

ABSTRACT

When the firefighters conduct burnout operations to rescue victims, the use of radio with traditional antenna tends to make firefighting experience difficulty communicating. Therefore we need an antenna that can provide comfort. With the emergence of wireless technology especially wearable antenna, the antenna allows the manufacture of textile materials are comfortable, lightweight, flexible, and heat resistance when used.

In this final project designed an textile antenna rectangular patch at 2.45 GHz frequency. Antenna design using aramid fabric 4 layer with a thickness of 1,76 mm as the substrate material and zelt as electro textile materials to patch and ground plane. Fabricated antenna can be done directly, helped by Puslit Telkoma PPET-LIPI and BKME-LIPI.

In this final project realized an textile antenna rectangular patch at 2.45 GHz frequency with VSWR 1.381 at free space condition and 1.191 when integrated in clothing. Antenna gain when free space is 2.655 dBi and when integrated in clothing is 3.271 dBi. Radiation pattern of antenna at free space condition is omnidirectional and polarization of antenna is ellips. It also obtained simulation of Spesific Absorption Ratio (SAR) using voxel model digital human $7.212 \cdot 10^{-8}$ W/Kg. Antenna dimensions obtained through theoritical calculation are then simulated using CST Microwave Studio.

Keywords : Wearable antenna, Rectangular, Textile antenna.