



# Rd-Kit Specification

Version V1.1.1

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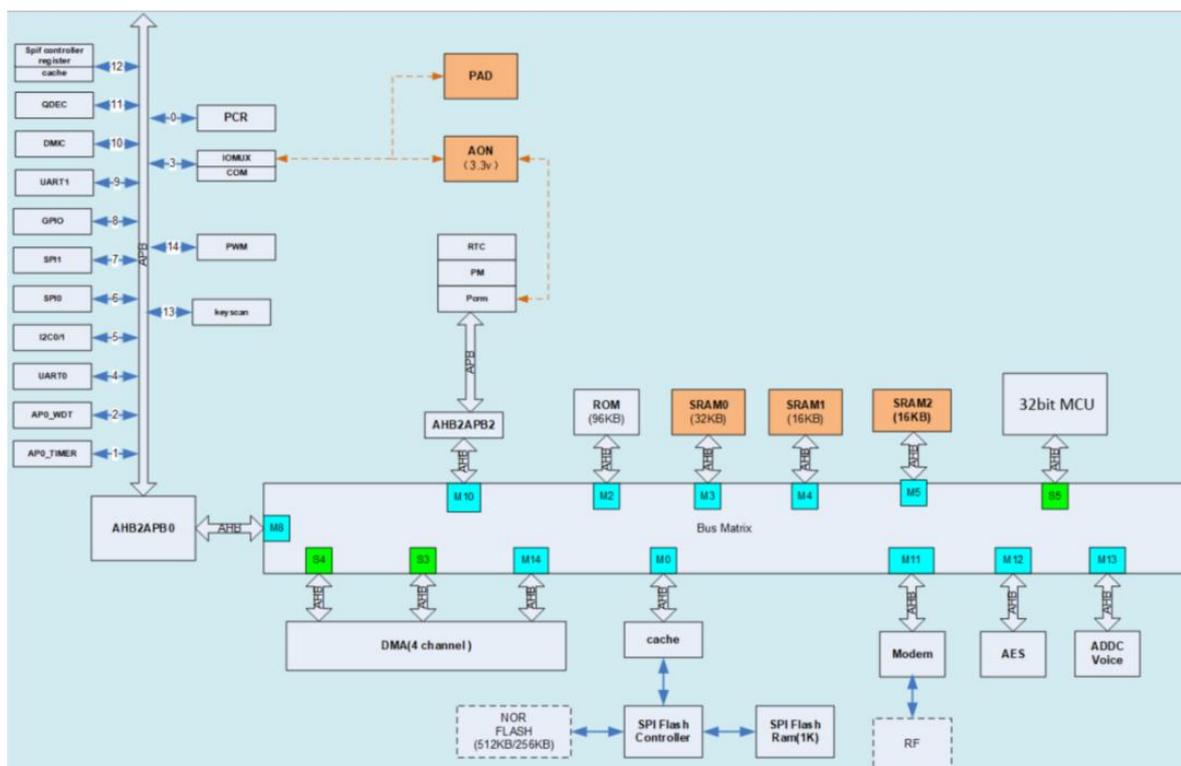
# 1. Product Overview

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 seven radars, namely Rd-02B, Rd-02C, Rd-03/03L, 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 seven radars, namely Rd-02B, Rd-02C, Rd-03/03L, 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 seven kinds of radars: Rd-02B, Rd-02C, Rd-03/03L, 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**

