Abstracts

Varactor-tuned active notch filter with low passband noise and signal distortion

C. Rauscher. "Varactor-tuned active notch filter with low passband noise and signal distortion." 2001 Transactions on Microwave Theory and Techniques 49.8 (Aug. 2001 [T-MTT] (Mini-Special Issue on the 2000 IEEE Radio and Wireless Conference (RAWCON))): 1431-1437.

The frequency-tunable band-reject filter described in this paper is designed to suppress signal interference in receivers of frequency-agile systems, while offering maximum transparency at passband frequencies. The presented solution is based on a new channelized-active-filter architecture in which the portion of the circuit that determines passband behavior is free of semiconductor devices. This permits passband residual noise and intermodulation distortion to be reduced to that of a simple nonresonant passive network. The concept is demonstrated with a varactor-tuned hybrid-integrated filter whose 40-dB-deep rejection notch of constant 70-MHz width can be tuned over a 9.5-10.5-GHz frequency span. Included are measurements of pertinent small-signal transfer characteristics and noise properties, as well as detailed assessments of nonlinear effects, such as third-order intermodulation distortion and compression of notch depth as a function of drive level.

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