E103-W08 User Manual

2.4G serial WIFI

BLE distribution network

Low power consumption



Chengdu Ebyte Electronic Technology Co.,Ltd.

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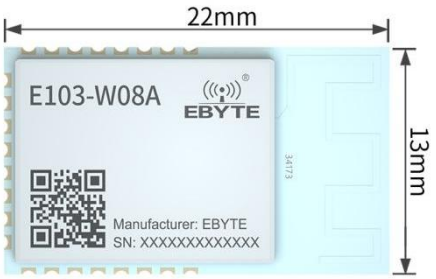
Chapter 1 Overview

1.1 Introduction

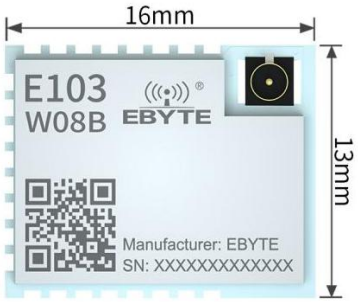
E103-W08 is a 2.4G-based WIFI re-serial module developed by Chengdu Yiyi, wiFI maximum transmit power of up to 10dBm, this module built-in ARM® Cortex®-M3 Application Processor and ARM ® Cortex ®-M Link Controller, the application layer and connection layer separate management, stable and reliable performance.

E103-W08 function support 802.11b protocol, support WPA, WPA2 encryption can meet a variety of standard wireless communication scenarios, as well as a variety of application protocols, to meet the industrial demand for tcp,http,mqtt, while the industry-wide automatic connection, power-on transmission, in addition to ATPA instructions parameter configuration also supports fast and convenient distribution network. In terms of power consumption, multi-stage adjustability can be achieved, users can set the corresponding power consumption level according to their own needs, in the state of maintaining wifi connectivity can communicate power consumption of up to 120uA, E103-W08 is an easy-to-use and high-reliability, high-performance integration of industrial-grade WIFI module.

The E103-W08 hardware is divided into two versions, only the PCB antenna is E103-W08A, only the IPX antenna interface is E103-W08B. The firmware is the same for both products except for the antenna on the hardware.



E103-W08A



E103-W08B

1.2 Features

- Support for IEEE802.11 b standard
- WIFI-enabled state
- Support for WPA, WPA2 encryption
- Supports regular TCP, HTTP client, MQTT and other network communications
- Support for AT instruction parameter configuration
- Supports BLE quick distribution network
- Supports disconnected reconnies
- Multi-connection support, up to 4 socket connections

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- Supports BLE quick wiring connection to AP
- WIFI scanning is supported
- Supports manual connection to manually disconnect the AP
- AT instruction configuration parameters are supported
- Supports multi-stage power adjustment

1.3 Scenario

- Medical and health care
  Multi-parameter patient monitor
  Electrocardiogram (ECG)
  Hospital electronic bed and bed control system
  Telemedicine system
- Building and home automation:
  HVAC system and thermostat
  Building safety systems and electronic locks
- Smart appliances
- Asset tracking
- Factory automation
- Grid infrastructure
-Low-power smart sensor device

Chapter 2 Specifications

2.1 Limit parameters

The main parameters	performance		remark
	E103-W08A	E103-W08B	
Supply voltage (V)	0～3.6		More than 3.6V permanently burned modules
Blocking Power (dBm)	10		The probability of burning is less likely to burn at close use
Operating temperature (.	-40～+85		Industrial

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2.2 Working parameters

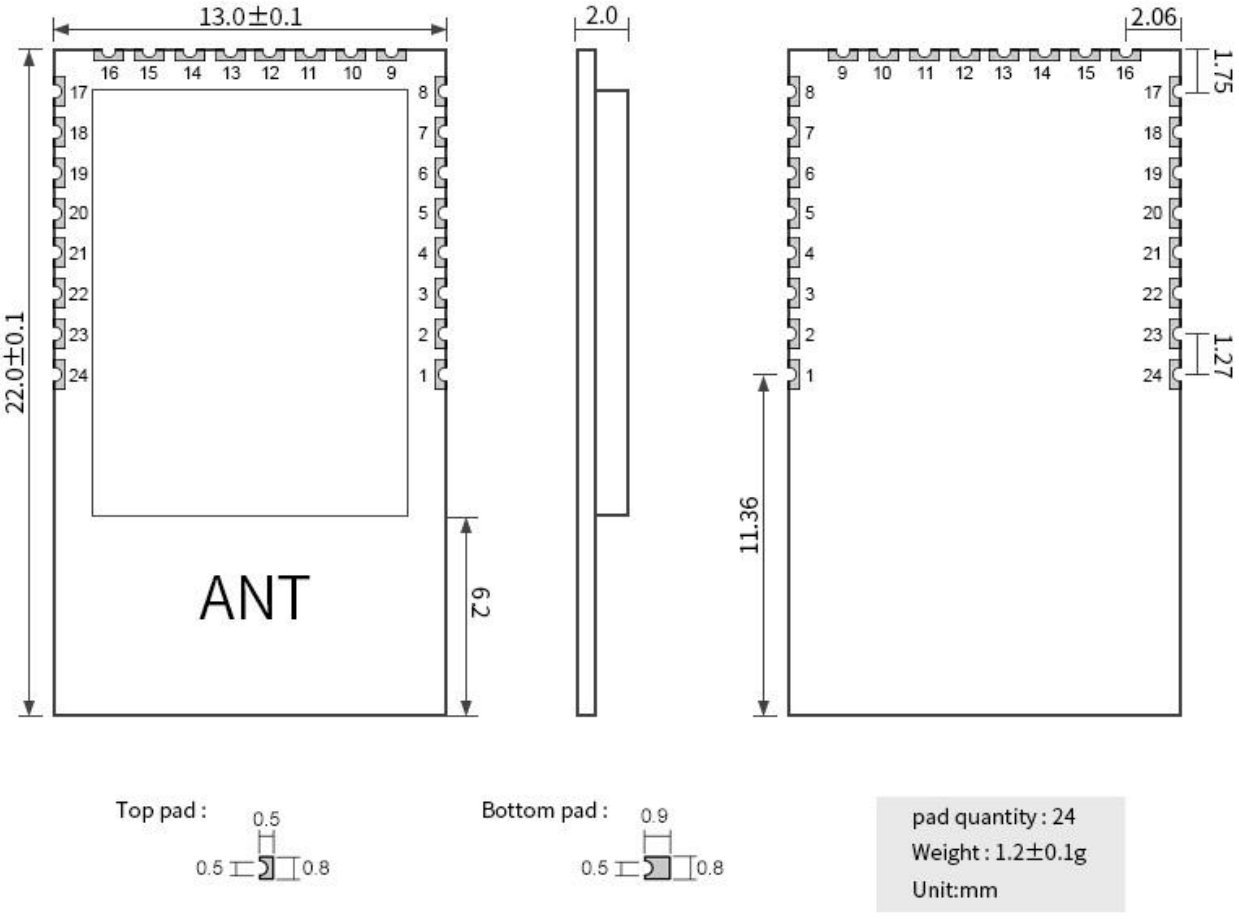
The main parameters		performance		remark
		E103-W08A	E103-W08B	
Operating voltage (V)		2.5～3.6		≥3.3V guarantees output power
Communication level (V)		3.3		Using 5V TTL is risky to burn
Operating temperature (C)		-40～+85		Industrial-grade design
Operating band (Hz)		2.412G～2.472G		Support for 2.4G bands
Maximum transmit power (dBm)		11～12		Test 2.412GHz
power consumption	Emission current (mA)	130mA		Instantaneous power consumption (2.412GHz)
	Receive current (mA)	18mA		Average power consumption received (2.412GHz)
	Sleep current ('A')	18uA		dormancy
WiFi version		802.11b		
Bluetooth version		LE 5.0EE		

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Chapter III Mechanical dimensions and pin definitions

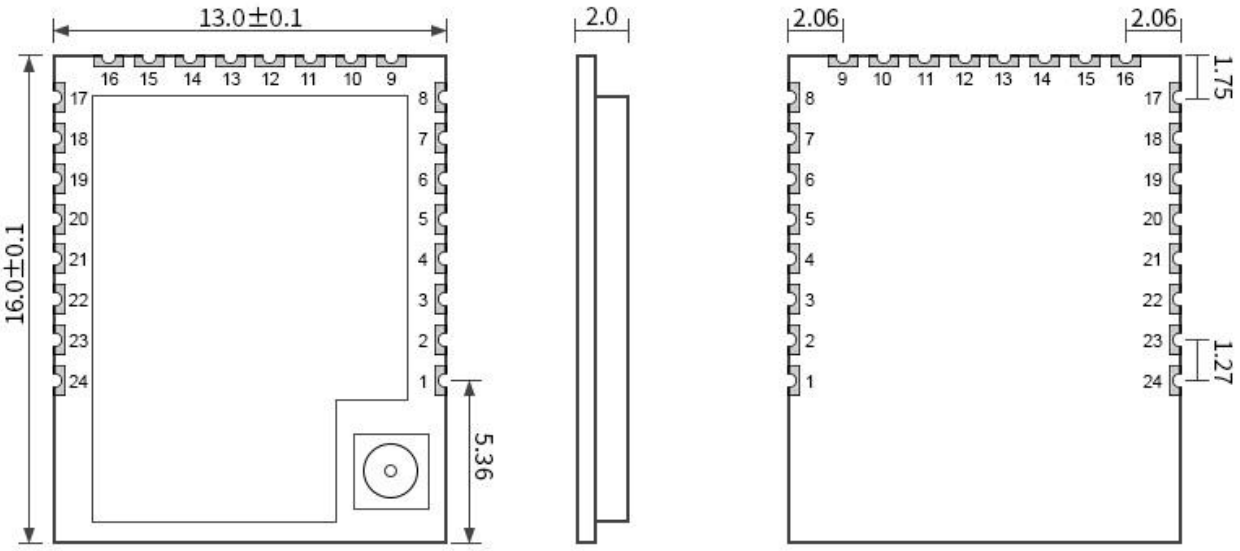
3.1 E103-W08A pin dimensions diagram



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3.2 Size dimensions of E 103-W08A



