

FCC statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation.

- If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden. This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If simultaneous with other transmitters is required, re-evaluation of RF Exposure is required according to KDB 996369. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2A769-WXT04R2111 Or Contains FCC ID: 2A769-WXT04R2111”

When the module is installed inside another device, the user manual of this device must contain below warning statements:

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

The host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

The end user manual shall include all required regulatory information/warning as shown in this manual, include:

This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

The list of applicable FCC rules:

FCC Part 15 (Section 15.407)

FCC Part 15 (Section 15.247)

IC statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

LE-LAN devices are restricted to indoor operation only in the band 5150-5250 MHz.

Les appareils LE-LAN sont limités à fonctionner à l'intérieur uniquement dans la bande 5150-5250 MHz.

IC RF Exposure statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

L'appareil est conforme aux limites d'exposition au rayonnement IC spécifiées pour les environnements non contrôlés. Lors de l'installation et de l'utilisation de cet appareil, la distance entre le radiateur et le corps doit être d'au moins 20 cm.

Antenna Information:

The product has 2 WIFI antennas and 1 Bluetooth antenna. These 3 antennas are exactly the same.

Antenna type: External Dipole Antenna

Antenna gain: Ant 1&2: 2.4G WIFI (2412~2462MHz): 4.30 dBi

Ant 1&2: 5G WIFI (5150~5250MHz): 1.99 dBi

Ant 1&2: 5G WIFI (5250~5350MHz): 1.95 dBi

Ant 1&2: 5G WIFI (5470~5725MHz): 3.52 dBi

Ant 1&2: 5G WIFI (5725~5850MHz): 3.85 dBi

Ant 3: Bluetooth (2402~2480MHz): 4.30 dBi



PRODUCT SPECIFICATION

Version 1.3

IEEE 802.11 a/b/g/n/ac/ax 2T/2R Band USB2.0 Combo Module Integrated Bluetooth V2.1/3.0/4.0/4.1/4.2/5.2

Model Number: WXT04R2111
(REALTEK : RTL8852BU)

客户认可 Customer Approval Section		
Customer Name		
Department		
Approval		Date:

拟制 DESIGN	审核 CHECK	批准 APPROVAL
包海滨	侯德伟	高照
2025-03-18	2025-03-18	2025-03-18

惠州高盛达科技股份有限公司

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PRODUCTS SPECIFICATION

WXT04R2111

Document revision history

Revision	Date	Approved by	Remarks
Version 1.0	2023-07-12		Draft
Version 1.1	2023-08-07		Update Label
Version 1.2	2024-01-05		Update Mechanical Dimensions
Version 1.3	2025-03-18		Update label



PRODUCTS SPECIFICATION

WXT04R2111

1. General Description

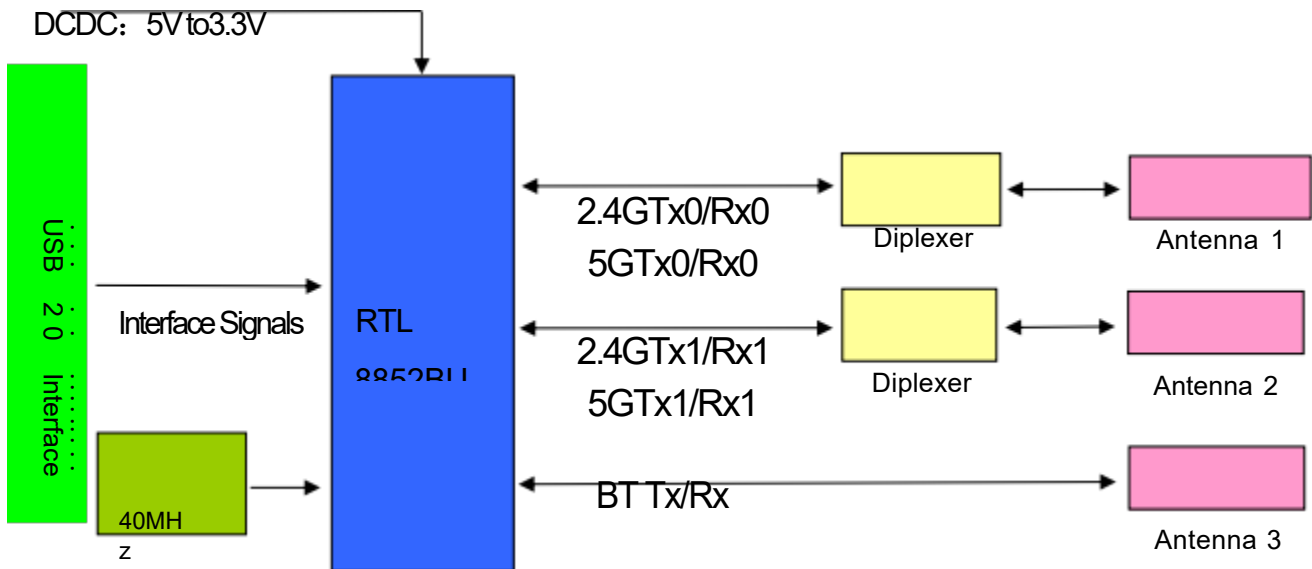
The Realtek RTL8852BU is a highly integrated single-chip that support 2-stream 802. 11ax solutions with Multi-user MIMO (Multiple-Input, Multiple-Output) with Wireless LAN (WLAN) USB interface controller. It combines a WLAN MAC, a 2T2R capable WLAN baseband, and RF in a single chip. The RTL8852BU provides a complete solution for a high-performance integrated wireless and Bluetooth device.

