Abstracts

Accurate determination of dielectric constant of substrate materials using modified Wolff model

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A new method is proposed for the accurate determination of the dielectric constant of the planar substrate materials. This method makes use of accurate determination of resonance frequency of a microstrip patch using the Modified Wolff Model (MWM). Accuracy and limitation of the MWM for calculation of resonance frequency of a rectangular patch are examined by comparing the computed resonance frequency with the measured resonance frequency for several patches both on low and on high dielectric constant substrates. An MWM based algorithm has been developed to extract value of the dielectric constant of the substrate from the measured resonance frequency anal accurate dimension of the patch. A sensitivity analysis has also been performed to explain the error in determination of dielectric constant due to errors in dimensions of the patch, thickness of substrate and measured resonance frequency. Our experimental results show that the accuracy of the proposed method is better than 1% for determination of dielectric constant of substrates.

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