

DK-2500

DEVELOPMENT KIT

INTRODUCTION

Tailored For 2026 Intel Cup Undergraduate Electronic Design Contest
-Embedded System Design Contest

SHENZHEN FUTURE ROBOT TECHNOLOGY CO., LTD

AGENDA



Overview



Product Introduction

- Product Features
- Physical Dimensions
- Package Contents
- Resource Download



Interface introduction



Connectivity & Expansion

- External I/O Interfaces
- Internal Expansion Interfaces



Connection Methods



Wired Setup

- Important Safety and Operational Notes for Wiring On-board Interfaces



System Setup



Software Configuration

- Pre-Use Preparation
- System Installation

Overview

PART ONE

DK 2500 Series

CORE SPECS

High-Performance Computing

- Intel® Core™ Ultra 5 Processor 225U
- 8GB DDR5 SO-DIMM Memory
- 128G SATA3.0 SSD Storage

Rich I/O Configuration

- Triple Display: HDMI + DP + eDP/LVDS
- 4 x GbE RJ45 Ethernet Ports
- 4 x USB3.2 Gen2 & 1 x USB2.0 Pin Header
- 2 x RS-232/485 Pin Header

Environmental Adaptability

- 9-36V Wide Range DC Input
- Watchdog & TPM 2.0 Security Module
- OS: Windows 10/11, Ubuntu LTS
- Operating Temp: 0°C ~ 60°C (32-142°F)

Flexible Hardware Expansion

Equipped with DDR5 SO-DIMM slots, M.2 slots, JTAG interfaces, and various low-speed buses, enabling flexible hardware prototyping and system expansion.



Flexible Software Ecosystem & Reliable Security Assurance

Operating System



Windows 10 / 11

Supports mainstream desktop graphical operating systems, providing a familiar and stable development environment that significantly reduces setup effort and configuration costs for developers.



Ubuntu 20.04 / 22.04/ 24.04 LTS

The preferred OS for AI and deep learning development, with a wealth of open-source libraries and mature toolchains. It is fully compatible with model training and edge computing scenarios.

Security Assurance

On-board TPM 2.0 Chip

Equipped with an on-board Trusted Platform Module (TPM), providing hardware-level encryption and key protection capabilities at the firmware level.



Secure Boot : Prevents malicious tampering with firmware and boot processes.



Key Storage : Protects sensitive data through hardware-based encryption.



Hardware Root of Trust : Establishes a trusted execution environment for system integrity.

Technical drawing of a rectangular electronic enclosure with dimensions in mm. The drawing includes a top view, a front view, a side view, and a cross-section.

Top View Dimensions:

- Overall width: 207.5
- Overall height: 222.5
- Internal width (excluding side rails): 157.0
- Internal height (excluding top and bottom rails): 114.1
- Distance from top rail to top component row: 12.0
- Distance from bottom rail to bottom component row: 12.0
- Distance from left rail to left component column: 43.0
- Distance from right rail to right component column: 65.4
- Number of mounting holes: 6- $\varnothing 3.3$ (top left), 4- $\varnothing 3.5$ (top right), 6- $\varnothing 3.3$ (bottom left), 4- $\varnothing 3.5$ (bottom right)

Front View Dimensions:

- Overall width: 224.0
- Overall height: 239.0
- Distance from top rail to top component row: 24.6
- Distance from bottom rail to bottom component row: 60.0

Side View Dimensions:

- Overall width: 60.0
- Distance from front rail to front component column: 1.6
- Distance from back rail to back component column: 48.3
- Distance from front rail to front component column (including mounting hole): 70.0
- Distance from back rail to back component column (including mounting hole): 76.0
- Distance from front rail to front component column (including mounting hole and spacing): 3.0
- Distance from back rail to back component column (including mounting hole and spacing): 12.0

Package Contents



- **DK-2500 PC x 1**
- **24V 5A Power Adapter x 1**
- **Power Cord x 1**
- **Serial Cable x 2**



Important Note:

Please check all items against the list immediately upon unboxing to prevent any potential disruptions to your project.

Resource Download

List of resources

- DK-2500 Development Kit Specification
- DK-2500 Development Kit User Manual
- Linux & Windows OS Installation SOP
- DK-2500 Development Kit BIOS Package
- DK-2500 Development Kit 2D/3D Drawings

Download Link

File shared via Baidu Netdisk: DK2500 Development Kit
Link: <https://pan.baidu.com/s/1INFvNN8X26XmJikb-mtESQ>
Access code: r9i3

