E101-32WN4-XS-IE

User Manual



成都亿佰特电子科技有限公司
Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Catalog

E101-32WN4-XS-IE ..... 错误!未定义书签。
User Manual 1
Ⅰ Functional Overview 3
1.1 Introduction 3
1.2 Features 3
Ⅱ Electrical Characteristics 3
2.1 Absolute maximum ratings 3
2.2 Recommended working conditions 4
2.3 RF Characteristics 4
Ⅲ Hardware Description 5
3.1 Mechanical size and pin definition 5
3.2 Minimal Schematic 8
3.3 Module size 9
3.4 PCB package pattern 10
Ⅳ AT Command 10
Ⅴ Common Questions 11
5.1 Unsatisfactory transmission distance 11
5.2 Module is easily damaged 11
5.3 Bit error rate is too high 11
Ⅵ Welding Operation Guidance 12
6.1 Reflow temperature 12
6.2 Reflow soldering curve 13
Ⅶ Disclaimer 14
Revise History 14
About us 14

Copyright ©2012–2025，Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Disclaimer and copyright notice

The information in this article, including the URL address for reference, is subject to change without notice. The document is provided "as is" without any guarantee responsibility, including any guarantees for merchantability, suitability for specific purposes, or non-infringement, and any guarantees mentioned elsewhere in any proposals, specifications or samples. This document does not take any responsibility, including the responsibility for infringement of any patent rights caused by the use of the information in this document. This document does not grant any license for the use of intellectual property rights in estoppel or other ways, whether express or implied.

The test data obtained in the article are all obtained by the Ebyte laboratory, and the actual results may vary slightly.

All brand names, trademarks and registered trademarks mentioned in this article are the property of their respective owners, and it is hereby declared.

The final interpretation right belongs to Chengdu Ebyte Electronic Technology Co., Ltd.

Notice

Due to product version upgrades or other reasons, the contents of this manual may change. Ebyte Electronic Technology Co., Ltd. reserves the right to modify the contents of this manual without any notice or prompt. This manual is only used as a guide. Chengdu Ebyte Electronic Technology Co., Ltd. makes every effort to provide accurate information in this manual. However, Chengdu Ebyte Electronic Technology Co., Ltd. does not guarantee that the contents of the manual are completely free of errors. All statements in this manual , Information and suggestions do not constitute any express or implied guarantee.

Copyright ©2012–2025，Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Ⅰ Functional Overview

1.1 Introduction



E101-32WN4-XS-IE is a WIFI module based on the ESP32-DOWD-V3 chip solution.

E101-32WN4-XS-IE is a general-purpose Wi-Fi module, powerful, built-in ESP32-DOWD-V3 chip, Xtensa® dual-core 32-bit LX6 microprocessor, 448 KB ROM, 520 KB SRAM, 16 KB RTC SRAM supports up to 240 MHz clock frequency.

Wi-Fi supports a wide range of communication connections and also supports direct connection to the Internet through a router; the sleep current of the ESP32 chip is less than 5 μA, making it suitable for battery-powered wearable electronic devices. The module supports a data transmission rate of up to 150 Mbps, and an antenna output power of 20 dBm, which can achieve the widest range of wireless communication. Therefore, this module has industry-leading technical specifications, and has excellent performance in terms of high integration, wireless transmission distance, power consumption, and network connectivity.

It can be used for low-power sensor networks and demanding tasks, such as speech encoding, audio streaming, and MP3 decoding.

1.2 Features

- 4 MB SPI flash,
- Support AT commands;
- Support serial communication and flow control. The baud rate is up to 128000.
- Support automatic and manual networking.

Ⅱ Electrical Characteristics

2.1 Absolute maximum ratings

Symbol	Parameter	Minimum	Maximum	Unit
VDD33	Power pin voltage	-0.3	3.6	V
TSTORE	Storage temperature	-40	85	° C

Chart 0-1 Absolute maximum ratings

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.2 Recommended working conditions

Symbol	Parameter	Minimum	Typical	Maximum	Unit
VDD33	Power Pin Voltage	3.0	3.3	3.6	V
IVDD	Supply current of external power supply	0.5	—	—	A
T	Recommended working temperature	-40	—	85	° C
Humidity	Humidity	—	85	—	%RH
Imax	Peak current			400	mA
I	Average current			100	mA