2. Features

- Compatible with IEEE 802.11a standard, providing wireless data rate up to 54Mbps.
- Compatible with IEEE 802.11b standard, providing wireless data rate up to 11Mbps.
- Compatible with IEEE 802.11g standard, providing wireless data rate up to 54Mbps.
- Compatible with IEEE 802.11n standard, providing wireless data rate up to 300Mbps.
- Compatible with IEEE 802.11ac standard, providing wireless data rate up to 866.7Mbps.
- Compatible with IEEE 802.11ax standard to provide wireless 573.5Mbps data rate in 2.4GHz band.
- Compatible with IEEE 802.11ax standard to provide wireless 1201Mbps data rate in 5GHz band.
- Support 20MHz, 40MHz bandwidth in 2.4GHz band.
- Support 20MHz, 40MHz, 80Mhz bandwidth in 5GHz band.
- Support STBC, LDPC.
- support QoS Enhancement (WMM) .
- Security support for WPA/WPA2/WPA3.
- Operation at 2.4~2.4835GHz and 5.15~5.850GHz frequency band to meet worldwide regulations.
- Bluetooth specification 2.1/3.0/4.2.
- Bluetooth 5.2.
- High speed USB 2.0 interface.
- HSF compliant.

3. Application Diagrams

3.1 Functional Block Diagram



3.2 General Requirements



PRODUCTS SPECIFICATION

WXT04R2111

3.2.1 IEEE 802.11b Section

	Feature	Detailed Description
3.2.1.1	Standard	IEEE 802.11b
3.2.1.2	Radio and Modulation Schemes	DQPSK , DBPSK and CCK with DSSS
3.2.1.3	Operating Frequency	2400 ~ 2483.5MHz ISM band
3.2.1.4	Channel Numbers	13 channels for Worldwide **
3.2.1.5	Data Rate	at most 11Mbps
3.2.1.6	Media Access Protocol	CSMA/CA with ACK
3.2.1.7	Transmitter Output Power at Antenna Connector	- Typical RF Output Power at each RF chain, and at room Temp. 25°C 17±2 dBm at 11Mbps
3.2.2 IEEE 802.11g Section		
3.2.1.8	Receiver Sensitivity at Antenna Connector	- Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate≤8% at room Temp 25°C -83 dBm for 11Mbps

	Feature	Detailed Description
3.2.2.1	Standard	IEEE 802.11g
3.2.2.2	Radio and Modulation Type	QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.2.3	Operating Frequency	2400 ~ 2483.5MHz ISM band
3.2.2.4	Channel Numbers	13 channels for Worldwide
3.2.2.5	Data Rate	at most 54Mbps
3.2.2.6	Media Access Protocol	CSMA/CA with ACK
3.2.2.7	Transmitter Output Power at Antenna Connector	- Typical RF Output Power at each RF chain, at room Temp. 25°C 15±2 dBm at 54Mbps

3.2.2.8	Receiver Sensitivity at Antenna Connector	• Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate$\leq$10% at room Temp 25°C • -71 dBm for 54Mbps
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3.2.3 IEEE 802.11a Section

	Feature	Detailed Description
3.2.3.1	Standard	IEEE 802.11a
3.2.3.2	Radio and Modulation Type	QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.3.3	Operating Frequency	5.15~5.25GHz 5.25~5.35GHz 5.47~5.725GHz 5.725~5.850GHz
3.2.3.4	Data Rate	at most 54Mbps
3.2.3.5	Media Access Protocol	CSMA/CA with ACK
3.2.3.6	Transmitter Output Power at Antenna Connector	- Typical RF Output Power at each RF chain, at room Temp. 25℃ 15±2 dBm at 54Mbps
3.2.3.7	Receiver Sensitivity at Antenna Connector	- Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate≤10% at room Temp 25℃ -71 dBm for 54Mbps

