

SDC009P Hardware Design

Short-Range PCBA Series

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Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service or repair of any terminal or mobile incorporating the PCBA. Manufacturers of the terminal should notify users and operating personnel of the following safety information by incorporating these guidelines into all manuals of the product. Otherwise, Quectel assumes no liability for customers' failure to comply with these precautions.



Full attention must be paid to driving at all times in order to reduce the risk of an accident. Using a mobile while driving (even with a handsfree kit) causes distraction and can lead to an accident. Please comply with laws and regulations restricting the use of wireless devices while driving.



Switch off the terminal or mobile before boarding an aircraft. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. If there is an Airplane Mode, it should be enabled prior to boarding an aircraft. Please consult the airline staff for more restrictions on the use of wireless devices on an aircraft.



Wireless devices may cause interference on sensitive medical equipment, so please be aware of the restrictions on the use of wireless devices when in hospitals, clinics or other healthcare facilities.



Terminals or mobiles operating over radio signal and cellular network cannot be guaranteed to connect in certain conditions, such as when the mobile bill is unpaid or the (U)SIM card is invalid. When emergency help is needed in such conditions, use emergency call if the device supports it. In order to make or receive a call, the terminal or mobile must be switched on in a service area with adequate cellular signal strength. In an emergency, the device with emergency call function cannot be used as the only contact method considering network connection cannot be guaranteed under all circumstances.



The terminal or mobile contains a transceiver. When it is ON, it receives and transmits radio frequency signals. RF interference can occur if it is used close to TV sets, radios, computers or other electric equipment.



In locations with explosive or potentially explosive atmospheres, obey all posted signs and turn off wireless devices such as mobile phone or other terminals. Areas with explosive or potentially explosive atmospheres include fueling areas, below decks on boats, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles such as grain, dust or metal powders.

About the Document

Revision History

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1 Introduction

QuecOpen® is a solution where the PCBA acts as the main processor. Constant transition and evolution of both the communication technology and the market highlight its merits. It can help you to:

- Realize embedded applications' quick development and shorten product R&D cycle
- Simplify circuit and hardware structure design to reduce engineering costs
- Miniaturize products
- Reduce product power consumption
- Apply OTA technology
- Enhance product competitiveness and cost-effectiveness

This document defines the characteristics of the SDC009P under the QuecOpen® solution, as well as its air interface and hardware interface for connection with your application. It also provides information on the PCBA's hardware interface features, RF characteristics, electrical characteristics, mechanical specifications, and other relevant details to help you quickly understand this PCBA.

1.1. Special Mark

Table 1: Special Mark

Mark	Definition
[...]	Brackets ([...]) used after a pin enclosing a range of numbers indicate all pins of the same type. For example, SDIO_DATA[0:3] refers to all four SDIO pins: SDIO_DATA0, SDIO_DATA1, SDIO_DATA2, and SDIO_DATA3.

2 Product Overview

SDC009P is a cost-effective MCU Wi-Fi 4 and Bluetooth PCBA that supports IEEE 802.11b/g/n and BLE 5.2 protocols. The PCBA uses connectors to support UART interface, eliminating the need for soldering.

- 160 MHz MCU processor
- Built-in 288 KB RAM and 2 MB Flash
- supports secondary development

Table 2: Basic Information

SDC009P	
Pin counts	4
Dimensions	(35.6 ±0.2) mm × (21.6 ±0.2) mm × (4.75 ±0.2) mm
Weight	Approx:2.39 g

2.1. Key Features

Table 3: Key Features

Basic Information	
Protocols and Standard	● Wi-Fi Protocols: IEEE 802.11b/g/n ● Bluetooth protocol: BLE 5.2 ● All hardware components are fully compliant with EU RoHS directive
Power Supply	VBAT Power Supply: ● 4.5~5.5 V ● Typ.: 5.0 V
Temperature Ranges	● Operating temperature ¹: -40 °C to +85 °C ● Storage temperature: -45 °C to +95 °C
Antenna/Antenna Interface	
Antenna/Antenna Interfaces ²	● PCB antenna ● RF coaxial connector ● 50 Ω characteristic impedance
Application Interface ³	
Application Interfaces	UART

¹ Within the operating temperature range, the PCBA's related performance meets IEEE and Bluetooth specifications.

² The PCBA is provided with one of the three antenna/antenna interface designs. For more details, please contact Quectel Technical Support.

³ For more details about the interfaces, see **Chapters 3.3** and **3.4**.

3 Application Interfaces

3.1. Pin Assignment

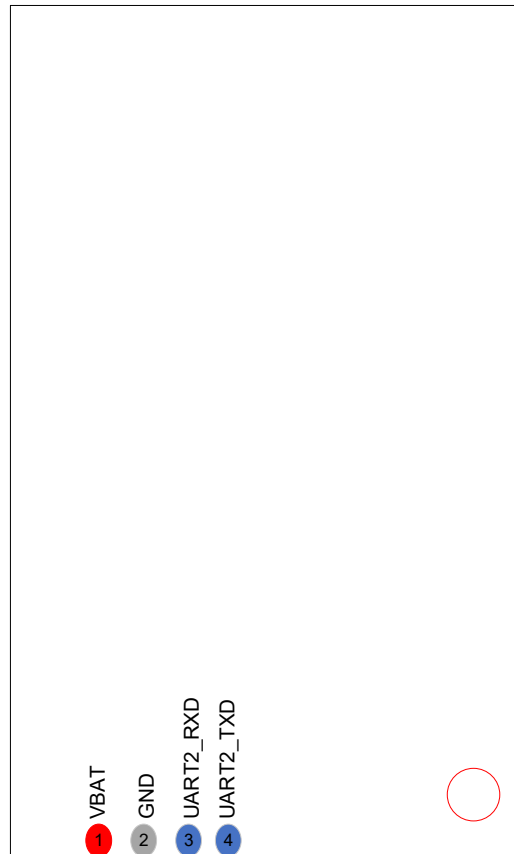


Figure 1: Pin Assignment (Top View)

