

# E103-W01-IPX User Manual

### ESP8266EX 2.4GHz 100mW SMD Wireless Module



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#### **1** General Introduction

#### 1.1 Brief Introduction

E103-W01-IPX is 100mW (20dBm) UART wi-fi module with competitive price. It is small-size with both IPX and ceramic antenna, operating at 2.4~2.4835GHz, The module can use the serial port for data transmission and reception, and very easy for user to operate.

E103-W01 is Ebyte based on ESP8266EX from Espressif, transparent transmission is available, easy for user to operate, supports AT command, server AT command. User can connect with internet by UART, which enable the module are widely used in wearable electronics, home automation, home application, smart plugs and lights and industrial wireless control.



E103-W01-IPX supports standard ieee802.11b/g/n protocol and

complete TCP / IP protocol stack, supports STA/AP/STA+AP mode, supports Smart Config, transparent transmission, IO control, transparent transmission on power-up, PWM output, AD detection etc. Network connection can be achieved after easy configuration, which saving operation and develop time for user.

#### 1.2 Features

- The measured communication distance can reach 100m;
- Maximum transmission power of 100mW, software multi-level adjustable;
- Support the global license-free ISM 2.4GHz band;
- 210ms boot transparent transmission, dropped automatically connected;
- Three operating mode: STATION, AP, STATION≈
- Support TCPServer、TCPClient &UDP;
- Support SmartConfig configuration function;
- Support 3.0V~3.6V power supply, power supply over 3.3V can guarantee the best performance;
- Industrial grade standard design, support -40 ~ 85 °C for working over a long time;
- Support Ceramic and IPEX interface, users can choose according to needs.

#### 1.3 Application

- Home security alarm and remote keyless access;
- Security system, positioning system;
- Wireless alarm security system;
- Building automation solutions;
- Wireless Industrial Remote Controller;
- Health care products;
- Advanced Metering Infrastructure(AMI);
- Automotive industry applications.

# 2 Specification and parameter

# 2.1 limit parameter

(((•))) EBYTE

Main annuatan	Perfor	mance	Demerk	
Main parameter	Min	Max	Kemark	
Deriver supply (V)		3.6	Voltage over 3.6V will cause	
rower suppry	0	5.0	permanent damage to module	
Plocking power (dPm)		10	Chances of burn is slim when modules	
BIOCKING POWER (dBIII)	-	10	are used in short distance	
Operating temperature (°C)	-40	85		

# 2.2 Operating parameter

Main nonserver	Performance			Demorik	
Main parameter	Min	Туре	Max	Kemark	
Operating voltage (V)	3.0	3.3	3.6	≥3.3 V ensures output power	
Communication level (V)		2.2		For 5V TTL, it may be at risk of	
		5.5		burning down	
Operating temperature (°C)	-40	-	85	Industrial grade	
Operating frequency (MHz)	2402	-	2483	Support ISM band	
Max TX power (dBm)	19.6	20.0	20.5		
WiFi version	-	802.11		b/g/n	
Tx802.11b,CCK11Mbps,POUT=+17dBm	165	170	180	mA	
Tx802.11g,OFDM54Mbps,POUT=+15dB	135	140	150	mA	
m					
Tx802.11n,MCS7,POUT=+13dBm	115	120	130	mA	
Rx802.11b,1024bytesPacket length,-	18	20	23	mA	
80dBm					
Rx802.11g,1024bytesPacket length,-	53	56	65	mA	
70dBm					
Rx802.11n,1024bytesPacket length,-	53	56	65	mA	
65dBm					
Partial sleep	13	15	18	mA	
Sleep	0.8	0.9	1.1	mA	
Deep sleeping	9	10	11	uA	
Shut down	0.4	0.5	0.6	uA	

Main parameter	Description	Remark	
Reference distance	100m	clear and open area, antenna gain: 5dBi,	antenna height:

		2.5m
AT Support	Built-in intelligent processing	Can be read by AT command
Communication interface	UART Serial port	-
Package	SMD	-
Interface	2.00mm	-
Size	16 * 24 mm	-
Antenna	Ceramic antenna / IPEX	50 ohm impedance

# 3 Size and pin definition



•	uu	ч	addready	•	•	~
ι	Jnit	:	mm			

Pin	Name	Туре	Function
1	RST	Ι	External reset signal (Low voltage level: Active)
2	ADC	Ι	ADC input pin
3	CH_PD	Ι	Module enable, need be pulled up
4	GPIO16	Ι	module wake up(from deep sleep state), high level effectively
5	GPIO14	ΙΟ	PWM1/GPIO14

6	GPIO12	ΙΟ	PWM0/GPIO12			
7	GPIO13	ΙΟ	GPIO13	GPIO13		
8	VCC	-	Power supply VDC:3.0V—3.6V (above 300mA)			
9	GND	-	GND pin			
10	GPIO15	Ι	GPIO15	GPIO2★	GPIO0	Boot
11	GPIO2	Ι	0	1	1	Boot from FLASH
12	GPIO0	Ι	0	1	0	Download firmware from UART
13	GPIO4	ΙΟ	PWM2/GPIO4			
14	GPIO5	ΙΟ	PWM3/GPIO5			
15	RXD	Ι	UART input pin, support AT command			
16	TXD	0	UART output pin,	support AT comma	nd	

 $\star$  GPIO2 is already been internal pulled up

 $\Box$  In transparent-transmission on power-up mode, GPIO2 will indicate the status of module. The module has connected a led to this pin. Users can get the status of the module by observing LED. Besides, you may connect GPIO2 to the external MCU.

LED indication when module works in power-on transparent transmission mode :

Intermittent double flash : cannot connect to AP access point.

Intermittent single flash : connect to AP access point, but cannot connect to TCP server.

Quench : connect to AP access point and TCP server.

#### 4 Recommended connection diagram



• Note : supply voltage is 3.0V~3.6V. 300mA LDO is recommended for steady operation of module.

# **5 Quick Start**

- E103-W01-IPX module is easy to use. In order to allow users to quickly familiarize themselves with the module, this section will guide the user through simple setup to achieve configuration and communication in various modes.
- The test process uses AT commands. For quick connection, we have developed quick configuration software for users.
- This section of the test uses the configuration software to operate, the module will echo the currently issued instructions, so that users can quickly understand the usage of the AT command (Note: you need to add a line break after each AT command).
- Of course, after the user is familiar with the AT command, the AT command can be manually sent using the serial debugging assistant without using the configuration software. It is also possible to use an external controller (MCU) to directly connect to the module UART for AT command communication without using the backplane.

