Abstracts

Calibratable adaptive antenna combiner at 5.2 GHz with high yield for laptop interface card

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This paper presents a calibratable adaptive antenna combiner with three branches for high-performance radio local area network at 5.2 GHz. The system was mounted on a reinforced duroid substrate and enables the integration in a laptop interface card. Each branch consists of a bent stacked slot antenna, a low-noise-amplifier monolithic microwave integrated circuit (MMIC) with antenna/calibration switching and a vector modulator MMIC with an amplitude control range of 15 dB and 3600 phase control range. The signals of the three branches are combined by an active adder MMIC. A calibration is proposed to significantly improve the phase and amplitude control resolution and the yield of the designed MMIC circuits, which were fabricated using a commercial GaAs process. Each branch has a maximum power gain of 16 dB, a noise figure of 3.3 dB, and a 1-dB output compression point of -4 dBm. The whole system draws less than 28 mA from a 2.7-V voltage supply. The total required MMIC chip size is 10.8 mm/sup 2/.

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