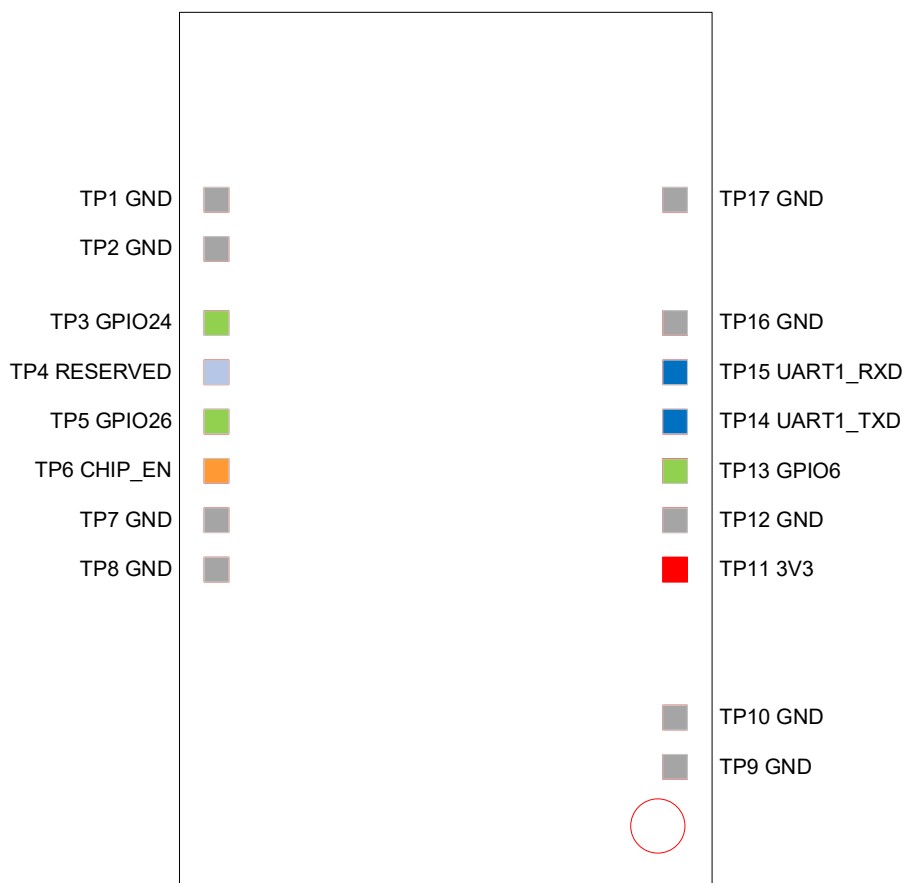


Figure 2: Test Point Allocation Top View

NOTE

1. Keep all unused pins unconnected.
2. All GND pins should be connected to ground.
3. The PCBA provides 1 UART. For more details, see **Chapters 3.3** and **3.4**.

3.2. Pin Definitions

Table 4: Parameter Definition

Parameter	Description
AIO	Analog Input/Output
DI	Digital Input
DO	Digital Output
DIO	Digital Input/Output

PI Power Input

DC characteristics include power domain and rated current.

Table 5: Pin Description

Power Supply and GND Pins					
Pin Name	Pin No.	I/O	Description	DC Characteristics	Comment
VBAT	1	PI	-Power supply for the PCBA	Vmax = 5.5 V Vmin = 4.5 V Vnom = 5.0 V	It is recommended to provide with sufficient current of at least 0.5 A.
GND	2				
UART					
Pin Name	Pin No.	I/O	Description	DC Characteristics	Comment
UART2_RXD	3	DI	Main UART receive	VBAT	
UART2_TXD	4	DO	Main UART transmit		
Test Point	Interfaces				
Test Point Name	Pin No.	I/O	Description	DC Characteristics	Comment
TP1	GND	-			Interrupt wakeup.
TP2	GND	-			
TP3	GPIO24	DIO	General-purpose input/output	3.3V	
TP4	RESERVED	-			
TP5	GPIO26	DIO	General-purpose input/output	3.3V	
TP6	CHIP_EN	DI	General-purpose input	Hardware enablement, reset.	Hardware enable; internally pulled up to 3.3V; high level effective. Pulling down the CHIP_EN test point for at least 100 ms and then releasing it can reset the

PCBA.					
TP7	GND	-			
TP8	GND	-			
TP9	GND	-			
TP10	GND	-			
TP11	3V3	DO	General-purpose output	3.3V	It is for hard supply debugging use, with a maximum current of 0.3 A.
TP12	GND	-			
TP13	GPIO6	DIO	General-purpose input/output		
TP14	UART1_TXD	DO	General-purpose input/output		It can be used for firmware download with a default baud rate of 921600 bps; it can also be used in conjunction with debugging tools to output logs to assist in troubleshooting PCBA anomalies. The voltage domain is 3.3V.
TP15	UART1_RXD	DI	General-purpose input		

3.3. GPIO Multiplexing

The PCBA is defaultly provided with 1 UART interface. The pin definitions are as shown in the table below:

Table 6: GPIO Multiplexing

Pin Name	Pin No.	Alternate Function 0 (GPIO No.)	Alternate Function 1	Alternate Function 2	Alternate Function 3	Alternate Function 4
UART2_RXD	3	GPIO1	-	-	-	
UART2_TXD	4	GPIO0	-	-	-	

NOTE

1. All GPIO can be used as sleep interrupt to wake up (rising edge wake-up) the PCBA which will immediately enter the operating state after being awakened.
2. After the PCBA is powered off, all of its GPIOs must be driven low. Otherwise, the current leakage may make the PCBA enter an abnormal state.

