

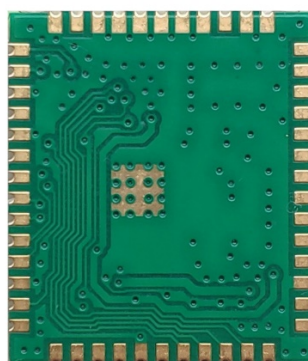


BL-M8761BT3

**Bluetooth5.0 UART
Module Specification**

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Module Name: BL-M8761BT3	
Module Type: Bluetooth 5.0 UART Module	
Revision: V1.1	
Customer Approval:	
Company:	
Title:	
Signature:	Date:
LB-LINK Approval:	
Title:	
Signature:	Date:

Revision History

Revision	Summary	Release Date
0.1	Initial release	2022-11-18
1.0	Update pin definition descriptions for pin 34 and pin 38	2023-03-27
1.1	Update pin definition descriptions for pin 42	2023-04-25

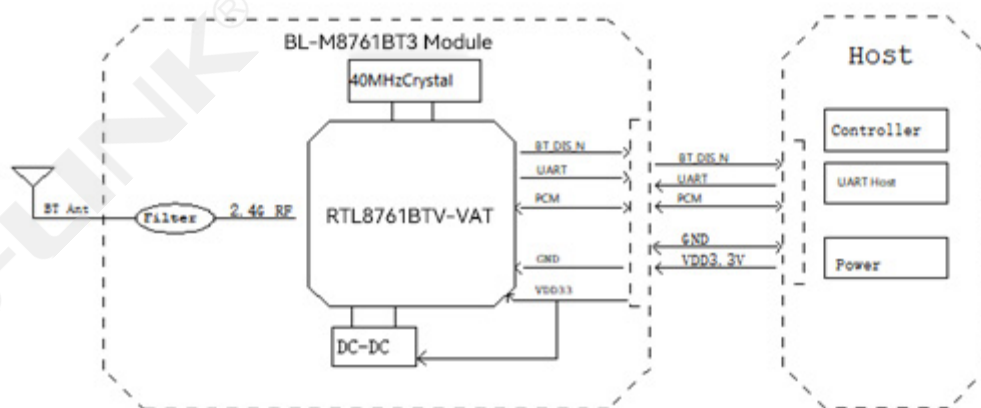
1. Introduction

The BL-M8761BT3 is a highly integrated Bluetooth 5.0 module with a UART interface designed base on Realtek RTL8761BTV-VAT. It combines a BT Protocol Stack (LM, LL, and LE), BT baseband, modem, and BT RF. The RTL8761BTV-VAT Bluetooth controller complies with Bluetooth core specification v5.0, and supports dual mode (BR/EDR + Low Energy Controllers). It is compatible with previous versions, including v2.1 + EDR. For BR/EDR, it allows multiple active links in either slave mode or master mode. For Low Energy, it supports multiple states and allows multiple active links in slave mode. The links in BR/EDR and LE can be active simultaneously.

1.1 Features

- Bluetooth 5 specification compliant, supports BDR/EDR/BLE
- Complies with HS-UART with configurable band rate
- Connect to external antenna through the half hole
- Power Supply: VDD3.3V±0.2V

