

Design of a 3-dB Directional Coupler Using Symmetric Coupled-Lines

Authors : Cem Çindaş, Serkan Şimşek

Abstract : In this paper, the study and design of a 3-dB 90° directional coupler operating in the S-band is proposed. The coupler employs symmetrical multi-section coupled lines designed in a stripline technique. Design is realized in AWR Design Environment and CST Microwave Studio. Using these two programs played a key role in attaining outcomes swiftly and precisely. The simulation results show that the coupler maintains amplitude consistency within ± 0.3 dB, isolation and reflection losses better than 16 dB, and phase difference between two output ports of $88^\circ \pm 0.6^\circ$ in the 1.7 - 4.35 GHz range. This simulation results indicate an improvement is achieved in fractional bandwidth (FBW) performance around the center frequency of $f_0 = 3$ GHz.

Keywords : coupled stripline, directional coupler, multi-section coupler, symmetrical coupler

Conference Title : ICECE 2024 : International Conference on Electronics and Communication Engineering

Conference Location : Prague, Czechia

Conference Dates : March 11-12, 2024