Hardware:	
1	E103-W01*1
2	E103-W01 baseboard*1

3	PC with wi-fi
4	Router*1 ( Mobile wi-fi hotspots )
Software ( do	ownload from our official website )
1	E103-W01 configuration software
2	TCP&UDP testing tool
3	Accessport 1.3

# 5.1 Connected to TCP server as Client

No.	Remarks
1	【Network connection】:         Computer connected to router, and the router named H60-L02(configurable for user)         Noted the IP address as 192.168.1.50
2	【Built TCP server】: Open TCP&UDP test tool to build a TCP server: port6000 (configurable for user). Click to start the server, then TCP server from PC starts to listen to port6000, and other network devices can connect and communicate with it.

			V
	3		
		ZNE-2001主切能型快速以入网转中口復兴 具有10/100M自适应以太网接口,串口通信最高 具有TCP Server,TCP Client, UDP, Real	<u>更</u>
		■ 创建连接 S 创建成劣器 (3) 日本加約分器 (3) (3) 注接 22 (3) 名 主即物开   ○ 面除 (3)   四   4 ]	
	Ė		
	[Module installa	tion]:	
	Substrates VCC sl	nort jumper GDIOO jumper disconnected	
	Plug F103-W01 ir	not jumper, of 100 jumper disconnected.	
	Plug the baseboar	d into PC by USB connector (Please download CP1202 driver if the P	C cannot recognize
	baseboard).		
	USD port number	for tosting : COM200	
	A D me de la the de	for testing. COM500	
	AP mode is the de	Tault mode for E105-W01, which is equivalent to W1-F1 router. Cellphon	he or PC can search
	to the wi-fi hame a	as EBI_AAAAAA (AAAAAA is last unree-byte for MAC address).	
	If the MAC addres	ss for module is "la:fe:34:ed:a6:68", then SSID is "EBT_EDA668".	
	No password for d	lefault.	
		4 🚔 9FDOJWF5ZUWJDMJ	
		▷ 🔮 DVD/CD-ROM 驱动器	
		▷ 🕞 IDE ATA/ATAPI 控制器	
		🛛 😴 Jungo	
		▶	
		· · · · · · · · · · · · · · · · · · ·	
3		▶ 🚡 电池	
		A 博 端口 (COM 和 LPT)	
		Silicon Labs CP210x USB to UART Bridge (COM30)	
		▶ ● 声音、视频和游戏控制器	
		▷ · · · · · · · · · · · · · · · · · · ·	
		▶ ♥ 通用串行总线控制器	
		▷ 💇 网络适配器	
		▷ 1 ● 系统设备	
		▷ 📲 显示适配器	

	STATION mode	e configuration	]:						
	Open Wi-Fi configuration software, select port number in the left corner, then the serial								
	automatically.	automatically.							
	Serial port status changes to open now, click "STATION" button to enter configuration interface.								
	The test router nam	The test router name as Ebyte, password is e30e31e32.							
	Click "enter Sta m	ick enter Sta mode" to change the mode to STATION.							
	Ulick "connect to router", and wait a few seconds to see the interface shown in the figure below, which means								
	module is connected	ed to the route	r successfully.						
	Then user can clic	K IP informat	to query to query	TP information.					
		EIUS-WUI WIFI復身	和自己的 11-2 —— 成	即口旧特电丁科汉有限					
		((()))							
				时电于科	文月限公	명			
		EBTI	E Chengdu Eby	te Electronic Tea	chhology co.,	_ta.			
4		串口测试 4	AP设置 Station设置	Server设置	Client设置	开机适传			
	名	3称: Ebyte	断开路由器		. 168. 4. 2				
		क्रम्ब . e30e31e32		默认网关: 192.	默认网关: 192.168.4.1				
				MAC地址: <sup>5e:</sup>	5e:cf:7f:0f:af:ad				
	路	由连接信息	Sta模式 SmartC Open	查询STA MAC	修改STA MAC	修改IP 网关			
	I	P信息查询	新启动 SmartC Close		开启DHCP	关闭DHCP			
	接收	AT+CWJAP_DEF="Eb	yte", "e30e31e32"			新王串口			
		WIFI CONNECTED WIFI GOT IP			=				
		ок			-	清屏			
	4232	2				白完义发			
	(2).区	2			■ ■ 国本別換1丁	BIERRA			
	串	□: COM30 •	115200 -	串口状态: CON	A30 打开				
	TCP Client conf	figuration ] :					-		
	Click "Client conf	figuration" to	modify the remote	port as 6000(cc	rresponding	to TCP serve	r) and modify		
	enex Chent com	(2.1.50) (meter	to DC ID ) there a				r), and mounty		
5	server ip as 192.10	08.1.30 ( refer	to PC IP J, then c	lick built conne	cuon dutton	l.			
5	See below figure :	: "CONNECT	OK" means connec	ction for TCP set	rver is done.				
	At present server s	hows the conne	ection is ok for devi	ce which IP addr	ress is 192.16	8.1.70(IP add	ress is assigned		
	by router).								



