SRWF-1021-50 Series Low Power Wireless Transceiver Data Module User Manual

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Contents

I. SRWF-1021-50 Main Application

SRWF-1021-50, the low-power wireless transceiver data module is used as the wireless data transceiver in short-ranges, with the small size, weight and power consumption and good stability and reliability. Narrowband low power UHF wireless data transmitters and receivers with 50 kHz channel band:

** AMR – Automatic Meter Reading*
** Wireless alarm and security systems*
** Home automation*
** Low power telemetry*
** 433MHz/470MHz ISM/SRD band systems*
** Data radio can be used for Wireless conference voting system;*
** Mapping;*
** Radio modem can be used for Sports training & competition;*
** Wireless dishes ordering;*
** Wireless POS, PDA wireless smart terminal;*
** RF modem can be used for Electronic bus station and intelligent traffic;*
** RF transmitter Wireless electronic display screen and queuing machine;*
** Wireless telemetry Charging for parking, parking lot;*
** Wireless modem Automobile inspection and four-wheel orientation;*
** Wireless sensor Industrial wireless remote control and air conditioning remote controller;*
** Observation and predication of oil well and hydrological information;*
** Wireless RS232/RS485 conversion/connector;*
** Point to multi-point wireless network, wireless on-the-spot bus and automatic data collection system;*

II. Feature of SRWF-1021-50 Low Power Data RF Module

1. Low power transmission

The transmission power is only 17dBm (433/470MHz).

2. ISM frequency band, requiring on application of frequency point.

The carrier frequency is of 433/470MHz.

3. High anti- interference and low BER(Bit Error Rate)

Based on the GFSK/FSK modulation mode, the high- efficiency forward error correction channel encoding technology is used to enhance data's resistance to both burst interference and random interference and the actual bit error rate of 10^{-5}~10^{-6} can be achieved when channel bit error rate is 10^{-2}.

4. Long transmission distance

Within the range of visibility, the reliable transmission distance is 1200m with AT-4 antenna's height greater than 2m (BER=10-3@433MHz, 1200bps).

Within the range of visibility, the reliable transmission distance is 1200 m with AT-4 antenna's height greater than 2m (BER=10-3@470MHz, 1200bps).

5. Transparent data transmission

Transparent data interface is offered to suit any standard or nonstandard user protocol. Any false data generated in the air can be filtrated automatically (What has been received is exactly what has been transmitted).

6. Multi- channel

The standard SRWF-1021-50 configuration provides 8 channels. If users need, it can be extended to 16/32 channels in the multiple communication mode

7. Dual serial port, 3 interface modes

SRWF-1021-50 provides 2 serial ports and 3 interfaces, with COM1 as the TTL level UART interface and COM2 as user defined standard RS-232/RS-485 interface (user only needs to plug/pull 1 bit short circuiter and energize it to make the definition).19200 baud rate only has TTL level UART interface.

8. Large data buffer zone

Interface baud rate is 1200/2400/4800/9600/19200bps with format of

8N1/8O1/8E1/9N1 and user self-definition, allowing the transmission of long data frames at one time for more flexible programming by users. (If users need, it can also transmit the data in unlimited length at one time).

9. Intelligent data control without excessive programs

Even for semi duplex communication, users don't need to prepare excessive programs, only receiving/transmitting the data from the interface. SRWF-1021-50 will automatically complete other functions, such as transmission/receiving conversion in the air, control, etc.

10. Low power consumption and sleeping function

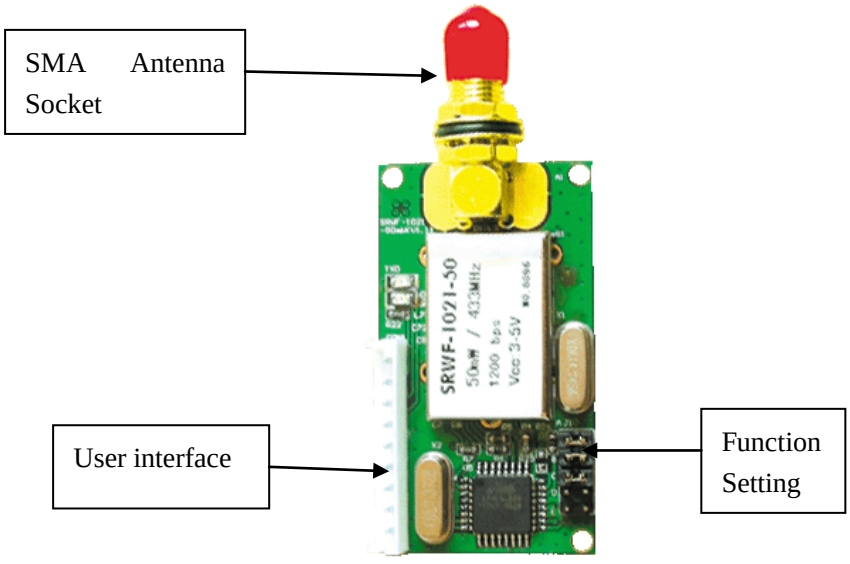
+5V supply power, receiving current is 28±2mA, transmitting current is 90±5mA, and sleep current is 5±2uA.

