APC810

27dBm ISM RF Transceiver Module   V1.0

Features

- 6000m distance cover(0.81Kbps)
- Spread Spectrum Modulation
- Frequency on 433MHz or 470MHz
- More than 100 channels
- 27dBm Max.output power
- -132dBm sensitivity @0.81Kbps
- UART/TTL,RS485/RS232 optional
- Dual 256bytes data buffer

Application

- Ultra long range communication
- Smart building and community
- Security and alarm system
- Wireless remote telemetry
- Remote automatic meter reading
- Wireless industrial data acquisition
- Remote monitor and control
- Wireless data transmission

DESCRIPTION

APC810 is a sub-1GHz transceiver module designed for operations in the unlicensed ISM (Industrial Scientific Medical) and LPRD bands. SSC(Spread Spectrum communication) modulation/demodulation, multi-channel operation, high bandwidth efficiency and anti-blocking performance makes APC810 module easily to realize an robust and reliable wireless link.

The module can be configured to work in different channel with requested frequency space. It adopts high efficient looped interleaving EDAC (Error Detection and correction) coding with coding gain up to 3dB which keeps in advance in EDAC and coding efficiency over normal FEC (Forward Error Correction). Because of its high reliability in correction, modules can filter error and fake information automatically and realize truly transparent wireless link, which makes APC810 very suitable in the complicated environment.

APC810 integrates dual 256 bytes buffer. When the buffer is empty, users can transfer 256 bytes

data per time and even limitless data transfer can be achieved as long as RF data rate (RF module to RF module) is configured to be faster than UART data rate (MCU to RF module). The module provides UART/TTL and RS232 or RS485 interface for selection. Users can choose six Air data rates and three parity checks which makes APC810 possibly tailor-made for different applications.

PIN FUNCTIONS

PIN	Name	Description
1	GND	Ground (0V)
2	VCC	Power supply. 4.7~8.0V
3	EN	Enable pin (>1.6V)
4	RXD	UART input, TTL level
5	TXD	UART output, TTL level
6	B/RX	RS485- or RS232 RX
7	A/TX	RS485+ or RS232 TX
8	SET	Reserved

Table 1: APC810 Pin Functions

ELECTRICAL SPECIFICATIONS

Symbol	Parameter (condition)	Min.	Typ.	Max.	Units
VCC	Supply Voltage	4.7		8	V
Temp	Operating temperature range	-30	25	85	°C
RH	Operating relative humidity	10		90	%
Freq	Frequency range		433/470		MHz
Sf	Stepped-frequency		1		KHz
Mod	Modulation type		Lora spread spectrum		
IDD	Receive mode			35	mA
	Transmit mode @ 27dBm			500	mA
	Sleep mode			5	uA
Pout	Output power			27	dBm
Sen	Receiving sensitivity @0.81K bps		-132		dBm
DR_{FSK}	Air data rate	0.81	9.11	18.23	Kbps
DR_{IN}	UART data rate	1.2		57.6	Kbps
ZANT	Antenna Impedance		50		Ohm

Table 2: APC810 Electrical Specifications

SETTING PARAMETERS

Parameter	Option	Default Value	Units
UART data rate	1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6	9.6	Kbps
Parity Check	No check, Even parity, Odd parity	No check	
Frequency	418 ~ 455MHz	433	MHz
Air data rate	0.81, 1.46, 2.6, 4.56, 9.11, 18.23	9.11	Kbps
Output Power	0 ~ 7 levels	9 (500mW)	

