Abstracts

A Nonreciprocal Tunable Waveguide Directional Filter Using a Turnstile Open Gyromagnetic Resonator

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The 4-port waveguide directional filter is a classic network in microwave engineering. The purpose of this paper is to describe one gyromagnetic version using an open gyromagnetic resonator in a dielectric-filled cavity. A property of the circuit is that it behaves as a 4-port circulator with one direction of circulation at one split frequeucy of the resonator and with the other direction for the other split frequency. An insertion loss between the coupled ports below 1.50 dB and an attenuation or isolation of typically 15 dB between the decoupled ports over most of the tuning range of the filter have been achieved. Its 3-dB bandwidth is typically 65 MHz. A typical tuning range of more than 1 GHz centered at about 10.5 GHz has been separately realized for each split branch.

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