Chapter 2
A Square–Slotted Dual–Bandwidth Rectangular–Patterned Antenna for IoT Applications

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ABSTRACT

This chapter presents a unique design for rectangular patch antenna considering 5GHz as frequency for IoT applications. In the booming world of technology, IoT has set a significant benchmark by its enormous applications in almost all the fields. So here we come up with this unique design of antenna which can be used for IoT applications. As an initial step, a simple normal rectangular antenna is configured for a frequency ranging from 3GHz to 8GHz, and then considering the 5GHz to be appropriate for IoT application, a conventional rectangular patch antenna was designed. This conventional patch antenna operates at dual frequencies 4.97GHz and 7.53GHz. In later stages of designing, square slots are made on the either side of the feedline to obtain better antenna parameters. This chapter presents a detailed study on conventional and slotted antenna and a brief discussion regarding the comparison of the antenna parameters of conventional antenna with the slotted antenna.

INTRODUCTION

A web of physical objects or things which connect with each other to share data and take action can be stated as IoT. It is basically a network comprising of things which communicate with each other and share information. These things or objects i.e., hardware devices which interact should be IP protocol enabled. For communicating with each other these devices need to send and receive the messages. (Lizzi & Ferrero, n.d.) IoT can be stated as an inter-network of physical units, other components with electronics, sensors, different software, actuators, vehicles and RFID devices. It is a system that enables these objects to assemble and transfer data in a diverse networking environment including objects of distinct functionality, technology and application field.

The Internet is "a global network for connecting innumerable embedded hardware devices like computers, smartphones and tablets providing a range of data and communication facilities and consisting of interconnected networks using standardized communication protocols". A unique id with IP address is given to all the devices present in the network. IP address could be a numerical label that identifies a device and locates it on the network and routes the web traffic. The Internet has accelerated the face of technological development, the growth of internet, considering the advancement, soon the following becomes reality. A day is one's life would be governed by Internet and IoT in near feature. IoT devices which have particular identities and can achieve remote sensing, actuating and monitoring capabilities can be noted as "Things" in IOT. Things refer to variety of devices. At times, even human in the loop becomes a thing. Anything to qualify as a "thing" requires identity. The "thing" can monitor, measure for example, a temperature sensor could be a thing. Some standard organizations have set up significant works to study the depth of IoT. In Toronto, Canada, an Internet of Everything research center is set up by Cisco where they have spent nearly $100 million.

INTRODUCTION TO ANTENNA

In modern communication system, the wireless the technology becomes integral part of human life. Because of the progression in innovation, the necessity and use of remote correspondence applications are increment step by step. As we know antennas are simple electrical devices which carry out receiving and transmitting action and thereby converting electrical signals to electromagnetics waves. Antennas receives the signal from transmission line or guided wave, that converts received signal to electromagnetic signal which can be transmitted to free space. (Panda et al., n.d.) Antenna can act as a transmitting antenna and receiving antenna where

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