Rd-Kit Specification

Version V1.1.1

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Document Resume

Version	Date	Develop/revise content	Formulat	Approval
V1.1.0	2023.11.03	First edition	Qian Zekai	Xu Hong
V1.1.1	2025.06.25	Added support for three radar modules: Rd-03V2, Rd-03L_V2, and Rd-03D_V2	Wei Jie	Xu Hong

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1. Product Overview

Rd-Kit is a radar test baseboard developed by Shenzhen Ai-Thinker Technology Co., Ltd. The core processor chip PHY6252 (SSOP24) of the test baseboard is a highly integrated low-power Bluetooth system-on-chip (SoC). We have carried out secondary development on it and adapted eight radars, including Rd-03, Rd-03_V2, Rd-03D, Rd-03D_V2, Rd-03L, Rd-03L_V2, Rd-03E and Rd-04, and it is designed specifically for radar debugging scenarios.

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

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

The Rd-Kit factory firmware is equipped with an APP developed by Anxinke, which can be used to detect data and adjust parameters of eight radars, including Rd-03, Rd-03_V2, Rd-03D, Rd-03D_V2, Rd-03L, Rd-03L_V2, Rd-03E and Rd-04. A Bluetooth chip reset button and a radar serial port power-off reset button are designed.

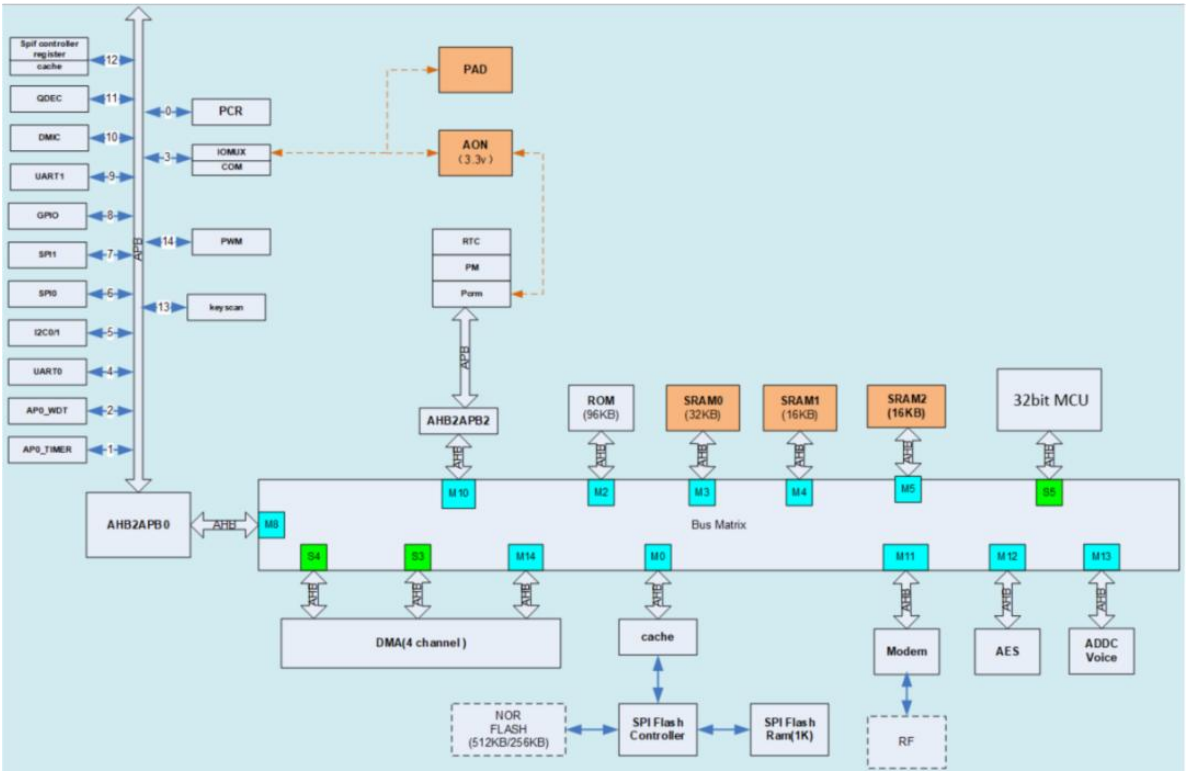


Figure 1 Main chip architecture diagram

1.1. Characteristic

- Supports eight radars module, including Rd-03, Rd-03_V2, Rd-03D, Rd-03D_V2, Rd-03L, Rd-03L_V2, 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, 256bit efuse
- Support serial port local upgrade and remote firmware upgrade (FOTA)
- It has six status indicators, one red and five blue, corresponding to the different states of the Rd-Kit
- Supports secondary development and integrates Windows and Linux development environments

2. Main parameters

Table 1 Description of main parameters

Development board model	Rd-Kit
Size	40 * 45 (±0.2)mm
Antenna type	Onboard antenna
Spectrum range	2400~2483.5MHz
Operating temperature	-20 ℃ ~ 70 ℃
Storage environment	-40℃~125℃,<90%RH
Power supply range	5V, supply current ≥500mA
Power supply interface	Type-C female connector
Support radar interface	Rd-03, Rd-03_V2, Rd-03D, Rd-03D_V2, Rd-03L, Rd-03L_V2, Rd-03E and Rd-04
Indicator Lights	6PCS (1 red 5 blue)
Serial port rate	Default 115200 bps
Security	AES-128
Flash	256KB

2.1. Power supply selection

Rd -Kit only supports 1 power supply mode :

- Type-C port for power supply

2.2. Electrostatic Requirements

The Rd -Kit is an electrostatically sensitive device and requires special precautions when handling.

