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A Low-Power, Low-Noise and High Linearity 60 GHz LNA for WPAN Applications

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Abstract : A low noise figure (NF) and high linearity V-band Low Noise Amplifier (LNA) is reported in this article. The LNA compromises a three-stage cascode configuration. This LNA will be used as a part of a WPAN (Wireless Personal Area Network) receiver in the millimeter-wave band at 60 GHz. It is designed according to the MMIC technology (Monolithic Microwave Integrated Circuit) in PH 15 process from UMS foundry and uses a 0.15 µm GaAs PHEMT (Pseudomorphic High Electron Mobility Transistor). The particularity of this LNA compared to other LNAs in literature is its very low noise figure which is equal to 1 dB and its high linearity (IIP3 is about 22 dB). The LNA consumes 0.24 Watts, achieving a high gain which is about 23 dB, an input return loss better than -10 dB and an output return loss better than -8 dB.

Keywords : low noise amplifier, V-band, MMIC technology, LNA, amplifier, cascode, pseudomorphic high electron mobility transistor (PHEMT), high linearity
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