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

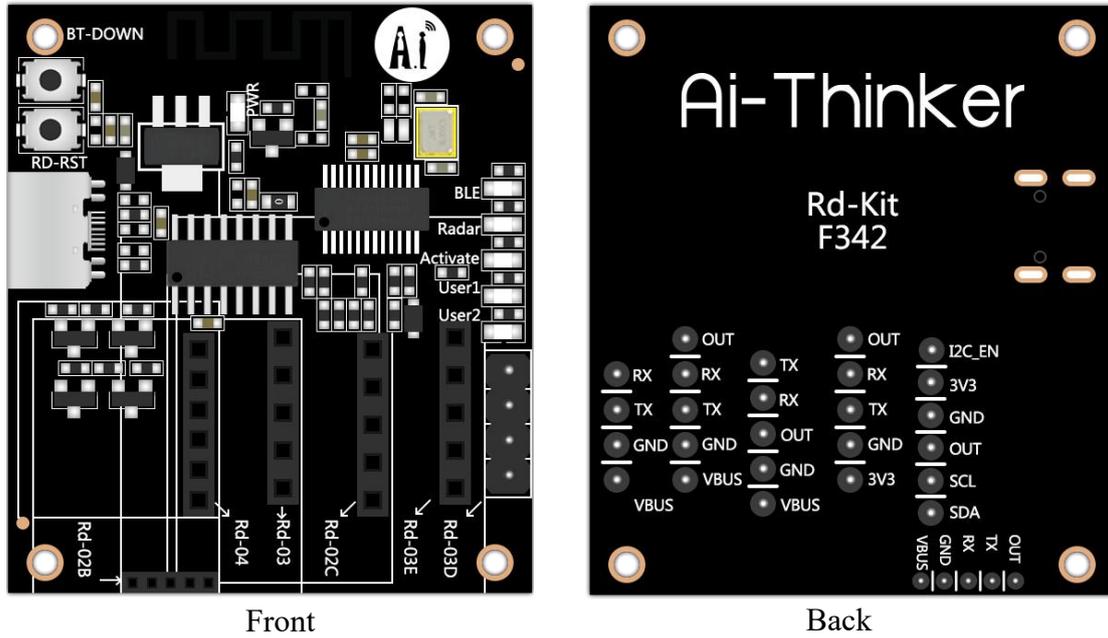
## 2.3. Consumption

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.

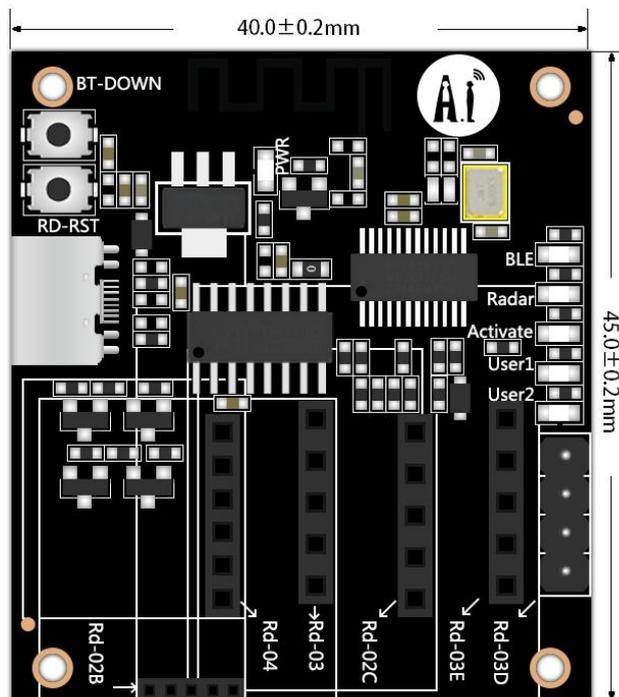
**Table 2 Power consumption table**

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-03L(1Hz report) trigger status	-	15	-	mA
Rd-04 Trigger state	-	20	-	mA

