



Rd-Kit Specification

Version V1.1.0

Copyright ©2023

Document resume

Version	Date	Develop/revise content	Edition	Approve
V1.1.0	2023.11.03	First Edition	Zekai Qian	Hong Xu

Content

1. Product Overview	4
1.1. Characteristic	5
2. Main parameters	6
2.1. Power selection	6
2.2. Electrostatic requirements	6
2.3. Consumption	7
3. Appearance size	8
4. Description of indicator lights and keys	9
5. Interface definition	10
6. Schematic diagram	13
7. Product packaging information	14
8. Contact us	14
Disclaimer and copyright notice	15
Notice	15
Important statement	16

1. Product Overview

Rd-Kit is a radar test board developed by Shenzhen Ai-Thinker Technology Co., Ltd. The core processor chip PHY6252(SSOP24) of the test board is a Bluetooth system on a chip (SoC) with high integration and low power consumption. We developed it adapted to six radars, namely Rd-02B, Rd-02C, Rd-03, Rd-03D, Rd-03E and Rd-04, which are specially designed for radar debugging scenarios.

PHY6252(SSOP24) chip has industry-leading low power consumption performance and RF performance, and supports Bluetooth BLE 5.2. Chip built-in 64 KB SRAM, 256KB flash, 96 KB ROM, 256bit efuse. The chip supports a variety of low-power working states and can meet the power consumption requirements of various application scenarios. The adjustable function of RF output power can achieve the best balance among communication distance, communication rate and power consumption.

Rd-Kit has five LED lights, two buttons, six radar seats and a Type-C interface.

The factory firmware of Rd-Kit is equipped with an APP developed by Ai-Thinker. Through the APP, data detection and parameter adjustment can be carried out for six radars, namely Rd-02B, Rd-02C, Rd-03, Rd-03D, Rd-03E and Rd-04. Bluetooth chip reset button and radar serial port power-off reset button are designed.