Pound definition:

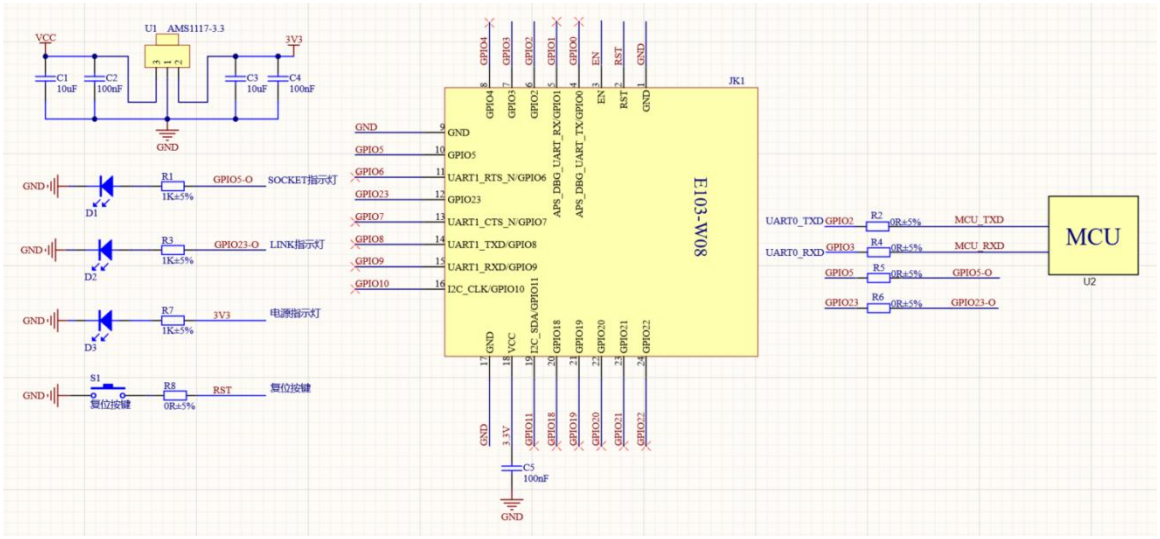
Pin no	The pin name	Pin type	Pin No, pin number for OPL1000	Pin usage
1	GND	-	-	Ground, connected to the power reference ground
2	RST_N	I	10	Reset pin, low active (built-in pull-up resistor 47k)
3	EN	I	11	OPL1000 chip enable pin, high level enable (built-in pull-up resistor 47k)
4	GPIO0	I/O	21	Universal IO port (not currently in use)
5	GPIO1	I/O	22	Universal IO port (not currently in use)
6	TXD	I/O	23	TTL serial output, connected to external RXD input pin (OPL1000 GPIO2)
7	RXD	I/O	24	TTL serial input, connected to external TXD output pin (OPL1000 GPIO3)
8	GPIO4	I/O	25	Universal IO port (not currently in use)
9	GND	-	-	Ground, connected to the power reference ground
10	GPIO5	I/O	27	The Socket connection indicates that the connection output is set to be high and the disconnect output is low
11	GPIO6	I/O	28	Universal IO port (not yet used, recommended suspension)
12	GPIO23	I/O	29	Link connection indicates that the wifi connection output is high and the wifi output is low

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13	GPIO7	I/O	30	Universal IO port (not currently in use)
14	GPIO8	I/O	31	Universal IO port (not currently in use)
15	GPIO9	I/O	32	Universal IO port (not currently in use)
16	GPIO10	I/O	33	Universal IO port (not currently in use)
17	GND	-	-	Ground, connected to the power reference ground
18	VCC	-	-	The module power supply is being referenced, with voltages ranging from 2.5 V to 3.6 V
19	GPIO11	I/O	34	Universal IO port (not currently in use)
20	GPIO18	I/O	44	Restore the default parameters, which can only be changed within the first 1 second of power-up, and the low level is valid
21	GPIO19	I/O	45	Universal IO port (not currently in use)
22	GPIO20	I/O	46	Universal IO port (not currently in use)
23	GPIO21	I/O	47	Universal IO port (not currently in use)
24	GPIO22	I/O	48	Universal IO port (not currently in use)

Chapter 4 Recommends a wire chart



1. The E103-W08 GPIO6 pin is recommended to hover and not to be connected to any level or IO.
2. The Socket and Link pins indicate that a high level indicates a connection, a low level indicates a disconnect, and a reset pin RST and chip enable EN pin have built-in pull-up resistance of 47k.
3. The E103-W08 is powered by DCDC internally, paying attention to the input power supply to do a good job of filtering.
4. GPIO18 only detects the status of the IO port within the first 1 second of power-up, and it is recommended to plug GPIO18 into GND before resetting the module or re-powering it.
5. GPIO 2 is 6 feet, and the serial port used is UART 0 _ TXD, while GPIO3 is 7 feet, and the serial port used is UART 0 _ RXD.

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Chapter 5 Feature Description

5.1 Mode of operation

The working mode refers to which communication protocol the module works according to after power-up, and the working mode is divided into three types: basic TCP communication mode, MQTT communication and HTTP communication. You can use instructions to query and set the mode of operation when you use it.

5.1.1 TCP communication

It is important to note that TCP operating mode is broken down into manual and automatic connection creation, as well as transmission and protocol transmission.

5.1.1.1 Create and close TCP connections

Creating a connection is divided into manual creation and automatic creation. Manual creation means that after power-up, the module will wait for the input AT instruction to create a TCP link, and then according to the parameters set for TCP connection, communication; Detailed parameters The settings are set in the AT instruction TCP-related AT instruction.

5.1.1.2 Transmission and **Protocol** Transfer

The so-called transmission is that the module after power-up only creates a path of socket communication, serial and network data without any processing directly to the end-to-end device. For example, the serial receiving data "1234567890" will be directly transmitted to the network side, from the network side to receive data "QWERTYUIOP" will be directly output to the serial port.

The so-called protocol transmission is to create more than all the way after the module power-up so-called soket communication, at this time serial input data needs to bring a certain protocol format, mainly used to distinguish between the data source address and the destination address.

The protocol transport format is as follows, and the packet entering the serial port contains a unique sokeed ID label, according to which the module transmits the data to the corresponding socket connection.

Secure the head	Socket ID	data
3 Byte	1Byte	N Byte

Fixed head: 0xAA 0xFE 0x55

Socket ID：

0x00, the representative found the Socket 0 link

0x01, the representative found the Socket 1 link

0x02, the representative found the Socket 2 link

0x03, the representative found the Socket 3 link

Data: Application Payload

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For example:AA FE 55 00 AA BB CC sends AA BB CC to Sockset 0 via serial port in protocol transfer mode

You'll get it on the network side of the soket 0 connection: AABBCC.

Protocol reception refers to the receipt of network data, the data in a certain format, the output format is as follows:

Secure the head	Socket ID	length	data
3 Byte	1Byte	2Byte	N Byte

Fixed head:

0xAA 0xFE 0x55

Socket ID：

0x00, the representative found the Socket 0 link

0x01, the representative found the Socket 1 link

0x02, the representative found the Socket 2 link

0x03, the representative found the Socket 3 link

length:

Apply the actual length value of the data, range: 0 to 500

Data:

Application Payload

For example:AA FE 55 00 00 03 11 22 33 In protocol mode, 3 bytes of data received from Socket0 are 0x11 0x22 0x33

5.1.1.3 Data source address display

Data source address display refers to whether the module displays the IP address and port number of the data source when it receives data on the network side. If printing is turned on, the protocol transfer format fails, and the IP and port of the data source are printed as strings at the head of each package of data, with a maximum subcontracting of 500 bytes.

The format of the display is as follows:

The data header		separator	data
Data source IP address (up to 15 bytes)	Data source port (up to 5 bytes 0 to 65535)	1 byte	The actual byte data received
192.168.1.127	4001	space	1234567890

It is important to note that if you turn off print IP addresses and port information, the output format is protocol transport format when the protocol is transmitted.

5.1.2 MQTT communication

MQTT communication for this module can support version 3.1 or version 3.1.1, which can be set using AT instructions. By subscribing to a topic, you can receive data from the server-specified topic or publish it to the specified topic, the MQTT topic of this module is compatible with the standard wildcard. The wildcard description can be found in the MQTT Standard Protocol Manual.

This module supports custom settings subscription topics, publishing topics, setting connection parameters, and more, as well as IP address connections. See att instruction MQTT-related AT instruction.

