TP Frequency mixer and amplifier

II. Measures

1) Characterization of local oscillator LO

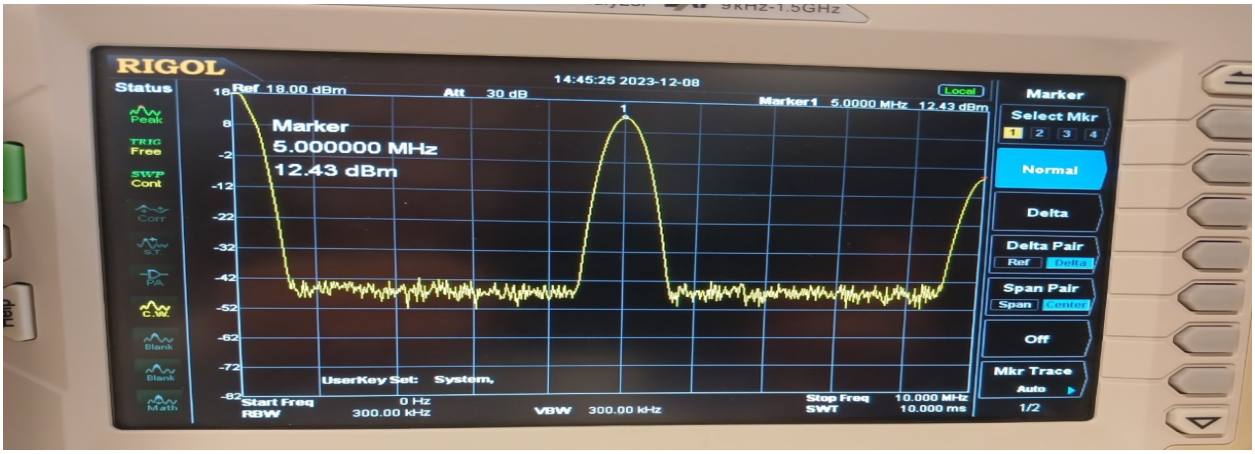

Figure.1.

We take a central frequency that prensent high frequency at 5 MHz and then we obtain from Figure.1. P=13 dBm

2) Characterization of local oscillator LO

We add for the initial schematic a low pass filter for eliminate Image frequency so the intermodulation

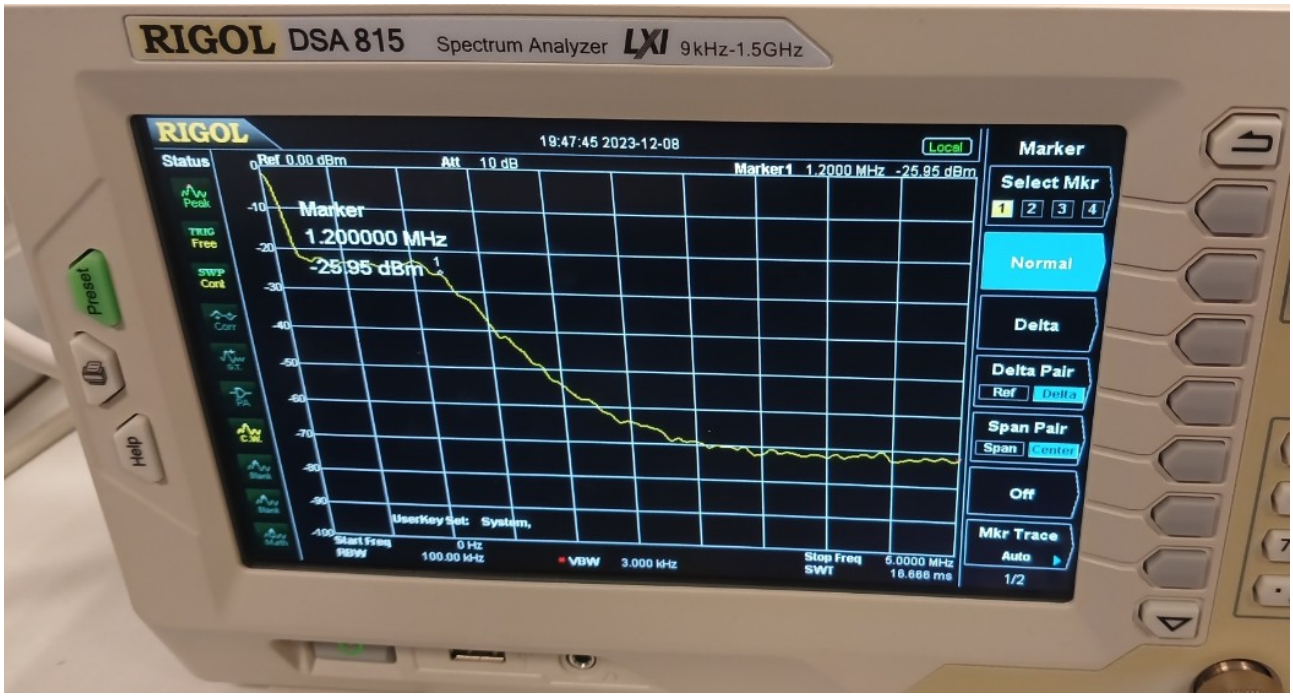

Figure.2.

