

Resonance frequency and bandwidth of rectangular microstrip antenna on thick substrate

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We report an improved cavity model called modified Wolff model (MWM) to compute the resonance frequency of a rectangular patch antenna on the thick PTFE substrate ($0.037/\sqrt{\epsilon_r}$ λ $-0.229/\sqrt{\epsilon_r}$ λ). The MWM accounts for the effect of anisotropy and total losses on the resonance frequency, therefore it has a maximum deviation 2% against the experimental results. The previous cavity model, the multiport cavity model, and MOM based commercial software, Ensemble, compute resonance frequency with deviation between 4%-36%. Results on the bandwidth computed by these models have also been compared against the experimental results.

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