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5.1.3 HTTP communication

HTTP communication refers to the way in which a module connects to the http server as an http client, obtains data, or uploads data. Because this mode of communication is a short-connection communication, i.e. the connection is disconnected after one communication is completed, the S_LINK indication pin does not come on constantly during communication.

This module supports IP address connections as well as domain name connections. See the AT instruction HTTP-related parameters for details.

5.2 TCP heartbeat package

This module supports four modes: heartless, serial heartbeat, network heartbeat, serial mouth and network heartbeat. It also supports setting heartbeat times and customizing heartbeat data content. See AT instructions for details query, set heartbeat data.

5.3 Automatic connection

Automatic connections include automatic WIFI connections and automatic connections to the network.

Automatic connection WIFI refers to the first through the AT instruction to write the target AP parameters flash, in the module work from flash to read out the parameters, and then scan whether there is a target AP, if there is a connection, if no continue scanning. When the module is disconnected, repeat this action until the target AP is connected again.

Automatic connection network refers to after the module and the target AP establish WIFI connection, according to the parameters set in flash in advance, create a network connection, the module can automatically connect to the target network, such as TCP server, MQTT server, and HTTP server and other servers, if disconnected, the module does not need manual operation, can still automatically initiate a connection to the server.

5.4 Manual connection

In order to increase the flexibility of module use, in addition to automatic connection and manual connection, manual connection refers to scanning the currently available AP according to THE instructions, scanning to AP, the module outputs AP information according to a certain format, including SSID, channel, BSSID, encryption type, RSSI. Then according to the scan results of the list, enter the target AP SSID, password, encryption type, you can make a WIFI connection. Directive Scans the available APto connect to the specified AP.

5.5 Manual disconnect

Manual disconnect refers to the use of the AT instruction to disconnect the module from the AP after the target AP is connected. The instruction is disconnected from the AP.

5.6 BLE distribution network

BLE distribution network refers to the module through the mobile phone APP to the target AP parameters into the module, the

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module to connect WIFI into the network. The distribution process is as follows, first of all, the module as BLE from the transmitter BLE broadcast data, mobile phone APP as the host scanning module, after scanning the user according to the name of the module to select the corresponding module to connect, after the connection after the user enters the password of the target AP. The distribution operation can be completed, and if the parameters are correct, the module will establish a WIFI connection with the target AP. After the success of the BLE distribution network, the next power-up will still be based on the results of this distribution network connection.

If you do not want to use BLE distribution network, or want to clear the distribution network information, then the user can reset the distribution parameters in the APP, after the reset operation, the last distribution information is cleared.

Start the BE distribution network see AT instruction query, set the connection mode. See BLE distribution for details of the distribution process.

This module supports modification of the BLE name and broadcast gap, as detailed in instruction BLE-related parameters.

5.7 Status indication

Status indications are divided into log information printing and indicators. INDICATOR: W_LINK indicator indicates the wifi connection status, S_LINK indicator indicates the locket connection status. A low output indicates a disconnect, and a high level indicates a connection.

note:

1、 In TCP protocol transfer mode, when there is a multiple connection S_LINK the indicator remains high until the last connection is disconnected.

2、 There is no connection in HTTP mode, so S_LINK does not have any more indication.

5.8 Low power consumption

This module supports a variety of power modes, including 5 power levels, which can be set from 0 to 4. The higher the level, the more power the module saves, the lowest power consumption can reach 100uA with wifi connectivity maintained, and it can communicate properly.

Enter low power consumption: You can enter low-power mode only using the instruction AT-SLEEP.

Wake-up: After entering low-power consumption, wake-up consists of two ways, the first receives network data after the module automatically wakes up, the module will directly output the received data, the second serial RX pin wake-up, during low power consumption to give RX a falling edge, the module will Wake-up (you can also send data directly, the module will treat the first frame data as a wake-up signal, the first frame data is invalid), wake up with the RX pin, the serial port prints out "wake up:x",x represents the last low-power mode. When the module is awakened, instructions are required to re-enter the low power consumption.

5.9 Precautions

1、 This module does not support large file streaming, and do not exceed 500 bytes of single-packet serial data

2、 In MQTT protocol mode, the length of the single package data should not exceed 200 bytes

3、 GPIO18 is only valid for 1 second before power-up when restoring the default parameters, so to use this feature you can connect GPIO18 to GND to pull down before resetting or powering up again.

4、 Low-power modes consume less power with the higher the level, but there are some data delays that follow. Corresponding power consumption levels and approximate operating currents: the average current at no low power consumption is approximately 8mA,

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the average current at primary power consumption is approximately 2mA, the average current at secondary power consumption is approximately 1.5mA, the average current at level 3 is approximately 300uA, the average current at level 4 is approximately 120uA, and sleep current is about 16uA (wake-up can be used with RX pins)

5、 The module cannot enter power mode of one, two, three, four levels until it is connected to the AP, otherwise it can only be in low-power mode or sleep mode.

6、 The communication distance of the module is affected by the target AP, the communication distance of the PCB antenna of the MW305R router can reach 115m, and the IPX antenna interface can reach 200m.

Chapter 6 Default Parameters

The default parameter is the parameter in which the module does not make any modifications at the factory, and if you want to restore this parameter after modification, use the factory parameter instruction to set it. The factory parameter is restored. Or use the GPIO18 pin to revert to the default parameters.

The parameter category	The name of the argument		The parameter value	Relevant instructions
Serial	baud rate		115200	AT+UART
	The data bit		8	
	Stop bit		0 (one stop bit)	
	Parity test		0 (no check)	
The working mode	The working mode		0（TCP）	AT+MODE
Connection mode	Connection mode		1 (manual connection)	AT+CWAUTO
Target AP	ssid		e103-w08	AT+CWHOST
	password		12345678	
	The type of encryption		3（WPA2_PSK）	
TCP parameters	How it was created		0 (manual)	AT+CIPMODE
	Transfer mode		0 (Transmission)	
	Whether to print IP information		0 (Off)	AT+ CIPDINFO
	The number of sockets		4	AT+CIPMUX
TCP remote destination	socket0	port	4001	AT+CIPREMOTE
		ip	192.168.43.64	
	socket1	port	4002	
		ip	192.168.43.64	
	socket2	port	4003	
		ip	192.168.43.64	
	socket3	port	4004	
		ip	192.168.43.64	
	The type of heartbeat		0 (Off)	

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TCP heartbeat bag	Heartbeat time	10 (seconds)	AT+CIPHEART
	Heartbeat data	E103-W08-HEART-BIT	
HTTP parameter	How to transfer	0（get）	AT+HTMODE
	The data print format	0 (output valid data)	
	URL	/myget	AT+URL
	port	8080	AT+HTREMOTE
	ip	192.168.43.64	
MQTT parameters	Quality of service	1	AT+MQPARA
	Heartbeat time	180	
	MQTT version	3（3.1）	
	Clean up the session flag	1	
	Will sign	1	
MQTT login information	The user name	admin	AT+MQLOG
	password	123456	
	Device ID	E103-W08	
MQTT theme	Subscribe to the topic	EBYTE_Sub_T	AT+MQSUB
	Publish the topic	EBYTE_Pub_T	AT+MQPUB
MQTT remote destination	port	1883	AT+MQREMOTE
	ip	192.168.1.127	
BLE parameters	BLE name	E103-W08-BLE-CFG	AT+BLENAME
	BLE broadcast gap	1600（1600*0.625=1000ms）	AT+BLEINTV

Chapter 7 AT Directives and Parameters

AT instructions are used to configure, get parameters, and so on. The AT instructions of this module are mainly divided into: basic AT instructions, WIFI function AT instructions, TCP/IP function AT instructions, HTTP function AT instructions, MQTT function AT instructions. The default serial port rate is 115200, 8 data bits, 1 stop bit, no verification. Here are some things to keep in mind when using:

1. The module operates in the AT instruction state when wifi is not connected, and automatically switches to the transport state when the wifi is connected. At any time, enter the "plus" separately into the AT instruction state, and the serial port outputs the "enter AT mode" prompt message after entering the AT instruction mode, and the "ENTER AT mode" is output after entering the AT command state, and the serial port outputs "exit AT mode". The module does not output instructions when the state is automatically switched.
2. The AT instruction is case insensitive, but must end with a carriage return line break. It is important to note that case insensitive is only for the AT instruction itself and does not include the parameters that follow it, such as the AT instruction: "AT-SETNAME-CDEBYTE", which can be written to"AT-SetNamE-CDEBYTE"or "can be written"TheAT instruction itself is not distinguished, but the parameters after "
3. The return parameter also ends with a carriage return line break. For the AT instruction to set the class, when the written

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parameters meet the requirements, the module returns """""""" For the AT instruction of the query class, if the parameter is successfully obtained, the module returns the word "OK-p", where p represents the specific parameter with the edge, and if there are multiple parameters, each parameter is separated by a comma that should be the character, such as the query serial "AT-UART?" Returns the words"OK-115200, 8,0,0".

4. The parameters set by the AT instruction will take effect when powered up again.
5. Since the length of the AT instruction set at each setting is not necessarily, the indeterminate AT instruction will only intercept valid data segments, such as setting serial parameters: AT-UART-p1, p2, p3, p4. There are only 4 parameters, but if 5 parameters are passed in, such as: AT-UART=115200, 8,0,0,123. If the first 4 parameters are legitimate, the module discards the fifth argument and saves the first 4 legitimate parameters.