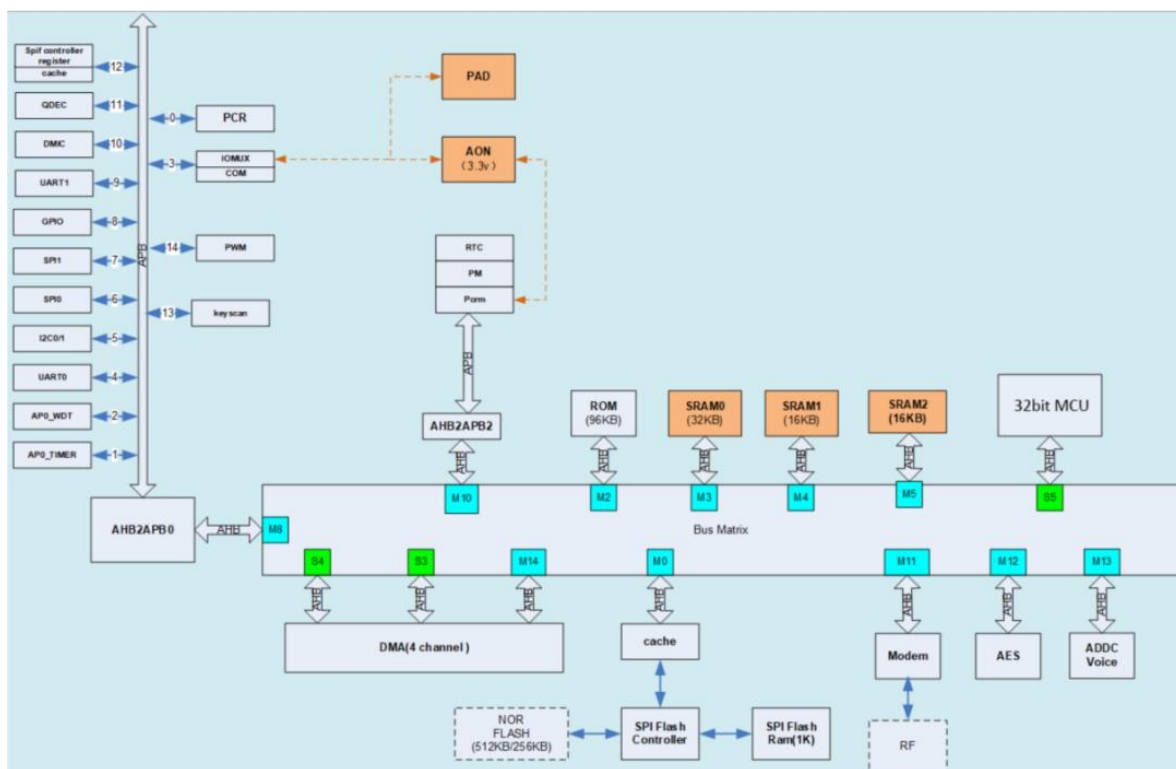


Figure 1 Main chip block diagram

1.1. Characteristic

- It supports six kinds of radars: Rd-02B, Rd-02C, Rd-03, Rd-03D, Rd-03E and Rd-04
- Equipped with Ai-Thinker APP for data detection and parameter adjustment
- Support BLE5.2, rate support: 125Kbps, 500Kbps, 1Mbps, 2Mbps
- With 64 KB SRAM, 256KB flash,96 KB ROM and 256bit efuse
- Support serial local upgrade and remote firmware upgrade (FOTA)
- There are six status indicators, one red and five blue, corresponding to different status of Rd-Kit
- It supports secondary development and integrates Windows and Linux development environments

2. Main parameters

Table 1 Description of the main parameters

Model	Rd-Kit
Size	40*45(±0.2)mm
Antenna	On-board antenna
Frequency range	2400~2483.5MHz
Operation temperature	-20°C~70°C
Storage environment	-40°C~125°C,<90%RH
Power supply	5V, supply current ≥500mA
Power supply	Type-C female seat
Support radar interface	Rd-02B、Rd-02C、Rd-03、Rd-03D、Rd-03E 和 Rd-04
Indicator light	6PCS (1 red 5blue)
UART rate	Default 115200 bps
Security	AES-128
Flash	256KB

2.1. Power selection

Rd-Kit only supports 1 power supply way:

- Type-C connector power supply

2.2. Electrostatic requirements

Rd-Kit is electrostatic sensitive equipment, please take special precautions during handling.



Figure 2 ESD Anti-static diagram

2.3. Consumption

All the following power consumption data are based on Type-C's 5V power supply and 25°C ambient temperature, and tested by power analyzer.

Table 2 Power consumption table

Mode	Min. Value	Typical value	Max. Value	Unit
Rd-Kit Bluetooth search	-	15	-	mA
Rd-03D Trigger state	-	150	-	mA
Rd-03E Trigger state	-	20	-	mA
Rd-03 Trigger state	-	120	-	mA
Rd-04 Trigger state	-	20	-	mA

