

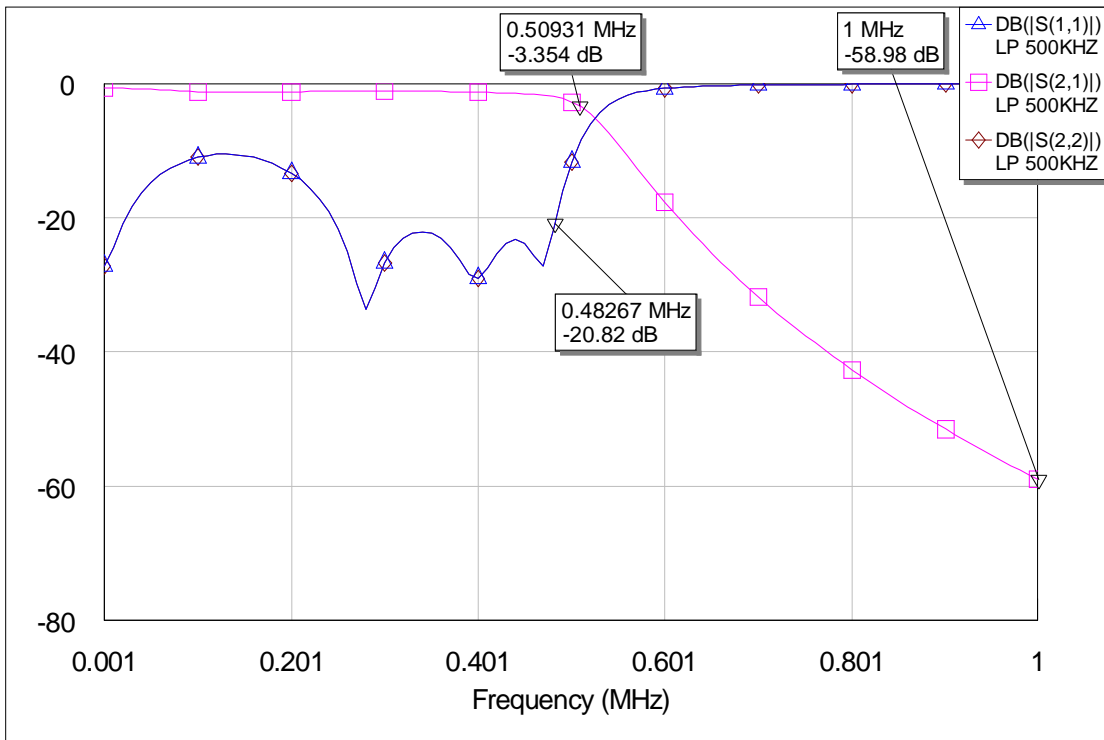
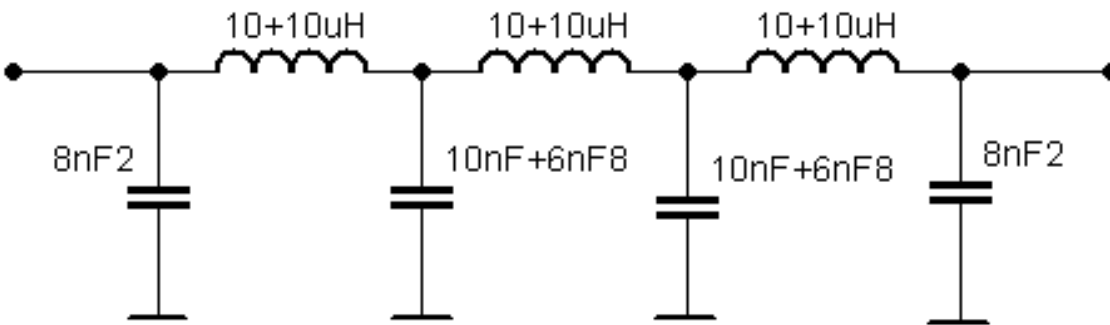
# Low Frequency Receiving BP (Band Pass) / LP (Low Pass) Filters

Dipl. Ing . Tasić Siniša –Tasa YU1LM/ORP

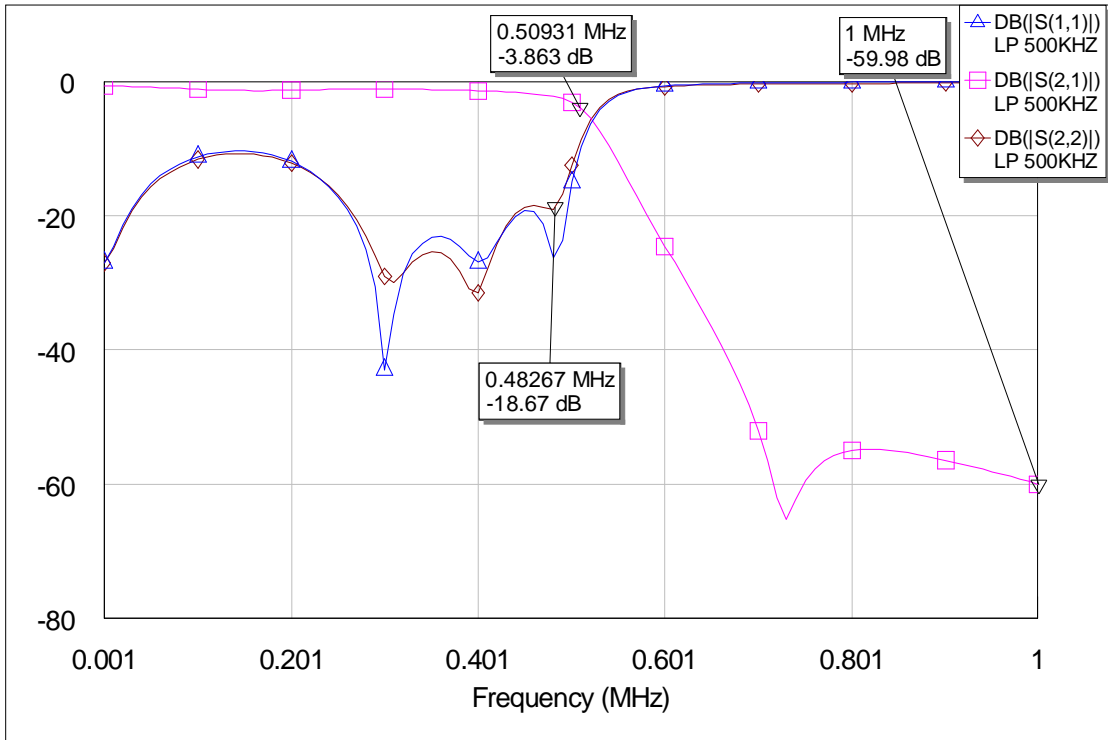
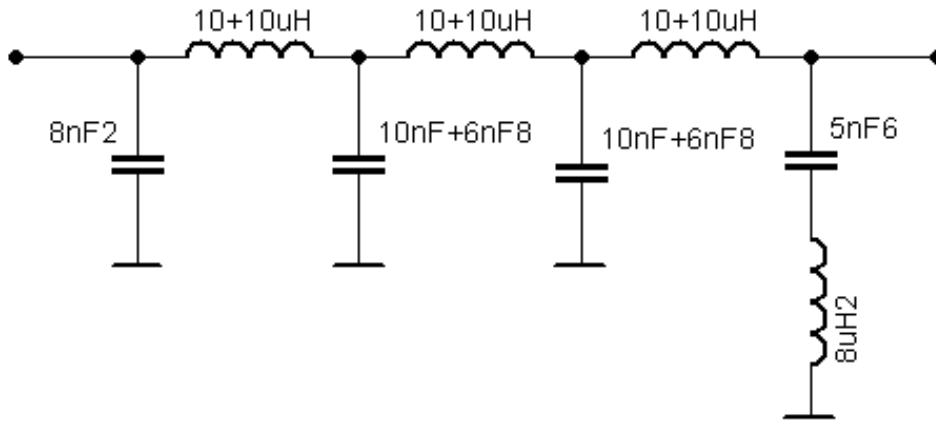
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This design is realized after Nick VK1AA asked me for possible simple BP/LP filters realization for new experimental 500 kHz band and 137 KHz HAM band too. The basic idea is practical filter realization with standard molded chokes but at the end of the article I am proposing BP realization with high Q inductors. Start point specification in design was that IL (insertion loss) has to be under -3 dB.

