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Cdtech SHRTL8822 iFi5 Plus BT5.0 Module

Specifications

Model	SH-RT8822CU-01
Product Name	WIFi 11a/b/g/n/ac 2T2R and BT5.0 Module
Standard	IEEE802.11a/b/g/n/ac, BT2.1/3.0/4.2/5.0
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60, 90,120 and maximu m of 867Mbps
Modulation Method	DSSS/DBPSK/DQPSK/16-QAM/ 64-QAM/256QAM

Frequency Band	2.4~2.4835GHz , 5.0~5.8 GHz
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE802.11a/g/n/ac: OFDM (Orthogonal rthogonal Frequency Division Multiplexing)
Interface	USB2.0
Operating Temperature	-10°C to 70°C (Ambient)

Storage Temperature	-40°C to 90°C
Humidity	5 to 90 % maximum (non-condensing)
Dimension	30x25x6.0mm (LxWxH)±0.2mm

Overview

- The SH-RT8822CU-01 is a highly integrated single-chip that support 2-stream

802.11ac solutions with Multi-user MIMO (Multiple-Input, Multiple-Output) with Wireless LAN (WLAN) USB2.0 network interface controller It combines a WLAN MAC, a 2T2R capable WLAN baseband, and RF in s single chip.

- The SH-RT8822CU-01 provides a complete solution for a high-performance integrated wireless and Bluetooth device.

