

Homework 2 of “Broadband Circuits and Systems”

Deadline: 2003/11/03

Constraints of digital filters:

- Mask of power spectrum density (PSD) as shown in Fig. 1.
- Peak-to-peak passband ripple < 2dB.
- Input rate: 2.208M samples per Hz (Msp/s)
- Output rate: 17.664Msp/s
- Assume that the AFE can provide 30dB of stopband attenuation. Please pay attention on the image rejection because of the upsampling operation.

1. Design an IIR digital filter according to the constraints
2. Design an FIR digital filter according to the constraints
3. According to the constraints, design a digital filter that consists of IIR and FIR digital filters
4. Calculate the required computing-power (adds and multiplications) of the designed digital filters

