DUAL ELEMENTS ISOLATED MAGNETIC DIPOLE MIMO ANTENNA WITH SEMI CIRCULAR SLOT STRUCTURE FOR ISOLATION ENHANCEMENT

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5. Report

5.1 Proposed Executive Summary

Currently, a conventional antenna structure has been designed with feeding line placed on outside the radiating element. Consequently, contributes to the increment of the array structure. In addition, the position of feeding line also creates more spurious effect of array antenna, and Spurious effect around the array element and feeding network will contribute to degradation of gain directivity and low antenna efficiency. The main objectives of this research are to determine the minimum distance between array elements of MIMO antenna, to analyze the gain of IMD MIMO patch antenna with closed feeding line structure and to investigate the spurious effect of the proposed antenna structure. To achieve the research objectives, systematic approach will be conducted starting with a quick review on MIMO patch antenna, followed by calculating the initial structure of the IMD patch antenna with Semi-circular Slot structure by using existence mathematical expressions. Then, modelling IMD MIMO patch antenna and closed feeding line structure with quarter wave impedance matching will be simulated and optimized to determine the output responsiveness of the proposed design. The outcome from the research can contribute in publishing fundamental data on the effect of feeding line position and semi-circular slot structure on antenna in order to conduct more comprehensive research in designing small MIMO array antennas with high gain and multitasking wireless medium that can support numerous integrated wireless communication systems.

5.2 Enhanced Executive Summary

This project is presenting preliminary research in designing the Isolated Magnetic Dipole (IMD) MIMO Antenna for wireless application. Isolated Magnetic Dipole structure is one of the unique geometries that offers compact and low damaging electrical current at the ground surface. However, less attention in discussing design the MIMO antenna using IMD structure. The two elements MIMO antenna using IMD with linear port configuration has been constructed at 2.4 GHz. Then simulated and analyzed has been carried out to validate the feasibility of the IMD-MIMO antenna. The simulation and analysis cover S-parameters, radiation, gain, correlation coefficient and diversity gain. In addition, simple semi-circle structure etched on the ground layer to improve the isolation of MIMO antenna. From the simulation results, the IMD-MIMO antenna provide better results and highly recommended for designing compact MIMO antenna.

Key Words—Simulation, Linear Configuration, Wireless, Semi-circle, MIMO

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