3. Appearance size

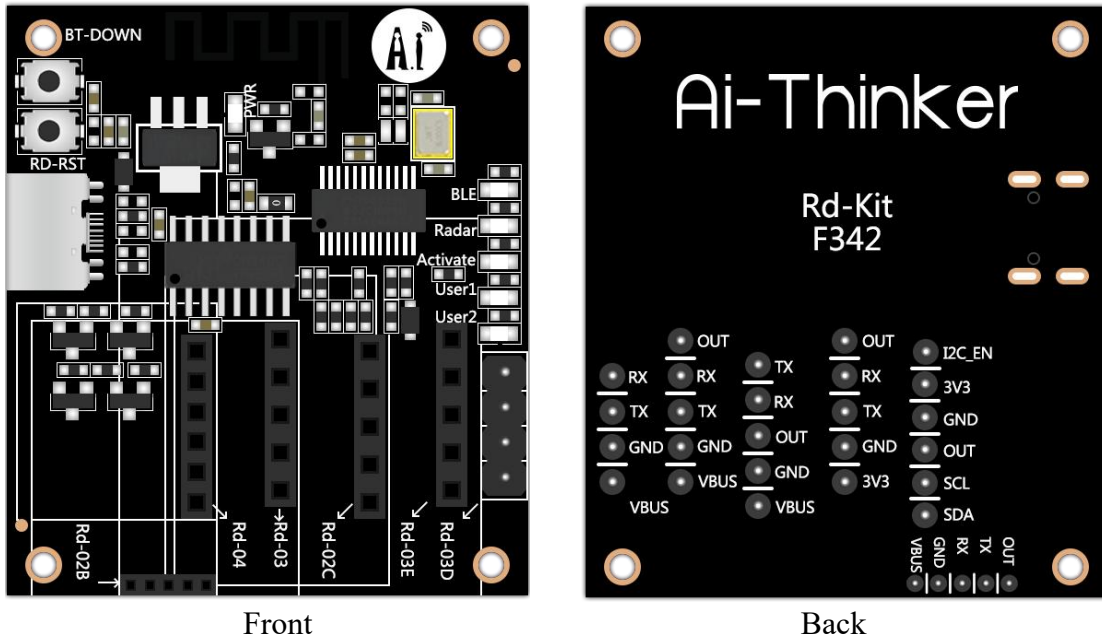


Figure 3 Appearance drawing (the rendering drawing is for reference only, subject to the real thing)

