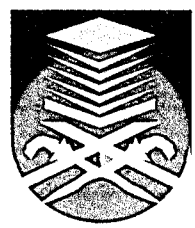
DUAL BAND MICROSTRIP PATCH ANTENNA

Thesis is presented in partial fulfillment for the award of the Bachelor of Engineering (Hons.) Electronics (Communication)

UNIVERSITI TEKNOLOGI MARA (UiTM)



NURUL ASFARINA BINTI ZAKARIA
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM,
SELANGOR, MALAYSIA.

MAY 2011

ACKNOWLEDGEMENT

Assalamualaikum,

Thanks to ALLAH SWT, The All Mighty for the blessing and mercy given for me in completing this Degree's project. Peace upon our prophet Muhammad S.A.W, who has given light to mankind.

I have finally completed my dual band microstrip patch antenna project. Completing this project was a challenge for me. However, fortunately, we had the help of many parties that made this project less difficult.

I would like to thank to my respective supervisor, Madam Suhaila Binti Subahir who deserve a special mention here. Her toughness, support and guidance made me work harder and for that I always am grateful. I also would like to thank En Hamizan for his help about the software. Lastly, I would like to give a big thank to Universiti Teknologi MARA (UiTM) and Microwave Technology Centre (MTC) for providing measurement facility. Not forgotten, I also would like to thank to my family for their understanding, to my friends and whom those gave their cooperation to me.

All those cooperation were appreciated and only ALLAH SWT can repay what have given to me.

Nurul Asfarina Binti Zakaria
Faculty of Electrical Engineering (Communication)
University Technology Mara (UiTM)
Shah Alam, Selangor
(January 2012)

ABSTRACT

This paper concentrates on designing a dual band microstrip patch antenna. The study involves two different frequencies which are 1.2GHz for Global Positioning System (GPS) and 2.4GHz for Wireless Local Area Network (WLAN) Industrial, Scientific and Medical (ISM) band applications respectively which these bands are standardized by Global Navigation Satellite Systems (GNSS) and IEEE 802.11b. The size of the antenna is 130mm x 131mm and simulated using Computer Simulation Technology (CST) software. Then the designed antenna is fabricated on a RT Duroid 5870 substrate with dielectric constant, ε_r = 2.33, loss tangent, $tan\ \delta$ = 0.0012 and thickness, h=0.787 mm. The results of return loss (S_{11}), Voltage Standing Wave Ratio (VSWR) and input impedance of the designed antenna are compared between simulation and measurement. The measurement is done by using Vector Network Analyzer (VNA). From the simulation results, a good return loss and VSWR was obtained for both frequencies although there are some relative errors for 1.2GHz that is 16.96% and for 2.4GHz it is 1.08%. Meanwhile, in the measurement, the operating frequencies were same as in the simulation.

TABLE OF CONTENT