QR code



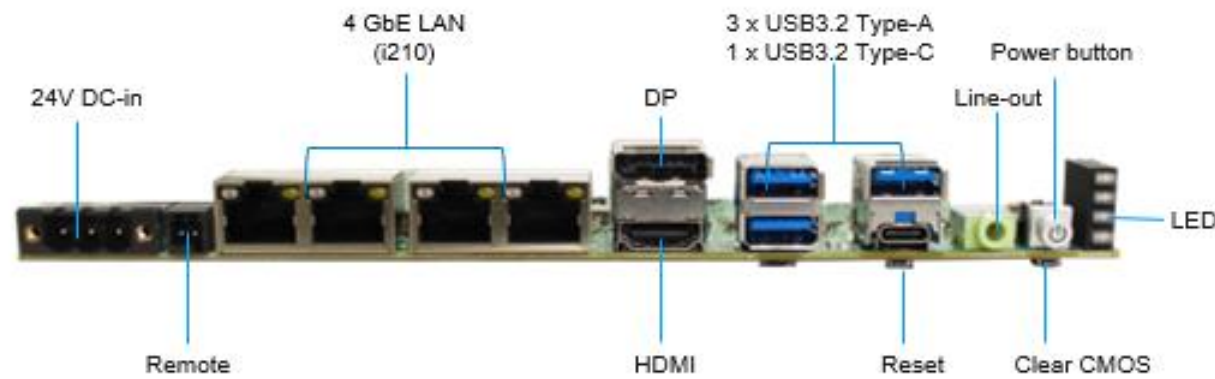
Get The Files

Always keep your
resources up-to-date

INTERFACE INTRODUCTION

PART TWO

I/O Interfaces



DC Power Input

1 x 3-Pin Phoenix Contact (9-36V DC-in) for Stable Industrial Power



Remote Power Control Interface

1 x 2-Pin Phoenix Contact for External Remote Power Control



Gigabit Ethernet

4 x RJ45 Ports (Intel® i210-AT) for High-Speed Network Connectivity



Display Outputs

1 x HDMI 2.1 (4K@60Hz),
1 x DP 1.4a (4K@60Hz)



High-Speed USB

1 x USB 3.2 Gen2 Type-C
3 x USB 3.2 Gen2 Type-A



Audio Line-Out

1 x 3.5mm TRS Stereo Jack for Headphones or External Speakers



Front Panel Controls

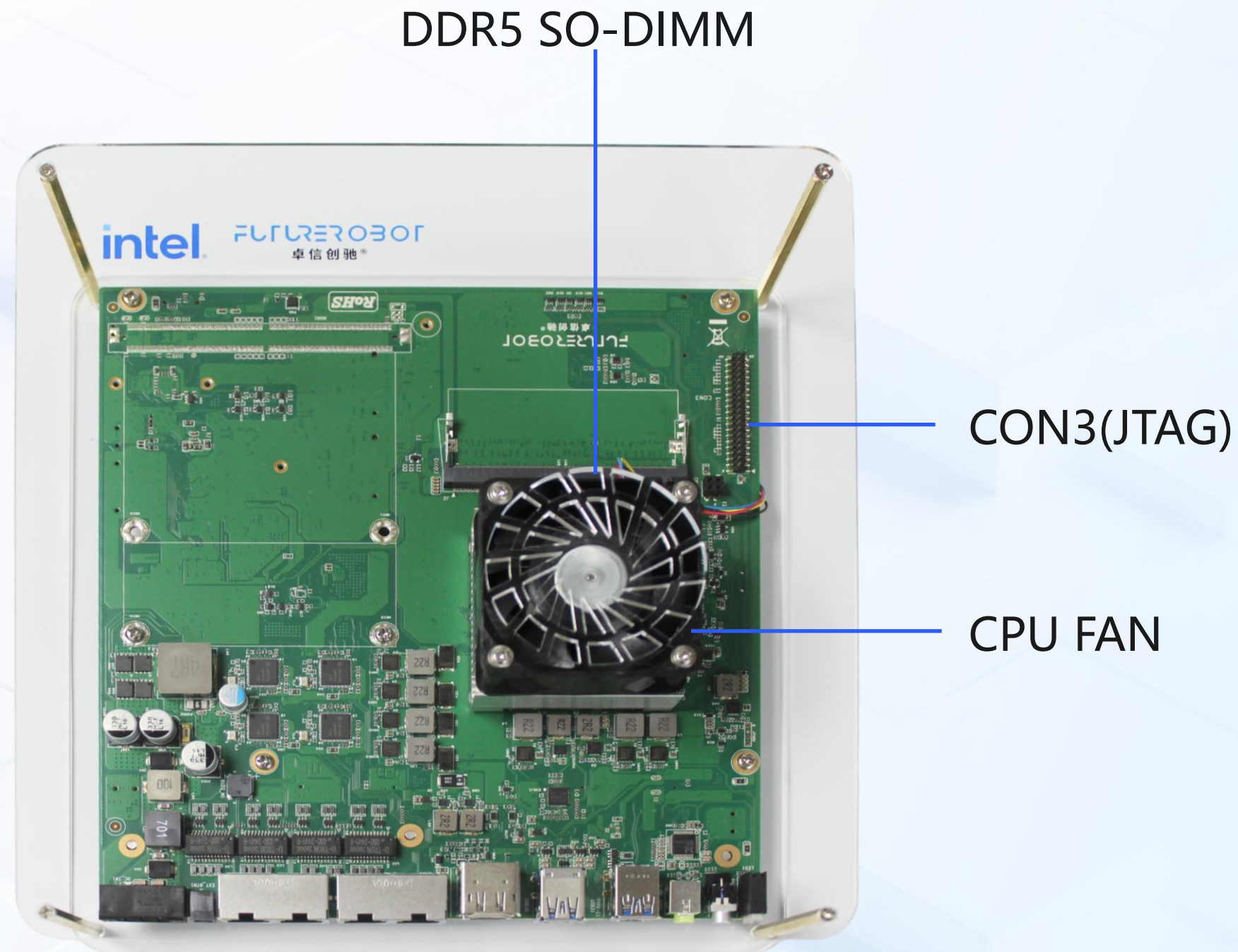
Power On/Off, System Reset, and Clear CMOS Function Buttons



System Status LEDs

4 x Front Panel Indicators (SATA, DG, USER1, USER2)

Internal Expansion



DDR5 SO-DIMM

DDR5 SO-DIMM interface for memory expansion.

