

Design of Ka-band Chip Antenna Based on Slot Antenna

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Abstract—A broadband chip antenna designed for millimeter wave (mmW) can be used in fifth-generation (5G) frequency bands. The on-chip mmW antenna designed for the Ka-band utilizes standard Complementary Metal-Oxide-Semiconductor (CMOS) technology. In this design, the mmW antenna structure is formed by connecting the top layer (Metal6) and the bottom metal layer (Metal1) to reduce losses. Many architectures have been proposed for chip antennas to overcome the metal thickness during fabrication and improve the gain of chip antennas. Therefore, this paper proposes an on-chip antenna for the fifth-generation mobile communication millimeter-wave frequency band. Using high-frequency electromagnetic simulation software, the chip antenna exhibits a minimum return loss of -18dB at 31GHz and a peak gain of -7 dB. The measured reflection coefficient is below -10dB from 18.8 GHz to 32.5 GHz.

Keyword— Antenna on-chip, CMOS, millimeter-wave



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