Task-5 Maximum Gain Amplifier Design

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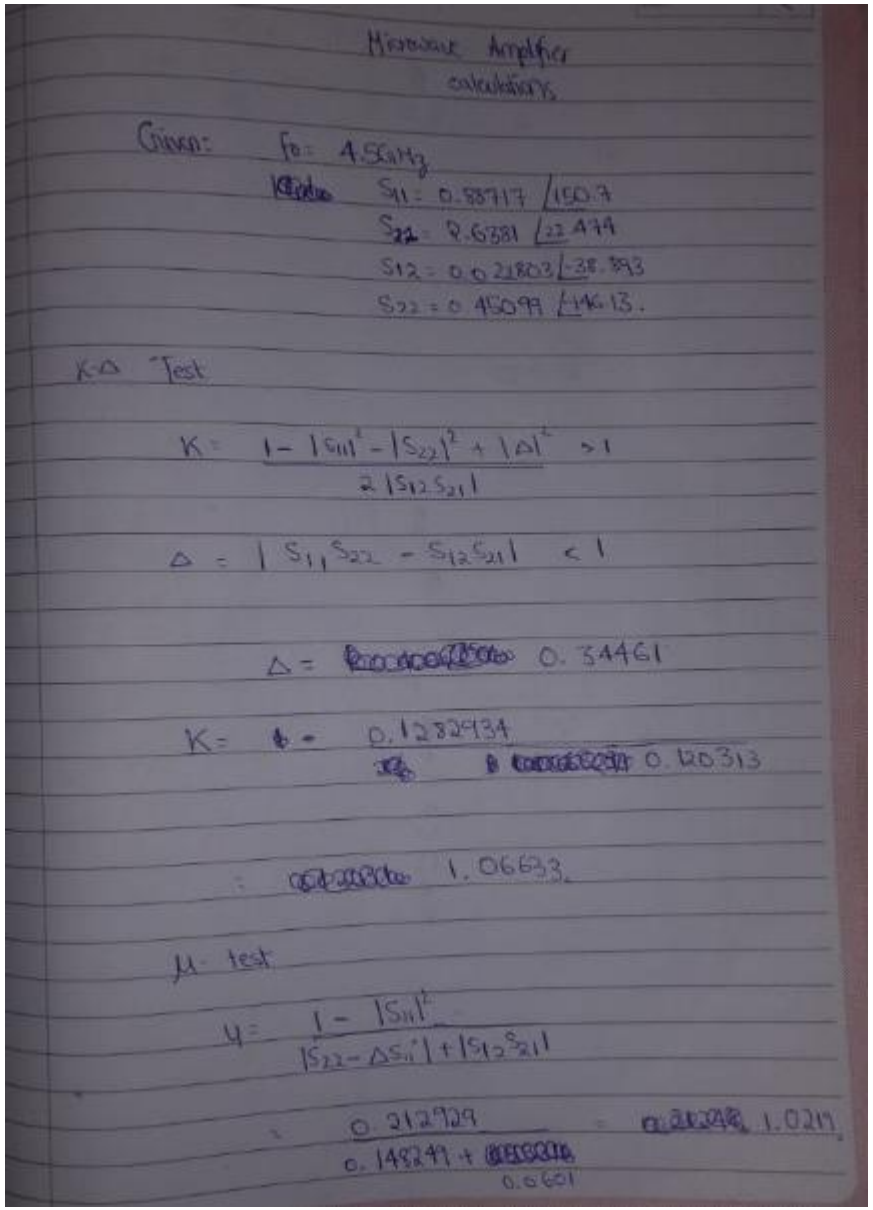
Objective

- Designing a Maximum gain Amplifier for specified operating frequency (*f*0=4.5Ghz) using given transistor
- S2p file in the rar-zip file is used for producing operation of transistor.
- The amplifier is designed and simulated.
- Analysing the performance, is later performed with graph.

