



BL-M5505NS1

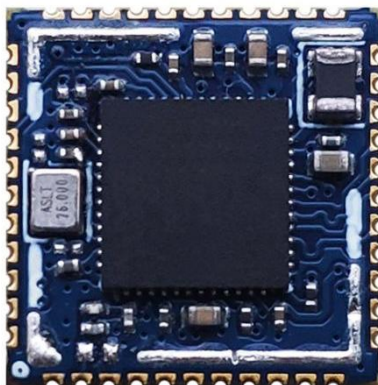
802.11n 150Mbps WLAN

SDIO Module Specification

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(Top View)



(Bottom View)

Module Name: BL-M5505NS1	
Module Type: 802.11b/g/n 150Mbps 1T1R WLAN SDIO Module	
Revision: V1.0	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date	Revised By
1.0	Official release	2023-08-18	Ch

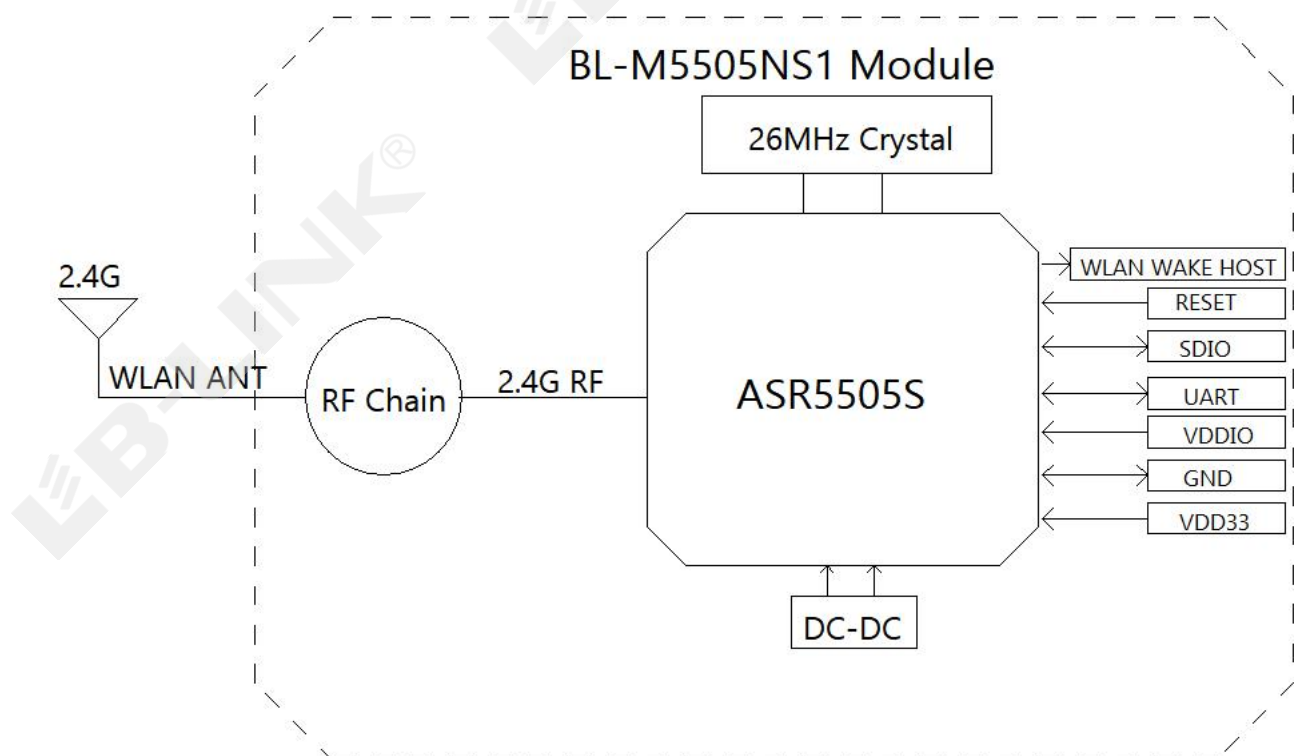
1. Introduction

BL-M5505NS1 is a highly integrated WLAN module, contains RF Transceiver, 1T1R capable WLAN PHY+MAC, SDIO 2.0 interface, and other circuits. It supports IEEE 802.11b/g/n standard and provides the highest PHY rate up to 150Mbps, offering feature-rich wireless connectivity and reliable throughput from an extended distance.