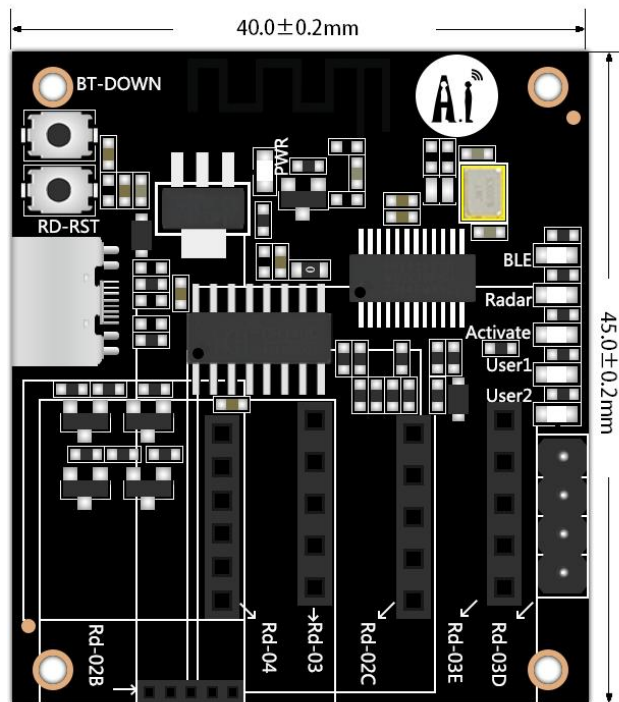


Figure 4 Dimension drawing

4. Description of indicator lights and keys

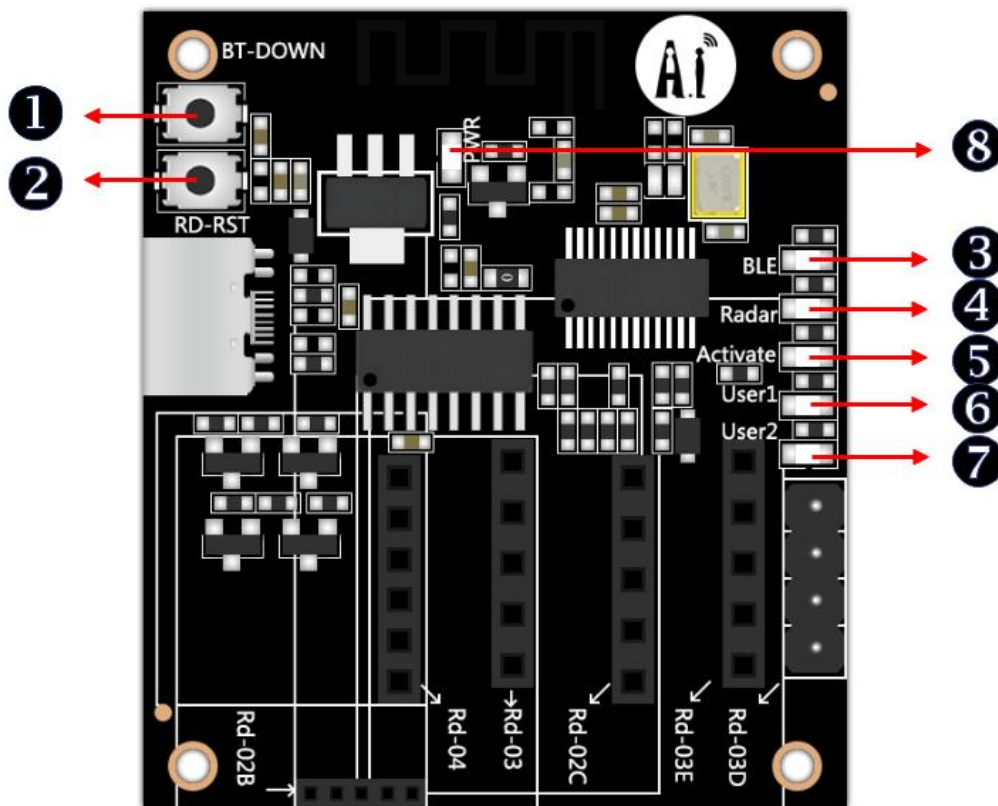


Figure 5 Rd-Kit indicator light and key position

Table 3 Rd-Kit indicator light and key position

No.	Description
①	BT-DOWN button, download button of Bluetooth chip.
②	RD-RST button, power-off reset button of radar.
③	BLE indicates blue light, indicating Bluetooth connection status (slow flash is not connected, and the light will be turned off after connection).
④	Radar LED indicates the blue light of the connection state between the radar module and the development board (slow flash is not connected, and the light will be turned off after connection).
⑤	Activate LED indicates blue light (lights up when radar triggers manned state, and lights off when no one is there).
⑥	Reserved User1 blue light
⑦	Reserved User2 blue light
⑧	Power indicator red light

5. Interface definition

There are six radar interfaces connected to Rd-Kit, and the wire connections of Rd-03D, Rd-03E, Rd-03 and Rd-04 are shown in the following figure.

