



RadioCore Series ESP32-S3R8 + LoRa

RC32-62

Datasheet-Rev1.0.0



Document version

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1. Overview

The RadioCore series is a quasi-system-level development platform that enables flexible integration of various MCUs and RF modules within an ultra-compact form factor, making it well suited for a wide range of IoT applications.

The **RC3262**, a model in this series, is equipped with the Espressif **ESP32-S3R8** and **SX1262**, supports 2.4 GHz **Wi-Fi**, **BLE** and **LoRa** connectivity.

The RC32 features a custom pin layout that supports **solder-free** plug-and-play operation, simplifying prototype assembly and module replacement, thereby accelerating development and iteration cycles.

It supports the official **Arduino** framework and is fully compatible with mainstream toolchains including Arduino, PlatformIO, and ESP-IDF, enabling developers to work in familiar environments and speed up project delivery.

Features

-  Equipped with the ESP32-S3R8 (with 8MB PSRAM onboard), integrating 2.4GHz Wi-Fi, BLE.
-  Integrated RA62A (SX1262) LoRa Module, features long communication range and low power consumption.
-  Provides **Arduino development framework**; compatible with mainstream toolchains including ESP-IDF, PlatformIO, and Micropython etc.
-  Compatible with various open-source projects, such as Meshtastic, MeshCore, Home Assistant, etc.
-  Compact form factor with solder-free pins for easy integration.

Application Scenarios

- | | |
|---|---|
|  Outdoor mesh networking |  Smart agriculture sensing |
|  Smart home gateway |  Bluetooth indoor positioning |
|  Environmental monitoring node |  Wireless repeater / relay |
|  Wearable device prototyping |  Maker education & experiments |
|  Industrial data acquisition |  Edge computing node |
|  Remote meter reading terminal |  Multi-protocol converter |

2. Specifications

2.1 Generic Parameter

Table 2.1 General specification

Parameters	Description
MCU	ESP32-S3R8 (Wi-Fi/BLE)
LoRa Module	HT-RA62A (SX1262)
TX Power	21dBm, 28dBm ^①
Interface	USB-C 2.0; B2B(Learn More); 2 x 10 Pin Headers
Peripherals	4 x SPI ^② , 3 x UART, 2 x I2C, 2xI2S, 3 x ADC1, 2 x ADC2
Memory	16MB Flash, 8MB PSRAM, 512KB SRAM, 384KB ROM
Temperature	-30~80°C ^③
Power Supply	USB-C: 5V Pin Header: 3V3 ; 5V ; Vbat(3.0-4.2V)
Shell Material	ABS
Dimensions	40.10 x 23.82 x 12.54 mm
Weight	8.5g

2.2 Power Consumption

Table2.2 Power consumption

Mode	Condition@3.7V-BAT	Typical	Unit
WiFi	TX @16dBm	340	mA
	RX	115	mA
BT	TX @16dBm	340	mA
	RX	110	mA

① Transmit power is determined by the onboard module's power specification.

② SPI0 and SPI1 are occupied by flash memory and internal PSRAM respectively.

③ Plastic housing top and bottom cover rated for -30°C ~ 65°C operating temperature.

Sleep		19	μA
LoRa	10	150	mA
	15	173	mA
	22	212	mA

3. Pin Description

This section describes the functions of partial pins on the RC32 module. Refer to the **RC3262 SCHEMATIC** and the official **ESP32-S3 datasheet** for full details

3.1 Exposed Pins (Broken-out Pins)

These pins are routed to the external pin headers of RadioCore. Their functions remain intact regardless of whether an external RF expansion module is soldered onto the board.

- **GPIO**: All pins marked GPIO are usable as general-purpose input/output pins.
- **Serial / SPI / I2C & Other Peripherals**: These peripherals follow the chip's default pin assignments. You may remap these functions to any available GPIO pins via software configuration in your code.
- **ADC / DAC**: These pins are the chip's dedicated analog input and analog output channels.

