

ABSTRACT

Antenna is one of the important element in the world of telecommunications. Lately, the development of compact antenna is growing rapidly, this is caused by the increasing demand for telecommunication devices which are getting smaller. Therefore, the writer proposes a microstrip-patch antenna based on metamaterial to fulfill the demand. It is also caused by the use of metamaterial which can reduce the antenna dimensions which are quite significant compared to the dimensions of a microstrip-patch antenna which are conventional. This was proven in various studies that had been done before.

With this approach, the concept of composite left handed transmission line (CRLH), the writer designs a microstrip-patch antenna based on metamaterial that works in the range of frequency 2,3-2,4 Ghz so that it can support mobile WIMAX application that will function as a receiver (dongle). Besides that, the antenna must have gain more than 0 dbi. The type of substrate used is FR4-hf (fiberglass epoxy resin-high frequency) which has a dielectric constant $\epsilon_r = 4.04$.

The realization of antenna can operate in the range of frequency 2,3 – 2,4 Ghz and has resonant frequency at 2,4 Ghz with 270 MHz bandwidth frequency for VSWR below 1,5. This antenna has gain 0,03 dbi, so that antenna is able to be allocated for dongle WIMAX application. In addition the use metamaterial antenna can reduce the size of up to 70% of the conventional antenna

Key words : Microstrip Antenna , Metamaterial, CRLH, WIMAX