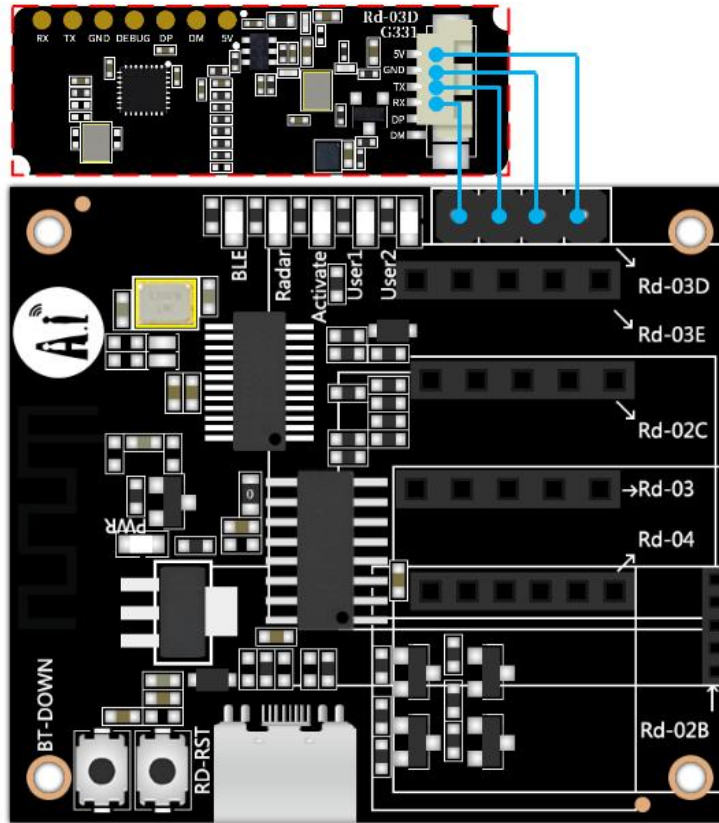


Figure 6 Schematic diagram of Rd-03D wiring

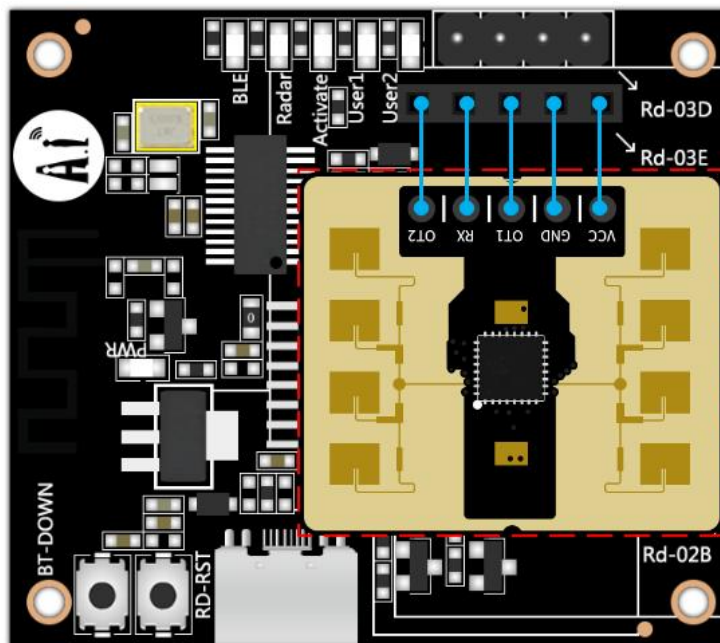


Figure 7 Schematic diagram of Rd-03E wiring

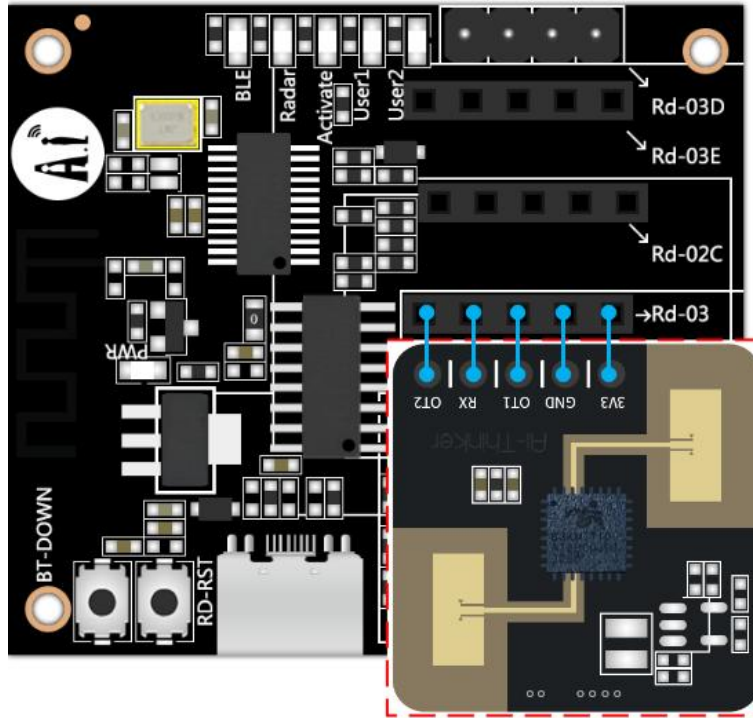


Figure8 Schematic diagram of Rd-03 wiring

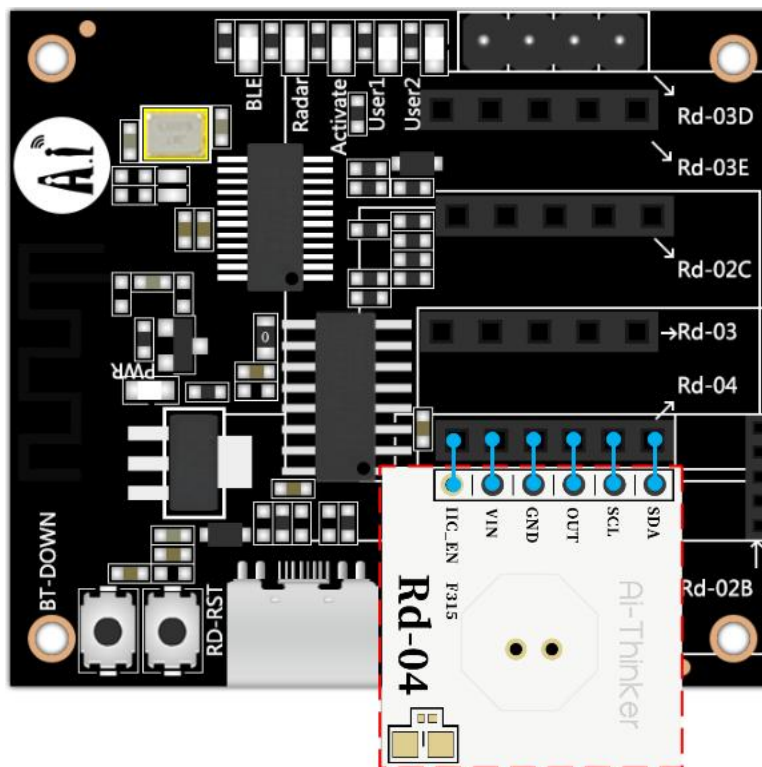


Figure 9 Schematic diagram of Rd-04 wiring

Note: Rd-04 has built-in MCU. If it needs to be matched with Rd-Kit, please remove the MCU and connect I2C_EN pins by yourself. The location of MCU is shown in Figure 10, and the red box is marked with the location of MCU.

