

## ABSTRACT

The development of wireless technologies are rapidly increases along with the development of devices that support the technology. Wireless technology can not be separated from other support devices, specially antenna. Basically, the antenna has many types, from simple to very complex shapes, which each kind has its own characteristics. The antenna has been widely used for the benefit of wireless telecommunications, among others, for the benefit of Ultra Wideband communications. Ultra Wideband (UWB) is a technology that requires a minimum bandwidth of 500 MHz or 20% of the frequency center. Working frequency of 3.1 GHz UWB to 10.6 GHz.

In this paper, designed a Koch Fractal microstrip antenna in second order of *iteration by manipulate the shape of the "feed strip line" and optimization in combination shape of the groundplane*. Then, the Fractal Antenna are simulated and realized on UWB applications in (3.1-10.6) Ghz, and then be compared between the result of simulation and measurement. So, from these two techniques, can be analyze by the differences of antenna parameter in order to the antenna will optimatically work, to use in UWB application.

The result of this paper, show that to make microstrip line technique by attaching patch Koch Fractal and combine groundplane shape with half circle shape, are able to improve the return loss on the antenna performances. From the result of antenna optimazation, obtained the dimension of antenna are antenna  $38.3 \text{ mm} \times 24.5 \text{ mm} \times 1 \text{ mm}$ . Then for the antenna parameters at the working frequency 3.1 GHz, 6.85 GHz, and 10.6 GHz. Obtained VSWR consecutively 1.382, 1.413, dan 1.462. And gain at the same working frequency, consecutively 2.211 dB, 1.275 dB, 2.486 dB, and the radiation pattern are bidirectional and polarization are elips.

Keyword : Fractal antenna, Koch, Ultra Wideband, Second Order of iteration