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K3 CoM260 Kit

User Guide
2026.11.03
V2.1

Version

Version	Date	Description
V2.1	2026.11.03	1.Reorganized Chapter 2 product specifications by core module and reference carrier board 2.Corrected RTC voltage range to 1.85 V ~ 5.5 V 3.Added DP interface usage notes 4.Unified power adapter specification description
V2.0	2026.03.19	1.Swapped the positions of UART0 RX and TX 2.Updated CAM0 to MIPI CSI1 (2-lane)
V1.0	2025.11.24	Initial release

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Preface

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1. Product Overview

1.1. Introduction

This document describes the key features, hardware characteristics, interface configuration, and software debugging methods of the **K3 CoM260** and the **K3 CoM260 Development Kit**. It is intended to support developers quickly understand the product capabilities and become familiar with the development and application solutions of the K3 CoM260 module.

1.2. Product Version

The product version is used in this document as listed below:

Product Name	Product Version
K3 CoM260	K3-CoM260_P1_LP5315B_32X2_v03_20260312

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2. Product Specifications

Module	Description
Chip	SpacemiT K3 RISC-V AI CPU
CPU	8 x X100™ 64-bit RISC-V CPU cores • 2 clusters x 4 cores per cluster, each cluster includes 4 MB shared L2 cache, with cross-cluster access • Each X100 core includes 64 KB I-cache and 64 KB D-cache -Compliant with the RVA23 profile • Supports RVV 1.0, VLEN: 256 bits
AI Performance	8 x A100™ AI CPU cores, delivering 60 TOPS • 2 clusters x 4 cores per cluster, each cluster includes 1 MB shared L2 cache and 1.5 MB TCM (Tightly Coupled Memory), with cross-cluster access • Each A100 core includes 32 KB I-cache and 32 KB D-cache • Supports RVV 1.0, VLEN: 1024 bits
Hardware Security Engine	Supports international and Chinese commercial cryptographic algorithms • Hash: SHA1 / SHA224 / SHA256, SM3 • Symmetric encryption: AES-128/192/256, SM4 • Asymmetric encryption: RSA-1024/2048/4096, ECC-128/256/512, SM2
Security System	HW-RoT-based Secure Boot Trusted Execution Environment (TEE) with RISC-V PMP/IOPMP isolation mechanisms Supports the OP-TEE OS
GPU	Integrated 3D GPU, with support for Vulkan, OpenCL, and OpenGL ES
Memory	8GB/16GB/32GB 64-bit LPDDR5, 6400MT/s
Storage	Supports internal UFS, SD card slot, and external NVMe
Video Encoding	4K60 (H.264/H.265)
Video Decoding	1x 4K120 (H.264/H.265/VP9) 2x 4K60 (H.264/H.265/VP9) 8x 1080p60 (H.264/H.265/VP9) 16x 1080p30 (H.264/H.265/VP9)
Power Consumption	18W ~ 35W

Reference Carrier Board

Module	Description
Camera	2 x MIPI CSI-1.1, 22-pin camera connectors
PCIe	M.2 Key M slot (PCIe Gen3 ×4) M.2 Key M slot (PCIe Gen3 ×1) M.2 Key E slot
USB	4 x USB 3.0 Type-A 1 x USB Type-C
Networking	1 x GbE connector
Display	1 x DP 1.2 connector 1 x MIPI DSI-1.2 30-pin display connector

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Module	Description
Other I/O	40-pin expansion header (UART, SPI, I2S, I2C, GPIO) 12-pin button header 4-pin fan header DC power jack
Mechanical	103mm x 90.5mm x 35mm (Height includes feet, carrier board, module, and thermal solution)

