

# Design of Compact MIMO Antenna for 5G Applications

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**Abstract:** *The objective of the work is to design a compact MULTIPLE INPUT MULTIPLE OUTPUT (MIMO) antenna at sub-6GHz for 5G applications. Multiple-inputs and Multiple-output (MIMO) refers to the fact that it is a wireless technology, which is used to transfer more data at the same time between transmitter and receiver to increase the data rate and minimize errors. The antenna is designed by employing two rectangular stacked patch structures and slots, making the antenna resonate at a dual frequency band. It is well known that MIMO technology takes advantage of a natural radio-wave phenomenon called multipath where the transmitted information bounces off walls, ceilings, and other objects, reaching the receiving antenna multiple times via different angles and at slightly different times. MIMO antenna is suitable for increasing the SNR of mobile Communication systems. The channel capacity can be increased by improving SNR. The analytical study of antenna design is carried out using the governing micro strip patch equation. The main objective of this paper is to design a MIMO antenna with a single substrate, which is fed by microstrip lines. In this proposed project the bandwidth, Directivity, return loss, VSWR, gain, efficiency, s-parameters and radiation pattern are simulated and determined. The characteristics of the proposed antenna are simulated using CST Microwave Studio 2021 Software.*

**Keywords:** 5G's High Data Rate, Microstrip Patch Antenna, Massive Multi-Input Multi-Output (MIMO), MIMO Antenna.

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