Chart 0-2 Recommended working conditions

2.3 RF Characteristics

Working channel center frequency range		2412~2484MHz
Wi-Fi		Protocol IEEE802.11b/g/n
Antenna type		IPEX Interface
Distance	With router @Mercury MW305R	400m
	Between Modules	400m

Chart 0-3 RF Characteristics

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Ⅲ Hardware Description

3.1 Mechanical size and pin definition

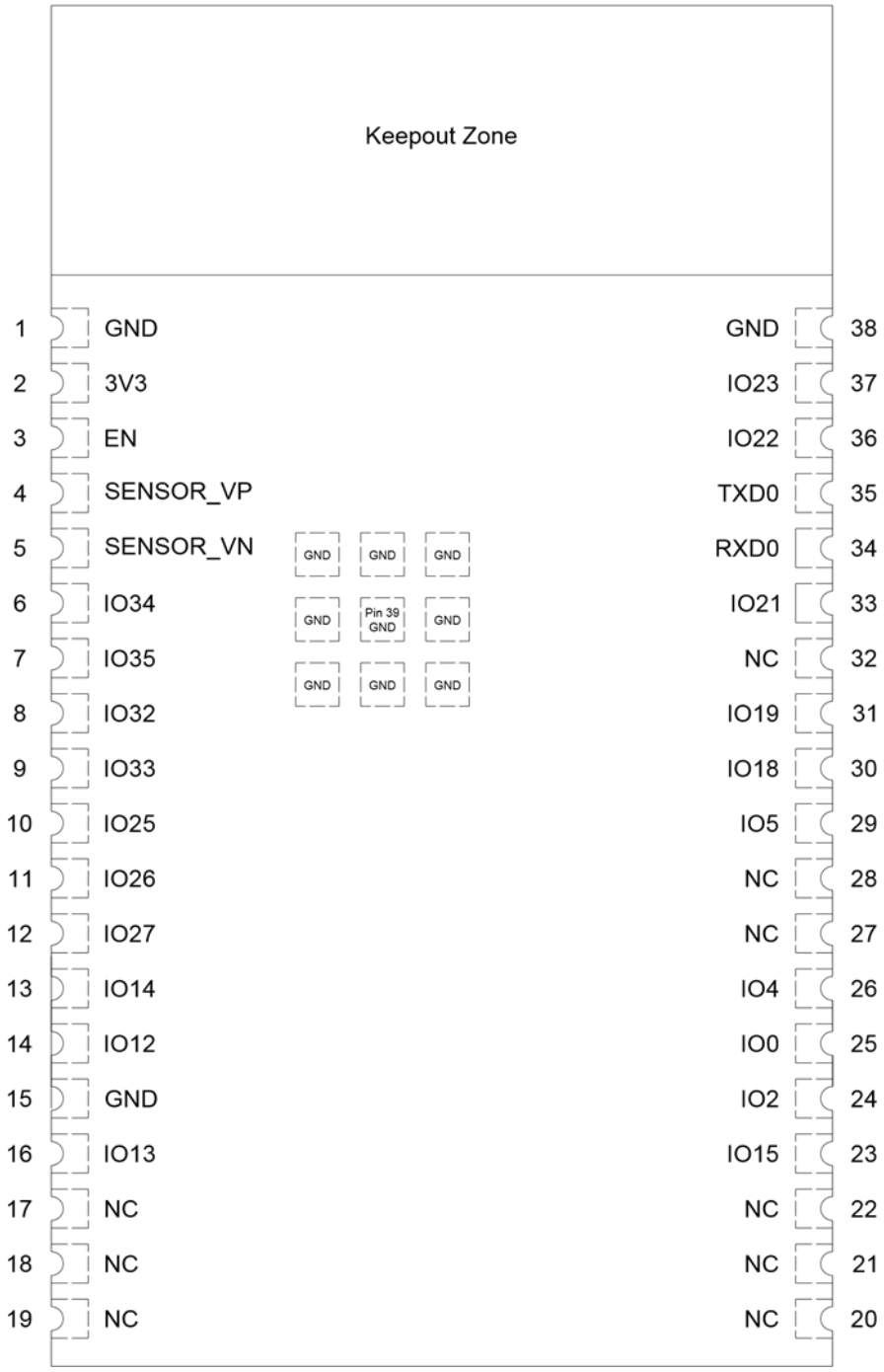


Chart 0-1 Pin layout diagram(top view)