11. High reliability, small and light

Radio frequency integrated circuit and MCU are used for lessened peripheral circuits, high reliability, and low false bit rate.

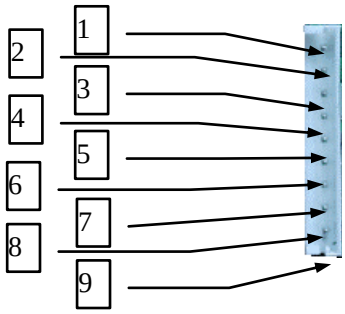
III. Use SRWF-1021-50 wireless data transceiver module

1. Appearance



2. Interface definition

SRWF-1021-50 supply 9- pin connector, and its definitions as well as below.



User interface

Connection method for terminals is shown in Table 1.

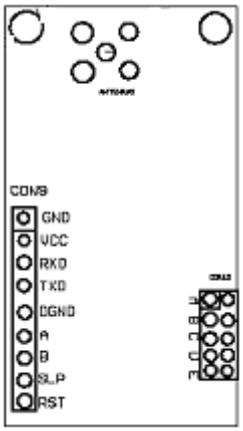
Table 1

Pin No	Pin Name	Description	Level	Connected to Terminal	Memo
1	GND	Grounding of Power Supply		Grounding of Power Supply	
2	VCC	Power supply DC	＋3.3～5.0V		
3	RXD/TTL	Serial data receiving end	TTL	TXD	COM1
4	TXD/TTL	Serial data transmitting end	TTL	RXD	
5	SGND	Grounding of the signal			
6	A(TX)	A of RS-485 Or TX of RS-232		A(RXD)	COM2
7	B(RX)	B of RS-485 or RX of RS-232		B(TXD)	
8	SLEEP	Sleep control (Input)	TTL	Sleep signal	Low level enable t>15ms
9	RESET	Reset control (input)	TTL	Reset signal	Negative pulse reset 1ms

IV. Channel, Interface, Baud Rate, Data Format Configuration

Before using SRWF-1021-50, you have to make simple configuration of your system parameter such as interface and data format. There is one group of 5-bit

short-circuiter wire (JP2) on the bottom right corner of SRWF-1021-50, defined as A、B 、C、D、E respectively .



1.Channel configuration

ABC jumper wires of JP2 provide 8 options and you can choose to use 0-7 channels .if the wireless module is working at the same channel (ABC jumper wire mode is same), you can transmit data between each module but keep in mind, at the same time only one module is in TX mode. More detail is Table 3.

Table3

JUMPER ABC	CHANNEL NUMBER	PROGRAM –FREQENCY(433MHz)	PROGRAM –FREQENCY(470MHz)
A B C	0(ABC NO SHORT)	433.85	470.25
A B C	1	432.10	470.36
A B C	2	433.20	470.49
A B C	3	433.25	470.10
A B C	4	434.00	470.652

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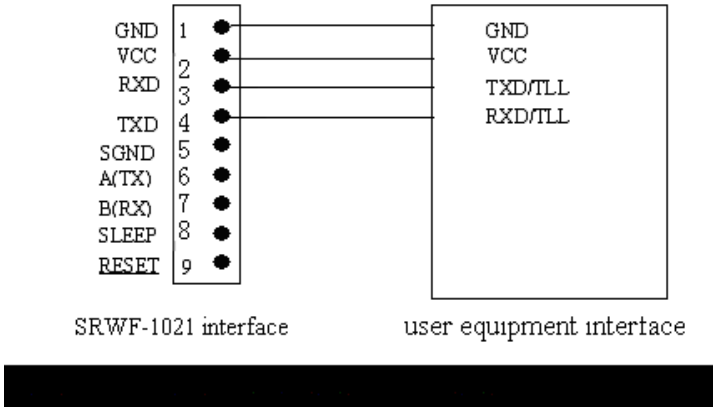
A B C	5	432.65	470.842
A B C	6	433.40	470.90
A B C	7	432.60	470.72

2. Selection of interface mode

SRWF-1021-50 provides 2 serial ports. COM1 (Pin3 and Pin4 of JP1) is fixed as UART serial port of TTL level; COM2 (Pin6 and Pin7 of JP1) can choose interface mode through D of JP2:

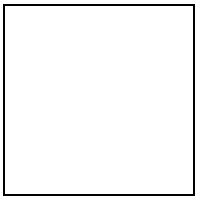
1) TTL interface connection application circuit.