1.1 Features

- Operating Frequency: 2.4~2.4835GHz
- Host Interface is SDIO 2.0
- IEEE Standards: IEEE 802.11b/g/n
- Wireless PHY rate can reach up to 150Mbps
- Connect to external antenna through half hole pad
- 3.3V Main and I/O Power supply

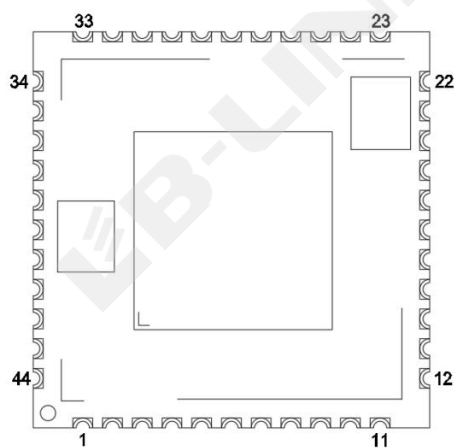
1.2 Block Diagram



1.3 General Specifications

Module Name	BL-M5505NS1
Chipset	ASR5505S
WLAN Standards	IEEE802.11b/g/n
Host Interface	SDIO 2.0
Antenna	Connect to the external antenna through half hole pad
Dimension	12*12*1.7mm (L*W*H)
Power Supply	DC 3.3V±0.2V @ 400 mA (Main power) DC 3.3V±0.2V (I/O power)
Operation Temperature	-20°C to +70°C
Operation Humidity	10% to 95% RH (Non-Condensing)

2. Pin Assignments



(Top View)

2.1 Pin Definition

No.	Pin Name	Type	I/O Level	Module Pin Description
1	GND	RF		RF Ground
2	WLAN ANT	RF		RF pad for WLAN ANT
3	GND	RF		RF Ground
4	NC	/		NC
5	NC	/		NC

6	NC	/		NC
7	NC	/		NC
8	NC	/		NC
9	VDD33	P		DC3.3V Main power supply
10	NC	/		NC
11	NC	/		NC
12	RESET	I	VDD33	Reset active low input, this pin can externally reset the module. Internal RC reset circuit pull up to VDD33 and parallel 0.1uF to GND, if not used, this pin can be left floating
13	WLAN WAKE HOST	I/O	VDDIO	Sheared with DIG_PAD11. WLAN to Wake-up Host output
14	SD_D2	I/O	VDDIO	SDIO data line 2
15	SD_D3	I/O	VDDIO	SDIO data line 3
16	SD_CMD	I/O	VDDIO	SDIO command input
17	SD_CLK	I	VDDIO	SDIO clock input
18	SD_D0	I/O	VDDIO	SDIO data line 0
19	SD_D1	I/O	VDDIO	SDIO data line1
20	GND	P		Ground
21	NC	/		NC
22	VDDIO	P		DC3.3V power supply for SDIO and other digital I/O
23	NC	/		NC
24	RTC_CLK	I	VDD33	32.768KHz low power RTC clock input. If not used, this pin can be left floating
25	NC	/		NC
26	NC	/		NC
27	NC	/		NC
28	NC	/		NC
29	NC	/		NC
30	NC	/		NC
31	GND	P		Ground
32	NC	/		NC
33	GND	P		Ground
34	NC	/		NC

