FC-RF209 ISM RF Module with UART

Data Sheet

SHENZHEN FRIENDCOM TECHNOLOGY DEVELOPMENT CO., LTD.

Address: 6/F,17 Building, Guangqian Industrial Park, Longzhu Road, Xili Town, Nanshan, Shenzhen City, 518055, CHINA

Contact person: Victoria Liu
Tel: +86-755-23230544-8078 **Fax: +86-755-86026300**
E-mail: sales05@friendcom.com **Web:www.friendcom.com**

TABLE OF CONTENTS

FC-RF209 is a multi-channel low-cost RF module with high-reliability and high-stability. It works as transceiver in ISM band with very small size. It's easy to embed into user's terminal system.

Ⅰ. Features

- **ISM frequency band, It can work in 433MHz, 868MHz or 915MHz.**
- **2FSK modulation, high sensitivity.**
- **Long distance transmission: While the antenna height >2m, the reliable line-of- sight transmission distance >800 meters. (BER=10^{-3}/9600Bps).**
- **The standard FC-RF209 configuration provides 20 channels. The channel can be changed by program software.**
- **Data interface: UART.**
- **RF data rate : 1200/2400/4800/9600bps**
- **Port data rate :1200/2400/4800/9600bps**
- **While RF data rate is more than or equal to Port data rate, FC-RF209 can transmit data of unrestrained length in 100% transparent mode. The data in the air is encrypted with M-serial.**
- **High stability and reliability, excellent industrial design which adopt single RF IC and MCU**

Ⅱ. Function and Interface Description

2.1 Connection between FC-RF209 and user terminal (Figure.1)

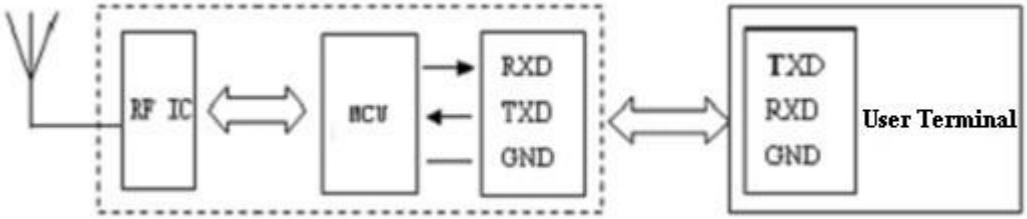


Figure .1

2.2 FC-RF209 Interface description (Figure 2)

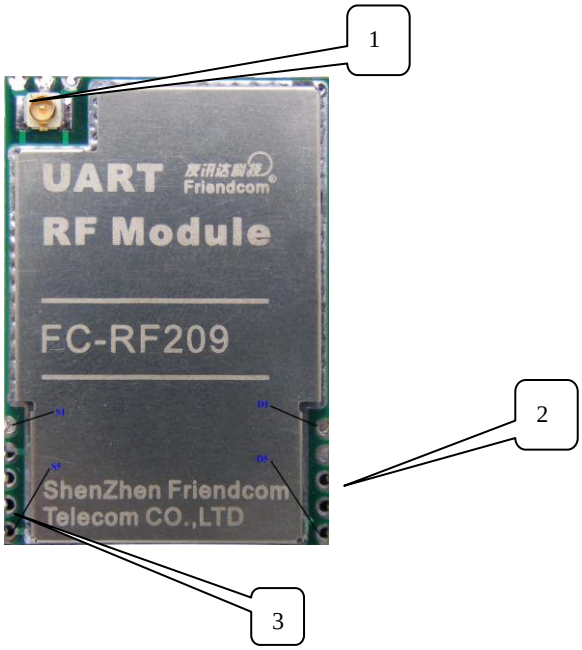


Figure .2

1 ——Antenna base（50 ohm Antenna Impedance）

2—— Data interface

3 ——Status setting interface

2.2.1 Data interface:

D1——VCC , 4.0--6.0VDC , 5VDC typically

D2——GND , Grounding **Tx/RX indicator**（While data transceiver sending

data, the red LED light. While receiving data, the green LED light.）

D3 ——RXD, data input, serial data RX end.

D4 ——TXD, Data output, serial data TX end

D5 —— C485, Control pin for RS-485

2.2.2 Status interface:

S1——RST , The RF module will reset in low level.

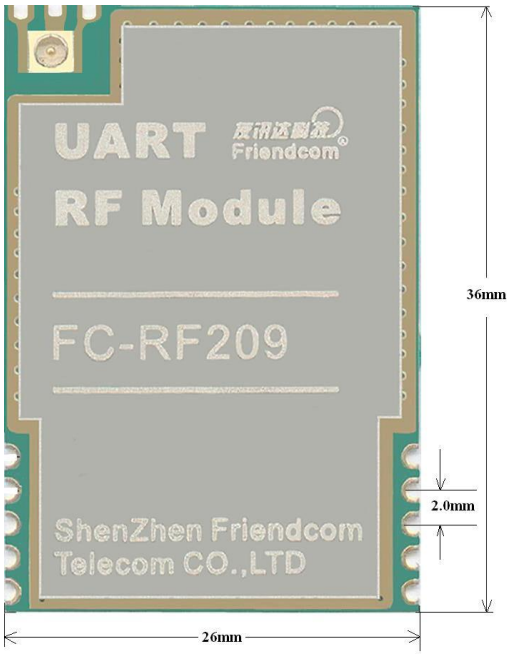
S2——SET, The module will enter into program status when in low level.