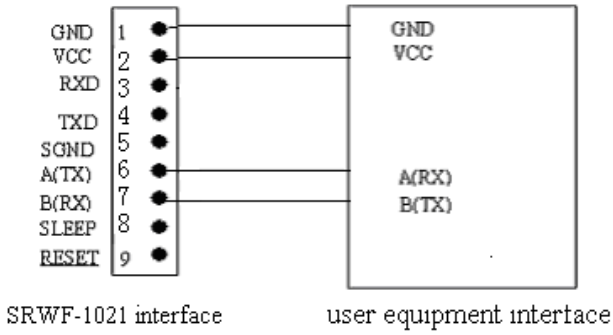


NOTE: Please do not connect any wire on PIN7 and PIN8 if com2 is not used

If you use the TTL only please make sure the D jumper of JP2 without jumper wire.

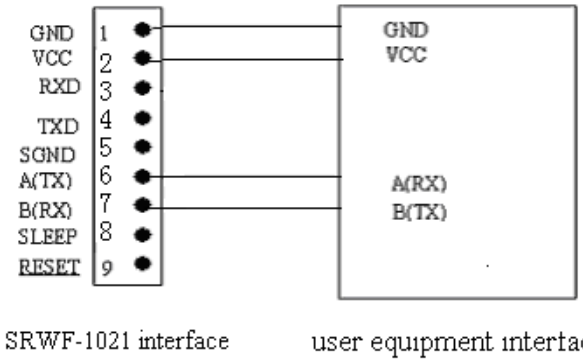
2) RS-232 interface connection application circuit.

D=1(with short jumper as： )



3) RS-485 Interface connection applicat D n circuit.

D=0(without short jumper as：o o)



NOTE: Please do not connect any wire on PIN3and PIN4 if com1 is not used. If the two use different power supply, please make sure they use the same GND (join the two's GND together).

3. Interface rate setting

The rate of SRWF-1021-50 is determined by hardware; to make sure the module rate is suit to your system, we are must be told your system's rate.

4.SRWF-1021-50 can support no parity and even parity mode of the serial communication UART. It can chose parity mode through E of JP2

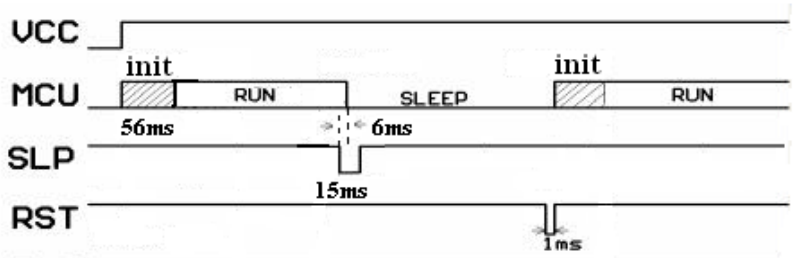
E=0 (without short circuiter) parity 8E1/8O1/9N1

E=1 (with short circuiter) parity 8N1

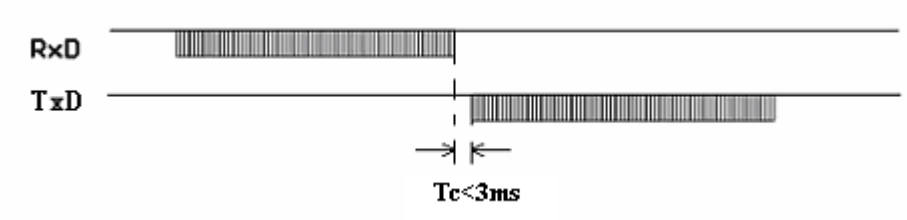
NOTE: Channel setting, Com2's Interface mode and parity mode is fixed after the power is on if you want to change the setting, you must reset the module or power on again.

5. Time Delay Diagram

1) The Pin8 'SLP' in JP1 is the signal of sleep control. In low power level, when the transceiver stays in sleep mode, the conversion from idle mode to sleep will be finished in 6ms. If the Sleep signal arrives when the transceiver is transmitting data, the module will enter sleep mode after finishing transmission. From sleep mode to transceiver mode, it takes when the RST signal comes.