35	NC	/		NC
36	GND	P		Ground
37	SEL1	I/O	VDDIO	UART BOOT Mode strap(reserved UART1 for debug): SEL1 external pull-up to VDDIO and SEL2 external pull-down to GND, the recommended pull-down/up resistor is 220Ω. SDIO BOOT Mode strap(default mode): SEL1 internal pull-down to GND and SEL2 internal pull-up to VDDIO. If not used, this pin can be left floating
38	SEL2	I/O	VDDIO	UART BOOT Mode strap(reserved UART1 for debug): SEL1 external pull-up to VDDIO and SEL2 external pull-down to GND, the recommended pull-down/up resistor is 220Ω. SDIO BOOT Mode strap(default mode): SEL1 internal pull-down to GND and SEL2 internal pull-up to VDDIO. If not used, this pin can be left floating
39	NC	/		NC
40	NC	/		NC
41	NC	/		NC
42	UART1_TX	I/O	VDD33	UART1_TX, reserved for debug. If not used, this pin can be left floating
43	UART1_RX	I/O	VDD33	UART1_RX, reserved for debug. Internal pull-up to VDD33, if not used, this pin can be left floating
44	NC	/		NC

P: Power, I: Input, O: Output, I/O: In/Output, RF: Analog RF Port

3. Electrical and Thermal Specifications

3.1 Recommended Operating Conditions

Parameters		Min	Typ	Max	Units
Ambient Operating Temperature		-20	25	70	°C
External Antenna VSWR			1.7	2.1	/
Supply Voltage	VDD33	3.1	3.3	3.5	V
	VDDIO	3.1	3.3	3.5	V

3.2 Digital 3.3V GPIO DC Specifications

Symbol	Parameter	Min	Typ	Max	Units
VIH	Input High Voltage	2.0	3.3	3.5	V
VIL	Input Low Voltage		0	0.9	V
VOH	Output High Voltage	2.97	--	3.3	V
VOL	Output Low Voltage	0	--	0.33	V

3.3 Current Consumption

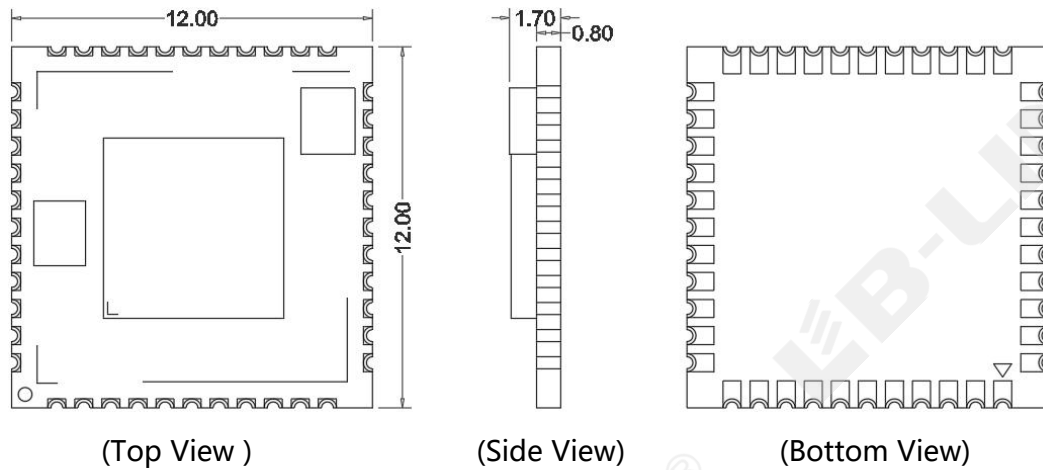
Conditions: VDD33=3.3V; VDDIO=3.3V; Ta:25°C			
Use Case	VDD33 Current		
	Typ (I _{RMS})	Max (I _{Peak})	Units
WLAN Unassociated (Linux Driver)	103	138	mA
2.4G WLAN TCP throughput TX 40Mbps (Linux Driver)	177	256	mA
2.4G WLAN TCP throughput RX 40Mbps (Linux Driver)	101	248	mA
2.4G WLAN TCP throughput TRX 40Mbps (Linux Driver)	113	252	mA
2.4G 11b@1Mbps TX@17dBm (RF-Test)	143	268	mA
2.4G 11b@1Mbps RX(RF-Test)	61	100	mA
2.4G 11b@11Mbps TX@17dBm (RF-Test)	140	268	mA
2.4G 11g@6Mbps TX@16dBm (RF-Test)	124	252	mA
2.4G 11g@54Mbps TX@14dBm (RF-Test)	121	236	mA
2.4G 11g@54Mbps RX(RF-Test)	60	97	mA
2.4G 11n@HT20_MCS0 TX@15dBm (RF-Test)	131	276	mA
2.4G 11n@HT20_MCS7 TX@13dBm (RF-Test)	115	224	mA
2.4G 11n@HT40_MCS7 TX@13dBm (RF-Test)	116	220	mA
2.4G 11n@HT40_MCS7 RX (RF-Test)	60	99	mA