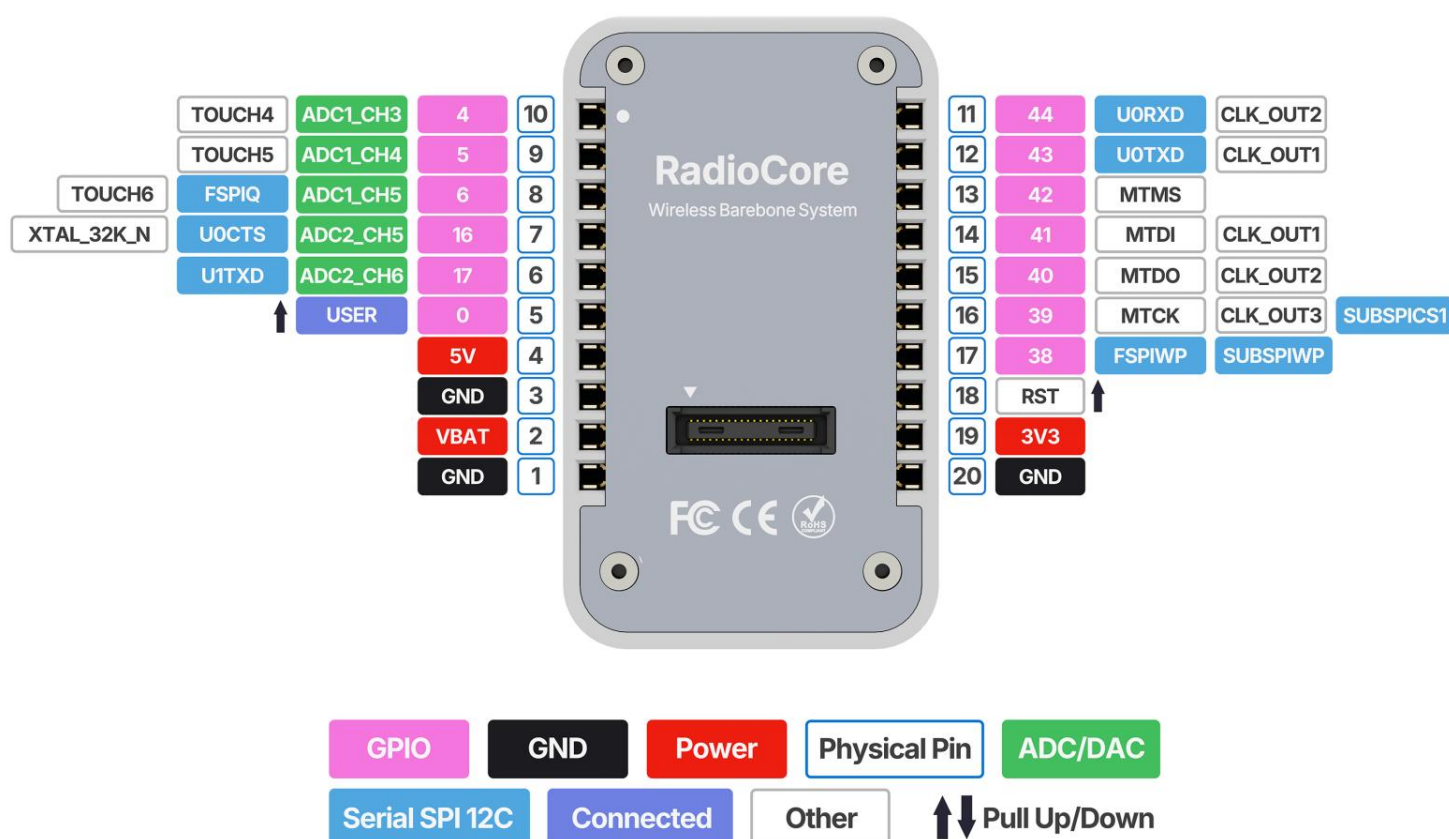


Table3.1: General Pins Description

NO.	Name	Type				Function
1	GND	G				Ground
2	VBAT	P				Lithium Battery Power Supply
3	GND	G				Ground
4	5V	P				5V Power Supply
5	0^④	I/O/T		RTC	IO_MUX	GPIO0, USER Button
6	17	I/O/T	Analog	RTC	IO_MUX	GPIO17, U1TXD , ADC2_CH6
7	16	I/O/T	Analog	RTC	IO_MUX	GPIO16, U0CTS , ADC2_CH5
8	6	I/O/T	Analog	RTC	IO_MUX	GPIO6, TOUCH6, ADC1_CH5
9	5	I/O/T	Analog	RTC	IO_MUX	GPIO5, TOUCH5, ADC1_CH4
10	4	I/O/T	Analog	RTC	IO_MUX	GPIO4, TOUCH4, ADC1_CH3
11	44	I/O/T			IO_MUX	U0RXD , GPIO44, CLK_OUT2
12	43	I/O/T			IO_MUX	U0TXD , GPIO43, CLK_OUT1
13	42	I/O/T			IO_MUX	MTMS, GPIO42
14	41	I/O/T			IO_MUX	MTDI, GPIO41, CLK_OUT1
15	40	I/O/T			IO_MUX	MTDO, GPIO40, CLK_OUT2
16	39	I/O/T			IO_MUX	MTCK, GPIO39, CLK_OUT3, SUBSPICS1
17	38	I/O/T			IO_MUX	GPIO38, FSPIWP , SUBSPIWP
18	RST^⑤	I				Reset Button
19	3V3	P				3.3V Power Supply
20	GND	G				Ground

3.2 General Pins

This chapter describes the functions of general-purpose pins on the ESP32 main controller, some of which are brought out.

Table3.2 General Pins Description

No.	Name	Type				Function
1	4	I/O/T	Analog	RTC	IO_MUX	GPIO4, TOUCH4, ADC1_CH3
2	6	I/O/T	Analog	RTC	IO_MUX	GPIO6, TOUCH6, ADC1_CH5
3	5	I/O/T	Analog	RTC	IO_MUX	GPIO5, TOUCH5, ADC1_CH4
4	21	I/O/T		RTC	IO_MUX	GPIO21
5	2	I/O/T	Analog	RTC	IO_MUX	GPIO2, TOUCH2, ADC1_CH1
6	18	I/O/T	Analog	RTC	IO_MUX	GPIO18, U1RXD , ADC2_CH7 , CLK_OUT3
