

SC208-W Hardware Guide

V1.0

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Contact Information

Website: <https://www.fibocom.com>

Address: 10/F-14/F, Block A, Building 6, Shenzhen International Innovation Valley, Dashi First Road, Xili Community, Xili Subdistrict, Nanshan District, Shenzhen

Tel: 0755-26733555

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Applicable Model

No.	Applicable Model	Description
1	SC208-W-20	4GB+64GB memory, WIFI only, suitable for global market

Change History

V1.0 (2024-09-02) 2.1 Product Introduction: Add the introduction of SC208-W

1 Foreword

1.1 Description

This document describes the electrical characteristics, RF performance, structure size, application environment, etc. of the SC208 module. With the assistance of the document and other instructions, the developers can quickly understand the hardware functions of the module and develop products.

2 Product Overview

2.1 Product Introduction

The module integrates core components such as Baseband, Memory, PMU, Transceiver, PA; it supports long distance multi-mode communication such as WIFI/BT short- distance radio transmission technology. The module is embedded with Android operating system and support various interfaces such as MIPI/USB/UART/SPI/I2C. It is the optimal solution for the core system of wireless smart products. Its corresponding network modes and frequency bands are as follows:

Table 2. Introduction to bands of SC208-W

Mode	Band
WIFI802.11a/b/g/n/ac	2402 MHz to 2482 MHz
	5170 MHz to 5835 MHz
BT5.0	2402 MHz to 2480 MHz



SC208-W series does not support GNSS

2.2 Key Features

Table 3. Key features

Feature	Description
Power Supply	DC: 3.5–4.35V, typical: 3.8 V

Feature	Description
Application processor	A customized 64-bit Arm v-8.0 compliant applications processor Kryo Gold: quad high-performance cores Kryo Silver: quad low-power cores
Memory	4GB + 64GB
WLAN features	Support 2.4G and 5G WLAN wireless communication. Support 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac. Maximum rate up to 433Mbps
Bluetooth features	BT5.0
SMS	Text and PDU modes Point-to-Point MO and MT SMS cell broadcast SMS storage: stored in the module by default
LCD interface	One 4-Lane MIPI_DSI D-PHY 1.2 interface Maximum rate 1.5Gbps/lane

Feature	Description
Camera interface	Three 4-Lane MIPI_CSI D-PHY 1.2 interfaces Maximum rate 2.5Gbps/lane, configurable as 4+4+2+1 or 4+4+4
Audio interface	Analog audio input: 3 sets of analog microphone inputs with internal bias integration. Analog audio output: a set of differential earpiece outputs A set of stereo headphone outputs A set of differential Lineout outputs that require external audio PA
USB interface	One USB interface USB conforms to the 3.1 Gen 1 specification and is downward compatible with USB2.0. It can be used for data transmission and software debugging.
(U)SIM interface	Two (U)SIM card interfaces supporting 1.8V or 2.95V (U)SIM card adaptation Support dual (U)SIM dual standby single pass, support hot plug
UART interface	Two UART serial interfaces, with the maximum rate up to 4Mbps. A set of debugging UART serial ports A set of four-wire serial ports supporting RTS and CTS hardware flow control
SD interface	Support 4-bit SD3.0, 1.8V/2.95V SD cards and hot plug
I2C interface	Multiple I2C interfaces can be used for peripherals such as TP, camera, sensor etc.
ADC interface	One channel universal ADC
RTC	Supported
Antenna interface	WIFI/BT antenna interfaces.
Physical characteristics	Dimensions: (41.0±0.15) mm x (41.0±0.15) mm x (2.8+0.05/-0.2) mm Package: 148 LCC+128 LGA Weight: ~10.6 g
Temperature range	Operating temperature ¹ : -30°C~75°C ¹⁾ Storage temperature: -40°C~85°C
Software update	USB/OTA/SD
RoHS	Comply with RoHS standard

2.2.1 Wi-Fi

The module supports 2.4G/5G WLAN wireless communication, and supports 802.11a, 802.11b, 802.11g, 802.11n and 802.11ac. The maximum throughput is 433Mbps with the following characteristics:

- Support Wake-on-WLAN (WoWLAN)
- Support ad hoc mode
- Support WAPI
- Support AP mode
- Support Wi-Fi Direct
- 2.4G band supports CCK, OFDM, HT20 and HT40
- 5G band supports OFDM, VHT20, VHT40, VHT80.
- Test condition: 3.8V power supply, environment temperature of 25°C

Table 4. WIFI transmit power

Frequency	Mode	Date Rate	Bandwidth (MHz)	TX Power (dBm)
2.4G	802.11b	1Mbps	20	17±3
		11Mbps	20	17±3
	802.11g	6Mbps	20	17±3
		54Mbps	20	15±3
	802.11n	MCS0	20	15±3
		MCS7	20	12±3
		MCS0	40	15±3
		MCS7	40	12±3
5G	802.11a	6Mbps	20	15±3
		54Mbps	20	13±3
	802.11n	MCS0	20	14±3

Frequency	Mode	Date Rate	Bandwidth (MHz)	TX Power (dBm)
		MCS7	20	12±3
		MCS0	40	13±3
		MCS7	40	12±3
	802.11ac	MCS0	20	13±3
		MCS8	20	12±3
		MCS0	40	13±3
		MCS9	40	11±3
		MCS0	80	13±3
		MCS9	80	9±3

Microstrip line is recommended for RF routing of Wi-Fi antenna. The insertion loss of 2.4G band is controlled within 0.2dB, the insertion loss of 5G band is controlled within 0.8dB, and the impedance is controlled within 50Ω.