4. 2.4G WLAN RF Specifications

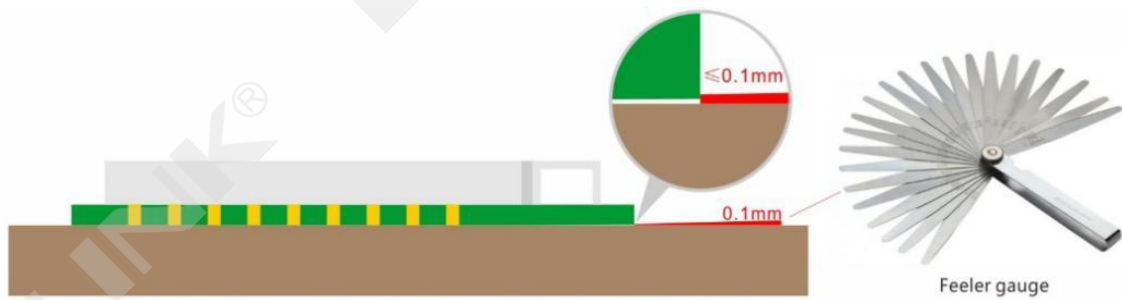
Conditions: VDD33=3.3V; VDDIO=3.3V; Ta:25°C			
Features	Description		
WLAN Standard	IEEE 802.11b/g/n		
Frequency Range	2.4~2.484GHz (2.4GHz ISM Band)		
Channels	Ch1~Ch14 (For 20MHz Channels)		
Modulation	802.11b (DSSS): DBPSK, DQPSK, CCK; 802.11g (OFDM): BPSK, QPSK, 16QAM, 64QAM; 802.11n (OFDM): BPSK, QPSK, 16QAM, 64QAM;		
Data Rate	802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps; 802.11n (HT20): MCS0~MCS7(1T1R_SISO) 6.5~72.2Mbps; 802.11n (HT40): MCS0~MCS7(1T1R_SISO) 13.5~150Mbps;		
Frequency Tolerance	≤±20ppm		
2.4G Transmitter Specifications (TX power tolerance calibrated, customers can define the target TX power by modifying configuration file of the driver software. Customers must define the TX power same or lower than recommended Target TX Power as below)			
TX Rate	TX Power (dBm)	TX Power Tolerance (dBm)	EVM (dB)
802.11b@1Mbps	17	±2	≤-10
802.11b@11Mbps	17	±2	≤-10
802.11g@6Mbps	16	±2	≤-10
802.11g@54Mbps	14	±2	≤-25
802.11n@HT20_MCS0	15	±2	≤-10
802.11n@HT20_MCS7	13	±2	≤-28
802.11n@HT40_MCS0	15	±2	≤-10
802.11n@HT40_MCS7	13	±2	≤-28
2.4G Receiver Specifications (WLAN_ANT)			
RX Rate	Min Input Level (Typ dBm)	Max Input Level (Typ dBm)	PER
802.11b@1Mbps	-94	-5	< 8%
802.11b@11Mbps	-86	-5	< 8%
802.11g@6Mbps	-90	-5	< 10%
802.11g@54Mbps	-72	-5	< 10%
802.11n@HT20_MCS0	-88	-5	< 10%
802.11n@HT20_MCS7	-70	-5	< 10%
802.11n@HT40_MCS0	-86	-5	< 10%
802.11n@HT40_MCS7	-67	-5	< 10%