3.4. Application Interfaces

3.4.1. UART

The PCBA provides 1 UART .

Table 7: Pin Definition of UARTs

Pin Name	Pin No.	I/O	Description	Comment
UART2_RXD	3	DI	UART2 received	
UART2_TXD	4	DO	UART2 transmit	

3.4.1.1. UART2

UART2 can be used for data transmission. The default baud rate is 115200 bps, and it can reach up to 6 Mbps at the maximum.

UART2 connection between the PCBA and the MCU is illustrated below.

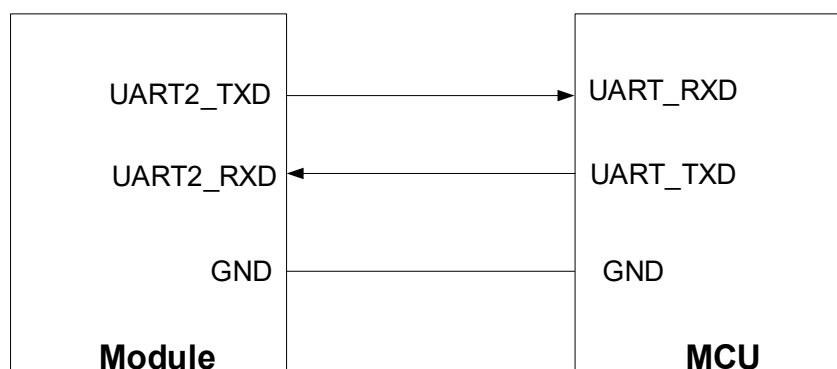


Figure 3: UART2 Reference Design

4 Operating Characteristics

4.1. Power Supply

Power supply pin and ground pins of the PCBA are defined in the following table.

Table 8: Pin Definition of Power Supply and GND Pins

Pin Name	Pin No.	I/O	Description	Min.	Typ.	Max.	Unit
VBAT	1	PI	PCBA main power supply	4.5	5.0	5.5	V
GND	2						

4.1.1. Reference Design for Power Supply

The PCBA is powered by VBAT, and it is recommended to use a power supply chip that can provide sufficient current of at least 0.5 A. For better power supply performance, it is recommended to parallel a 22 μ F decoupling capacitor, and two filter capacitors (1 μ F and 100 nF) near the PCBA's VBAT pin. C4 is reserved for debugging and not mounted by default. In addition, it is recommended to add a TVS near the VBAT to improve the surge voltage bearing capacity of the PCBA. In principle, the longer the VBAT trace is, the wider it should be.

VBAT reference circuit is shown below:

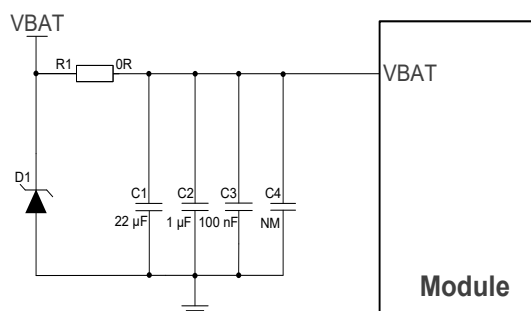


Figure 4: VBAT Reference Circuit

4.2. Turn On

After the PCBA VBAT is powered up, keep the CHIP_EN pin at high level to realize the automatic startup of the PCBA.

Table 9: Test point Definition of CHIP_EN

Test point Name	Function	I/O	Description	Comment
TP6	CHIP_EN	DI	Enable the PCBA	Hardware enable. Internally pulled up to VBAT. Active high.

The turn-on timing is shown below:

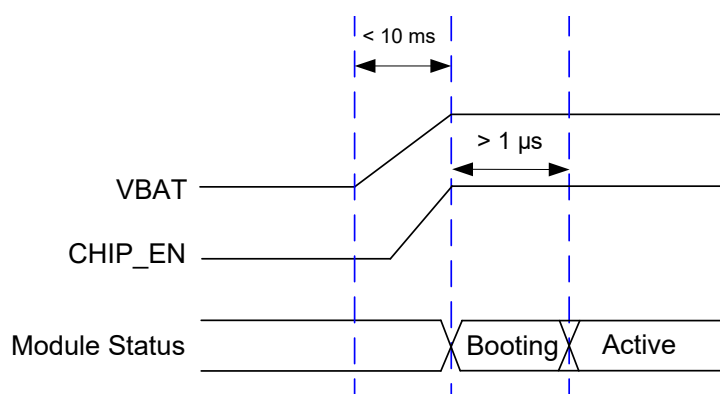


Figure 5: Turn-on Timing

4.3. Reset

When the voltage of CHIP_EN drops below 0.3 V or pull CHIP_EN down for at least 100 ms and then release it, the PCBA can be reset. The reference designs for hardware resetting of the PCBA are shown below. An open collector driving circuit can be used to control the CHIP_EN pin.

Table 10: Test point Definition of CHIP_EN

Test point Name	Function	I/O	Description	Comment
-----------------	----------	-----	-------------	---------

TP6	CHIP_EN	DI	Enable the PCBA	Hardware enable. Internally pulled up to VBAT. Active high.
-----	---------	----	-----------------	---

The reset timing of the PCBA is as shown in the following figure:

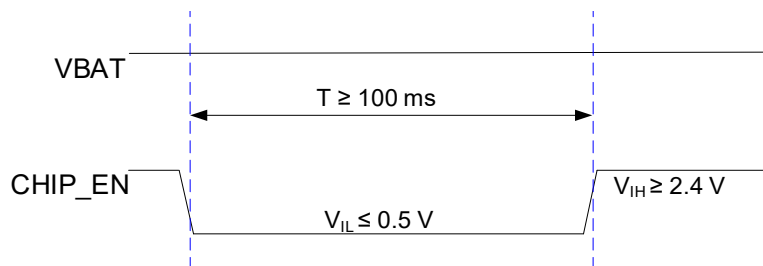


Figure 6: Reset timing diagram

4.4. Download mode

During the PCBA reset or power-on startup process, keep the CHIP_EN pin input at a low level, and the PCBA will enter the download mode. In the download mode, the firmware can be downloaded through UART1. During the hardware design process, connect the PCBA's CHIP_EN pin to the RTS of the serial port chip, or control CHIP_EN through the host GPIO as shown in the waveform below. Otherwise, the download will fail. After the download is completed, the PCBA needs to be restarted to exit the download mode.