Ē	目回测试 AP设	置 Station语	置 Server设置	t Client设置	开机运传
	远端端口号: 60	00	TCP		
	本地端口号: 60	.00	🔘 VDP	建立连接	
	服务器IP: <sup>19</sup> 注意」	2.168.1.50 学问及法律博士·寻知	42年今117条型1	断开连接	
	注思; 网络连接信	夫团多佳接模式才能 <b>用启多连接</b>	进入透传模式	PING IP	
	IP信息查询	〕 关闭多连接	退出透传模式		
接收	AT+CIPSEND=6				▲ 断开串口
	OK >				
مديدية	AT LOT DORND-C				
	AI+CIL2END-0			☑ 自动换	
串口	· COM30 + 115	5200 <del>-</del>	串口状态:	COM30 <b>†TH</b>	
After ">" symbol s Data communicatio	hows, transmit c on completed 03-W01 WIFI模块配	lata "123456", ≣软件-V1.2	user can see th 成都亿佰特电子科技	te TCP server re	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit con completed 03-W01 WIFI模块配	lata "123456", 重软件-V1.2 — 成都亿 Chengdu Et	user can see th 成都亿佰特电子科技 <b>佰特电子</b> 和 yte Electronic	te TCP server ro 支有限公司—— 科技有限公 Technology Co	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit con completed 03-W01 WIFI模块配 (((小)) EBYTE	lata "123456", 重软件-V1.2 — 成都亿 Chengdu Et 置 Station设	user can see th 成都亿佰特电子科技 百特电子和 byte Electronic	te TCP server re 数有限公司—— 科技有限公 Technology Co Client设置	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit o on completed 03-W01 WIFI模块配 (((•))) EBYTE 印测试 AP段 远端端口号: <sup>60</sup>	ata "123456", 雪软件-V1.2 — 成都亿 Chengdu Et 雪 Station设 00	user can see th 成都亿佰特电子科技 百特电子和 byte Electronic 管 Server设置 ③ TCF	te TCP server re 教育限公司—— 科技有限2 Technology Co Client设置	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit o on completed 03-W01 WIFI模块配 ((())) EBYTE 印测试 APE 远端端口号: <sup>60</sup> 本地端口号: <sup>60</sup>	ata "123456", 重软件-V1.2 — 成都亿 Chengdu Et 置 Station设 00	user can see th 成本以乙佰特电子科技 <b>佰特电子</b> 和 byte Electronic Server设置 ③ TCF ③ UDP	te TCP server ro ta有限公司—— 科技有限公 Technology Co Client设置 建立连接	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit con completed 03-W01 WIFI模块配 (((•))) EBYTE 回测试 APG 远端端口号: <sup>60</sup> 本地端口号: <sup>60</sup> 服务器IF: <sup>19</sup>	lata "123456",	user can see th 成都亿佰特电子科技 <b>百特电子</b> 和 byte Electronic ② TCP ③ TCP	te TCP server re 如有限公司—— <b>科技有限公</b> Technology Co Client设置 建立连接 断开连接	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit o on completed 03-W01 WIFI模块配 (((•))) EBYTE 口测试 APE 远端端口号: <sup>60</sup> 本地端口号: <sup>60</sup> 服务器IF: <sup>19</sup> 注意! 网络连接信!	lata "123456",	user can see th 成都亿佰特电子科技 <b>百特电子</b> 和 <b>5</b> yte Electronic ② TCP ③ UDP 建立服务器! 进入透传模式	te TCP server re 如有限公司—— 帮技有限公司—— Technology Co Client设置 建立连接 断开连接 FING IP	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit of on completed 03-W01 WIFI模块配 (((・))) EBYTE 口測試 APK 远端端口号: <sup>60</sup> 本地端口号: <sup>60</sup> 服务器IF: <sup>19</sup> 注意! [P[络连接信] [IP[信息查话	lata "123456",            雪软件-V1.2 <b>反都亿</b> <b>Chengdu Et Station</b> 设 <b>Station</b> 设 <b>Station</b> 设 <b>D0 Station</b> 设 <b>Station</b> 设 <b>Station</b> 设 <b>Station</b> 会	user can see th 成都亿佰特电子科技 <b>百特电子</b> 和 <b>安住 Electronic</b> ② TCP ③ TCP ③ TCP ③ TCP ③ TCP ③ TCP ③ TCP ③ TCP	te TCP server re 如有限公司—— <b>科技有限公</b> <b>正echnology Co</b> Client设置 建立连接 断开连接 FING IP	eceive data "12.
After ">" symbol s Data communicatio	hows, transmit o on completed 03-W01 WIFI模块配 (((•))) EBYTE 口测试 APR 远端端口号: <sup>60</sup> 本地端口号: <sup>60</sup> 服务器IF: <sup>19</sup> 注意! 网络连接信! IF信息查准	lata "123456",         雪软件-V1.2         反都亿         Chengdu El         雪       Stationig         00       00         2. 168. 1. 50         关闭多连接         1       关闭多连接	user can see th 成本以乙佰特电子科技 <b>佰特电子</b> 和 byte Electronic ② TCP ③ UDP 建立服务器! 进入透传模式 〕 遇出透传模式	te TCP server re 数有限公司—— <b>科技有限</b> <b>正在hnology Co</b> <b>Client设置</b> 建立连接 断开连接 PING IP	eceive data "12. 、 、 、 、 、 、 、 、 、 、 、 、 、
After ">" symbol s Data communicatio	hows, transmit o on completed 03-W01 WIFI模块配 ((空)) EBYTE 回测试 APG 远端端口号: <sup>60</sup> 本地端口号: <sup>60</sup> 服务器IP: <sup>19</sup> 注意! 网络连接信! IP信息查谁 Recv 6 bytes SEND OK	Iata "123456",	user can see th 成都亿佰特电子科技 <b>百特电子</b> 和 byte Electronic ② TCP ③ TCP ③ TCP ③ TCP ③ TCP ③ TCP ③ TCP ③ TCP	te TCP server re 如有限公司—— 《社技有限公 Technology Co Client设置 建立连接 断开连接 PING IP	eceive data "12. 、 、 、 、 、 、 、 、 、 、 、 、 、

	TCP&UDP测试上具 - [192.168.1.     Factor 安口440 朝		
	: 操作(U) 宣君(V) 窗口(W) 報 ZNE-2001全功能刑	第初(日) へ	
	具有10/100M自适应 波特索高计115Mb		
	1 创建连接 1 创建服务器 3 日		
	雇性栏 <b>7</b> ×		
	□□□	目标IP: 发送区 Г 自动发送: 间隔 100 ms 发送 停止	
	□ 38 本机(192.168.1.50):6000	192.166.1.70 F 按16进制 F 发送文件 清空 选项	
	192.168.1.70:4059	4059	
		▶ 指定本机端口:	
		5000    	
		接收区 暫停显示 清空 保存 选项 [ 按16进制	
		→ 计数 □ 保存到文件 (实时)   □   123456	
		接收:	
		发送速度(B/S): 0 接收速度(B/S): 0	
	【Transparent transmission】:		
	After the configuration, module can	transmit data to TCP server directly without AT protocol.	
	Configuration : click "enter transp	parent transmission mode"(AT+CIPMODE=1) after connected to serv	ver,
	then input AT+CIPSEND to enter tra	ansparent transmission mode.	
	E103-W01 WIFI模块配置	置软件-V1.2 ——成都亿佰特电子科技有限公司——	
	14.55	ドサウクサップション	
	EBYTE	成都亿旧符电于科技有限公司 Chengdy Ebyte Electronic Technology CoLtd.	
	串口测试 AP设置	置 Station设置 Server设置 Client设置 开机透传	
	远端端口号: 600	00 • TCP	
	本地端口号: 600	00	
	服务器IP: 192	2. 168. 1. 50 断开连接	
7	注意! 5		
	IP信息查询	J 关闭多连接 退出速传模式	
	接收 AT+CIPMODE=1	(新开串口)	
	ок		
		→ 清屏	
	发送 AT+CIPSEND	◎ 自动换行 ● 自定义发	
	目: COM30 → 1152	-200 ▼   単山状态: COM30 打开	
	Notes: module no longer receive AT	Command transmit the data from UAPT to server directly	
	Troces, moure no longer receive Al	command, dansmit are data nom OART to Server directly.	
	If user continue to transmit data AT+	+CIPSEND, module will treat AT+CIPSEND as data and transmit it to	
	I CF server direculy.		
	Data sent by server is also output dir	rectly from the module.	