5. Mechanical Specifications

5.1 Module Outline Drawing

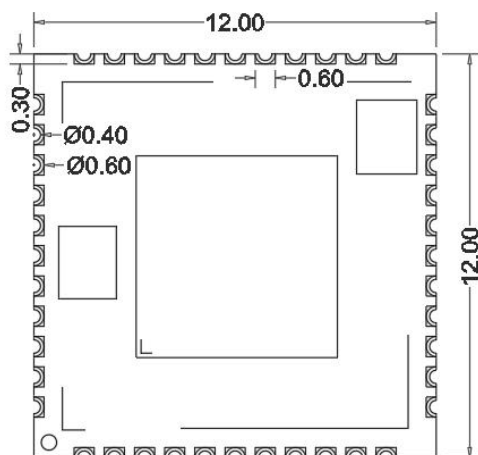


Module dimension: 12.0*12.0*1.7mm(L*W*H; Tolerance: $\pm 0.3\text{mm}_L/W$, $\pm 0.2\text{mm}_H$)

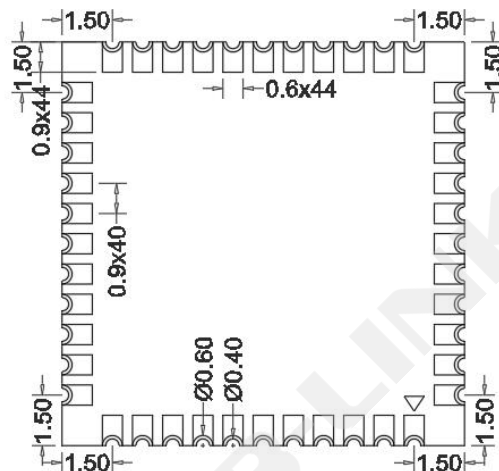


Module Bow and Twist: $\leq 0.1\text{mm}$

5.2 Mechanical Dimensions



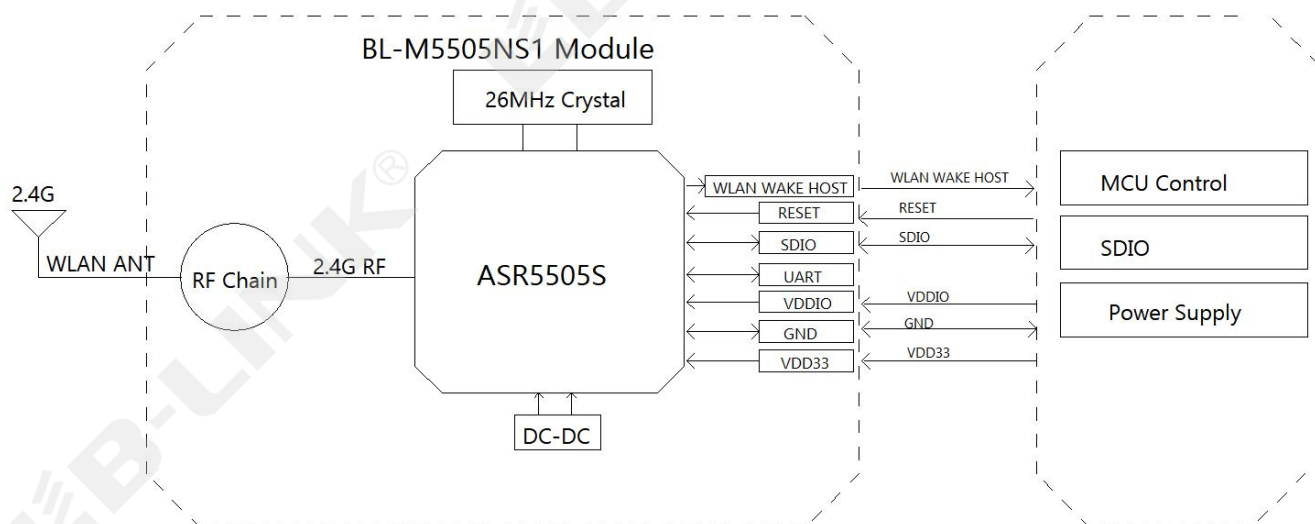
(Top View)