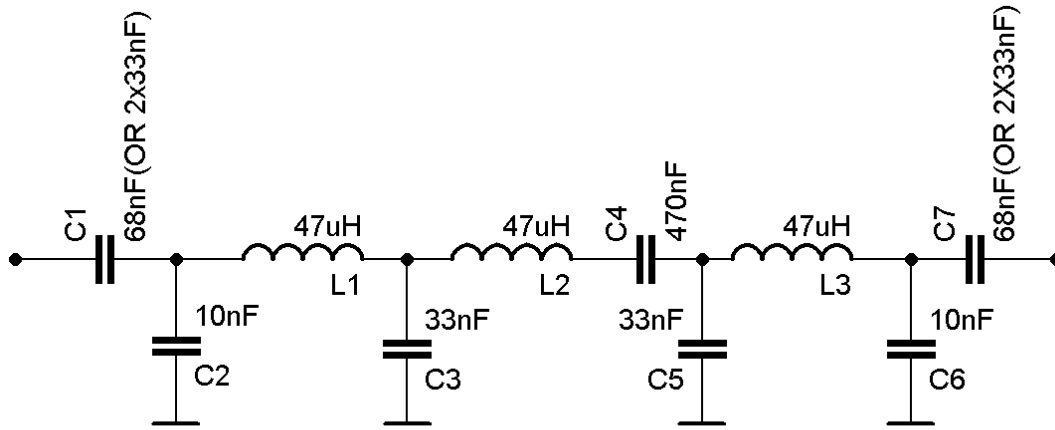
## LP filter for 500 kHz with molded chokes



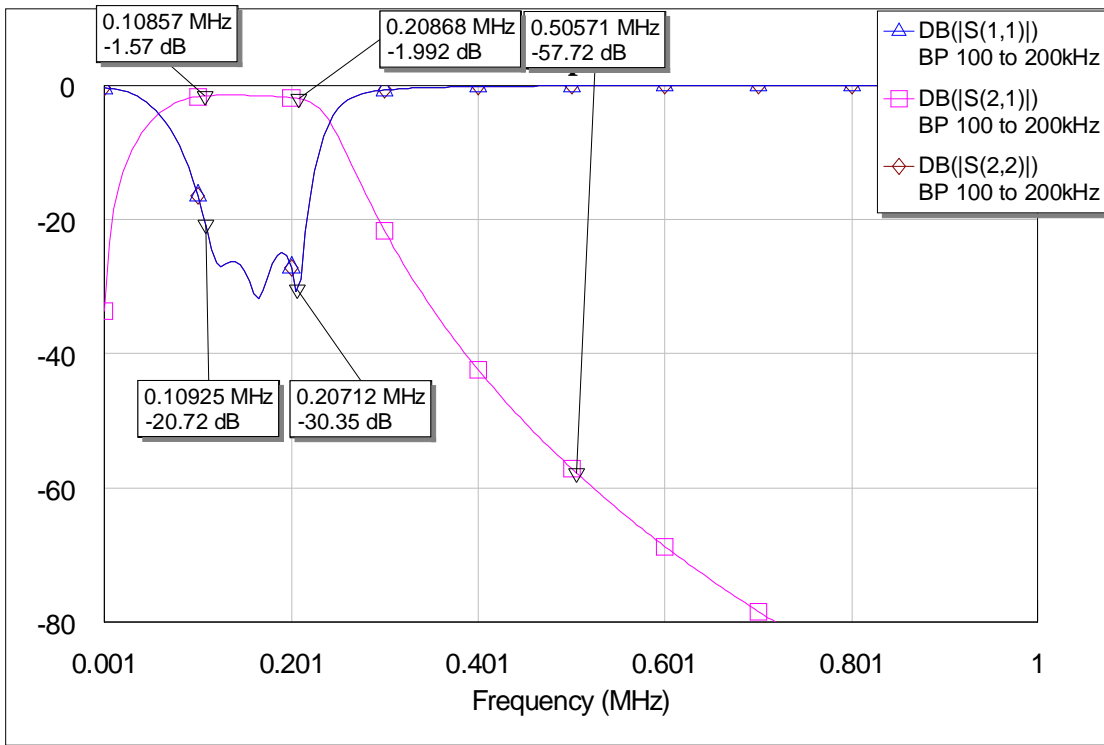
Verzija 2



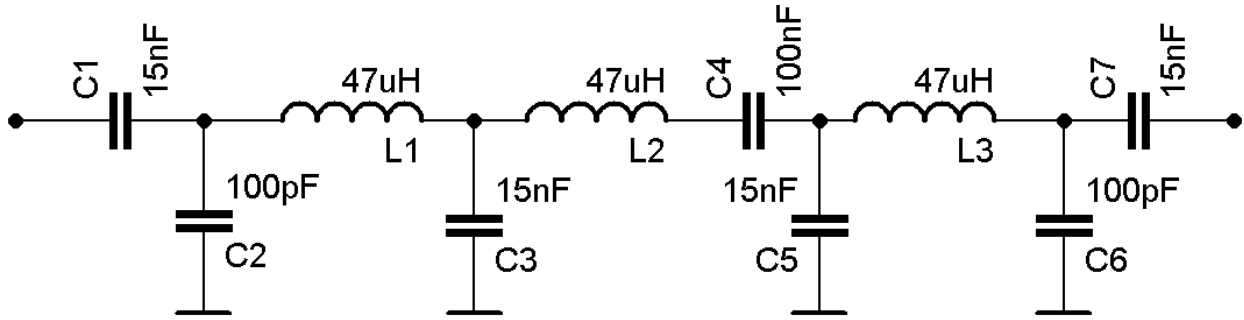
### BP for 100-200 kHz with molded chokes