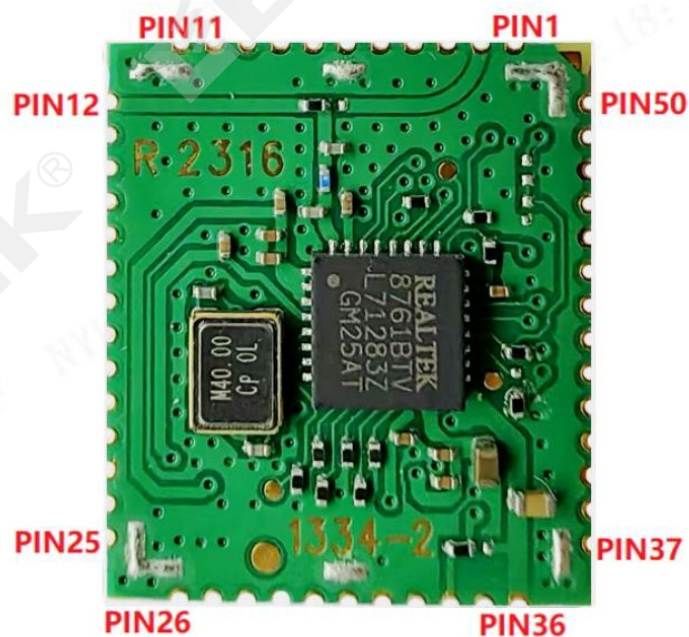
1.2 Block Diagram



1.3 General Specifications

Module Name	BL-M8761BT3
Chipset	RTL8761BTV-VAT-CG
Host Interface	UART
Antenna	Connect to external antenna through the half hole
Dimension	SMD, 13.0*15.0*1.7mm (L*W*H)
Power Supply	2.97V~3.63V maximum supply current up to 500mA EDR 6dBm: 70mA (max)
Operation Temperature	0°C to +70°C
Operation Humidity	10% to 95% RH (Non-Condensing)
Storage Temperature	-45°C to +85°C
Storage Humidity	10% to 95% RH (Non-Condensing)
Product Weight	0.45g

2. Pin Assignments



Top View

2.1 Pin Definition

No	Pin Name	Type	Description	Supply
1	GND	RF	Ground connections	
2	ANT1	RF	NC (BT RF support by FAE)	
3	GND	RF	Ground connections	
4	GND	P	Ground connections	
5	GND	P	Ground connections	
6	GND	P	Ground connections	
7	GND	P	Ground connections	
8	GND	RF	Ground connections	
9	NC	RF	Not connect	
10	GND	RF	Ground connections	
11	GND	RF	Ground connections	
12	BT-ANT	RF	The RF pad for 2.4G BT_ANT	
13	NC	-	NC	
14	NC	-	NC	
15	NC	-	NC	
16	NC	-	NC	
17	NC	-	NC	
18	NC	-	NC	
19	NC	-	NC	
20	NC	-	NC	
21	NC	-	NC	
22	NC	-	NC	
23	GND	P	Ground connections	
24	NC	-	NC	
25	NC	-	NC	
26	NC	-	NC	
27	PCM_SYNC	I/O	PCM data line	
28	PCM_IN	I/O	PCM data line	
29	PCM_OUT	I/O	PCM data line	
30	PCM_CLK	I/O	PCM data line	
31	NC	-	NC	

32	GND	P	Ground connections	
33	NC	-	NC	
34	VDDIO	P	3.3V/1.8V Supply for GPIO (Determined by host)	
35	NC	-	NC	
36	VDD33	P	3.3V Main Power Supply	
37	NC	-	NC	
38	EN_CHIP	-I	RESET	
39	GND	P	Ground connections	
40	UART_TXD	I/O	Bluetooth UART interface	
41	UART_RXD	I/O	Bluetooth UART interface	
42	UART_RTS_N	I/O	GND	
43	UART_CTS_N	I/O	Bluetooth UART interface	
44	NC	-	NC	
45	NC	-	NC	
46	GND	P	Ground connections	
47	NC	-	NC	
48	GND	P	Ground connections	
49	Host_WAKE	I/O	Host Wake BT	
50	BT_WAKE	I/O	BT Wake Host	

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		0	25	70	°C
Antenna VSWR			1	2	/
Supply Voltage	VDD33	3.1	3.3	3.5	V

3.2 Current Consumption

Conditions : VDD33=3.3V ; Ta:25°C

Use Case	VDD Current (average)		
	Typ	Max	Units
BT BR_1M DH5 TX@6dBm (RF test)	48	66	mA
BT EDR_2M DH5 TX@6dBm (RF test)	49	67	mA
BT EDR_3M DH5 TX@6dBm (RF test)	49	69	mA
BT LE_1M TX@6dBm (RF test)	46	66	mA
BT LE_2M TX@6dBm (RF test)	33	63	mA
BT LE_125K TX@6dBm (RF test)	49	68	mA
BT LE_512K TX@6dBm (RF test)	47	57	mA
BT BR_1M DH5 RX Active (RF test)	27	39	mA
BT EDR_2M DH5 RX Active (RF test)	27	38	mA
BT EDR_3M DH5 RX Active (RF test)	27	39	mA
BT LE_1M RX Active (RF test)	26	37	mA
BT LE_2M RX Active (RF test))	27	38	mA
BT LE_125K RX Active (RF test)	26	38	mA
BT LE_512K RX Active (RF test)	26	38	mA

