

# R9A06G062GNP

RTK0EE0013D10002BJ User's Manual

Sub-GHz Wireless Communication Evaluation Kit  
For Europe

Rev.1.02

All information contained in these materials, including products and product specifications, represents information on the product at the time of publication and is subject to change by Renesas Electronics Corp. without notice. Please review the latest information published by

## Notice

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation or any other use of the circuits, software, and information in the design of your product or system. Renesas Electronics disclaims any and all liability for any losses and damages incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics hereby expressly disclaims any warranties against and liability for infringement or any other claims involving patents, copyrights, or other intellectual property rights of third parties, by or arising from the use of Renesas Electronics products or technical information described in this document, including but not limited to, the product data, drawings, charts, programs, algorithms, and application examples.
3. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You shall be responsible for determining what licenses are required from any third parties, and obtaining such licenses for the lawful import, export, manufacture, sales, utilization, distribution or other disposal of any products incorporating Renesas Electronics products, if required.
5. You shall not alter, modify, copy, or reverse engineer any Renesas Electronics product, whether in whole or in part. Renesas Electronics disclaims any and all liability for any losses or damages incurred by you or third parties arising from such alteration, modification, copying or reverse engineering.
6. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The intended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.

"Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; industrial robots; etc.

"High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control (traffic lights); large-scale communication equipment; key financial terminal systems; safety control equipment; etc.

Unless expressly designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not intended or authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems; surgical implantations; etc.), or may cause serious property damage (space system; undersea repeaters; nuclear power control systems; aircraft control systems; key plant systems; military equipment; etc.). Renesas Electronics disclaims any and all liability for any damages or losses incurred by you or any third parties arising from the use of any Renesas Electronics product that is inconsistent with any Renesas Electronics data sheet, user's manual or other Renesas Electronics document.

7. No semiconductor product is absolutely secure. Notwithstanding any security measures or features that may be implemented in Renesas Electronics hardware or software products, Renesas Electronics shall have absolutely no liability arising out of any vulnerability or security breach, including but not limited to any unauthorized access to or use of a Renesas Electronics product or a system that uses a Renesas Electronics product. RENESAS ELECTRONICS DOES NOT WARRANT OR GUARANTEE THAT RENESAS ELECTRONICS PRODUCTS, OR ANY SYSTEMS CREATED USING RENESAS ELECTRONICS PRODUCTS WILL BE INVULNERABLE OR FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION ("Vulnerability Issues"). RENESAS ELECTRONICS DISCLAIMS ANY AND ALL RESPONSIBILITY OR LIABILITY ARISING FROM OR RELATED TO ANY VULNERABILITY ISSUES. FURTHERMORE, TO THE EXTENT PERMITTED BY APPLICABLE LAW, RENESAS ELECTRONICS DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THIS DOCUMENT AND ANY RELATED OR ACCOMPANYING SOFTWARE OR HARDWARE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.
8. When using Renesas Electronics products, refer to the latest product information (data sheets, user's manuals, application notes, "General Notes for Handling and Using Semiconductor Devices" in the reliability handbook, etc.), and ensure that usage conditions are within the ranges specified by Renesas Electronics with respect to maximum ratings, operating power supply voltage range, heat dissipation characteristics, installation, etc. Renesas Electronics disclaims any and all liability for any malfunctions, failure or accident arising out of the use of Renesas Electronics products outside of such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of Renesas Electronics products, semiconductor products have specific characteristics, such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Unless designated as a high reliability product or a product for harsh environments in a Renesas Electronics data sheet or other Renesas Electronics document, Renesas Electronics products are not subject to radiation resistance design. You are responsible for implementing safety measures to guard against the possibility of bodily injury, injury or damage caused by fire, and/or danger to the public in the event of a failure or malfunction of Renesas Electronics products, such as safety design for hardware and software, including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult and impractical, you are responsible for evaluating the safety of the final products or systems manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. You are responsible for carefully and sufficiently investigating applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive, and using Renesas Electronics products in compliance with all these applicable laws and regulations. Renesas Electronics disclaims any and all liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. Renesas Electronics products and technologies shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You shall comply with any applicable export control laws and regulations promulgated and administered by the governments of any countries asserting jurisdiction over the parties or transactions.
12. It is the responsibility of the buyer or distributor of Renesas Electronics products, or any other party who distributes, disposes of, or otherwise sells or transfers the product to a third party, to notify such third party in advance of the contents and conditions set forth in this document.
13. This document shall not be reprinted, reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
14. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products.

