

ABSTRACT

Lung tumor were diseases caused by the spread of cancer cells from other body part, that can be monitored their distribution necessary detection lung tumors early. Tumor detection is done through medical imaging with Microwave Medical Imaging (MMI) applications using Ultra WideBand (UWB) technology. MMI can be a good medical imaging choice, because it has many advantages such as safer, accurate results, and low cost. The use of UWB technology is very much needed, because it has the characteristics of wide bandwidth and narrow pulses to provide high resolution detection results. Federal Communications Commission (FCC) agency has regulated UWB technology in the frequency range 3.1 - 10 GHz for MMI purposes.

This final project designs and realizes a UWB microstrip planar antenna that can be used to detect lung tumors. The antenna is designed by simulation using 3D software. Then realized with FR-4 Epoxy material which has a dielectric constant of 4,4 with a thickness of 1,6 mm as a substrate, and copper as a patch and groundplane.

Result from simulation, the antenna works at a frequency of 3,1 – 10,6 GHz with a 7,5 GHz bandwidth, and unidirectional radiation pattern. As a result of measurements, the antenna works at a frequency of 4,4 – 7,5 GHz with a 3,1 GHz bandwidth, and unidirectional radiation patterns. There are differences in e-field values and return loss when the antenna is brought closer to healthy tissue and tissue with tumors during the simulation. In addition, when the return loss value was realized when the antenna was brought closer between healthy lung tissue and lung tissue infected with a tumor, it was different. This proves that the antenna can detect foreign objects in the lungs, namely tumors.

Keyword: *Tumour, Microwave Medical Imaging, Return Loss, Ultra WideBand.*