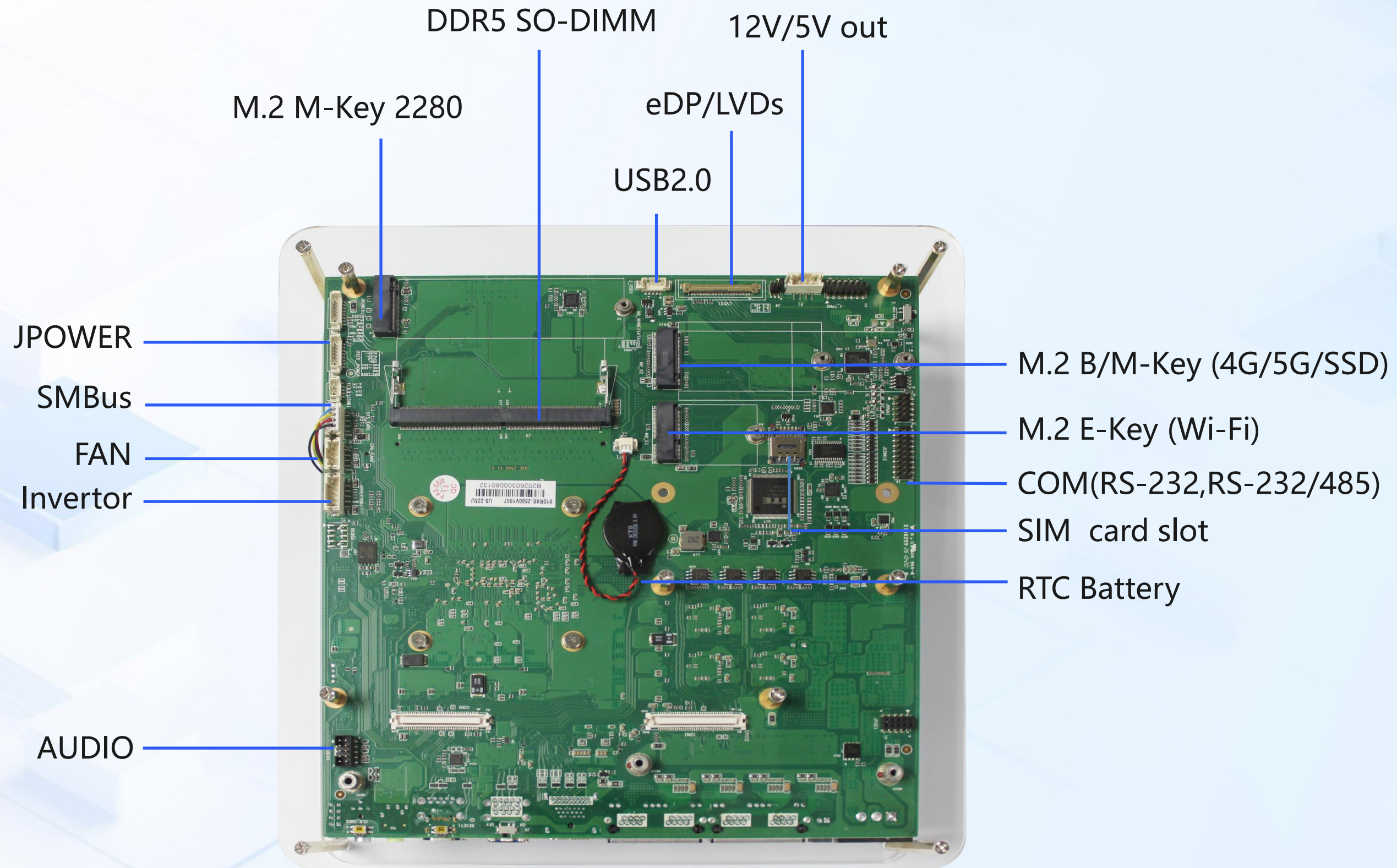
CON3 (JTAG)

40-pin interface, integrating I2C, UART, GPIO and other multi-channel control signals for development and debugging.

CPU FAN

Cooling the processor through air convection.

Internal Expansion



JPOWER (User Button)

Includes expandable indicator light, power on/off and system reset button.

SMBus

Provides standard SMBus management signals for system control.

FAN (Temp Control)

Two-way intelligent temp control paths for CPU and SYS fans.

INVERTOR (Backlight)

Supports a dedicated and unique backlight control interface.

Audio Expansion

Supports extended audio Line-in and MIC inputs.

M.2 M-Key (SSD)

Compliant with M.2 2280 spec, natively supports SATA SSD for high-speed storage.

USB 2.0

Standard internal USB 2.0 pin header for peripheral expansion.

LVDS Display Interface

Dual-channel LVDS output, supports up to 4K resolution for high-quality display.

P1 (Power Output)

Supports external 12V/5V output with a maximum load capacity of 1A.

M.2 B-Key (4G/5G)

Designed for wireless comms, supports mainstream 4G/5G modules for full wireless solutions.

NANO SIM Card Slot

Standard Nano SIM size, linked with B-key module for mobile network access.

M.2 E-Key (WIFI)

Supports Intel CNVi for Wi-Fi 6 & BT 5.2 wireless network cards.

COM Pin Header

Dual COM interfaces, COM1 supports RS232/RS485 switching.

CONNECTION METHODS

PART THREE

Important Safety and Operational Notes for Wiring On-board Interfaces



ESD Protection Guidelines

Before handling any internal components, you must wear anti-static gloves or wristbands.

Note:Electrostatic discharge (ESD) can cause irreversible physical damage to precision circuits.