7.1 Error code table

The error code table is the state returned when an AT instruction is executed that produces an error, and you can know whether the operation was successful and how quickly it could find the cause of the failure if it failed.

Error code	illustrate
-1	The instruction is wrong and does not exist
-2	The parameter range is wrong
-3	The MAC operation failed
-4	The manual connection failed
-5	The start scan failed
-6	Stopping the scan failed
-7	The disconnect failed
-8	A TCP connection has been created
-9	No TCP connection was established
-11	Carriage return wrapping was not entered
-20	This directive is not supported in this mode
-21	The read RSSI failed
-30	Read, write parameters failed

7.2 Basic AT instructions

7.2.1 AT test instruction

This instruction is used to test whether the AT mode is correct

directives	Response	parameter
AT	+OK	not

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7.2.2 Restart the module

This instruction is used to restart the module, which is equivalent to the process of powering down and powering up again

directives	Response	parameter
AT+RST	RESET	not

7.2.3 Restore factory parameters

This directive is used to empty all parameters of the setting and revert to the factory default parameters

directives	Response	parameter
AT+RESTORE	RESTORE	not

7.2.4 Query version information

This directive is used to obtain the current hardware version and software version number

directives	Response	parameter
AT+GMR	SW:V1.0,HD:V1.0	not

SW: Software version, HD:hardware version

7.2.5 Query, set serial parameters

directives		Response	parameter
Inquire	AT+UART?	+OK=P1,P2,P3,P4	P1:Porter Rate P2:Data Bit P3:Stop Bit P4:Test Bit
Set up	AT+UART=115200,8,0,0	Success: s OK; failed: serr.x	x: Error code

Parameter range:

Baud Rate: P1	Data bit: P2	Stop bit: P3	Check bit: P4
1200,2400,4800,9600,14400,19200 28800,38400,57600,76800,115200 230400,460800	7: Data bit 7 8: Data bit 8	0:1 stop bit 2:2 Stop bit	0: No checksum 1: Even check 2: Odd check

7.2.6 Query, set the working mode

directives		Response	parameter
Inquire	AT+MODE?	+OK=P1	P1 mode of operation;0:TCP,1:MQTT,2:HTTP
Set up	AT+MODE=P1	Success: s OK; failed: serr.x	

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7.2.7 Query, set the power mode

directives		Response	parameter
Inquire	AT+SLEEP?	Success: s OK s P1	P1: Power mode 0: No low power consumption 1: Primary power consumption 2: Secondary power consumption 3: Three-stage power consumption 4: Level 4 power consumption 5: Go to sleep
Set up	AT+SLEEP=p1	Success: s OK; failed: serr.x	

illustrate:

1、 The higher the power consumption level, the more power-saving it is, and the default is 0 without low power mode

2、 This parameter takes effect immediately and the power-down is not saved

3、 Wifi connection can be maintained during low power consumption, data can be received normally, the module wakes up automatically after receiving data, and instructions need to be sent to re-enter the low power consumption (wake-up can be RX pin-receiving data wake-up, or wake-up to network data).

4、 When entering sleep mode, the module retains only the RX pin wake-up function, which is equivalent to a power-off restart.

7.3 WIFI-related AT instructions

7.3.1 The scan is available apAs

directives	Response	parameter
AT+CWLAP	Success: s OK; failed: serr.x	x error code

It is important to note that this instruction can only be used in manual connection mode, and when the instruction is executed successfully, a list of AP information is output if scanned to an available AP

7.3.2 Connect to the specified AP

This instruction is used to manually connect the module to the specified AP and needs to be used in conjunction with the previous instruction, Scan Available AP. The AP needs to be scanned before making a connection, or it will be reported if there is a target AP in the list to connect.

directives	Response	parameter
AT+CWJAP=P1,P2,P3	Success: s OK, failed: serr.x	P1: Target APssid, P2: Password, P3: Encryption Type

Parameter range:

P1:SSID	P2; password	P3: Encryption type
Up to 32 bytes	Up to 32 bytes	0：open 1：WEP 2：WPA_PSK

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		3：WPA2_PSK 4：WPA_WPA2_PSK 5：WPA2_ENTERPRISE

7.3.3 Disconnected from AP

directives	Response	parameter
AT+CWQAP	Success: s OK, failed: serr.x	x: Error code

7.3.4 Query, set connection mode

directives		Response	parameter
Inquire	AT+CWAUTO?	+OK=P1	P1 represents connection mode, 0: Automatic connection 1: Connect manually 2: BLE distribution network
Set up	AT+CWAUTO=P1	Success: s OK, failed: serr.x	

7.3.5 Query the MAC address

directives		Response	parameter
Inquire	AT+CWMAC?	+OK=P1	P1:mac address

Modifying MAC addresses is not supported in this module

7.3.6 Query, set the host name

This directive is used to set the SSID, password, and encryption type of the module's target AP.

directives		Response	parameter
fetch	AT+CWHOST?	+OK=P1,P2,P3	
Set up	AT+CWHOST=P1,P2,P3	Success: s OK, failed: serr.x	

The range of parameters

P1:SSID	P2; password	P3: Encryption type
Up to 32 bytes	Up to 32 bytes	0：open 1：WEP 2：WPA_PSK 3：WPA2_PSK 4：WPA_WPA2_PSK 5：WPA2_ENTERPRISE

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This directive is the target AP for setting E103-W08

7.4 TCP-related AT Directive

7.4.1 Query the status of the network connection

directives	Response	parameter
AT+CIPSTATUS	+OK=P1	P1 connection status

Description: When TCP is set to protocol transfer, the return parameter is a four-way soket connection status: .OK=0:0:0:0.0

7.4.2 Establish a TCP transfer

Create a TCP in manual mode

directives	Response	parameter
AT+CIPSTART	Success: s OK, failed: serr.x	

7.4.3 Turn off TCP transmission

Turn off TCP in manual mode

directives	Response	parameter
AT+ CIPCLOSE	Success: s OK, failed: serr.x	

7.4.4 Query local IP

directives	Response	parameter
AT+CIFSR	Success: s OK s P1, failed: serr s x	

Description: Because static IP is not supported in this module, this directive can only query the IP assigned to the module by the AP, not set the IP

7.4.5 Query, set up multi-connection

directives		Response	parameter
Inquire	AT+CIPMUX?	+OK=P1	P1 is the number of sokets established, ranging from 1 to 4
Set up	AT+CIPMUX=P1	Success: s OK, failed: serr.x	

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7.4.6 Query, set TCP mode

directives		Response	parameter
Inquire	AT+CIPMODE?	+OK=P1,P2	P1:TCP creation mode, 0:Manual 1: Automatic P2::TCP transmission mode, 0: transmission, 1: protocol
Set up	AT+CIPMODE=P1,P2	Success: s OK, failed: serr	

Description: If P1 is set to be created manually, you will need to use the creation instructions in 6.3.2 to generate a TCP connection.

7.4.7 Query, set whether to print peer-to-peer IP, port

directives		Response	parameter
Inquire	AT+CIPDINFO?	+OK=P1	0: IP, port information is not printed 1: Print IP, port information
Set up	AT+CIPDINFO=P1	Success: s OK, failed: serr s X	

Description: If printing is turned on, the IP port of the data source is printed at the head of each package of data in the following format:

The data header		separator	data
Data source IP address (up to 15 bytes)	Data source port (up to 5 bytes 0 to 65535)	1 byte	The actual byte data received
192.168.1.127	4001	space	1234567890

Both the IP address and the port are output as strings.

It is important to note that if you turn off print IP addresses and port information, the output format is protocol transport format when the protocol is transmitted.

7.4.8 Query, set remote target parameters

directives		Response	parameter
Inquire	AT+CIPREMOTE? P1	+OK=P1,P2,P3	P1: Label, P2: Port, P3:ip address
Set up	AT+CIPREMOTE=P1,P2,P3	Success: s OK, failed: serr.x	

Parameter range:

P1 label	P2 port number	P3IP address
0~3	0~65535	Number of four segments not greater than 255 (255.255.255.255)

Description: Be careful to bring the number P1 of the remote destination you want to query

When setting transmission, the parameter of 0 is used as the connection target by default.