Figure 2 ESD anti-static diagram

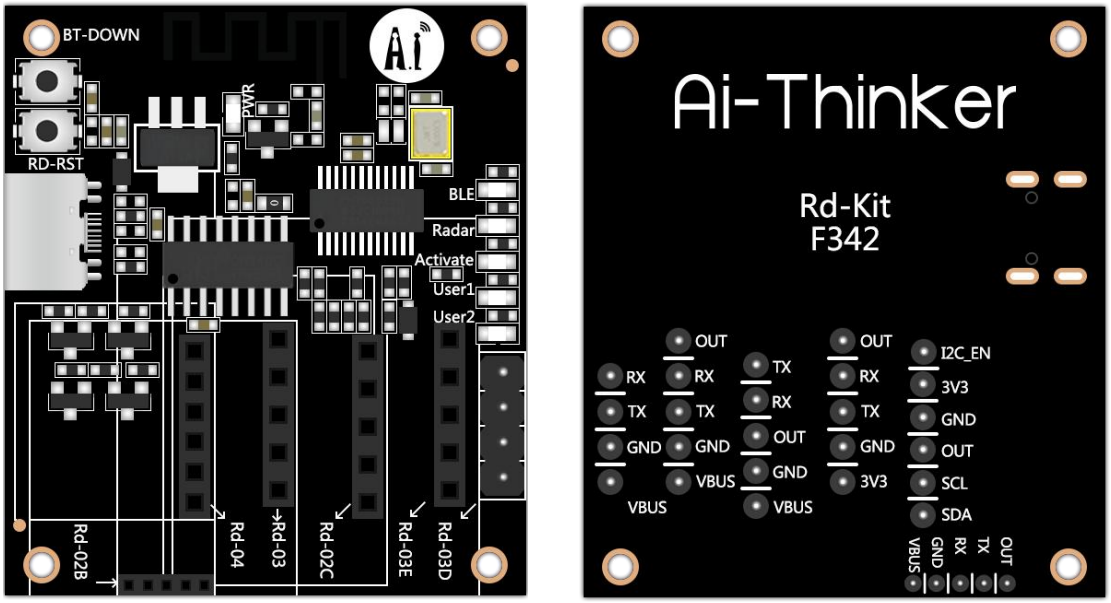
2.3. Power consumption

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

Table 2 Power consumption

Model	Minimum value	Average value	Maximum value	unit
Rd-Kit Bluetooth Search	-	15	-	mA
Rd-03D trigger Status	-	150	-	mA
Rd-03D_V2 trigger Status	-	105	-	mA
Rd-03E trigger Status	-	20	-	mA
Rd-03 trigger Status	-	120	-	mA
Rd-03_V2 trigger status	-	65	-	mA
Rd-03L trigger Status	-	18	-	mA
Rd-03L_V2 trigger status	-	18	-	mA
Rd-04 trigger status	-	20	-	mA

3. Dimensions



Front Back

Figure 3 Appearance (rendering is for reference only, the actual product shall prevail)

