

Medical pulse WIFI IC planning

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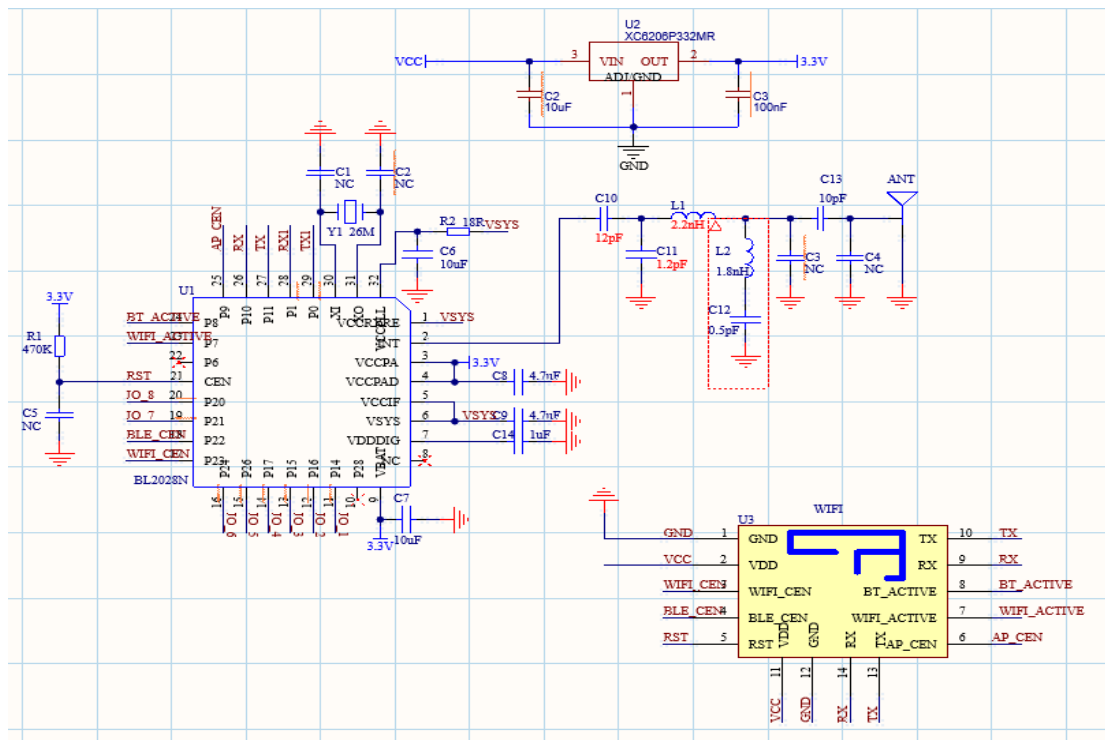
version: V1.1.1

date : 2022-04-14

Revision experience					
version	Revised content	formula te	Auditing	sanctio n	Old file processin g
V1.0.0	First planning				
V1.0.1	Change some details after communicating with Boxin				
V1.0.2	Increase the WIFI AP functionality				
V1.0.3	Fixed a MAC definition				
V1.0.4	Add UUID recognition Bluetooth and AT command acquisition status				
V1.0.5	Invalid update requirement due to the IIC				
V1.0.6	Update the schematic and add WIFI / BLE to enable control				
V1.0.7	Add a WIFI communication port description				
V1.0.8	Correct current parameters, protocol AT + instruction return format				
V1.0.9	Add a data transfer description				
V1.1.0	Add WIFI read MAC address and modify name function				
V1.1.1.	Adjust the schematic pin naming				
V1.1.2	Modify product reference graphs and template dimensions				

The WIFI module name: FDAC4110

Product reference circuit:



Footposition instructions (See the lower right corner of the circuit diagram) :

order numbe	foot position	IC foot position	mold	function declaration	other
1	WIFI_ACTIVE	P7	O	WIFI connection status 0 - not connected 1 - connected	
2	BLE_ACTIVE	P8	O	BLEconnection status 0 - not connected 1 - connected	
3	AP_CEN	P9	I	WIFI mode selection 0 - STA 1 - AP	
4	BLE_TX	P11	O	UART communication TX	Compatible with burning mouth

5	BLE_RX	P10	I	UART communication RX	Compatible with burning mouth
6	RST	RST	/	Reset the foot, and the low level is effective	
7	VCC	/	/	Power input pin	
8	GND	/	/	power ground	
9	IO_0	P14	O	Controlled output port	The default low level
10	IO_1	P15	O		
11	IO_2	P16	O		
12	IO_3	P17	O		
13	IO_4	P20	O		
14	IO_5	P21	O		
15	IO_6	P24	O		
16	IO_7	P26	O		
17	BLE_CEN	P22	O	BLE Enable end 1 - BLE open 0 - BLE close	The suspension is high level
18	WIFI_CEN	P23	I	WIFI Enable end 1 - WIFI open 0 - WIFI close	The suspension is high level
19	ANT	ANT	/	Antenna mouth	