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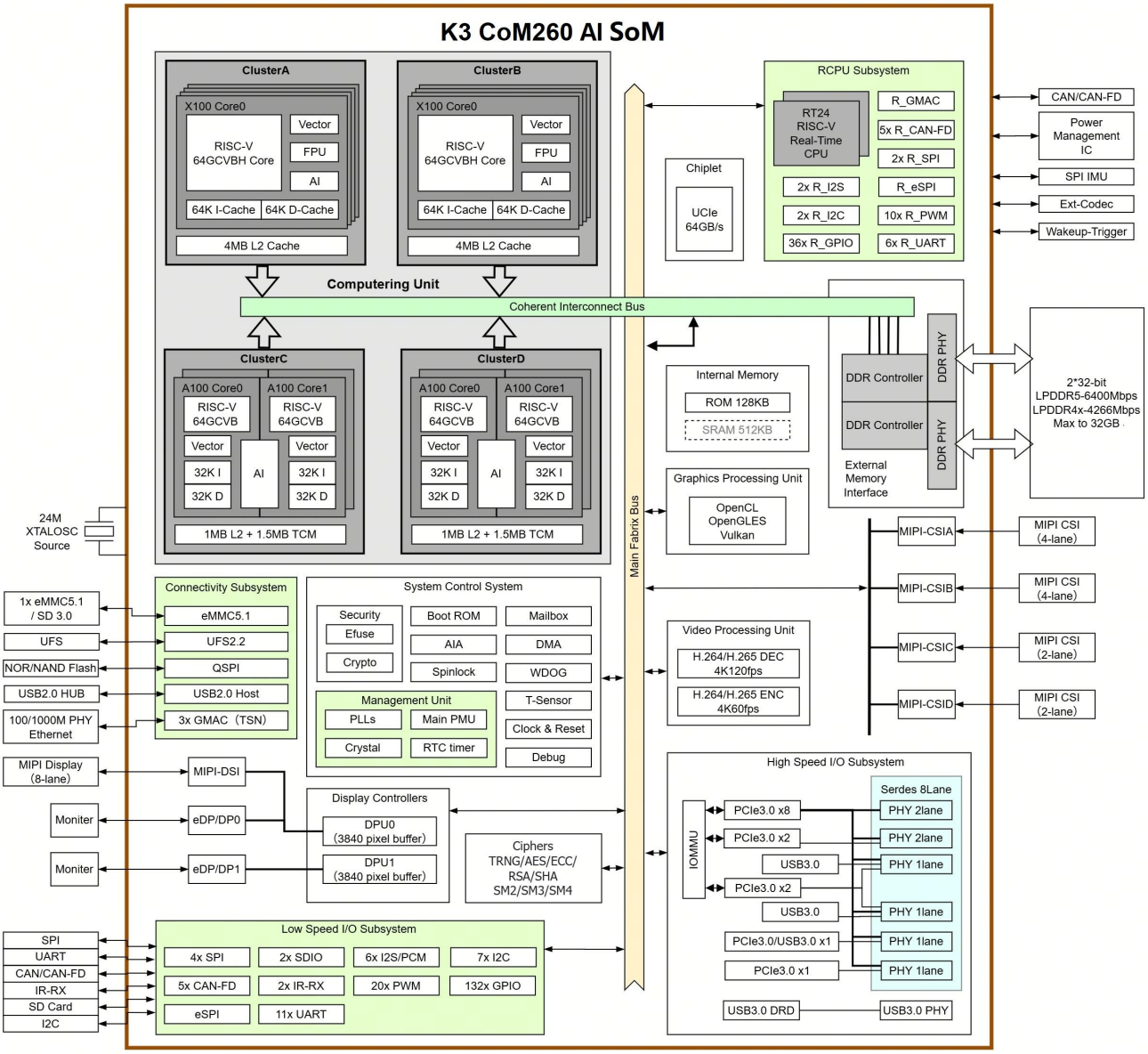
3. System Overview

3.1. K3 Chip Overview

K3 is a new-generation high-performance RISC-V AI CPU launched by SpacemiT, with the following features:

- 8 high-performance X100 compute cores, with a maximum frequency of 2.4 GHz, 130K DMIPS computing power, and single-core Specint2006 > 9.0/GHz
- 60 TOPS of AI computing power
- Multiple high-speed expansion interfaces, including 8 lanes of PCIe, 4x USB 3.0 ports, and 4x GMAC ports

3.2. K3 Chip Block Diagram



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3.3. K3 CoM260 Reference Solution Block Diagram

