



BU03-Kit Specification

Version V1.1.2

Copyright ©2026

Content

1. Product Overview	4
1.1. Characteristic	5
2. Main parameters	6
2.1. Static electricity requirements	6
2.2. Electrical characteristics	6
2.3. RF Parameter	7
2.4. Power Consumption	7
3. Appearance dimensions	8
4. Button and indicator description	9
5. Pin definition	10
6. Schematic	13
7. Product packaging information	14
8. Contact us	14
Disclaimer and copyright notice	15
Notice	15
Important Statement	16

1. Product Overview

BU03-Kit is a UWB development board developed by Ai-Thinker Co., Ltd. The development board is a test and evaluation board based on BU03 transceiver module and equipped with an ST master. The BU03 module integrates the onboard antenna, RF circuit, and power management. The BU03-Kit can be used in bidirectional ranging or TWR positioning systems with positioning accuracy up to 10 cm and supports data rates of up to 6.8 Mbps. It can be widely used in the Internet of Things (IoT), mobile devices, wearable electronic devices, smart home and other fields.

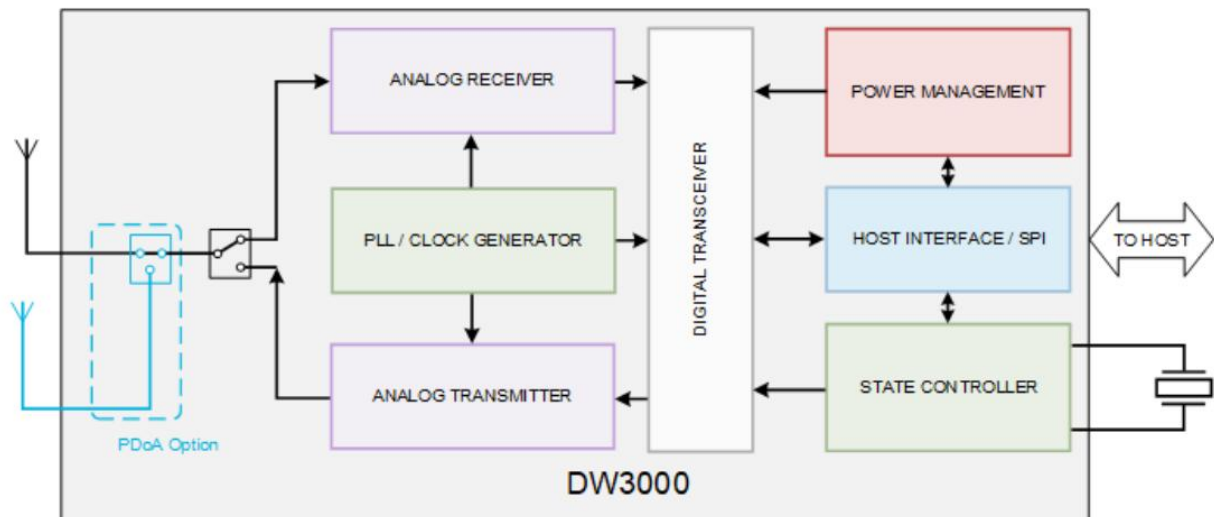


Figure 1 Main chip architecture diagram

1.1. Characteristic

- SMD-40 package
- Complies with the IEEE 802.15.4-2015 UWB standard
- Complies with the IEEE802.15.4z (BPRF mode)
- Channel 5 and channel 9 are supported
- Easy integration without RF design
- Integrated MAC support
- The use of RTLS infrastructure extends the range of communication
- Data rate 850 Kbps, 6.8 Mbps
- Supports bidirectional ranging and TWR and PDOA positioning schemes
- Provides accurate positioning and data transfer
- Positioning accuracy 10 cm
- Supports high label density
- Integrated HW AES 256
- Supports the SPI interface
- 9 GPIO available
- Programmable adjustment of the transmit power
- BU03 module power consumption $<1\mu\text{A}$ in sleep mode
- Suitable for button battery solutions

