

# System Description

## 1. System Structure Diagram

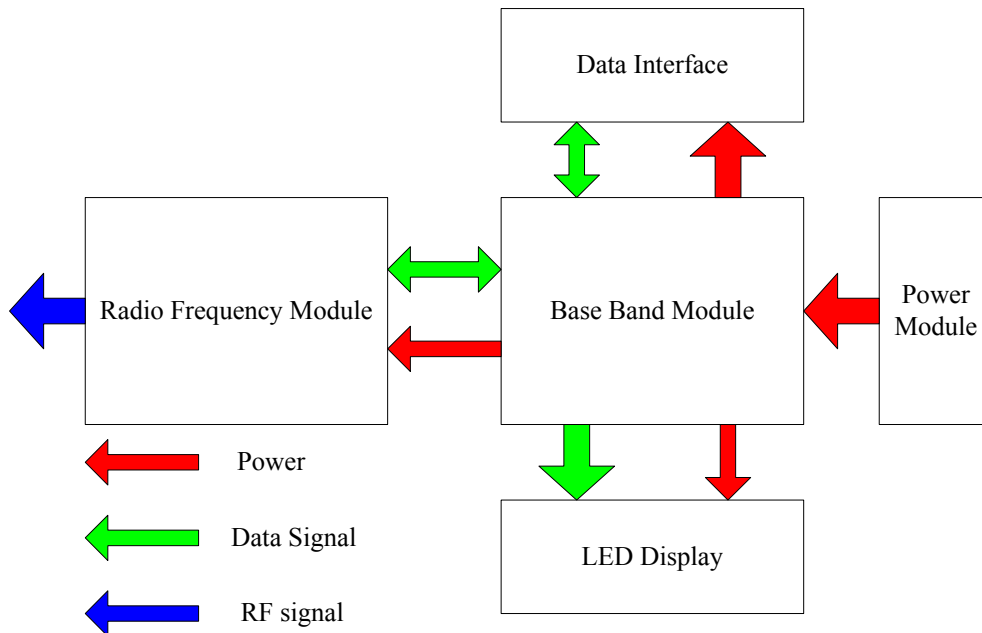


Diagram 1: System Structure Diagram

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

The base band performs decoding of the tag signal and communicates with the PC. The power module provides all the direct voltage.