Features

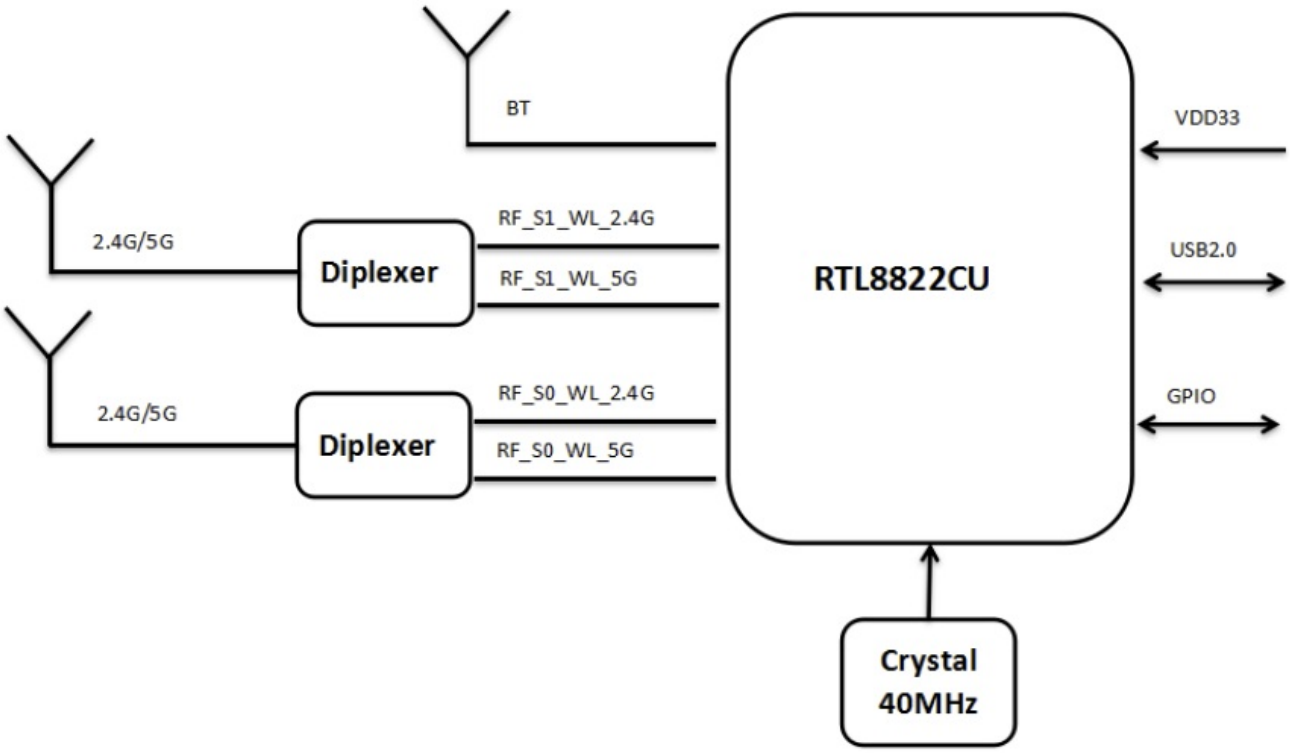
WLAN

- IEEE 802.11a/b/g/n/ac compatible WLAN
- 20MHz / 40MHz / 80MHz bandwidth transmission
- Complies with USB2.0 for WLAN and BT controller
- Dual-band 2T2R mode with data rate up to 867Mbps
- Support 802.11ac 2×2,Wave-2 compliant with MU-MIMO
- Complete 802.11n MIMO solution for 2.4GHz and 5Ghz band
- Maximum PHY data rate up to 173.3 Mbps using 20MHz bandwidth, 400Mbps using 40MHz bandwidth, and 866.7Mbps using 80MHz bandwidth
- DSSS with DBPSK and DQPSK, CCK modulation with long and short preamble
- Short Guard Interval (400ns)
- Sounding packet

Bluetooth

- Support Bluetooth 5.0 system
- Compatible with Bluetooth v2.1 Systems
- Supports all packet types in basic rate and enhanced data rate
- Dual Mode support: Simultaneous LE and BR/EDR
- Enhanced BT/Wi-Fi Coexistence Control to improve transmission quality in different profiles
- Integrated MCU to execute Bluetooth protocol stack
- Supports Bluetooth Low Energy
- Supports Enhanced Power Control

System Block Diagram



DC Characteristics

Symbol	Parameter	Min.	Typ.	Max	Units
VD33	3.3V I/O supply Voltage	3.0	3.3	3.6	V
IDD_3.3V	3.3V Rating Current	—	—	800	mA
VD10	1.05V Core Supply Voltage	0.945	1.05	1.155	V
VIH	Input high Voltage	2.0	3.3	3.6	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

Electrical Characteristics

