# PRINTED (2x1) PATCH ARRAY ANTENNA at 2.45 GHz

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# ABSTRACT

This paper proposed of a microstrip rectangular patch array antenna with operating frequency at 2.45GHz for WLAN application. The antenna array of 2x1 microstrip rectangular patch antenna with microstrip line feeding based on quarter-wave impedance matching technique was designed and simulated using CST Microwave Environment software. The performance of the designed antenna was analyzed in term of return loss, VSWR, bandwidth, directivity, radiation pattern and gain. The antenna was then fabricated on the substrate type FR-4 with dielectric constant of 4.7 and thickness of 1.6mm respectively. The antenna was measured using Vector Network Analyzer (VNA) and the details of the proposed antenna design and simulation result for 2.45GHz WLAN band are promising. The return loss, s11 for the single patch antenna and (2x1) array antenna are -12.938 and -19.468 respectively. Other than that, the simulated bandwidth for the single patch antenna is 3.82%. Meanwhile for the (2x1) array antenna is 3.98%.This is proved that (2x1) array antenna is better than single patch antenna in term of wider bandwidth, higher gain and better directivity.

Keywords- *Microstrip Antennas, Array Antenna, Microstrip Line Feeding, substrate FR-4, CST*

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

The research on patch array antenna used for WLAN communication is rapidly a growing segment in communication sector, which with the potential to provide high-quality information exchange between portable devices without using wires. Within these chapters, the outlines of this project are discussed including the project overview, project objectives, project scope and background as well as project implementation of the printed patch array antenna which operates in the frequency of 2.45 GHz for WLAN communication applications.

## 1.2 Introduction to Printed Patch Array Antenna at 2.45 GHz

Development of microwave technology gives significant impacts to many applications in modern society and our future. As microwave technology keep upgraded and improved, one of the applications that fully utilizes microwave system also experience rapid development. It is telecommunication technology where now people experience a rapid progress in wireless communication which seems to replace wired communication networks. In this case, antennas play a more important role.