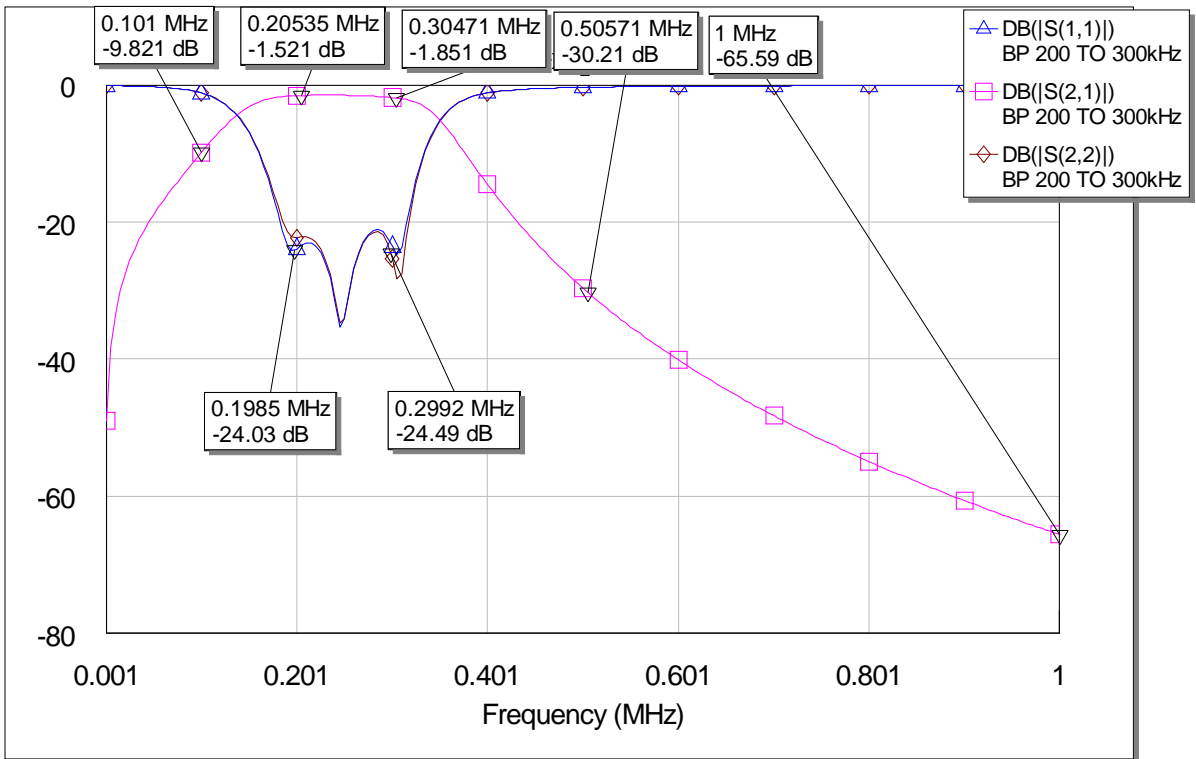
BP FILTER FOR 100-200kHz DESIGN -YU1LM



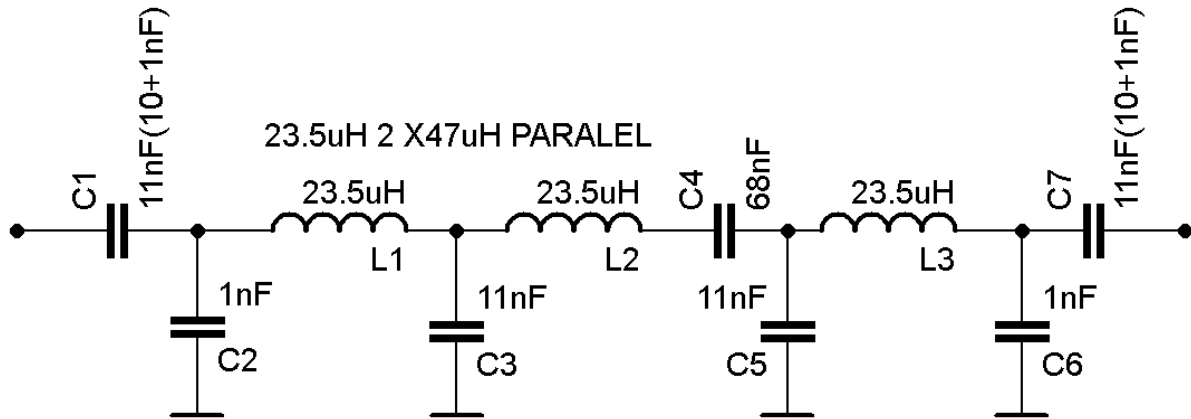
BP for 200-300 kHz with molded chokes



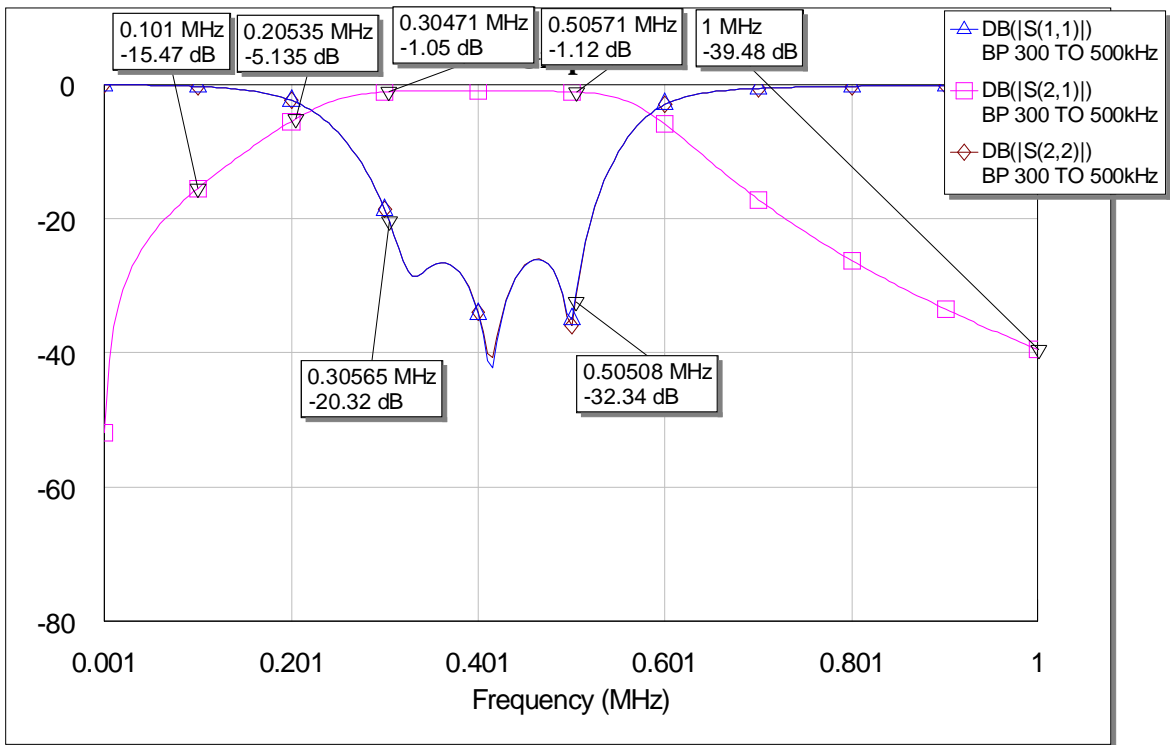
BP FILTER FOR 200-300kHz DESIGN -YU1LM



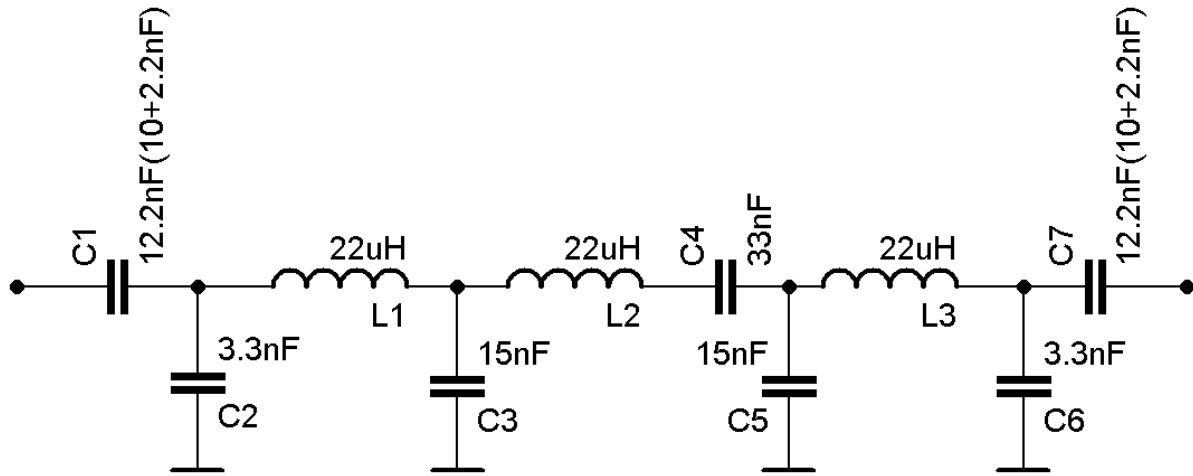
BP for 300-500 kHz with molded chokes



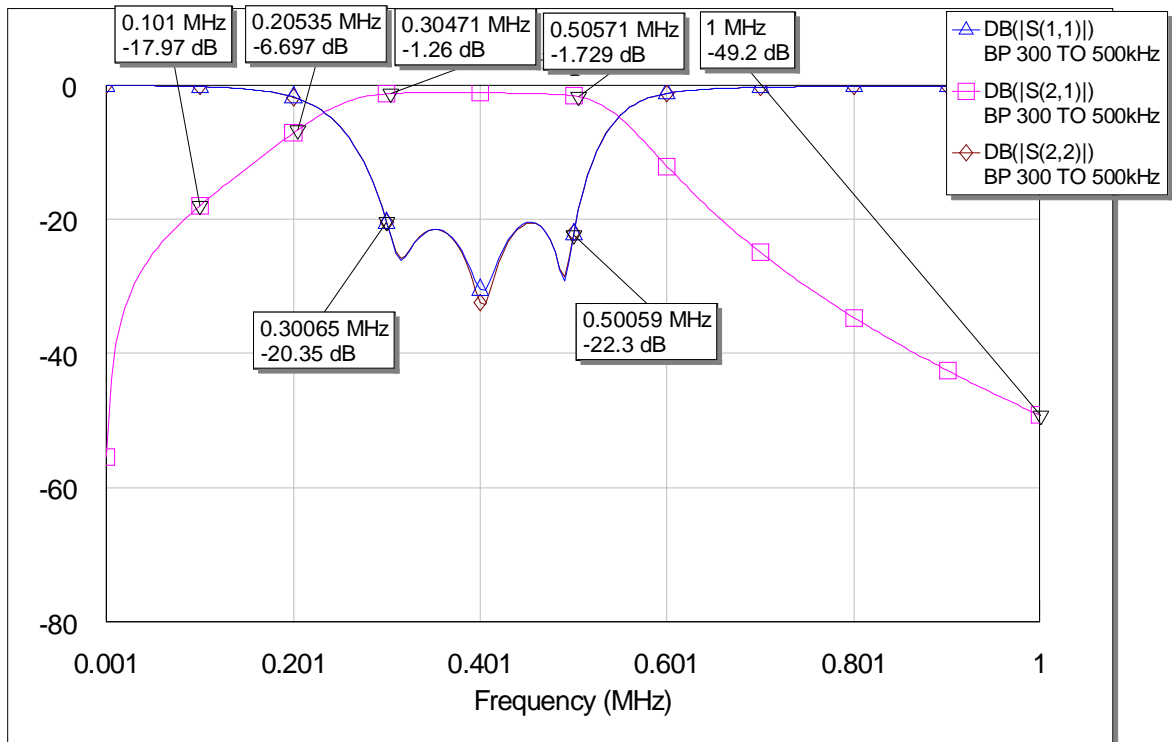
BP FILTER FOR 300-500kHz DESIGN -YU1LM



BP for 300-500 kHz with molded chokes version 2

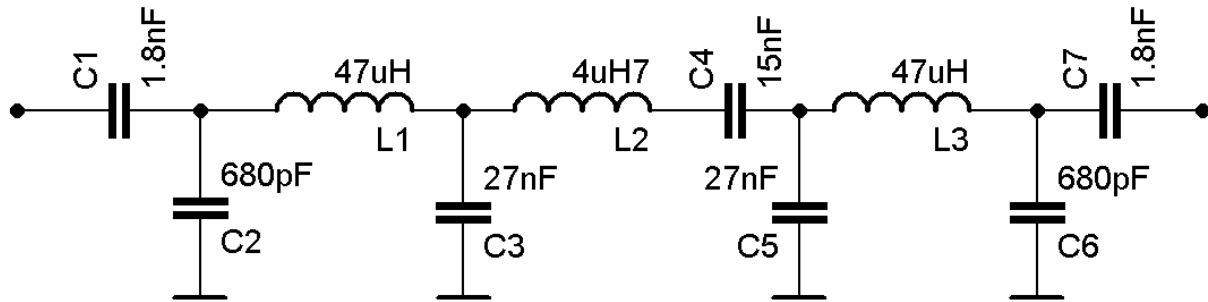


BP FILTER FOR 300-500kHz DESIGN -YU1LM

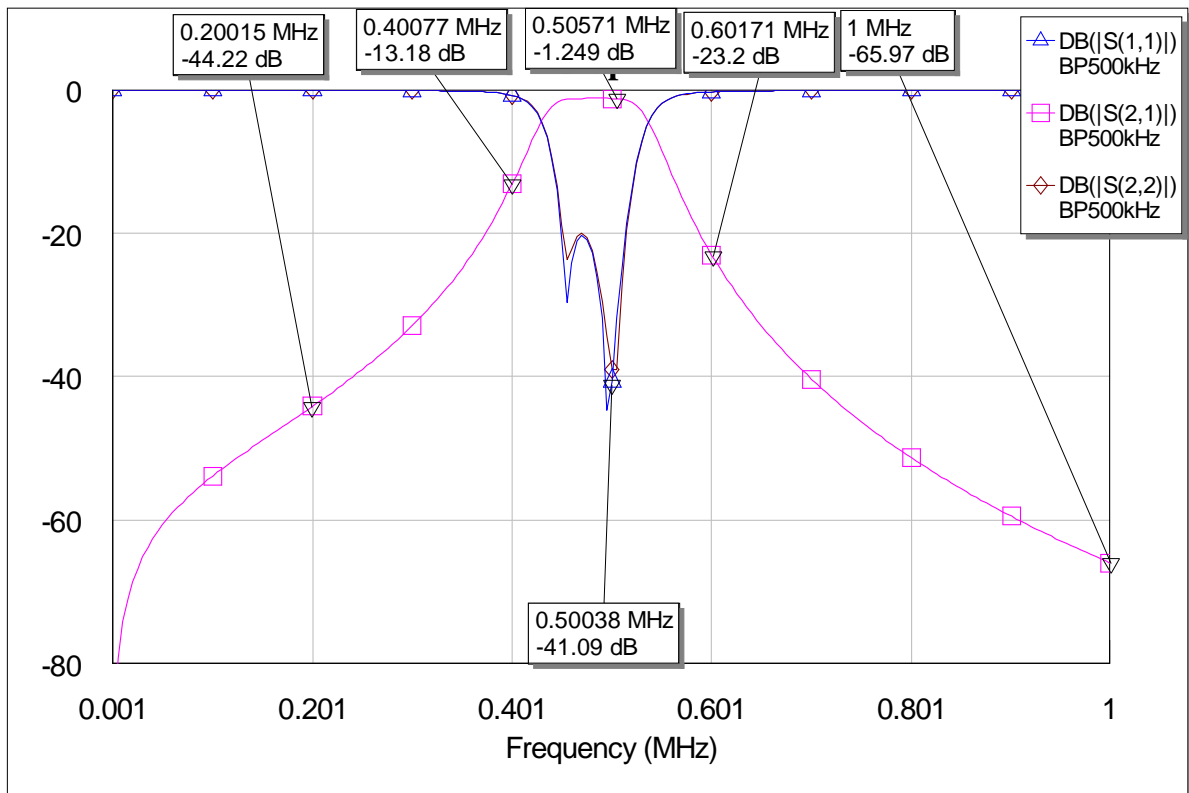