Power Operation Safety Guidelines

Always disconnect the device power before making any hardware configuration changes. Use only the power adapter specified by the original manufacturer. Keep power cords neatly arranged to avoid tripping hazards.



Core Warning

Improper operation may cause permanent hardware damage or safety hazards.

Important Safety and Operational Notes for Wiring On-board Interfaces



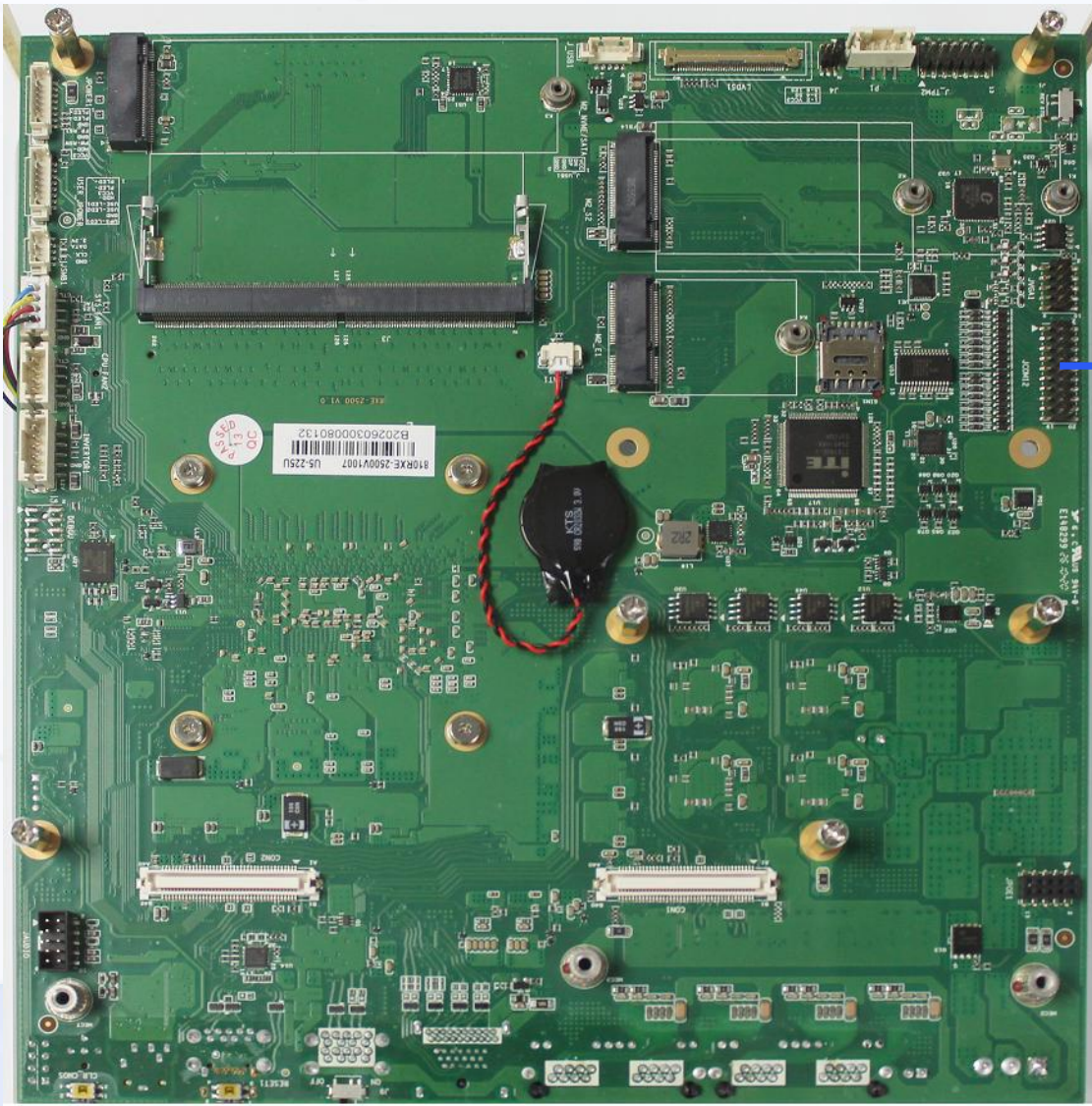
PIN↵	Signal↵
1↵	5V↵
2↵	GND↵
3↵	GND↵
4↵	12V↵

P1: The external power output supports a maximum load current of **1A**. The interface is implemented via a **PH 2.0mm pitch 1x4-pin wafer** header.

PIN↵	Signal↵
1↵	Vbus↵
2↵	D -↵
3↵	D +↵
4↵	GND↵
5↵	GND↵

JUSB: This interface uses a vertical **1x5-pin PH1.25 wafer** connector. If you need to use this interface, please purchase the matching cable assembly separately.