WiFi Section: 2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/b/g/n/ac WiFi compliant
Frequency Range	2.4 GHz ISM Band
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Receive Sensitivity 11b,20MHz @8%PER	– 1Mbps PER @ -96 dBm, typical
	– 11Mbps PER @ -88dBm, typical
Receive Sensitivity 11g,20MHz @10%PER	– 6Mbps PER @ -92 dBm, typical
	– 54Mbps PER @ -76 dBm, typical
Receive Sensitivity 11n,20MHz @10%PER	– MCS=0 PER @ -90 dBm, typical
	– MCS=7 PER @ -73 dBm, typical
Receive Sensitivity 11n,40MHz @10%PER	– MCS=0 PER @ -88 dBm, typical
	– MCS=7 PER @ -70 dBm, typical

5GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/n 2×2, WiFi compliant

Frequency Range	5.0 GHz ISM Band	
Modulation	802.11a : OFDM /64-QAM,16-QAM, QPSK, BPSK 802.11n : OFDM /64-QAM,16-QAM, QPSK, BPSK	
Receive Sensitivity 11a,20MHz @10%PER	– 6Mbps	PER @ -91 dBm, typical
	– 54Mbps	PER @ -76 dBm, typical
Receive Sensitivity 11n,20MHz @10%PER	– MCS=0	PER @ -91 dBm, typical
	– MCS=7	PER @ -73 dBm, typical
Receive Sensitivity 11n,40MHz @10%PER	– MCS=0	PER @ -88 dBm, typical
	– MCS=7	PER @ -71 dBm, typical
Receive Sensitivity 11ac,20MHz @10%PER	– MCS=0	PER @ -91 dBm, typical
	– MCS=7	PER @ -68 dBm, typical
Receive Sensitivity 11ac,40MHz @10%PER	– MCS=0	PER @ -88 dBm, typical
	– MCS=7	PER @ -64 dBm, typical
Receive Sensitivity	– MCS=0	PER @ -86dBm, typical