(Note1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its directly or indirectly controlled subsidiaries.

(Note2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

(Rev.5.0-1 October 2020)

## Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan

[www.renesas.com](http://www.renesas.com)

## Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

## Contact information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:  
[www.renesas.com/contact/](http://www.renesas.com/contact/).

## General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

### 1. Precaution against Electrostatic Discharge (ESD)

A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity.

Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

### 2. Processing at power-on

The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

### 3. Input of signal during power-off state

Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

### 4. Handling of unused pins

Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

### 5. Clock signals

After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

### 6. Voltage application waveform at input pin

Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between  $V_{IL}$  (Max.) and  $V_{IH}$  (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between  $V_{IL}$  (Max.) and  $V_{IH}$  (Min.).

### 7. Prohibition of access to reserved addresses

Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

### 8. Differences between products

Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems.

The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

# How to Use This Manual

## 1. Purpose and Target Readers

This manual is intended to give users an understanding of the basic specifications and correct usage of this product. This manual is intended for users who want to use this product to evaluate the MCU and debug programs. The readers of this manual are expected to have knowledge of the MCU functions and debuggers.

Particular attention should be paid to the precautionary notes when using the manual. These notes occur within the body of the text, at the end of each section, and in the Usage Notes section.

The revision history summarizes the locations of revisions and additions. It does not list all revisions. Refer to the text of the manual for details.

The following documents apply to RTK0EE0013D10002BJ. Be sure to refer to the latest versions of these documents. The newest versions of the listed documents are available on the Renesas Electronics Web site.

Document Type	Description	Document Title	Document No.
User's manual	RTK0EE0013D10002BJ hardware specifications	RTK0EE0013D10002BJ User's Manual	R02UZ0005EJ (this manual)
Design data	RTK0EE0013D10002BJ Circuit schematics Parts list	RTK0EE0013D10002BJ Circuit schematics Parts list	R02AN0048EJ
User's manual for R9A06G062GNP	Hardware specifications (pin assignments, peripheral function specifications, electrical characteristics, timing charts) and descriptions of operation	R9A06G062GNP Sub-GHz Transceiver User's Manual: Hardware	R02UH0006EJ
RX65N User's manual for the hardware	Hardware specifications (pin assignments, memory maps, peripheral function specifications, electrical characteristics, timing charts) and descriptions of operation	RX65N Group User's Manual: Hardware	R01UH0590EJ
ISL80510 Datasheet	Hardware specifications (pin assignments, electrical characteristics) and descriptions of operation	ISL80510 Datasheet	FN8767
ISL9005A Datasheet	Hardware specifications (pin assignments, electrical characteristics) and descriptions of operation	ISL9005A Datasheet	FN6452

# Table of Contents

1. Overview.....	4
1.1 Package Components.....	4
1.2 Purpose.....	4
1.3 Features.....	4
1.4 Sub-GHz Wireless Communication Evaluation Kit: Table of Specifications .....	4
1.5 Block Diagram.....	5
2. External view .....	6
3. Parts Layout .....	7
4. Operating Environment.....	8
4.1 Virtual COM Port USB Driver.....	8
4.2 Serial Terminal Software .....	8
5. User Circuits .....	9
5.1 DIP switch .....	9
5.2 Connection of control MCU(RX65N) and wireless transceiver IC (CWX-M).....	9
6. Wireless evaluation.....	10
6.1 Serial terminal software connection settings .....	10
6.2 Command specification.....	10
7. Hardware specifications.....	13
7.1 Europe Band .....	13
7.1.1 OFDM、Channel Spacing = 200KHz、Modulation = Option4 / MCS6 / 300kbps.....	13
7.1.2 FSK、Channel Spacing = 100KHz、50kbps / m = 0.5.....	14
7.1.3 FSK、Channel Spacing = 200KHz、100kbps / m = 0.5.....	14
8. Additional Information .....	15
9. Certification of Compliance .....	16
9.1 Radio-Related Laws.....	16
9.1.1 EU Compliance information .....	16
9.1.2 UK Compliance information .....	16

## 1. Overview

### 1.1 Package Components

Thank you for purchasing the Sub-GHz Wireless Communication Evaluation Kit from Renesas (hereinafter referred to as "this product"). This product consists of the Target Board for Sub-GHz Wireless Communication Evaluation Kit (RTK0EE0013D10002BJ)

### 1.2 Purpose

This product is an evaluation tool for a Sub-GHz Wireless Communication Solutions. This manual describes hardware specifications.