Important Safety and Operational Notes for Wiring On-board Interfaces

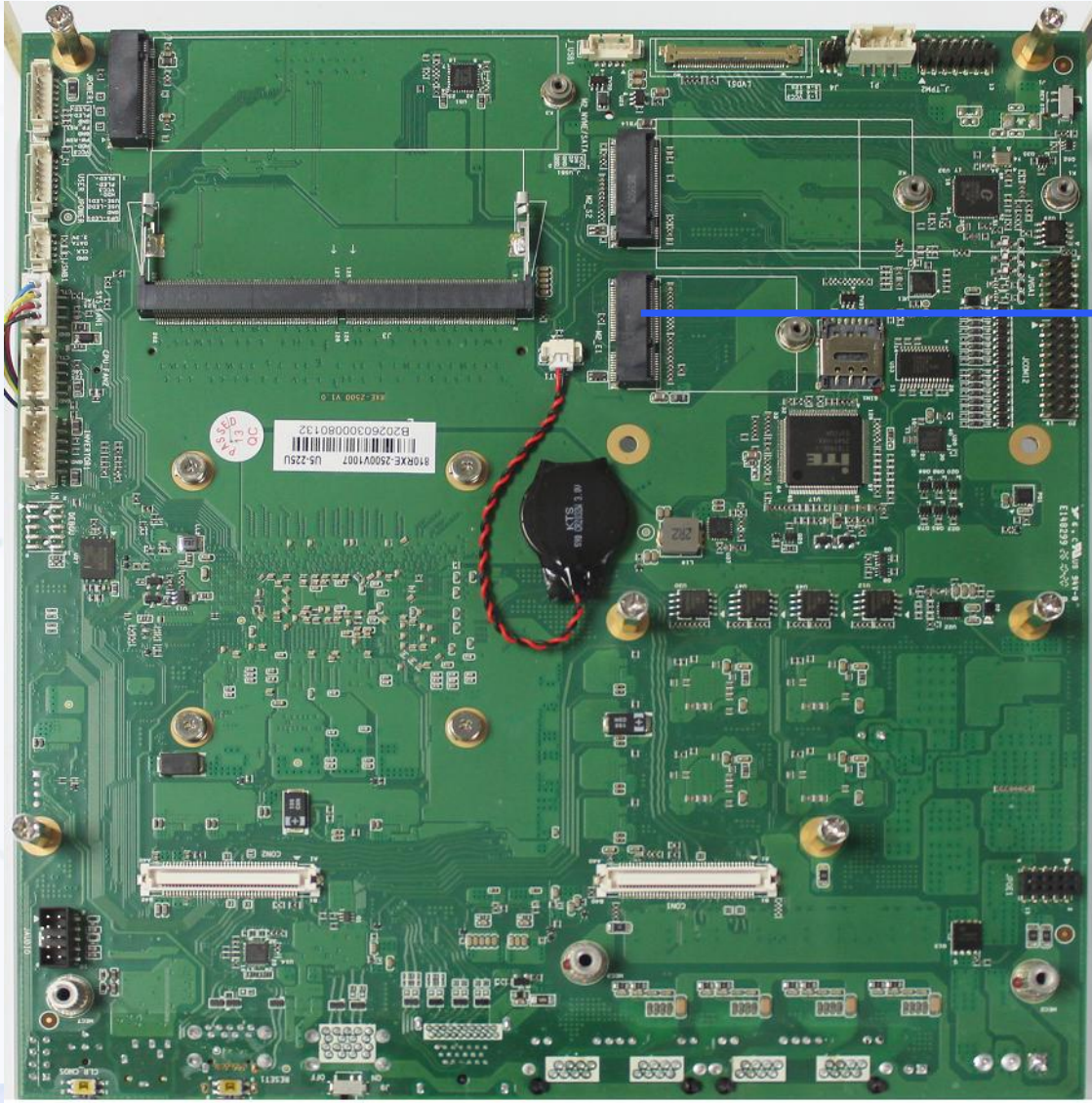


PIN↵	RS232↵	RS422(DB9)↵	RS485 (DB9) ↵
1↵	JDCD_1↵	JTx-_1↵	JDATA -_1↵
2↵	JRXD_1↵	JTx+_1↵	JDATA+_1↵
3↵	JTXD_1↵	JRx+_1↵	NC↵ 
4↵	JDTR_1↵	JRx-↵	NC↵
5↵	JGND_1↵	JGND↵	JGND↵
6↵	JDSR_1↵	NC↵	NC↵
7↵	JRTS_1↵	NC↵	NC↵
8↵	JCTS_1↵	NC↵	NC↵
9↵	JRI_1↵	NC↵	NC↵
10↵	NC↵	↵	↵
11↵	JDCD_2↵	NC↵	NC↵
12↵	JRXD_2↵	NC↵	NC↵
13↵	JTXD_2↵	NC↵	NC↵
14↵	JDTR_2↵	NC↵	NC↵
15↵	JGND_2↵	NC↵	NC↵
16↵	JDSR_2↵	NC↵	NC↵
17↵	JRTS_2↵	NC↵	NC↵
18↵	JCTS_2↵	NC↵	NC↵
19↵	JRI_2↵	NC↵	NC↵
20↵	NC↵	NC↵	NC↵

Wiring Tips:

- Ensure correct alignment by matching **Pin 1 of the cable** with **Pin 1 of the header**.
- The DB9 connector outputs standard RS232 signals by default.
- Always refer to the respective pin definitions when using RS485 or RS422 modes.
- COM1 function mode switching is performed in the BIOS setup.