S3 ——TXLED, Tx indicator LED, valid in low level.

S4 ——LED- V+ Power indicator（The LED is on while in working mode）.

S5 —— RXLED/SQ , Rx indicator LED, or receive signal indicator, valid in low level.

2.3. Size description



Ⅲ. How to use FC-RF209

1. How FC-RF209 works:

FC-RF209 is a wireless data transceiver which can transfer data of one interface node to another interface node.（Its application schematic shown below:）

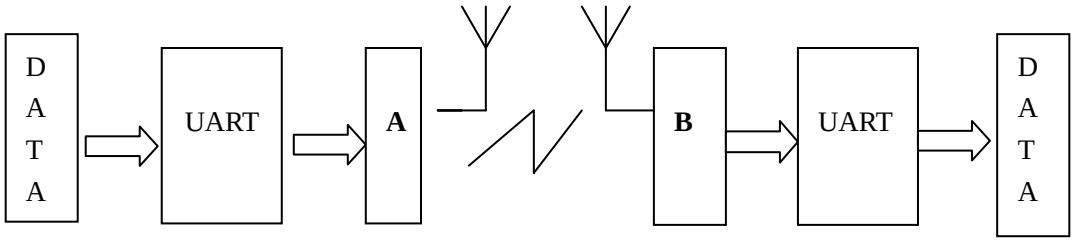


Figure3：Application Schematic(Where A,B is FC-RF209 module)

2. How to Use FC-RF209

2.1. The prerequisite of using FC-RF209

a. Use 5V manostat Power supply（Powered by external power supply）

b. Use standard 50Ohm impedance antenna for FC-RF209

c. Choose standard TTL interface to work with.

3. The below rules should be complied to implement correct transmission between two pcs of FC-RF209

a. While FC-RF209 used with user terminal, Its serial interface configuration should be same with the terminal .

b. Choose the same channel.

c. Configure the same RF data rate.

d. The serial interface baud is better to be the same.

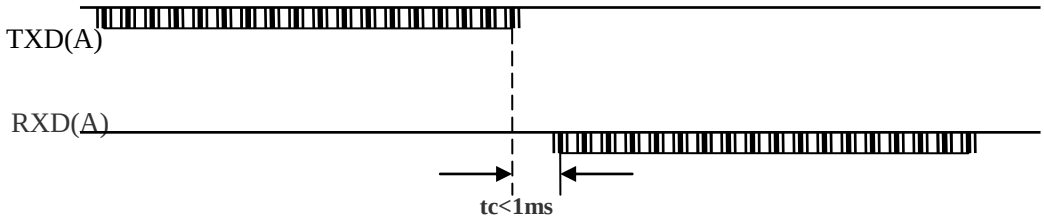
e. The communication protocol should be the same.

4. Data transmission:

a. TC ＜ 1ms: The delay between the Tx and Rx.

Timing diagram:

FC-RF209



The switch time from Tx to Rx is different based on different port baud rate.

Port Data Rate	Wait Time (mS)
1200bps	32ms
2400bps	16ms
4800bps	8ms
9600bps	4ms

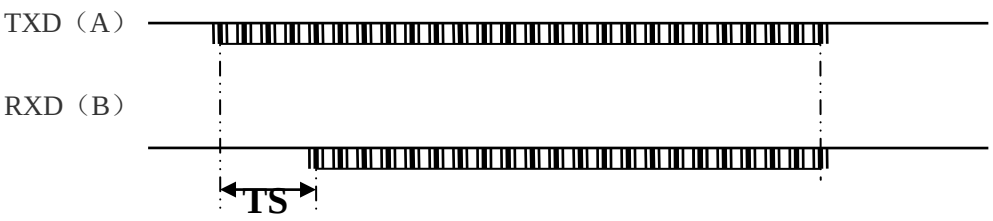
b. Data transmission delay: The time of sending a byte from TXD of Tx to RXD of Rx.

Data transmission delay is different for different data rate. The difference is shown below table:

Table 3:

RF Data Rate	Port Data Rate	Data Delay (TS)
1200bps	1200bps	244ms
2400bps	2400bps	122ms
4800bps	4800bps	61ms
9600bps	9600bps	31ms

Timing diagram (FC-RF209)



c. The sensitivity related to different RF data rate shown as below:

Table 5:

RF data rate	1200bps	2400bps	4800bps	9600bps
Sensitivity	-113dBm	-111dBm	-109dBm	-107dBm

Ⅳ. Technical Specification of FC-RF209

Table 6:

No.	Item	Technical Specification	Remark
1	Modulation	2FSK	
2	Work Frequency	ISM band, 433MHz(default), 868Mhz, 915MHz available	
3	RF output power	<500mW	
4	Sensitivity	-113dBm（1200bps）	
5	Transmit current	< 340mA	
6	Receive current	< 27mA	
7	RF data rate	1200/2400/4800/9600bps	Set by user
8	Port data rate	1200/2400/4800/9600bps	Set by user
9	Port Data Format	8E1/8N1/8O1	
10	Power supply	4.0V-6.0VDC	DC
11	Operate Temperature	-40℃～85℃	
12	Humidity	10%～90% RH,	
13	Dimension	41mm×22mm×3.2mm	
14	Weight	45g (Not including Antenna or data cable)	