Abstracts

Analysis of the performance of four-cascaded single-stage distributed amplifiers

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In this paper, the analysis, design, and implementation of a hybrid broad-band distributed amplifier based on four-cascaded single-stage distributed amplifiers (4-CSSDAs) is demonstrated. The available gain produced by this amplifier is significantly higher than conventional distributed amplifiers (CDAs) using the same number of active devices. Simulation results for two versions of the 4-CSSDA are demonstrated, one with low interstage characteristic impedance (Zo/sub int/) and the other with high Zo/sub int/. Simulation results show a number of advantages of the proposed amplifier over the CDA, in particular, that the available gain can be increased by increasing the Zo/sub int/ of the amplifier stages. Simulation predicts that gains approaching 50 dB could be achieved by appropriate design modification. Measured results for implementation of the two versions of the 4-CSSDA are reported. These show excellent performance with high gain, good gain flatness, input and output matching, flat group delays, and a low noise figure across a 1-10-GHz bandwidth. The amplifier configuration achieved a measured wide-band performance (0.8-10.8 GHz) with up to 39/spl plusmn/2-dB flat gain using discrete packaged active devices.

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