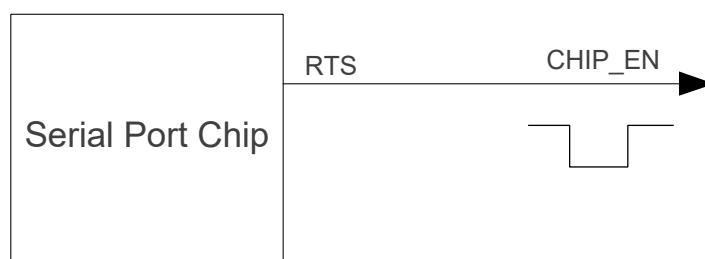


Figure 7: Download mode reference circuit

5 RF Performances

5.1. Wi-Fi Performances

Table 11: Wi-Fi Performances

Operating Frequency			
2.4 GHz: 2.400–2.4835 GHz			
Modulation			
DBPSK, DQPSK, CCK, BPSK, QPSK, 16QAM, 64QAM			
Operating Mode			
- AP - STA			
Encryption Mode			
WPA-PSK, WPA2-PSK, WPA3-PSK, AES-128, TRNG			
Transmission Data Rate			
802.11b: 1 Mbps, 2 Mbps, 5.5 Mbps, 11 Mbps 802.11g: 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps 802.11n: HT20 (MCS 0– MCS 7)			
Condition (VBAT = 5V; Temp: 25 °C)	EVM	Typ.; Unit: dBm, Tolerance: ±2 dB	
		Transmit Power	Receiver Sensitivity
2.4 GHz	≤ 35 %	802.11b @ 1 Mbps	17
		802.11b @ 11 Mbps	-97
	≤ -5 dB	802.11g @ 6 Mbps	17
		802.11g @ 54 Mbps	-89
	≤ -25 dB	802.11n, HT20 @ MCS 0	16
	≤ -5 dB		-91
			-75
			-90

802.11n, HT20 @ MCS 7	≤ -27 dB	14	-72
-----------------------	----------	----	-----

5.2. Bluetooth Performances

Table 12: Bluetooth Performances

Operating Frequency		
2.400–2.4835 GHz		
Modulation		
GFSK		
Operating Mode		
BLE		
Condition (VBAT = 5 V; Temp: 25 °C)	Typ.; Unit: dBm, Tolerance: ±2 dB ⁴	
	Transmit Power	Receiver Sensitivity
BLE (1 Mbps)	6	-96
BLE (2 Mbps)	6	-94
BLE (S = 2)	6	-96
BLE (S = 8)	6	-101

⁴ The tolerance for Bluetooth receiver sensitivity is ±4 dB at high channel (CH39).

5.3. Antenna/Antenna Interfaces ⁵

The PCBA is provided with one of the three antenna/antenna interface designs: pin antenna interface (ANT_WIFI/BT), PCB antenna and RF coaxial connector. The RF coaxial connector is not available when the PCBA is designed with ANT_WIFI/BT antenna interface or PCB antenna. The impedance of antenna port is 50 Ω .

Appropriate antenna type and design should be used with matched antenna parameters according to specific application. It is required to perform a comprehensive functional test for the RF design before mass production of terminal products. The entire content of this chapter is provided for illustration only. Analysis, evaluation and determination are still necessary when designing target products.

5.3.1. PCB Antennae

Table 13: ANT_WIFI/BT Pin Definition

Parameter	Require
Frequency range (GHz)	2.4 GHz: 2.400~2.500
Input impedance (Ω)	50
VSWR	<1.4
Gain (dBi)	2.9
Efficiency	69.9%

5.3.2. RF Coaxial Connector

5.3.2.1. Receptacle Specifications

The mechanical dimensions of the receptacle supported by the PCBA are as follows.

⁵ The PCBA is provided with one of the three antenna/antenna interface designs. For more details, please contact Quectel Technical Support.

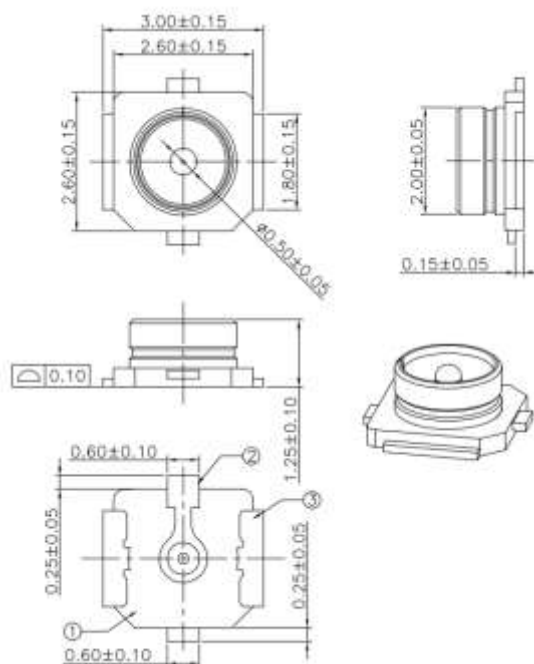


Figure 8: Dimensions of the Receptacle (Unit: mm)

Table 14: Major Specifications of the RF Connector

Item	Specification
Nominal Frequency Range	DC to 6 GHz
Nominal Impedance	50 Ω
Temperature Rating	-40 °C to +105 °C
Voltage Standing Wave Ratio (VSWR)	Meet the requirements of: Max. 1.3 (DC–3 GHz) Max. 1.45 (3–6 GHz)

5.3.2.2. Antenna Connector Installation

The receptacle mounted on the PCBA accepts two types of mated plugs that will meet a maximum height of 2.0 mm using a $\varnothing$ 0.81 mm coaxial cable or a maximum height of 2.2 mm utilizing a $\varnothing$ 1.13 mm coaxial cable.