## Super selective BP filters for 500 KHz realized with high Q coils

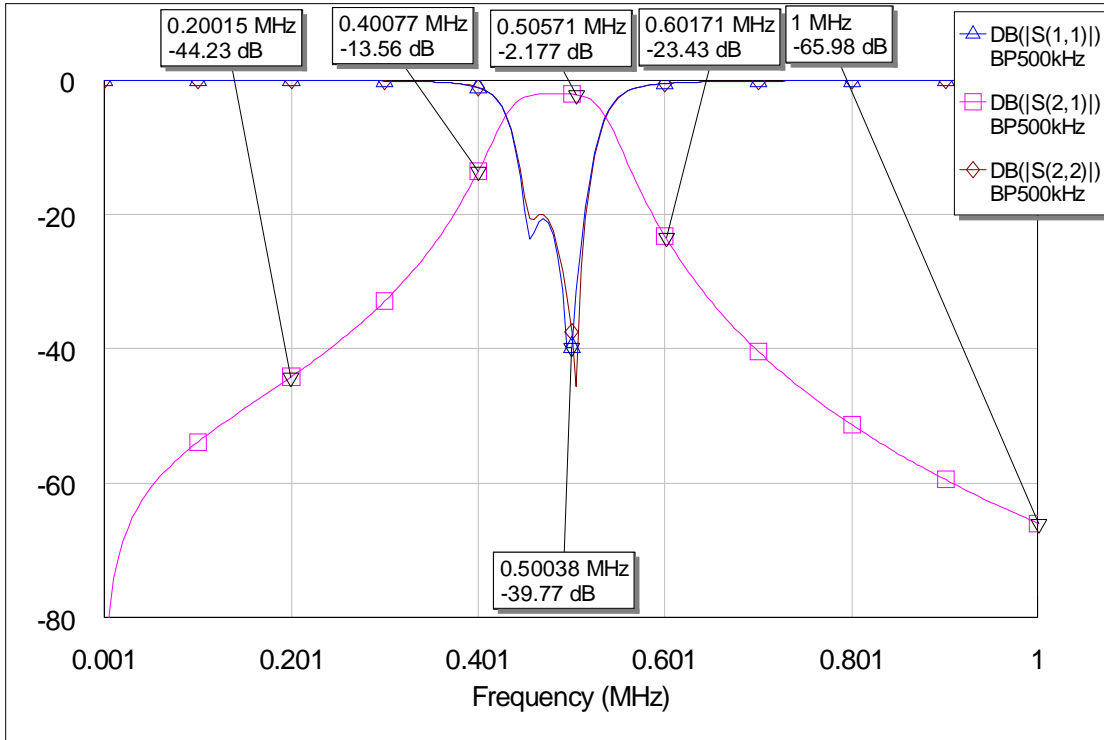
This design is little "touchy" for "no tune" realization but it is offering better selectivity. I am giving two proposals with predicted results for real Q factor for all built in components. To repeat good simulation results in praxis it is necessary that all components have tolerance under 5%. Inductor turn number is possible calculate with freeware software [4].



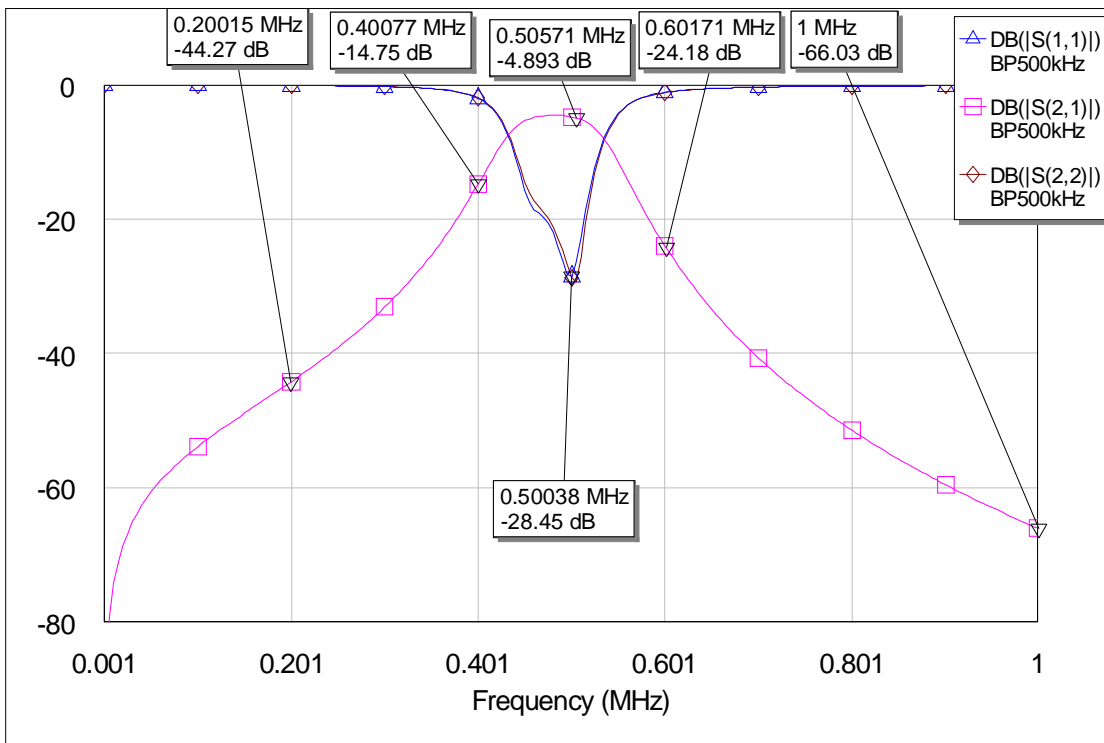
### SELECTIVE BP FILTER FOR 500kHz DESIGN -YU1LM



