

Dual Tag Antenna for UHF RFID Applications

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ABSTRACT

Continuous researches are carried out on different identification technologies. The Radio Frequency Identification (RFID) is the well-known one.

The most RFID systems used are the passive systems based on backscattering modulation.

In this paper, analysis and design of a Dual IFA (Inverted F Antenna) Tag antenna are proposed for UHF RFID applications.

The antenna is designed to operate at 0.4 GHz and 2.4 GHz; it is fabricated on the FR4 substrate with dielectric constant of 4.4. The antenna fundamental parameters such as return loss, radiation pattern and current distribution are presented.

Simulation tool, based on the FIT (Finite Integration technique),(CST Micro Wave Studio) has been used to analyze the antenna.

The proposed dipole antenna is simple and robust in design.

General Terms

RFID (Radio Frequency Identification), Return loss, Radiations pattern, current distribution.

Keywords

RFID, Dual Band, IFA, Tag antenna, UHF, Finite Integration Technique.

1. INTRODUCTION

Contactless Identification has become a mature technology worldwide [1]; nowadays the UHF Radio Frequency Identification is the most widespread one.

An RFID system uses wireless radio communication technology to uniquely identify tagged objects or people.

There are three basic components to an RFID system, as shown in "Figure 1" [1][2]:

- A tag (transponder), which is composed of a semiconductor chip, an antenna, and sometimes a battery; "Figure 2" illustrate the tag components;
- An interrogator (reader), which is composed of

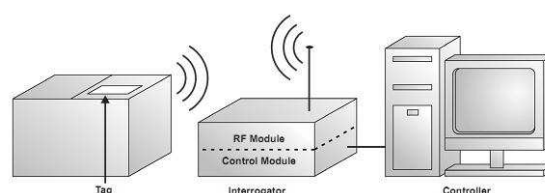


Fig1: RFID tag

2. UHF RFID TAG

We will focus our studies on the tag; which has as a basic function to store Data and transmit data to the interrogator.

As it is mentioned previously, Tag consists of an electronics chip and an antenna "Figure 2" encapsulated in a package to form a usable tag, some tags also contain batteries, and this is what differentiates active tags from passive tags.

The more used RFID systems are based on the passive tags due to their low cost.

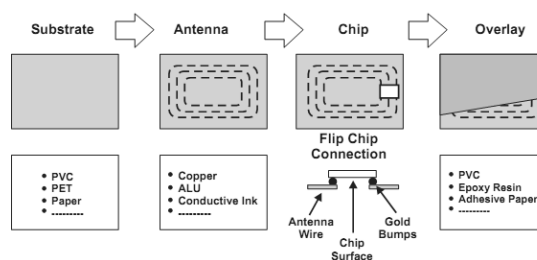


Fig2: RFID Tag Components

Passive Tags are activated and powered by the