### 1.3 Features

This product includes the following features:

- Sub-GHz Wireless Communication evaluation  
This product offers sub-GHz wireless communication solutions with CE(REDA) of Europe to help you easily start developing your application.

### 1.4 Sub-GHz Wireless Communication Evaluation Kit: Table of Specifications

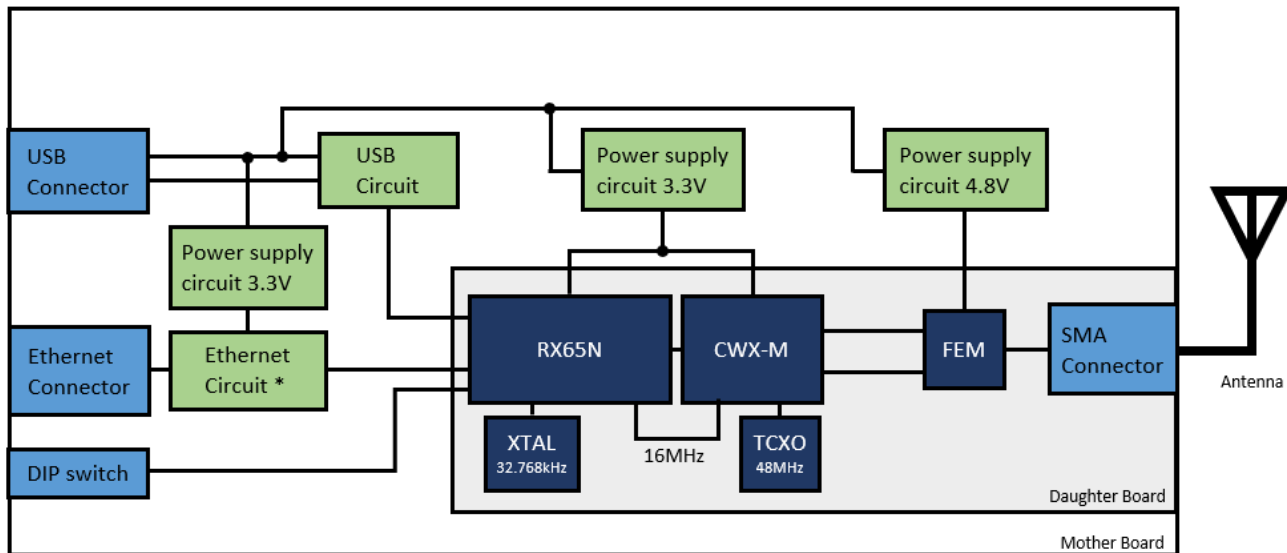
Table 1-1 shows the specifications of this product.

**Table 1-1: Sub-GHz Wireless Communication Evaluation Kit Specification Table**

Item	Specification
Enclosure size	Size: 92.0mm x 66.5mm x 28.0mm
Operating ambient temperature	-10 to +60°C
Power-supply circuit	USB connector: 5-V input
Transceiver IC (CWX-M)	Part Number: R9A06G062GNP (Renesas) Package: 40-Pin HVQFN
Control MCU (RX65N)	Part Number: R5F565NEDDFP (Renesas) Package: 100pin LQFP
Power-supply IC	Part Number: ISL80510 (Renesas) Part Number: ISL9005A (Renesas)
FEM	Part Number: SKY66122-11(Skyworks)
Control MCU/ Main clock	Connected to CKOUT pin of CWX-M (16MHz)
Control MCU/ Sub-clock	Crystal oscillator for the sub-clock (32.768KHz)
Wireless function	Sub-GHz Wireless circuit Europe band: 863 to 870MHz (CE) Modulation Method: FSK / OFDM
USB : Type-C USB bus power (DC5.0V/3.0A) USB2.0	Connector for an on-board emulator: USB Connector for a USB serial-conversion interface
Setting of USB Mode	DIP switch x1
Ethernet	Part Number: LAN8720A (Microchip) Note: The Ethernet function is disabled on this product.
Antenna	Part Number: W1063M (Pulse Electronics)

### 1.5 Block Diagram

Figure 1-1 shows the block diagram of this product.



\*Ethernet function is disabled.