3.2.4 IEEE 802.11n Section

	Feature	Detailed Description
3.2.4.1	Standard	IEEE 802.11n
3.2.4.2	Radio and Modulation Type	BPSK , QPSK , 16QAM ,64QAM with OFDM
3.2.4.3	Operating Frequency	2.4GHz :2400 ~ 2483.5MHz for ISM band 5GHz : 5.15~5.25GHz; 5.25~5.35GHz; 5.47~5.725GHz; 5.725~5.850GHz;
3.2.4.4	Data Rate	at most 300 Mbps
3.2.4.5	Media Access Protocol	CSMA/CA with ACK

3.2.4.6	Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain, and at roomTemp. 25°C 2GHZ Band: 15±2dBm at HT20 MCS7 15±2dBm at HT40 MCS7 5GHZ Band: 15±2dBm at HT20 MCS7 15±2dBm at HT40 MCS7
3.2.4.7	Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs)Error Rate≤10% and at room Temp. 25°C 2GHZ Band: -69dBm at HT20 MCS7 -66dBm at HT40 MCS7 5GHZ Band: -69dBm at HT20 MCS7 -66dBm at HT40 MCS7

3.2.5 IEEE 802.11ac Section

	Feature	Detailed Description
3.2.5.1	Standard	IEEE 802.11ac
3.2.5.2	Radio and Modulation Type	QPSK , BPSK , 16QAM ,64QAM,256QAM with OFDM
3.2.5.3	Operating Frequency	5GHz : 5.15~5.25GHz; 5.25~5.35GHz; 5.47~5.725GHz; 5.725~5.850GHz;
3.2.5.4	Data Rate	5G: at most 1732Mbps
3.2.5.5	Media Access Protocol	CSMA/CA with ACK
3.2.5.6	Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain, at room Temp. 25 °C 5GHZ Band: 13 ± 2dBm at VHT20 MCS8 13 ± 2dBm at VHT40 MCS9 11 ± 2dBm at VHT80 MCS9
3.2.5.7	Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs)Error Rate≤10% at room Temp 25 °C 5GHZ Band: -64 dBm at VHT20 MCS8 -58 dBm at VHT40 MCS9 -55 dBm at VHT80 MCS9

	Feature	Detailed Description
3.2.6.1	Standard	IEEE 802.11ax
3.2.6.2	Radio and Modulation Type	QPSK , BPSK , 16QAM ,64QAM,256QAM, 1024QAM with OFDMA
3.2.6.3	Operating Frequency	2G: 2400 ~ 2483.5MHz ISM band 5GHz : 5.15~5.25GHz; 5.25~5.35GHz; 5.47~5.725GHz; 5.725~5.850GHz;
3.2.6.4	Data Rate	2G: at most 573.5Mbps 5G: at most 1201Mbps
3.2.6.5	Media Access Protocol	CSMA/CA with ACK

3.2.6.6	Transmitter Output Power at Antenna Connector	Typical RF Output Power at each RF chain, at room Temp. 25°C 2GHZ Band: 11 ±2dBm at HE20 MCS11 11 ±2dBm at HE40 MCS11 5GHZ Band: 13±2dBm at HE20 MCS11 13±2dBm at HE40 MCS11 11 ±2dBm at HE80 MCS11
3.2.6.7	Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain. @Frame(1000-byte PDUs)Error Rate≤10% at room Temp 25°C 2GHZ Band: -58 dBm at HE20 MCS11 -55 dBm at HE40 MCS11 5GHZ Band: -57 dBm at HE20 MCS11 -55 dBm at HE40 MCS11 -50 dBm at HE80 MCS11



PRODUCTS SPECIFICATION

WXT04R2111

3.2.7 Bluetooth Section

Feather		Description	
General specification			
Bluetooth standard	Bluetooth V2.1/3.0/4.2/5.2		
Frequency band	2402MHz-2480MHz		
Channel Numbers	79 channels for BDR+EDR 40 channels for BLE		
Modulation	GFSK, π /4-DQPSK and 8DPSK		
RF specification			
	Min（dBm）	Type（dBm）	Max（dBm）
BDR Output Power		6	
BLE Output Power		6	
Sensitivity @BER=0.1% FOR GFSK(1Mbps)		-86	
Sensitivity @BER=0.01% FOR π /4-DQPSK(2Mbps)		-86	
Sensitivity @BER=0.01% FOR 8DPSK(3Mbps)		-80	
Maximum input level	GFSK(1Mbps) -20dBm		
	π /4-DQPSK(2Mbps) -20dBm		
	8DQPSK(3Mbps) -20dBm		
Sensitive @PER=30.8% FOR BLE		-90	