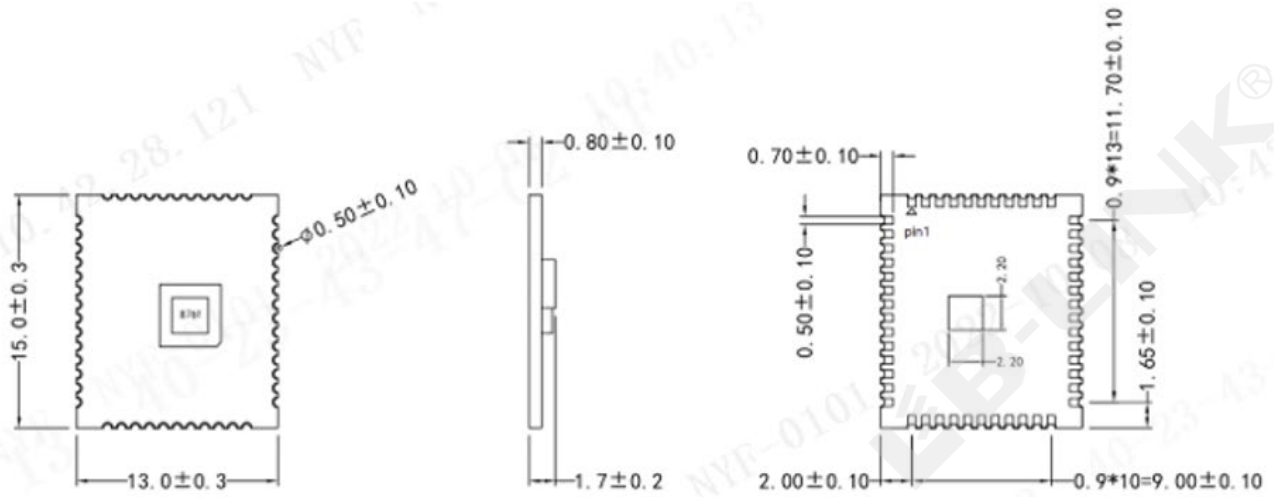
4. Bluetooth RF Specifications

Conditions: VDD33=3.3V; Ta:25°C	
Features	Description
Bluetooth Specification	Bluetooth v2.1+EDR/3.0+HS/4.2/5.0
Frequency Range	2.4~2.4835GHz (2.4GHz ISM Band)
Channels	Bluetooth Classic: Ch0~Ch78 (For 1MHz Channels); Bluetooth Low Energy: Ch0~Ch39 (For 2MHz Channels);
Power Classes	Bluetooth Classic: Class1; Bluetooth Low Energy: Class1.5;

Date Rate & Modulation	BR_1Mbps: GFSK; EDR_2Mbps: $\pi/4$ -DQPSK; EDR_3Mbps: 8DPSK; LE_125Kbps: GFSK (Coded_S=8); LE_500Kbps: GFSK (Coded_S=2); LE_1Mbps: GFSK (Uncoded); LE_2Mbps: GFSK (Uncoded);			
Bluetooth Transmitter Specifications				
Items	Min (dBm)	Typ (dBm)	Max (dBm)	
TX Power				
BR_1M	0	4.5	10	
EDR_2M	0	4.5	10	
EDR_3M	0	4.5	10	
LE_125/500K	0	4.5	10	
LE_1M	0	4.5	10	
LE_2M	0	4.5	10	
Bluetooth Receiver Specifications				
Items	Sensitivity		Maximum Input Level	
	Input Level (Typ: dBm)	BER	Input Level (Typ: dBm)	BER
BR_1M	-90	$\leq 0.1\%$	-5dBm	$\leq 0.1\%$
EDR_2M	-86	$\leq 0.01\%$	-5dBm	$\leq 0.1\%$
EDR_3M	-86	$\leq 0.01\%$	-5dBm	$\leq 0.1\%$
	Input Level(Typ)	PER	Input Level (Typ)	PER
LE_125K	-85	$\leq 30.8\%$	-5dBm	$\leq 30.8\%$
LE_500K	-85	$\leq 30.8\%$	-5dBm	$\leq 30.8\%$
LE_1M	-85	$\leq 30.8\%$	-5dBm	$\leq 30.8\%$
LE_2M	-85	$\leq 30.8\%$	-5dBm	$\leq 30.8\%$