Figure 1-1: Block Diagram

## 2. External view

Figure 2-1 shows the external view of this product.



Figure 2-1: External view

**Note:**

Never disassemble or remodel this product.



### 3. Parts Layout

Figure 3-1 shows the parts layout of this product.

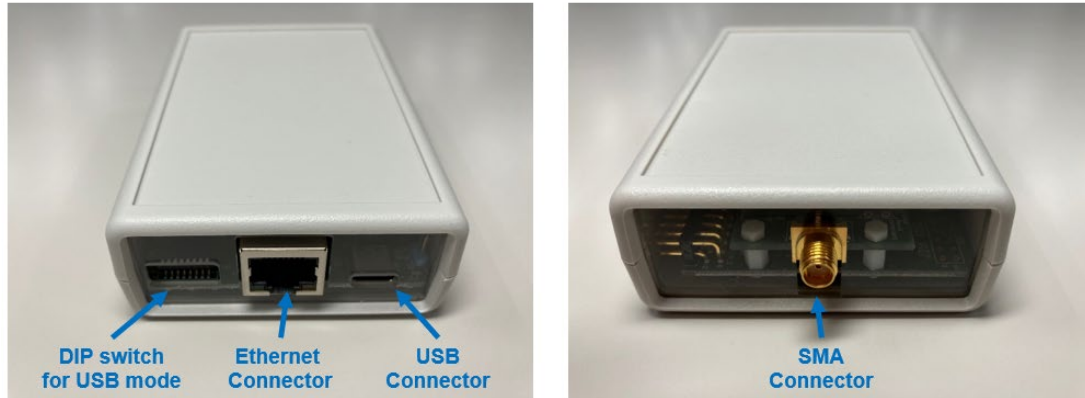


Figure 3-1: Parts Layout

Connect the antenna provided with the product to SMA connector on this product



Figure 3-2: Antenna connection diagram

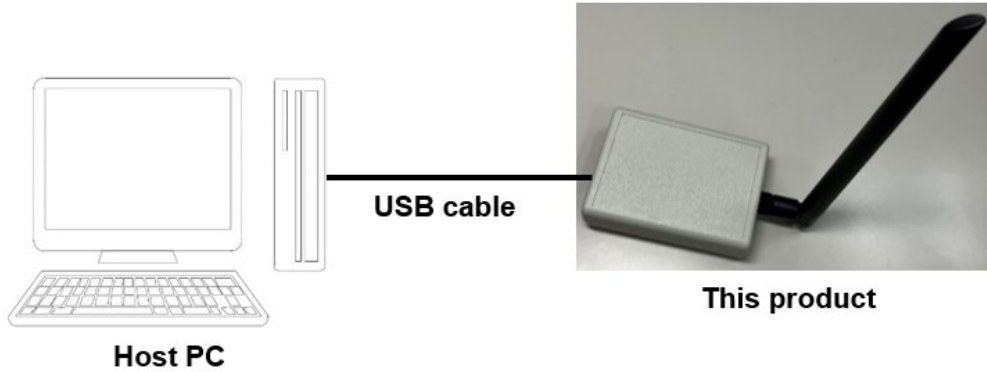
This product includes Sub-GHz wireless function.

**Note:**

Never use an antenna other than the antenna provided with the product, as it violates the radio-related laws.

## 4. Operating Environment

**Figure 4-1** shows the operating environment of this product. Install “Virtual COM Port USB Driver” on the host PC. In addition, install the serial terminal software as it will be used for wireless evaluation.



**Figure 4-1: Operating Environment**

### 4.1 Virtual COM Port USB Driver

If your PC is connected to the Internet, Windows Update will automatically install the latest driver. Please wait until you see the following pop-up message: Your device is ready to use. If you have not yet installed the driver on your PC, Download and install the driver. Virtual COM port drivers can be downloaded from the FTDI website. FTDI manufactures USB chips embedded in this product.

FTDI website : <http://www.ftdichip.com/Drivers/VCP.htm>

### 4.2 Serial Terminal Software

The serial terminal software enables data to be input to and output from a serial console. The serial terminal settings are as shown in **Table 4-1**.

**Table 4-1: Serial Terminal Settings**

Setting item	Setting value
Baud rate	500000 bps
Data	8 bits
Parity	None
Stop bit	1 bit
Flow control	Not used
Newline code	Reception: LF or AUTO Transmission: CR+LF or LF
Local echo	Enabled

**Note:**


Windows does not come with serial terminal software. Please use the free terminal software of your choice.