We observe in Figure 2 low pass filter and before him we have some modulation due to parasitic resistor, after we put bandwidth for eliminate fluctuations; We remark flat band consequentelly to the low pass filter, so he remove all the intermodulation.

We calculte cutoff frequency at -25,95dBm F0=1,2MHz.

3) Characterization of Mixer
a)Identification of mixing products

RF=OL(+-)IF
RF=5MHz(+-)500KHz

1st case
we have RF high than IF
RF=5,5MHz

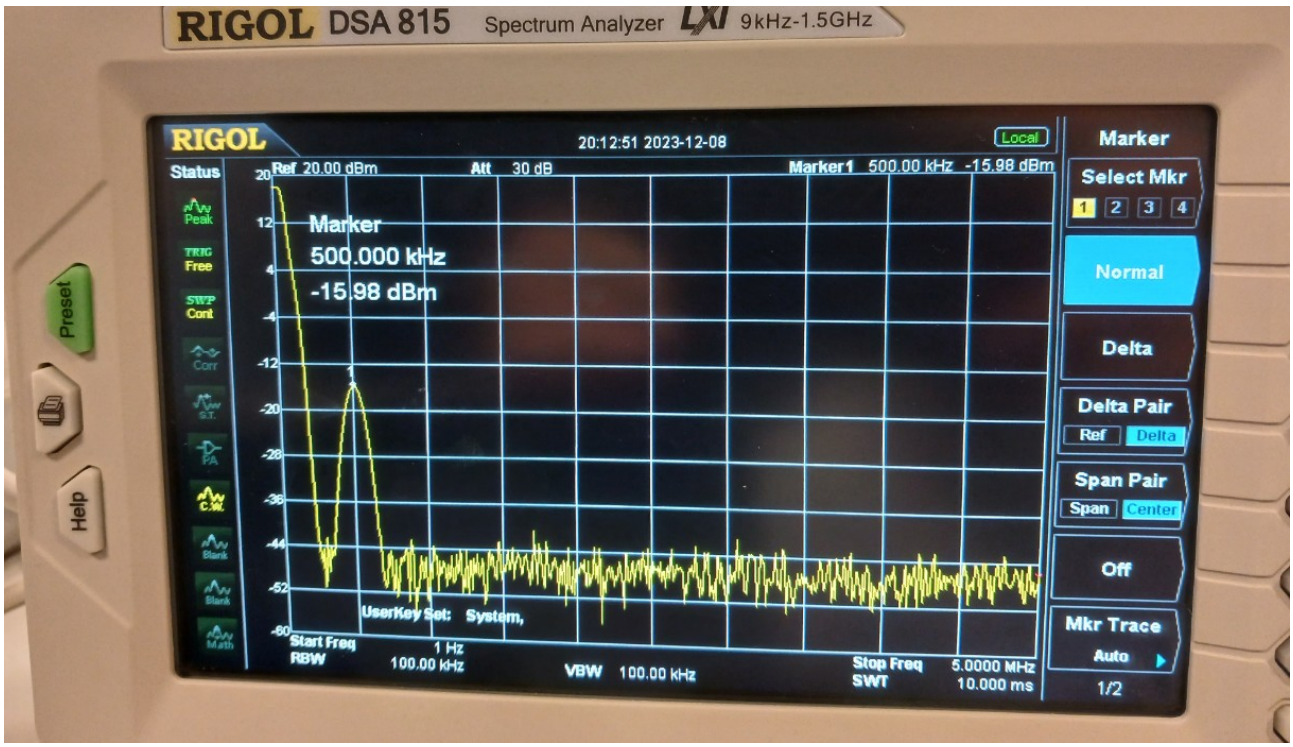

Figure.3.

from figure.3. we deduce this value
=-15

2nd case
RF=4,5MHz
=-14,8

We notice for the cases the values are the same

b)Conversion losses

1st case(RF=5,5MHz)
0dBm----------→-29,95dBm
5dBm----------→-35dBm
7dBm----------→-36,67dBm

2nd case(RF=4,5MHz)

0dBm----------→-29,95dBm
5dBm----------→-34,80dBm
7dBm----------→-36,70dBm

we notice that the both cases are the same

c) Isolation between ports

Is=OL_{OL}-OL_{IF}
Is=-44-(-7)
Is=37dBm

1st case(RF=5,5MHz)
Is(RF/IF)=P(LO at LO)-P(LO at IF)
=0-(40)=40dBm

Is(LO/IF)=P(LO at LO)-P(LO at IF)
=7-(-37)=44dBm

2nd case(RF=4,5MHz)

Is(LO/IF)=P(LO at LO)-P(LO at IF)
=7-(-44)=51dBm

Is(RF/IF)=P(RFat RF)-P(RF at IF)
=0-(-40)=40dBm

P(IF at IF)=-38dBm

P(IF at LO)=-50dBm

P(LO at LO)=7dBm