Inductor  $Q \geq 200$



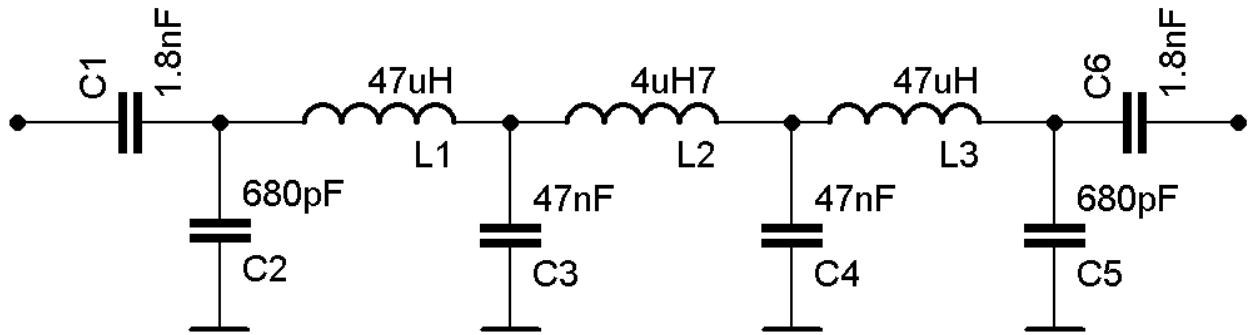
Inductor Q=100



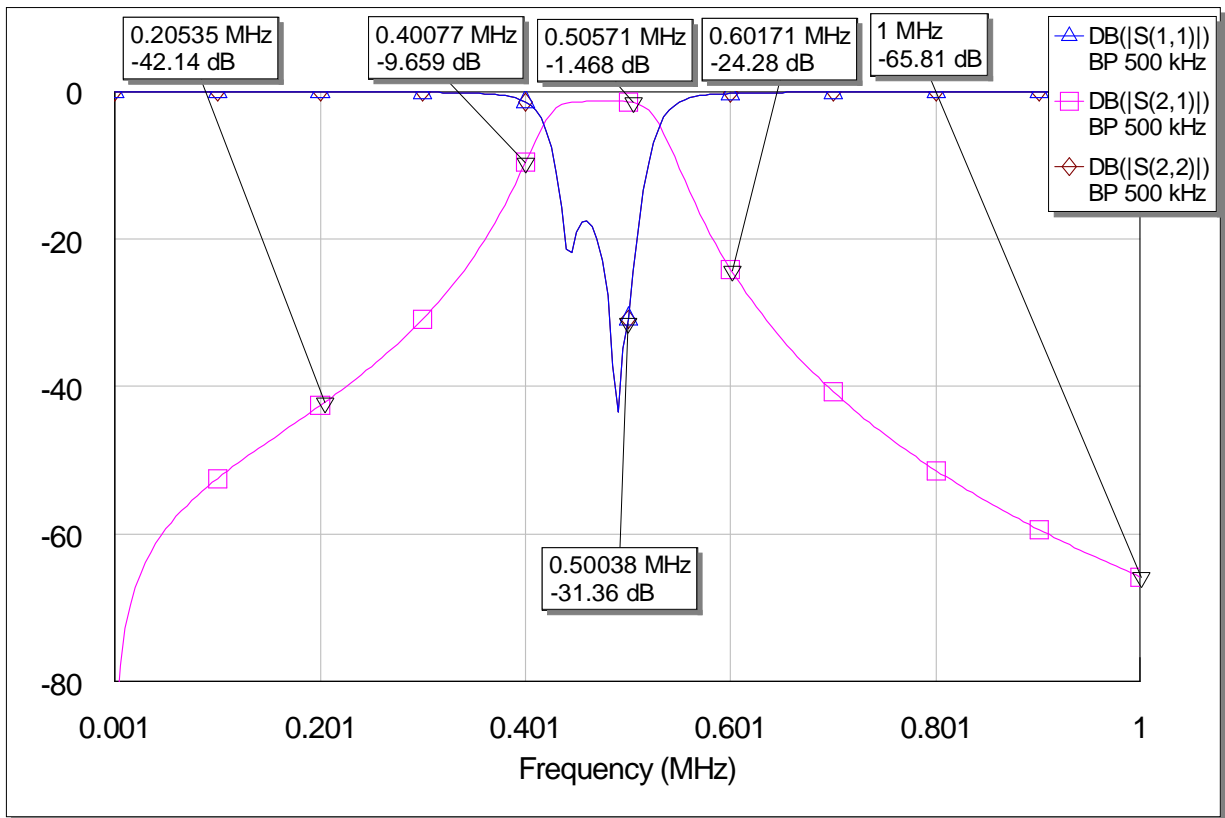
Inductor Q=40 typical value for molded chokes. I am not recommending this realization reason is too high IL.



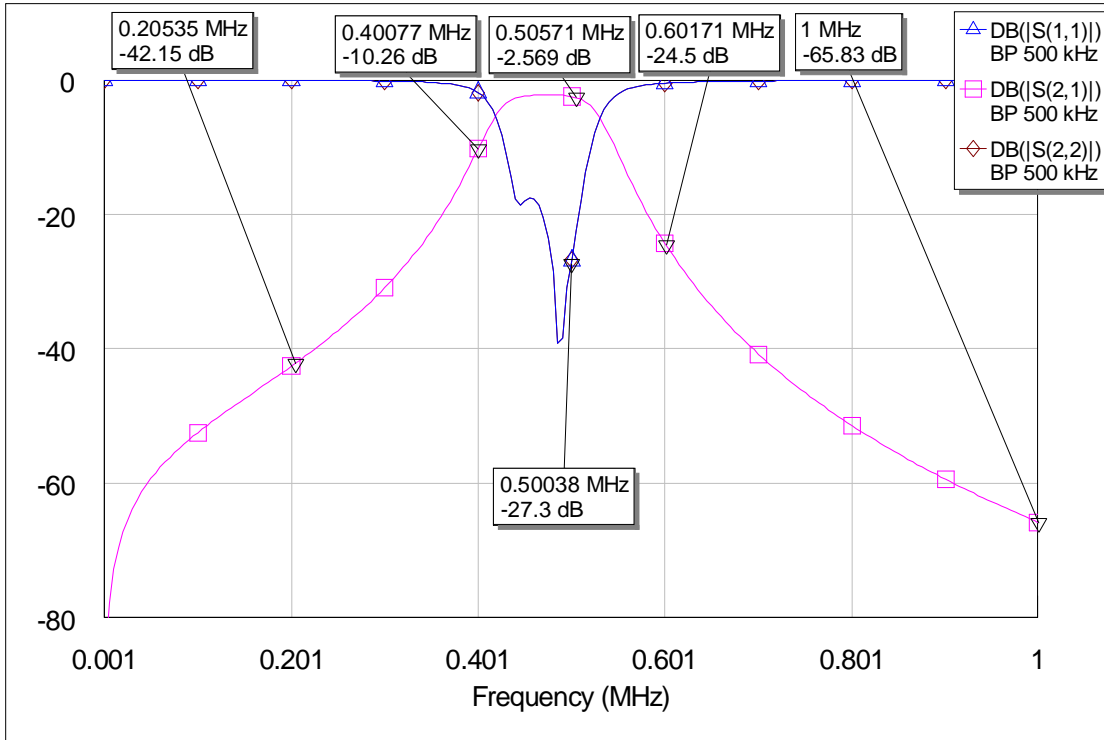
Simplified BP for 500 kHz



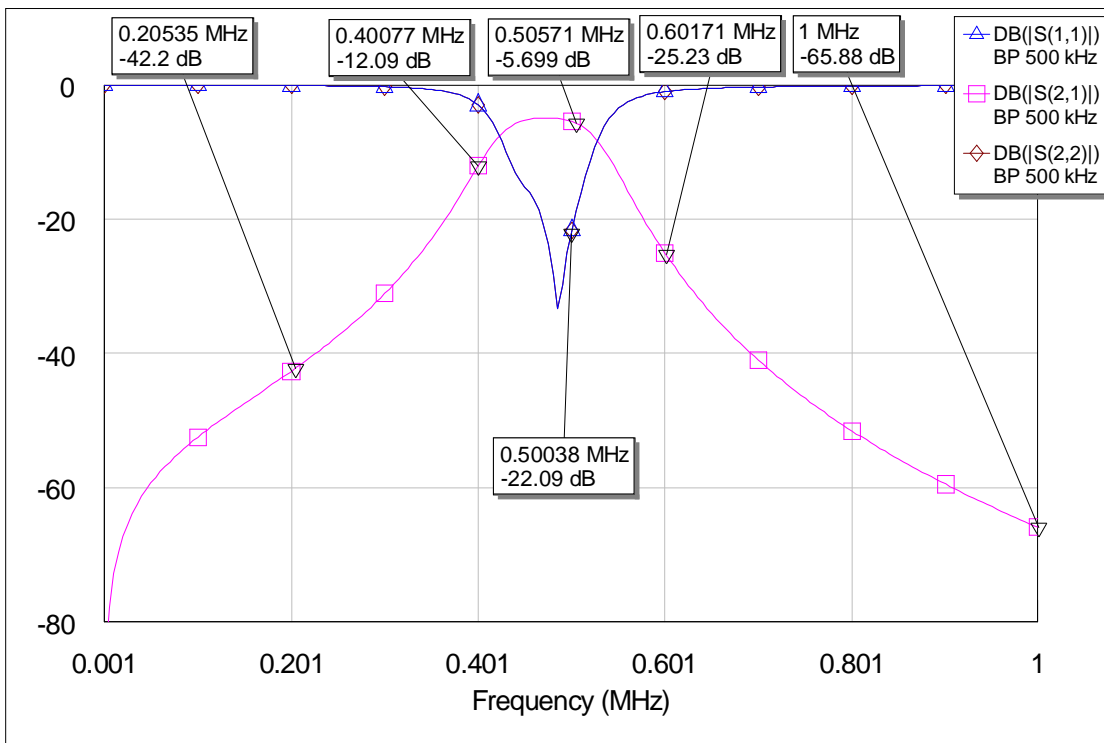
SELECTIVE BP FILTER FOR 500kHz DESIGN -YU1LM



