

ABSTRACT

Traffic jams grew more rapidly causes the increase in the number of vehicle accidents. A better controlled traffic is needed for efficiency and enhance safety of road users. A Doppler radar sensors can easily measure the land, vehicle speed and relative speed between car and obstacle that can be used to avoid accidents or simply to monitor the traffic density that is very high. The radar is designed for easy navigation and can be used to detect the speed of a moving body by detecting the energy of a moving object and determine their position at any given time. Radar frequency is selected based radar receiver that called with the target RCS (Radar Cross Section) that server as a speed detector.

In this final project discussed about the design and implementation of antennas that can support the application of Doppler radar sensors. This antenna is designed using dual-beam microstrip antenna that works at frequency of 10 GHz. The software used for design and simulation of this antenna is Ansoft HFSS 10.

This final project begins by calculating the dimensions of the antenna according to the existing formula. Dimensions of the calculation will be used in the simulation process. Modification of the antenna dimensions are used as a way to get optimum results in the simulation, then the optimum dimensions are used in the manufacturing process. Prototype antenna has a characteristic that is working at a frequency of 10 GHz with a bandwidth of 60 MHz at $VSWR \leq 1.5$, and has a gain equal to 12.42dBi.

Key words: *microstrip antenna, Doppler Radar Sensor, Bandwidth, VSWR*

KATA PENGANTAR

Segala puji dan syukur penulis haturkan kehadiran Ida Sang Hyang Widhi Wasa, Tuhan Yang Maha Esa, yang telah melimpahkan berkah dan karunia-Nya sehingga penulis dapat menyelesaikan Tugas Akhir dengan judul Perancangan dan Implementasi Antena Array Mikrostrip Dual Beam untuk Aplikasi Radar Sensor Doppler.

Tugas Akhir ini ditujukan untuk memenuhi syarat kelulusan dalam menempuh pendidikan tingkat Sarjana Fakultas Elektro dan Komunikasi Institut Teknologi Telkom Bandung. Di dalam buku Tugas Akhir ini berisi tentang perancangan sebuah antena mikrostrip ,dimana dijelaskan mengenai perhitungan dimensi, simulasi, realisasi *prototype* dan analisa dari parameter – parameter antena, dimana menyatakan karakteristik dari antena tersebut.

Penulis menyadari sepenuhnya bahwa Tugas Akhir ini masih jauh dari kesempurnaan. Hal ini karena keterbatasan pengetahuan dan pengalaman yang dimiliki penulis. Dengan segala kerendahan hati, penulis sangat mengharapkan kritik serta saran sehingga pada nantinya dapat memperbaiki Tugas Akhir ini dan mengembangkannya di kemudian hari. Semoga karya ini dapat memberikan manfaat bagi pembaca.

Bandung, 7 Maret 2011

Penulis