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REDUCTION OF THE DIMENSIONS OF TRANSMISSION LINES, COUPLERS AND FILTERS USING MICROSTRIP COMBLINES IN MICROWAVES

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ABSTRACT: This dissertation deals with the analysis, development of models and construction of transmission lines, couplers and coupled line filters in microstrip, using combline structures, aiming to reduce their original dimensions in the microwave range. The work comprises three parts. The first one concerns the improvement of an existing model of analyzing and designing a microstrip combline. It consists in a better initial design, which reduces the number of the required adjustments. The second one describes a new model to treat coupled lines in microstrip combline, so that their dimensions can be reduced. It is also shown that the model can equally be applied to reduce the dimensions of microstrip couplers and filters by means of a combline structure. The third part deals with electromagnetic simulation and with the construction of prototypes of a transmission line, a coupler and a filter in microstrip comblines whose measurements revealed a size reduction of 30%, confirming the adequacy of the theory here presented.