PRODUCTS SPECIFICATION

WXT04R2111

4. Electrical and Thermal Characteristics

4.1 Temperature Limit Ratings

Parameter	Minimum	Maximum	Units
Storage Temperature	-40	+80	°C
Ambient Operating Temperature	0	70	°C
Junction Temperature	0	125	°C

4.2 General Section

	Feature	Detailed Description
4.2.1	Antenna Type	• Dipole (ANT1/ANT2/ ANT3)
4.2.2	Operating Voltage	• 5V±10%
4.2.3		
4.2.4	Current Consumption	----

4.3 Software

Driver	Windows, Android, Linux
Security	WPA ,WPA2,WPA3

4.4 Mechanical Dimensions

Feature	Detailed Description
Length	• 76mm
Width	• 40mm
Height	• 1.0mm(PCB) • MAX:5.2±0.2mm
Weight	• TBD

3	GND	GND	-
4	WL_HOSTWAKE	Wake on Wireless LAN	O
5	RESET	Reset controlled by main SOC	I
6	GND	GND	-
7	USB -DP	USB Communication signal USB-DP	I/O
8	USB -DM	USB Communication signal USB-DM	I/O
9	5V	VDD 5V	P
10	5V	VDD 5V	P

Note:

WIFI and BT share the same address segment, but do not share the same address.

Pin 5. RESET has been pulled up to 3.3v on module, active low.

Pin 2. BT_HOSTWAKE: pull-up to 3.3V on module, active low.

Pin 4. WL_HOSTWAKE: pull-up to 3.3V on module, active low.

7.IO DC Characteristics

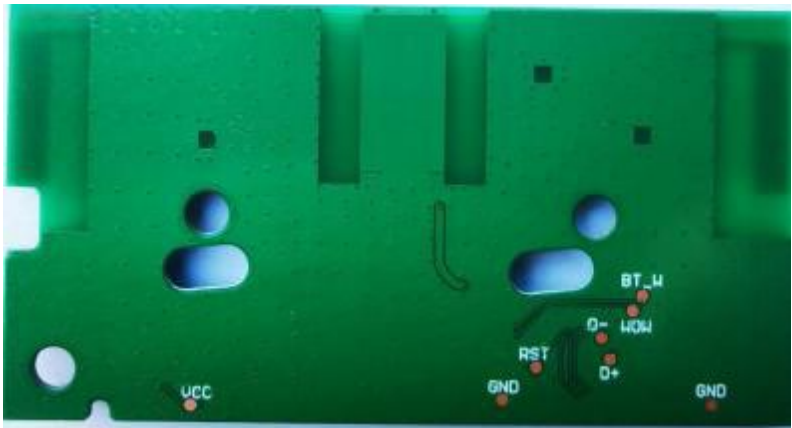
3.3V IO DC Characteristics

Symbol	Parameter	Minimum	Normal	Maximum	Units
V_{IH}	Input high voltage	2.0	3.3	3.6	V
V_{IL}	Input low voltage	--	0	0.9	V
V_{OH}	Output high voltage	2.97	--	3.3	V
V_{OL}	Output low voltage	0	--	0.33	V

