COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electronics and Communications Engineering, Cairo

Graduation Project Description Form

Project Title: Stripline Filtennas for 3G applications

Duration from mo/year_____till mo/year _____
Project Supervisor(s): Associate professor Dr. Hussein Hamed Ghouz

Associate professor Dr. Kairy al-Barbary

Product Category
Algorithm____   Hardware____   Software_____
Standards:
Safety: UL, CE_____   IEEE _____FCC _____Other _____
Practical Realization Form
PCB _____ Firmware___   Embedded CPU Kit (ARM, ..etc):_____
PC Software _____   Ready-made Package_____   DSP Kit____   FPGA Kit__
VLSI Schematics ____   VLSI Layout _____   VLSI Silicon (ASIC)_____
Language
VHDL/Verilog_____   Matlab _____   C/C++/Java _____
Productization
Finished Product Form:____   Possible Commercialization _____
Amount of funds needed for buying components: _____
IEEE GOLD Made-In-Egypt/Engineering Day: ___
ITAC (ITIDA) or NTRA Funding Application:_____
Testing
Functional___   Simulation___   Parameters___   Final Hardware_____Other:
Lab Test Setup
EMC _____   Environmental_ Microwave _____ Analog Lab_   Other:
CAD Tools (No unauthentic software is allowed):
Elective Classes Required:

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Abstract

Planar filtenna is the most current and advanced element in wireless communication systems. Such filtenna is basically one antenna circuit with built in band rejection/band pass filters. The use of these filtennas elevates the necessity of using separate filters at the receiver front end. The main objective of this project is to design, analyze, and implement a stripline filtenna. First, the students review the basic concept and parameters of different planar antenna configurations. Second, the students learn the concept of partial ground, defective ground and digital ground to control the resonance frequency band of planar filtennas. Third, the students learn one of the basic electromagnetic simulators (CST_MW – HFSS – ADS). The required filtenna specifications are: maximum gain is 3.0-5.0 dB, total radiation efficiency is about 70 %, and radiation pattern is almost Omni/Directive shape, operating frequency band (2.0 – 7.0) GHz

Required Number of Students: Four

Project Plane:

The first semester:

1. Review the different types of planar transmission line (Microstrip – Coplanar waveguide – stripline)
2. Review the different ground configurations
3. Study the basic properties of stripline
4. Learn the CST_MW

The second semester:

1. Propose a stripline filtenna structure
2. Using the CST_MW simulate the following:
   a. The proposed stripline filtenna structure
   b. Antenna parameters

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3. Implementation and measurement of the proposed stripline filtenna

References and Links