Inductor  $Q \geq 200$



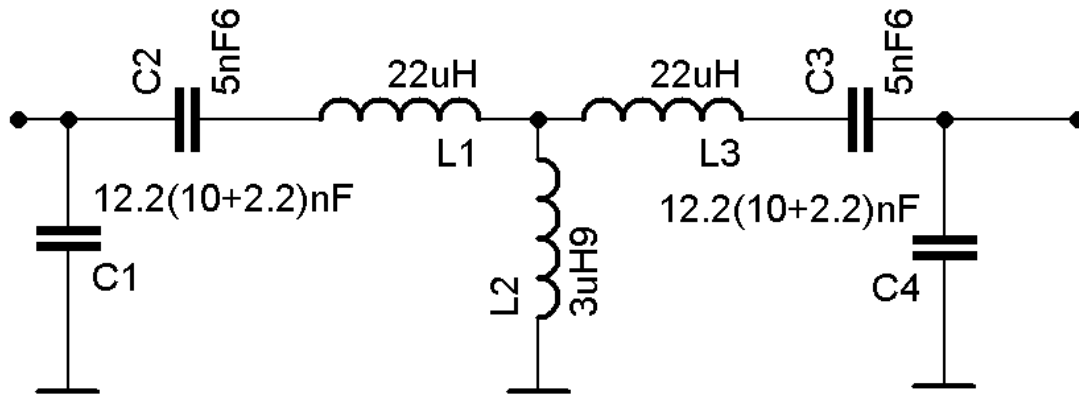
Inductor Q=100



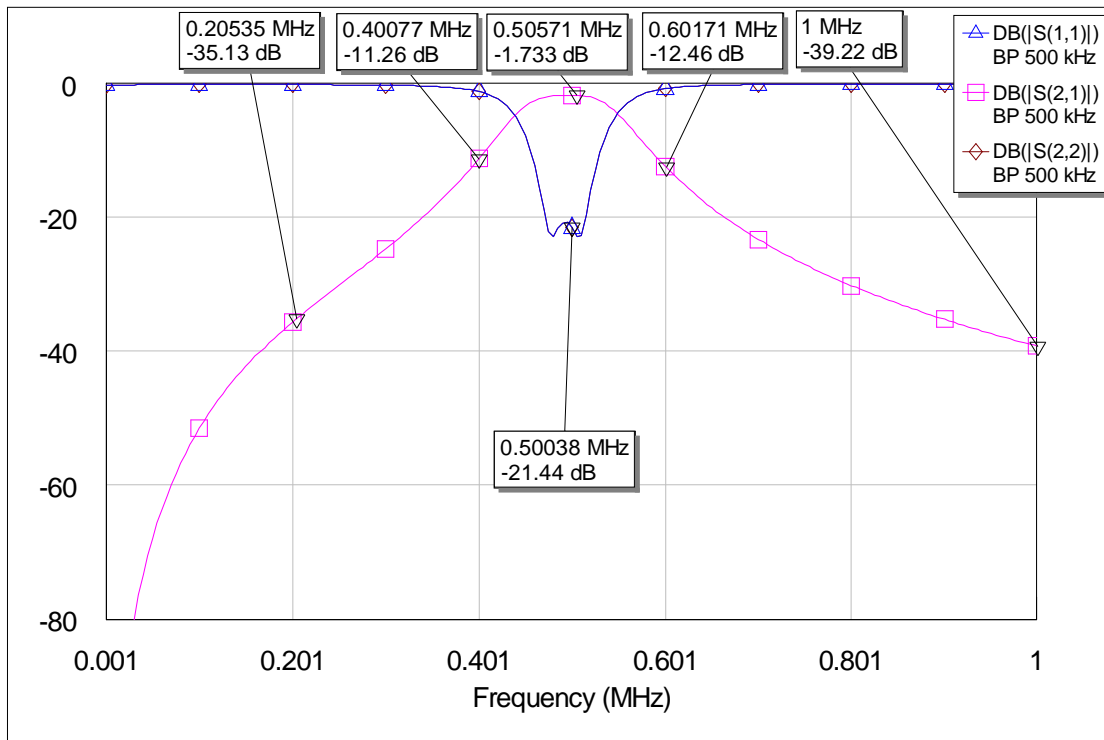
Inductor Q=40 typical value for molded chokes. I am not recommending this realization reason is too high IL >5 dB.

## Selective BP filters for 500 KHz minimum components and minimum IL (insertion loss)

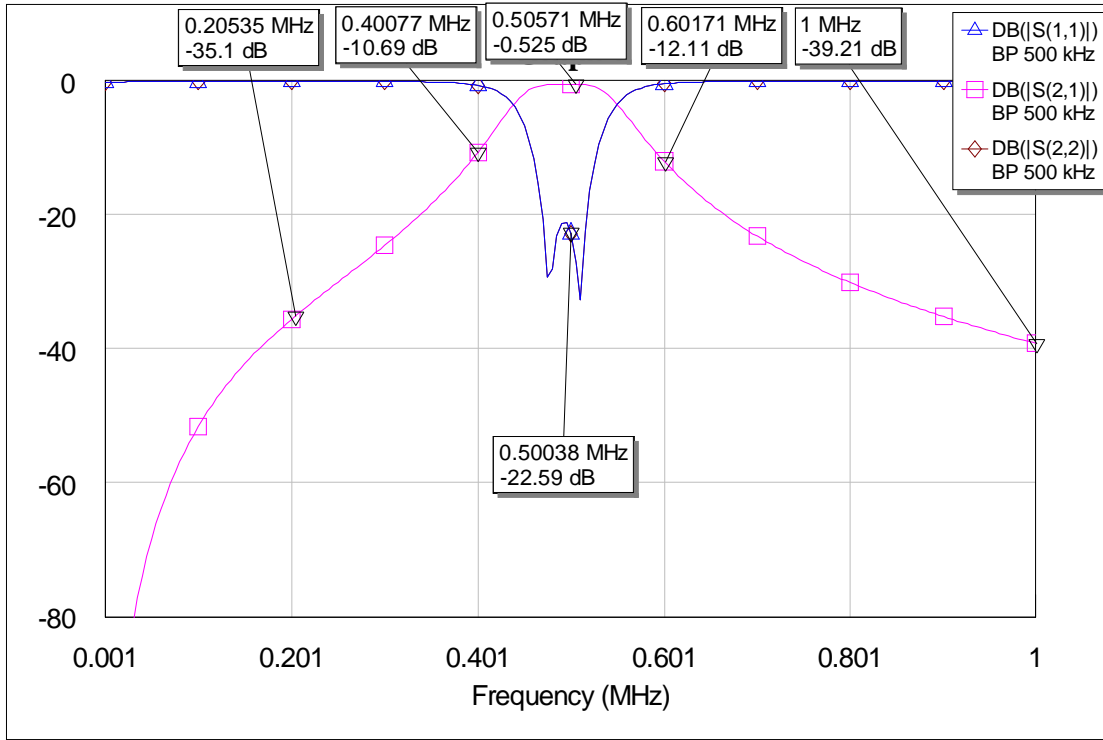
This design is little “touchy” for “no tune” realization but it is offering moderate selectivity, minimum IL (insertion loss) with minimum built in components. Realization is possible with high Q inductors but with molded chokes too. To repeat good simulation results in praxis it is necessary that all components have tolerances under 5%. L2 inductor is independent inductor not tap at coils L1 or L2. In practical realization it is necessary prevent unwanted L2 mutual coupling with L1 and L3 to achieve wanted selectivity and IL shape.



