Abstracts

Ferrite Microstrip Phase Shifters-Theory and Experiment

G.J. Buck. "Ferrite Microstrip Phase Shifters-Theory and Experiment." 1970 G-MTT International Microwave Symposium Digest of Technical Papers 70.1 (1970 [MWSYM]): 332-336.

Past investigations of reciprocal, ferrite microstrip phase shifters have been concentrated on the effects of longitudinal magnetization (parallel to the microstrip) on the phase-shifting properties of linear sections of microstrip. The effect of a transverse magnetization in the plane of the substrate on the phase velocity of the propagating fields has been assumed to be nil. As shown in Figures 1 and 2, the phase shift induced by transverse magnetization has both a reciprocal and a non-reciprocal component and the composite phase shift induced by transverse magnetization is in the direction opposite to the phase shift generated by the longitudinal magnetization. Some non-reciprocal phase shift has been previously reported for widely spaced meander lines, but the effect was attributed to coupling between the lines. The presence of the non-reciprocal phase shift in a single linear section of microstrip is evidence of the fact that the propagating microstrip mode is not purely TEM in nature. This TEM approximation is generally made, although it has long been known that the wave is not pure.

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