Abstract

Variable-gain amplifier (VGA) is one of the basic building blocks of many communication systems. In this paper we present a novel structure of VGA with 22 db of gain range and 220 MHz of bandwidth frequency variation. This circuit combines a voltage to current (V-I) converter and two-stage CMOS amplifier to achieve programmable gain and bandwidth. The gain is varied by changing the input voltage (Vin) from -1V to 0V. The maximum bandwidth is about 300 MHz. The gain can be varied from 38 dB to 60 dB in 1 dB gain steps. The overall circuit draws current from 10µA to 150µA at ±1. 5V power supply. The noise figure of the system at maximum gain is 18dB, and the third-order intermodulation intercept point (IIP3) at minimum gain is -8 dBm. Simulations results with static and dynamic behaviour is presented and validated with the technology AMS 0. 35µm. Eventually we have also succeeded in reducing the static power consumption to 0. 5 mW.

References

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**Index Terms**

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