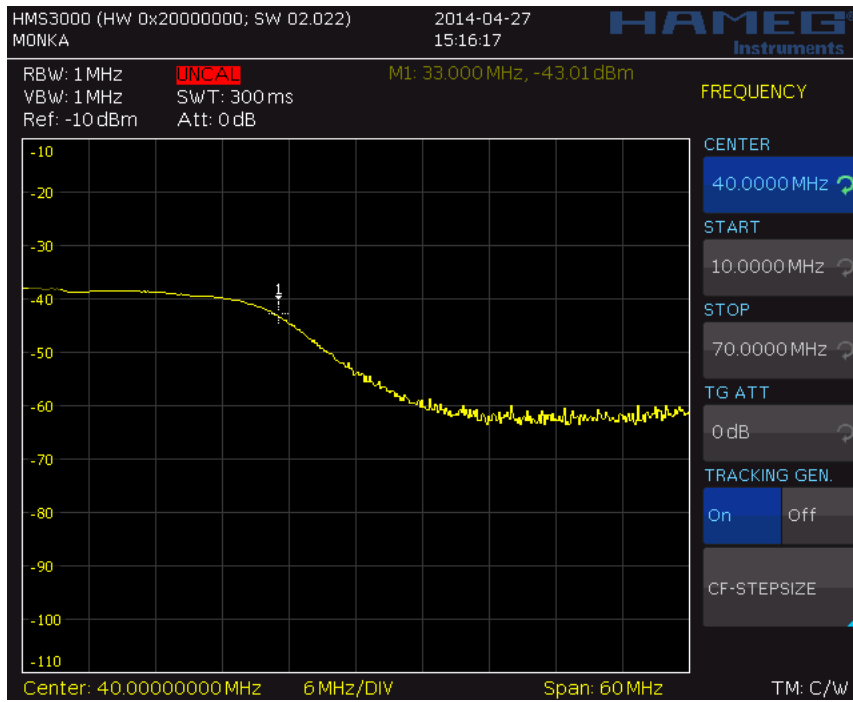


Fig4: Filter response 17m to 10m

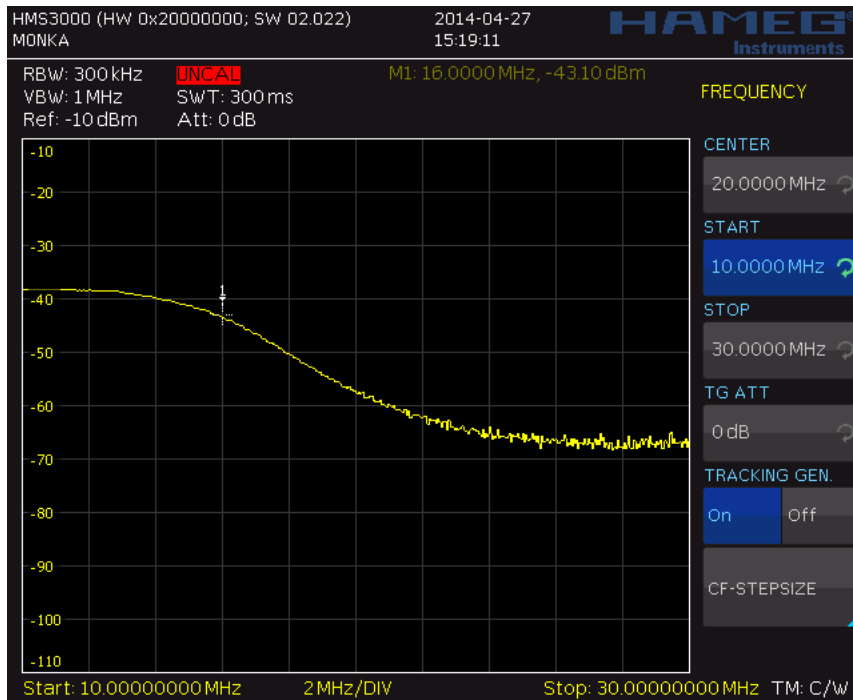


Fig5: Filter response 30/10m