Important Safety and Operational Notes for Wiring On-board Interfaces



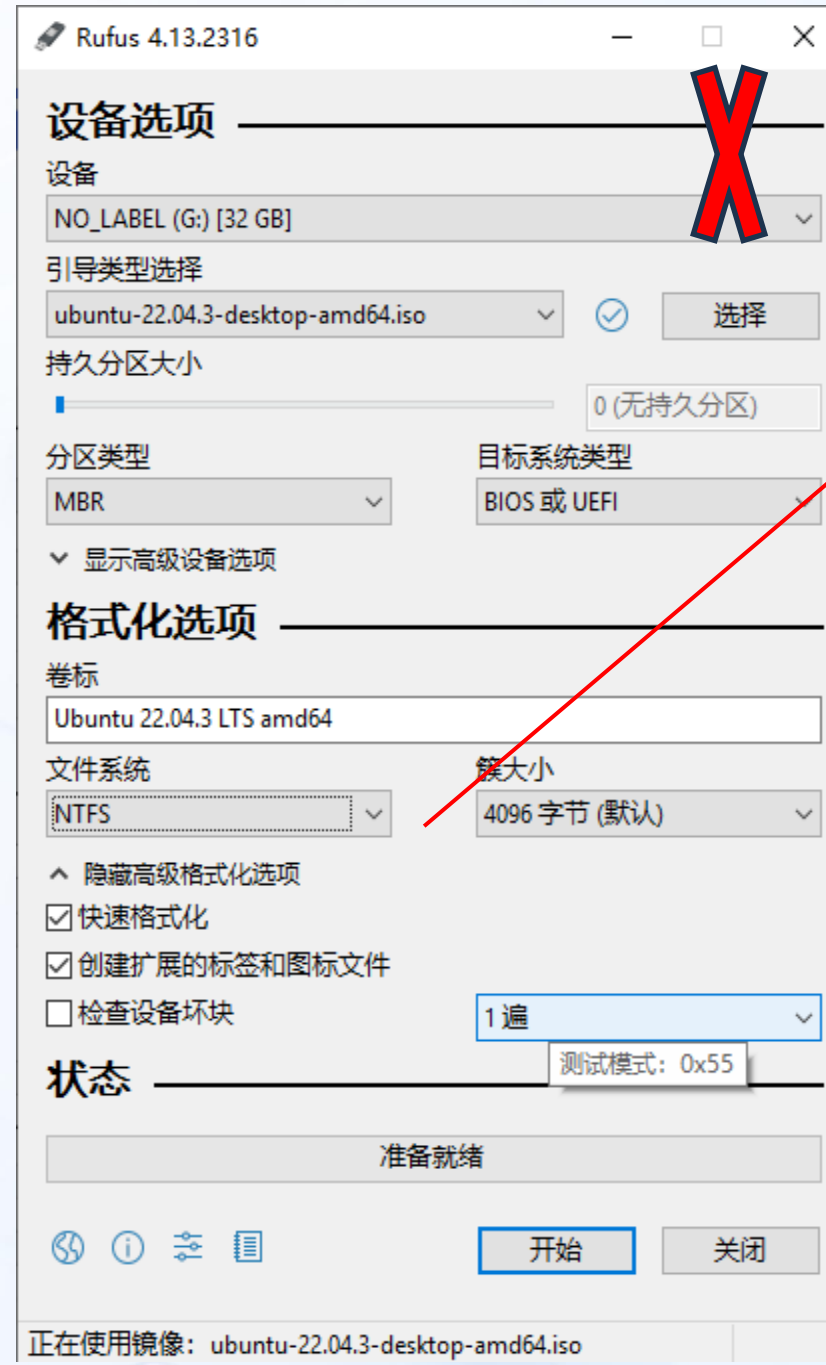
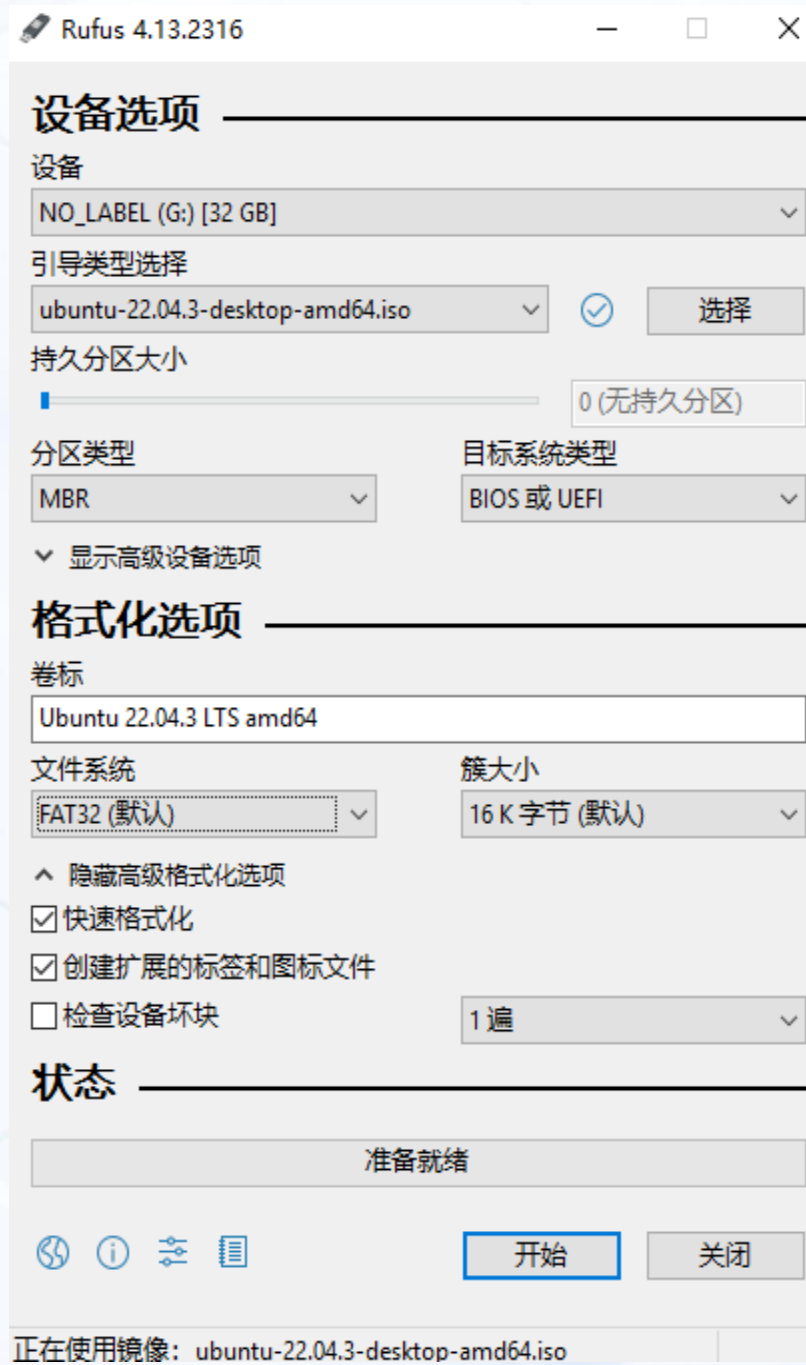
Integrated Bluetooth	Yes
Bluetooth Version	5.2
Package Specifications	
Board Form Factor	M.2 2230, M.2 1216
Package Size	22mm x 30mm x 2.4mm, 12mm x 16mm x 1.65mm
System Interface Type	M.2: CNVio2
Advanced Technologies	
MU-MIMO	Yes
Orthogonal Frequency-Division Multiple Access (OFDMA)	Yes