5. Mechanical Specifications

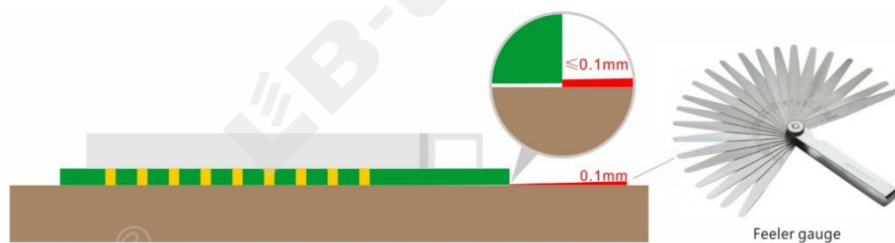
5.1 Module Outline Drawing



Top View

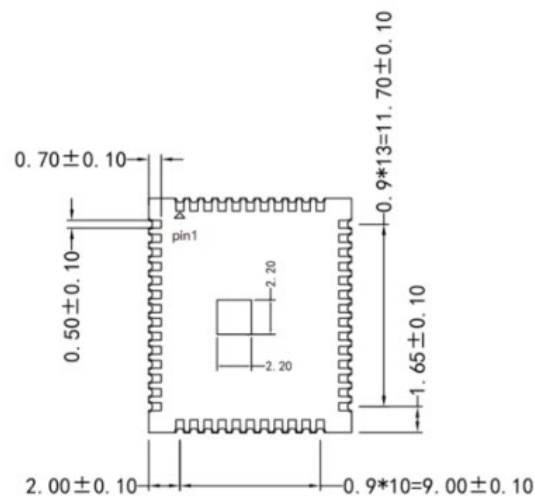
Bottom View

Module dimension: 15.0*13.0*1.7mm(L*W*H)



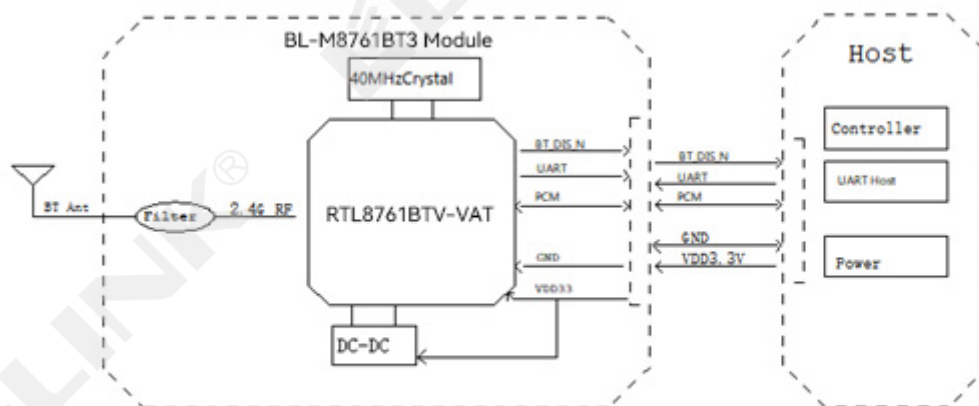
Module Bow and Twist: $\leq 0.1\text{mm}$

