2.45 GHz Inter-/Intra- Board Wireless Communication using a CPW-fed Vertical Bow-tie Antenna

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ABSTRACT

Coplanar waveguide (CPW)-fed vertically standing bow-tie antennas for 2.45 GHz ISM band applications for Inter-/intra- board wireless communication are presented. The vertical antenna scheme provides wave propagation in the horizontal direction parallel to the substrate, allowing effective in-plane board-to-board communication. The monopole bow-tie antenna is implemented in an air-lifted fashion, resulting in high efficiency, broad bandwidth, and small footprint compared to the conventional surface mounted patch type antenna. The vertical bow-tie antenna with a height of 22.4 mm and a flare angle of 43° shows a 10-dB bandwidth of 20.4%, a footprint of approximately 1 mm^2 and a height reduction of 33% compared to a cylindrical monopole counterpart. A numerical analysis has been performed between 1 and 4 GHz and the transmission characteristics using two identical antennas have been performed at 2.45 GHz with a network analyzer. The numerical results are in good agreement with experimental data.

KEYWORDS : bow-tie antenna, vertically standing , inter board communication, intra board communication, in-plane board-to-board communication