2. Main parameters

Table 1 Description of the main parameters

Model	BU03-Kit
Package	DIP-40
Size	35.56*55.00(±0.2)mm
Antenna	Onboard ceramic antenna
Center frequency	CH5(6489.5MHz)、CH9(7987.2MHz)
Operating temperature	-40℃ ~ 85℃
Storage temperature	-40℃ ~ 125℃, < 90%RH
Power supply	Power supply voltage USB Type-C or pin 3.3 or 5V power supply. Power supply current ≥500mA
Interface	UART, I2C, SPI
I/O	20

2.1. Static electricity requirements

BU03-Kit is an electrostatic sensitive device, and special precautions must be taken when handling it.



Figure 2 ESD anti-static diagram

2.2. Electrical characteristics

Table 2 Electrical characteristics table

Parameter	Name	Min.	Typical value	Max.	Unit
Supply voltage	VDD	1.7	3.3	3.6	V
Supply voltage	VCC	2.5	3.3	3.6	V
I/O	VIL	-	-	0.3*VDD1	V
	VIH	-	0.7*VDD1	-	V
	VOL	-	-	0.1*VDD1	V

	VOH	-	-	0.9*VDD1	-	V
	IMAX	-	-	-	10	mA

2.3. RF Parameter

Table 3 UWB RF parameters

Description	Typical value	Unit
CH5 center frequency	6489.6	MHz
CH9 center frequency	7987.2	MHz
Channel bandwidth	499.2	MHz

2.4. Power Consumption

The following power consumption data is based on a 3.3V power supply and an ambient temperature of 25° C.

Table 4 Power Consumption

Mode	Min.	Typical	Max.	Unit
CH5 is transmitting at 0.85Mbps	-	17.03	-	mA
CH5 is transmitting at 6.81Mbps	-	15.06	-	mA
CH5 is transmitting at 0.85Mbps	-	24.85	-	mA
CH5 is transmitting at 6.81Mbps	-	22.6	-	mA
CH5 receives at 0.85Mbps	-	39.81	-	mA
CH5 receives at 6.81Mbps	-	40.01	-	mA
CH5 receives at 0.85Mbps	-	49.23	-	mA
CH5 receives at 6.81Mbps	-	48.05	-	mA
Instantaneous start-up current	-	174	-	mA
Deep sleep	-	179	-	nA

3. Appearance dimensions

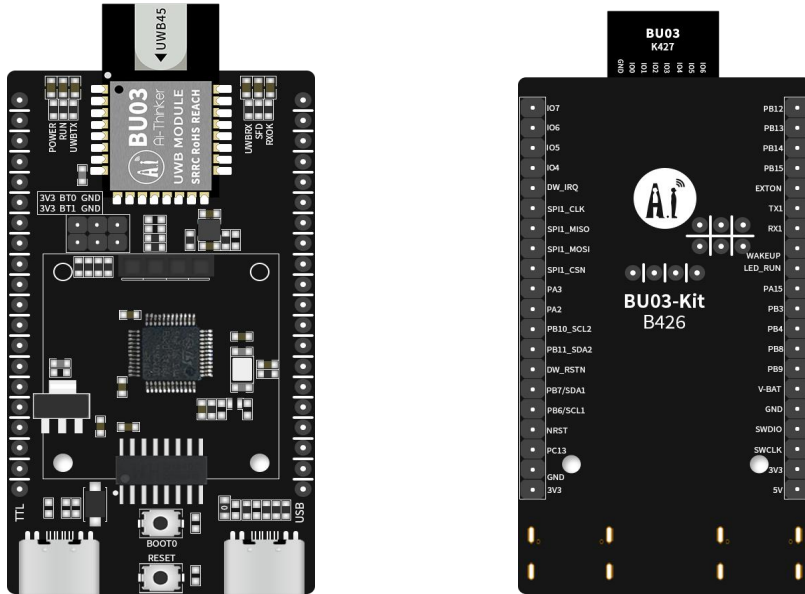


Figure 3 Appearance diagram (rendering diagram is for reference only, subject to the actual object)