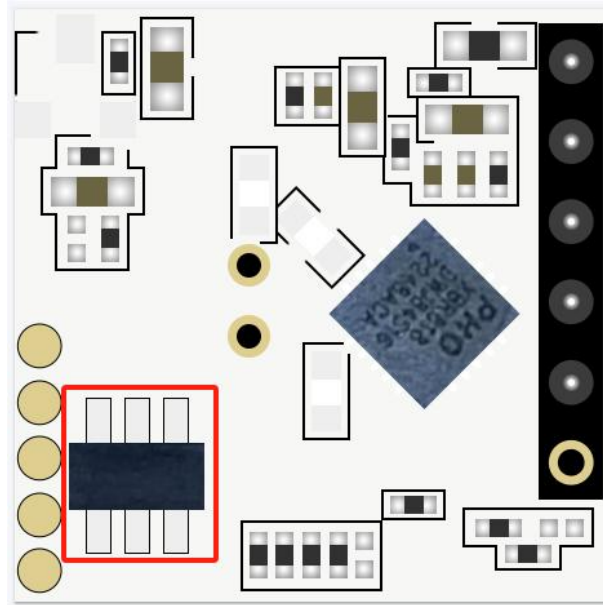


Figure 10 Rd-04

Table 4 Radar Interface Parameter Table

Rd-03D	2.54mm spacing single row 1x4P male interface
Rd-03E	2.54mm spacing single row 1x5P female connector
Rd-02C	2.54mm spacing single row 1x5P female connector
Rd-03	2.54mm spacing single row 1x5P female connector
Rd-04	2.00mm spacing single row 1x6P female socket interface
Rd-02B	1.27mm spacing single row 1x5P female socket interface

