

Influence of uncertainty in dielectric properties on the design performance of a tunable composite right/left handed leaky wave antenna

ABSTRACT

Uncertainties of the order of 8 % in the accuracy of lithography used to define co-planar waveguides on ferroelectric thin films lead to a similar uncertainty in the value of relative permittivity of the film extracted from measurements. When such films are used as the tunable elements in a tunable composite right/left handed leaky wave antenna, such variations of the capacitance of the varactors can lead to a reduction in radiation and total efficiency around of the order of 1 dB in 5 dB due to the appearance of a bandgap in the frequency response.

Keyword: Antenna; Characterisation; Ferroelectric; Permittivity; Uncertainty