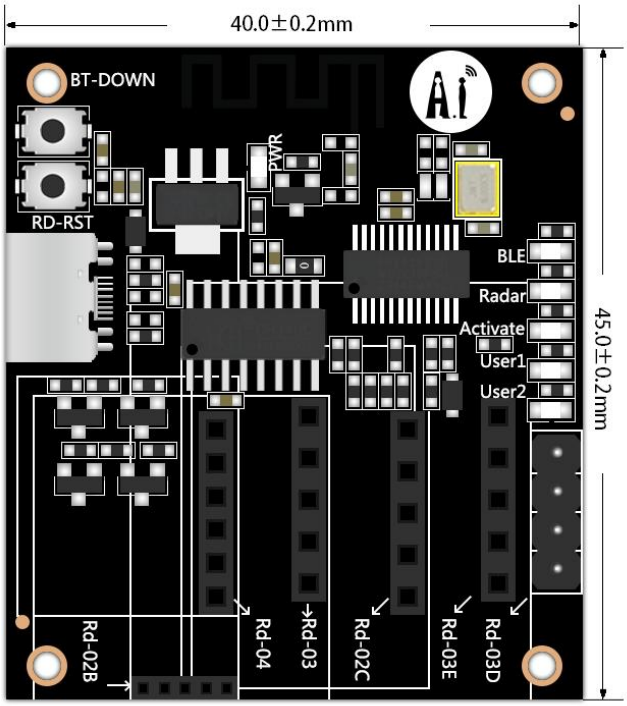


Figure 4 Dimensions

4. Indicator lights and button instructions

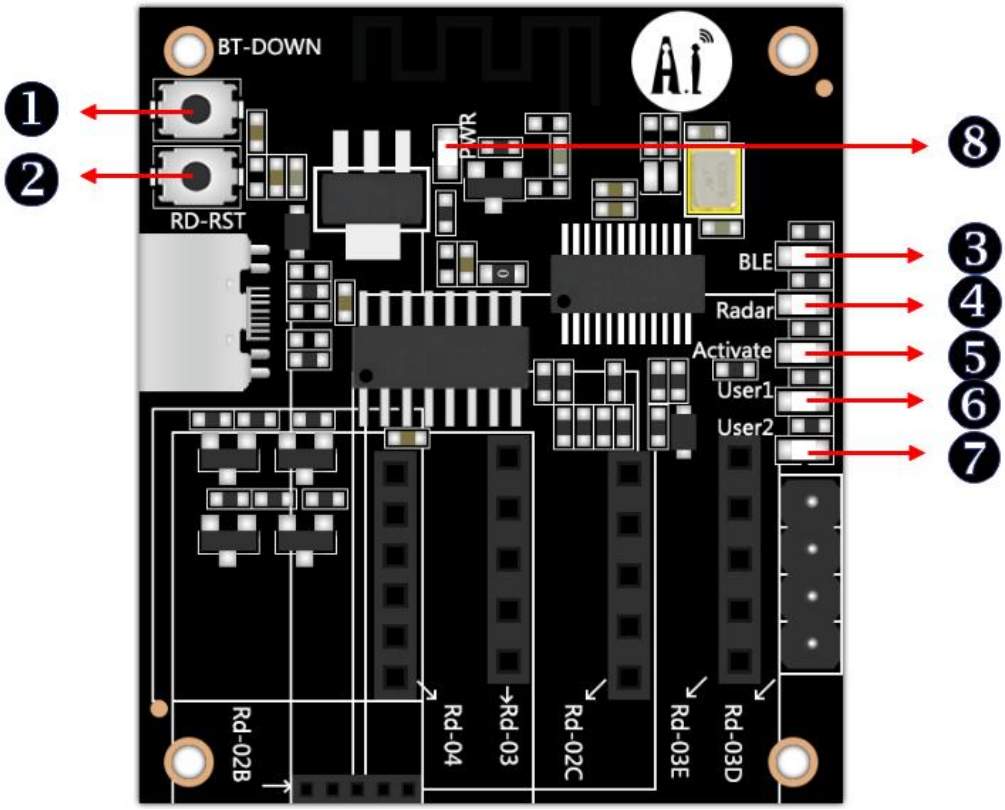


Figure 5 Rd -Kit indicator light and button locations

Table 3 Rd -Kit indicator light and button position

Serial number	illustrate
①	BT-DOWN button, download button of Bluetooth chip
②	RD-RST button, radar power-off reset button
③	BLE indicator blue light, indicating the Bluetooth connection status (slow flashing when not connected, off when connected)
④	Radar LED indicates the connection status between the radar module and the development board. Blue light (slow flashing when not connected, off when connected)
⑤	Activate LED indicates a blue light (light up when radar triggers a human presence status, and extinguished when no one is present)
⑥	Reserved User1 blue light
⑦	Reserved User2 blue light
⑧	Power indicator red light

5. Interface Definition

Rd -Kit has six radar interfaces, which can be connected to Rd-03D, Rd-03D_V2, Rd-03E, Rd-03, Rd-03_V2, Rd-03L, Rd-03L_V2, and Rd-04. The wiring of Rd-03D is consistent with that of Rd-03D_V2, and the wiring of Rd-03, Rd-03_V2, Rd-03L, and Rd-03L_V2 is consistent. Their wiring is shown in the figure below .

