Abstracts

Integration of optimized low-pass filters in a bandpass filter for out-of-band improvement (Dec. 2001 [T-MTT])

C. Quendo, E. Rius, C. Person and M. Ney. "Integration of optimized low-pass filters in a bandpass filter for out-of-band improvement (Dec. 2001 [T-MTT])." 2001 Transactions on Microwave Theory and Techniques 49.12 (Dec. 2001 [T-MTT] (Special Issue on 2001 International Microwave Symposium)): 2376-2383.

In this paper, we discuss the control and suppression of spurious resonances commonly encountered with distributed bandpass filters. The basic idea consists of introducing low-pass structures within bandpass topologies. By adjusting low-pass filter cutoff frequencies, harmonic resonances are attenuated, while maintaining in-band performances. In addition, transmission losses may be reduced as the insertion technique leads to optimum designs in terms of overall size. The approach described here is based upon the combination of classical synthesis techniques and optimization procedures provided by conventional computer-aided-design tools. Experimental results are obtained in the case of /spl lambda//sub g//4 shunt-stub filters implemented in classical semilumped low-pass architectures. Then, we investigate alternative integration technologies and techniques to improve the out-of-band rejection over very wide operating bandwidth. To overcome some design limitations, i.e., workable characteristic impedance value, we propose and validate a multilayer solution. Finally, new low-pass topologies are suggested to improve low-pass filter band rejection.

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