## SELECTIVE BP FILTER FOR 500kHz DESIGN -YU1LM

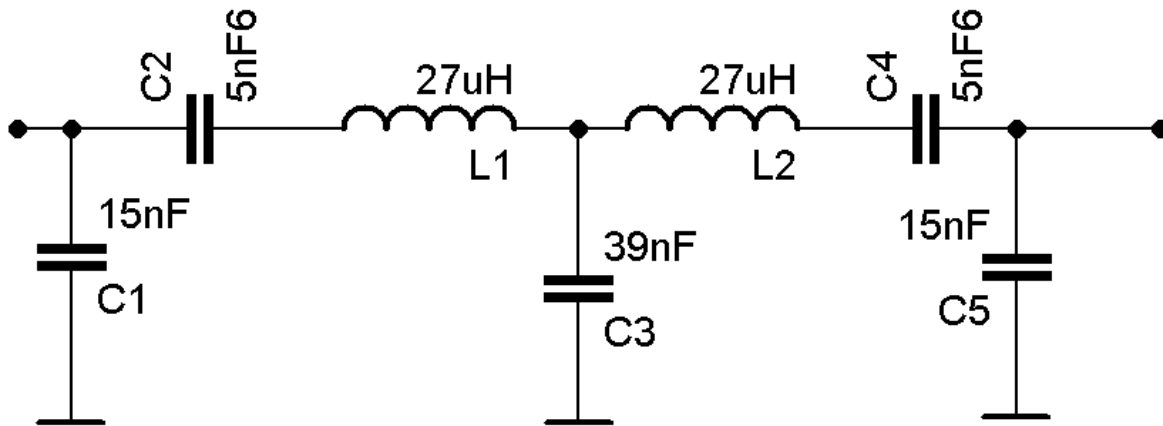


BP 500 kHz response with built in molded chokes

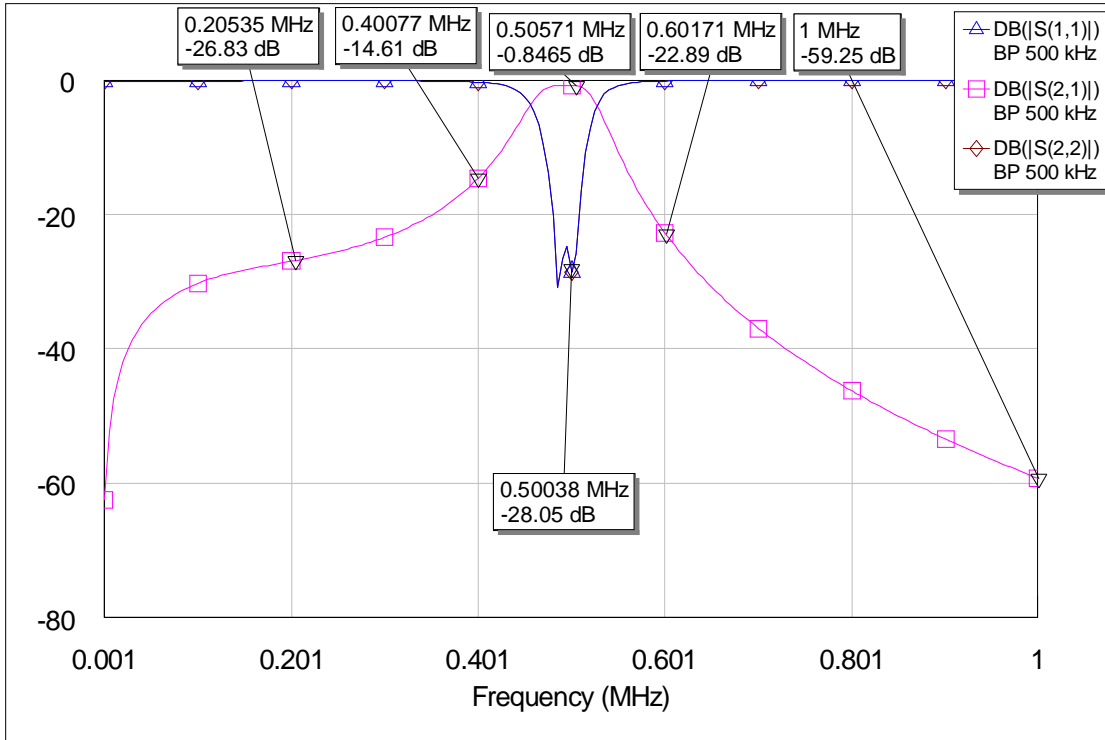


BP 500 kHz response with built in inductors  $Q \geq 200$

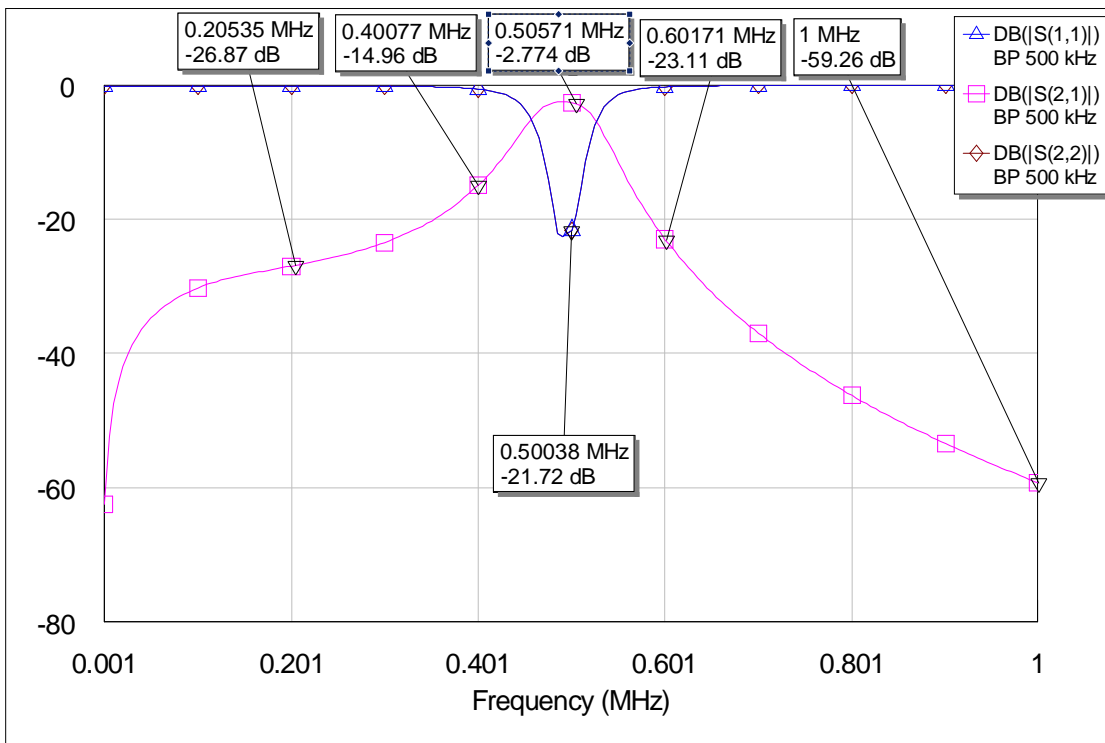
Selective BP filters for 500 KHz minimum components and minimum IL (insertion loss) version 2