## 2. Radio Frequency Structure Diagram

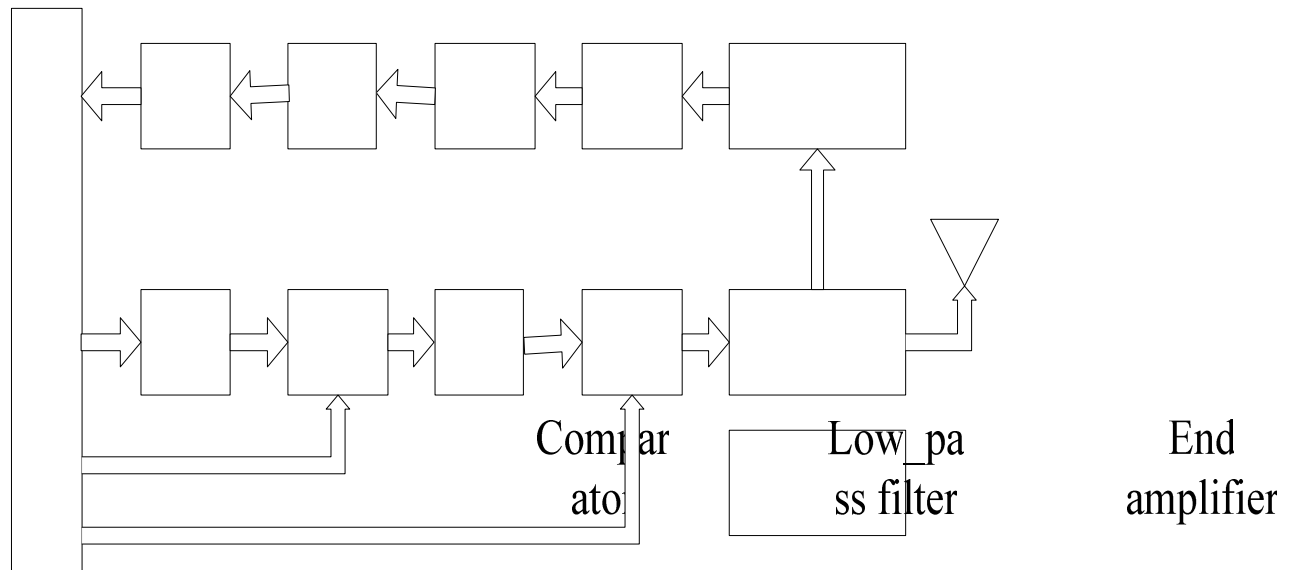


Diagram 2: Radio Frequency Structure Diagram

The radio frequency module is consist of transmitting and receiving parts controlled by Baseband circuit. the phase lock loop generates carrier with frequency range from 902MHz~928Mhz,which could be amplified by the front amplifier and end amplifier, then emitted by the antenna that return tag's signal via demodulator to mixer where the signal is detected and amplified to output to the baseband circuit.

The radio frequency module is consist 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 loop → RF2302 power front amplifier → end amplifier with power adjustable → microwave switcher with maximum output power

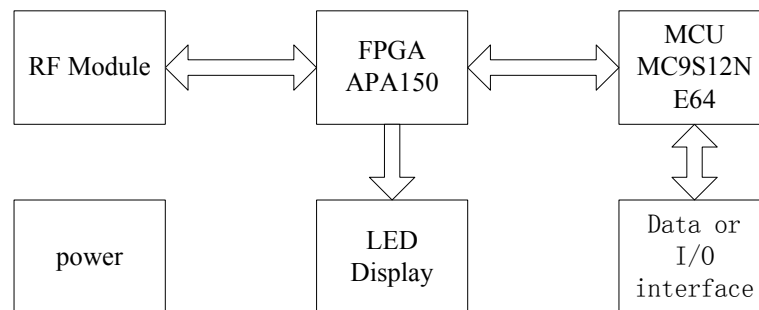
30dBm(1W).

·receiving part

The receiving part is as below according to the return signal flow

Demodulated network → front differential amplifier → end amplifier → comparator output → output double channel digital signal.

### 3. Base Band Structure Diagram



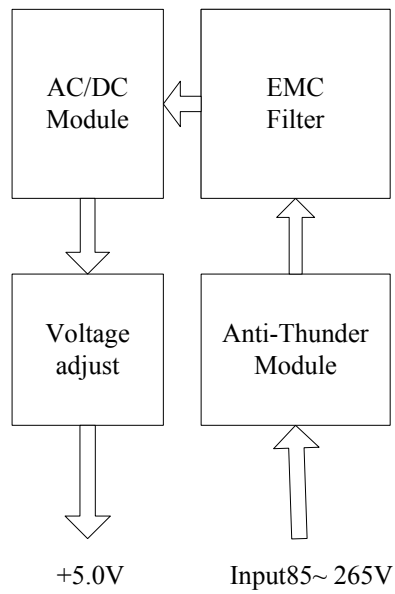
#### Base Band Structure Diagram

The baseband module is consist of coding/decoding part, and control parts, which respectively is FPGA and MCU.

The coding/decoding part employs built-in-FLASH modeled APA150 .the APA150 performs coding/decoding for tag signal and controlling the transmitting circuit.

The control unit employs MCU produced by Freescale company. with 19200serial interface and 10Mbps Ethernet network interface, MCU performs order analyzing , data uploading ,and data storage etc.

#### 4. Power Structure Diagram



Power Structure Diagram

Power module output is +5V direct current to interrogator, the maximum output current is 2A.