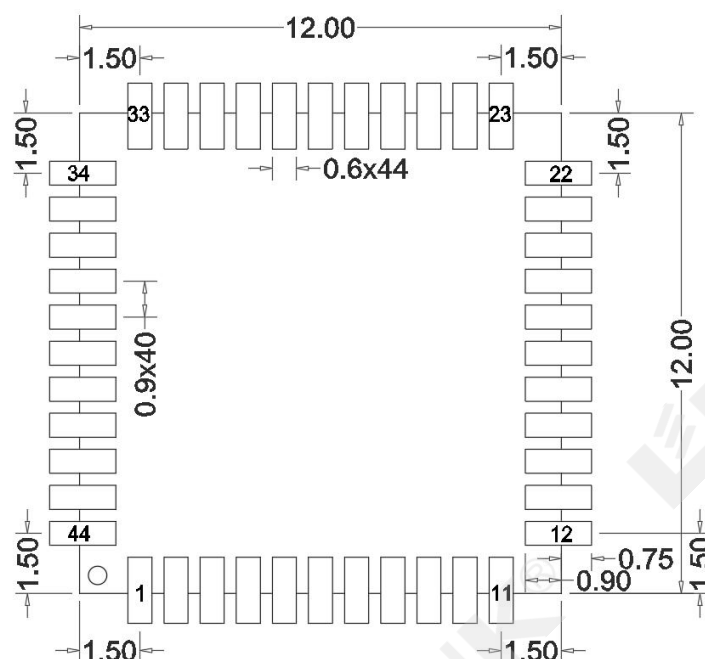
(Bottom View)

6. Application Information

6.1 Typical Application Circuit

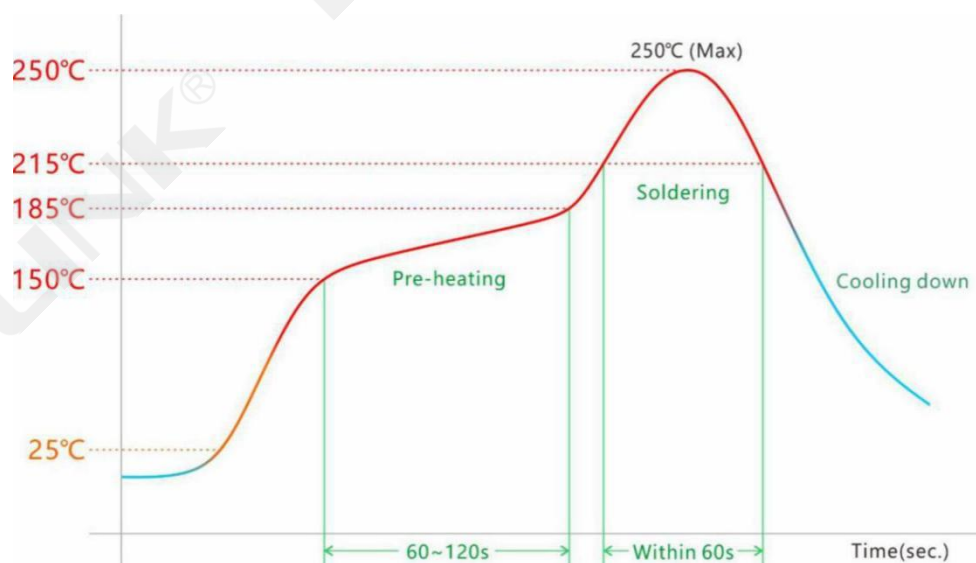


6.2 Recommend PCB Layout Footprint



(Design Unit: mm)