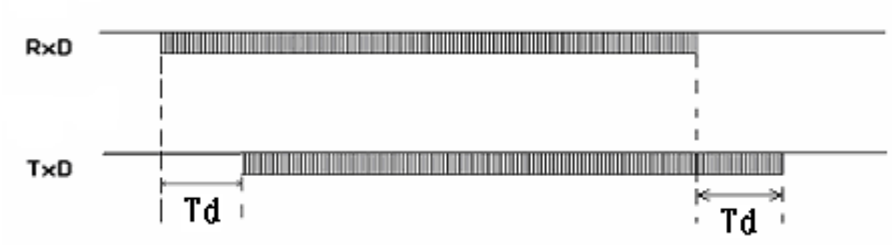
2) The delay time (Tc) of conversion between transmitting and receiving is less than 3ms.



The delay time of transceivers between the first bit sent by TxD to the first bit received by RxD. Due to a data processing will be made on user's data by SRWF-1021-50 transceiver using FEC(Forward Error Correction) or other correction algorithm, when RxD of a SRWF-1021-50 transceiver 'A' receives the data, then transmits it, the other one transceiver 'B' will have a delay (Td) to receive and transmit by TxD. Different RF data rate causes different delay time.

Please see the specific delay time below:

Baud rate(bps)	Delay Time(Td/ms)
1200	122
2400	58
4800	31
9600	16
19200	8



6. Indicator Function

When in transmitting mode, the red indicator light will twinkle. (UART TTL only)

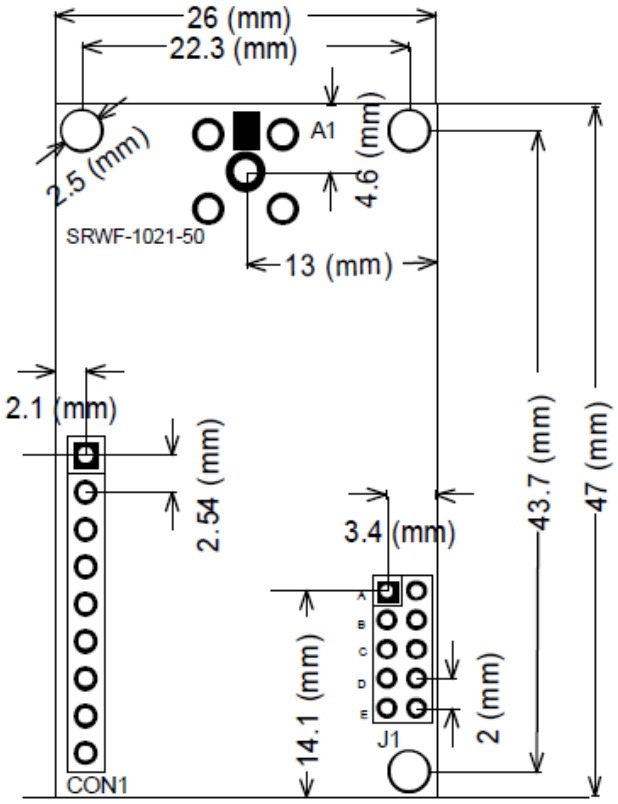
When in receiving mode, the green indicator light will twinkle.

V. Technical specification

Serial number	Item	Parameter	Note
1	Modulation mode	GFSK/FSK	
2	Working frequency	433MHz/470MHz	
3	Transmitting power	17dBm	433MHz
		17dBm	470MHz
4	Receiving sensitivity	-118 dBm	1200bps@433MHz
		-118 dBm	1200bps@470MHz
5	Channel counts	8channel	16/32 channel custom-made
6	Transmitting current	90±5mA	
7	Receiving current	28±2mA	
8	Sleeping current	5±2uA	-40℃~50℃
9	Interface velocity	1200/2400/4800/9600/19200bps	

10	Interface mode	UART TTL/RS-232/RS-485	User setting, 19200 bps has TTL only
11	Power supply	+3.3～5VDC	
12	Working temperature	-25℃~75℃	-40℃~85℃ custom-made
13	Working humidity	10%~90%(relative humidity without condensation)	
14	Dimension	47mm×26mm×10mm	
15	Reliable transmit distance	1200m@ AT-4 antenna(Height=2m)	433MHz@1200bps
		1200m@ AT-4 antenna(Height=2m)	470MHz@1200bps

VI. Layout Dimension



VII. Technical Support and After Service

We provide technical support of applications and secondary development for our clients. Our products have one-year warranty and perpetual maintenance services.