

## ABSTRACT

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This project looks into the design of a circular patch microstrip array antenna (CPMAA), with 15 patches, using the Hansen-Woodyard End-Fire array design. The aim of the project is to achieve a VSWR of less than 2 and a gain of 12dBi. The required frequency of 3GHz was changed to 20GHz due to limitation of the ADS Version 2006A Software in that it was unable to simulate larger dimensions. The antenna design was optimized until the aims of the project were met. Performance of the antenna was evaluated from the simulation results. These results showed that the model of the CPMAA designed was excellent as it had a reflection coefficient of 0.234, indicating that almost none of the signal was reflected back. The theoretical gain of 13.987dB differed slightly from the simulated result, 11.947dB. This could be because the ADS Version 2006A software rounded up the values of radii. The antenna achieved a value of VSWR of 1.611. The CPMAA had an efficiency of 100%. The input impedance of the CPMAA was , only a slight mismatch from the characteristic impedance of . Further calculations suggested that the antenna had a radiation efficiency of 1.058. This shows that the designed antenna was able to transmit all of its power. In addition to the project requirement, the antenna was fabricated and tested using the Lab-Volt Antenna Training and Measuring System at a frequency of 10GHz. The test showed that the antenna functioned well as a transmitter.