### 3. Appearance size

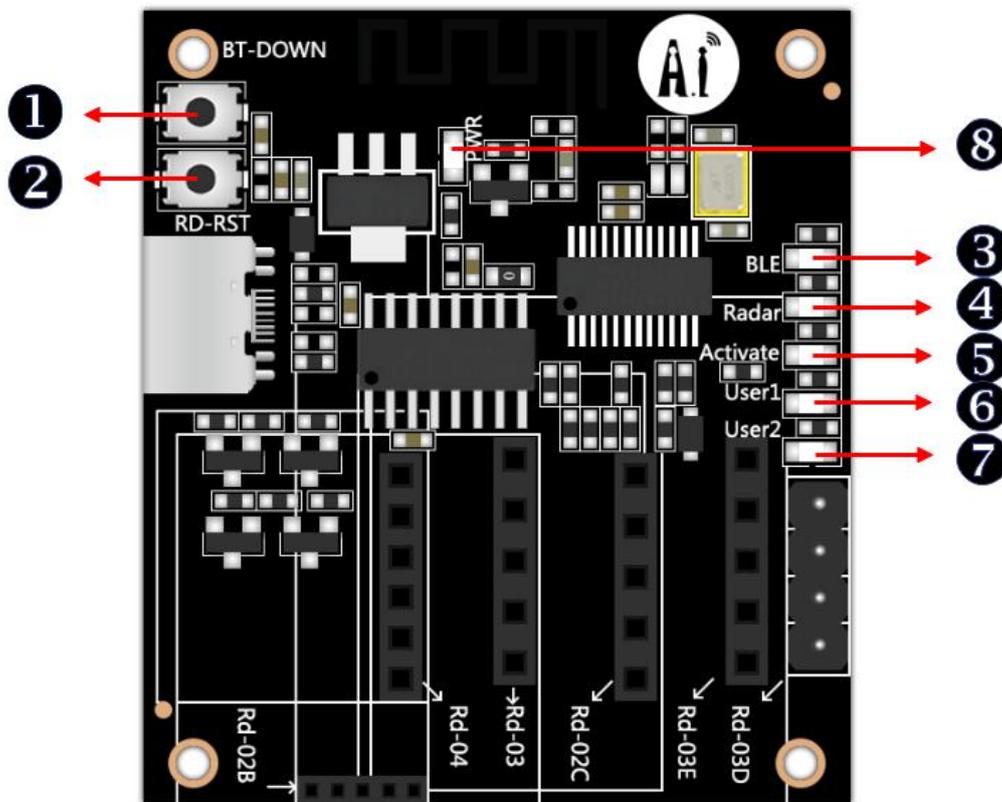


**Figure 3 Appearance drawing (the rendering drawing is for reference only, subject to the real thing)**



**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-03/03L and Rd-04 are shown in the following figure.