11ac,80MHz @10%PER	– MCS=7	PER @ -61 dBm, typical

Bluetooth Section:

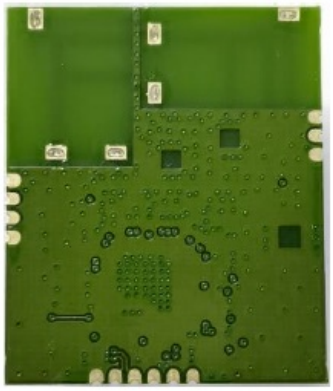
Feature	**Description**		
General Specification			
Bluetooth Standard	BT2.1/3.0/4.2/5.0		
Host Interface	USB2.0		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
	Min.	**Typical.**	**Max.**
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	

Maximum Input Level	GFSK (1Mbps):-20dBm
	π/4-DQPSK (2Mbps) :-20dBm
	8DPSK (3Mbps) :-20dBm

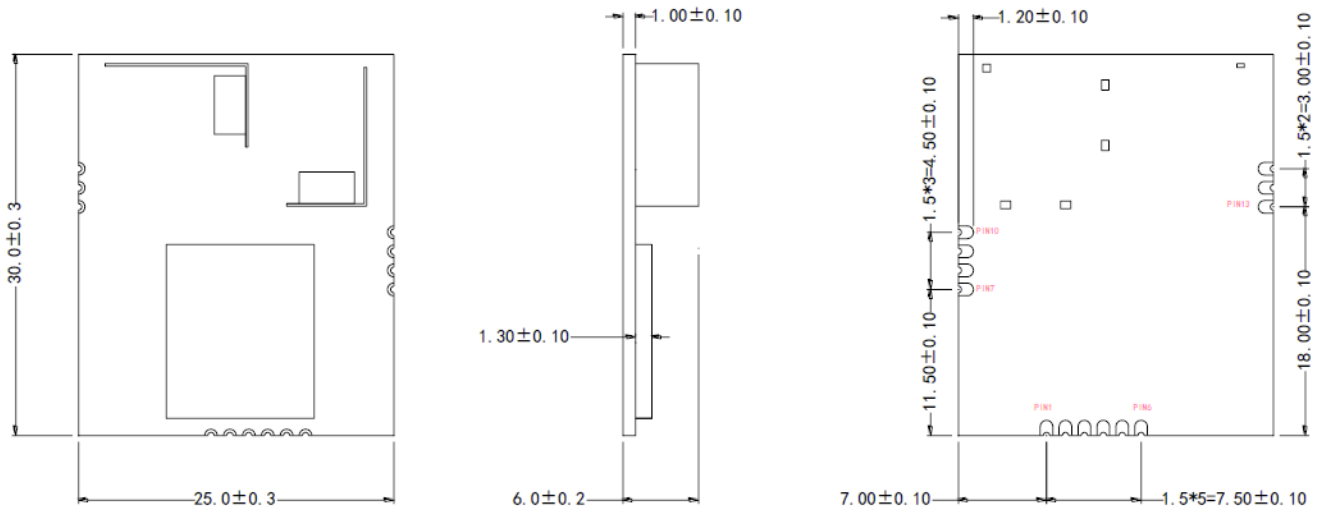
Supplier

Supplier list	
Name of Material	Supplier brand
Main chip	RTL
Crystal	FK
PCB	Bomin/Benchuang/E-Tech/MInzhenghon/Zhuoyi
Diplexer	ACX
Inductor	Sunlord
Capacitance	SAMSUNG
Resistor	UniOhm

