

ABSTRACT

Coupler is a passive device in the microwave and bidirectional which can be used as a power combiner and power divider. Coupler in a manufacturing method, there are several types and one of them is a 90 degrees hybrid coupler which is a branch network with the entire port compatible with each other with a certain load and has a characteristic phase shift the output by 90 degrees.

In this final project has realized a 90 degree one-section branch line hybrid coupler using microstrip technology circuitry with each input and output impedance are 50 ohm. This coupler is used as a power divider with two equal power output and there are 90 degrees phase difference between adjacent output ports. The materials used in the design of this coupler using Roger Duroid PCB type 4003C. Coupler is to be applied in a radar placed on the transmitter which works at a frequency of 9370-9430 MHz. The insertion loss to be achieved in < 1 db, isolation between ports is ≥ 20 db. VSWR magnitude is ≤ 1.5 and coupling factor to be achieved by 3 db.

To get information about performance and characteristics of coupler that has been made, then the coupler was tested by using a network analyzer . Measurement results for the coupler insertion loss in range -4.374 dB until -4.750 dB, Measurement results for the coupler coupling factor in range -4.180 dB until -4.577 dB, the maximum SWR is 1.360, impedance in every port in range $41.376 \Omega - 54.739 \Omega$, the isolation between the output port ranges from 23-24 dB, the isolation between the input port and isolation port in ranges from 21 - 23 dB , phase shift between ports output phase shift occurs near 0.93 degrees about 19 degrees.

Keywords: *Coupler, 90° Hybrid Branch-line, microstrip*