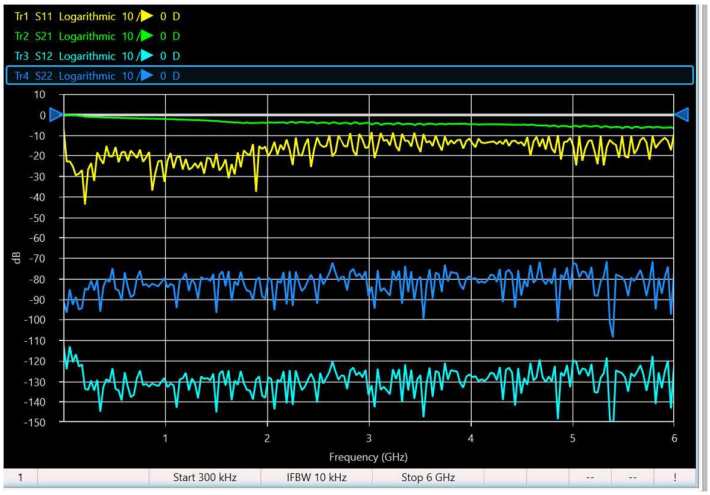
Bouskila laurene 949271043

Microwave Lab3

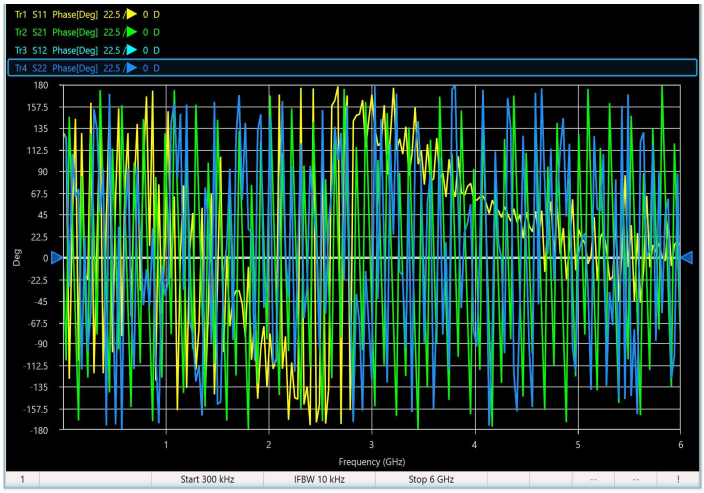
Calibration Meas

Uncalibrated gain measurements

Gain



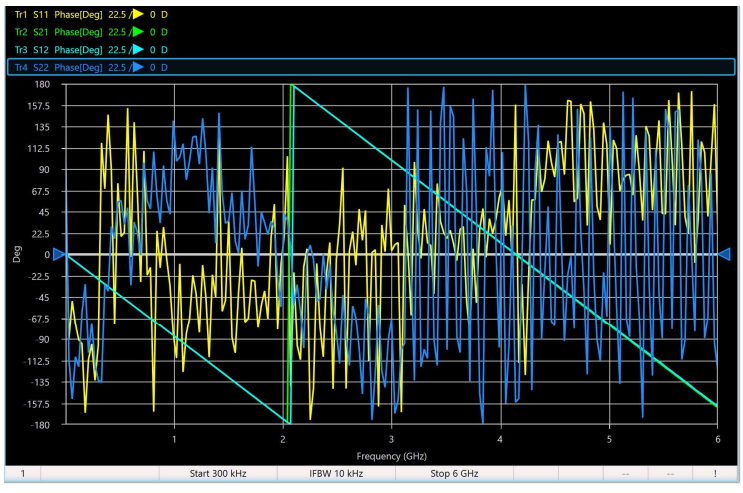
Phase



Calibrated gain measurements

Gain

Phase



We can observe that the calibration process enabled the S parameter S11 to decrease in magnitude which results in a decrease of the loss or of the noise that come with the signal. S22 goes to 0 dB after calibration process.

Regarding the phase, we can clearly see a tendency for the calibrated port S12 and S21 to be defined (somehow constant) whereas the uncalibrated ports keeps variating very abruptly.