Module photo

		
P/N:SH-RT8822CU-01		
		
		BOTTOM VIEW
TOP VIEW		
Dimension:30.0*25.0*6.0mm (LxWxH) ±0.2mm		

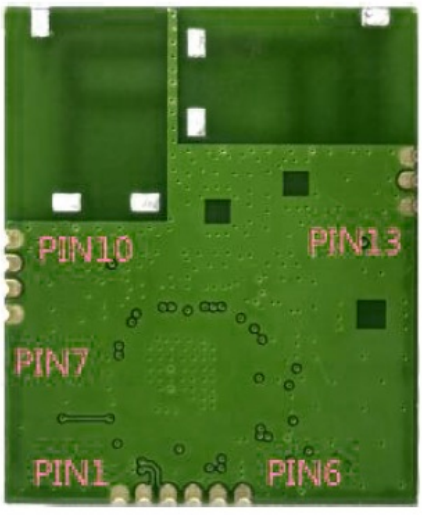
Module size

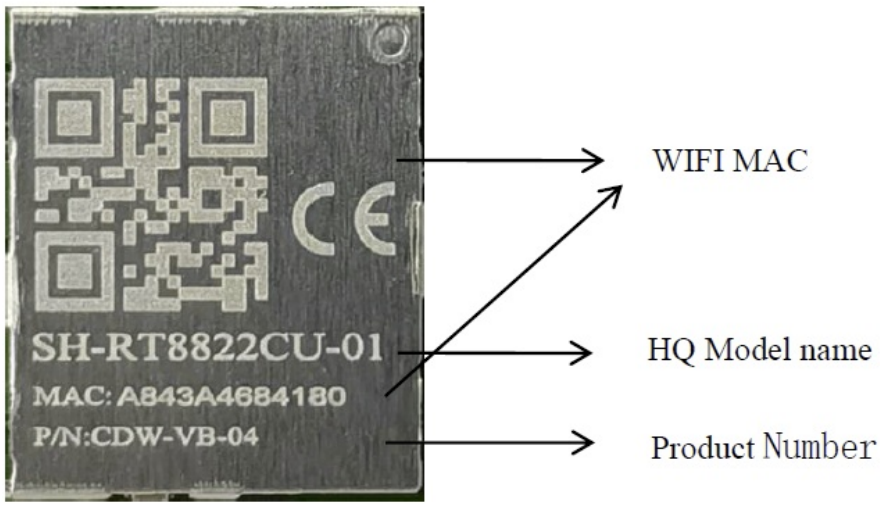


Main View　　Side View　　Back View

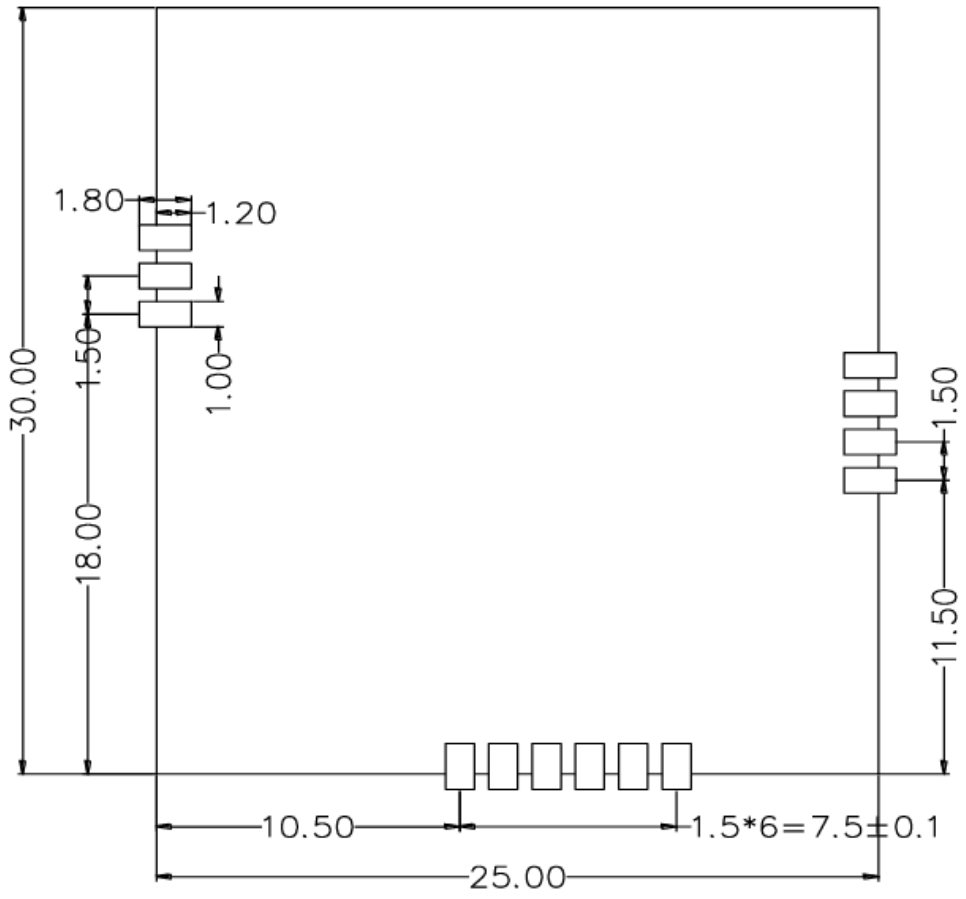
Pin Description

NO.	Symbol	Description
1	GND	Ground connections
2	DP	USB positive differential data lines
3	DM	USB negative differential data lines
4	VCC	Power supply 3.3V
5	RESET	System reset ,low active(47k , 100R)
6	WOW	Wake up system via wifi,low active(10k)
7	GND	Ground connections
8	NC	
9	BT_WAKE_HOST	Wake up system via BT,low active(10k)
10	GND	Ground connections
11	GND	Ground connections
12	BT_RF	Bluetooth RF output
13	GND	Ground connections