Electrical parameter requirements:

order numbe	project	demand	unit	other
1	supply voltage	2.1~3.6	V	
2	Sleep current	≤ 10	uA	3.8uA
3	work environment	-20~70	°C	

The WIFI block parameters:

order numbe	project	demand	unit	other
1	working frequency	2412~2484	MHz	
2	transmitting power	13~15	dBm	non-tunable
3	working current	≤ 100	mA	(75 mA)
4	receiving sensitivity	≤ -70	dBm	
5	Standby current	≤ 100	mA	Bluetooth function turned off (75mA)
6	peak current	≤ 200	mA	

BLE, the block parameter:

order numbe	project	demand	unit	other
1	frequency	2402~2480	Mhz	
2	receiving sensitivity	≤ -94	dBm	
3	transmitting power	0	dBm	Automatic adjustable
2	Radio gap	100	ms	
3	Minimum connection gap	10	ms	
4	Maximum connection gap	10	ms	
5	Connection timeout	5	s	
6	Standby current	≤ 35	mA	The WIFI functionality is turned off (25mA)
7	Receiving / transmitting current	≤ 45	mA	bluetooth connection (31 mA)

Communication requirements:

UART communication:

order number	project	demand	unit	other
1	Baud rate	57600	Bit/S	Modifiable (by default)
2	check bit	none		
3	stop bit	1	bit	

Bluetooth protocol description (APP interface):

Bluetooth Service UUID:0000feef-0000-1000-8000-

00805f9b34fb

UUID	Handle	attribute	Byte number	remarks
0xFF01		notify	The longest single package517	Data entered from the serial port RX will generate a notification to the mobile device in this channel
0xFF02		Write	The longest single package517	Data written by the APP is output from the serial port TX

0xFF03		Write	longest ⁹	Module broadcast name
0xFF04		Read	6	Module MAC address Address coding format see attachment
0xFF05	0x01	Read		Set the serial port port rate: (default 57600) 0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps 4: 57600 bps 5: 115200 bps
	0x02	Write		
0xFF06		Read	2	Read the module software version (3 ↑ Byte: 000000)
0xFF07		Write	2	0xAA, 0x55: factory data reset other: invalid instruction Restore content: Name, wifi memory
0xFF08		Write	longest32	Write to the WIFI SSID
0xFF09		Write	longest32	Write to the WIFI password
0xFF0A		Read	1	Query distribution status 0 - Distribution network failure 1 - Distribution network success 2 - wrong password
0xFF0B		Write		HTTP Server IP
0xFF0C		Write		HTTP Server PORT
0xFF0D		Write		The HTTP Server URL
0xFF0E		Write \Read	1	Gets the server connection status 0 - not connected 1 - Connection success
0xFF0F	0x01	Read	2	Specifies the IO port status High byte-IO port serial number (Start with 0x00) Low byte-IO port status 0x00 - output low level 0x01 -Output high level
	0x02	Write		

The server does the user management , The WIFI module uploads the MAC to the server for identification

WIFI protocol specification:

STA pattern:

WIFI distribution network : The BLE distribution network is adopted for the first time, establish the connection with BLE, and then input the SSID and password of the target AP, after the configuration, the module automatically connects to the AP, after each wifi boot automatically connected, with memory saving function, only one set of WIFI information is saved. Save the relevant information after the successful network connection, and automatically connect the save network every time you boot on

WIFI configure:

When the product is connected to the wifi, the module can be configured through the mobile phone. The configuration information is as follows:

UDP protocol

Configure the port: 6090

Configuring commands:

data head: fixed 0x18

instruct - To the objects to be read or sent

instruction character - 00 Representative read 01 -

Representative write / send

record - When read, data bits are not, only sending instructions and operators When written / sent, data bits are used to indicate content to be given

data head	instruct	instruction character	record (byte)	Directive exporter	remarks
0x18	0x03	0x01	longest9	APP	Change the module broadcast name
0x18	0x04	0x00	/	APP	Module MAC address Address coding format see attachment
0x18		0x01	6	module	
0x18	0x05	0x00	/	APP	Set the serial port port rate: (default57600) 0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps 4: 57600 bps 5: 115200 bps
0x18		0x01	1	APP	
0x18	0x06	0x00	/	APP	Read the module software version

0x18		0x01	3	module	(APPRead the data: 000000)
0x18	0x07	0x01	2	APP	0xAA , 0x55: factory data reset Other:invalid instruction Restore content: Name, wifi memory

WIFI Penetrate:

When the product has data transmitted to the module via the UART (non-AT command data), the wifi module proactively transmits the data to the server

AP Penetrate mode:

In the AP mode, the APP is directly connected to the WIFI module, and the product data is directly transmitted to the APP through the wifi

Serial port of communication: 35000

The WIFI gets the information from the server / APP:

- 1、Internet Time (only valid after the product time is issued by the product order)
- 2、User data (voice, control instructions, etc.)
- 3、OTA upgrade (Users upgrade the WIFI through the APP) (Specialized OTA software, which the APP does not need to do)

	port	functional description	data head (data[0])	directive (data[1])	Content (data[2])	persist (data[3])	persist (data[4])	persist (data[5])	Accumulation and check (data[6])
OTA function	6090	Inform the device to start the OTA	0x17	0x38 (Start of OTA)	For example, as 0x64 (100), the data [3] ~data [3 + 100-1] is in the json range	Content of json such as: {"url": "http: / / 192.168.1.1:8090 / ota_file"}			According to the calculation
		Equipment feedback on the OTA progress	0x17 0x80	0x39 (ota progress report)	Like 0x05 (5), indicates data [3] ~data [3 + 5-1]	In progress, bit7:1 OTA bit6~bit0: OTA%	data[4] persist	data[5] persist	data[6]check

		Query device version number	0x27	0x38	Like 0x05 (5), indicates data [3] ~data [3 + 5-1]	data[3]persist	data[4]persist	data[4]persist	According to the calculation
		Report the equipment version number	0x27 0x80	0x39	As in 0x64 (100), it indicates that data [3] ~data [3 + 100-1]为json 范围	The json content is something like: {"version": "FW-20210125-V001"}			According to the calculation

The data format of the communication is as follows: "Device MAC address" + "Device type" + "Command character" + "Transmission data", in Json format

```
MAC:"XXXXXXXXXXXX",
TYPE:"...",
CMD:"...",
VALUE:".....",
}
```

protocol : HTTP

Module protocol description (product interface)

The string starting with "AT +" is resolved and executed as an AT instruction and returned from the serial port, followed by additional output execution results, "AT + OK" or "AT + ERR" or "AT + (return information)", etc. Serial packets that do not start with "AT +" will be treated as transmission data.

instruction character	Content bytes	attribute	remarks
REN=xxxxxxxxx	9	Write	Module naming(This is the Bluetooth and WIFI name)
PTY=xx	2	Write	product type (Need to be put in the broadcast to the APP identification, or server data) ET - electronic thermometer IR - Infrared thermometer BP - tonometer ES - Physical therapy instrument Other reserved
BSW	0	Read	Read the module software version Returns the data, AT + XXXXXX (Three-gear module version)
RSV	0	Read	Gets the server connection status (Effective only for the WIFI) bridging order: AT+HOST OK AT+HOST ERR
RBS	0	Read	Gets the BLE connection status bridging order: AT+BLE OK --BLE linkage OK AT+BLE ERR--The BLE connection was unsuccessful
RWS	0	Read	Gets the WIFI connection status bridging order: AT+WIFI OK --WIFI linkage OK AT+WIFI ERR --WIFI connection unsuccessful
RIO=GPIOxx	0	Read	Gets the IO port output status xx - IO mouth serial number Return data: AT+GPIOxx, x
SIO=GPIOxx,x	3	Write	Change the IO port status xx - IO mouth serial number x - IO port level 0-low level 1-High power level
WLMAC		Read	Read the module MAC address Return data:

			AT+WLMACxxxxxxxxxxxx (xxxxxxxxxxxxFor hexadecimal numbers) failure: AT+ERR
HTTP_POST=x xxxxxxxxxxxxxx x (The x table is the data)		Write	Send the data to the server (Return data)

example: AT+REN=FDIR8001 Module naming: FDIR8001

The above settings require power-off storage

Other requirements:

Account management:

- 1、Each module has a separate MAC address for later server account management discrimination
- 2、OTA upgrade
- 3、Information required in the broadcast: module name, device type, service UUID (0xFEEF)
- 4、When both BLE and WIFI are connected, if BLE is APP connection, transfer data from BLE is preferred, if BLE is other connection (such as network connection), select transmission from WIFI
- 5、WIFI Default name [FD_WIFI](#), Bluetooth default name [FD_BLE](#)

[data transmission :](#)

- 1、Directive package length:
BLE: Short bag≤32 Byte, Long bag≤517 Byte;
WIFI: most 1460 Byte;
- 2、Data transmission mechanism:
After the Bluetooth data transmission, more than 100ms did not receive the data transmission to re-enter the low power consumption state.
During the data transmission process, if the data is not received within 20ms, no longer wait, and the data is sent directly, used to judge each instruction node.

[Burning configuration:](#)

[WIFI name](#), [Bluetooth name](#), [port rate](#).

Attached a: The MAC address information is as follows:

The MAC address should contain the content: XX XX XX XXXXXX

first XX: tatted code

the second XX: A high 4bit means year + 2015, for example a high four

digits of 6 represents 2021

Low 4bit indicates the month

The third XX: date

The last three XXXXXX: serial number

Module size:

thickness0.8MM