7	GND	G				Ground

^④ A 10K pull-up resistor is fitted.

^⑤ A 10K pull-up resistor is fitted.

8	17	I/O/T	Analog	RTC	IO_MUX	GPIO17, U1TXD, ADC2_CH6
9	GND	G				Ground
10	16	I/O/T	Analog	RTC	IO_MUX	GPIO16, U0CTS, ADC2_CH5, XTAL_32K_N
11	48	I/O/T			IO_MUX	GPIO48, SUBSPICLK_N_DIFF, SPICLK_N_DIFF
12	0 [®]	I/O/T		RTC	IO_MUX	GPIO0, 0 Button
13	47	I/O/T			IO_MUX	GPIO47, SUBSPICLK_P_DIFF, SPICLK_P_DIFF
14	42	I/O/T			IO_MUX	GPIO42, MTMS
15	GND	G				Ground
16	41	I/O/T			IO_MUX	GPIO41, CLK_OUT1, MTDI
17	GND	G				Ground
18	RST [™]	I				CHIP_PU, RST Button
19	5V	P				5V Power Supply
20	20	I/O/T	Analog	RTC	IO_MUX	GPIO20, U1CTS, ADC2_CH9, CLK_OUT1, USB_D+
21	5V	P				5V Power Supply
22	19	I/O/T	Analog	RTC	IO_MUX	GPIO19, U1RTS, ADC2_CH8, CLK_OUT2, USB_D-
23	5V	P				5V Power Supply
24	38	I/O/T			IO_MUX	GPIO38, FSPiWP, SUBSPiWP
25	5V	P				5V Power Supply
26	39	I/O/T			IO_MUX	GPIO39, CLK_OUT3, SUBSPICS1, MTCK
27	43 [®]	I/O/T			IO_MUX	GPIO43, CLK_OUT1, U0TXD
28	40	I/O/T			IO_MUX	GPIO40, CLK_OUT2, MTDO
29	44	I/O/T			IO_MUX	GPIO44, CLK_OUT2, U0RXD
30	GND	G				Ground
31	45	I/O/T			IO_MUX	GPIO45
32	GND	G				Ground
33	46	I/O/T			IO_MUX	GPIO46
34	VBAT	P				Lithium Battery Power Supply
35	3V3	P				3.3V Power Supply
36	VBAT	P				Lithium Battery Power Supply
37	3V3	P				3.3V Power Supply
38	VBAT	P				Lithium Battery Power Supply
39	3V3	P				3.3V Power Supply
40	VBAT	P				Lithium Battery Power Supply

[®] A 10K pull-up resistor is fitted.

