

## **ABSTRACT**

*Broadband Wireless Access (BWA) is a wireless service with a wide bandwidth. Based on its mobilization, BWA can be classified into several types, and one of them is Nomadic BWA. For practical uses, BWA applies a MIMO (multiple-input multiple-output) system to increase the canal capacity without increasing SNR (Signal to Noise Ratio) and bandwidth. When this antenna is applied to a mobile devices, it only needs a small antenna namely microstrip antenna.*

*The process of designing the antenna had several (four) stages. First, it started from selecting the model of microstrip antenna. Second, several simulations using CST MICROWAVE STUDIO® (CST MWS) software were carried out to obtain a similar result to the starting specification. Third, several simulations and measuring the antenna were conducted. When measuring the VSWR, impedance and S-parameter, each antenna ports were connected to network analyzer ports. However, when measuring the pattern of radiation, polarization and gain, only one measured port was connected to the spectrum analyzer.*

*The results of the experiment showed that the VSWR at 2.3-2.39 GHz, Port 1 had a value of 1.556 and Port 2 of 1.466. At 2.345 GHz, the value of Port 1 impedance was  $43.121-0.050134j \Omega$  and Port 2 of  $40.46-11.848j \Omega$ . The value of  $S_{11}$  was -14.701 dB,  $S_{22}$  was -13.896 dB,  $S_{21}$  was -17.098 dB, and  $S_{12}$  was -17.05 dB. The gain value of Port 1 antenna was 2,656 dBi and Port 2 was 2,287*

*dBi. The final dimensions of the MIMO antenna were 67.2 mm x 29.5 mm x 1.6 mm.*

*Keywords : microstrip antenna, circular microstrip antenna, MIMO system, isolation, correlation.*