The following figure shows the dimensions of mated plugs using $\varnothing$ 0.81 mm coaxial cables.

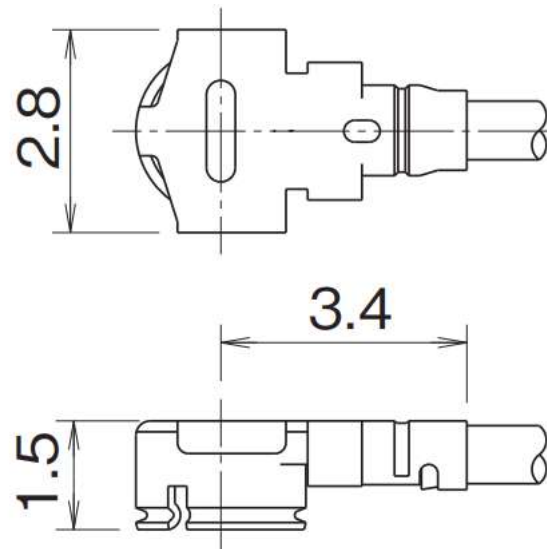


Figure 9: Dimensions of Mated Plugs (Ø 0.81 Coaxial Cables) (Unit: mm)

The following figure illustrates the connection between the receptacle on the PCBA and the mated plug using a Ø 0.81 mm coaxial cable.

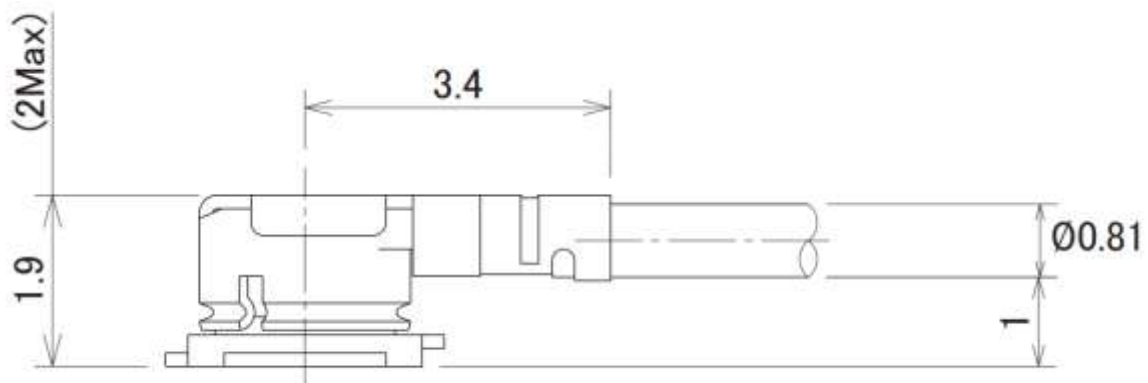


Figure 10: Space Factor of Mated Connectors (Ø 0.81 mm Coaxial Cables) (Unit: mm)

The following figure illustrates the connection between the receptacle mounted on the PCBA and the mated plug using a Ø 1.13 mm coaxial cable.

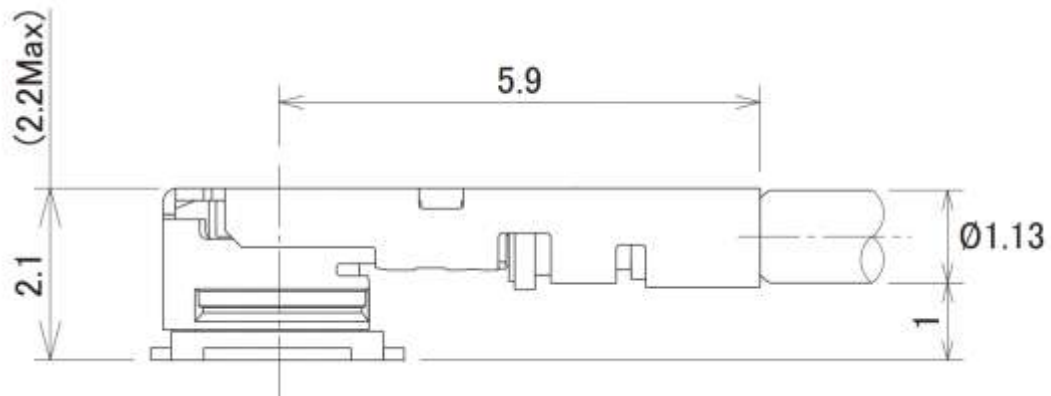


Figure 11: Space Factor of Mated Connectors (Ø 1.13 mm Coaxial Cables) (Unit: mm)

5.3.2.3. Recommended Manufacturers of RF Connector and Cable

RF connectors and cables by I-PEX are recommended. For more details, visit <https://www.i-pex.com>.