Only CNVi Wi-Fi modules are supported.
Intel AX201,AX203 ,AX211 are recommended.

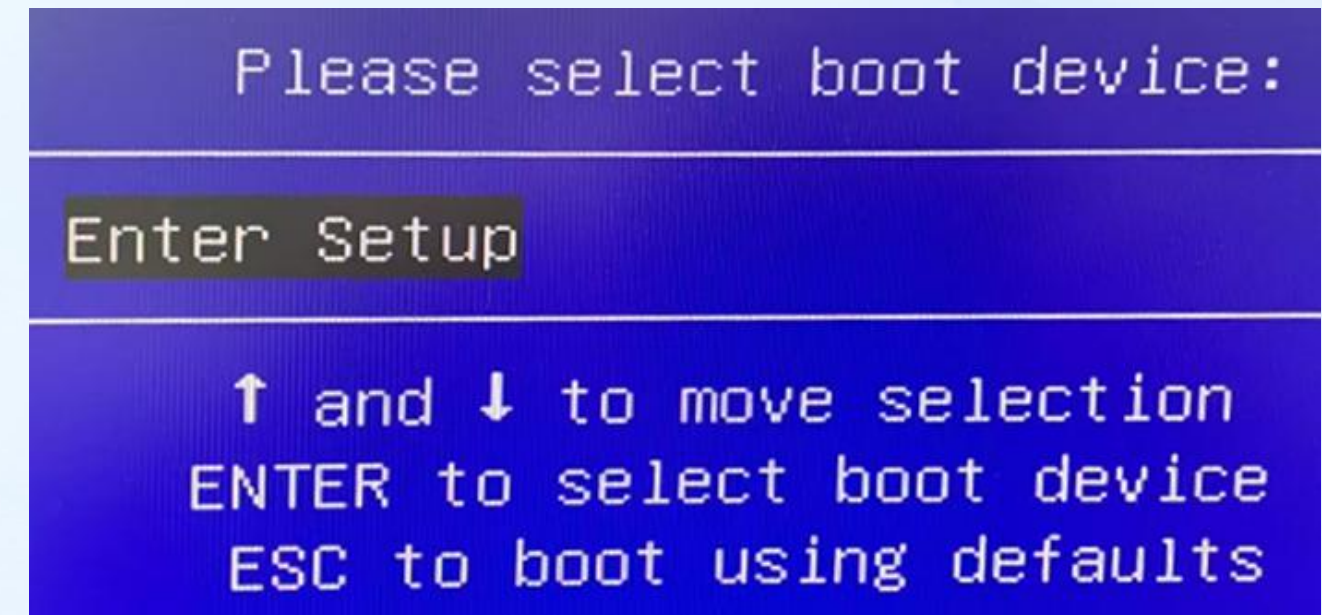
SYSTEM SETUP

PART FOUR

Precautions for Creating System Installation USB Drive



The USB drive created by this method can be recognized by the BIOS, but the USB boot menu cannot be seen under F7 (BBS menu).



Intel® Core™ Ultra Processors (Series 2) support UEFI boot only. When creating a system installation USB drive, please note: UEFI boot requires the FAT32 file system and a valid bootx64.efi file.

Pre-Use Preparation and System Installation

01 / Preparation

Core Equipment: DK-2500 Development Kit, matching power adapter and power cord.

Human-Machine Interaction: Display (DP/HDMI), USB mouse and keyboard.

Installation USB Drive: Create a system installation USB drive.

Functional Peripherals: Other required peripherals.

02 / Installation Procedure

Step 01

Connect the display: Connect the DP/HDMI cable to the monitor.

Step 03

Connect peripherals: Connect required peripherals as needed.

Step 05

Power on the system: Follow the principle of "Connect peripherals first, then power".

Step 02

Connect input devices: Plug the mouse and keyboard into the USB ports.