8.Product picture

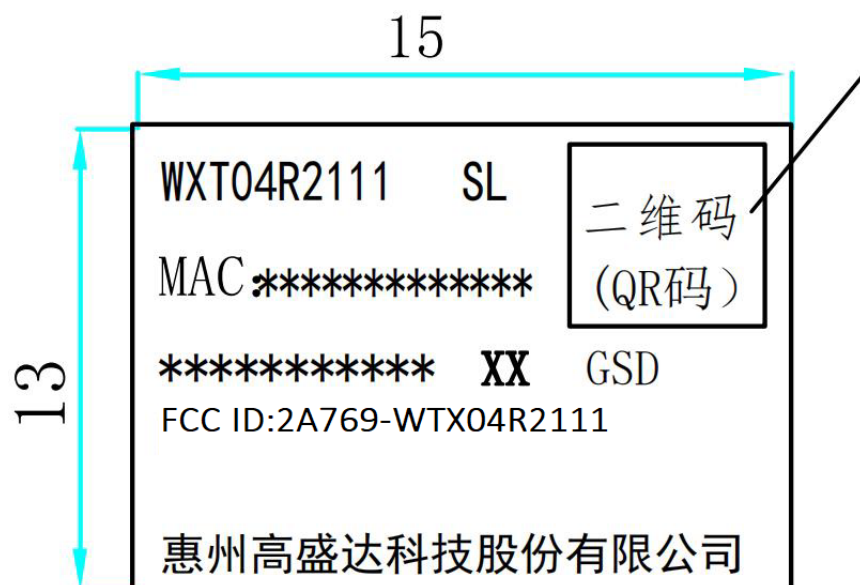


Label



模组需要离背板的高度为20mm，离下边缘的距离<10mm，尽量远离金属物、主板以及T-CON等干扰源。

单位：（mm）

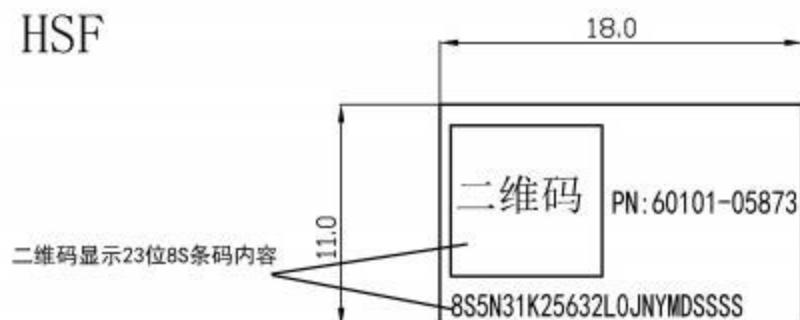




PRODUCTS SPECIFICATION

WXT04R2111

单位: (mm)



完整的8S条码共 23 位， 构成部分

8S（固定不变）+PN（联想提供）+AVLV（固定不变的代码L0JN）+YMD（年月日）+SSSS（34进制流水号）

23 Digits SN Barcode Content



AVLV : Head Code

A: Individual Supplier

T-TPV FQ; W-Wistron; F-Foxconn; B-BOE; H-Huntkey; K-KTC; L-Linkee(IGRS); Other letter: Open.

V: Revision History

First edition: 0;

LC: Supplier Location Code

FQ-FuQing; ZS-ZhongShan; CQ-ChongQing; HF-HeFei; HZ-Huizhou; GZ-Gongzhou; Other Letter: Open.

示例：量产前2周，联想根据供应商样机拆分服务BOM，申请对应的lenovo PN 即label中的Part Number，联想输出按照下图格式输出服务BOM表。供应商可安排条码打印量产。

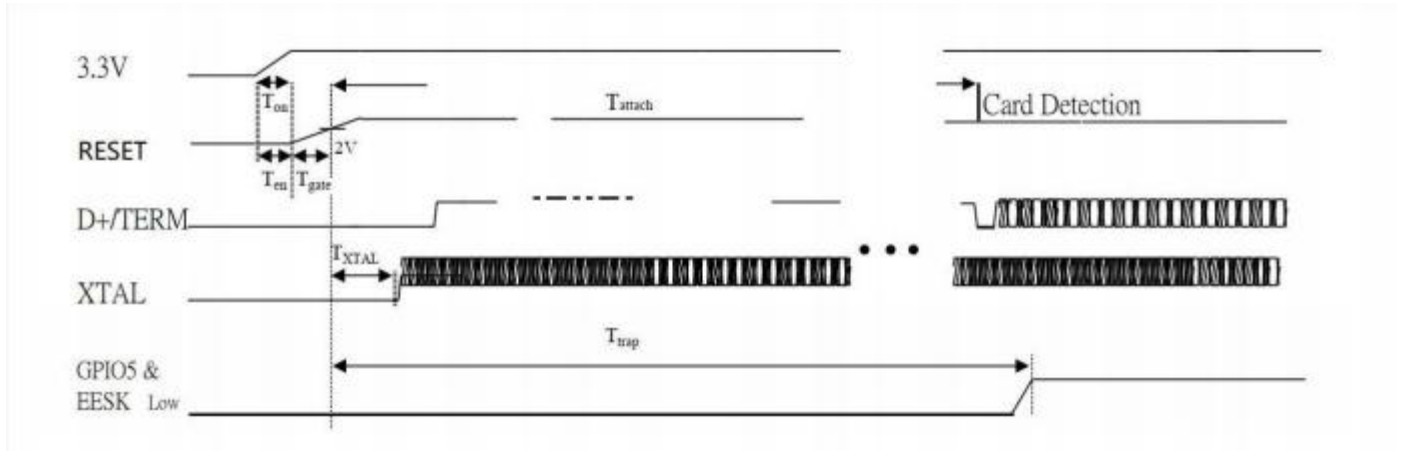
Part Item	LENOVO PN	8S
主板	5D1JK25638	8S5N31K25632L0JNYMDSSSS 以 2022-6-27 为例

