Mid Semester Progress Report

2896

Designing Oscillator for an Antenna at ∼3.5 GHz

Students:

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Project carried out at: **Tel Aviv University**

For the project instructor:

I approve the submission of the following report

Edoh Shaulov

	Accomplished Task	**Comments**
1	Paper review	Conduct a thorough review of relevant literature and research papers to establish a foundation for the project.
2	Choosing an oscillator model to build upon	Evaluate and select a suitable oscillator model as the basis for further development. Consider factors such as stability and frequency range.
3	Building Ideal Single-Ended Oscillator Model and Simulating for S-parameters	Construct an ideal single-ended oscillator model and perform simulations to analyze S-parameters, ensuring initial functionality.
4	Choosing a transistor, building its spice model, and using it in place of the ideal one	Identifying a suitable transistor, developing its Spice model, and integrating it into the oscillator model, replacing the idealized component.
5	Research on Antenna matching	Reading papers related to antenna matching for design inspirations
6	Building a matching networks assuming antenna to be 50[Ω]	Design a matching network under the assumption of a 50[Ω] antenna impedance. Simulate and optimize for effective impedance matching.
7	Using a Microstrip Patch Antenna with required impedance	Developing an antenna system with the specified impedance characteristics, considering radiation patterns, efficiency and bandwidth.
8	Enhancing Bandwidth	Enhancing bandwidth of the antenna to account for fabrication variations in the oscillator
9	Component Search	Finding components with required values and tolerances to keep Δ(oscillating frequency) inside the antenna's $S_{11} \leq -10[dB]$ region
10	PCB layout	Design the printed circuit board (PCB) layout, considering optimal component placement
11	PCB fabrication	Sending the PCB for fabrication of the design (vendor: JLCPCB)

	The following month tasks	**Comments**
1	Testing Transmitter	Conduct comprehensive testing of the assembled transmitter system to validate its functionality and performance.