WIFI名称: Ebyte	服务器IP: <sup>192,168,1,50</sup>	
WIFI密码: e <sup>30e31e32</sup> 进入STA模式 开机WIFI	服务器端口: <sup>6000</sup> 连接方式: ● TCP ● WP 关闭透传 开机透传	连接状态 重新启动 退出透传状态
接收 AT+CWJAP_DEF="Ebyte", "e30e31e32 WIFI CONNECTED WIFI GOT IP OK 发送	"	▲ 断开串口 ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
串口: COM30 + 115200 +	串口状态: COM30	打开
E103-W01 WIFI模块配置软件-V1.2 (((*))) EBYTE Cheng	一成都记佰特电子科技有限公司 亿佰特电子科技存 du Ebyte Electronic Techn	与限公司 ology Co.,Ltd.
串口测试 AP设置 Sta	ntion设置 Server设置 Cl	ient设置 开机透传
WIFI名称: Ebyte WIFI密码: e30e31e32	服务器IP: <sup>192.168.1.50</sup> 服务器端口: <sup>6000</sup> 连接方式: ◎ TCP ◎ VDP	连接状态
进入STA模式 开机WIFI	关闭透传 开机透传	退出透传状态
X AT+SAVETRANSLINK=1, "192.168.1.50 OK	)", 6000, "TCP", 10	1 断开串口
	<ul> <li>进入STA模式 开机WIFI</li> <li>港入STA模式 开机WIFI</li> <li>部 AT+CWJAP_DEF="Ebyte", "e30e31e32</li> <li>WIFI CONNECTED WIFI GOT IP OK</li> <li>安送</li> <li>車口: COM30 • 115200 •</li> <li>address, port number, and choc interface means configuration</li> <li>EI03-W01 WIFI模块配置软件-V1.2</li> <li>(()) CDE Chong</li> <li>車口測試 AP设置 Sta</li> <li>WIFI名称: Ebyte WIFI名称: Ebyte</li> <li>WIFI名称: Ebyte</li> <li>WIFI名称: Fbyte</li> <li>WIFI密码: e30e31e32</li> <li>进入STA模式 开机WIFI</li> <li>AT+SAVETRANSLINK=1, "192. 168. 1. 50 OK</li> </ul>	進入STA模式 开机WIFI 注接方式: ● TCP ● UPP 送放STA模式 开机WIFI 关闭透传 开机透传 #UT+CWIAP_DEF="Ebyte", "e30e31e32" WIFI CONNECTED WIFI CONNECTED WIFI CONNECTED WIFI GOT IP OK 定 #□ : COM30 • 115200 • #□状态: COM30 address, port number, and choose TCP mode, then click " interface means configuration is done E103-W01 WIFI壇块配置软件-V1.2 ——成都亿佰特电子科技有限公司

