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标题: A SiGe BiCMOS Transmitter/Receiver Chipset With On-Chip SIW Antennas for Terahertz Applications
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来源出版物: IEEE JOURNAL OF SOLID-STATE CIRCUITS 卷: 47 期: 11 页: 2654-2664
DOI: 10.1109/JSSC.2012.2211658 出版年: NOV 2012
在 Web of Science 中的被引频次: 0
被引频次合计: 0
引用的参考文献数: 19
摘要: This paper presents a terahertz (THz) transmitter (Tx) and receiver (Rx) chipset operating around 400 GHz in 0.13-mu m SiGe BiCMOS technology. The Tx chip consists of a voltage-controlled oscillator, a buffer, a modulator, a power amplifier, a frequency tripler, and a substrate integrated waveguide (SIW) antenna. This antenna has an additional high-pass filtering characteristic to suppress the unwanted fundamental (f(0)) and second harmonic (2f(0)) signals by 50 and 30 dB, respectively. The Rx chip includes a proposed reconfigurable SIW antenna and a novel two-mode subharmonic mixer with similar to 5-dB reduction of conversion loss. The Rx chip consumes 50 nA from a 1.2-V supply. The measurement results of the Tx and Rx chips and a back-to-back test of the Tx/Rx chipset show the feasibility and pave the way of implementing a fully integrated THz system in silicon technology for mass production.
入藏号: WOS:000310888200010
语种: English
文献类型: Article
作者关键词: On-chip antenna; receiver; reconfigurable; substrate integrated waveguide (SIW); terahertz (THz); transmitter
KeyWords Plus: TECHNOLOGY
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出版商: IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC
出版商地址: 445 HOES LANE, PISCATAWAY, NJ 08855-4141 USA
Web of Science 类别: Engineering, Electrical & Electronic
研究方向: Engineering
IDS 号: 034QO
ISSN: 0018-9200
29 字符的来源出版物名称缩写: IEEE J SOLID-ST CIRC
ISO 来源出版物缩写: IEEE J. Solid-State Circuit
来源出版物页码计数: 11