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# A1032F

447MHz FSK Receiver Module

Revision 1.1, 2017-05-23



**A1032F, FSK Receiver Module**

## Introduction

A1032F

FSK

## Applications

- 447 MHz band wireless system
- Data reception
- Home / Industrial remote control
- Remote Monitoring / Telemetry
- AMR – Automatic Meter Reading

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## Features

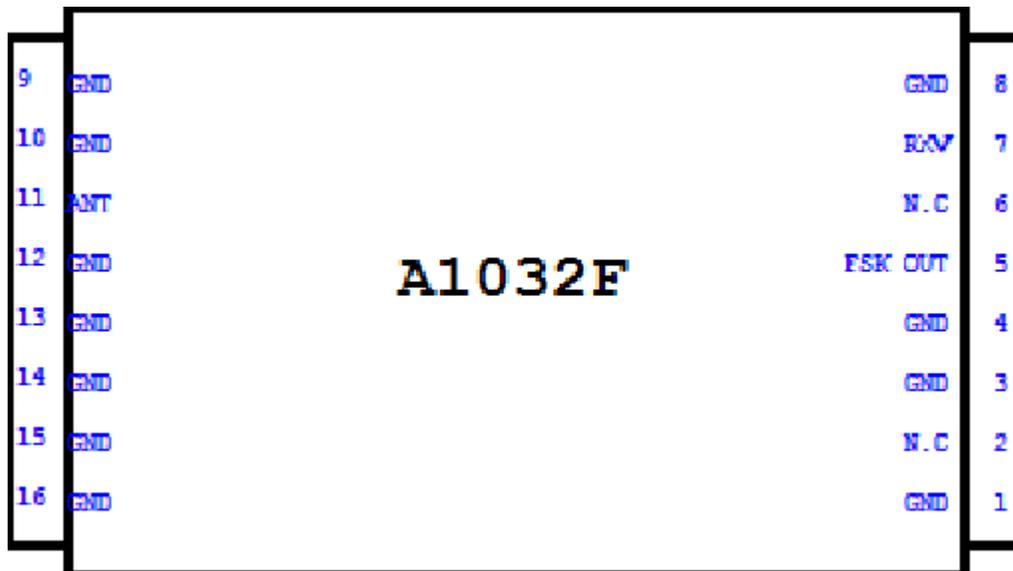
- Narrow band FSK receiver (occupied bandwidth < 8.5KHz)
- Exceptional sensitivity (Max. -120dBm)
- Operating temperature: -40 ~ 80
- Wide operating voltage range: 2.8V ~ 6.0V
- Low power consumption for battery operation

## Electrical Specifications

| Parameter              | Designation | Min. | Typ. | Max. | Unit | Notes |
|------------------------|-------------|------|------|------|------|-------|
| Supply Voltage         | RXV         | 2.8  | 5.0  | 6.0  | V    |       |
| Current Consumption    |             |      | 16   |      | mA   |       |
| Receiver Start-up Time |             |      | 46   | 50   | ms   |       |
| Receiver Sensitivity   |             |      | -118 | -120 | dBm  | BER   |
| RF Impedance           |             |      | 50   |      | Ohm  |       |
| Data Rate              |             | 500  | 1200 | 2400 | Baud |       |
| Operating Temperature  |             | -40  |      | 85   |      |       |

(RXV = 5.0V, Temperature = 25 , Otherwise, Specified)

## Pin Assignment



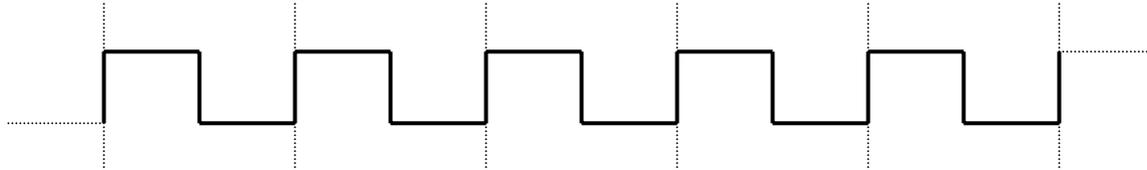
| Pin Name | Pin No   | I/O Type | Description          |
|----------|--|----------|----------------------|
| FSK OUT  | 5  | O        | Data Output(5.0V)    |
| N.C      | 2, 6   |          | Not Used             |
| RXV      | 7  | P        | Supply Voltage(5.0V) |
| ANT      | 11   | A        | Antenna              |
| GND      | 1, 3, 4,<br>8, 9, 10,<br>12, 13,<br>14<br>15, 16 | P        | Ground               |