5.3.3. Antenna Design Requirements

Table 15:Antenna Design Requirements

Antenna Type	Requirement
Pin Antenna Interface, RF Coaxial Connector	● Frequency Range: 2.400–2.4835 GHz
	● VSWR: ≤ 2 (Typ.)
	● Max. Input Power: 50 W
	● Input Impedance: 50 Ω
	● Vertical Polarization
	● Cable Insertion Loss: < 1 dB

5.4. Structural Component

5.4.1. Recommended Wire-to-Board Connectors

The 4-pin wire-to-board connector provided by the PCBA is model KRC1501RS104T01RA. Its dimensions are as follows:

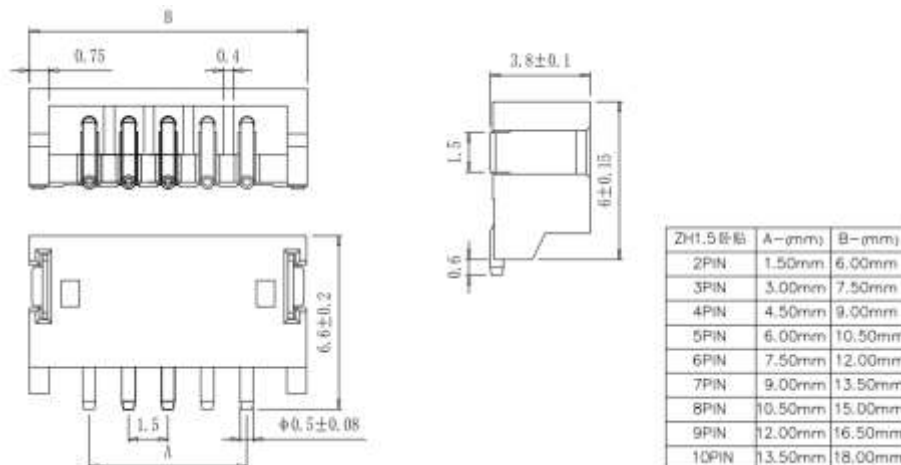


Figure 12: Diagram of wire-to-board connector (unit: mm)

6 Electrical Characteristics & Reliability

6.1. Absolute Maximum Ratings

Table 16: Absolute Maximum Ratings (Unit: V)

Parameter	Min.	Max.
VBAT	-0.3	5.5
Voltage at Digital Pins	-0.3	5.5

6.2. Power Supply Ratings

Table 17: PCBA Power Supply Ratings (Unit: V)

Parameter	Description	Condition	Min.	Typ.	Max.
VBAT	Power supply for the PCBA	The actual input voltages must be kept between the minimum and maximum values.	4.5	5.0	5.5

6.3. ESD Protection

Static electricity occurs naturally and may damage the PCBA. Therefore, applying proper ESD countermeasures and handling methods is imperative. For example, wear anti-static gloves during the development, production, assembly and testing of the PCBA; add ESD protection components to the ESD sensitive interfaces and points in the product design.

Table 18: ESD Characteristics (Unit: kV)

Model	Test Result	Standard
Human Body Model (HBM)	± 4	<i>ANSI/ESDA/JEDEC JS-001-2017</i>
Charged Device Model (CDM)	± 0.25	<i>ANSI/ESDA/JEDEC JS-002-2018</i>

7 Mechanical Information

This chapter describes the mechanical dimensions of the PCBA. All dimensions are measured in millimeters (mm), and the dimensional tolerances are ± 0.2 mm unless otherwise specified.

7.1. Mechanical Dimensions

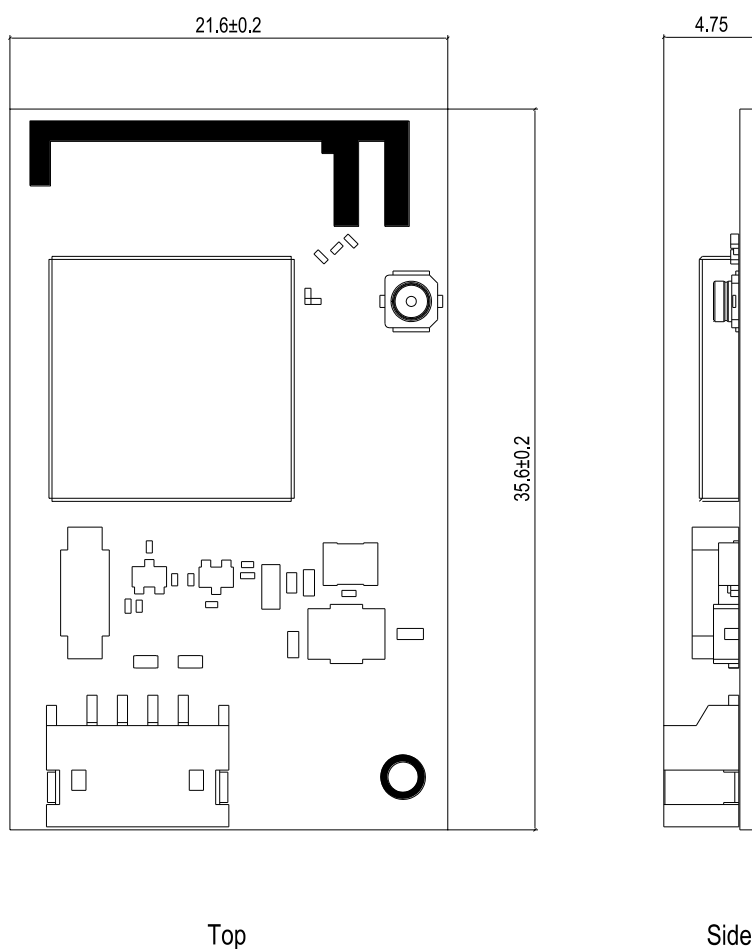
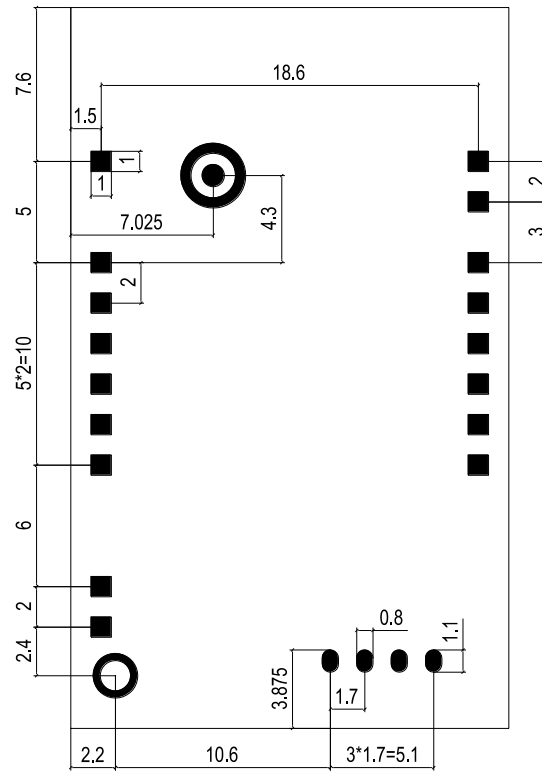