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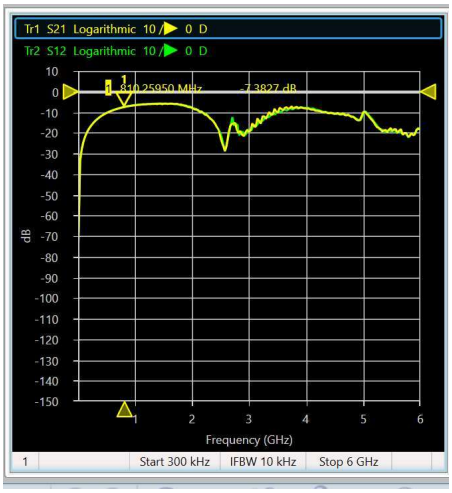
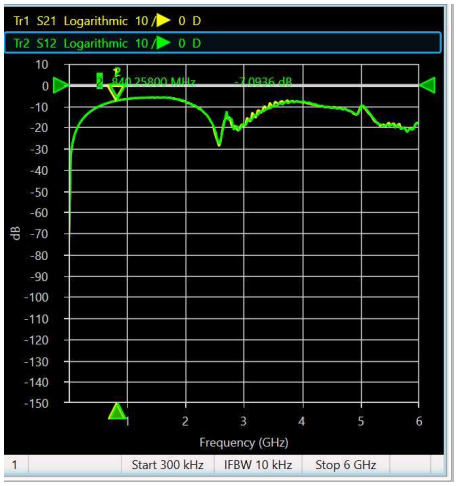
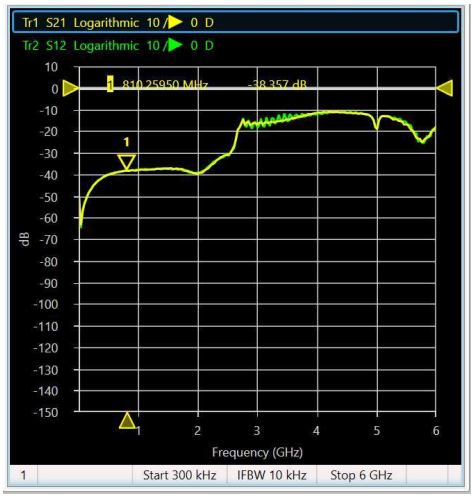
Coupler Measurements

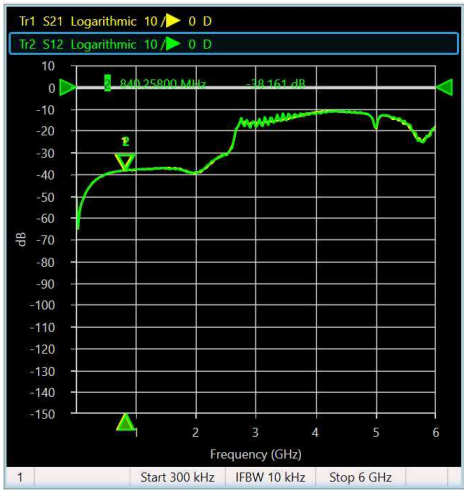
S21=-7.38dB S12=-7.09dB S21/12=transmission in-coupledport=-0.29dB





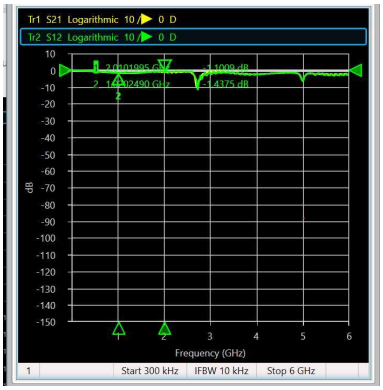
S12 gain = -38.161dB, S21 gain = -38.357dB, S21/S12 out-coupled = 0.196dB





D=directivity=0.486dB

1GHz->2GHz, IL = -1.43+1.1= -0.33 dB -> input to output



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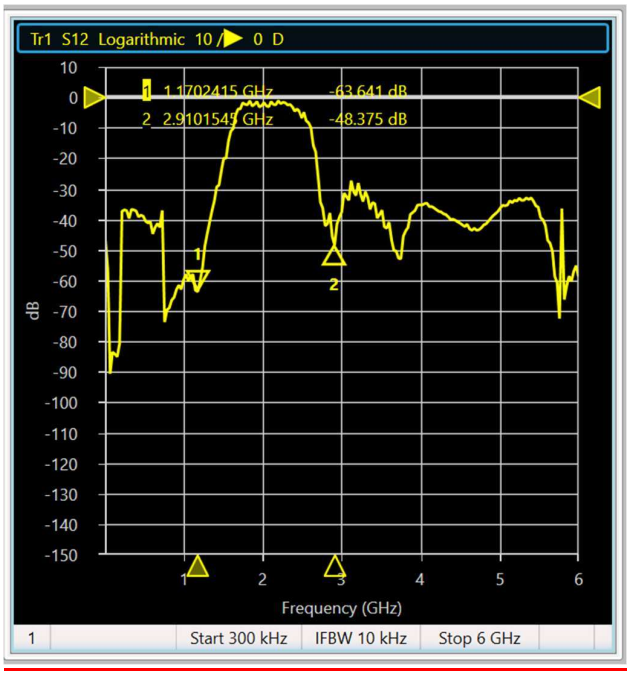
Filter Measurements