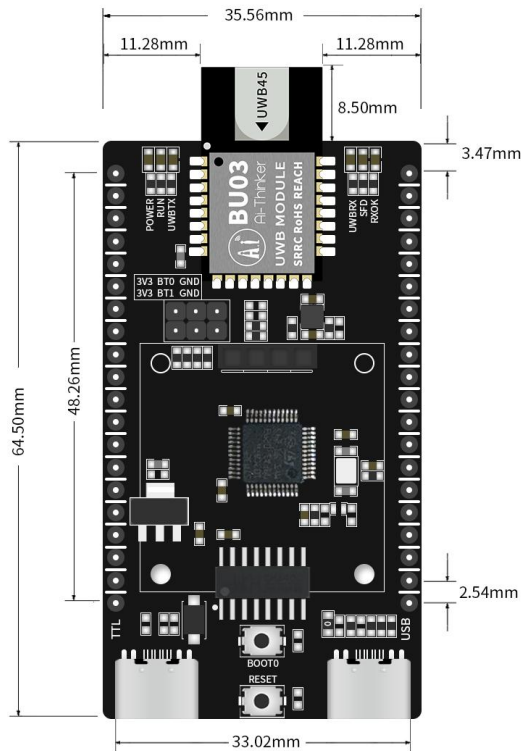


Figure 4 Module size diagram

4. Button and indicator description

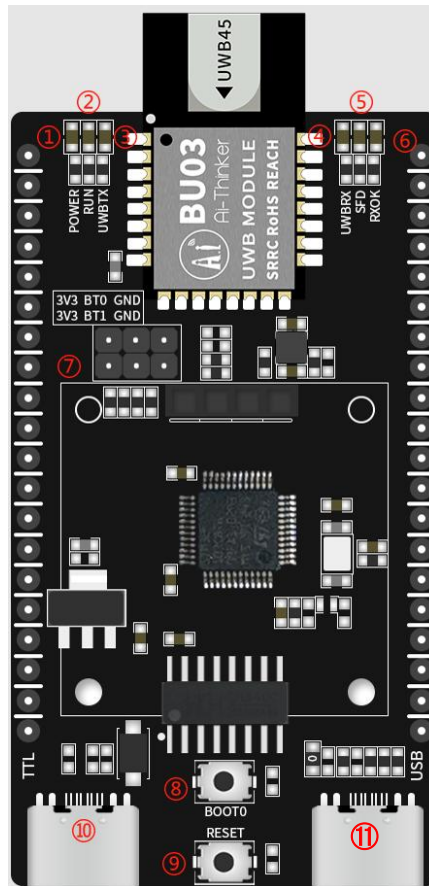


Figure 5 Button and Indicator Diagram

Table 5 Button and Indicator Function Description

①	POWER, Power indicator light, power on red;
②	RUN, Running indicator, running successfully on
③	UWBTX, Communication indicator 1, data transmission blinking;
④	UWBRX, Communication indicator 2, data reception blinking;
⑤	SFD, LED with undefined function;
⑥	RXOK, LED with undefined function;
⑦	Pin, STM32 serial port burn BOOT control;
⑧	BOOT, Burning control key;
⑨	RESET button, reset button;
⑩	Positioning and ranging data interface;
⑪	Serial port, support burning and AT command interaction;

5. Pin definition

BU03-Kit connects to a total of 40 interfaces. For example, in the pin diagram, the pin function definition table is the interface definition.