Legend : O=Output P=Power A=Antenna

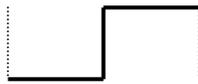
## Coding and Decoding

### Example 1 – Manchester Code(Recommendation)

#### 1. Preamble



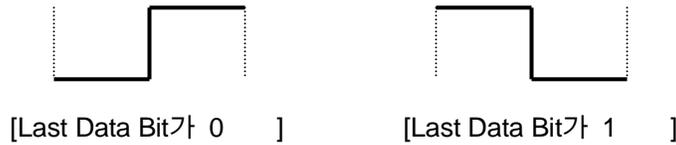
#### 2. Start Bit



#### 3. Data Bit



#### 4. Stop Bit

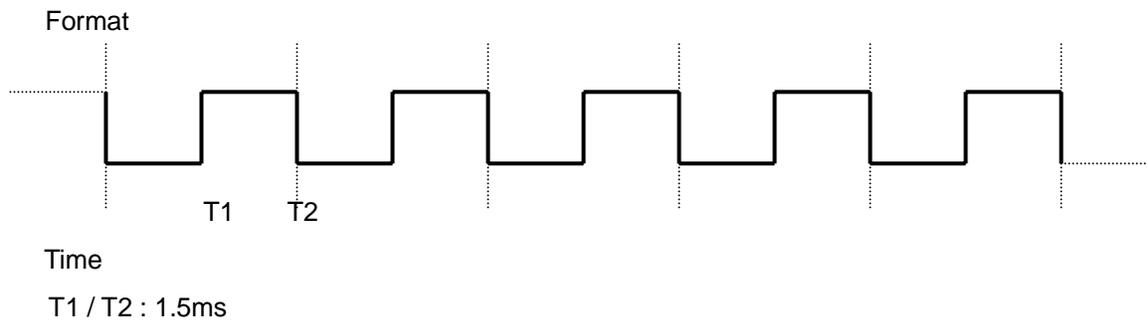


#### 5. Description

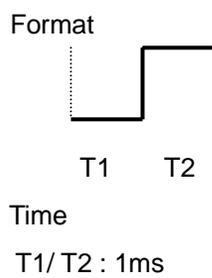
- Duty Cycle 1:1
- Preamble 10
- Preamble RF Module Sync , Bit Loss 가
- Start Bit Bit 0 Start Bit
- Stop Bit Last Data Bit Sampling Bit.

## Example 2

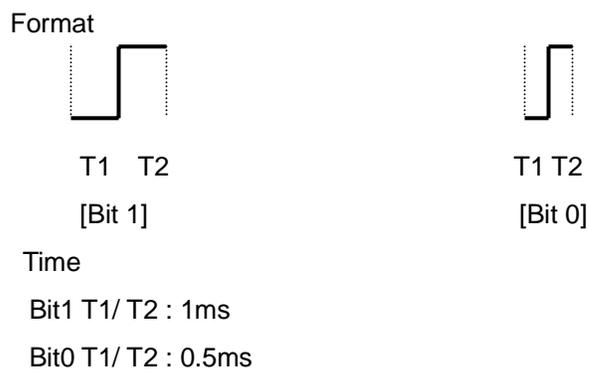
### 1. Preamble



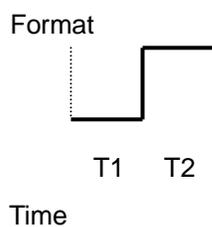
### 2. Start Bit



### 3. Data Bit



### 4. Stop Bit



T1 / T2 : 1ms

## 5. Description

- Coding/Decoding      Simple .
- Codec .
- Bit Duty Cycle 1:1.
- Preamble              10 .
- Stop Bit              Last Data Bit      Sampling Bit.
- [FSK OUT] Pin      MPU External Interrupt Pin      Falling Edge Interrupt.
- Timer              Count      Preamble / Start Bit / Data Bit0 / Data Bit1  
Decoding 가 . , Timer
  - 3ms      Preamble
  - 2ms      Start Bit
  - 2ms      Data Bit 1
  - 1ms      Data Bit 0
  - else Noise or

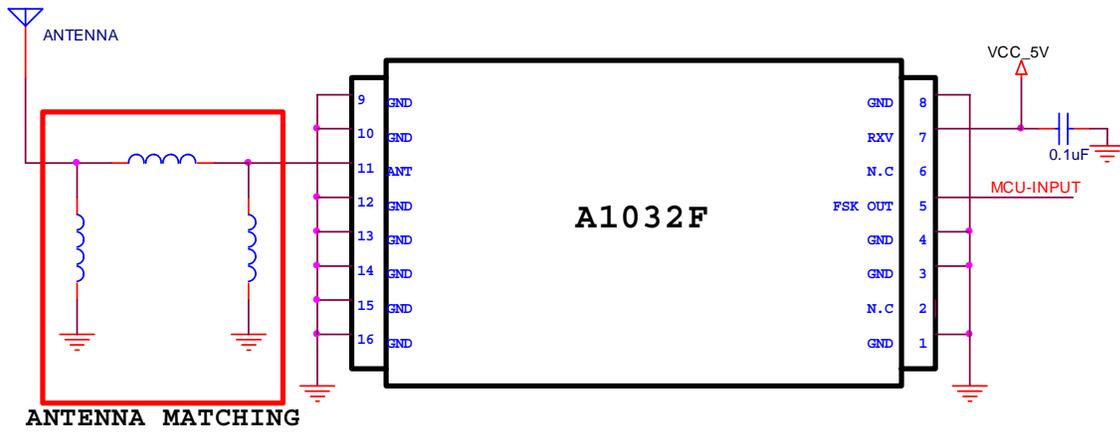
## Program

- 1200 Baud Rate / Manchester
- Data Coding/Decoding Manchester Bit
- Bit Time Transition Codec
- NRZ(UART)Codec
- Encoder/Decoder Chip
- Minimum 150 Baud Rate
- Data Data Duty Cycle  
 ( Duty = 5:5 Duty 7:3 )
- Data Sampling Check Sampling
- Application System RF Module Noise RF Noise가  
 Data Glitch가 Decoding Program **Glitch**  
 가 Glitch 10us

## H/W Artwork

- RF Module Vcc Ground Part
- RF Module PCB Through Hole  
 Ground Pattern
- RF Module Antenna Pin Antenna  
 50Ω Cable Antenna  
 가 : 1 , 2 ( )
- Antenna Matching 1 Km 가
-

## Application Circuit



## Dimension

### Top View

