

ABSTRACT

One of the wireless communication network technologies that are widely used today is Wi-Fi. In order the Wi-Fi network to work, a telecommunication device is required to transmit information over radio waves through the air. In data transmitting, one of the important components is antenna

Nowdays, microstrip antenna with a Multiple Input Multiple Output (MIMO) system is developing. In MIMO system, not only using one antenna but two or more transmitters and receivers. The MIMO technique is used to increase the performance capacity of antennas on applied system and has already supported it to be applied in wireless networks such as Wi-Fi, based on the IEEE 802.11ax standard which is a wireless network standard.

This study is going to create of microstrip antenna MIMO 4×4 and with rectangular patch with a purpose to increase the amount of data that can be sent over a wider range of regions. The antenna uses electromagnetically coupled (EMC) profiteering techniques that are expected to provide large bandwidth that works at 2.4 Ghz frequencies on 802.11ax Wi-Fi. The single patch antenna will be made first as the basis for making the MIMO 4X4 antenna. As a transmitting antenna on Wi-Fi technology, it is very important for this antenna to have sufficient Gain and Bandwidth value, because it relates to how well the antenna can emit Wi-Fi signals to users around it.

Based on the simulations that have been done, the results of the antenna design which has a size of 38.03×27.6 and 47.63×37.2 mm for patch sizes. it has a return loss of -21 dB, VSWR of 1,175 and the gain value is 2,989 dB. But the results obtained have not worked at the expected frequency, therefore optimization will be done to get the desired results. After optimization is done, the antenna's dimension is $27.5 \times 29.5 \times 47 \times 41.5$ mm with a return loss of -39 dB, VSWR of 1.02, 3.13 dBi for gain and bandwidth value is 107 Mhz.

Keywords: Microstrip Antenna, MIMO, Wi-Fi, Gain, Bandwidth