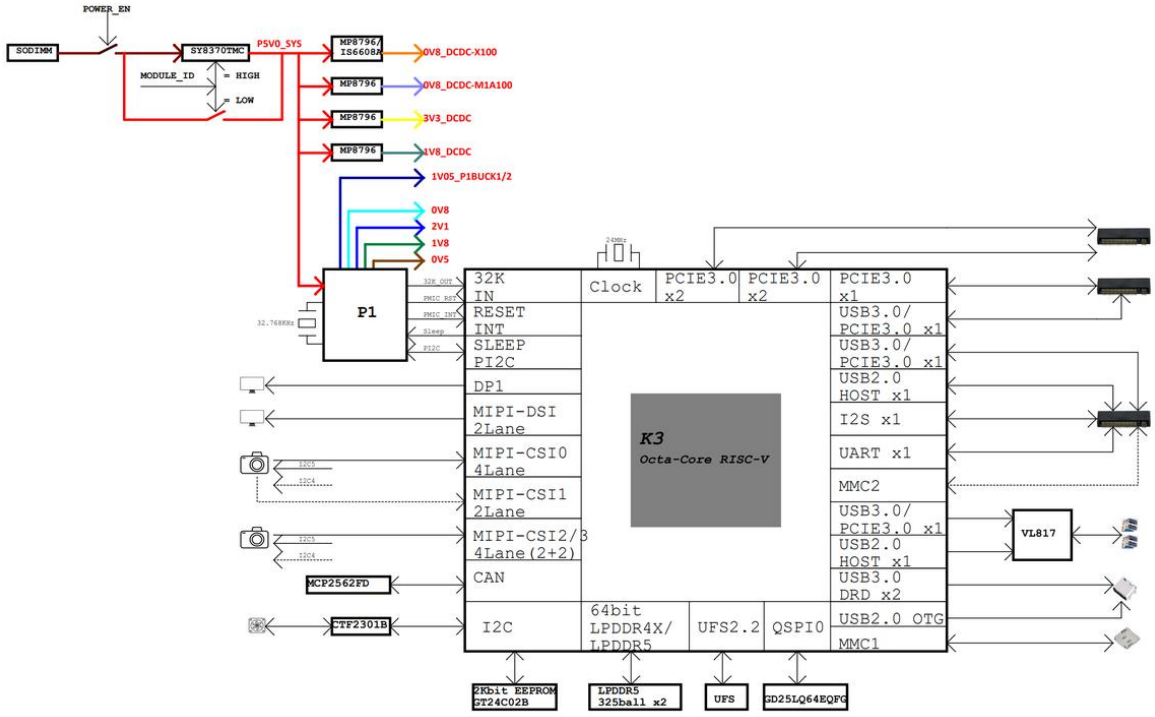
3.3.1. Reference Solution Overview

The K3 CoM260 system solution has the following features:

- Built on the K3 chipset
- Uses a power supply design based on the P1 PMIC + external DC-DC
- DRAM configuration includes 2 × LPDDR5 and UFS 2.2
- Peripheral interfaces include:
  - 7 lanes PCIe 3.0
  - 3x USB 3.0 ports
  - 1x GMAC port
  - TF Card and other interfaces

The overall solution is stable, reliable, and suitable for mass production.

The reference solution block diagram is shown below:



3.3.2. Functional Overview

The K3 CoM260 Development Kit provides the following features:

- **Type-C**: 1 × USB 3.0 Type-C UFP interface for system firmware upgrade
- **DP**: 1 × DP 1.2 Type-A interface, supporting output up to 3840 × 2160 @ 60fps
- **MIPI DSI**: 1 × 30 Pin FPC connector; 1 × 2-lane MIPI DSI signal for an LCD panel, and 1 × I2C signal for a CTP panel