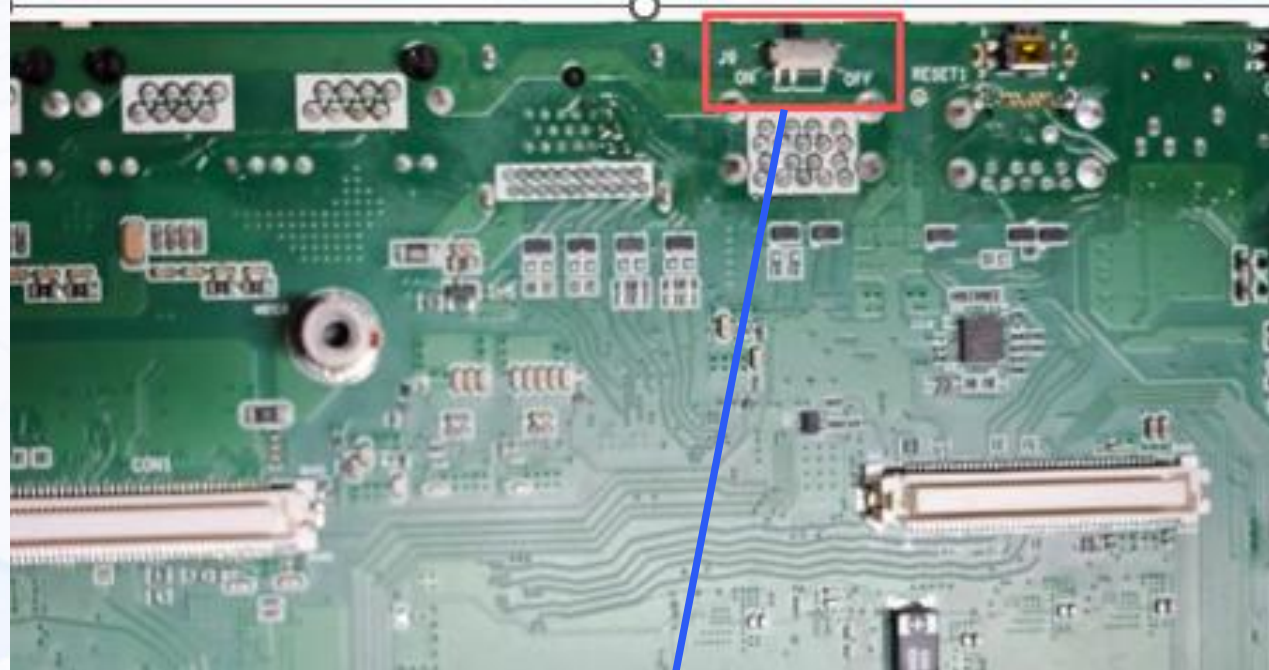
Step 04

Connect power: Connect the adapter to mains power and the Phoenix terminal block.

Step 06

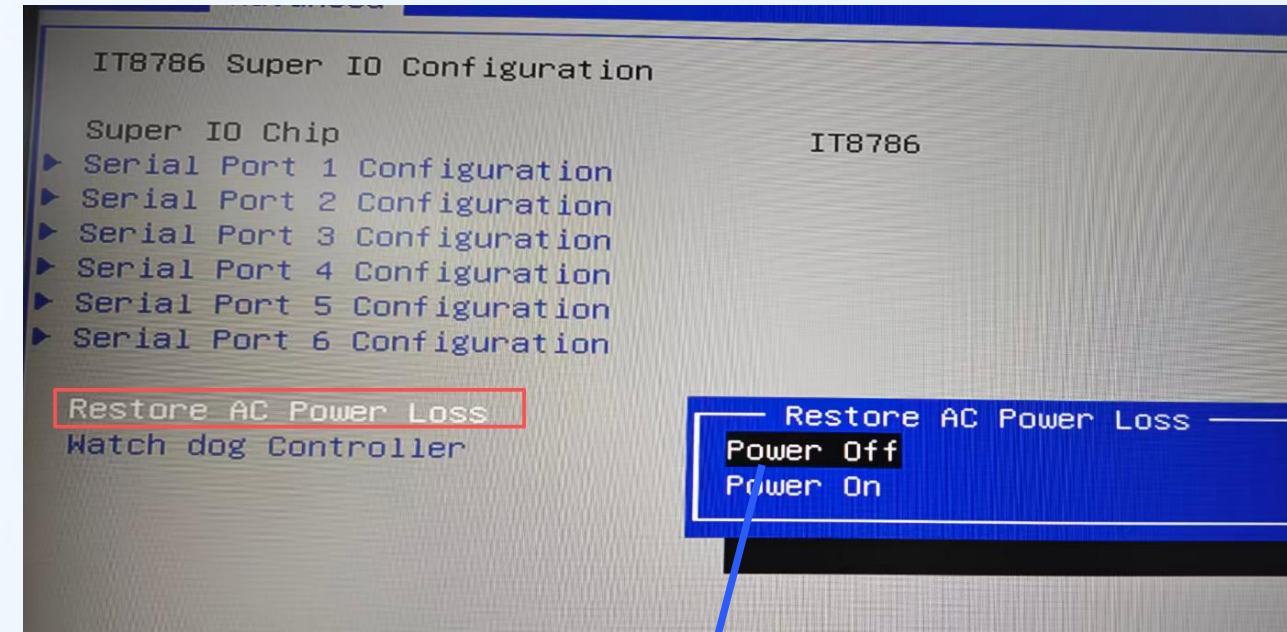
Boot from the USB drive to install the operating system.

Auto Power On/Off



Step 01

Auto Power On/Off Switch



Step 02

Auto Power On/Off BIOS setup

Hardware configuration has the highest priority. The BIOS setting will only take effect when the hardware switch is set to Off.

How to get the information you require



Baidu Netdisk



WeChat Official Account



Company Official Website

THANKS!

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