7.4.9 Query and set heartbeat data

directives		Response	parameter
Inquire	AT+CIPHEART? P1	+OK=P1,P2,P3,P4	P1: Label P2: Heartbeat Type P3: Heartbeat Time
Set up	AT+ CIPHEART =P1,P2,P3,P4	Success: s OK, failed: serr.x	

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			P4: Heartbeat data

The range of parameters

P1: Label	P2: Heartbeat type	P3: Heartbeat time	P4: Heartbeat data
0~3	0: Close 1: Serial heartbeat 2: Network heartbeat 3: Serial mouth and network heartbeat	1~65535	Strings that are not greater than 20 bytes

7.5 MQTT-related AT instructions

7.5.1 Query and set MQTT remote targets

directives		Response	parameter
Inquire	AT+MQREMOTE?	+OK=P1,P2	P1: Port number P2:Ip address or domain name
Set up	AT+MQREMOTE=P1,P2	Success: s OK, failed: serr.x	

The range of parameters

P1: Port number	P2: IP address or domain name
0~65535	Number not greater than 255 when IP address (255.255.255.255) A valid domain name string that is no larger than 63 bytes when it is a domain name

7.5.2 Query, set up MQTT publishing topic

directives		Response	parameter
Inquire	AT+MQPUB?	+OK=P1	Strings no larger than 100 bytes
Set up	AT+MQPUB=P1	Success: s OK s P1, failed: serr s x	

7.5.3 Query, set MQTT subscription topic

directives		Response	parameter
Inquire	AT+MQSUB?	+OK=P1	Strings no larger than 100 bytes
Set up	AT+MQSUB=P1	Success: s OK s P1, failed: serr s x	

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7.5.4 Query, set MQTT login parameters

directives		Response	parameter
Inquire	AT+MQLOG?	+OK=P1,P2,P3	P1: User name, P2: password, P3: device ID
Set up	AT+MQLOG=P1,P2,P3	Success: s OK, failed: serr.x	

Parameter range:

P1 username	P2 password	P3 device ID
Strings that are not greater than 32 bytes	Strings that are not greater than 32 bytes	Strings that are not greater than 32 bytes

7.5.5 Query, set MQTT connection parameters

directives		Response	parameter
Inquire	AT+MQPARA?	+OK= P1,P2,P3,P4,P5	
Set up	AT+MQPARA=P1,P2,P3,P4,P5	Success: s OK, failed: serr.x	

The range of parameters

P1 quality of service	P2 heartbeat time	P3: MQTT version	P4: Session clear flag	P5: Will mark
0，1，2	60 to 65535 seconds	3：v3.1 ; 4:v3.1.1	0 or 1	0 or 1

7.6 HTTP-related parameters

7.6.1 Query, set remote destinations

directives		Response	parameter
Inquire	AT+HTREMOTE?	+OK=P1,P2	P1: Port number P2:Ip address or domain name
Set up	AT+HTREMOTE=P1,P2	Success: s OK, failed: serr.x	

The range of parameters

P1: Port number	P2: IP address
0~65535	Number of no more than 255 when IP address (255.255.255.255) A legitimate domain name string that is no larger than 63 bytes when it is a domain name

7.6.2 Query, set the URL

directives		Response	parameter
Inquire	AT+HTURL?	+OK=P1	P1: URL information

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Set up	AT+ HTURL=P1	Success: s OK, failed: serr.x	

Explain that UTL must begin with a slash "/"

7.6.3 Query, set the data type

directives		Response	parameter
Inquire	AT+HTMODE?	+OK=P1,P2	P1:Request type:0:get,1:post P2:Output Type: 0: Valid data, 1: So data
Set up	AT+HTMODE=P1,P2	Success: s OK, failed: serr.x	

Description: Valid data refers to the data segment in http communication, and all data refers to the complete data returned to the module by the http server

7.7 BLE-related parameters

This module supports BLE distribution network, as well as modification of BLE name and broadcast gap

7.7.1 Query and set the BLE broadcast name

directives		Response	parameter
Inquire	AT+BLENAME?	+OK=P1	P1: String no greater than 30 bytes
Set up	AT+BLENAME =P1	Success: s OK, failed: serr.x	

7.7.2 Query, set BLE broadcast gap

directives		Response	parameter
Inquire	AT+BLEINTV?	+OK=P1,P2	P1: Maximum broadcast clearance, P2: Minimum broadcast clearance Range 32,16000. Unit 0.625ms
Set up	AT+BLEINTV =P1,P2	Success: s OK, failed: serr.x	

Note: The range of broadcast clearances is 0.625ms. Because the BLE broadcast parameter is only allowed to be an integer multiple of 0.625ms, for example, when set to 32, the actual broadcast gap is 32 x 0.625ms x 20ms.

Chapter 8 Uses tutorials

8.1 TCP communication

When doing data transmission, to ensure that the module and the PC's end server in the same local area network, the PC is first

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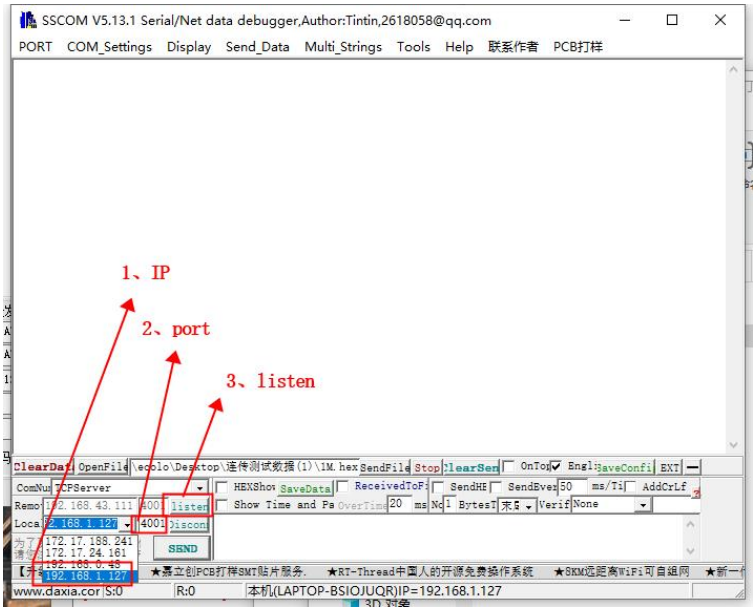
connected to the target AP, to obtain the IP address.



8.1.1 Transmission

Here's how:

1、 Create a TCP server, fill in the above IP address into 1, 2 ports according to their own needs to define, set up to complete the click 3 listening.



2、 Set the target AP. AT+CWHOST=E880-IR01,JSZXE880,3

3、 Set the operating mode to TCP, AT-MODE-0

4、 Set the TCP mode to transmission, AT-CIPMODE-1,0

5、 Set the remote destination server address, port. Note that the IP address port here is the IP address and port in the first step.

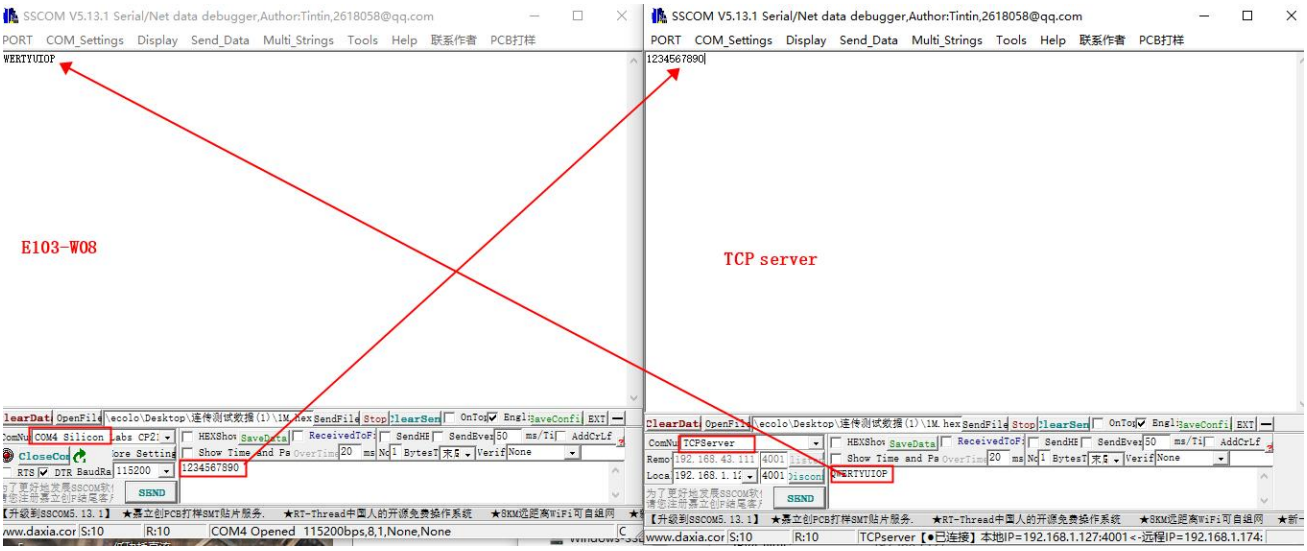
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AT+CIPREMOTE=0,4001,192.168.1.127