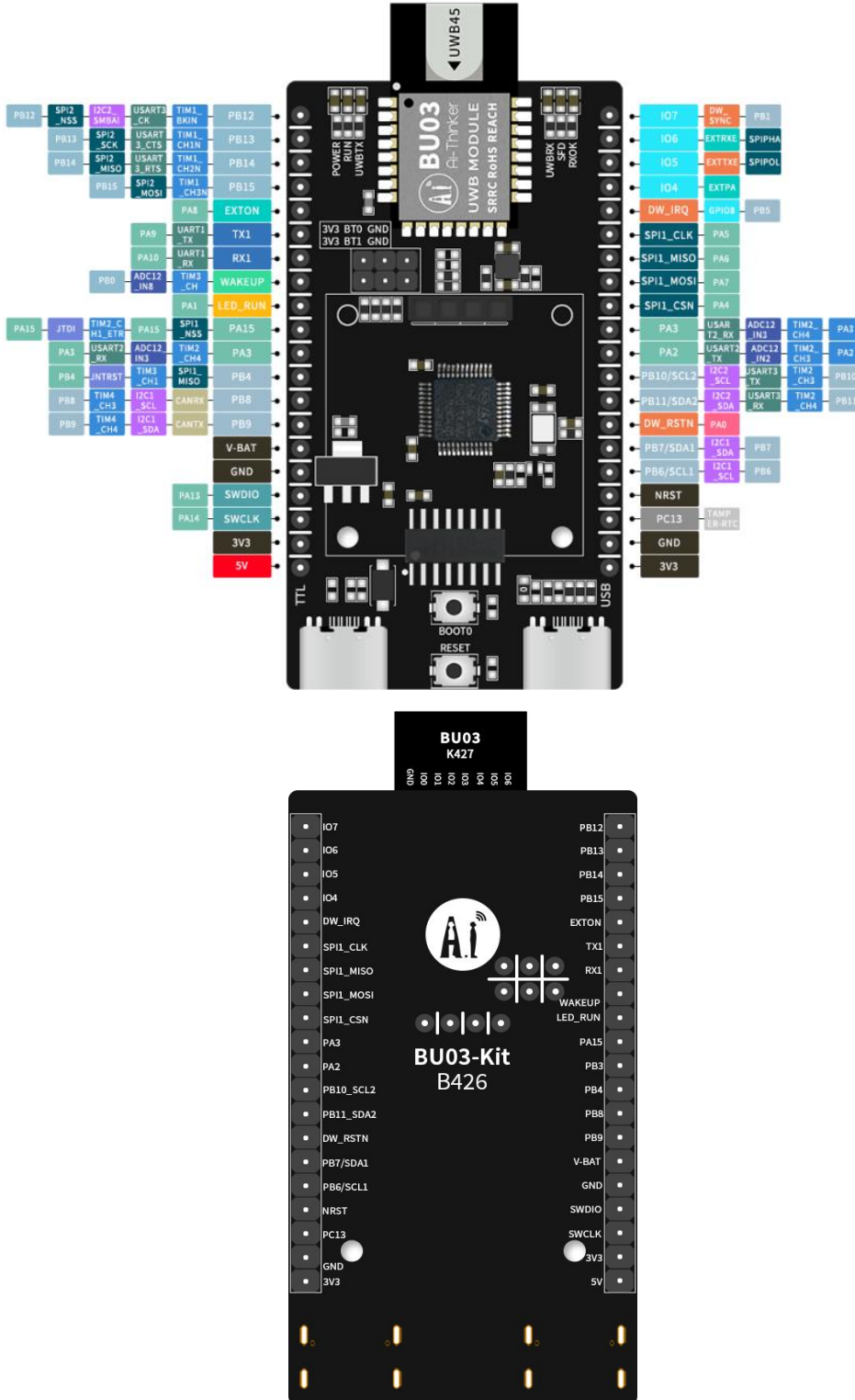


Figure 6 Pin Diagram

Table 6 Pin function definition table

No.	Name	Function
1	PB12	PB12,SPI2_NSS/I2C2_SMBAl/USART3_CK/TIM1_BKIN
2	PB13	PB13,SPI2_SCK/USART3_CTS/TIM1_CH1N
3	PB14	PB14,SPI2_MISO/USART3_RTSTIM1_CH2N
4	PB15	PB15,SPI2_MOSI/TIM1_CH3N
5	EXTON	EXTON_PA8
6	TX1	UART1_TX
7	RX1	UART1_RX
8	WAKEUP	PA0WKUP,PA0,WKUP/USART2_CTS(9)/ADC12_IN0/TIM2_CH1_ETR
9	LED_RUN	PA1_LED_RUN
10	PA15	JTDI,,TIM2_CH1_ETR/PA15/SPI1_NSS
11	PA3	PA3,,USART2_RX/ADC12_IN3/TIM2_CH4
12	PB4	JNTRST,TIM3_CH1/PB4/SPI1_MISO
13	PB8	PB8,TIM4_CH3,I2C1_SCL/CANRX
14	PB9	PB9,TIM4_CH4,I2C1_SDA/CANTX