串口测试	AP设置	Station设置 Server设置	Client设置 开	机适传
WIFI名称:	Ebyte	服务器IP: 192.168.1.50		
WIFI密码:	e30e31e32	服务器端口: 6000	连接机	术态
		连接方式: 💿 TCP 💿 WP	重新	自动
进入STA模式	式 开机WIFI	关闭透传 开机透传	退出透行	专状态
接收 CCCCCCCC			- E	断开串口
			-	清屏
发送 XXXXX			☑ 自动执行	自定义发
		ll annu i		
串山: COM3	• 115200 •	串山状态: COM3	10 <del>1</del> ]#	
😭 TCP&UDP测试工具	릝 - [192.168.1.70:17717]			- 0 <mark>- x</mark>
操作(0) 查看(V)	窗口(W) 帮助(H)			
ZNE 具有	-200T全功能型快速以太网 10/100M自适应以太网接[	转串口模块 1,串口通信最高 VETCOM- 具有TCP S	10S标准型以太网转串口设 Server,TCP Client, UDP,	<mark>备</mark> Real 丐
	率高达1.15Mbps		oup组播,TCP Auto等多种]	I作模式 <sup>—</sup>
	₽ X 😽 😵 🖓	2.168.1.70:17717	1997 - 199 🛃	4 Þ
/出1土1二	1 1000			
▲ 田田 一一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一 一	目标IP:	发送区 □ 自动发送: 间	隔 100 ms 发送	É 停止
////////////////////////////////////	58.1.50):6000 1 70.17717 日标端口	1.70         「 自动发送: 间           ・         「 按16进制 「	隔 100 ms 发送 发送文件清空	É <u>停止</u> E 选项
/居住 ■ 名户选模式 ■ 服务器模式 ■ 服务器模式 ■ 32 本机(192.10 192.168	58.1.50):6000 3.1.70:17717 日标端口 17717	1.70 : : : : : : : : : : : : : : : : : : :	隔 100 ms 发送 发送文件 <u>清空</u>	<u>停止</u> E <u>选</u> 项
////////////////////////////////////	58.1.50):6000 3.1.70:17717 「192.188 日标鴻口 17717 「指定2 「5000	1.70        :     ご 投16进制「       :     CCCCCCCC	隔 100 ms 发送 5 发送文件     清全	É <u>停止</u> E 选项
/届任任 ● ■ 客户选模式 日 ■ 服务器模式 日 ■ 3 本机(192.10	58.1.50):6000 58.1.70:17717 日标IP: 192.168 日标潟ロ 月7717 戸 指定2 6000 类型:	1.70 : : : : : : : : : : : : : : : : : : :	隔 100 ms 发送 发送文件 <u>清玄</u>	É 停止 E 选项
□ 當户達模式 □ □ 服务器模式 □ □ 3 本机(192.1( □ 192.168	58.1.50):6000 5.1.70:17717 日标: 日标: 日标: 日标: 日标: 192.168 日标: 日标: 17717 「指定2 6000 类型: TCP	1.70     ご       :     ご       :     ご       た机端口:     ご	隔 100 ms 友送 友送文件 清空	▲ 停止 ▲ 修正 ▲ 透顶 ▲ 透顶
////////////////////////////////////	58.1.50):6000 58.1.70:17717 日标IP: 192.168 日标端口 17717 デ 指定3 6000 类型: TCP	1.70     送区     □     自动发送: 间       :     □     按16进制     □       :     □     CCCCCCCC     □       :     □         :     □	隔 100 ms 发送 一发送文件 清空 空 保存 选项 厂 :	
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	58.1.50):6000 8.1.70:17717 第192.168 日标端口 [17717 反指定2 [6000 类型: [TCP 计数 发送:	1.70          :          :       CCCCCCCC         :          :	隔 100 ms 发送 发送文件 清空 空 保存 选项 厂 (34)	€ 停止 登 选项 按16进制
□ = 客户读模式 □ = 服务器模式 □ = 服务器模式 □ 3 本机(192.10	58.1.50):6000 58.1.70:17717 58.1.70:17717 同标端口 17717 デ 指定2 6000 类型: TCP 计数 发送: 28	1.70       送区       □ 自动发送: 间         :       □ 按16进制       □         :       □ 按收区       暂停显示       査         :       □ 保存到文件 (3)       □         :       □ XXXXX       □       □         :       □ Y       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □ <td>隔 100 ms <u>发送</u> 一发送文件 <u>清</u>空 空 保存 透顶 [ : 阳1)</td> <td><u>(</u>停止) 2 <u>选</u>项 技16进制</td>	隔 100 ms <u>发送</u> 一发送文件 <u>清</u> 空 空 保存 透顶 [ : 阳1)	<u>(</u> 停止) 2 <u>选</u> 项 技16进制
////////////////////////////////////	58.1.50);6000 58.1.70:17717 日标端口 17717 「指定2 6000 类型: TCP 计数 发送: 28 接收: 35	1.70          :          :       CCCCCCC         :          :       CCCCCCC         : <td:< td=""></td:<>	隔 100 ms 友道 「友送文件 <u>清</u> 会 空 保存」 选项 「 [明])	€ 停止 多 选项
/居亡亡   ■ ■ 客户读模式   ■ ■ 服务器模式   ■ ■ 本机(192.10	58.1.50):6000 58.1.70:17717 日标IP: 192.188 日标端口 17717 「指定2 6000 类型: 「TCP 计数 发送: 28 接收: 35 清全	1.70       送区       □ 自动发送: 间         :       □ 按16进制       □         :       □ 按收区       暂停显示       雪         :       □ 保存到文件 (3)       □       □         :       □ XXXXX       □       □         :       □ XXXXX       □       □         :       □ XXXXX       □       □         :       □ □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □       □         :       □       □	隔 100 ms <u>发送</u> 一发送文件 <u>清</u> 空 空 保存 <u>选项</u> [ : [明])	
□ = S合铸模式 □ = 服务器模式 □ = 服务器模式 □ = S 本机(192.16	58.1.50);6000 58.1.70:17717 日标3端口 17717 「指定2 6000 类型: TCP 计数 支送: 28 接收: 35 - 清全	1.70       发送区 「自动发送: 间         :       「按16进制 「         :       CCCCCCCC         *       *	隔 100 ms 友道 「友送文件 <u>清</u> 会 空」保存 选项 「 田力)	使止 停止 透顶 按16进制
□ = 客户选模式 □ - = 服务器模式 □ - 32 本机(192.14	58.1.50):6000 3.1.70:17717 58.1.70:17717 58.1.70:17717 58.1.70:17717 58.1.70:17717 58.1.70:17717 58.1.70 192.188 日标端口 17717 56.000 类型: 70 102 102 102 102 102 102 102 10	1.70       送区       □ 自动发送: 间         :       □ 按16进制       □         :       □ 按16进制       □         :       □ 按16进制       □         :       □ 按收区       暂停显示       膏:         :       □ 保存到文件 G       □         :       □ 保存到文件 G       □         :       □ 採牧速度(B/S): 0       接收速度(B/S): 0	隔 100 ms <u>友</u> 道 「友送文件 <u>清</u> 谷 空 保存 <u>选项</u> 厂 : (明7)	使止 适项 按16进制
-Fi indicator(GPIO2) sp	58.1.50);6000 58.1.70:17717 58.1.	1.70       送区       自动发送:       间         :       按16进制       「       按16进制       「         :       CCCCCCCC            :       :             :       :               :       :       :	隔 100 ms 友道 支送文件 <u>清</u> 会 空 保存 透项 「 昭寸)	É 停止 医 选项 按16进制
Fi indicator(GPIO2) sj rmittent double flash	58.1.50):6000 58.1.70:17717 日标調口 192.168 日标調口 17717 「指定2 6000 类型: 「CP 计数 发送: 28 接收: 35 二 査全 受送速 pecification : こ cannot connect	1.70       送送区 □ 自动发送: 间         :       □ 按16进制 □         :       □ 按16进制 □         :       □ 按16进制 □         :       □ 按收区 暂停显示 素:         :       □ 保存到文件 ③         :       □ 保存到文件 ③         :       □ 採收速度(B/S): 0         :       :         :       □ 接收速度(B/S): 0         to AP access point.	隔 100 ms <u>友</u> 道 「友送文件 <u>清</u> 谷 空 保存 <u>选</u> 项 厂 (現す)	使止 这项 按16进制
Fi indicator(GPIO2) sp rmittent single flash :	58.1.50):6000 58.1.70:17717 日标端口 192.168 日标端口 17717 「指定2 6000 类型: 7CP 计数 发送: 28 接收: 35 清空 发送速 pecification : cannot connect connect to AP ac	1.70       发送区 □ 自动发送: 间         :       □ 技16进制 □         :       :      :       : <tr< td=""><td>隔 100 ms 友道 友送文件 <u>清空</u> 空 保存 选项 □ 田力)</td><td>使止       透顶       按16进制</td></tr<>	隔 100 ms 友道 友送文件 <u>清空</u> 空 保存 选项 □ 田力)	使止       透顶       按16进制

	DMM Pro // 34410A // 169.254.4.10	0 2 F ×
	Instrument settings         Data Logger         Digital control           Adc         1         2           0.36         0.31         0.26           0.21         0.16         0.14	
	0.06 0.066 0.006 0.006 0.006 0.000 0.00.00.06/ ★ O = 50 mAdc/ ★ P = 1 0.000 s 1.046 s 1.09 Digitizer stopped. 000:00:00.046/ ★ O = 50 mAdc/ ★ P = 1 0.000 s 1.046 s 1.09 Digitizer stopped. 000:00:00.046/ ★ O = 50 mAdc/ ★ P = 1 0.000 s 1.046 s 1.09 Master 1 0.000 s 1.046 s 1.09 Master 2 10.000 s 1.046 s 1.046 s 1.09 Master 2 10.000 s 1.046 s 1	2 s 1.139 s
	Start O 🖬 🖕 🕻	) 0 <sup>2</sup> E Export
	Send "+++" to exit transparent transmission mode and re-enter AT mode. After exiting transparent transmission mode, user can use AT command to exit transparent transmission mode, user can use AT command to exit transparent transmission" (send "+++" without line break) to enter AT command mod "turn off transparent transmission" to see below interface. After the configuration, module will not works at transparent transmission mode automatically at rebooting.	nission on le. Click fter
9	串口測試       AP设置       Station设置       Server设置       Client设置       开机送传         WIFI名称:       Ebyte       服务器IP: 192.168.1.50            WIFI密码:       e30e31e32       服务器端口: 6000             进入STA模式       开机WIFI	
	<ul> <li>擦收 AT+SAVETRANSLINK=0</li> <li>0K</li> <li>清屏</li> <li>发送 +++</li> <li>▼ 自动操行 自定义发</li> <li>車口: COM30 ▼ 115200 ▼</li> <li>車口状态: COM30 打开</li> </ul>	