Table 5. Wi-Fi operating frequency

Mode	Frequency	Unit
2.4G	2402 to 2482	MHz
5G	5170 to 5835	MHz

2.2.2 Bluetooth

The module supports BT5.0 (BR/EDR+BLE) standard. The modulation method supports GFSK, 8-DPSK and $\pi/4$ -DQPSK. The BR/EDR channel bandwidth is 1MHz and can accommodate 79 channels. The BLE bandwidth is 2MHz and can accommodate 40 channels. Its main features are as follows:

- BT 4.2+BR/EDR+BLE
- Support for ANT protocol
- Support for BT-WLAN coexistence operation, including optional concurrent receive
- Up to 3.5 piconets (master, slave and page scanning)

Table 36. BT rate and version information

Version	Date Rate	Throughput	Note
BT1.2	1Mbit/s	> 80Kbit/s	--
BT2.0+EDR	3Mbit/s	> 80Kbit/s	--
BT3.0+HS	24Mbit/s	Refer to 3.0+HS	--
BT4.2 LE	24Mbit/s	Refer to 4.2 LE	--
BT5.0 LE	24Mbit/s	Refer to 5.0 LE	--

Test condition: 3.8V power supply, environment temperature of 25°C

Table 6. BT performance indicator

Type	DH-5	2-DH5	3-DH5	BLE	Unit
Transmitter	10±2.5	9±2.5	9±2.5	6±2.5	dBm
Sensitivity	-86	-84	-82	-90	dBm



- The sensitivity here is a typical value. Microstrip line is recommended for the RF routing of Bluetooth antenna, with insertion loss within 0.2dB and impedance at 50Ω.

Table 7. BT operating frequency

Mode	Frequency	Unit
Bluetooth	2402 to 2480	MHz

3 Regulatory Compliance statement

3.1 CE Regulatory Compliance statement

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

Hereby, Fibocom Wireless Inc. declares that the radio equipment type SC208-W is in compliance with Directive 2014/53/EU as well as UK Radio Equipment Regulations SI 2017 No.1206. The full text of the EU/UK declaration of conformity is available at the following internet address: Download Center (fibocom.com) for CE.

Frequency band: 5150 - 5250 MHz:

Indoor use: Inside buildings only. Installations and use inside road vehicles and train carriages are not permitted. Limited outdoor use: If used outdoors, equipment shall not be attached to a fixed installation or to the external body of road vehicles, a fixed infrastructure or a fixed outdoor antenna. Use by unmanned aircraft systems (UAS) is limited to within the 5170 - 5250 MHz band.



Frequency band: 5250 - 5350 MHz:

Indoor use: Inside buildings only. Installations and use in road vehicles, trains and aircraft are not permitted. Outdoor use is not permitted.

Frequency band: 5470 - 5725 MHz:

Installations and use in road vehicles, trains and aircraft and use for unmanned aircraft systems (UAS) are not permitted.

	AT	BE	BG	CZ	DK	EE	FR	DE	IS	IE	IT
	EL	ES	CY	LV	LI	LT	LU	HU	MT	NL	NO
	PL	PT	RO	SI	SK	TR	FI	SE	CH	UK(NI)	HR

3.2 FCC Conformance information

Important Notice to OEM integrators

This module is limited to OEM installation ONLY.

This module is limited to installation in mobile applications, according to Part 2.1091(b).

The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part 15

Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while

the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e.

fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are compliant with the transmitter(s) rule(s). The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

Important Note

notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify to Fibocom Wireless Inc. 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 USI, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: ZMOSC208W"

" The FCC ID can be used only when all FCC compliance requirements are met.

Antenna Installation

The antenna must be installed such that 20 cm is maintained between the antenna and users,

The transmitter module may not be co-located with any other transmitter or antenna. Part 15 antenna must meet the requirements of FCC Rule §15.203, which requires the use of a permanently attached antenna or of an antenna that uses a unique coupling.

Only antennas of the same type and with equal or less gains as shown below may be used with this module. Other types of antennas and/or higher gain antennas may require additional authorization for operation.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

Federal Communication Commission Interference Statement

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 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 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.

Any changes or modifications not expressly approved by the party responsible for

compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

List of applicable FCC rules

This module has been tested and found to comply with part 22, part 24, part 27, part 90, part 15B requirements for Modular Approval. 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.

This device is intended only for OEM integrators under the following conditions: (For module device use)

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and 2) The transmitter module may not be co-located with any other transmitter or antenna. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Radiation Exposure Statement

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