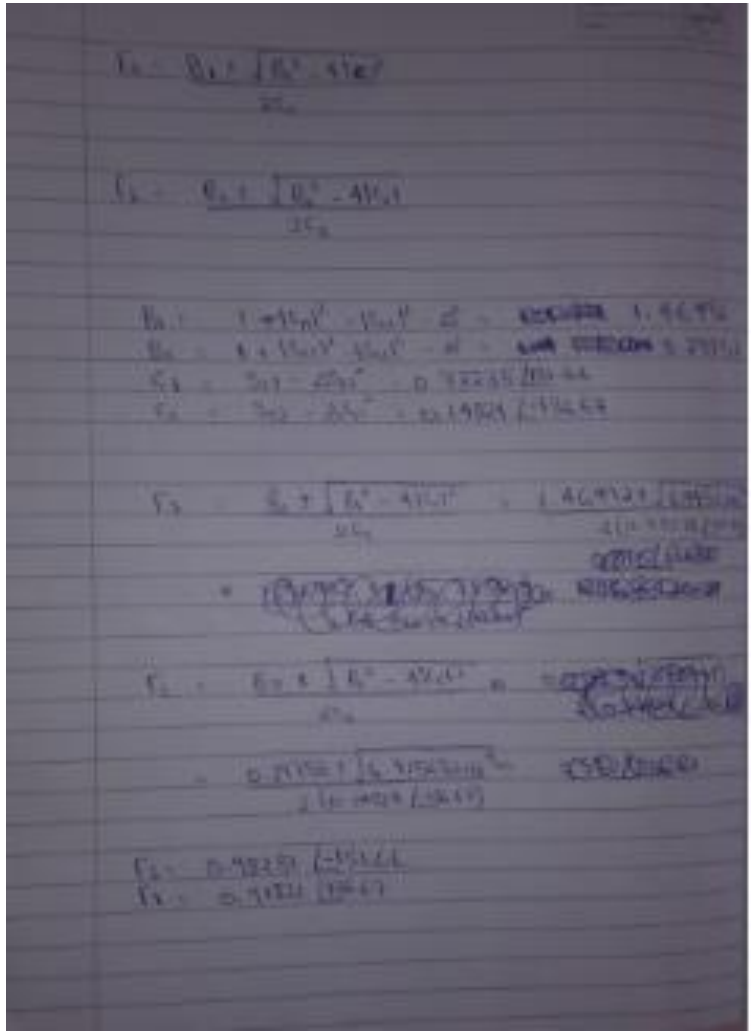
Procedure

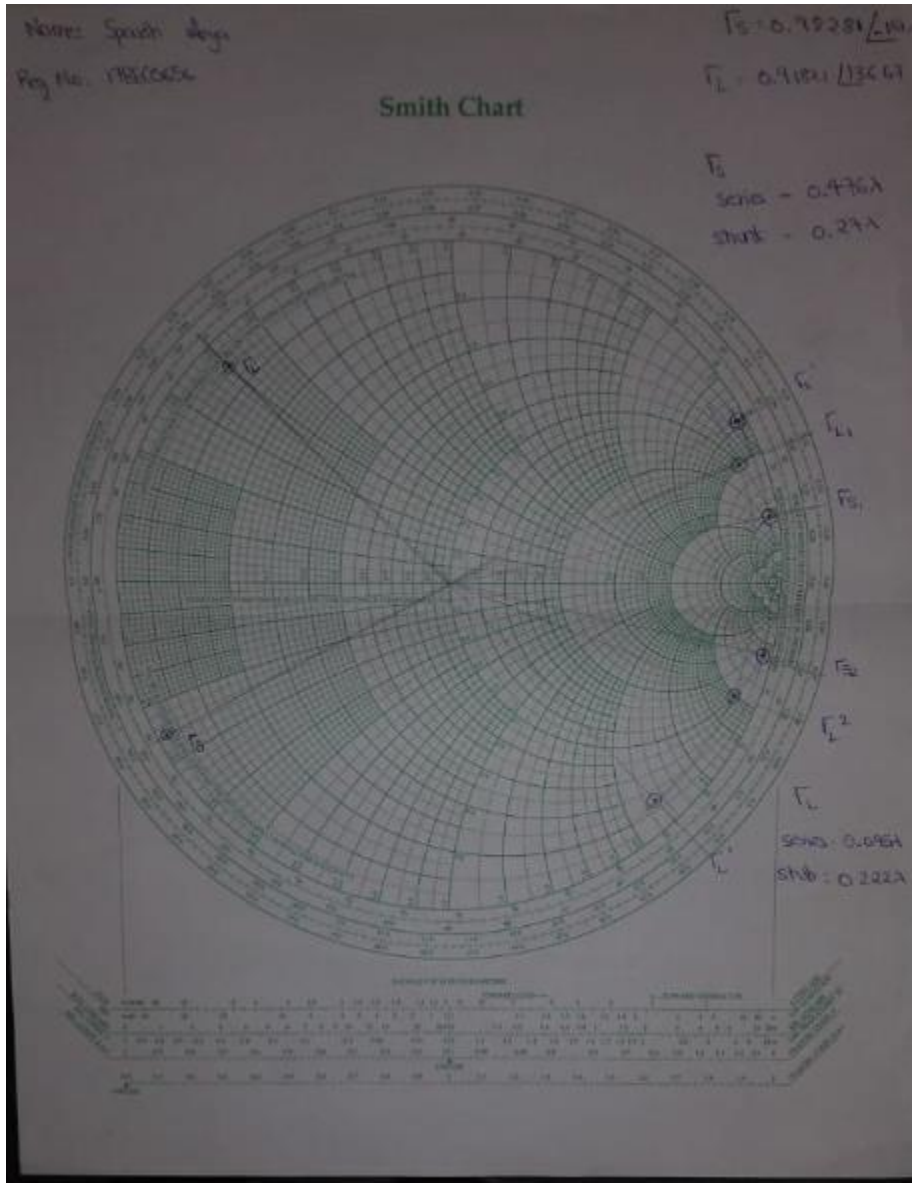
- Calculate Fs and Fl using the equations.
- Plot the Fs and Fl in a smith chart and find respective values for series and shunt stub.
- Find the respective values of W and L for the series and shunt stub using transmission line calculator.
- Design the circuit
- Simulate the circuit.
- Analyze the results.

