ABSTRACT

The need for wireless network technology, especially in supporting people's daily lives, is increasingly important. The emergence of Wi-Fi 6 as the latest standard offers higher efficiency compared to its predecessor, Wi-Fi 802.11ac. One of the key components in supporting Wi-Fi 6 technology is the MIMO (Multiple Input Multiple Output) system, which can increase throughput without the need for additional bandwidth or transmission power. Microstrip antennas were chosen as an important supporting component in this technology because of their ease in fabrication, small size, and ability to be modified according to user needs. Previous research has succeeded in designing and fabricating a 4x4 MIMO Microstrip antenna with rectangular patches for indoor Wi-Fi 802.11ax applications at the 2.4 GHz frequency. This research achieved VSWR results of less than 2 and a gain of 5,374 dBi, as well as increasing the bandwidth using the AGS (artificial ground structure) technique. This final project aims to design and fabricate a 4x4 MIMO Microstrip antenna with rectangular patches and square elements. This 4x4 MIMO configuration will increase the transfer rate and performance of wireless connectivity, which is very important in Wi-Fi technology. By applying the EMC (Electromagnetically Coupled) Supply Technique and the AGS (Artificial Ground Structure) Technique, it is hoped that the designed antenna can provide an increase in wider bandwidth and a gain of 6 dBi at a working frequency of 6 GHz with a bandwidth of 107 MHz and VSWR ≤2. Thus, the design of the 4x4 MIMO Microstrip antenna is expected to make a significant contribution to the development of increasingly developing Wi-Fi technology.