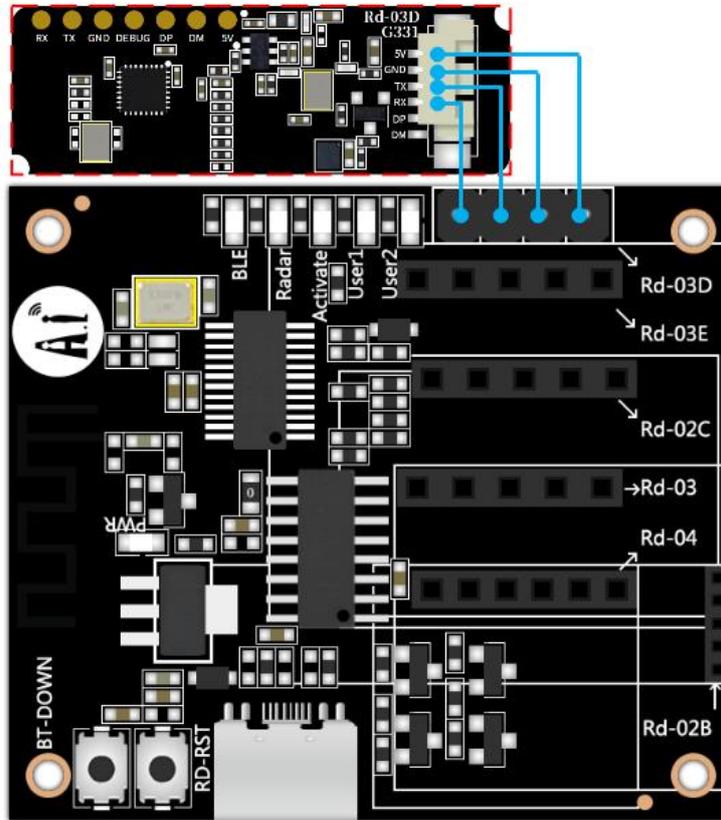


Figure 6 Schematic diagram of Rd-03D wiring

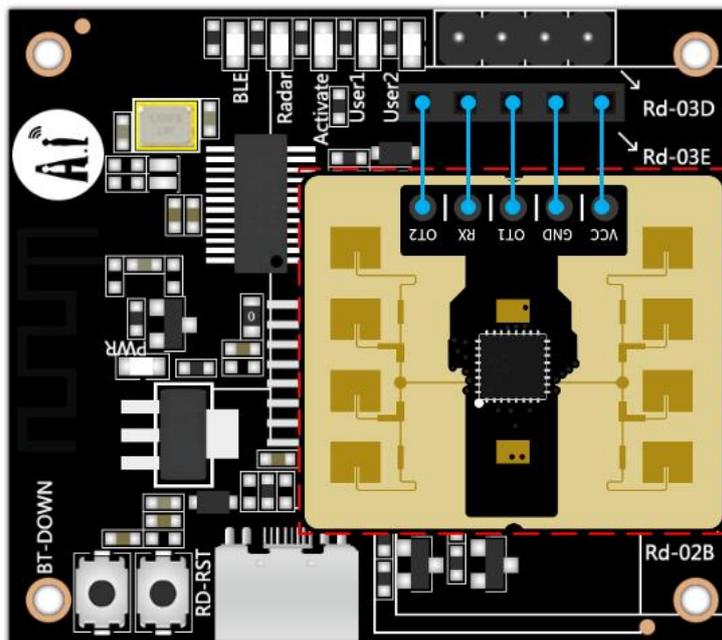
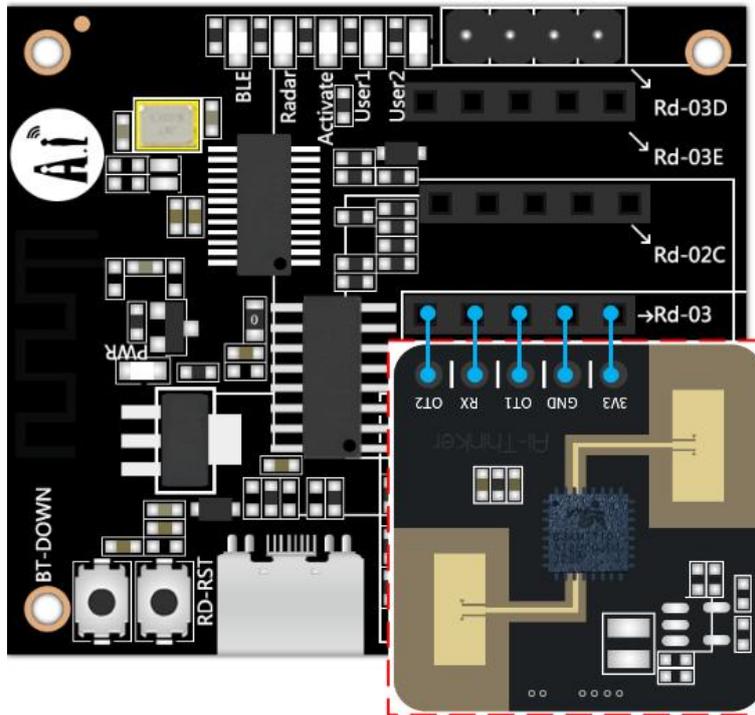
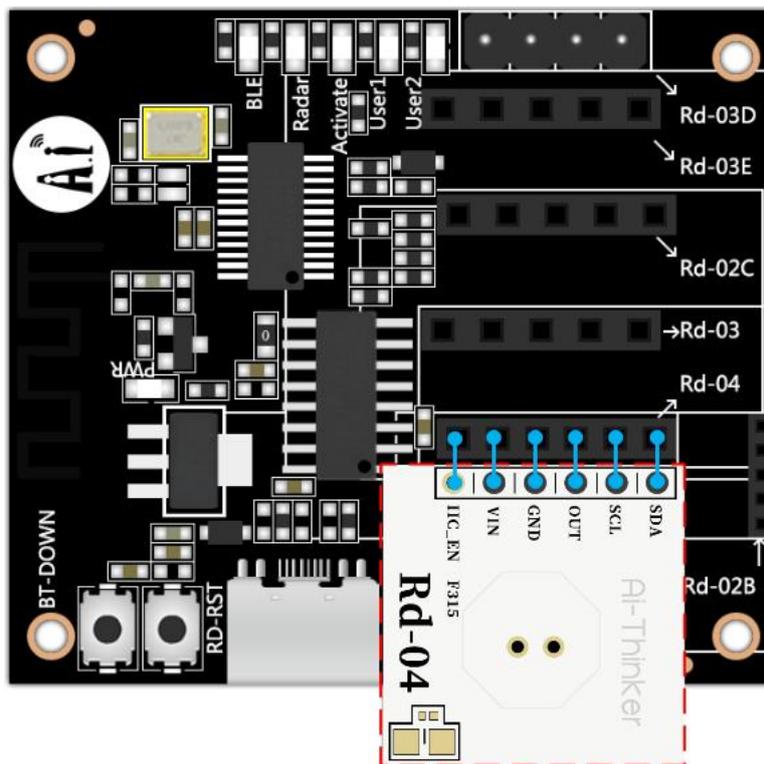


