

Thesis Title	Study on Finite Size Ground Plane Effects to Radiation Patterns of Rectangular Microstrip Antenna
Thesis Credits	12
Candidate	Mr. Chairat Tongjub
Supervisor	Assoc. Prof. Nirun Kumprasert
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### Abstract

In this thesis, radiation patterns of rectangular microstrip antenna with finite size ground plane are plotted from the total electric field intensity. Determining the total electric field intensity of microstrip antenna using geometrical optics (GO) and geometrical theory of diffraction (GTD) can be obtained. The GO is used to calculating the main electric field intensity ( $E_{GO}$ ) and the GTD is used to determining the diffraction electric field intensity ( $E_d$ ) at the edges of finite size ground plane. The diffraction electric field intensity effect to the main electric field intensity. Hence, the main electric field intensity has distorted radiation pattern such as occurring the ripple at boundary of radiation pattern and the side lobe and black lob of radiation pattern. The diffraction electric field intensity, which is analyzed in the thesis, is in the simple closed form and suitable for application. This  $E_d$  is added to the  $E_{GO}$  which produce the main electric field intensity. It is used to plot the radiation pattern of the microstrip antenna with finite size ground plane. The results from plotting the radiation patterns by this research are accuracy, which appropriate to the practical data. Error of the radiation pattern is less than 10 % if the ground plane is more than  $9\lambda$ .

Keywords : Microstrip Antenna / Ground Plane / Radiation Pattern / GO / GTD