Abstracts

A 1.4-dB-NF variable-gain LNA with continuous control for 2-GHz-band mobile phones using InGaP emitter HBTs (2001 [RFIC])

Y. Aoki, M. Fujii, S. Ohkubo, S. Yoshida, T. Niwa, Y. Miyoshi, H. Dodo, N. Goto and H. Hida. "A 1.4-dB-NF variable-gain LNA with continuous control for 2-GHz-band mobile phones using InGaP emitter HBTs (2001 [RFIC])." 2001 Radio Frequency Integrated Circuits (RFIC) Symposium 01. (2001 [RFIC]): 231-234.

We designed a continuously variable-gain low-noise-amplifier (VG-LNA) circuit with a noise figure (NF) of 1.4 dB. This VG-LNA has a diode-loaded emitter follower and a variable-current source. The diode-loaded emitter follower enables gain control without NF degradation at the maximum gain; the variable-current source improves the linearity and widens the range of gain control. It was fabricated by using InGaP-emitter hetero bipolar transistors (HBTs) and has an NF of 1.4 dB at maximum gain, 1.95 GHz, and a 3-V supply voltage. Its maximum gain is 15 dB, its input 3rd-order-intercept-point (IIP3) at the maximum gain is 3.4 dBm, and the gain-control range is 40 dB. The obtained of NF of 1.4 dB is the lowest so far reported for a continuously controlled VG-LNA.

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