Figure 7 Schematic diagram of Rd-03E wiring



**Figure8 Schematic diagram of Rd-03/03L 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.

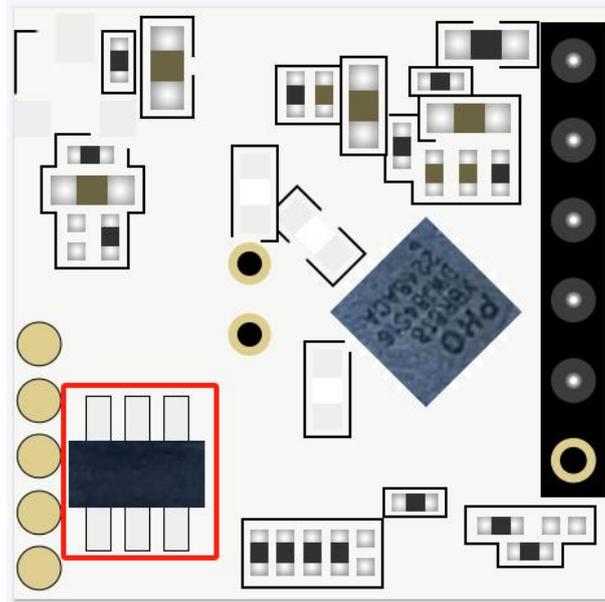


Figure 10 Rd-04

Table 4 Radar Interface Parameter Table

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

## 6. Schematic diagram

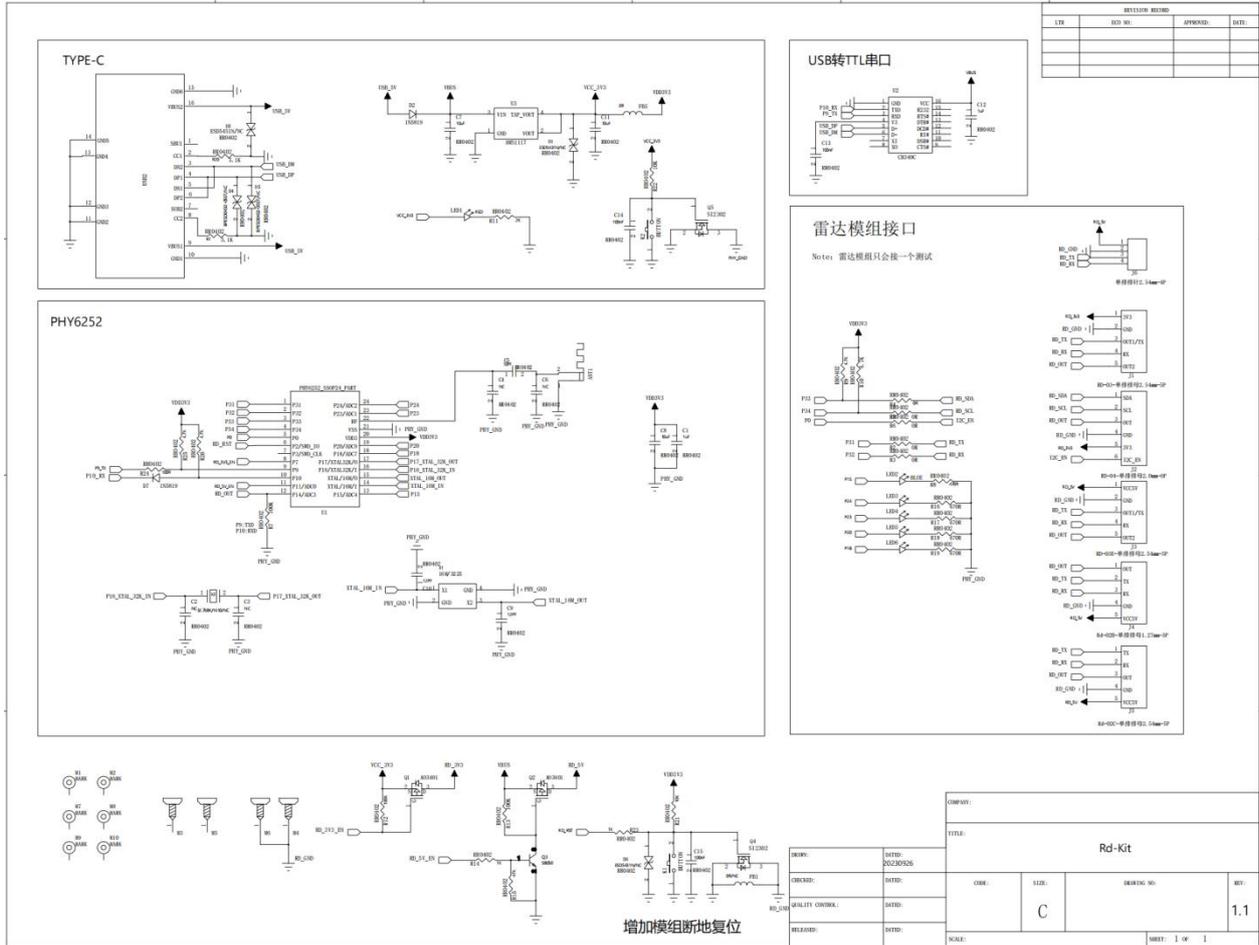


Figure 11 Schematic diagram

## 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

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