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Title:Substrate-Integrated Millimeter-Wave and Terahertz Antenna Technology

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Abstract:Significant advances in the development of millimeter-wave and terahertz (30-10 000 GHz) technologies have been made to cope with the increasing interest in this still not fully explored electromagnetic spectrum. The nature of electromagnetic waves over this frequency range is well suited for the development of high-resolution imaging applications, molecular-sensitive spectroscopic devices, and ultrabroadband wireless communications. In this paper, millimeter-wave and terahertz antenna technologies are overviewed including the conventional and nonconventional planar/nonplanar antenna structures based on different platforms. As a promising technological platform, substrate-integrated circuits (SICs) attract more and more attention. Various substrate-integrated waveguide (SIW) schemes and other synthesized guide techniques have been widely employed in the design of antennas and arrays. Different types of substrate-integrated antennas and beamforming networks are discussed with respect to theoretical and experimental results in connection with electrical and mechanical performances.

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