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Name	Serial number	Type	Function
GND	1	P	Grounded
3V3	2	P	Powered by
EN	3	I	Enable the module, high level is effective.
SENSOR_VP	4	I	GPIO36, ADC1_CH0, RTC_GPIO0
SENSOR_VN	5	I	GPIO39, ADC1_CH3, RTC_GPIO3
IO34	6	I	GPIO34, ADC1_CH6, RTC_GPIO4
IO35	7	I	GPIO35, ADC1_CH7, RTC_GPIO5
IO32	8	I/O	GPIO32, XTAL_32K_P (32.768 kHz Crystal input), ADC1_CH4, TOUCH9, RTC_GPIO9
IO33	9	I/O	GPIO33, XTAL_32K_N (32.768 kHz Crystal output), ADC1_CH5, TOUCH8, RTC_GPIO8
IO25	10	I/O	GPIO25, DAC_1, ADC2_CH8, RTC_GPIO6, EMAC_RXD0
IO26	11	I/O	GPIO26, DAC_2, ADC2_CH9, RTC_GPIO7, EMAC_RXD1
IO27	12	I/O	GPIO27, ADC2_CH7, TOUCH7, RTC_GPIO17, EMAC_RX_DV
IO14	13	I/O	GPIO14, ADC2_CH6, TOUCH6, RTC_GPIO16, MTMS, HSPICLK, HS2_CLK, SD_CLK, EMAC_TXD2
IO12	14	I/O	GPIO12, ADC2_CH5, TOUCH5, RTC_GPIO15, MTDI, HSPIQ, HS2_DATA2, SD_DATA2, EMAC_TXD3
GND	15	P	Grounded
IO13	16	I/O	GPIO13, ADC2_CH4, TOUCH4, RTC_GPIO14, MTCK, HSPID, HS2_DATA3, SD_DATA3, EMAC_RX_ER
NC	17	-	-
NC	18	-	-
NC	19	-	-
NC	20	-	-
NC	21	-	-
NC	22	-	-

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

IO15	23	I/O	GPIO15, ADC2_CH3, TOUCH3, MTDO, HSPICS0, RTC_GPIO13, HS2_CMD, SD_CMD, EMAC_RXD3
IO2	24	I/O	GPIO2, ADC2_CH2, TOUCH2, RTC_GPIO12, HSPIWP, HS2_DATA0, SD_DATA0
IO0	25	I/O	GPIO0, ADC2_CH1, TOUCH1, RTC_GPIO11,CLK_OUT1, EMAC_TX_CLK
IO4	26	I/O	GPIO4, ADC2_CH0, TOUCH0, RTC_GPIO10, HSPIHD, HS2_DATA1, SD_DATA1, EMAC_TX_ER
NC	27	-	-
NC	28	-	-
IO5	29	I/O	GPIO5, VSPICS0, HS1_DATA6, EMAC_RX_CLK
IO18	30	I/O	GPIO18, VSPICLK, HS1_DATA7
IO19	31	I/O	GPIO19, VSPIQ, U0CTS, EMAC_TXD0
NC	32	-	-
IO21	33	I/O	GPIO21, VSPIHD, EMAC_TX_EN
RXD0	34	I/O	GPIO3, U0RXD, CLK_OUT2
TXD0	35	I/O	GPIO1, U0TXD, CLK_OUT3, EMAC_RXD2
IO22	36	I/O	GPIO22, VSPIWP, U0RTS, EMAC_TXD1
IO23	37	I/O	GPIO23, VSPID, HS1_STROBE
GND	38	P	Grounded

1 P：power；I：input；O：output；T：Can be set to high resistance。

Chart 0-2 Pin definition list

Copyright ©2012–2025，Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.2 Schematic