Table 3: APC810 Default Settings

2. PARAMETER SETTING

BY PC: Users can configure the module parameters (frequency, data rate, output power, etc.) by PC. The interface of APC810 is UART/TTL. Users have to use an level converter board to connect the PC, **Figure 1**. APPCON provides two types converter boards (TTL-to-RS232 and TTL-to-USB) to do it. Then run the RF-Magic software(The software should be run as administrator). **Figure 2**. when the status bar of software shows "Found Device". Users could read/write the parameters for module configuration.
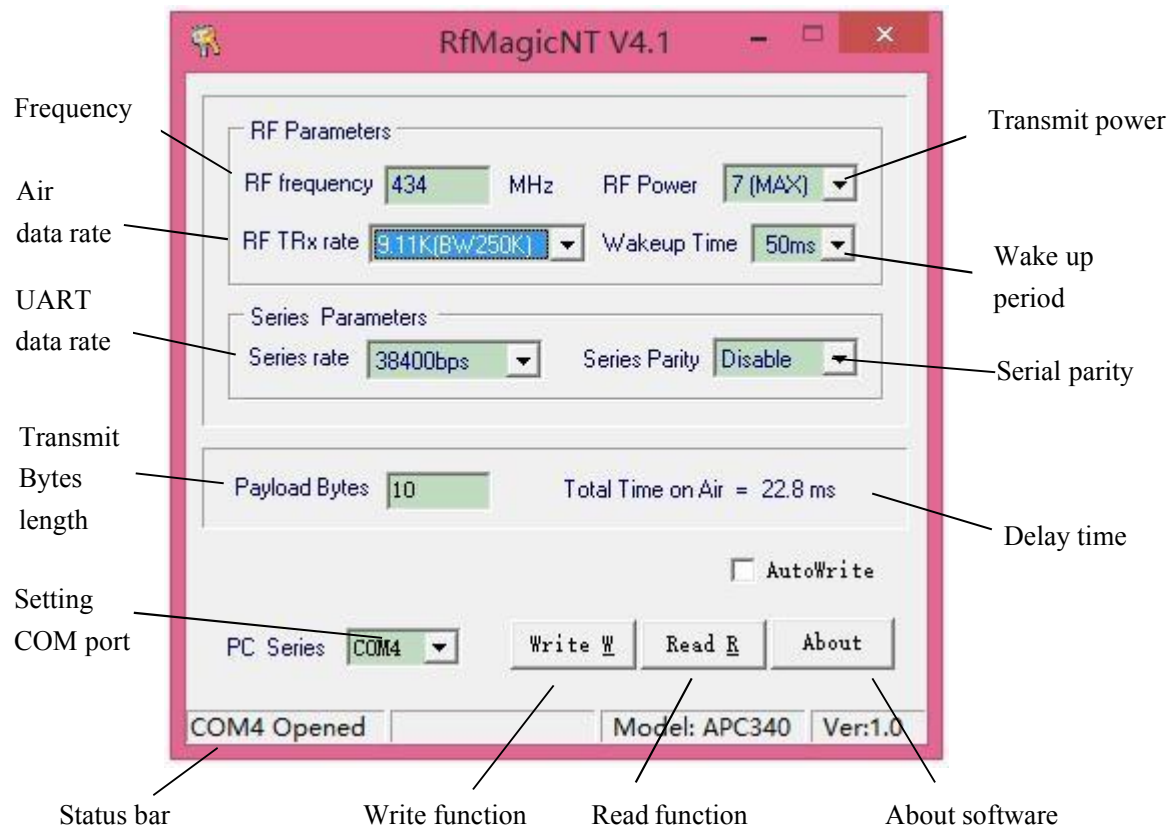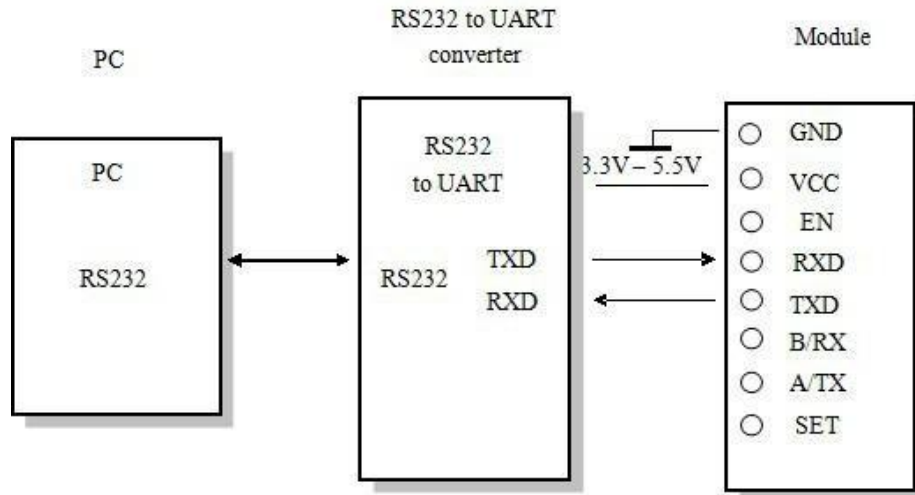