## 5. User Circuits

### 5.1 DIP switch

Set the following when evaluating (normal mode).

**Table 5-1: DIP switch Settings**

Mode	DIP switch Settings
Evaluation (normal mode)	ON:1,2 OFF:3,4,5,6,7,8 

### 5.2 Connection of control MCU(RX65N) and wireless transceiver IC (CWX-M)

**Table 5-2: Connection of control MCU(RX65N) and wireless transceiver IC (CWX-M)**

Control MCU(RX65N)	Transceiver IC (CWX-M)	Note
RSTB	P46	CWX-M reset control
MODE	P47	CWX-M operation mode control
INTOUT0	PD5	CWX-M GPIO0
INTOUT1	PD6	CWX-M GPIO1 *1
INTOUT2	PD7	CWX-M GPIO2 *1
CLK	PD3	SPI Serial clock *2
SEN	PD4	SPI Slave select *2
SIN	PD1	SPI MOSI(Master Out Slave In) *2
SOUT	PD2	SPI MISO(Master In Slave Out) *2

\*1 Reserved for option use.

\*2 RX65N is master device.

## 6. Wireless evaluation

### 6.1 Serial terminal software connection settings

1. Connect the host PC and this product with a USB cable.
2. Check which COM port the USB of this product is assigned to using the device manager.
3. Start up the serial terminal software and set serial port.

### 6.2 Command specification

1. When the sample program is started, it enters "command menu mode" and is ready to accept commands. **Table 6-1** shows the command list of sample program.
2. To execute the function of a command, enter the command and then press the return key. When the command has an argument, enter the command, a space and the argument, and then press the return key.

**Table 6-1:** Command list of sample program

Command	Function	Argument
tboot	Renesas Sub-GHz transceiver bootstrapping	Boot mode
tinit	Test function initialization and reset Renesas Sub-GHz transceiver	(None)
tope	PHY operation mode setting	FSK/OFDM operation mode Prohibit the use in modes other than the following. tope FSK EU FSKwoFEC 1a 32 tope FSK EU FSKwoFEC 2a 33 tope OFDM EU OFDMOP4 MCS6 33
tch	Channel number setting	Channel number
txpow	FSK and OFDM transmission output power setting	Transmission output power value (Index number)
txpowd	FSK and OFDM transmission output power setting (dBm)	Transmission output power value (dBm)
ttxpowd	FSK transmission output power setting (dBm)	FSK transmission output power value (dBm)
totxpowd	OFDM transmission output power setting (dBm)	OFDM transmission output power value (dBm)
trxgain	External gain setting for reception signal	External gain value for RF input signal
trxgaind	External gain setting for reception signal	External gain value for RF input signal(dBm)
tfrlen	Transmission packet length setting	Transmission packet length
ti	Continuous transmission interval time setting	Continuous transmission interval time setting
txopt	Transmission option setting	Transmission option
tsfd	FSK SFD mode setting	FSK SFD mode
tfpl	FSK Preamble length setting	FSK Preamble length
tdw	FSK Data whitening option setting	FSK Data whitening option
tffcs	FSK FCS length setting	FSK FCS length
tfscheme	FSK FEC scheme setting	FSK FEC Scheme
tffecrx	FSK Reception packet FEC setting	FSK FEC setting
tofcs	OFDM FCS length setting	FSK FCS length (CRC bit width)
tointl	OFDM Interleaving mode setting	Interleaving mode
toscr	OFDM Scrambler value setting	OFDM Scrambler value
tostf	OFDM STF length setting	OFDM STF length

