

ABSTRACT

Development in technology especially radar technology has important role in various facilities including civil, military, health, transportation and etc. Besides that, radar technology has the ability to detect location and also distance of an object. Through wall radar is one of radar technology development that has the ability to detect the existence of an object behind the wall. One of the most important components of through wall radar application is antenna. Antenna is used to transmit and receive electromagnetic signal through various medium. Therefore, through wall radar must have good wall penetration capability. To acquire that, required an antenna that has ultra wideband characteristic.

Generally antenna that is designed for through wall radar is microstrip antenna using bowtie patch. This final project has designed microstrip antenna using diamond patch. The designing process of diamond patch involved using FR-4 Epoxy that has 4.3 dielectric constants and a thickness of 1.6 mm. The usage of diamond patch has its benefits like easy dimension design to get a wide bandwidth. Diamond patch microstrip that has been designed is using direct supply so its production price is relatively cheap.

Microstrip diamond patch antenna simulation shows a result that has 2126 MHz bandwidth in a range of 890-3016 MHz while realization antenna has bandwidth of 1954 MHz in a range of 794-2749 MHz. On that frequency, simulation and realization result of some other antenna parameters has return loss value of ≤ -10 dB, $VSWR \leq 2$, $gain \geq 3dBi$, impedance $\pm 50 \Omega$, linear polarization and omnidirectional radiation pattern.

Keywords : TWR, UWB, microstrip antenna, diamond patch, FR-4 Epoxy