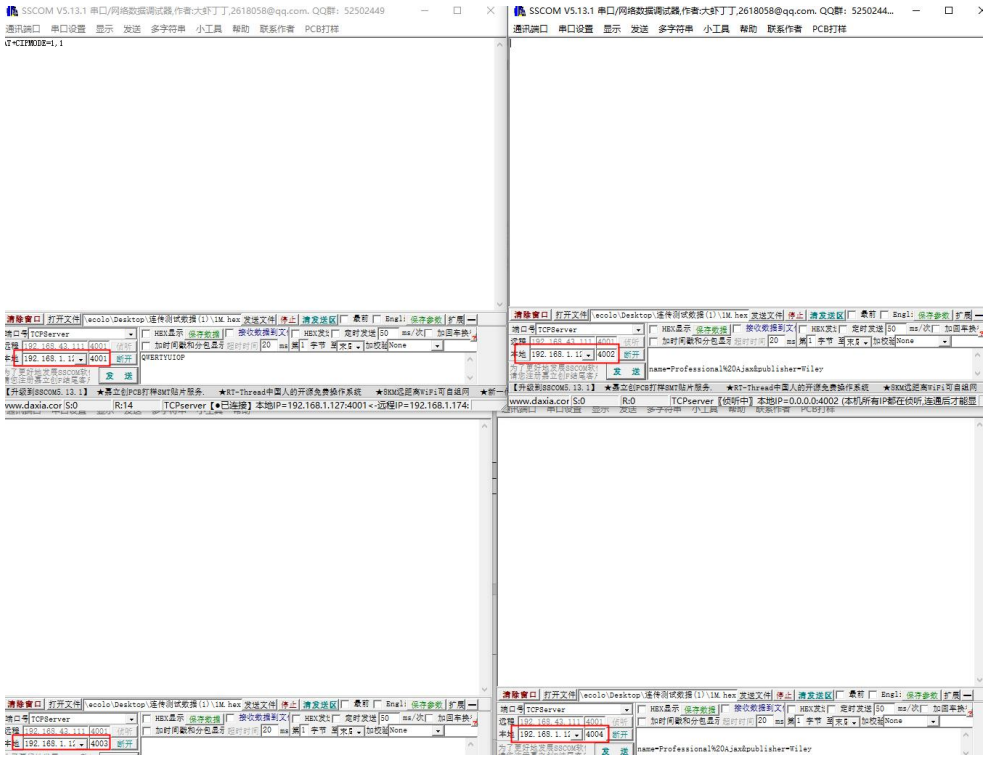
6、 When set up, restart the module and wait for the connection to be established.

7、 Observe the state of the S_LINK and communicate when the connection is successfully established.



8.1.2 Protocol transfer

1、 To create multiple TCP servers, see the previous section, where you set up four servers with ports of 4001,4002,4003,4004. The IP address is 192.168.1.127.



2、 Set the module to pass-through mode. At-CIPMODE=1,1, connection number set to 4:AT-CIPMUX=4

3、 Set the segment grams and IP addresses in the first step to the remote destination address of the module:

AT+CIPREMOTE=0,4001,192.168.1.127

AT+CIPREMOTE=0,4001,192.168.1.128

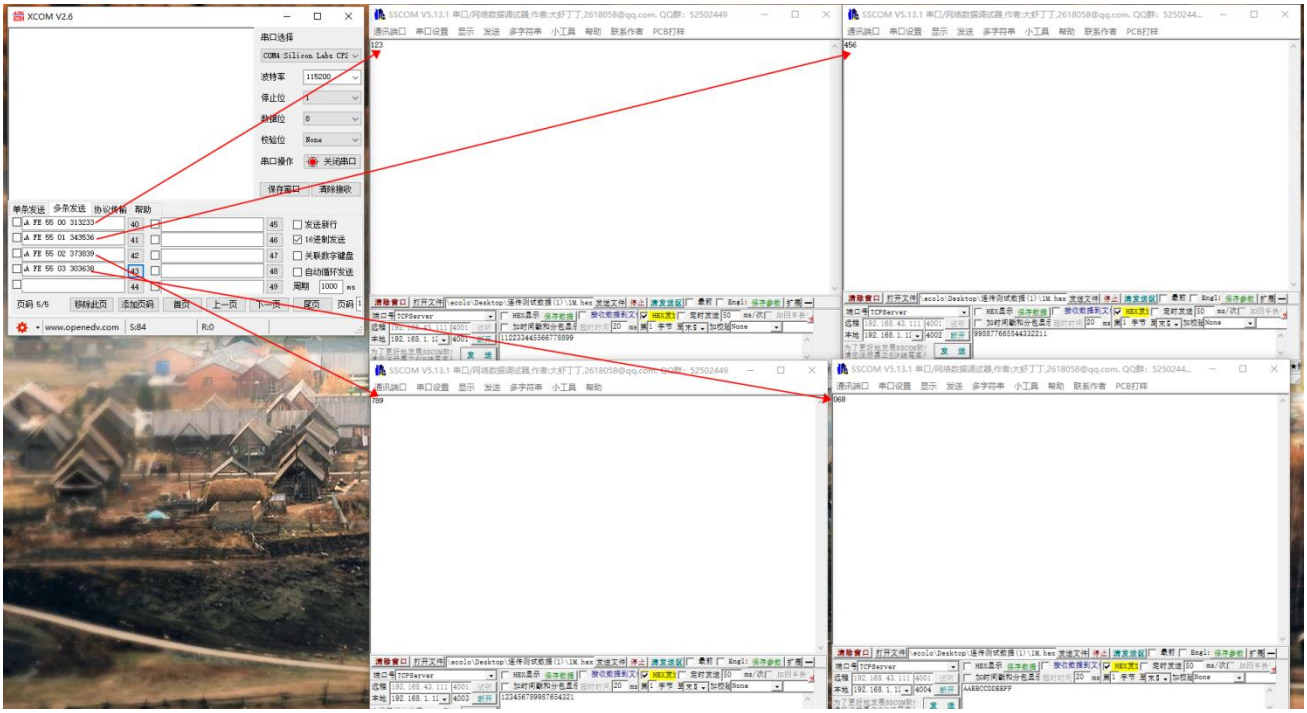
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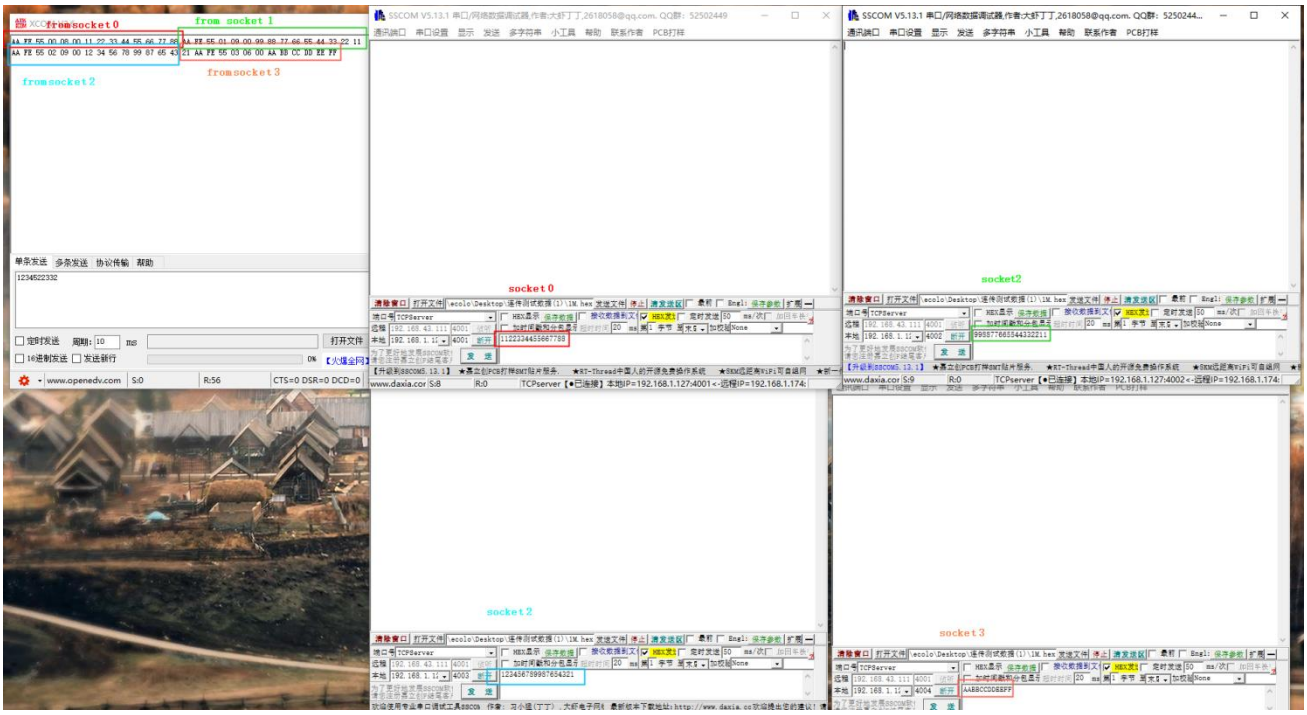
AT+CIPREMOTE=0,4001,192.168.1.128

AT+CIPREMOTE=0,4001,192.168.1.128

4、 Restart the module waiting for the connection to be established



Data is sent in accordance with the protocol transfer format in Chapter 5.



When data is received, it is output to the module in the format of the receive as agreed in Chapter 5.