tccam	CCA mode setting	CCA mode
tfcdr	CCA duration setting for FSK	CCA duration for FSK
tfccavt	CCA level threshold for FSK	CCA level threshold value for FSK
tfccavtd	CCA level threshold for FSK in dBm	CCA level threshold value (dBm) for FSK
tocdr	CCA duration setting for OFDM	CCA duration for OFDM
toccavt	CCA level threshold for OFDM	CCA level threshold value for OFDM
toccavtd	CCA level threshold for OFDM in dBm	CCA level threshold value (dBm) for OFDM
tgpios	GPIO terminal setting	GPIO terminal function
tgpio	Get the current settings of the GPIO terminal	(None)
tgpioo	GPIO output port voltage level setting	GPIO output port voltage level
tgpioi	Get the GPIO input port voltage level	GPIO port number
tberlen	Frame length for RX BER setting	Frame length for RX BER
tberpn9	PN9 mode for BER setting	PN9 mode for BER
tffh	Frequency hopping transmission (FSK)	Setting for frequency hopping transmission
tofh	Frequency hopping transmission (OFDM)	Setting for frequency hopping transmission
ram	RAM read and write mode	read and write mode setting
reg	Register read and write mode	read and write mode setting
tftx	FSK Packet transmission	Number of transmissions
totx	OFDM Packet transmission	Number of transmissions
tfpn9	FSK PN9 continuous modulated transmission	(None)
topn9	OFDM PN9 continuous modulated transmission	(None)
tnmtx	Continuous unmodulated transmission	(None)
tfrx	FSK Packet reception	Reception option
torx	OFDM Packet reception	Reception option
te	ED measurement	(None)
tcca	CCA execution	(None)
tmstxs	Tx setting for ModeSwitch & New Mode Frame	Setting option
tmstx	ModeSwitch & New Mode Frame transmission	Number of transmissions
tmsrxs	Rx setting for ModeSwitch & New Mode Frame	Setting option
tmsrx	ModeSwitch & New Mode Frame reception	Reception options
tttl	Regulation mode setting (Tx Total Time Limit, Max Tx Duration and Min Pause Duration Setting)	Regulation mode and parameters Fixed to the following settings. Function OFF and settings cannot be changed. mode: UD tcum_period: 60 tcum_limit: 100000 tcn_max: 1000 toff_min: 100 threshold_time: 1000
tantdv	Antenna diversity setting	Enable / Disable
tantnum	Setting the number of antennas to use	Number of antennas
tantsel	Setting the antenna number used for Tx / Rx	Antenna number
rst	Reset all (Test function, RF driver and	(None)

	Renesas Sub-GHz transceiver)	
opt	Test function option setting	Display mode of Test function
val	Test function settings display	(None)
help	Command list display	(None)
tsleep	Sleep Mode Setting	(None)

- The gray areas are commands not supported by this product.
- The transmission output power setting of R9A06G062GNP is fixed to the following settings. It cannot be changed by command.  
FSK : -11.0dBm OFDM : -9.5dBm
- Details on the command specification is explained in the application note " RF Characteristic Evaluation Program for Renesas Sub-GHz Transceiver Operation Manual (R30AN0376)". Obtain the latest version of this document from the Renesas website.

## 7. Hardware specifications

Table 7-1 shows the communication specifications of this product.

**Table 7-1: Communication specifications**

		Channel Spacing	Modulation		
			Option	MCS	Data Rate / Modulation Index
Europe Band 863 - 870MHz	OFDM	200KHz	Option4	MCS6	300kbps
	FSK	100KHz	Operating mode #1a		50kbps / m=0.5
		200KHz	Operating mode #2a		100kbps / m=0.5

### 7.1 Europe Band

#### 7.1.1 OFDM、Channel Spacing = 200KHz、Modulation = Option4 / MCS6 / 300kbps

- Transmission output power at SMA connector = +14dBm
- Channel Number Setting: ChanPlanID 33

Channel number	Frequency [MHz]	Channel number	Frequency [MHz]	Channel number	Frequency [MHz]	Channel number	Frequency [MHz]
0	863.1	1	863.3	2	863.5	3	863.7
4	863.9	5	864.1	6	864.3	7	864.5
8	864.7	9	864.9	10	865.1	11	865.3
12	865.5	13	865.7	14	865.9	15	866.1
16	866.3	17	866.5	18	866.7	19	866.9
20	867.1	21	867.3	22	867.5	23	867.7
24	867.9	25	868.1	26	868.3	27	868.5
28	868.7	29	868.9	30	869.1	31	869.3
32	869.5	33	869.7	34	869.9		

The gray areas are channels that this product does not support and should not be used for wireless evaluation.