6.3 Reflow Soldering Standard Conditions



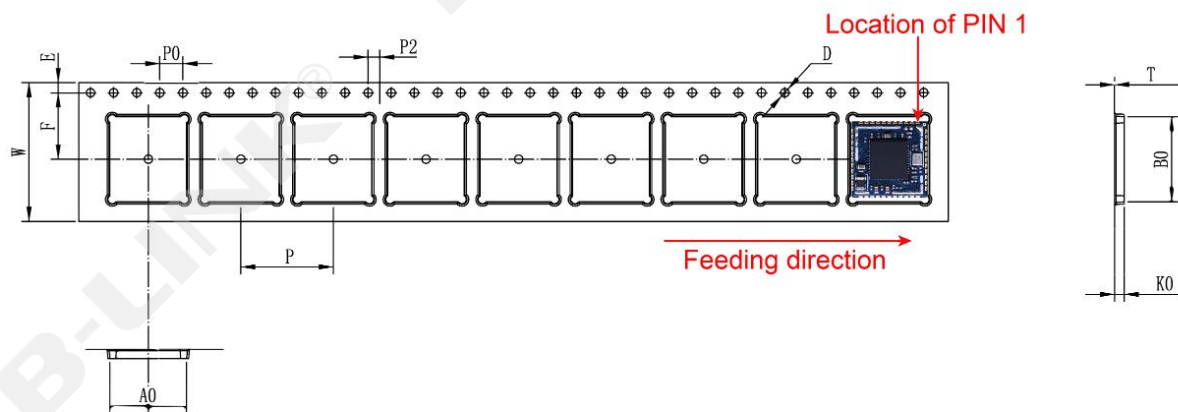
Please use the reflow within 2 times.
Set up the highest temperature within 250°C.

7. Key Components Of Module

No.	Parts	Specification	Manufacturer	Note
1	Chipset	ASR5505S	ASR Microelectronics Co.,Ltd	
2	PCB	BL-M5505NS1	SHEN ZHEN QILI ELECTRON CO.,LTD	
			ShenZhen Tie Fa Technology Limited	
			Huizhou Dayawan Kexiang Technology Circuit Board Co., Ltd	
3	Crystal	26MHz	Chengde oscillator Electronic Technology CO.,LTD	
			JinHua East Crystal Electronic CO.,LTD	
			LUCKI CM ELECTRONICS CO.,LTD	
4	Power Inductor	4.7uH	Shenzhen Sunlord Electronics Co., Ltd.	
			SHENZHEN MICROGATE TECHNOLOGY CO.,LTD	

8. Package and Storage Information

8.1 Package Dimensions



ITEM	W	A0	B0	K0	E	F	P	P0	P2	D	T
DIM	24.00±0.3	12.50±0.1	12.50±0.1	2.40±0.1	1.75±0.1	11.5±0.1	20.00±0.1	4.00±0.1	2.00±0.1	Ø1.5±0.1	0.30±0.05



Package specification:

1. 1,000 modules per roll and 5,000 modules per box.
2. Outer box size: 37.5*36*29cm.
3. The diameter of the blue environment-friendly rubber plate is 13 inches, with a total thickness of 28mm (with a width of 24mm carrying belt).
4. Put 1 package of dry agent (20g) and humidity card in each anti-static vacuum bag.
5. Each carton is packed with 5 boxes.

8.2 Storage Conditions

Absolute Maximum Ratings:

Storage temperature: -40°C to +85°C,
Storage humidity: 10% to 95 (Non-Condensing)

Recommended Storage Conditions:

Storage temperature: 5°C to +40°C,
Storage humidity: 20% to 90% RH

Please use this Module within 12month after vacuum-packaged.

The Module shall be stored without opening the packing.

After the packing opened, the Module shall be used within 72hours.

When the color of the humidity indicator in the packing changed,

The Module shall be baked before soldering.

Baking condition: 60°C, 24hours, 1time.

ESD Sensitivity:

ESD Protection: 2KV(HBM ,Maximum rating)

The Module is a static-sensitive electronic device.

Do not operate or store near strong electrostatic fields.

Take proper ESD precautions!



ESD CAUTION