

ABSTRACT

The development of telecommunications technology is getting faster every year, the need for information is getting bigger, 5G technology is present as the fifth generation after 4G. Microstrip antenna is a component to support 5G technology. but the required dimensions are smaller so that metamaterial structures are used to reduce the dimensions of the 5G antenna so that this final project focuses on adding metamaterial structures to the microstrip antenna patch.

This final project is designing a rectangular microstrip patch antenna based on metamaterial that uses a phi-shaped structure and design on the patch antenna and works at a frequency of 3.5 GHz. The substrat used is FR-4 with a dielectric constant of 4.3 and a substrate thickness of 1.6 mm.

The test was carried out on a patch antenna with 4 x 4 material at a frequency of 3.5 GHz with dimensions of 59.74 x 80.92 mm². Based on the results of the realization of the antenna, it showed an increase in bandwidth of 138 MHz. The return loss value is -22.71 dB, VSWR 1.16, gain 2.984 dBi with a unidirectional radiation pattern.

Keywords: *5G technology, microstrip antenna, metamaterial*