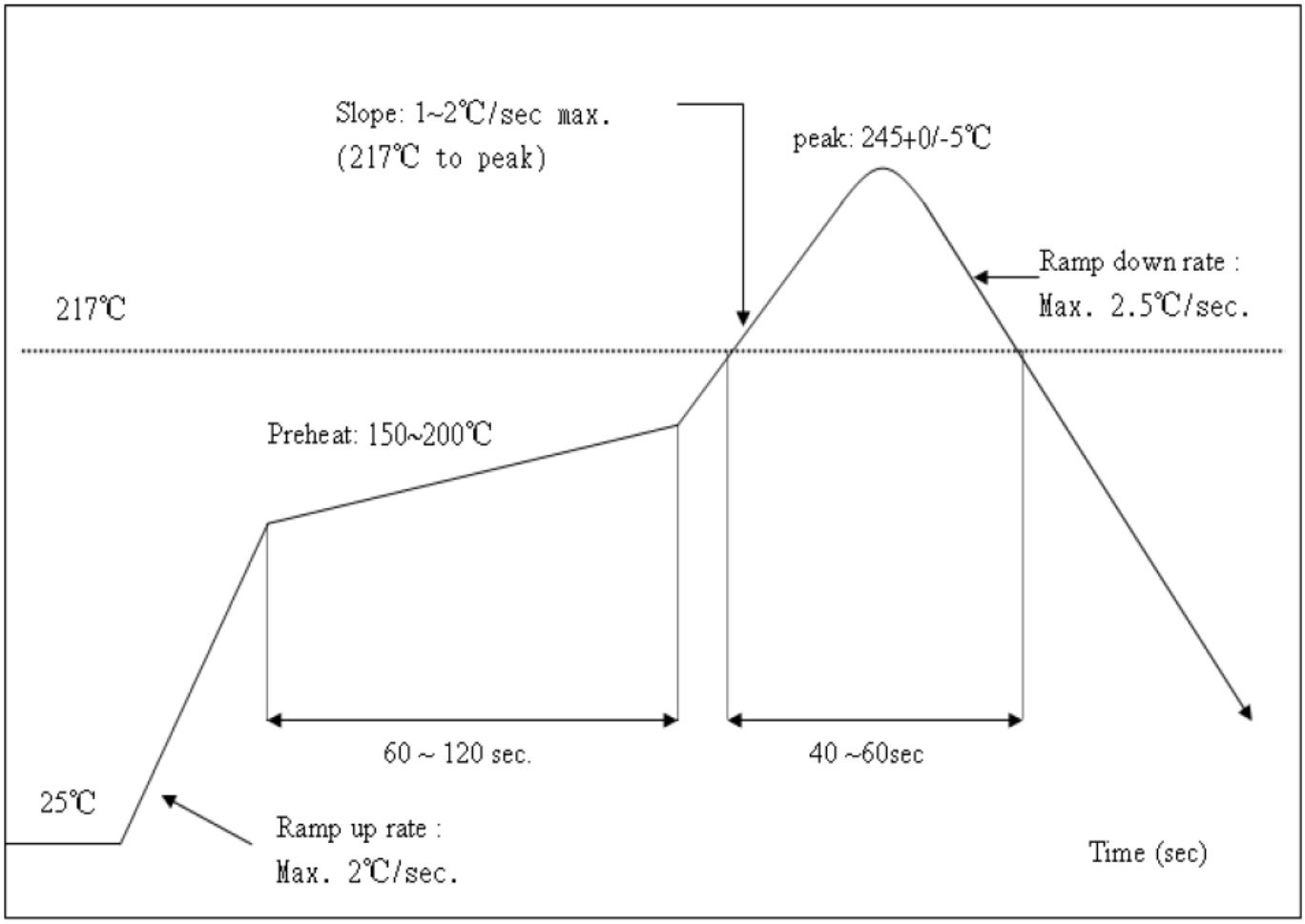


Package Size

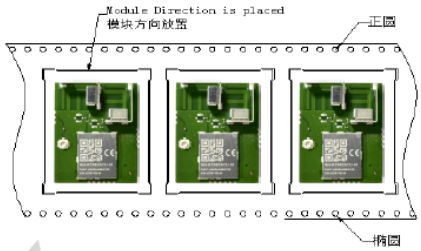


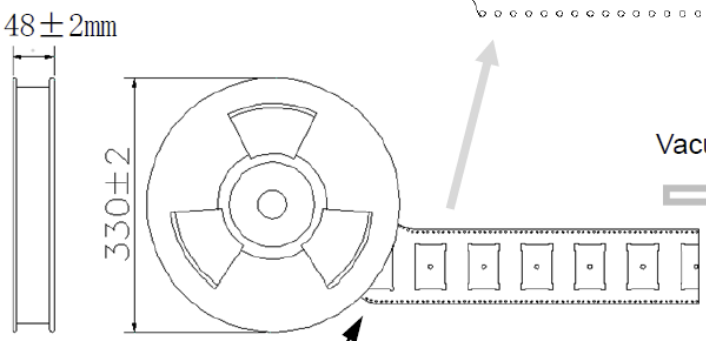
Recommended Reflow Profile

- Referred IPC/JEDEC standard.
- **Peak Temperature**: <250°C
- **Number of Times:** 2 times


Slope: 1~2℃/sec max.
(217℃ to peak)
peak: 245+0/-5℃
Ramp down rate :
Max. 2.5℃/sec.
217℃
Preheat: 150~200℃
60 ~ 120 sec.
40 ~60sec
25℃
Ramp up rate :
Max. 2℃/sec.
Time (sec)