6. Schematic diagram

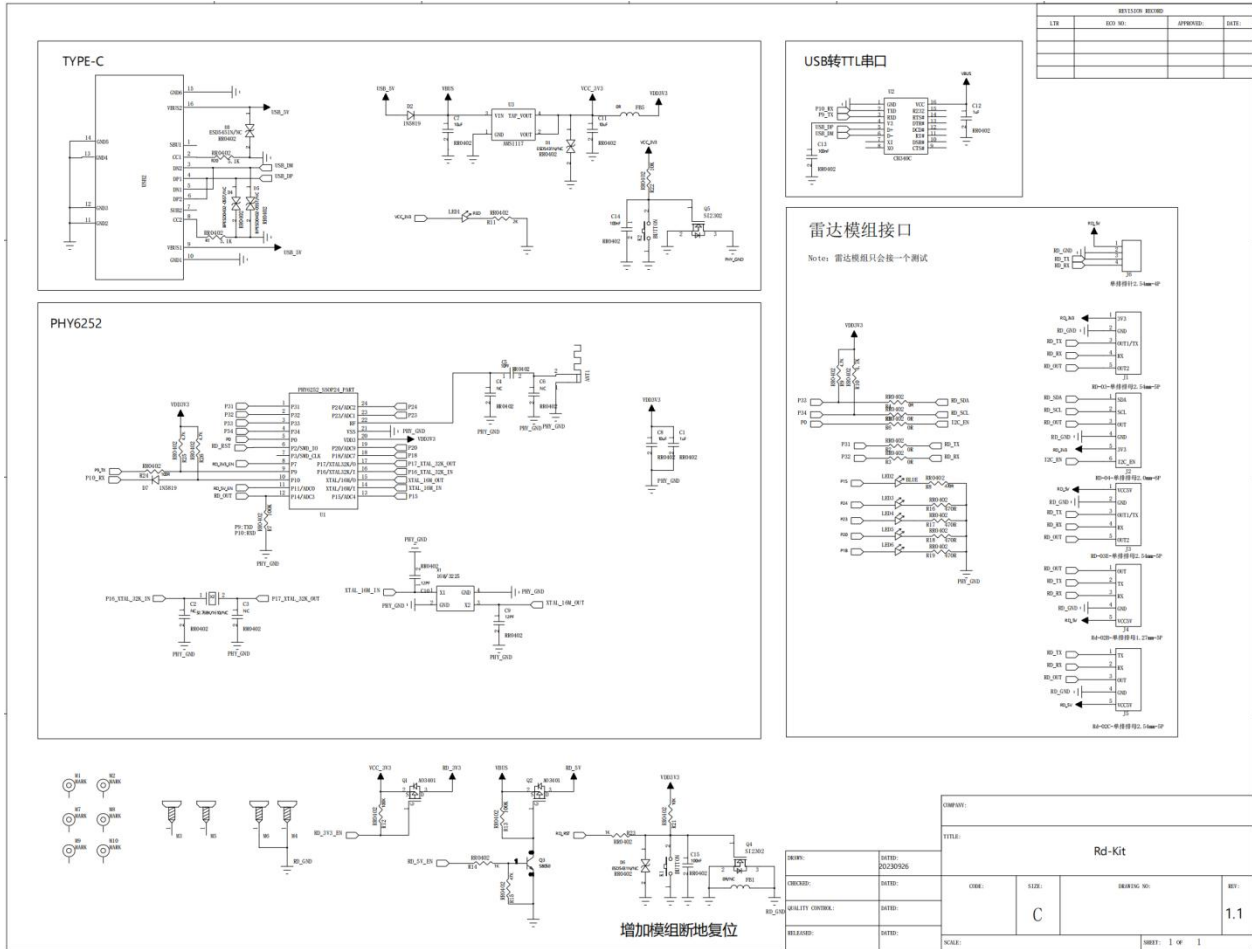


Figure 11 Schematic diagram

7. Product packaging information

Table 5 Packaging Information Table

Packing list	Packing way	Quantity per package (electrostatic bag)	Quantity per package (sealed bag)
Rd-Kit	Foam+electrostatic bag	1pcs	20pcs