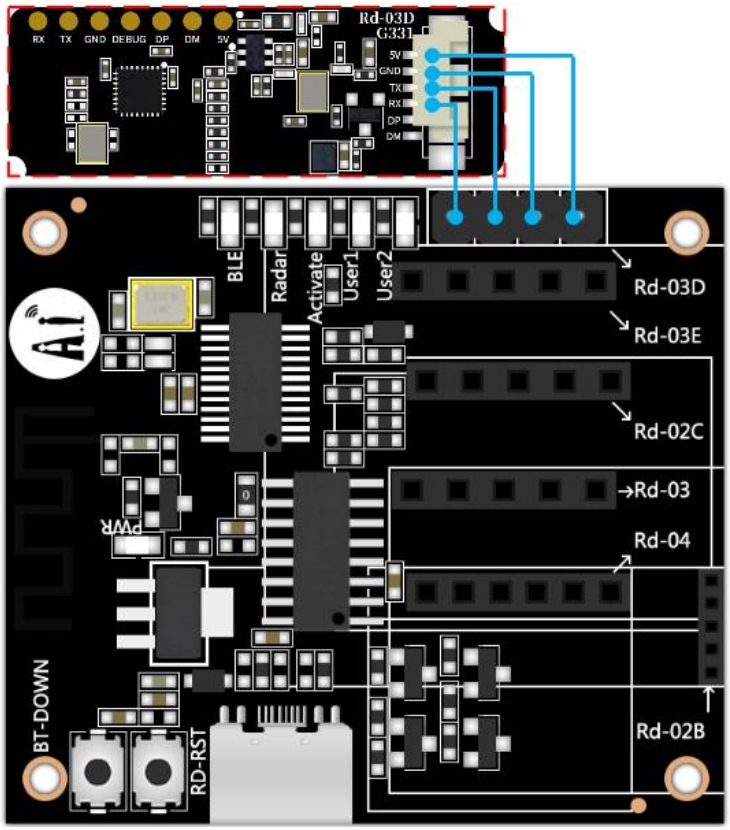


Figure 6 Rd-03D, Rd-03D_V2 wiring diagram

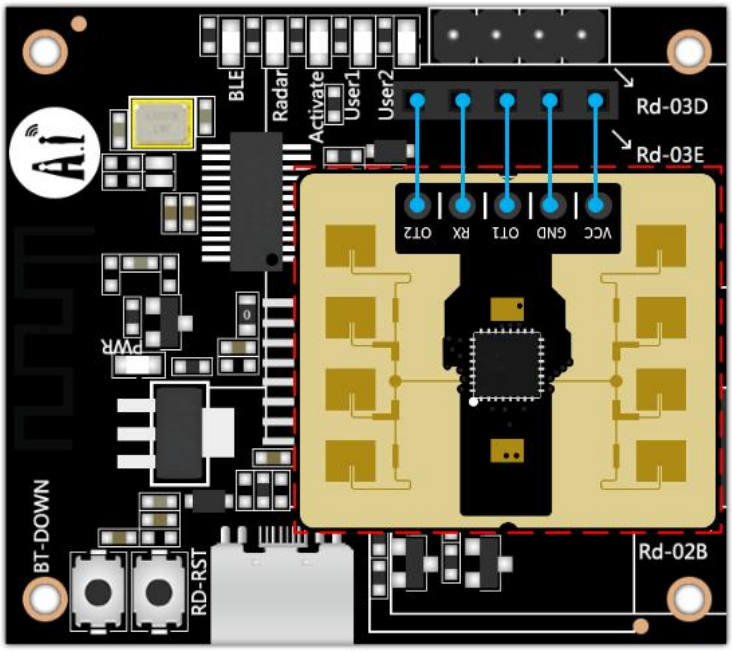


Figure 7 Rd-03E wiring diagram

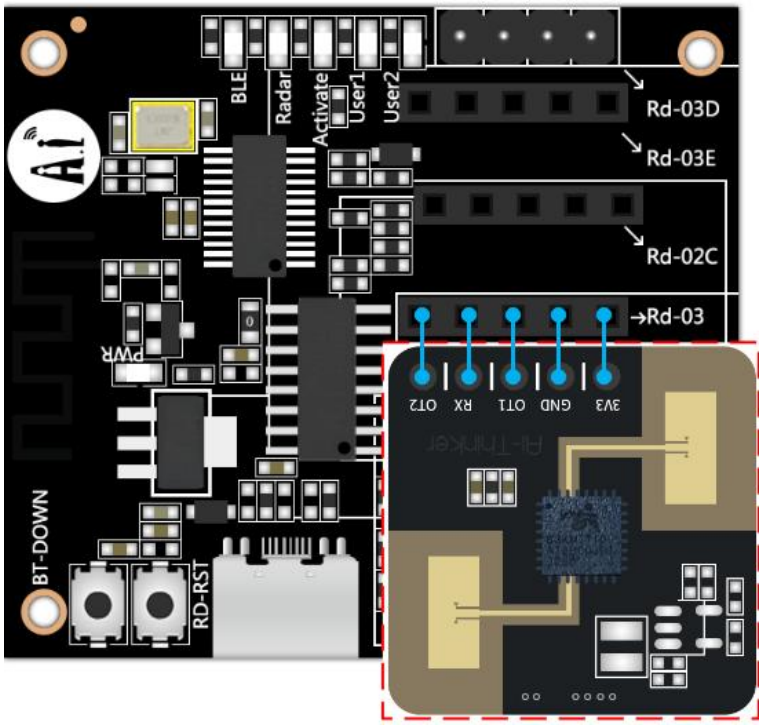


Figure 8 Rd-03, Rd-03_V2, Rd-03L, Rd-03L_V2 wiring diagram

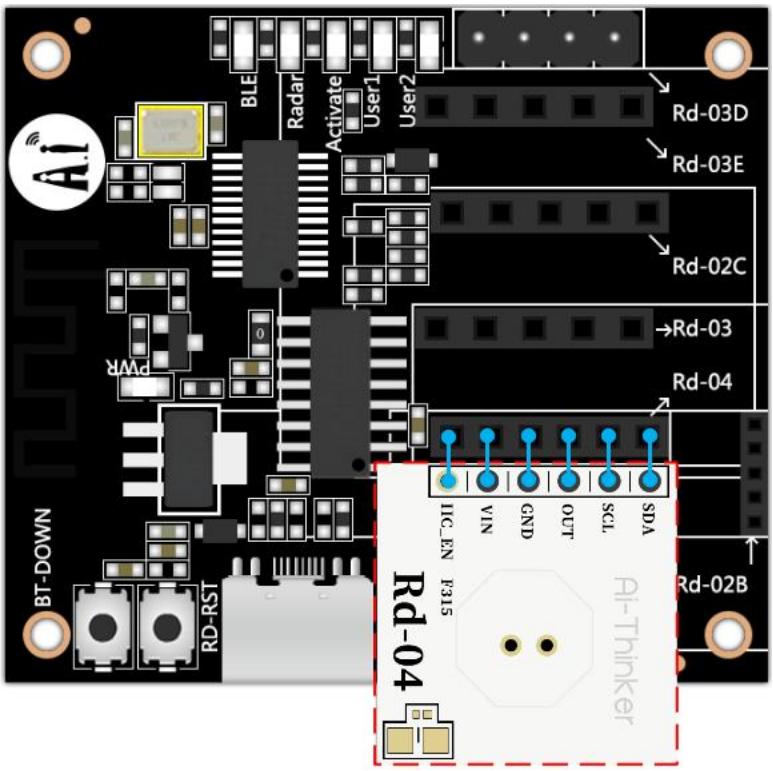


Figure 9 Rd-04 wiring diagram