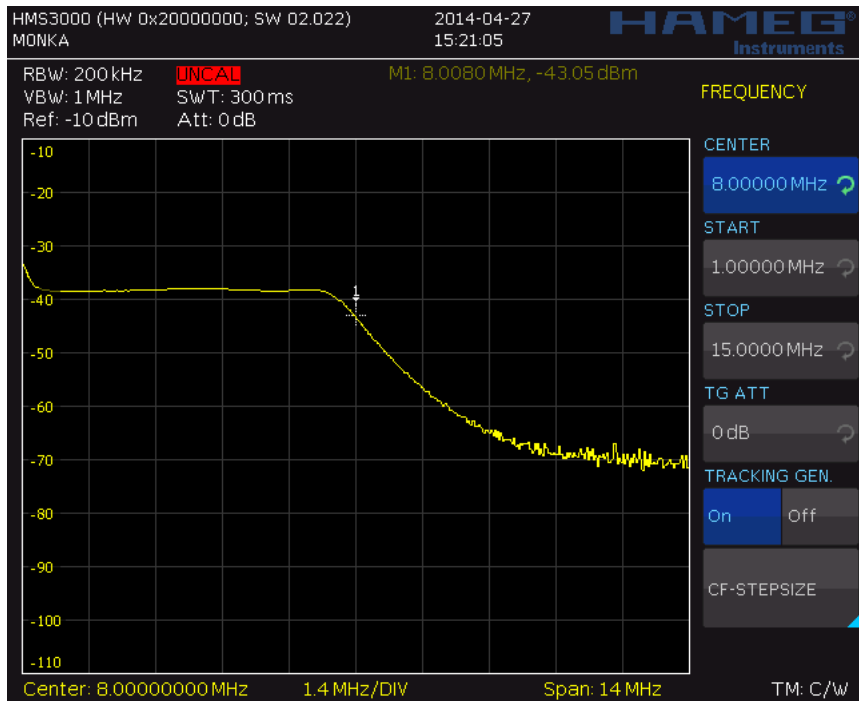


Fig6: Filter response 60/40m

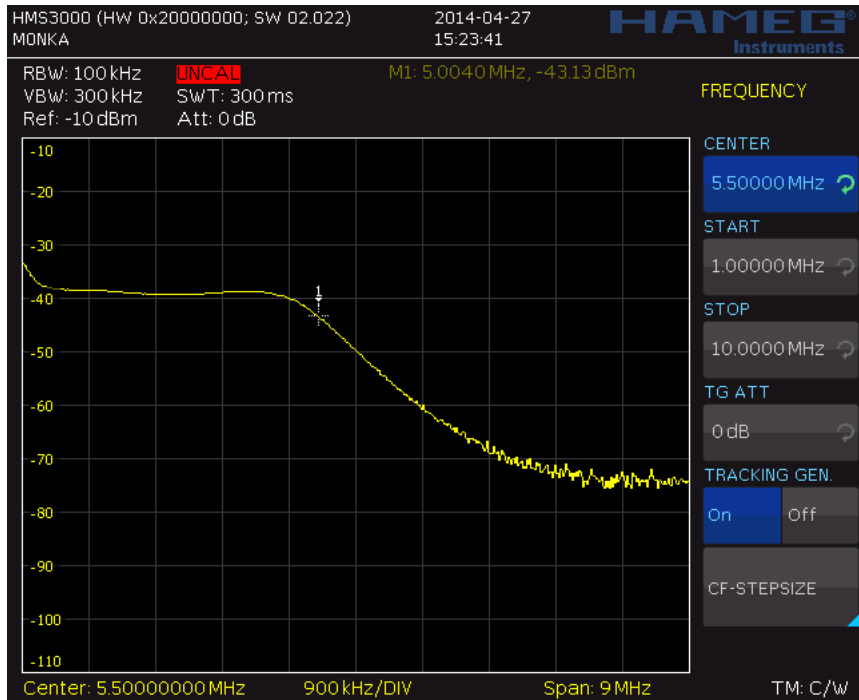


Fig7: Filter response 80m