Abstracts

A filter synthesis technique applied to the design of multistage broad-band microwave amplifiers (Dec. 2002 [T-MTT])

J.-P. Rooney, R. Parry, I. Hunter and R.D. Pollard. "A filter synthesis technique applied to the design of multistage broad-band microwave amplifiers (Dec. 2002 [T-MTT])." 2002 Transactions on Microwave Theory and Techniques 50.12 (Dec. 2002 [T-MTT] (Special Issue on 2002 International Microwave Symposium)): 2947-2953.

A method for designing multistage broad-band amplifiers based upon well-known filter synthesis techniques is presented. Common all-pole low-pass approximations are used to synthesize prototype amplifier circuits that may be scaled in frequency and impedance. All-pass filters introduced at the first stage are shown to improve input match while maintaining circuit performance less 6 dB gain. A theoretical comparison is made with the distributed amplifier and the cascaded single-stage distributed amplifier. Theoretically, a larger gain-bandwidth product is achieved using the synthesis technique. A proof-of-concept Butterworth low-pass two-stage amplifier was designed, simulated, and measured and achieved a flat gain performance of 1-4 GHz with a power gain of 14.5/spl plusmn/1 dB close to the predicted 1-4.2 GHz, 15/spl plusmn/1 dB.

❑ Return to main document.