

Millimeter-Wave and Terahertz Wireless RFIC and On-Chip Antenna Design: Tools and Layout Techniques

T.S. Rappaport, F. Gutierrez, T. Al-Attar

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Abstract:

This invited contribution provides insights for implementation of millimeter-wave and terahertz wireless systems on a chip (MTWSOC). We present an overview of important software and simulation tools and key layout issues and design rules for millimeter-wave (mmWave) circuits.

An example of a recently fabricated $0.18\mu\text{m}$ CMOS integrated circuit by the Wireless Networking and Communications Group (WNCG) at The University of Texas at Austin is presented. The example chip includes 60 GHz on-chip antennas, an array of transmission lines, and IMPATT diodes.

Index Terms:

60 GHz, millimeter-wave, on-chip antenna, IMPATT diode, CPW, Transmission Lines, RFIC, CMOS, WPAN, SOC, MTWS.