# INFRARED TRANSCEIVER FOR DIGITAL COMMUNICATION

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**Most Gracious Most Merciful**

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# ABSTRACT

This project involves the design, operation and analysis of an infrared transceiver. The transceiver was designed to transmit data over a free space. The system is known as the 'infrared transceiver for digital communication'. In the thesis, the design methodology is described in detail starting from the theoretical concept to the working circuit design. The system consists of a transmitter and receiver. The optical beam emitted by the transmitter spreads in space or air, mainly in a forward direction. The receiver in a particular distance should detect the beam. Results are presented in maximum distances obtained between the transmitter and receiver, maximum input frequency of the system and optical power produced based on angular orientation. The proposed data rate of the transmission is 5Mbps.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

A major breakthrough occurred in the world's electronic development with the entry of applied science into infrared optical technology. The advancement in semiconductor technology has made the electrical appliances and electronic communication devices operate without cable or wire or in simple word operate in wireless. TV remote control and wireless LAN are examples of electronic communication device that uses the wireless technology.

When talking about infrared communication, it is also in the same field as the free-space optical communication. In optical communication, the most important components are the light source and light detector. Usually light source uses the infrared technology. Actually infrared is generated from the vibration of atoms in a substance when it is heated. As temperature of an object is increased, the atoms are further agitated, causing them to vibrate. As a result they emit infrared rays. The higher the temperature, the greater the amount of infrared energy emitted. As an object is cooled, it emits less heat. Any object that generates heat emits infrared.[8]

Although infrared communication has already been implemented in some applications but the usage of that technology is still limited and researchers are still continue to improve this technology for better performance to other applications.