15	V-BAT	V-BAT
16	GND	GND
17	SWDIO	SWDIO
18	SWCLK	SWCLK
19	3V3	3V3 power supply
20	5V	5V power supply

21	3V3	3V3 power supply
22	GND	GND
23	PC13	PC13-TAMPER-RTC,PC13,TAMPER-RTC
24	NRST	NRST
25	I2C1_SCL	I2C1_SCL/PB7
26	I2C1_SDA	I2C1_SDA/PB7
27	DW_RSTN	RSTN
28	I2C3_SDA	PB11,I2C2_SDA/USART3_RX,TIM2_CH4
29	I2C2_SCL	PB10,I2C2_SCL/USART3_TX,TIM2_CH3
30	PA2	PA2,USART2_TX/ADC12_IN2/TIM2_CH3
31	PA3	PA3,USART2_RX/ADC12_IN3/TIM2_CH4
32	SPI1_CSN	SPI1_CSN
33	SPI1_MOSI	SPI1_MOSI
34	SPI1_MISO	SPI1_MISO
35	SPI1_CLK	SPI1_CLK
36	DW_IRQ	DW_IRQ/GPIO8
37	IO4	IO4/EXTPA
38	IO5	IO5/EXTTXE/SPIPOL
39	IO6	IO6/EXTRXE/SPIPHA
40	IO7	DW_SYNC