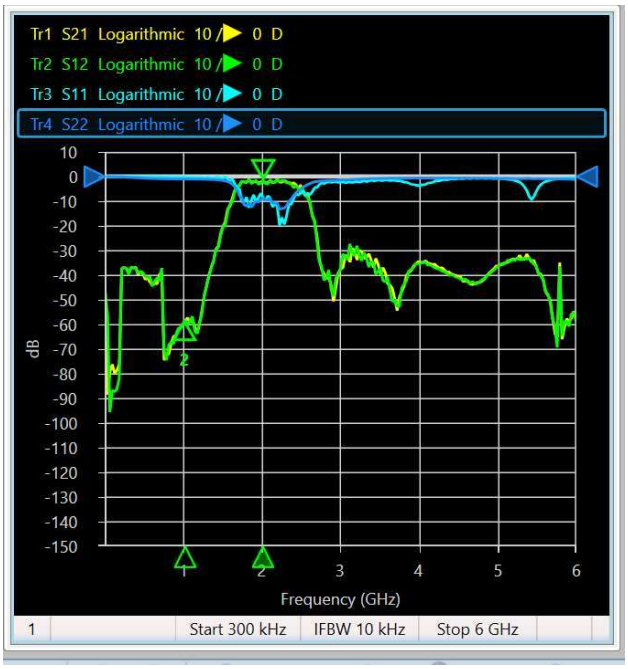
VBFZ-2130+:

Bandwidth = 2.91 – 1.17= 1.74 GHz



IL = S21/S12 = -10.8+3.62 = -7.18 dB

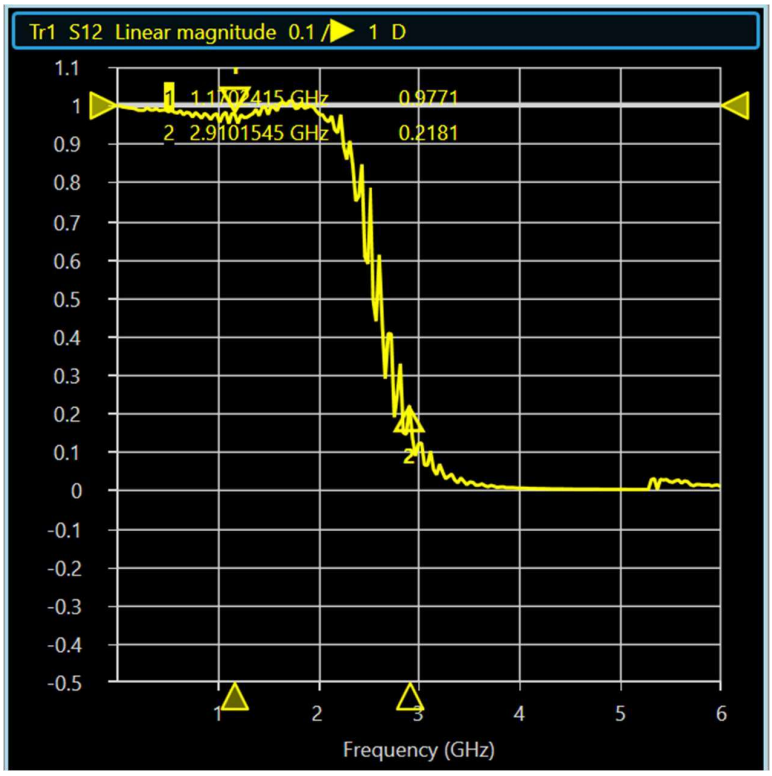
RL = S22/S11 = -2.56 + 8.78 = 6.22dB



The observed frequency response are typical of a bandpass filter.

SLP-2400+:

Bandwidth = 2 GHz



IL = S21/S12 = -0.05+ 0.600 = 0.550dB

RL = S22/S11 = -0.6 + 0.64 = 0.04 dB

Wesee that the filter has the typpical frequency response of a LPF(s21)

MICROWAVE LAB

- Experiment 3 -

9497103
Bousiala
Laurène

Analysis

1) Compare your measurements results w/ the spec. provided in Datasheets
Discuss similarities and diff. Between them.

- Low Pass filter

Frequencies selected on datasheet of the filter and compared to frequencies from measurement are close.

3dB @ 2,5GHz vs 2,4GHz in datasheet

BPF

Bandwidth of the measurements are also close to the datasheet

Values from datasheet and from graph are also close

Differences might be created By Noise

2) which of the Devices measured are lossless and which are Reciprocal? Explain.

There are no lossless devices measured.
LPF, BPF, Coupler are Reciprocal devices (measured).

Reciprocal Devices are saving a lot of work in the experimental results due to their symmetry

3) Classify the various devices measured as passive or active.
For 4 of the latter, evaluate the energy Balance and then specify the relevant efficiency parameters

Couplers ⊕ Filters → Passive Devices
Amplifier ⊕ Mixers → Active "