

ABSTRACT

Currently the technology has developed rapidly, as well as wireless cellular technology are required to have mobile *device* at this time to have features that fit the needs and desires of the community, Indonesia exactly. Wireless cellular technology that is currently being developed in Indonesia is Wi-Fi (Wireless Fidelity), 3G / UMTS (Universal Mobile Telecommunications System), 3.5G / HSPA (High-Speed Packet Access), and 4G / LTE (*Long Term Evolution*). Each of these technologies has a working frequency is different. Wi-Fi works at a frequency of 2400 MHz - 2483.5 MHz and 5725 MHz - 5825 MHz, 3G / UMTS and 3.5G / HSPA works at frequencies from 1910 to 2110 MHz, 2110 MHz - 2170 MHz, and 4G / LTE will work on frequency of 1,805 MHz - 1,880 MHz and also GPS L2 working at frequency 1.227 MHz.

In the wireless cellular technology, one of the most important components is the antenna. In its development, the antenna on the mobile *devices* are required to be able to follow the needs of the development. One type of antenna that can be used on mobile *devices* is a Planar Inverted-F antenna (PIFA) because they have a lightweight design, a simple and relatively low manufacturing cost. In the previous research has explained that PIFA antenna *slot on patch* can produce some of the resonant frequency, so it used to obtain multiband antenna.

In this final project has been designed and realized Fractal PIFA antenna combined with two slots parallel to the plane Ground plane LTE and WIFI by using copper as the patch and ground plane also substrate used is air. At a frequency of 1.227 VSWR value generated is 1,575 and Gain value of 1,37 dB and at frequency 1.842,5 MHz VSWR value generated is 1,7 and Gain value of 2,734 dB, at a frequency of 1.960 MHz VSWR value generated is 1.4 and the value of Gain 3,5 dB, at a frequency of 2.140 MHz VSWR value generated was 1.95 the Gain value of 3,23 dB, at a frequency of 2.442,5 MHz VSWR value generated is 3.89 and Gain value is 2.99 dB and at a frequency of 5.775 MHz VSWR value generated was 1.53 with a value of 4.227 dB Gain While the resulting radiation pattern each frequency is omnidirectional and Linear polarization.

Keyword : Planar, PIFA, *fractal*, *Ground plane*, VSWR dan Gain