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- **MIPI CSI**: 2 × 22 Pin FPC connectors; 2 × MIPI CSI signals, supporting two cameras
- **40 Pin Header**: Raspberry Pi-compatible 40 Pin header supporting I2C, UART, SPI, I2S, and GPIO debugging
- **SD-Card**: Supports high-speed TF cards
- **PCIe Wi-Fi**: 1 × M.2 E-Key connector; module model RTL8852BE; external SMA antenna; supports wireless networking
- **Ethernet**: 1 × RJ45 connector with 10/100/1000M adaptive Ethernet
- **PCIe 3.0**: 2 × M.2 M-Key connectors for 2280 and 2230 SSDs
- **USB 3.0 Type-A**: 2 × USB 3.0 Type-A dual connectors for USB device expansion
- **12 Pin Button Header**: Used to connect the LED, UART debug, ACOK, power on/off, and reset buttons
- **FAN**: 1 × 4 Pin fan connector for a 4-wire speed-controllable fan
- **CAN**: 1 × 4 Pin header with an integrated CAN transceiver for CAN device connection
- **RTC**: 1 × 2 Pin wire-to-board connector supporting 1.85 V ~ 5.5 V input

3.3.3. Functional Interfaces

Function	Available (Yes/No)
2 × LPDDR5 (4 GB / 8 GB / 16 GB)	Yes
UFS (128 GB)	Yes
SPI Flash	Yes
DC Jack	Yes
DP 1.2 OUT	Yes
MIPI DSI	Yes
MIPI CSI	Yes
SD-Card	Yes
Wi-Fi & Bluetooth	Yes
GbE	Yes
2 × M.2 M-Key	Yes
2 × USB 3.0 Type-A Dual	Yes
40 Pin	Yes
12 Pin	Yes
FAN	Yes
CAN	No
RTC	No

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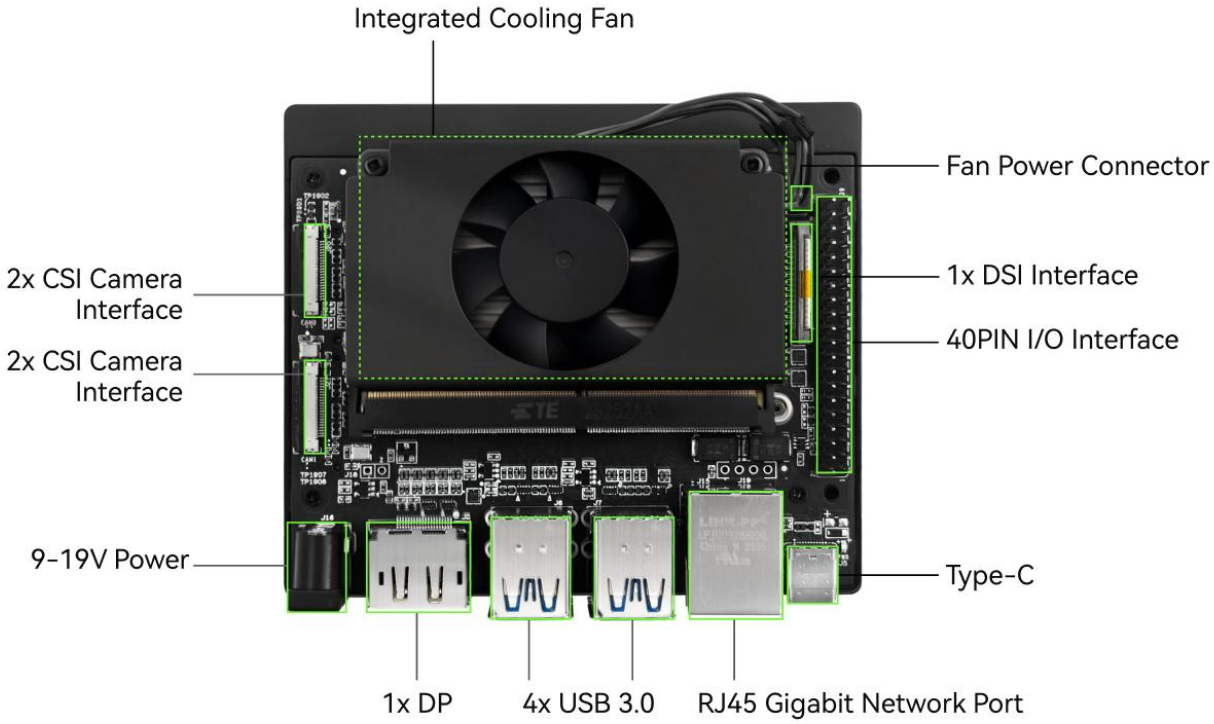
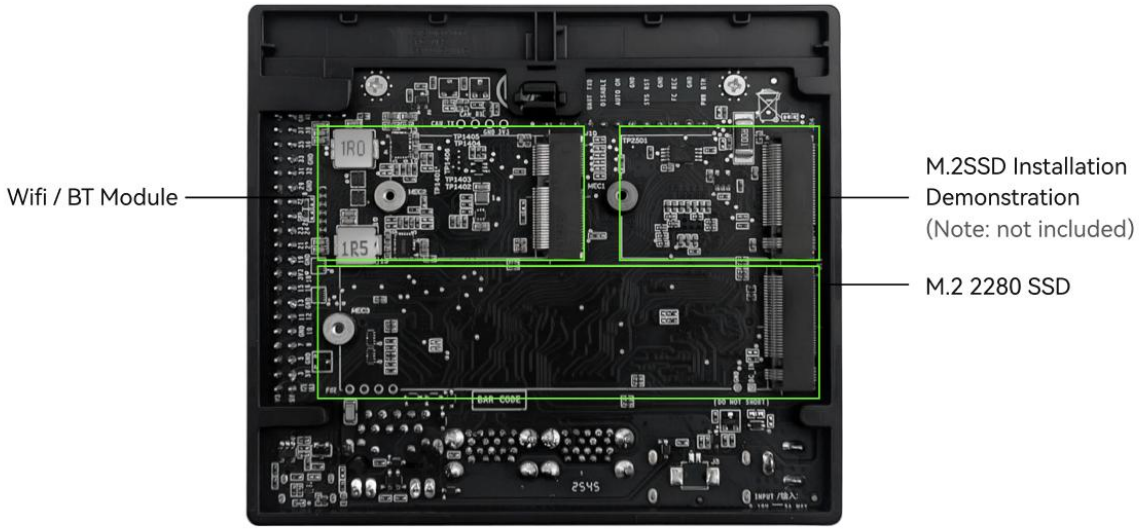
4. Hardware Description