SELECTIVE BP FILTER FOR 500kHz DESIGN -YU1LM

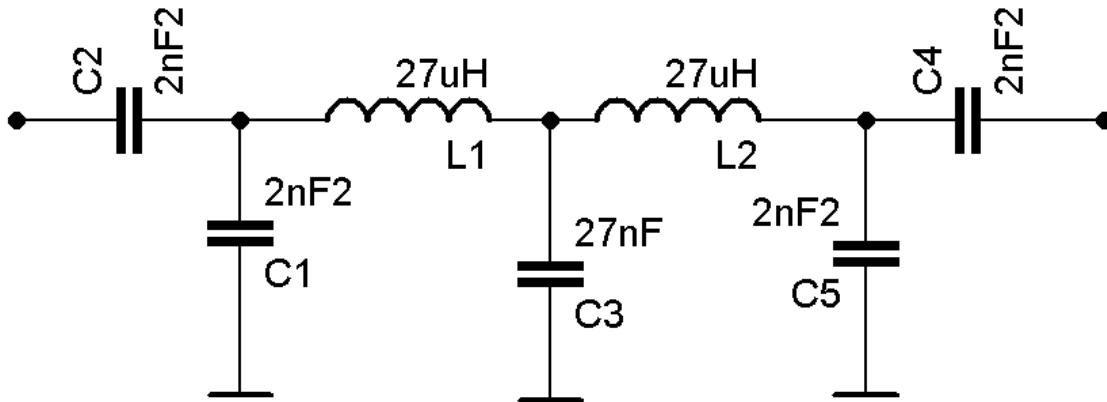


BP 500 kHz response with built in inductors  $Q \geq 200$

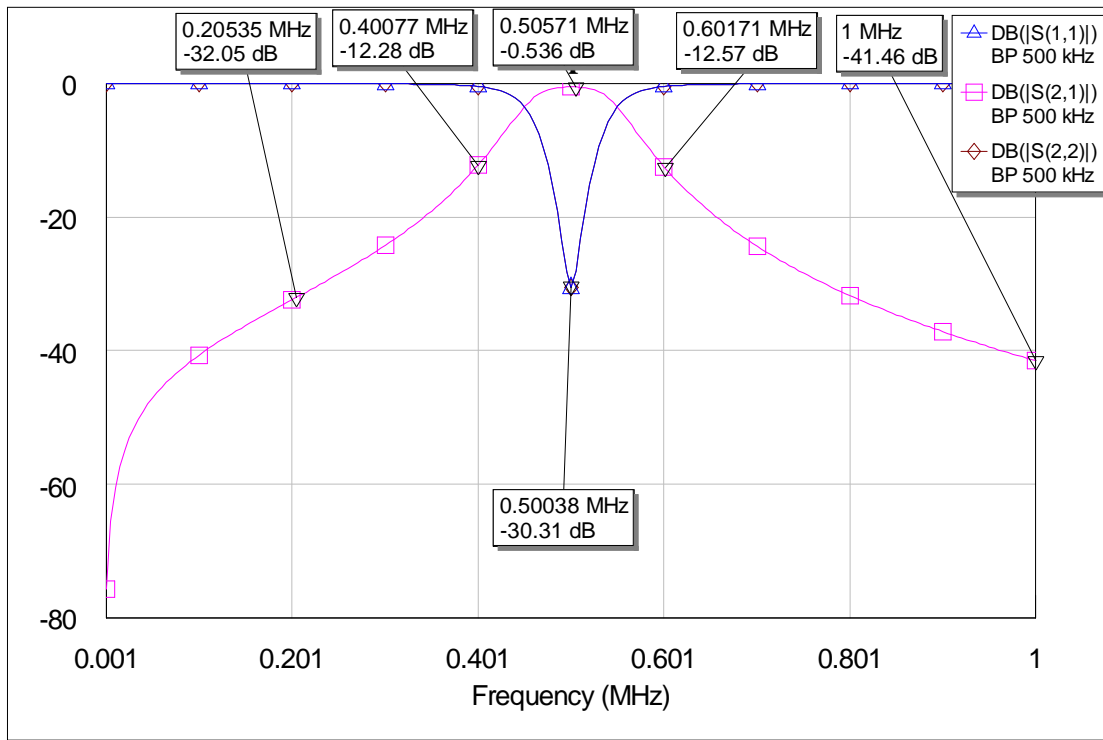


BP 500 kHz response with built in molded chokes

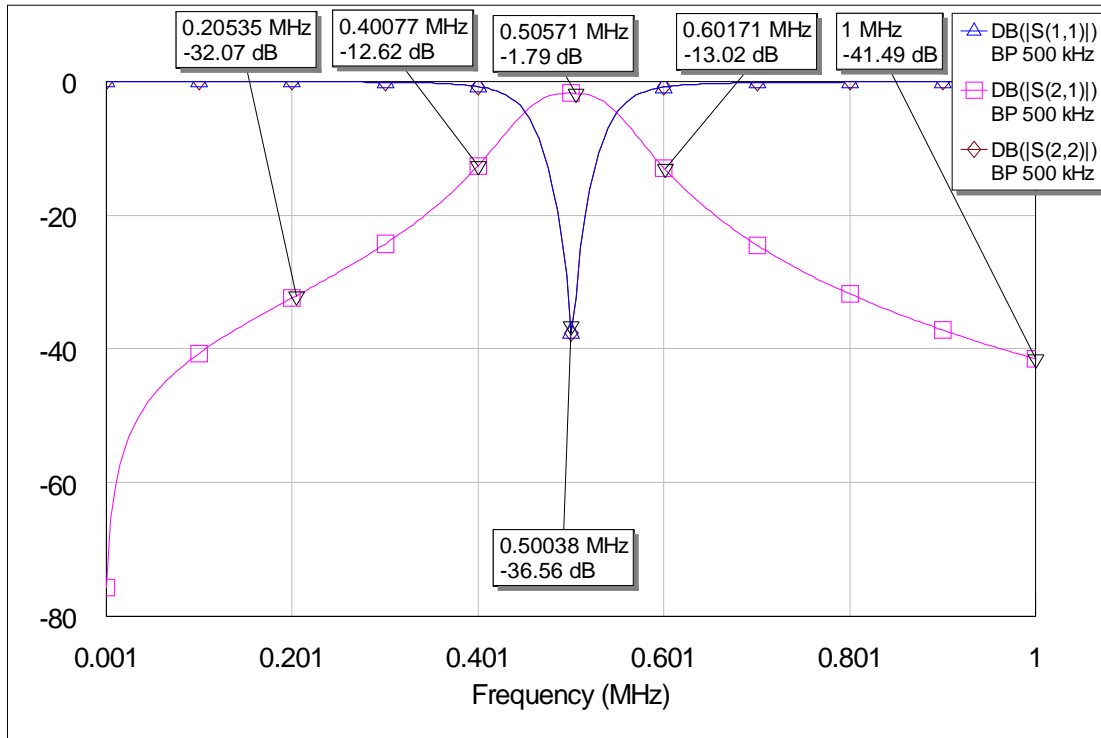
Selective BP filters for 500 KHz minimum components and minimum IL (insertion loss) version 3



SELECTIVE BP FILTER FOR 500kHz DESIGN -YU1LM



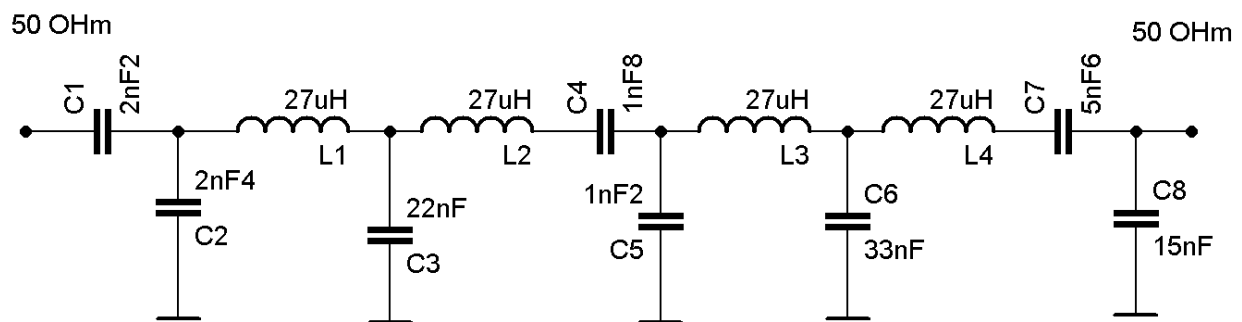
BP 500 kHz response with built in inductors  $Q \geq 200$



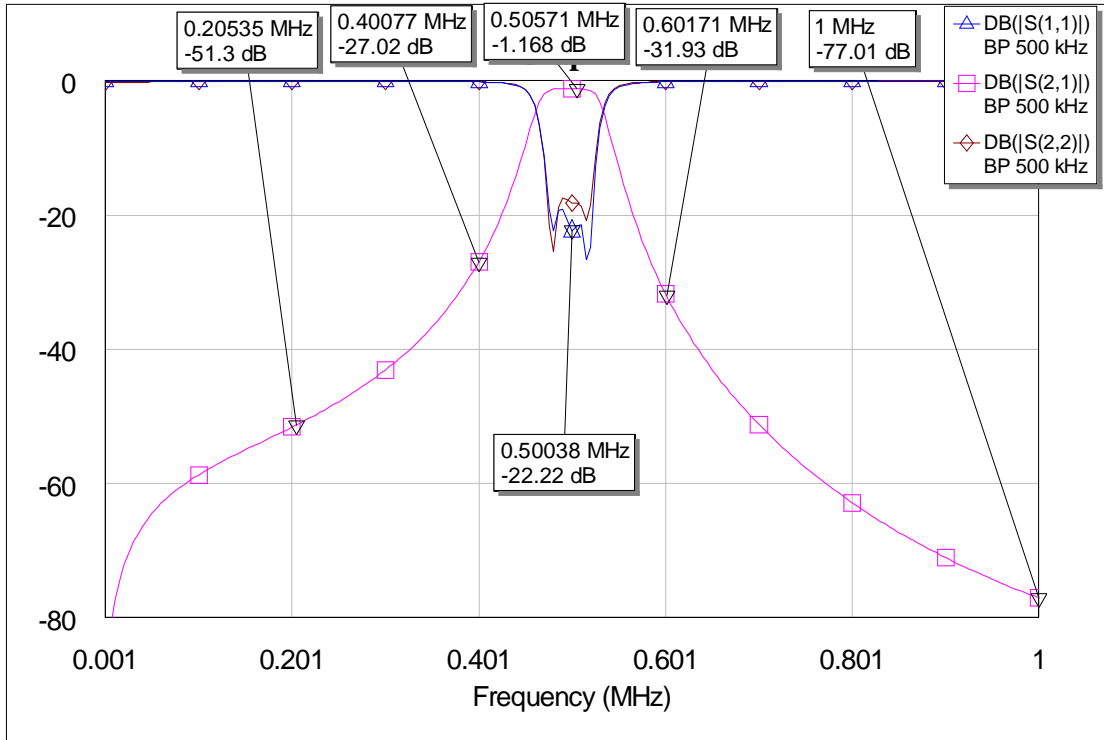
BP 500 kHz response with built in molded chokes

### Super selective BP filters for 500 KHz

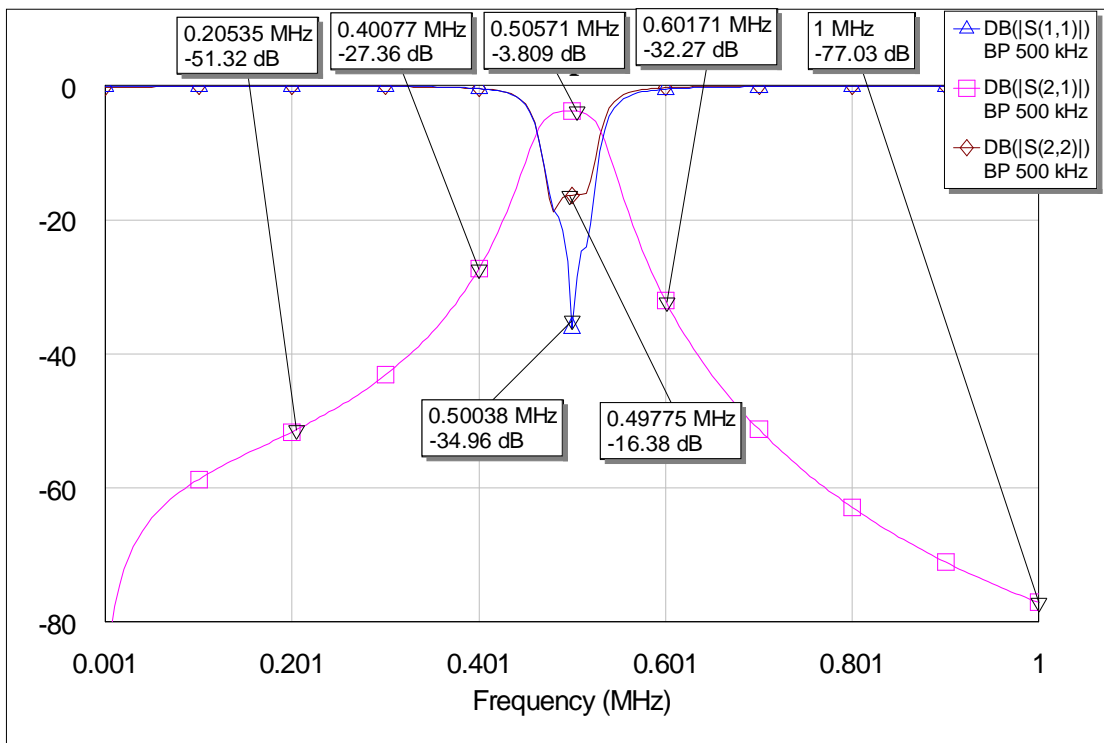
The super selective BP filter for 500 kHz is very really 'touchy' design in version "no tune" design. But if you have components with precise values 3% or better tolerances you will have very easy realization.



SUPER SELECTIVE BP FILTER FOR 500kHz DESIGN -YU1LM



BP 500 kHz response with built in inductors  $Q \geq 200$



BP 500 kHz response with built in molded chokes



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VY 73/72 and GL in homebrew Tasa YU1LM/QRP

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**References:**

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2. <http://www.linear.com/designtools/software>
3. [\*M.Martin DJ7VY :A New Type of Preamplifier for 145 MHz and 435 MHz Receivers/UKW berichte 1/1978\*](#)
4. [www.dl5swb.de](http://www.dl5swb.de)
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7. <http://www.bavarian-contest-club.de/projects/bandpassfilter/100W-BP.pdf>
8. <http://www.atceramics.com/>
9. *Lew Gordon K4VX-Band-Pass Filters for HF transceivers, QST September 1988 (pages 17-23)*