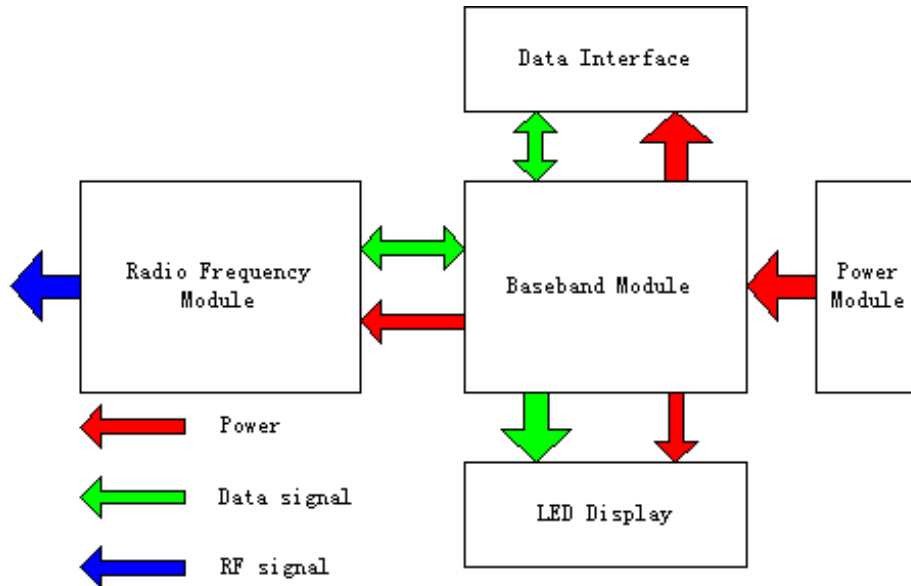# System Description

## 1.System Structure Diagram

Diagram1:    System Structure diagram

The system consists of radio frequency module, Baseband module, power module, data interface and LED display interface. Under the control of Baseband module radio frequency module transmits the modulated carrier signal with varying frequency and power. The antenna transmits the signal to a certain area within which the tags receive the signal and then feedback its signal. After going into radio frequency module the feedback signal will be demodulated to form Baseband signal.

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Baseband module performs decoding the tag signal and communicating with PC, and power module provides all the direct voltage .

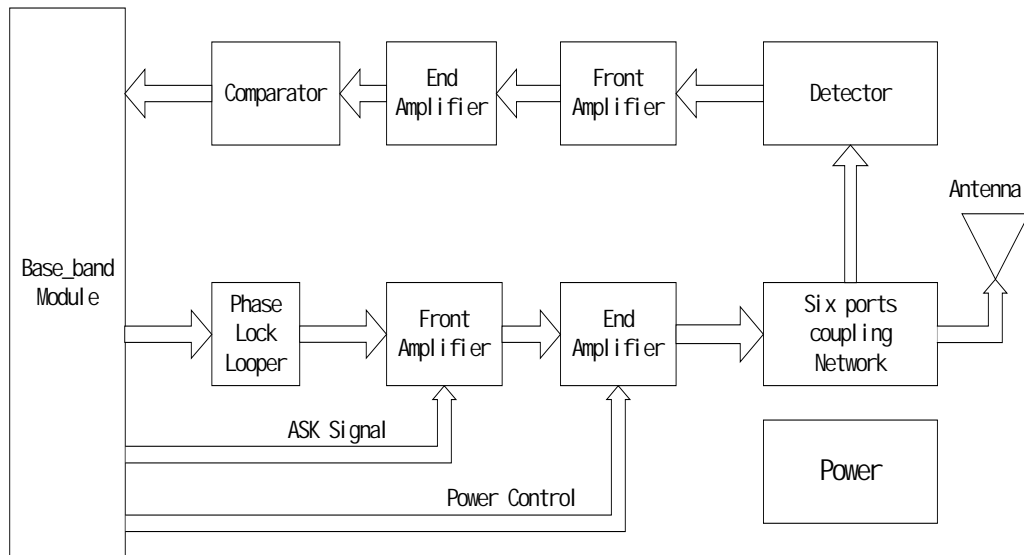## 2   Radio Frequency Structure Diagram

Diagram2    radio frequency module diagram

The radio frequency module consists of transmitting and receiving parts controlled by Baseband circuit. The Phase Lock Looper generates carrier with frequency range from 902MHz~928MHz, which could be amplified by the Front Amplifier and End Amplifier and then emitted by the antenna that returns tag's signal via six ports coupling network to the detector, where the signal are detected and amplified to output to the Baseband circuit.
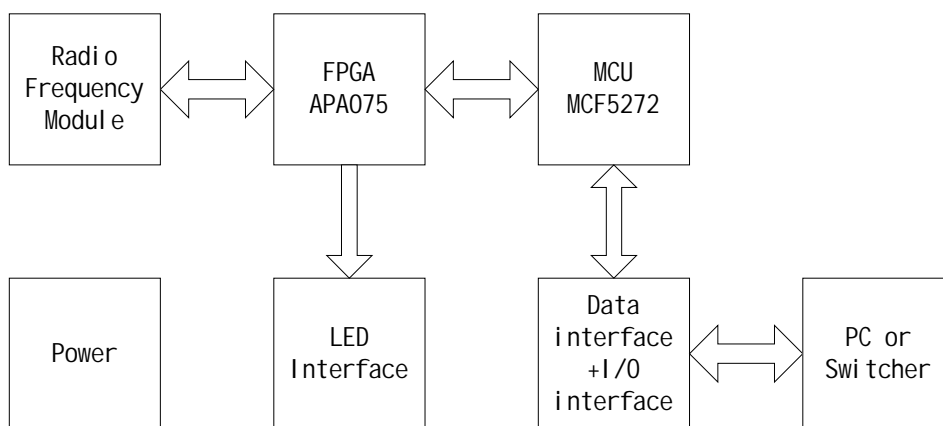
## 3    Baseband Structure Diagram



Diagram 3    Baseband module diagram

## 4    Radio Frequency Module

The radio frequency module consists of transmitting and receiving part.

● Transmitting Part

The transmitting part is as below according to the RF signal flow.

Temperature-compensated oscillator(12.8MHz)　PLL915A phase lock looper
RF2302 power front-amplifier　end-amplifier(power adjustable)　microwave
switcher　(Maximum output power: 30dBm).

● Receiving part

The receiving part is as below according to the returned(feedback) signal flow.

six-ports coupling network　front difference amplifier　end amplifier
comparator output. (Output double-channel digital signal).


## 5　Baseband Module

The Baseband module consists of coding/decoding and control parts, which
respectively are FPGA(APA075) and IP2022 MCU.

The coding/decoding part employs built-in-FLASH FPGA modeled APA075
produced by Actal Company. The device performs coding/decoding for tag and
controlling the transmitting circuit.

The control part employs IP2022 produced by Ubicom Company. With
19200bps serial interface and 10Mbps Ethernet network interface, IP2022 performs
order analyzing, data uploading, and data storage, etc.