8.2 HTTP communication

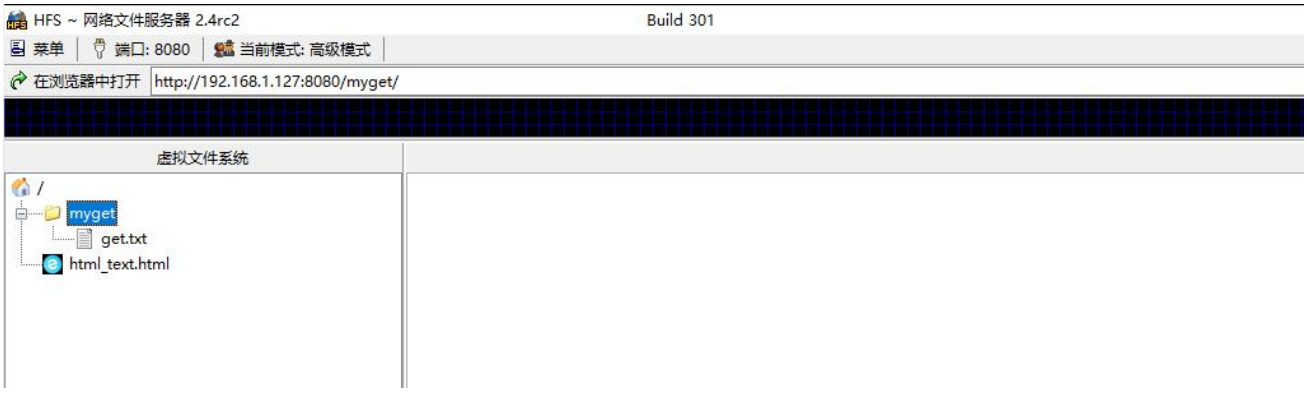
There are only two ways to transfer data in this module, get and post

1、 Set bit HTTP mode. AT+MODE=2

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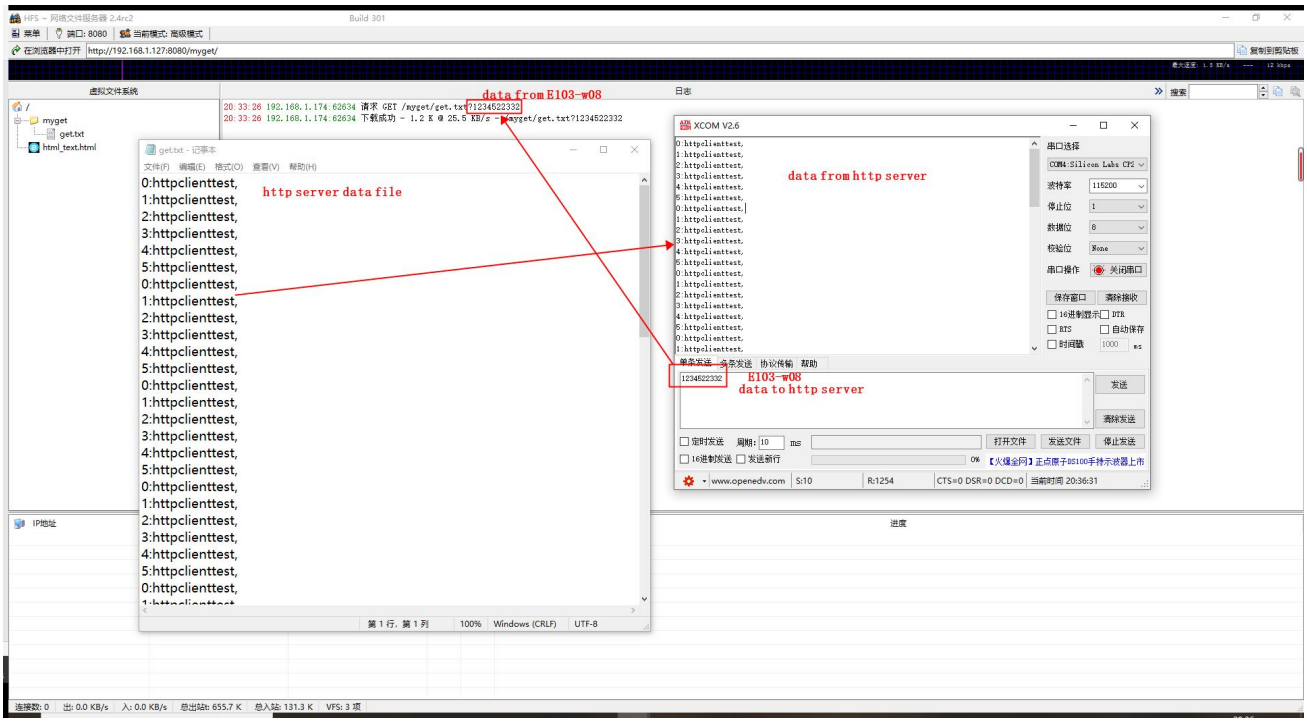
2、 Set up remote HTTP ports and IP addresses. AT+HTREMOTE=8080,192.168.1.127。 Use the local server in this routine



3、 Set the URL address of http. AT+HTURL=/myget/get.txt

4、 Set http transmission mode to get and effective output. AT+HTMODE=0,0

5、 Restart the module and wait for the connection to be established before initiating communication



Note: HTTP is short-connection communication, so the SOCKET INDICATOR does not change throughout the process.

8.3 MQTT communication

1、 Set the mode to MQTT mode. AT+MODE=1.

2、 Set up remote MQTT server IP and port. AT+MQREMOTE=1883,192.168.1.127

3、 Set up a subscription topic. AT+MQSUB=EBYTE_Sub_T.

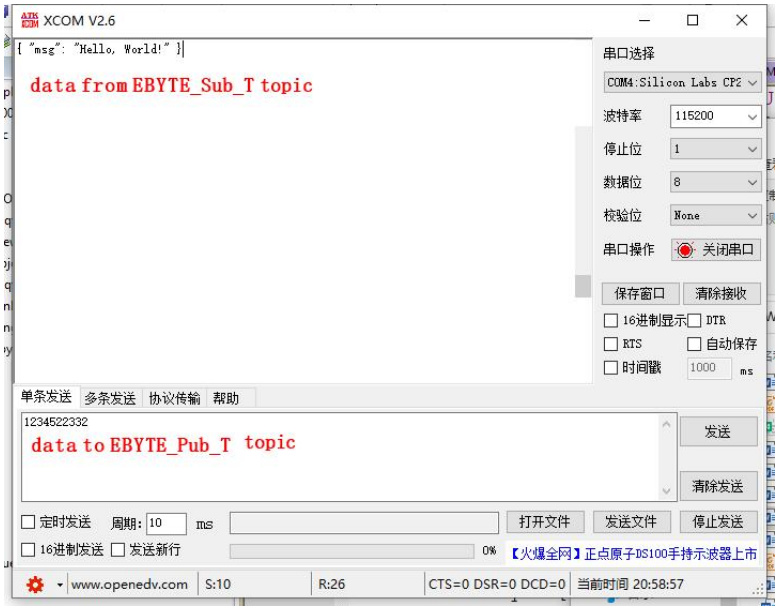
4、 Set the publishing topic. AT+MQPUB=EBYTE_Pub_T

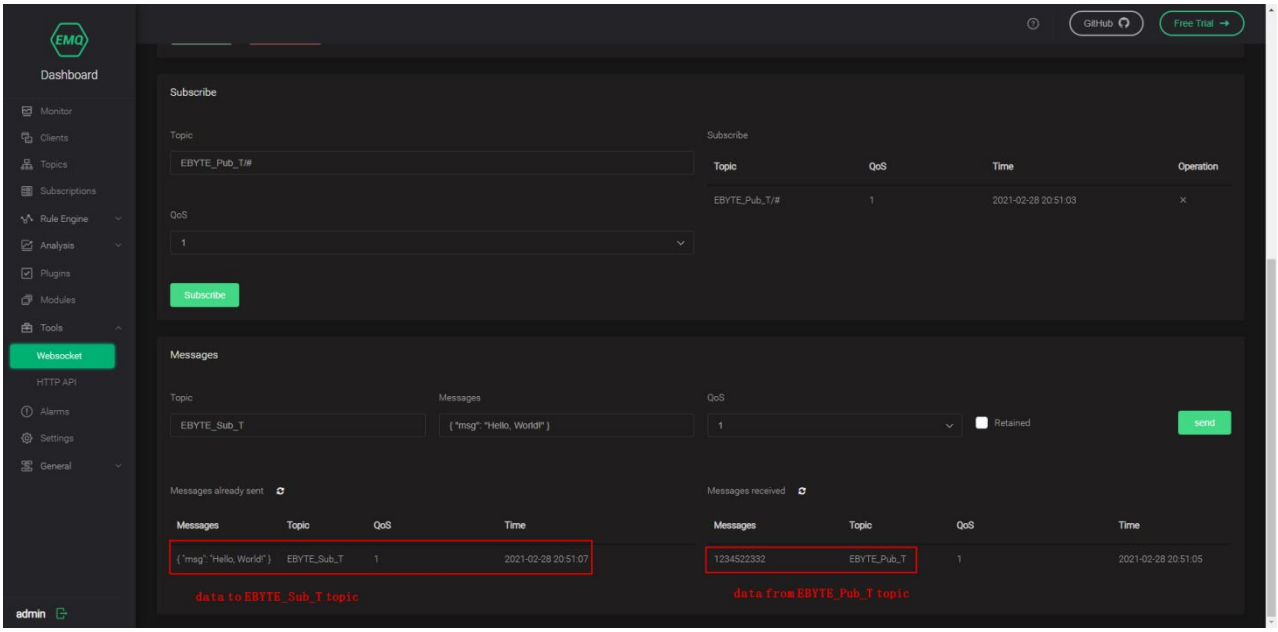
5、 Set up login information. AT+MQLOG=admin,123456,E103-W08

6、 Restart waiting for a connection to be established to communicate.

