High Performance 200GHz Two Way Combined G-band Power Amplifier for Short Range Imaging Applications

Obumneme Obiajulu Umeonwuka[1], Athanisius Terlumun Utev[2], Aliyu Danjuma Usman[2], Abdulmalik Shehu Yaro[2], Habeeb Bello[2], and Abdoulie M. S. Tekanyi[2]

[1]University of Johannesburg Faculty of Engineering and the Built Environment
[2]Ahmadu Bello University

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Abstract

A 2-way combined G-band differential power amplifier (PA) designed using a 130-nm SiGe BiCMOS technology is shown in this work. A differential PA is designed at 200GHz using cascode topology (CT) resulting in an overall gain and saturated output power of >27 dB and >16.5dBm respectively. To complete the design of the 2-way combined PA, a balun was also loaded with two differential PAs which improved the bandwidth to 80GHz. **The area occupied by the chip of the manufactured PA was 0.55 mm^2, which demonstrates a reduction of 59.25 % when compared to the existing approach**. Simulation results showed that the 2-way combined G-band PA achieved a peak gain of 27dB, which showed of 4.24% increase in the gain obtained when compared with the 4-way combined PA, which was 25.9dB. Additionally, the 2-way combined G-band PA achieved a PAE value of 5.4%, which demonstrated a percentage increase of 54.2% in comparison to the 4-way combined PA, which had a PAE of 3.5%. As a result, a 3.3% decrease was observed in the DC power consumed by the 2-way combined G-band PA.

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