#### 5.2 Module build TCP SERVER to connect to PC as AP

No	Remarks
1	In factory mode, module's IP address is 192.168.4.1 when act as AP. Check network status of PC, see below information means the connection between PC and module is ok. AT command can be used to restore the factory state if user ever changed module's parameter.

	all 无线网络连接 状态
	常规         连接       正 Internet 访问权限         IPv4 连接:       无 Internet 访问权限         媒体状态:       已启用         SSID:       BET_SOEB3C         持续时间:       06:25:23         速度:       54.0 Mbps         信号质量:       通知         详细信息 (0)       IPv4 拉地         详细信息 (0)       IPv4 拉地         正发送 —       一         字节:       19.248         2,916       Ela用 NetBIOS ove         连接-本地 IPv6 地址       fe80::1984:5421:148e:6698%12         IPv6 型糕(0)       诊断(0)         美闭 (C)
2	【Module recommends TCP server】: Make sure PC is connected to the modules, then click "server settings" button. Click "open multiple connections"(exiting transparent transmission mode is necessary) first, then click "b server" to see below information. EET03-W01 WIFI模块配置软件-V1.2 — 成都亿佰特电子科技有限公司— ((w)) EBYTE Chengdu Ebyte Electronic Technology Co.,Ltd. #UNIX APQE Station设置 Server设置 Client设置 开机送传 端口号: 1001 建立服务器 停止服务器 注意! 开启多连接模式才能建立服务器! IP信息查询 网络连接信息 关闭多连接 开启多连接
	<ul> <li>接收 AT+CIPSERVER=1,1001</li> <li>K</li> <li>方法 AT+CIPSNED=0,10</li> <li>第日: COM30 → 115200 →</li> <li>申□状态: COM30 打开</li> </ul>
3	[PC connected with TCP server of module to transmit data]: PC uses TCP&UDP test tool to build TCP server, target IP:192.168.4.1, port : 1001. Click "connect" button, then the module should output as shown below: "0, CONNECT" (0 means connect ID), indicating that clients (up to 5) are connected to the module. PC transmits data, module outputs "+IPD,0,15:XXXXXXX" ( +IPD : command 0:connection ID 15 : consecting the package length XXXXXX : data ) Specified connection ID is necessary during transmitting : AT+CIPSEND=0,10 means transmitting 10-build in the package length is a stransmitting in the package length is necessary during transmitting is a stransmitting in the package length is necessary during transmitting is a stransmitting in the package length is necessary during transmitting is a stransmitting is necessary during transmitting is a stransmitting is necessary during transmitting is necessary during transmi

E	(((•)) BYTE	成都亿佰 Chengdu Ebyte	特电子科 Electronic T	技有限公 echnology Co.,	Ltd.
串口测试	AP设置	Station设置	Server设置	Client设置	开机适传
	端口号: <sup>10</sup>	01	建立服务器	停止服务器	
	IP信息查询	注意: 开启多连接 ] 网络连接信息	模式才能建立服务者 关闭多连接	g! 开启多连接	
接收 0, CONNECT +IPD, 0, 16 友送 AT+CIPSEN	::HELLO, ESP_EDA6( D=0, 10	38		▼ 自动换行	断开串口 清屏 自定义发
串口: COM:	30 • 115200	•	││串□状态: CC	DM30 打开	
操作( <u>O</u> ) 查看( <u>V</u> ) ZNE·	窗口(W) 帮助(H)	-1			
具有: 波特型	10/100M自适应以太 藝高达1.15Mbps 劃服务器   38 启动服	以太网转串口模块 网接口,串口通信最高 务器 88 ◎ ◎ 第 连接	NETC 具有TI COM	OM-10S标准型以太网 CP Server,TCP Clien ,Group组播,TCP Auto ※ 删除 %   図   ?	转串口设备 nt, UDP, Real o等多种工作模式
具有: 波特2 · · · · · · · · · ·	10/100m目适应以太 藝高达1.15Mbps 觀察务器 3 启动服 年 × 1001 目 [10] [10] [10] [10] [10] [10] [10] [10]	以太网转串口模块 网接口, 串口通信最高   务器 ※ ② ※ 注述   ◆ 192.168.4.1:1001   示IP:   2.168.4.1   示試口:   01   指定本机端口:   01   图	NETC 具有T COM ○ 全部断开	OM-10S标准型以太网 CP Server,TCP Clien Group組積,TCP Autu ※ 删除 % 20 7 20 7 20 7 20 7 20 7 20 7 20 7 20 7	封串□设备 技, UDP, Real の等多种工作模式 、 、 、 、 、 、 、 、 、 、 、 、

# 5.3 Usage of Smart Config

No.	Remark
	Smart Config enable user to use phone APP to configure module and connected with network with fast-speed.
1	When module works at STATION mode, send "AT+CWSTARTSMART" to enter Smart Config mode, then the
1	configuration for module can be done by cellphone.
	User only need to start EspTouchAPP ( download from Expressif systems ) on cellphone, then input router



### 5.4 Usage of PWM

Steps				
E103-W01-IPX supports 4 channel PWM output, can be configured through the AT instruction to fast PWM cy (1~10ms) and duty cycle,	ycle			
Steps: enter "peripheral control option" to configure parameters:				
1 Period range 1000~10000 corresponds to 1ms~10ms				