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8.4 BLE distribution network

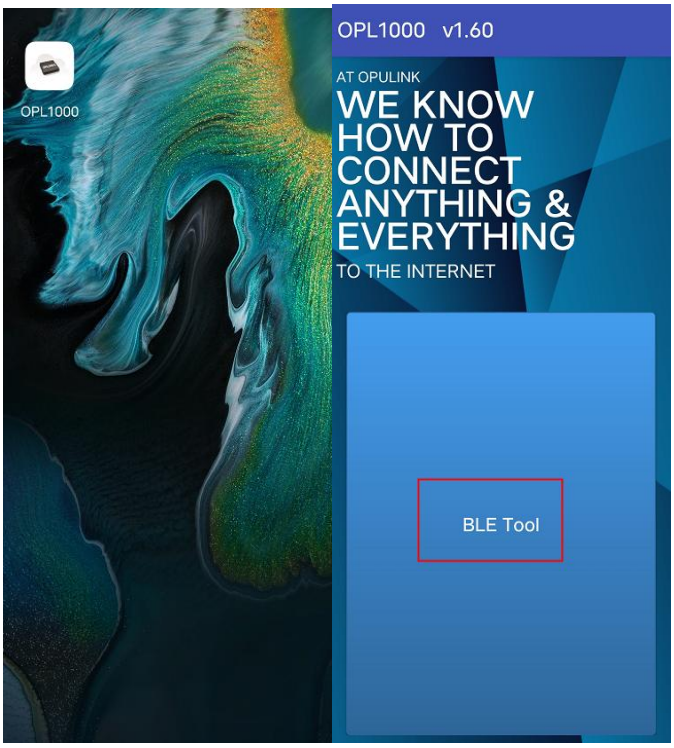
When using BLE distribution network, the module is first set to BLE connection mode, and then use APP for distribution. Apps can be searched in the Store or downloaded and installed on our website.

1、 Set the BLE connection mode. AT+CWAUTO=2。 Restart the module.

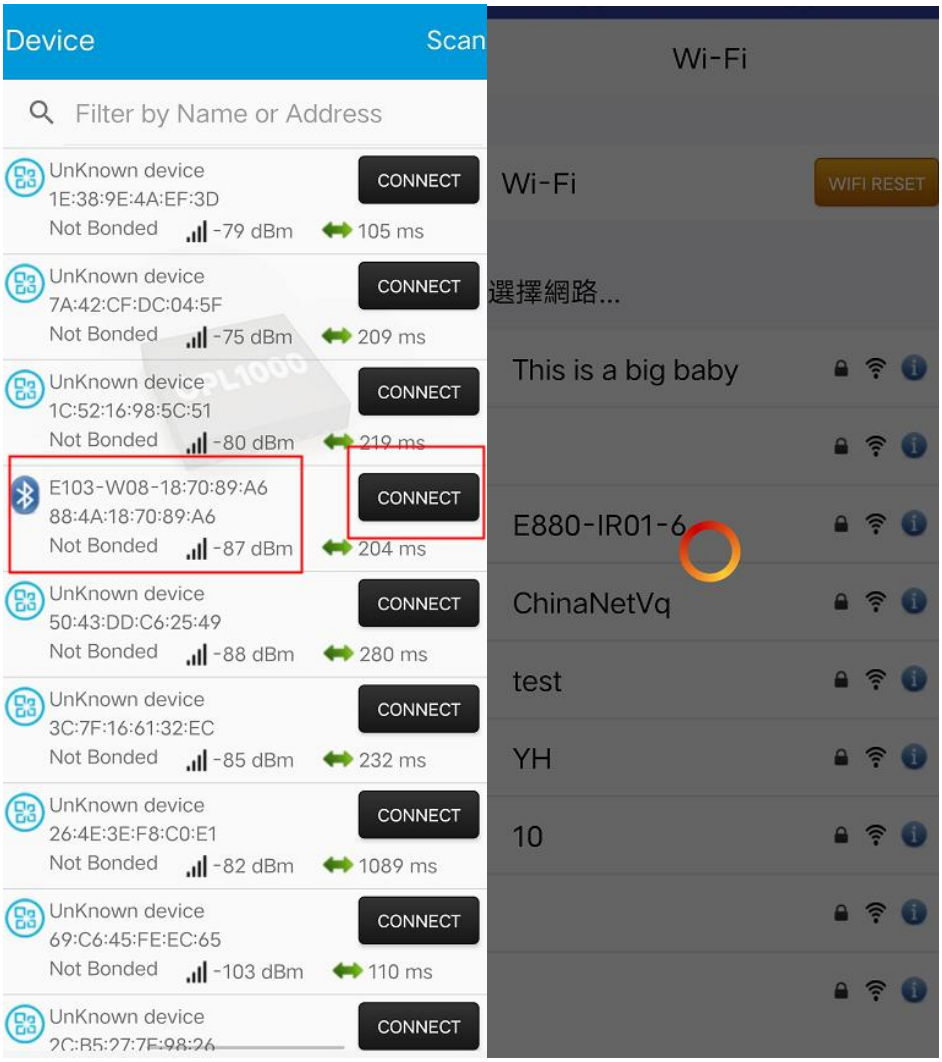
2、 Open the distribution software OPL1000. Click BLE Tool.

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3、 Find the target module click connect for the BLE connection, waiting for the connection to complete



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4、 Select the target AP to enter the password and wait for the connection to succeed.



Note: After the completion of the use of BLE distribution network, the next power will use this distribution parameters to connect by default, so if you do not replace the connection target AP this distribution operation can only be done once, to replace the target AP can do this again.

Wifi reset: To empty the information of the last BLE distribution network, after connecting to the module via app, click WIFI RESET to wait for the reset to succeed.



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Chapter 9 Welding Work Instructions

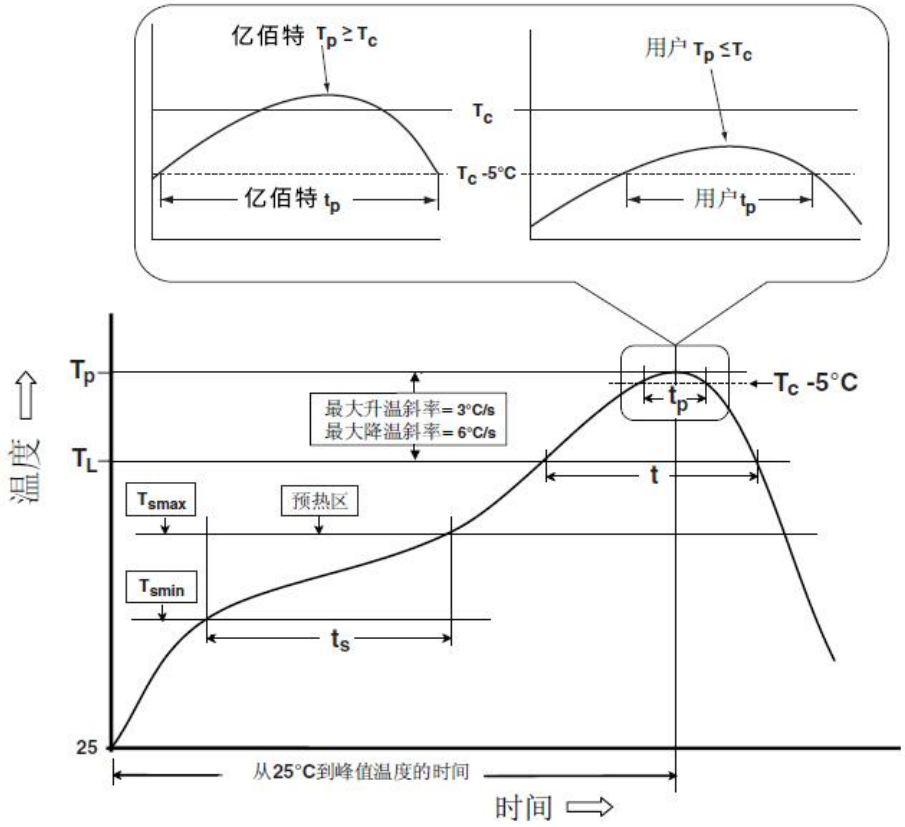
9.1 Reflow soldering temperature

Reflow Soldering Profile Characteristics		**Sn-Pb Assembly**	**Pb-Free Assembly**
Preheat/keep warm	Min. Temperature（Tsmin）	100℃	150℃
	Max. Temperature（Tsmax）	150℃	200℃
	Time（Tsmin~Tsmin）	60-120s	60-120s
Average ramp-up rate（TL~Tp）		3℃/s, Maximum	3℃/s, Maximum
Liquidous Temperature（TL）		183℃	217℃
Time（tL）Maintained Above		60~90s	60~90s
Package peak temperature Tp		Should not exceed the temperature indicated on the product's label of "Moisture Sensitivity".	Should not exceed the temperature indicated on the product's label of "Moisture Sensitivity".
The time (Tp) within 5°C of the specified classification temperature (Tc), see the figure below		20s	30s
Aveage ramp-down rate（Tp~TL）		6℃/s, Maximum	6℃/s, Maximum
Time from 25℃ to peak temperature		6min，Maximum	8min，Maximum
※The peak temperature (Tp) tolerance definition of the temperature profile is an upper limit for the user			

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9.2 Reflow soldering curv



Revise history

version	The revision date	Revised instructions	Maintainer
1.0	2021.04.02	The initial version	luo
1.1	2023.04.24	Manual merger	Hao

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