Figure 13: Top and Side Dimensions



Bot

Figure 14: Bottom Dimensions (Bottom View)

NOTE

The coplanarity standard: ≤ 0.13 mm.

7.2. Top and Bottom Views

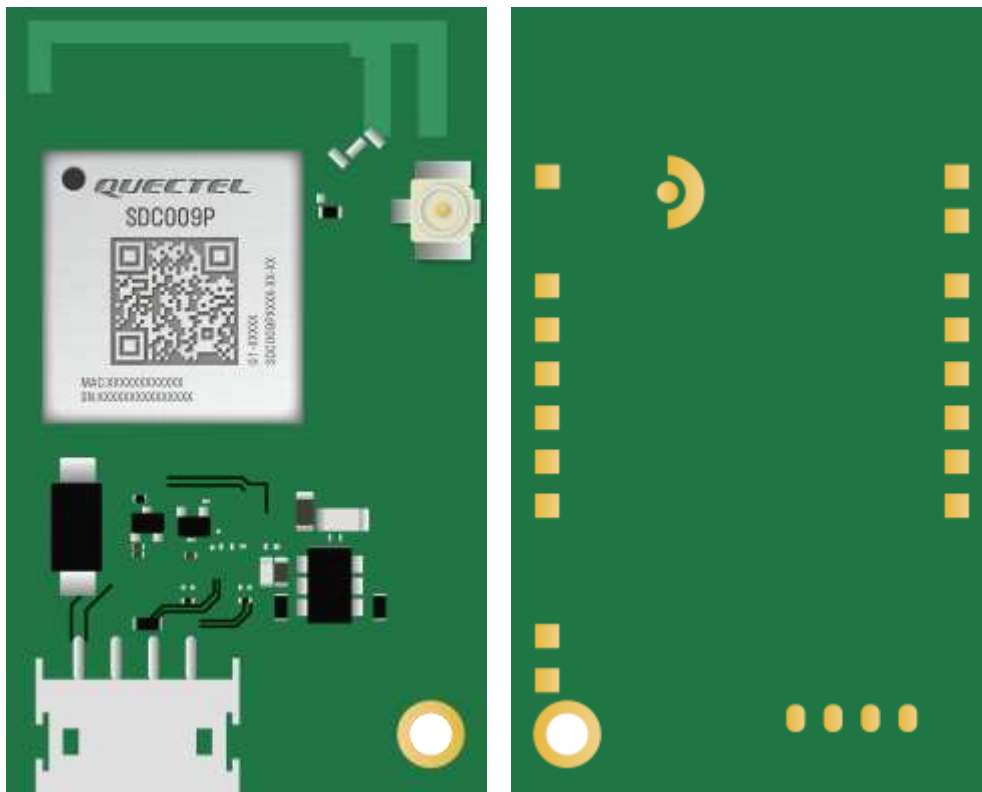


Figure 15:Top and Bottom Views

NOTE

1. The above picture is for reference only. For the actual product appearance and label information, please refer to the physical PCBA of Miao Yuan Communication.
2. When using PCB antennas, no RF coaxial antenna socket is soldered on the PCBA.

8 Storage, Manufacturing & Packaging

8.1. Storage Conditions

The PCBA is provided with vacuum-sealed packaging. MSL of the PCBA is rated as 3. The storage requirements are shown below.

1. Recommended Storage Condition: the temperature should be 23 ± 5 °C and the relative humidity should be 35–60 %.
2. Shelf life (in a vacuum-sealed packaging): 12 months in Recommended Storage Condition.

NOTE

1. To avoid blistering, layer separation and other soldering issues, extended exposure of the PCBA to the air is forbidden.
2. Take out the PCBA from the package and put it on high-temperature-resistant fixtures before baking. If shorter baking time is desired, see *IPC/JEDEC J-STD-033* for the baking procedure.
3. Pay attention to ESD protection, such as wearing anti-static gloves, when touching the PCBA.