2	Adjustment for duty cycle value Range of 0~222222 corresponding to 0ms~10ms (high level time?	≈value*45ns)
3	Channel number range 1~4 indicates the number of currently enabled PWM channels, increasing for example channel number is equal to 2, then PWM0 and PWM1 are enabled(channel number changed after the first transmission)	from PWM0, per cannot be
	Notes	
1	The actual duty cycle = adjustment value for duty cycle *45ns/ cycle The following figure shows the cycle for opening four channel is 10ms, the duty cycle is 50% for	r PWM.
2	Calling PWM command once again to modify the duty cycle.	
Click "	'PWM output" after parameter-setting (AT+EBPWM=4, 10000, 111111, 111111, 111111, 111111).	
( Pleas	se refer to the AT chapter for AT command )	
Click " But cha	'PWM output'' one more time after parameter-setting to modify PWM output. annel number cannot be changed after the first setting.	
Channe	el number after modifying other parameters must keep the same as the first set, otherwise the error is	return ed.
Notes:	PWM channel cannot be closed after opening. It can be reset by reset command or re-power.	
	<ul> <li>◆ 金思拓虚拟仪器 (LA1010 - 已连接)</li> </ul>	
	0-通道0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	- 」 _ 」 _ 」 _ 」 _ 」 _ 」 _ 」 _ 」 _ 」 _ 」	
	■ E103-W01 WIFI模块配置软件-V1.2 ——成都亿佰特电子科技有限公司——	
	((··)) 成都亿佰特电子科技有限公司 EBYTE Chengdu Ebyte Electronic Technology Co.,Ltd.	
	串口测试 AP设置 Station设置 Server设置 Client设置 开机送传	
	接收 AT+EBFWM=4, 10000, 111111, 111111, 111111	
	发送 AT+EBFWM=4, 10000, 111111, 111111, 111111 ▼ 自动操行 自定义发	
	□ 申U: COM30 T13200 T132000000000000000000000000000000000000	

# 5.5 Usage of GPIO

No.	Remark									
1	E103-W01-IPX provide 5 GPIO interfaces:GPIO4\GPIO5\GPIO12\GPIO13\GPIO14, and GPIO4\GPIO5\GPIO12\GPIO12\GPIO14 and PWM pin cannot use at the same time. For example, when PWM pin is operating, the GPIO is inoperable.									
2	User can do pin's status-setting (AT+EBIOSET) and obtain pin's status (AT+EBIOGET) by using AT command.									
3	Click "PIN_State_Set" to set pin's status; Click "PIN_State_Get" to get pin's status.									
	E103-W01 WIFJ模块配置软件-V1.2									

# 5.6 Usage of ADC

No.	Remark
1	E103-W01-IPX provides one ADC with 10-byte precision, with which $0.0V \sim 1.0V$ voltage can be detected.
2	User can get current ADC value by AT command (AT+EBADC), then obtain the real voltage by calculation.
3	Input voltage=ADC value/1024 For example ADC value is 45, so the really voltage is equal to45/1024=0.044V.

Image: Biology WiFi模块配置软件-V1.2						
串口测试	AP设置	Station设置	Server设置	Client设置	开机透传	
接收 AT+EBADC 98				*	断开串口	
OK 会社					清屏 白完义发	
串口: COM30	<ul><li>▼ 115200</li></ul>	•	串口状态: COM	M30 打开		

# 5.7 Modify UART baud rate

No.	Remark					
E103-W01-IPX module supports 10 standard UART baud rate. The user must not set the baud rate out of the effective range, or there will be an issue when debugging If so, please reload the firmware or contact us for help.						
2	2 User can modify UART baud rate by sending AT+UART command. For example: AT+UART=115200,8,1,0,0					
3	For specific instructions, please refer to the	AT command set.				
		9600				
		19200				
		38400				
Supporting baud rate		57600				
		115200				
		230400				
		256000				
		460800				
		921600				
Parity		NONE (default)				
		EVEN				
		ODD				
		5 bits				
		6 bits				
	Data lengin	7 bits				
		8 bits				
	Stop bit	1 bit				

2 bits	
	2 bits

### 6 Specification for networking

#### 6.1 Wi-fi role

No.	Remark
1	E103-W01-IPX supports AP mode (router) and STATION mode (wi-fi equipment). At most 3 wi-fi devices can be supported when module works at AP mode.
2	E103-W01-IPX including TCP Server、TCP Client and UDP as Socket. At most 5 sockets can be connected when module works at TCP Server mode. Based on TCP connection mechanism, if long time connection is needed, please use TCP heartbeat bag.

### 6.2 Networking model

Module build TCP Client to connect with remote server when works at STATION mode(classic)

Can be used for home LOT, meter-reading, real-time monitoring etc. Module can communicate with network server for real-time data. User can operate module by real-time communication.





# 7 AT command

Only l	list some special AT command for your reference, mor	e AT command please refer to the official datasheet.					
	AT+EBPWM-PWM Set or modify						
1	T+EBPWM= <channel_num>,<period>,<duty0>[,<du ty1&gt;][,<duty2>][,<duty3>]</duty3></duty2></du </duty0></period></channel_num>	Parameter specification: channel_num: channel number period: cycle (1000~10000corresponding to1~10ms) duty0~duty3: PWM0~PWM3Duty cycle setting ( high level time=duty*45ns ) Duty number should keep the same with channel number. Response: First transmission response : PWM Start! Non-first transmission response : OK Error response : ERROR					
	Example: Set PWM0 duty cycle 25% PWM1 duty cycle AT+EBPWM=2,10000,55555,111111	e 50% cycle 10ms					
	Notes: PWM cannot be closed after booting, and chan	nel number cannot be modified.					
	AT+EBIOGET to get IO input status						
2	AT+EBIOGET= <gpio_num></gpio_num>	Parameter specification : gpio_num : GPIO number, 4,5,12,13 and 14 are available. Response : 0 or 1					
	Example : AT+EBIOGET=4						
	Notes : The pins which could been used to be the DWM output, is not suitable for this command						
	AT+ERIOSET to configure IO output status						
3	AT+EBIOSET= <gpio_num> , <value></value></gpio_num>	Parameter specification : gpio_num : GPIO number, 4,5,12,13 and 14 are available. Value: Pin status can be configure to 0,1 Response : OK					
	Example : AT+EBIOSET=4, 1						
	Notes : The pins which could been used to be the PWM output, is not suitable for this command.						
	AT+EBADC to get ADC value						
4	AT+EBADC	Parameter specification : Range of input voltage : DC 0.0V~1.0V Response : 45 ( real voltage=45/1024 ) OK					
	Example : AT+EBADC						
5	AT+EBSTATE register GPIO13 as Wi-Fi indicator						

AT+EBSTATE= <en></en>	Parameter specification : en: Setting to 1 indicates set GPIO13 as wi-fi status indicator. Setting to 0 indicates cancel for set GPIO13 as wi-fi status indicator. Response : OK			
Example : AT+EBSTATE=1				
Notes: After setting GPIO13 as wi-fi indicator, the IO operation is forbidden.				