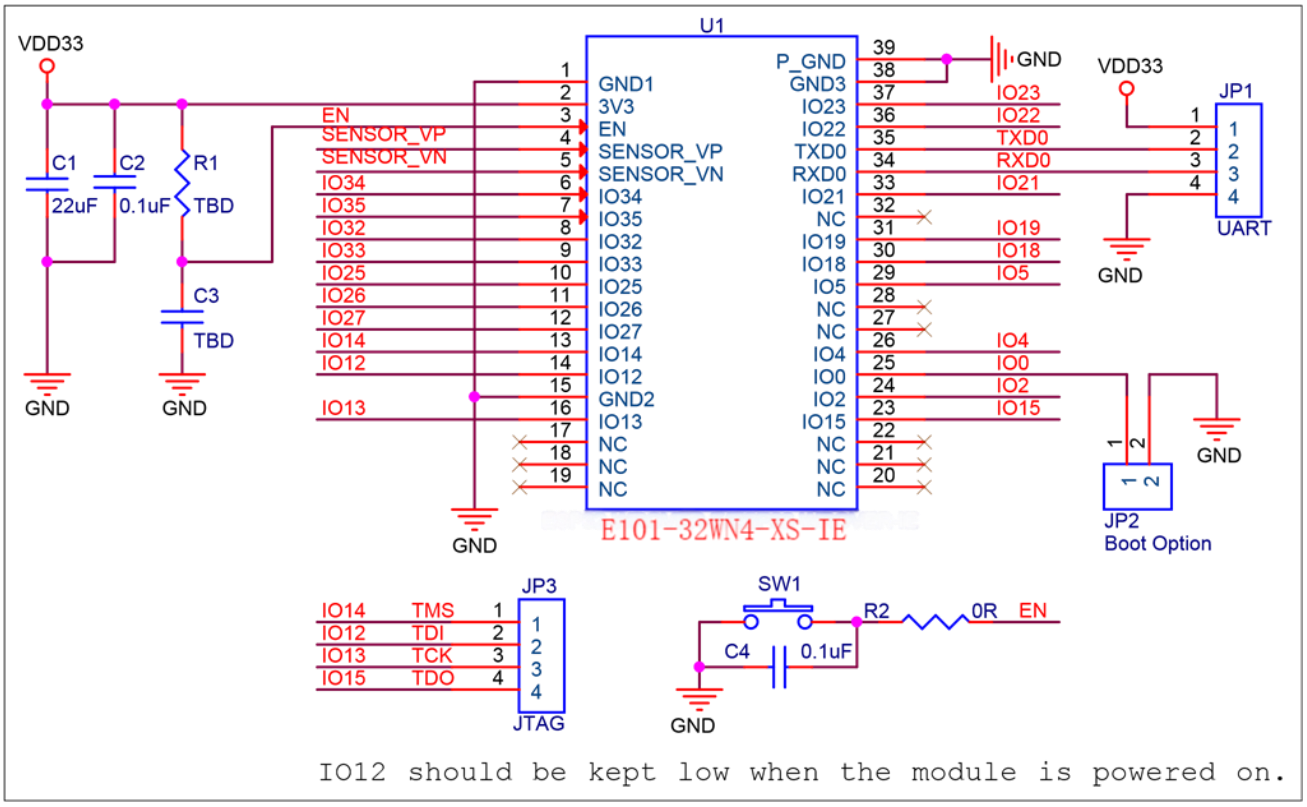


Chart 0-3 Schematic

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.3 Module size

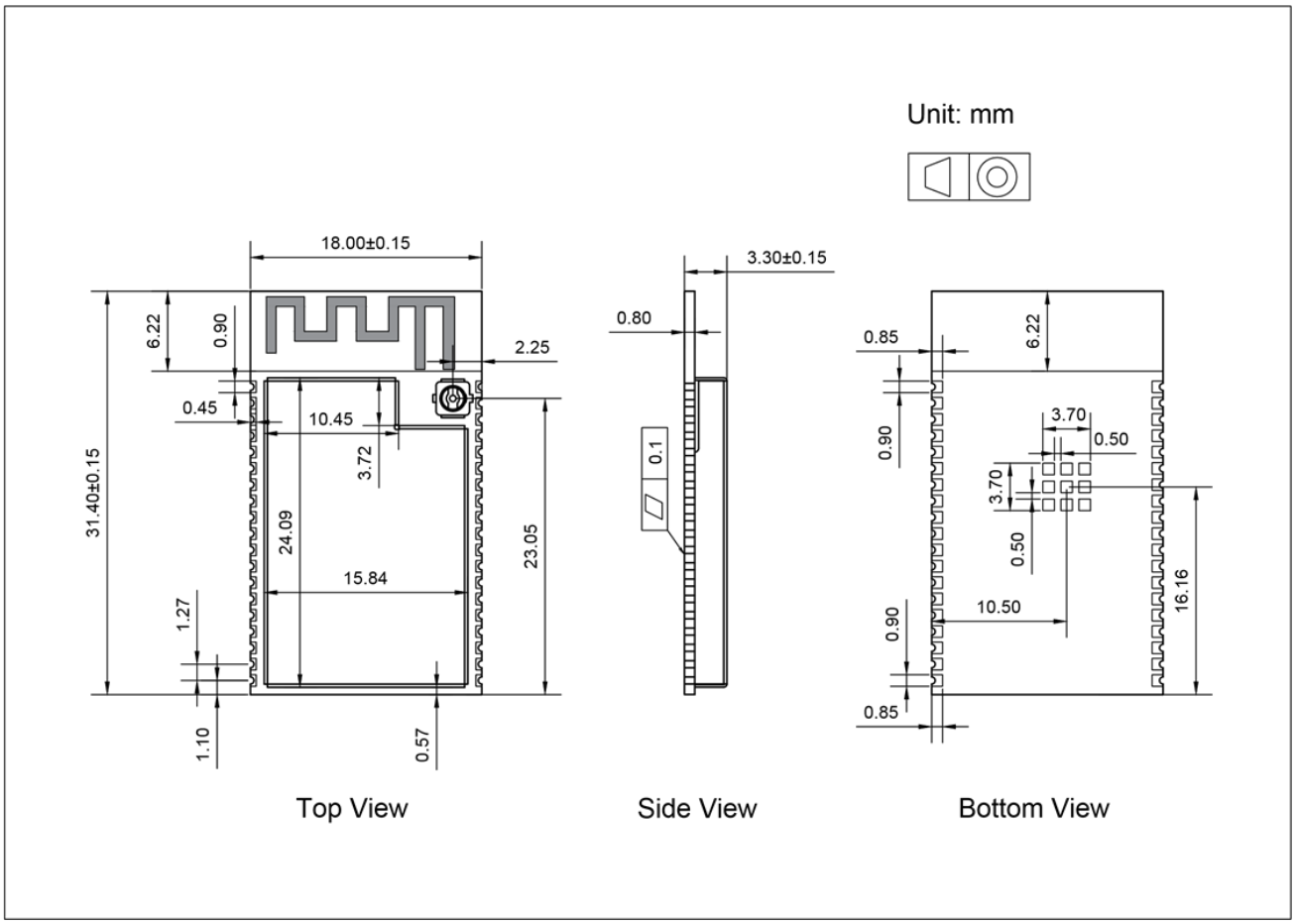


Chart 0-4 Module size

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.4 PCB package pattern

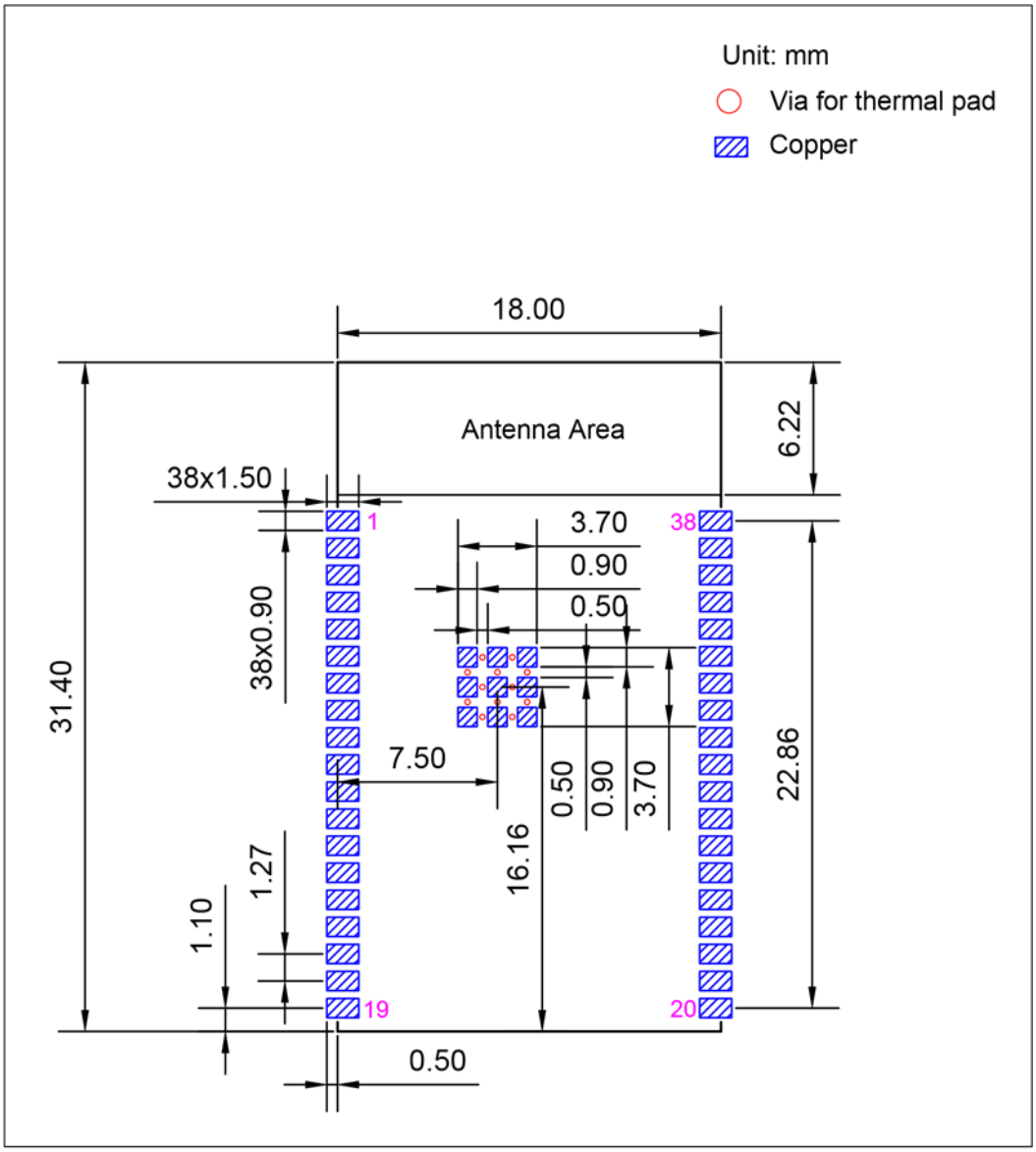


图 9: PCB 封装图形

Chart 0-5 PCB Package

IV AT Command

For AT commands, please refer to the download page《E101-32WN4-XS-IE_AT_Bin_V2.2.0.0》

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

V Common Questions

5.1 Unsatisfactory transmission distance

- When there is a straight line communication obstacle, the communication distance will be attenuated accordingly;
- Temperature, humidity, and co-frequency interference will increase the communication packet loss rate;
- The ground absorbs and reflects radio waves, and the test effect is poor when it is close to the ground;
- Sea water has a strong ability to absorb radio waves, so the seaside test effect is poor;
- If there is a metal object near the antenna or placed in a metal shell, the signal attenuation will be very serious;
- The power register is set incorrectly, and the air speed is set too high (the higher the air speed, the closer the distance);
- The low voltage of the power supply at room temperature is lower than the recommended value, the lower the voltage, the lower the power output.

5.2 Module is easily damaged

- Please check the power supply to ensure that it is within the recommended power supply voltage. If it exceeds the maximum value, it will cause permanent damage to the module;
- Please check the stability of the power supply, and the voltage should not fluctuate greatly and frequently;
- Please ensure that the installation and use process is anti-static, and high-frequency components are electrostatically sensitive;
- Please ensure that the humidity should not be too high during installation and use, and some components are humidity sensitive devices;
- If there is no special requirement, it is not recommended to use it at too high or too low temperature.

5.3 Bit error rate is too high

- There is co-frequency signal interference nearby, stay away from the interference source or modify the frequency and channel to avoid interference;
- The clock waveform on the UART is not standard, check whether there is interference on the UART line;
- Unsatisfactory power supply may also cause garbled codes, so the reliability of the power supply must be ensured.

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Ⅵ Welding Operation Guidance

