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Design of a low-loss microstrip diplexer with a compact size based on coupled meandrous open-loop resonators

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Abstract

In this paper, we have designed and fabricated a novel microstrip diplexer. It has two quite close channels at 1.67 GHz and 1.88 GHz make it suitable for FDD schemes and GSM applications. The proposed structure includes two coupled meandrous open loop resonators which are coupled to spiral cells. An approximated *LC* model of the presented resonator is proposed and analyzed to give some information about the resonator behavior. Based on the obtained information, the proposed diplexer is optimized and miniaturized. It occupies a small size of $0.036 \lambda_g^2$. Despite of having close channels, the low insertion losses of 0.43 dB and 0.35 dB are obtained for the first and second bands, respectively. For verifying the simulation results and designing method, the diplexer is fabricated and measured, where the measurement and simulation results show a good agreement.