4.1. Product Appearance





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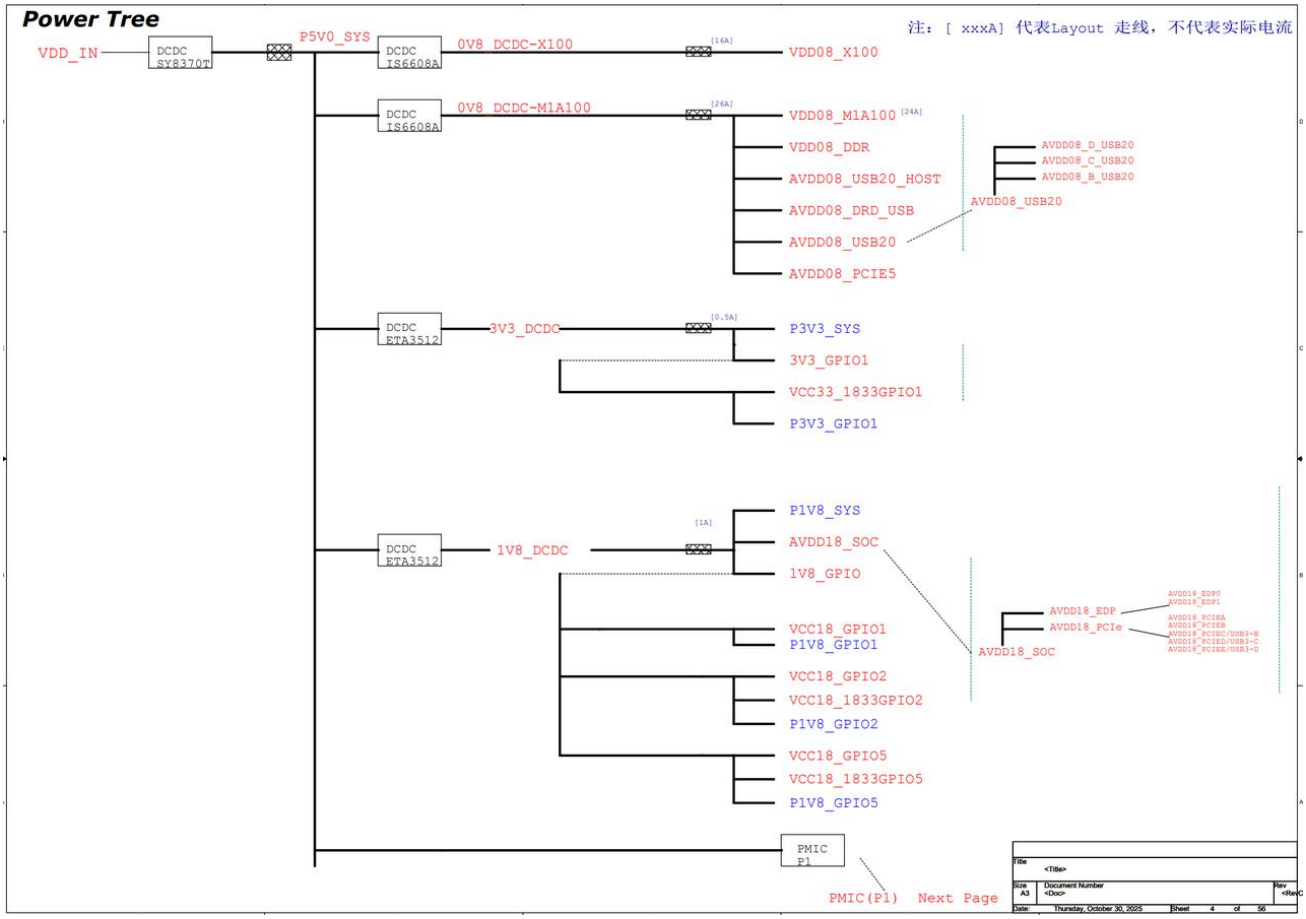
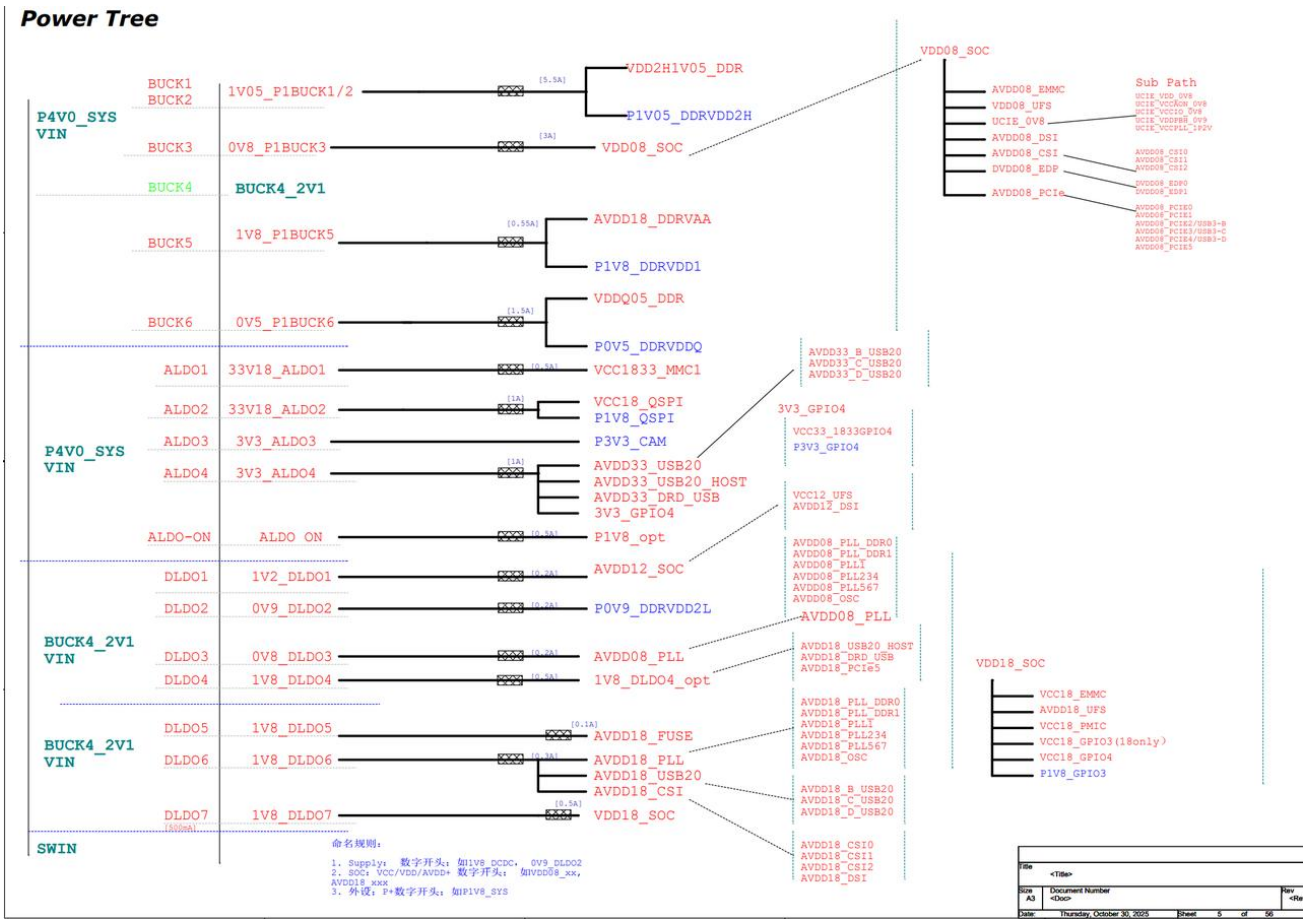
4.2. Power Block Diagram