**7.1.2 FSK, Channel Spacing = 100KHz, 50kbps / m = 0.5**

- Transmission output power at SMA connector = +14dBm
- Channel Number Setting: ChanPlanID 32

Channel number	Frequency [MHz]	Channel number	Frequency [MHz]	Channel number	Frequency [MHz]	Channel number	Frequency [MHz]
0	863.1	1	863.2	2	863.3	3	863.4
4	863.5	5	863.6	6	863.7	7	863.8
8	863.9	9	864.0	10	864.1	11	864.2
12	864.3	13	864.4	14	864.5	15	864.6
16	864.7	17	864.8	18	864.9	19	865.0
20	865.1	21	865.2	22	865.3	23	865.4
24	865.5	25	865.6	26	865.7	27	865.8
28	865.9	29	866.0	30	866.1	31	866.2
32	866.3	33	866.4	34	866.5	35	866.6
36	866.7	37	866.8	38	866.9	39	867.0
40	867.1	41	867.2	42	867.3	43	867.4
44	867.5	45	867.6	46	867.7	47	867.8
48	867.9	49	868.0	50	868.1	51	868.2
52	868.3	53	868.4	54	868.5	55	868.6
56	868.7	57	868.8	58	868.9	59	869.0
60	869.1	61	869.2	62	869.3	63	869.4
64	869.5	65	869.6	66	869.7	67	869.8
68	869.9						

The gray areas are channels that this product does not support and should not be used for wireless evaluation.

**7.1.3 FSK, Channel Spacing = 200KHz, 100kbps / m = 0.5**

- Transmission output power at SMA connector = +14dBm
- Channel Number Setting: ChanPlanID 33

Channel number	Frequency [MHz]	Channel number	Frequency [MHz]	Channel number	Frequency [MHz]	Channel number	Frequency [MHz]
0	863.1	1	863.3	2	863.5	3	863.7
4	863.9	5	864.1	6	864.3	7	864.5
8	864.7	9	864.9	10	865.1	11	865.3
12	865.5	13	865.7	14	865.9	15	866.1
16	866.3	17	866.5	18	866.7	19	866.9
20	867.1	21	867.3	22	867.5	23	867.7
24	867.9	25	868.1	26	868.3	27	868.5
28	868.7	29	868.9	30	869.1	31	869.3
32	869.5	33	869.7	34	869.9		

The gray areas are channels that this product does not support and should not be used for wireless evaluation.



## 8. Additional Information

### Technical Support

For details on the Transceiver IC (CWX-M), refer to the R9A06G062GNP Sub-GHz Transceiver User's Manual: Hardware.

The latest information is available from the Web page.

### Technical Contact Details

General information on Renesas microcontrollers can be found on the Renesas website at:

<https://www.renesas.com/>

### Note

- This product has a CE and UKCA conformity declaration.
  - In order to use wireless equipment and devices, it is necessary to comply with the wireless regulations established in the country of use.
  - Modifications to the product will invalidate the CE and UKCA conformity, any modifications done to the evaluation board are done at the risk of the user and any CE and UKCA compliance is then the responsibility of the user. Example modifications are (but not limited to):
    - ◇ Using an antenna which is different to the one provided with the product.
    - ◇ Modifications to the firmware supplied on the kit.
- This product is designed as an evaluation platform only and therefore is not designed to be used as, or in combination with, an end product or for mass production purposes.

### Trademarks

All brand or product names used in this manual are trademarks or registered trademarks of their respective companies or organisations.

### Copyright

This document may be, wholly or partially, subject to change without notice. All rights reserved. Duplication of this document, either in whole or part is prohibited without the written permission of Renesas Electronics Corporation.

© 2023 Renesas Electronics Corporation. All rights reserved.

## 9. Certification of Compliance

This product complies with the laws and regulations described below.

### 9.1 Radio-Related Laws

#### 9.1.1 EU Compliance information



#### Simplified EU Declaration of conformity

Hereby, Renesas Electronics Corporation declares that the radio equipment type RTK0EE0013D10002BJ is in compliance with RED 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<https://www.renesas.com/>

#### 9.1.2 UK Compliance information



#### Simplified UK Declaration of conformity

Hereby, Renesas Electronics Corporation declares that the radio equipment type RTK0EE0013D10002BJ is in compliance with the Radio Equipment Regulations 2017.

The full text of the UK declaration of conformity is available at the following internet address:

<https://www.renesas.com/>

Revision History	RTK0EE0013D10002BJ User's Manual
------------------	----------------------------------

Rev.	Date	Description	
		Page	Summary
1.00	2022.12.31	—	First Edition issued
1.01	2023.3.24	15	Note, added
1.02	2023.5.31	15	Note, modified

---

R9A06G062GNP  
RTK0EE0013D10002BJ User's Manual

Publication Date: Rev.1.02 May 31, 2023

Published by: Renesas Electronics Corporation

---

R9A06G062GNP