

A dual-band branch-line coupler using quasi composite right/left-handed transmission lines

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Abstract

A quasi-RH/LH dual-band 3 dB branch-line coupler (BLC) constructed in microstrip form is proposed. The designed BLC circuit replaces the conventional chip inductors in the coupler arms with microstrip stubs for easier circuit integration and lower fabrication cost, while providing favorable dual-band operation. The newly designed BLC is implemented on an RT/Duroid 6010 substrate with all microstripline sections in the coupler arms meandered to reduce the circuit size. With an amplitude-difference less than 1 dB and a phase-difference of between 80° and 100° required between the two output arms, the designed BLC exhibits dual operating bands having fractional bandwidths of 17.3 and 8.4 percent for the first and second band, respectively, which are wider than those of many dual-band 3 dB BLCs reported in the literature.