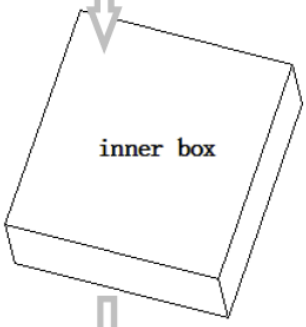
Package



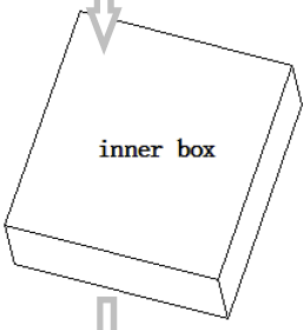


Vacuum packing

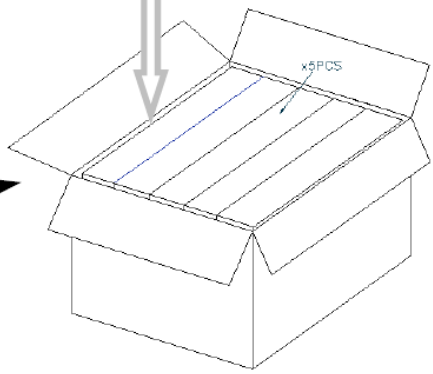
Color of plastic disc: blue
A roll of 300pcs(前后留空15pcs)



inner box K3K:
33.5cm*34.7cm*7cm
A box of 300 PCS



inner box K3K:
33.5cm*34.7cm*7cm
A box of 300 PCS



carton K=A:
36.4*35.7*37.5cm
A case of 1500 PCS

The SH-RT8822CU-01 is ESD (electrostatic discharge) sensitive device and may be

damaged with ESD or spike voltage. Although SH-RT8822CU-01-03 is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.

FCC WARNING

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
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.
This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

15.105 Information to the user.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:
Note: 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.

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

Radiation Exposure Statement:

- This equipment complies with FCC 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.
- The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination.
- The firmware setting is not accessible by the end user.
- The final end product must be labelled in a visible area with the following:

“Contains Transmitter Module 2BOB7 SHRTL8822

Requirement per KDB996369 D03

List of applicable FCC rules

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance with unintentional radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.

Explanation:

This module meets the requirements of FCC part 15C(15.247) 15.247), FCC Part15 15.407

Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.

Explanation:
Yes, the module contains 2 permanently attached antennas and an IPEX connected antenna with a maximum antenna gain of 3.25dBi.

Limited module procedures

- If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module's limiting conditions.
- A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include the limited module manufacturer reviews, detailed test data, or host designs prior to giving the host manufacturer approval.
- This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained, such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approv ed with the module.
- **Explanation**: The module is a single module.

Trace antenna designs

For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ Modules for Micro Strip Antennas and traces. The integration information shall include, for the TCB review the integration instructions for the following aspects: layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.

1. Information that includes permitted varianc es (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna);
2. Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequencies, the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered);
3. The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (P C) board layout;
4. Appropriate parts by manufacturer and specifications;
5. Test procedures for design verification; and
6. Production test procedures for ensuring compliance.

The module grantee shall provide a notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure, followed by a Class II permissive change application.

Explanation: Yes, the module with a metal antenna and Copper tube antenna designs

RF exposure considerations

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information:

1. to the host product manufacturer, to define the application conditions (portable xx cm

from a person’s body); and
2. additional text needed for the host product manufacturer to provide to end users in their end product manuals.

If RF exposure statements and use conditions are n ot provided, then the host product manufacturer is required to take responsibility for the module through a change in FCC ID (new application).

Explanation: This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiation and your body.” This module is designed to comply with the FCC statement, FCC ID is: 2B OB7 SHRTL8822

Antennas

- A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an “omni directional antenna” is not considered to be a specific “antenna type”)). For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connectors must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.
- **Explanation:** Yes, the module contains 2 permanently attached antennas and an IPEX connected antenna with a maximum antenna gain of 3.25 dBi.

Label and Compliance Information

- Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating “Contains FCC ID” with their finished product. See Guidelines for Labeling and User Information for RF Devices KDB Publication 784748.