Note: Rd-04 has a built-in MCU. If you need to use it with Rd-Kit, please remove the MCU and connect the I2C_EN pin header yourself. The location of the MCU is shown in Figure 10. The red box is the location of the MCU.

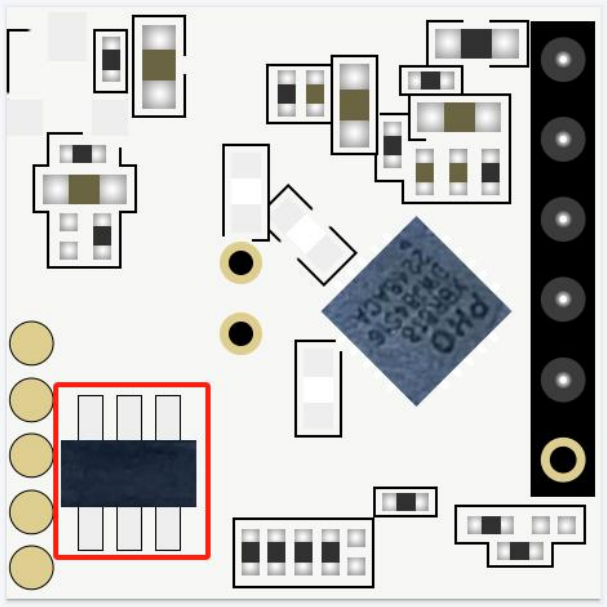


Figure 10 Rd-04

Table 4 Radar interface parameter table

Rd-03D, Rd-03D_V2	2.54mm pitch single row 1x4P male connector
Rd-03E	2.54mm pitch single row 1x5P female connector
Rd-02C	2.54mm pitch single row 1x5P female connector
Rd-03, Rd-03_V2, Rd-03L, Rd-03L_V2	2.54mm pitch single row 1x5P female connector
Rd-04	2.00mm pitch single row 1x6P female connector
Rd-02B	1.27mm pitch single row 1x5P female connector