6. Schematic

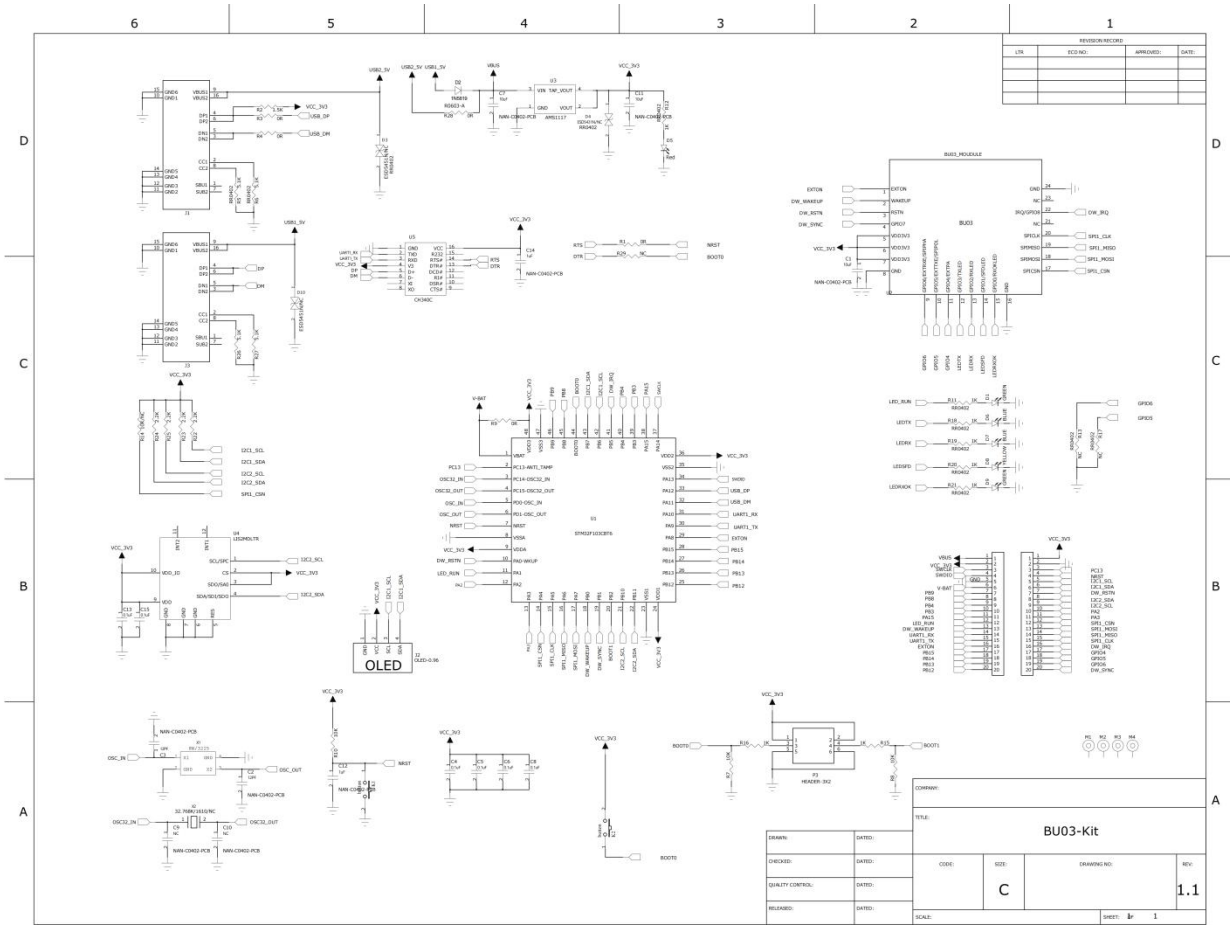


Figure 7 schematic diagram

7. Product packaging information

Packing List	Package	Pack Quantity Units	Pack Quantity Units(Sealed bag)
BU03-Kit	Foam + electrostatic bag	1pcs	10pcs

8. Contact us

[Ai-Thinker official website](#)

[Office forum](#)

[Develop DOCS](#)

[LinkedIn](#)

[Tmall shop](#)

[Taobao shop](#)

[Alibaba shop](#)

Technical support email: support@aithinker.com

Domestic business cooperation: sales@aithinker.com

Overseas business cooperation: overseas@aithinker.com

Company Address: Room 403-405,408-410, 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 provides technical and reliability data (including data sheets), design resources (including reference designs), application or other design advice, web tools, safety information, and other resources "as is" (hereinafter referred to as "these resources"), There is no warranty against defects and no warranties of any kind, express or implied, including, but not limited to, express or implied warranties of fitness, fitness for a particular purpose, or non-infringement of any third party intellectual property rights, are disclaimed. And specifically disclaims responsibility for any inevitable or incidental losses including but not limited to the application or the use of any products and circuits of our company.

Ai-Thinker reserves the right to change the information released in this document (including but not limited to indicators and product descriptions) and any involved products of the company without prior notice. This document automatically supersedes and replaces the previous version of the same document number. All information provided.

These resources are available to skilled developers designing with Ai-Thinker products. You will be solely responsible for the following: (1) Select the appropriate Ai-Thinker product for your application; (2) Design, verify, and operate your application and product throughout the life cycle; (3) Ensure that your application meets all Appropriate standards, codes and laws, and any other functional safety, information security, regulatory or other requirements.

Ai-Thinker authorizes you to use these resources only to develop applications for the Ai-Thinker products described in this resource. Without the permission of Ai-Thinker, no unit or individual may excerpt, copy part or all of these resources, and shall not spread them in any form. You have no right to use any other Ai-Thinker intellectual property or any third party intellectual property. You shall fully indemnify and in no event shall Ai-Thinker be liable to Ai-Thinker and its representatives for any claims, damages, costs, losses and liabilities arising out of the use of these resources.

Products offered by Ai-Thinker are subject to Ai-Thinker's Terms of Sale or other applicable terms accompanying Ai-Thinker products. Ai-Thinker's provision of these resources does not extend or otherwise alter the applicable warranties or warranty disclaimers for product releases.