8.2. Packaging Specifications

TBD

9 Appendix References

Table 19: Reference Documents

Document Name
[1] Quectel_FCM242D_TE-B_User_Guide
[2] Quectel_RF_Layout_Application_Note
[3] Quectel_PCBA_Stencil_Design_Requirements
[4] Quectel_PCBA_SMT_Application_Note

Table 20: Terms and Abbreviations

Abbreviation	Description
ADC	Analog-to-Digital Converter
AES	Advanced Encryption Standard
AP	Access Point
BLE	Bluetooth Low Energy
BPSK	Binary Phase Shift Keying
CCK	Complementary Code Keying
CDM	Charged Device Model
DSSS	Direct Sequence Spread Spectrum
ESD	Electrostatic Discharge
EVM	Error Vector Magnitude
GFSK	Gauss frequency Shift Keying
GND	Ground

GPIO	General-Purpose Input/Output
HT	High Throughput
I/O	Input/Output
I2C	Inter-Integrated Circuit
IEEE	Institute of Electrical and Electronics Engineers
IoT	Internet of Things
LCC	Leadless Chip Carrier (package)
Mbps	Million Bits Per Second
MCU	Microcontroller Unit
MISO	Master In Slave Out
MOSI	Master Out Slave In
OTA	Over-the-Air
PCB	Printed Circuit Board
PSK	Pre-Shared Key
PWM	Pulse Width Modulation
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RAM	Random Access Memory
RF	Radio Frequency
RoHS	Restriction of Hazardous Substances
SMD	Surface Mount Device
SMT	Surface Mount Technology
SPI	Serial Peripheral Interface
STA	Station
TRNG	True Random Number Generator
TVS	Transient Voltage Suppressor
Tx	Transmit

UART	Universal Asynchronous Receiver/Transmitter
(U)SIM	(Universal) Subscriber Identity PCBA
V_{IH}	High-level Input Voltage
V_{IL}	Low-level Input Voltage
V_{max}	Maximum Voltage
V_{min}	Minimum Voltage
V_{nom}	Nominal Voltage Value
V_{OH}	High-level Output Voltage
V_{OL}	Low-level Output Voltage
VSWR	Voltage Standing Wave Ratio
WPA	Wi-Fi Protected Access

Hereby, Quectel Wireless Solutions Co., Ltd. declares that the radio equipment type SDC009P is in compliance with Directive 2014/53/EU. This product can be used across EU member states.

The full text of the EU declaration of conformity is available at the following internet address:
<http://www.quectel.com/support/technical.htm>

Disposal of old electrical appliances



The European directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE), requires that old household electrical appliances must not be disposed of in the normal unsorted municipal waste stream. Old appliances must be collected separately in order to optimize the recovery and recycling of the materials they contain, and reduce the impact on human health and the environment.

The crossed out "wheeled bin" symbol on the product reminds you of your obligation, that when you dispose of the appliance, it must be separately collected.

Consumers should contact their local authority or retailer for information concerning the correct disposal of their old appliance.

This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

FCC Certification Requirements.

According to the definition of mobile and fixed device is described in Part 2.1091(b), this device is a mobile device.

And the following conditions must be met:

1. This PCBA Approval is limited to OEM installation for mobile and fixed applications only. The antenna installation and operating configurations of this transmitter, including any applicable source-based time-averaging duty factor, antenna gain and cable loss must satisfy MPE categorical Exclusion

Requirements of 2.1091.

2. The EUT is a mobile device; maintain at least a 20 cm separation between the EUT and the user's body and must not transmit simultaneously with any other antenna or transmitter.

3. A label with the following statements must be attached to the host end product: This device contains FCC ID: XMR2026SDC009P.

4. To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, maximum antenna gain (including cable loss) must not exceed:

WIFI 2.4G/BLE:2.9dBi

5. This PCBA must not transmit simultaneously with any other antenna or transmitter.

6. The host end product must include a user manual that clearly defines operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.

For portable devices, in addition to the conditions 3 through 6 described above, a separate approval is required to satisfy the SAR requirements of FCC Part 2.1093

If the device is used for other equipment that separate approval is required for all other operating configurations, including portable configurations with respect to 2.1093 and different antenna configurations.

For this device, OEM integrators must be provided with labeling instructions of finished products. Please refer to KDB784748 D01 v07, section 8. Page 6/7 last two paragraphs:

A certified PCBA has the option to use a permanently affixed label, or an electronic label. For a permanently affixed label, the module must be labeled with an FCC ID - Section 2.926 (see 2.2 Certification (labeling requirements) above). The OEM manual must provide clear instructions explaining to the OEM the labeling requirements, options and OEM user manual instructions that are required (see next paragraph).

For a host using a certified PCBA with a standard fixed label, if (1) the PCBA's FCC ID is not visible when installed in the host, or (2) if the host is marketed so that end users do not have straightforward commonly used methods for access to remove the PCBA so that the FCC ID of the module is visible; then an additional permanent label referring to the enclosed PCBA: "Contains Transmitter PCBA FCC ID: XMR2026SDC009P." or "Contains FCC ID: XMR2026SDC009P." must be used. The host OEM user manual must also contain clear instructions on how end users can find and/or access the PCBA and the FCC ID.

The final host / PCBA combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

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.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

IC Certification Requirements.

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

To comply with IC regulations limiting both maximum RF output power and human exposure to RF radiation, maximum antenna gain (including cable loss) must not exceed:

WIFI 2.4G/BLE:2.9dBi

L'appareil contient un émetteur / récepteur exempté de licence conforme au CNR exempté de licence d'innovation, sciences et développement économique Canada. Les opérations sont soumises aux deux conditions suivantes:

1. Cet appareil peut ne pas causer d'interférence.

L'appareil doit accepter toute interférence, y compris celles qui peuvent entraîner un fonctionnement indésirable de l'appareil.

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. To comply with RSS-102 RF Exposure compliance requirements, this grant is applicable to only Mobile Configurations. The antennas used for the transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

The host product shall be properly labelled to identify the modules within the host product.

The Innovation, Science and Economic Development Canada certification label of a module shall be clearly visible at all times when installed in the host product; otherwise, the host product must be labeled to display the Innovation, Science and Economic Development Canada certification number for the module, preceded by the word "Contains" or similar wording expressing the same meaning, as follows: "Contains IC: 10224A-26SDC009P" or "where: 10224A-26SDC009P is the module's certification number".