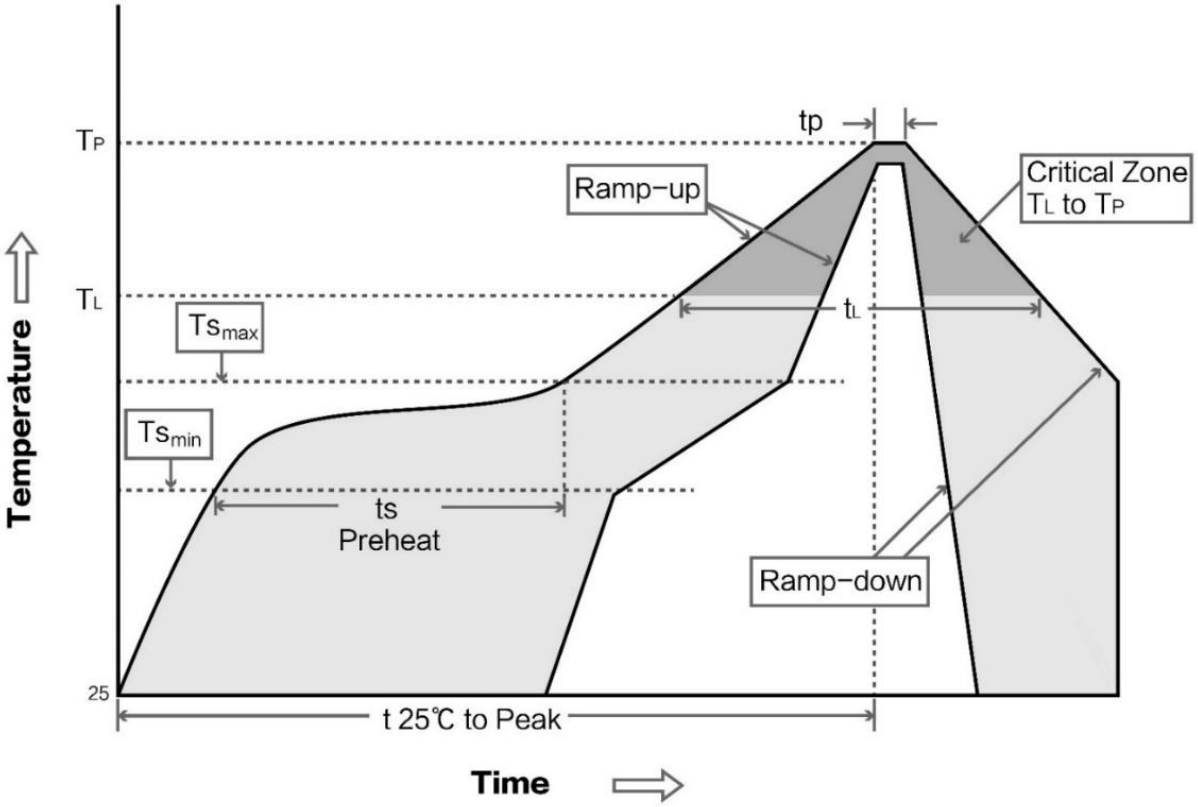
6.1 Reflow temperature

Profile Feature	Curve characteristics	Sn-Pb Assembly	Pb-Free Assembly
Solder Paste	Tin paste	Sn63/Pb37	Sn96.5/Ag3/Cu0.5
Preheat Temperature min (Tsmin)	Minimum preheating temperature	100℃	150℃
Preheat temperature max (Tsmax)	Maximum preheating temperature	150℃	200℃
Preheat Time (Tsmin to Tsmax)(ts)	Preheat time	60-120 sec	60-120 sec
Average ramp-up rate(Tsmax to Tp)	Average ascent rate	3℃/second max	3℃/second max
Liquidous Temperature (TL)	Liquidus temperature	183℃	217℃
Time (tL) Maintained Above (TL)	Time above liquidus	60-90 sec	30-90 sec
Peak temperature (Tp)	Peak temperature	220-235℃	230-250℃
Aveage ramp-down rate (Tp to Tsmax)	Average rate of descent	6℃/second max	6℃/second max
Time 25℃ to peak temperature	Time from 25℃ to peak temperature	6 minutes max	8 minutes max

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6.2 Reflow soldering curve



Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Ⅶ Disclaimer

- This manual shall try its best to provide a comprehensive and detailed introduction based on the existing information. The company reserves the right to modify the content of the manual without further notice.
- This manual is only used as a guide, all the information in the manual does not constitute any express or implied guarantee.

Revise History

Version	Revision Date	Revision Description	Maintainer
1.0	2021-12-14	Initial version	-
1.1	2025-4-14	Add pin description	Hao

About us

Hotline: 4000-330-990
Technical Support: support@cdebyte.com
Official Website: https://www.cdebyte.com
Company Address: Building B2 and Building B5, No. 199, West District Avenue, High-tech West District, Chengdu, Sichuan Province.

成都亿佰特电子科技有限公司
Chengdu Ebyte Electronic Technology Co.,Ltd.

Copyright ©2012–2025, Chengdu Ebyte Electronic Technology Co.,Ltd.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000