[™] A 10K pull-up resistor is fitted.

[®] A 499R series resistor is placed on the U0TXD pin.

3.3 LoRa Pins

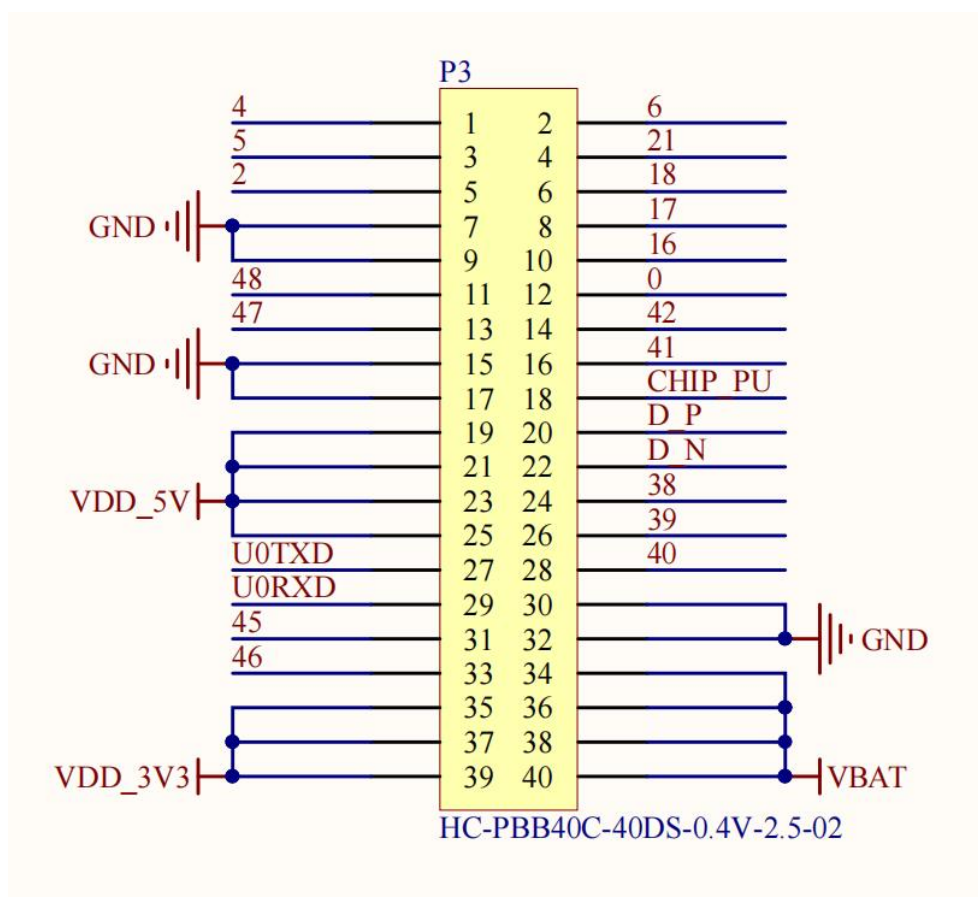
This section describes the mainboard pins corresponding to the RF module pads. For the matching pins on the RF module itself, please refer to the module datasheet.

Table3.3 LoRa Pins

NO.	Name	LoRa Function
1	GPIO23	LoRa CS
2	GPIO22	LoRa MOSI
3	GPIO21	LoRa CLK
4	GPIO20	LoRa MISO
5	GPIO19	LoRa DIO1
6	GPIO7	Module Version Select
7	GPIO8	LoRa Reset
8	GPIO10	LoRa BUSY
9	GPIO11	VEXT_LDO_Ctrl