8. Contact us

[Ai-Thinker official website](#)

[Office forum](#)

[Develop DOCS](#)

[LinkedIn](#)

[Tmall shop](#)

[Taobao shop](#)

[Alibaba shop](#)

[Technical support email: support@aithinker.com](mailto:support@aithinker.com)

[Domestic business cooperation: sales@aithinker.com](mailto:sales@aithinker.com)

[Overseas business cooperation: overseas@aithinker.com](mailto:overseas@aithinker.com)

Company Address: Room 403,408-410, Block C, Huafeng Smart Innovation Port, Gushu 2nd Road, Xixiang, Baoan District, Shenzhen.

Tel: +86-0755-29162996



WeChat mini program



WeChat official account

Disclaimer and copyright notice

The information in this article, including the URL address for reference, is subject to change without notice.

The document is provided "as is" without any guarantee responsibility, including any guarantee for merchantability, suitability for a specific purpose, or non-infringement, and any guarantee mentioned elsewhere in any proposal, specification or sample. This document does not bear any responsibility, including the responsibility for infringement of any patent rights arising from the use of the information in this document. This document does not grant any license for the use of intellectual property rights in estoppel or other ways, whether express or implied.

The test data obtained in the article are all obtained from Ai-Thinker's laboratory tests, and the actual results may vary slightly.

All brand names, trademarks and registered trademarks mentioned in this article are the property of their respective owners, and it is hereby declared.

The final interpretation right belongs to Shenzhen Ai-Thinker Technology Co., Ltd.

Notice

Due to product version upgrades or other reasons, the contents of this manual may be changed.

Shenzhen Ai-Thinker Technology Co., Ltd. reserves the right to modify the contents of this manual without any notice or prompt.

This manual is only used as a guide. Shenzhen Ai-Thinker Technology Co., Ltd. makes every effort to provide accurate information in this manual. However, Shenzhen Ai-Thinker Technology Co., Ltd. does not guarantee that the contents of the manual are completely free of errors. All statements and information in this manual And the suggestion does not constitute any express or implied guarantee.

Important statement

Ai-Thinker can provide technical and reliability data (including datasheets), design resources (including reference designs), applications or other design suggestions, network tools, safety information and other resources (hereinafter referred to as "these resources") as is, without guarantee of defects and without any express or implied warranty, including but not limited to the express or implied warranty of adaptability, suitability for a specific purpose or non-infringement of any third party's intellectual property rights. In particular, it declares that it will not be responsible for any inevitable or accidental losses, including but not limited to those arising from this application or the use of any products and circuits of our company.

Ai-Thinker reserves the right to release information (including but not limited to indicators and product descriptions) and any product changes of our company without prior notice. This document automatically replaces and replaces all information provided by the same document number in the previous version.

These resources can be used by skilled developers who use Ai-Thinker products to design. You will be solely responsible for the following: (1) Select the appropriate Ai-Thinker products for your application; (2) Design, verify and run your applications and products in the whole life cycle; (3) Ensure that your application meets all relevant standards, specifications and laws, as well as any other functional security, information security, regulatory or other requirements.

Ai-Thinker authorizes you to use these resources only for developing the application of Ai-Thinker products described in this resource. Without the permission of Ai-Thinker, no unit or individual may extract or copy part or all of these resources without authorization, and may not spread them in any form. You have no right to use any other Ai-Thinker intellectual property rights or any third-party intellectual property rights. You should fully compensate any claims, damages, costs, losses and debts caused to Ai-Thinker and its representatives in the use of these resources, and Ai-Thinker is not responsible for this.

The products that Ai-Thinker can provide are subject to the sales terms of Ai-Thinker or other applicable terms attached to Ai-Thinker products. Ai-Thinker can provide these resources without expanding or otherwise changing the warranty or warranty disclaimer applicable to product release.