Miniaturize size of dual band branch-line coupler by implementing reduced series arm of coupler with stub loaded

Abstract:

An extremely reduced size branch-line coupler operating at dual frequencies of WLAN band 2.45 GHz and 5.8 GHz is presented which is 58% smaller compared to the conventional design. The technique presented introduces the combination method in which the length of series lines is half than the length of shunt branch lines and the loading of stub tapped to the center of the series branch line that forms the couplers arms. Furthermore, the coupler accurately divides the input signal by two parts with the same power and 90° phase difference. Also, the reflection coefficient and the isolation are as good as conventional one. The agreement of the measurement and simulated confirms the theory and validates the proposed coupler design. The measurement shows 33.83% and 9.22% bandwidth for the lower and upper frequency, respectively.