注意：

1. 字体上下左右对称。
2. 标签应粘着力强，字体应清楚，表面应平整，不许有折子，皱纹，斑点，孔眼等。
3. 对环保产品印刷材料及贴纸都要求环保材料。
4. 字体是黑体。
5. 粘贴在印制板背面。

8S-	XXXXXXXXXX	HHPP	YYYYSSSS
DI	物料 PN	Plant code	YMD+SN
8S	Lenovo 定义的部件物料号(包含量产整机及内部零部件)	乙方生产公司名称缩写 闪联代码 (L0JN)	7 digit Num-alphabet, Skip "I,O," (数字+字母, 跳过英文 T, O) Year (年) = last digit of year (每年最后一位数字) ; Month (月) = 1-9 for Jan-Sep(1-9月), A=Oct(十月用 A 代替), B=Nov十一月用 B 代替), C=Dec 十二月用 C 代替) Day (日) = 1-9 for 1" thru 9", A=10, B=11, etc. skip "I,O" (以此类推, 跳过字母 "I, O") SN(SSSS): 4bit(4 位), use 0-9 and A-Z numeral-alphabet, skip letter "I,O"; SN must NOT be duplicated. (数字 0-9, 字母 A-Z; 跳过字母 "I, O"; 单个物料 SN 号不能重复 (比如本次订单 5 台, 使用条码 1-5, 下批次的订单 SN 号从 6 开始))