8 Hardware design

- It is recommended to use a DC stabilized power supply. The power supply ripple factor is as small as possible and the module needs to be reliably grounded.
- Please pay attention to the correct connection of the positive and negative poles of the power supply, reverse connection may cause permanent damage to the module.
- Please check the power supply to ensure that between the recommended supply voltage, if exceeding the maximum, the module will be permanently damaged;
- Please check the stability of the power supply. Voltage can not fluctuate greatly and frequently;
- When designing the power supply circuit for the module, it is often recommended to reserve more than 30% of the margin, so the whole machine is beneficial for long-term stable operation;
- The module should be as far away as possible from the power supply, transformers, high-frequency wiring and other parts with large electromagnetic interference;
- Bottom Layer High-frequency digital routing, high-frequency analog routing, and power routing must be avoided under the module. If it is necessary to pass through the module, assume that the module is soldered to the Top Layer, and the copper is spread on the Top Layer of the module contact part(well grounded), it must be close to the digital part of the module and routed in the Bottom Layer;
- Assuming the module is soldered or placed over the Top Layer, it is wrong to randomly route over the Bottom Layer or other layers, which will affect the module's spurs and receiving sensitivity to varying degrees;
- It is assumed that there are devices with large electromagnetic interference around the module that will greatly affect the performance. It is recommended to keep them away from the module according to the strength of the interference. If necessary, appropriate isolation and shielding can be done;
- Assume that there are traces with large electromagnetic interference (high-frequency digital, high-frequency analog, power traces) around the module that will greatly affect the performance of the module. It is recommended to stay away from the module according to the strength of the interference. If necessary, appropriate isolation and shielding can be done;
- If the communication line uses a 5V level, a 1k-5.1k resistor must be connected in series (not recommended, there is still a risk of damage);
- Try to stay away from some physical layers such as TTL protocol at 2.4GHz, for example: USB3.0;
- The mounting structure of antenna has a great influence on the performance of the module. It is necessary to ensure that the antenna is exposed, preferably vertically upward. When the module is mounted inside the case, use a good antenna extension cable to extend the antenna to the outside.

### 9 FAQ

#### 9.1 Communication range is too short

- The communication distance will be affected when obstacle exists;
- Data lose rate will be affected by temperature, humidity and co-channel interference;
- The ground will absorb and reflect wireless radio wave, so the performance will be poor when testing near ground;
- Sea water has great ability in absorbing wireless radio wave, so performance will be poor when testing near the sea;
- The signal will be affected when the antenna is near metal object or put in a metal case;
- Power register was set incorrectly, air data rate is set as too high (the higher the air data rate, the shorter the distance);
- The power supply low voltage under room temperature is lower than recommended value, the lower the voltage, the lower the transmitting power;
- Due to antenna quality or poor matching between antenna and module.

#### 9.2 Module is easy to damage

- Please check the power supply and ensure it is within the recommended range. Voltage higher than the peak will lead to a permanent damage to the module.
- Please check the stability of power supply and ensure the voltage not to fluctuate too much.
- Please make sure anti-static measures are taken when installing and using, high frequency devices have electrostatic susceptibility.
- Please ensure the humidity is within limited range for some parts are sensitive to humidity.
- Please avoid using modules under too high or too low temperature.

#### 9.3 BER(Bit Error Rate) is high

- Here are co-channel signal interference nearby, please be away from interference sources or modify frequency and channel to avoid interference;
- Poor power supply may cause messy code. Make sure that the power supply is reliable;
- The extension line and feeder quality are poor or too long, so the bit error rate is high.

### **10 Production guidance**

#### 10.1 Reflow soldering temperature

Profile Feature	Feature	Sn-Pb Assembly	Pb-Free Assembly	
Solder Paste	Solder paste	Sn63/Pb37	Sn96.5/Ag3/Cu0.5	
Preheat Temperature min (Tsmin)	Min preheating temp.	100°C	150°C	
Preheat temperature max (Tsmax)	Max preheating temp.	150°C	200°C	

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Preheat Time (Tsmin to Tsmax)(ts)	Preheating time	60-120 sec	60-120 sec	
Average ramp-up rate(Tsmax to Tp)	Average ramp-up rate	3°C/second max	3°C/second max	
Liquidous Temperature (TL)	Liquid phase temp	183°C	217°C	
Time (II) Maintained Above (TI)	Time below liquid phase	60,00,000	20,00,000	
Time (IL) Maintained Above (IL)	line	00-90 sec	50-90 sec	
Peak temperature (Tp)	Peak temp	220-235°C	230-250°C	
Aveage ramp-down rate (Tp to Tsmax)	Average ramp-down rate6°C/second max		6°C/second max	
	Time to peak	( minutes man	8 minutes max	
Time 25°C to peak temperature	temperature for 25°C	o minutes max		

# 10.2 Reflow soldering curve



### 11 E103 series

Model	IC	Frequency Hz	Tx power	Distance	communication	Size	Size
Widder			dBm	km	protocol	mm	mm
<u>E103-W01-IPX</u>	ESP8266EX	2.4G	20	0.1	802.11b/g/n	16 * 24	Ceramic/IPX
E103-W02-DTU	CC3200	2.4G	0.1W	0.3	802.11 b/g/n	82*62*25	SMA-K

<u>E103-W02</u>	CC3200	2.4G	20	0.3	802.11b/g/n	19 * 27	PCB/IPX
<u>E103-W01</u>	ESP8266EX	2.4G	20	0.1	802.11b/g/n	16 * 24	РСВ

### 12 Antenna recommendation

#### 12.1 Recommendation

The antenna is an important role in the communication process. A good antenna can largely improve the communication system. Therefore, we recommend some antennas for wireless modules with excellent performance and reasonable price.

Model No.	Туре	Frequency Hz	Interface	Gain dBi	Hright	Cable	Function feature
<u>TX2400-NP-5010</u>	Flexible	2.4G	SMA-J	2	50*10mm	-	FPC soft antenna
	Antenna						
<u>TX2400-XP-150</u>	Sucker	2.4G	SMA-J	3.5	15cm	150cm	High Gain
	antenna						
<u>TX2400-JK-20</u>	Rubber	2.4G	SMA-J	3	200mm	-	Flexible&omnidirectional
	antenna						
<u>TX2400-JK-11</u>	Rubber	2.4G	SMA-J	2.5	110mm	-	Flexible&omnidirectional
	antenna						
<u>TX2400-JZ-3</u>	Rubber	2.4G	SMA-J	2	30mm	-	Short straight
	antenna						&omnidirectional

#### 12.2 Antenna selection



The default 0R resistor is soldered as shown above (left), and the antenna interface is ceramic antenna. If you need to change the antenna interface mode to IPEX, please change the 0R resistor to the above (right).

# 13 Package



# **Revision history**

Version	Date	Description	Issued by
1.00	-	Initial version	huaa
1.10	2018-5-25	Content update	huaa
1.20	2018-11-2	new version update	Huaa

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