Figure 1: RF-Magic for APC810

Figure 2: Connection Diagram
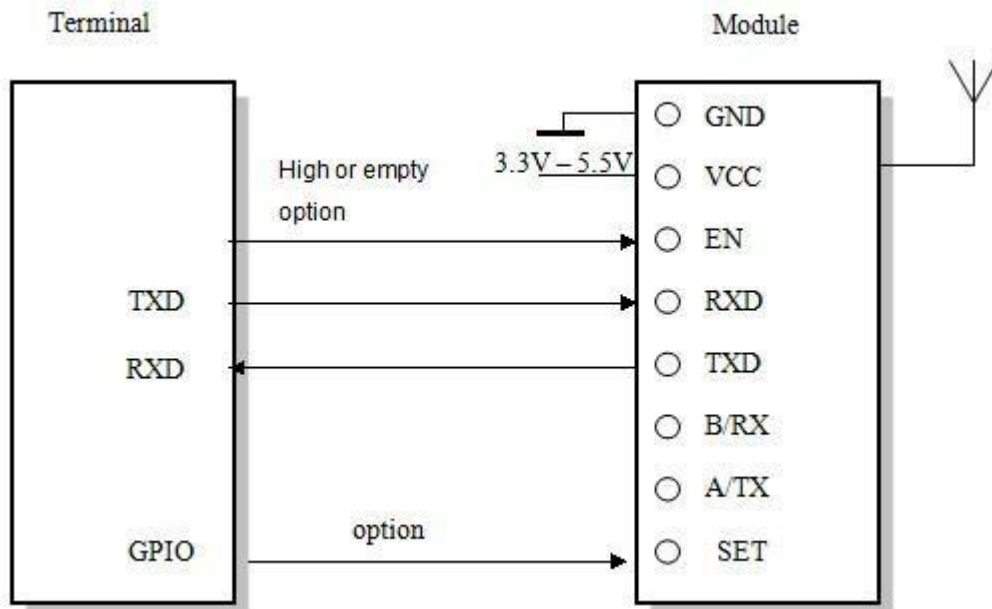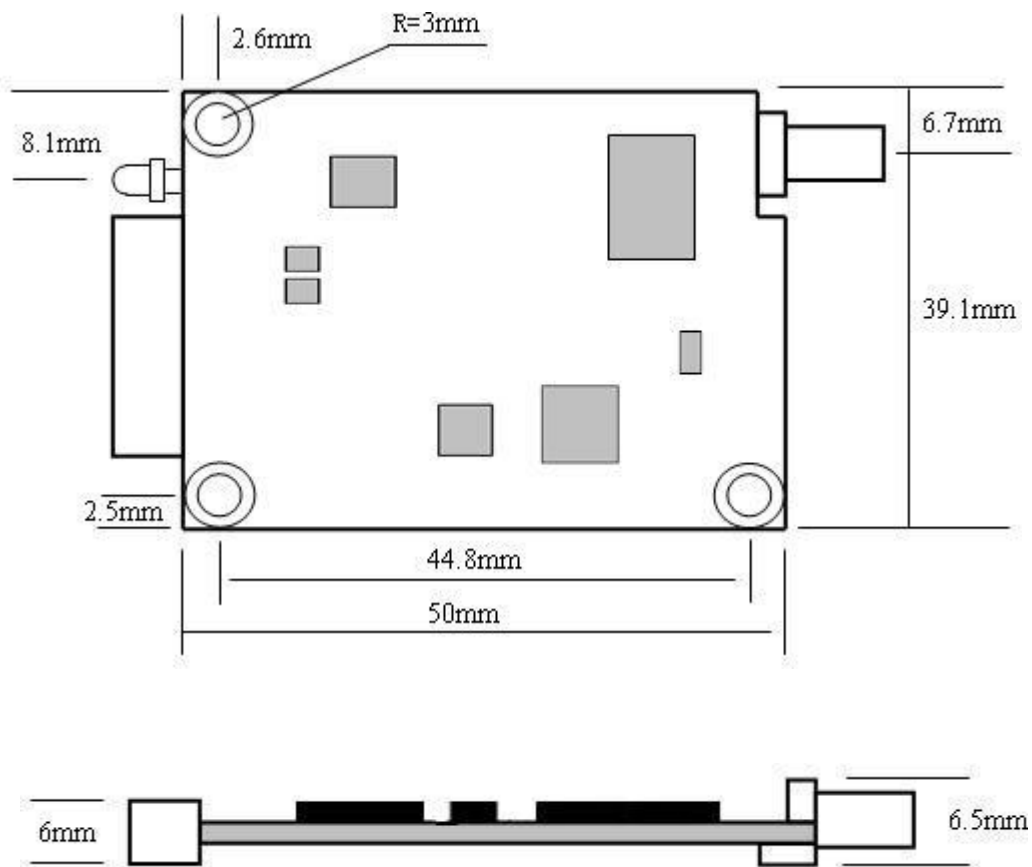
APPLICATION CONNECTION

Figure 3: Connection between Module and Terminal

APPLICATION NOTES

APC810 is an half-duplex RF modules which can be used in point-to-point or point-to-multipoint applications. In the latter application, users need to set one module as the host and others as client modules. Each module must have an unique ID and the communication coordination is controlled by the host which send data and commands including ID. If the client module finds that the ID contained in the received message is the same as its own, it will continue to receive the remaining data; otherwise it will discard the coming message. In order to avoid any interference, only one module is allowed to work in transmitting mode at any time.

The APC810 and APC340 could communicate each other for more complicated application and combinations.

MECHANICAL DATA

Figure 5: Mechanical Dimension