9. Power on sequence timing

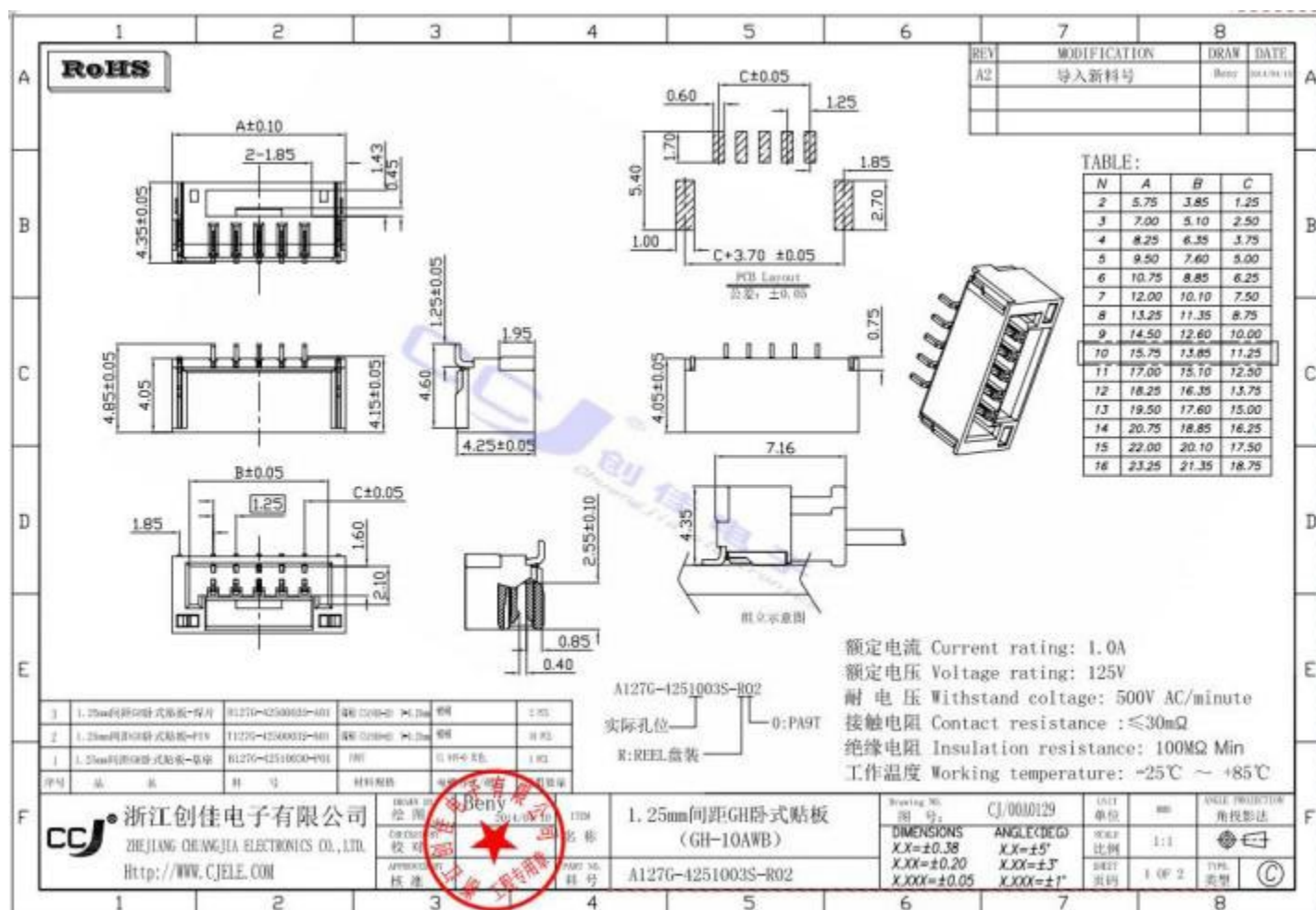


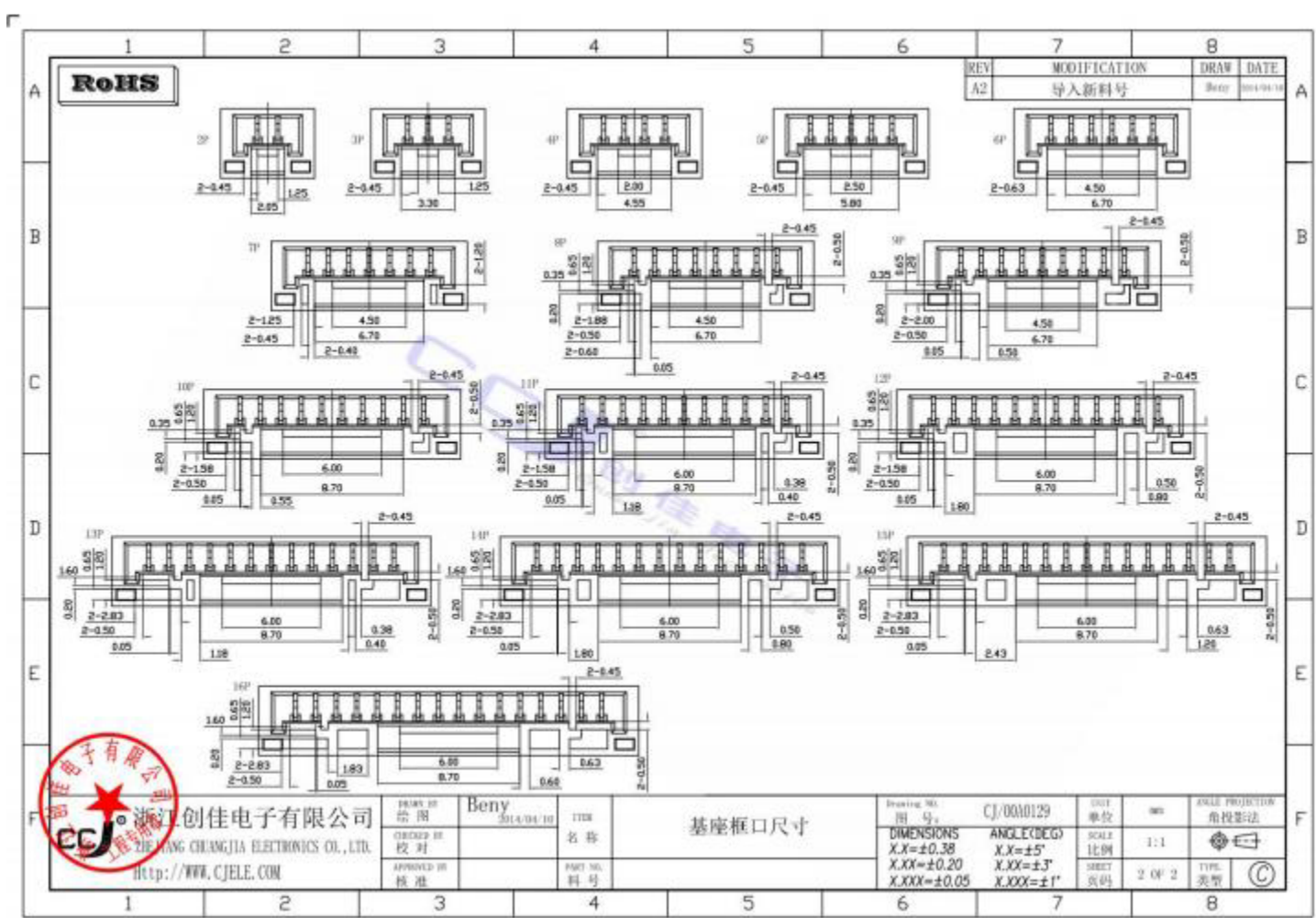
Note: This allows reset to be pulled down on main board and driven by host to control when module comes out of reset.

