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(57) Abstract :

Milli-meter waves (mm Wave) represent a pivotal breakthrough in wireless communication technology, particularly in the context of 5G frequency bands. The operation at higher frequencies facilitates unparalleled data transmission speeds, reaching several gigabits per second. This article introduces a meticulously crafted Multiple Input Multiple Output (MIMO) antenna, specifically designed for optimal performance at 28 GHz and 38 GHz. The MIMO antenna comprises two elements with overall dimensions of 15x10x0.9mm³. It consists of two patches, a ground made of copper, and a substrate composed of Rogers RT5880 material with a dielectric constant of 2.2. The two copper patches measure 4x4 mm, while both the ground and substrate have dimensions of 15x10 mm. Noteworthy features of the antenna include an inverted L-shape cut on the patch and an angled line cut at 45 degrees in a patch, contributing to the achievement of a dual-band operation at frequencies of 28 GHz and 38 GHz. The antenna achieves an impressive overall efficiency ranging between 89%-90%. Furthermore, the isolation between the two patches is remarkably low, measuring less than -15 db. This antenna attains a remarkable bandwidth of 7 GHz (28GHz) and 3.1 GHz (38GHz), accompanied by a gain of 7.5 dbi and 6.4 dbi, respectively at two bands. The Voltage Standing Wave Ratio (VSWR) is consistently below 2. The antenna effectively covers bands such as n257, n260, and n261, contributing to its versatility and applicability in various 5G scenarios.

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