Design and calculations

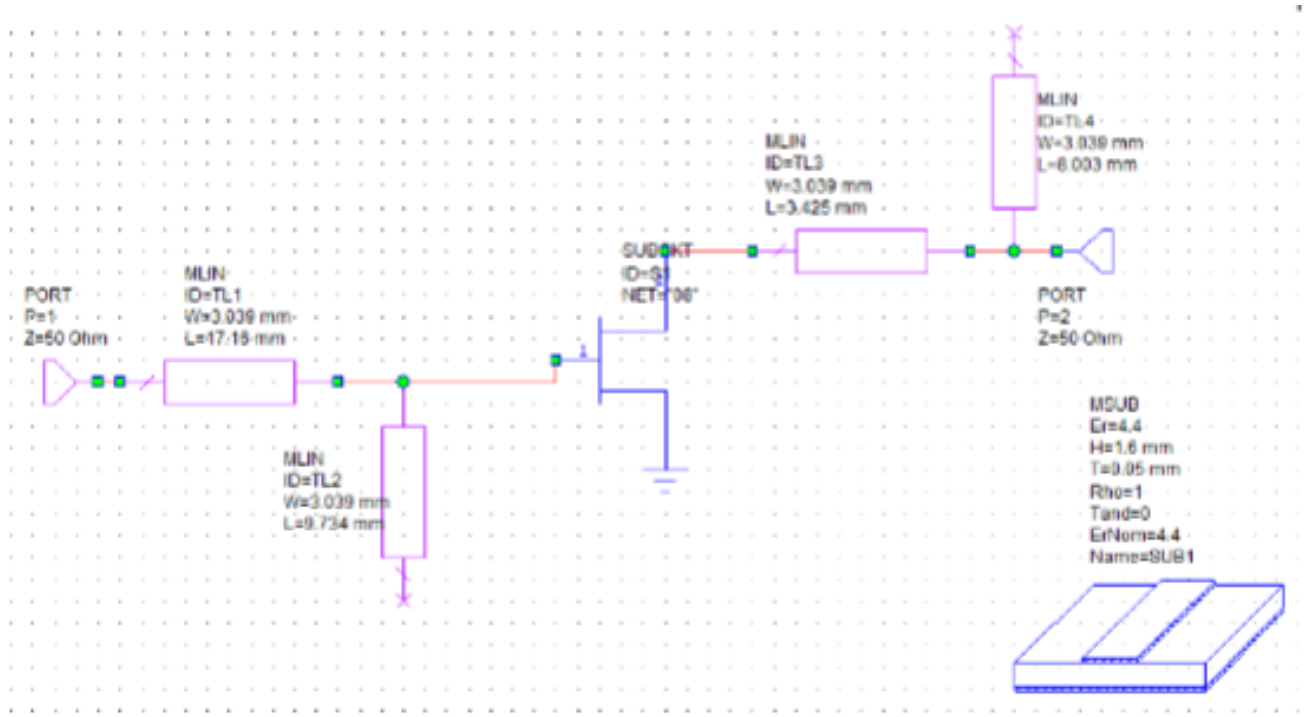


Design and calculations

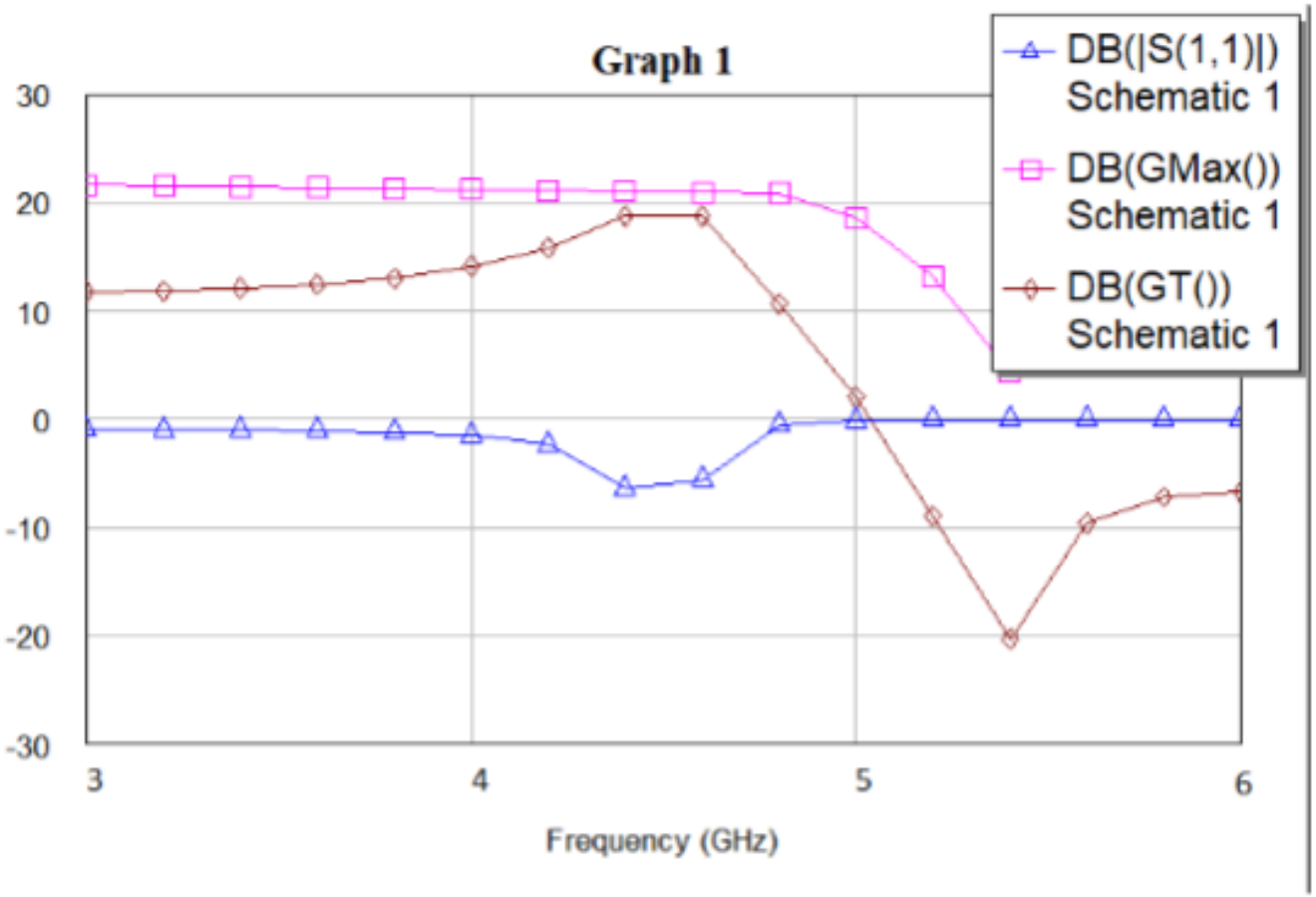




Schematic


MLIN
ID=TL4
W=3.039 mm
L=6.003 mm
MLIN
ID=TL3
W=3.039 mm
L=3.425 mm
PORT
P=1
Z=50 Ohm
MLIN
ID=TL1
W=3.039 mm
L=17.18 mm
PORT
P=2
Z=50 Ohm
MLIN
ID=TL2
W=3.039 mm
L=9.734 mm
MSUB
Er=4.4
H=1.6 mm
T=0.05 mm
Rho=1
Tand=0
ErNom=4.4
Name=SUB1

Results and Graph



Inference

- The output waveform is produced and the results are in accordance with the theoretical values.
- Thus a maximum gain amplifier has been designed for maximum gain at 4.5 Ghz frequency.

References

- Microwave Engineering- David M. Pozar
- https://www.tutorialspoint.com/microwave_engineering/microwave_engineering_introduction.htm
- https://www.microwaves101.com/encyclopedias/waveguide-mathematics
- https://en.wikipedia.org › wiki › Microwave_engineering