Typical Timing Range

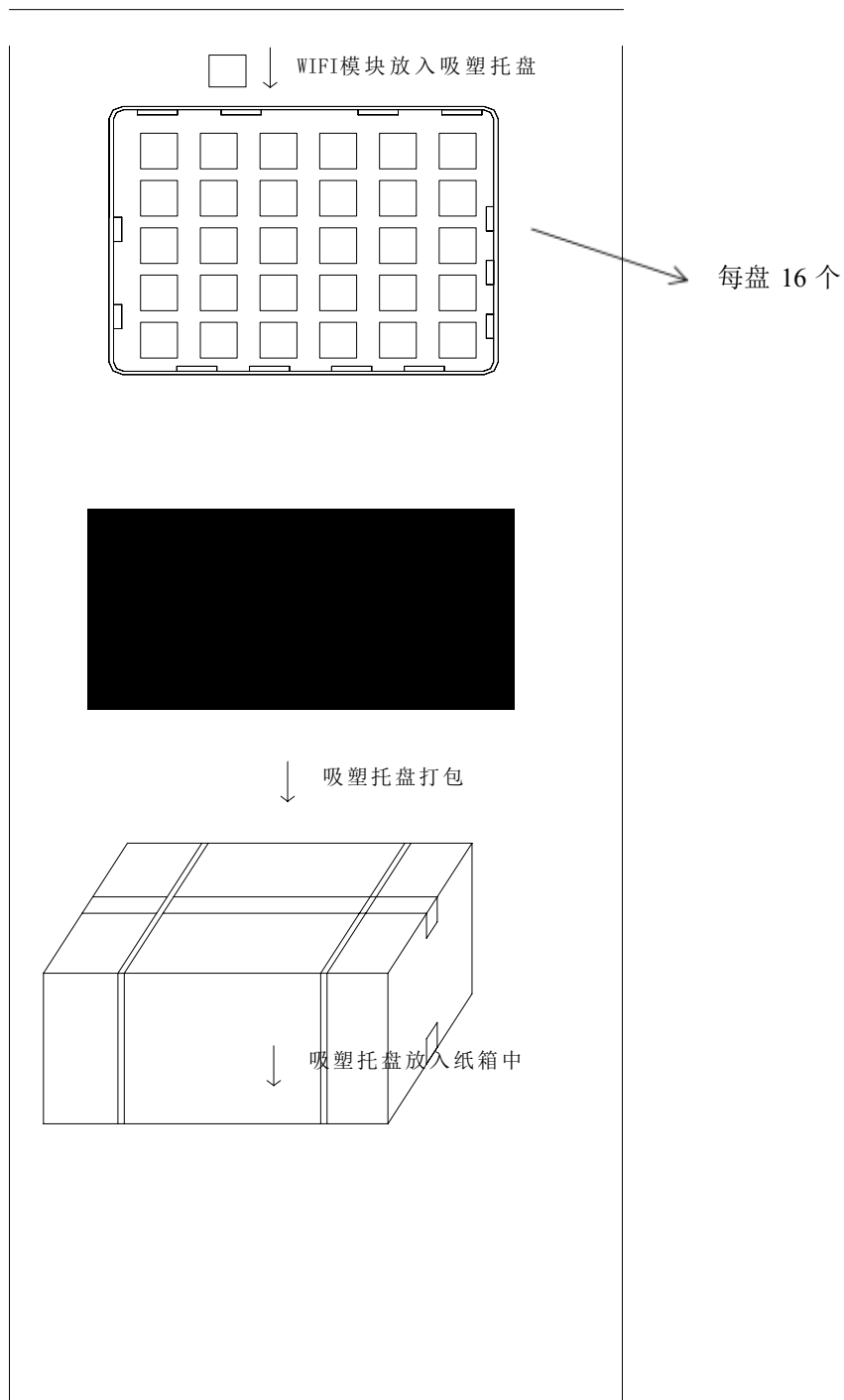
	Unit	Min.	Typical	Max.
T_{on}	ms	-	1.5	5
T_{en}	ms	0	0	5
T_{gate}	ms	0	1.5	8
T_{attach}	ms	100	250	-
T_{xtal}	ms	-	1.5	8
T_{lv35}	ms	-	3	11
T_{trap}	ms	400	500	-

Appendix 1: SMT connector





10.package



外箱尺寸：39.0*29.0*23.0cm

一箱包装数量：320 只

