Abstracts

A high-performance Si-bipolar RF receiver for digital satellite radio

G. Cali, G. Cantone, P. Filoramo, G. Sirna, P. Vita and G. Palmisano. "A high-performance Si-bipolar RF receiver for digital satellite radio." 1998 Transactions on Microwave Theory and Techniques 46.12 (Dec. 1998, Part II [T-MTT] (1998 Symposium Issue)): 2568-2576.

An integrated low voltage RF receiver for digital satellite radio is presented. It contains all the basic building blocks from the low noise amplifier (LNA) to the baseband buffer and two phase-locked loops (PLLs) which provide the RF and the intermediate frequency (IF) local oscillator signals. Innovative solutions for critical blocks such as the LNA, the IF buffer, the voltage controlled oscillator (VCO), etc., as well as new arrangements for bias circuits have been adopted which greatly increase circuit performance. Moreover, 2.4 V regulated power supplies with power down capability have also been included. The receiver needs a small number of external components that are principally the RF image filter and the surface acoustic wave (SAW) channel filter. It achieves a maximum gain of 120 dB and a noise figure of 5 dB. The internal regulators are set to 2.4 V and ensure correct operation with an external power supply varying from 2.7 to 5.5 V. The receiver was integrated in a high performance 20 GHz silicon bipolar technology. Its die size is 18 mm/sup 2/ and it needs a quiescent current of 75 mA.

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