- **Explanation:** The host system using this module should have a label in a visible area indicating the following text: “Contains FCC ID: 2BOB7 SHRTL8822”

Information on Test Modes and Additional Testing Requirements

- Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host. Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulate or characterize a connection by enabling a transmitter. This can greatly simplify a host manufacturer’s determination that a module as installed in a host complies with FCC requirements.
- **Explanation:** Can increase the utility of our modular transmitters by providing instructions that simulate or characterize a connection by enabling a transmitter.

Additional Testing, Part 15 Subpart B Disclaimer

- The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that 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. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.
- **Explanation:** The module is only FCC authorized for the specific rule parts listed on the grant. The OEM integrator is responsible for testing their end product for any additional compliance requirements required with this module installed. If the final product contains circuits of other FCC PART 15 Subparts, the final host product still

requires Part 15 Subpart B compliance testing with the modular transmitter installed.

IC Statement

This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science, and Economic Development Canada's license-exempt RSS(s).

Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

The term "IC:" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

This product meets the applicable Industry Canada technical specifications.

Please note that if the ISED certification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed displays a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC: 3374633746-SHRTL8822 ", any similar wording that expresses the same meaning may be used.

- The device meets the exemption from the routine evaluation limits in section 6 of RSSRSS-102 Issue 6 December 15, 2023, and compliance with RSS RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.
- This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.
- Operation of this device is restricted to indoor use only. (5180- 5180-5240MHz)

This radio transmitter 33746-SHRTL8822 has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited

for use with this device.

	ANT Type	Manufacturer	Model	Peak Gain	Frequency range	impedance
BT antenna	Copper tube antenna	Dongguan Huangjie Communication Technology Co., LTD	TX-HF-H-TV 101X	3.21dBi	2400-2500 MHz	50Ω
WIFI Antenna A	Metal Antenna	INPAQ TECHNOLOGY CO., LTD.	RFMTA1107 00NNLB004	2.4G: 1.2 dBi 5.1G: 2.93 dBi 5.8G: 3.25 dBi	2400-2500 MHz 5150-5850 MHz	50Ω
WIFI Antenna B	Metal Antenna	INPAQ TECHNOLOGY CO., LTD.	RFMTA1107 00NNLB004	2.4G: 1.76 dBi 5.1G: 3.01 dBi 5.8G: 3.21 dBi	2400-2500 MHz 5150-5850 MHz	50Ω

SH-RT8822CU-01 Module Datasheet

Part NO.	Description

SH-RT8822CU-01	1. RTL8822CU-VB-CG USB2.0 802.11a/b/g/n/ac Wi-Fi 2T2 R +Bluetooth V5.0; 2. 3 antenna type,shielding Bluetooth RF interface IPEX1;

FAQ

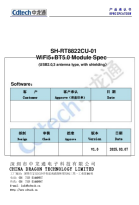
Q: What is the standard data transfer rate of the SH-RT8822CU-01 module?

A: The standard data transfer rate is 1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and a maximum of 867Mbps.

Q: Does the module support Bluetooth Low Energy?

A: Yes, the module supports Bluetooth Low Energy.

Documents / Resources

	Cdtech SHRTL8822 iFi5 Plus BT5.0 Module [pdf] Instruction Manual SHRTL8822, SHRTL8822 iFi5 Plus BT5.0 Module, iFi5 Plus BT5.0 Module, BT5.0 Module, Module

References

- Cdtech -
- Cdtech -
- User Manual

BT5.0 Module, Cdtech, iFi5 Plus BT5.0 Module, Module, SHRTL8822, SHRTL8822 iFi5 Plus BT5.0

Cdtech Module

—Previous Post
Cdtech EL.RT8733BU-WFT Dual Band WiFi4 11n plus BT5.2 Module Owner's Manual

Leave a comment

Your email address will not be published. Required fields are marked *

Comment *

Name

Email

Website

Save my name, email, and website in this browser for the next time I comment.

Post Comment

Search:

e.g. whirlpool wrf535swhz

Search

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