6. Schematic

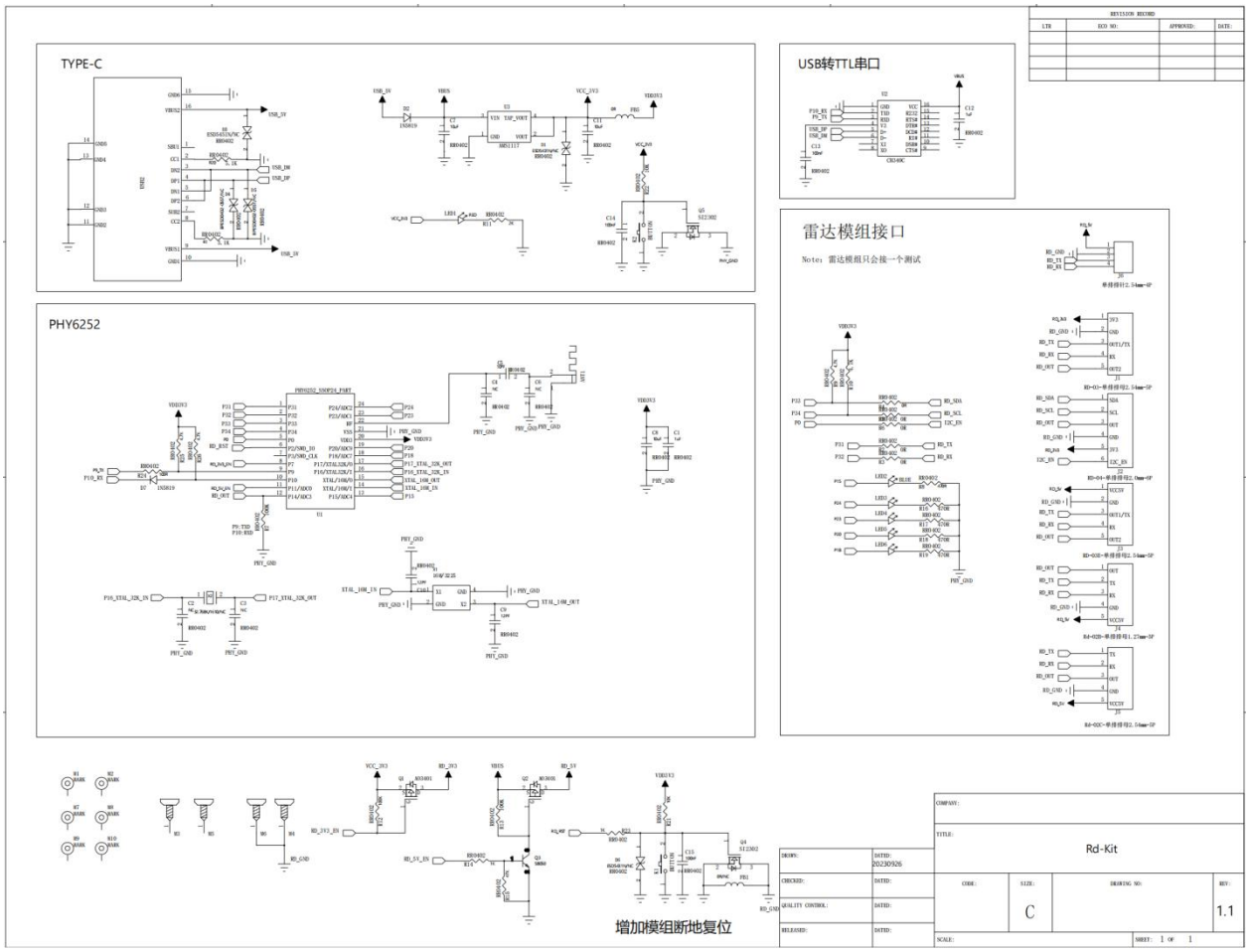


Figure 11 Schematic diagram

7. Product Packaging Information

Table 5 Packaging information

Packing list	Packaging	Quantity per package (static bag)	Quantity per pack (sealed bag)
Rd -Kit	Foam + anti-static bag	1pcs	20pcs

8. Contact Us

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