

ABSTRACT

Antenna channel is an additional tool on the antenna that has a function so that the antenna radiation pattern can be precise and focused according to their own needs. In this study designed an antenna channel with the 4x4 Butler matrix model which uses the S-Band spectrum of 2.9 - 3.1 GHz for weather radars, ship radars and several communication satellites. To design it, use the CST Studio Suite 2018 software by making the constituent elements of the 4x4 Butler matrix circuit such as a 90 ° Hybrid coupler, crossover and phase shifter. After that, the Butler matrix 4x4 is optimized to be the final design which has dimensions of 129.12 mm x 106.67 mm, resulting in S-parameters with an average return loss of -20,103 dB, isolation of -25,322 dB, insertion loss of -6.38 dB, VSWR 1.222 and the phase difference at port 1 input to port output 5-6 is -33.99° and port 7-8 is -30.18°. Furthermore, the antenna channel is realized in the form of a prototype Butler matrix 4x4 using Rogers R04003C substrate material with a dielectric constant of 3.55 mm obtained by measuring S-parameters with an average return loss of -20,468 dB, isolation of -32,115 dB, Insertion loss -7, 08 dB, VSWR 1,246 and the phase difference in input port 1 to port output 5-6 is -28.09°, and port 7-8 is -23.29°.

Keywords : *Antenna channel, Butler matrix 4x4, S-Band spectrum, return loss, insertion loss, isolation, VSWR, phase difference*