5.2 Mechanical Dimensions

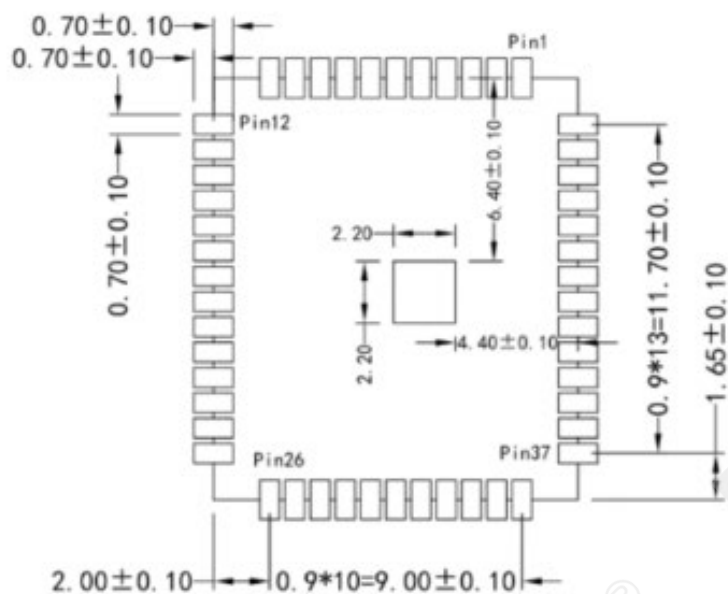


6. Application Information

6.1 Typical Application Circuit

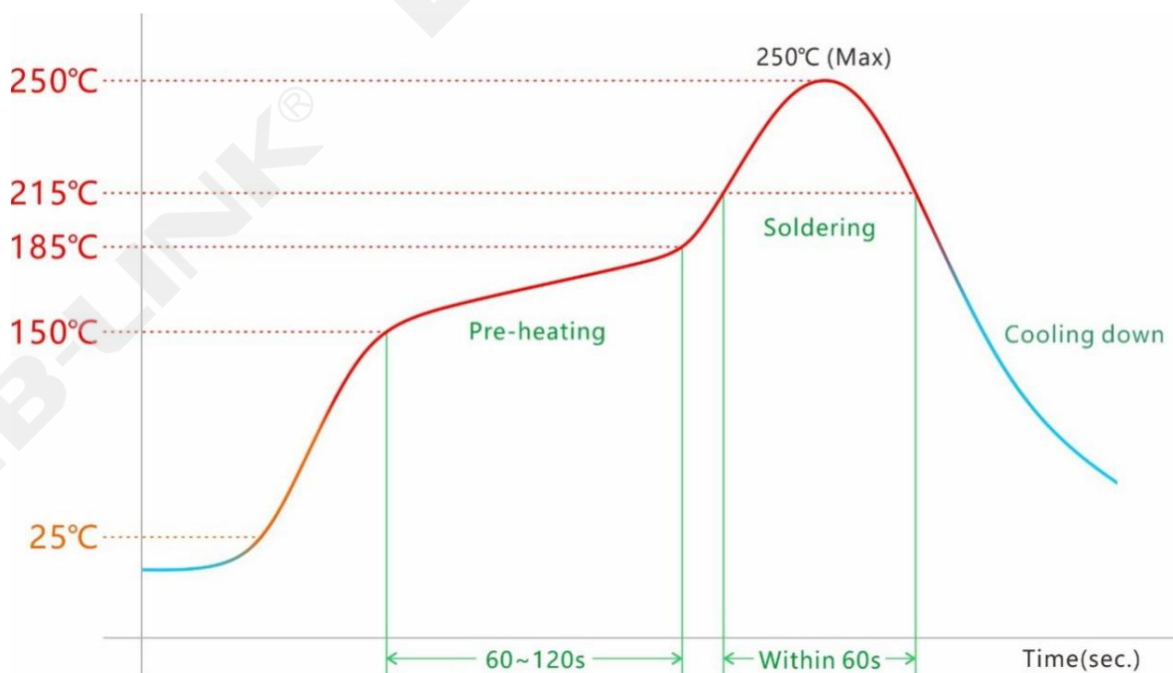


6.2 Recommend PCB Layout Footprint



TOP View

6.3 Reflow Soldering Standard Condition

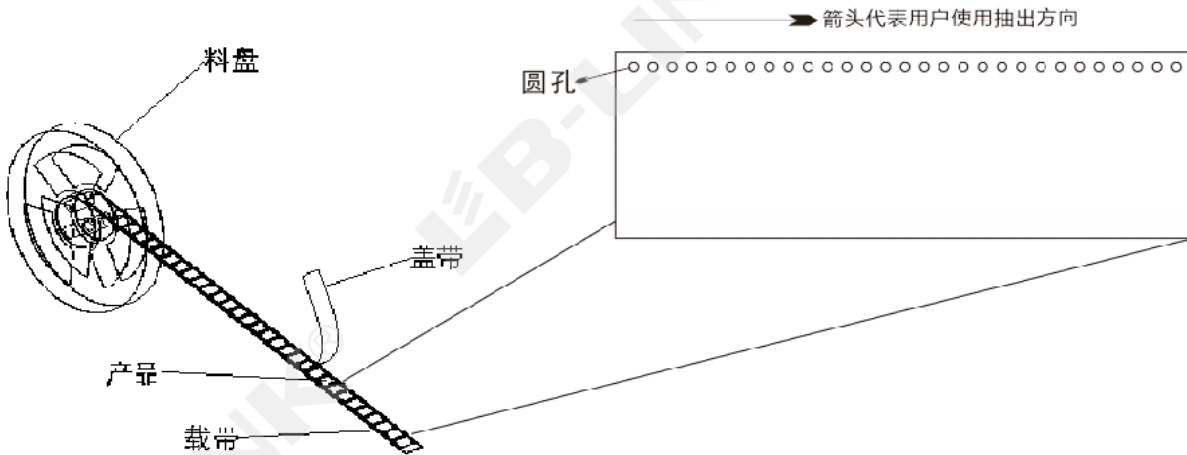


7. Key Components Of Module

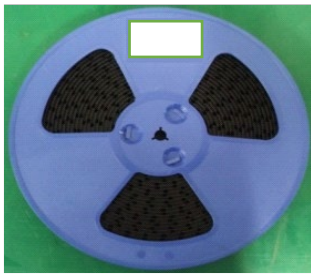
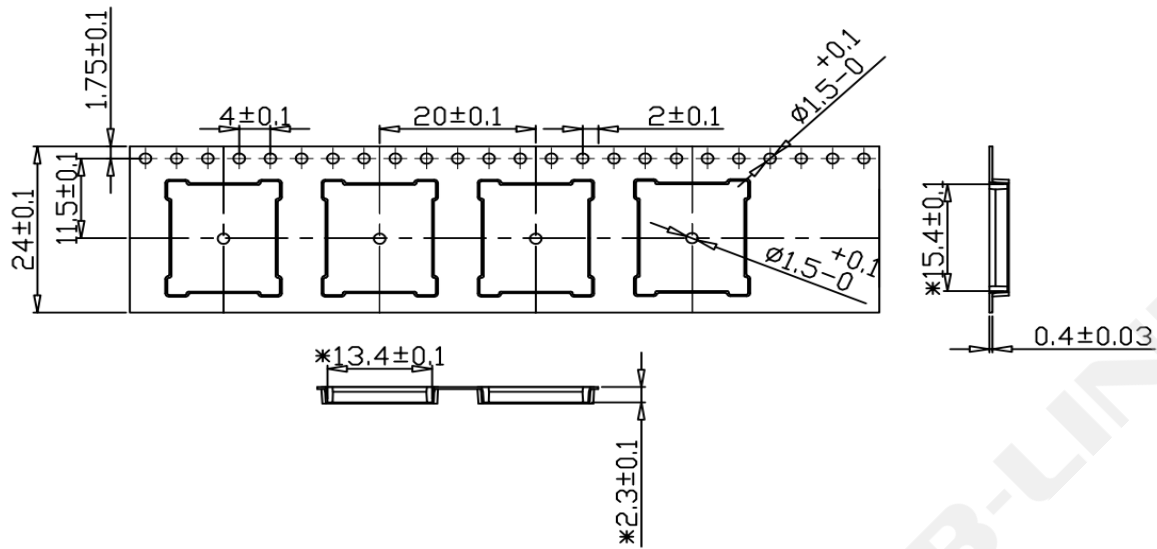
No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8761BTV-VAT-CG	Realtek CO., LTD	
2	PCB	BL-M8761BT3	Shenzhen Tie Fa Technology CO. LTD	
			IQE	
			Guangdong KINGSHINE ELECTRONICS CO., LTD	
			Quzhou Sunlord Electronics CO., LTD	
3	Crystal	3225 40MHz		

8. Package and Storage Information

8.1 Package Dimensions



Carrier Tape Detail



8.2 Storage Conditions

Absolute Maximum Ratings:

Storage temperature: -40°C to $+85^{\circ}\text{C}$,
Storage humidity: 10% to 95 (Non-Condensing)

Recommended Storage Conditions:

Storage temperature: 5°C to $+40^{\circ}\text{C}$,
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:

The Module is a static-sensitive electronic device.
Do not operate or store near strong electrostatic fields.
Take proper ESD precautions!