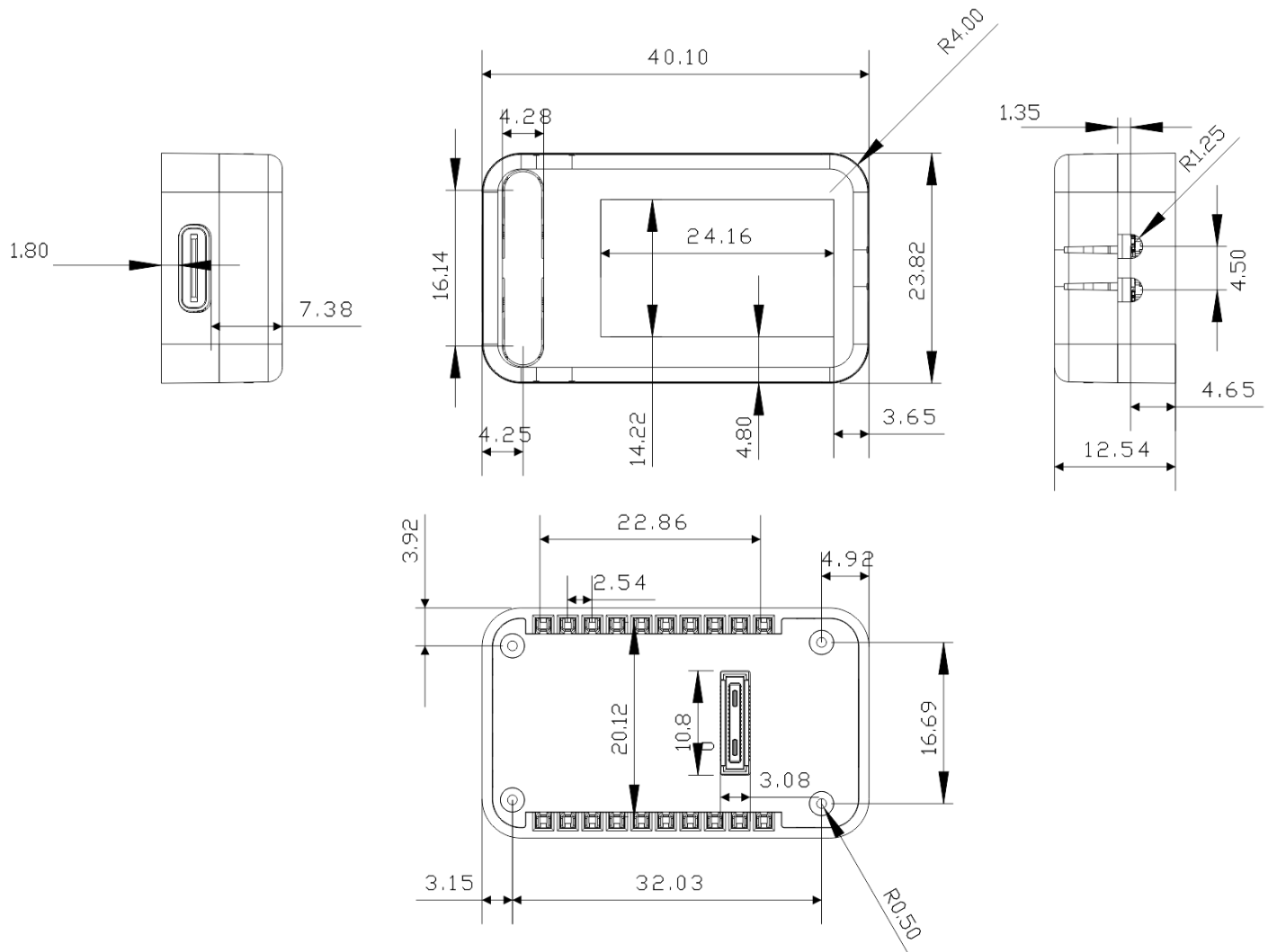
3.4 B2B Interface Pin Definition

[BTB Connector Datasheet]



4. Dimensions

Main device dimensions are listed below; see **outline drawing** for full data.



5. Schematic Diagram

This section contains only the main-board schematic. For the schematic including the RF module, please refer to the link: [RadioCore Schematic Diagram](#)

6. SDK

The device supports all development frameworks built around the ESP32-S3 chip, including ESP-IDF, PlatformIO, Arduino and more. At present, Arduino is the primary officially supported development framework.

6.1 Development Environment (Core Libraries & Board Manager)

- [Heltec ESP32 series boards](#)

6.2 LoRa Library

- [Heltec ESP32 expansion library](#)

6.3 RadioCore Expansion Library

- [RadioCore series hardware](#)

7. Docs and Resource

- [USER Manual\(Wiki\)](#)
- [Resource Download Center](#)
- [Official Product Link](#)

8. Heltec Contact Information

Heltec Automation Technology Co., Ltd

Chengdu, Sichuan, China

Email: support@heltec.cn

Phone: +86-028-62374838

<https://heltec.org>