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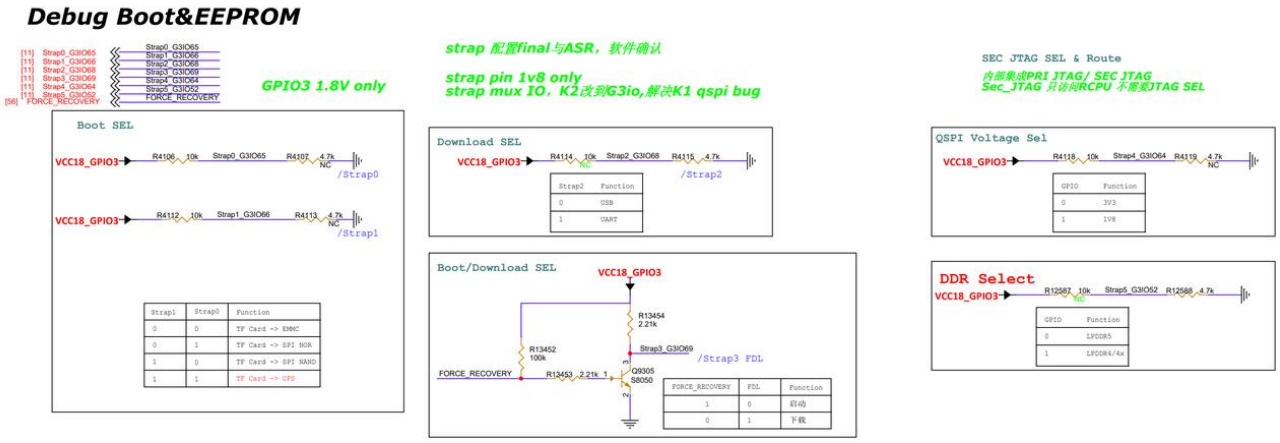
4.3. Boot Download Sel & JTAG Sel

Boot Download Sel and JTAG Sel diagram is shown as below.



4.4. I2C Addresses

K3 CoM260 provides abundant peripheral interfaces. When debugging I2C peripherals, I2C channel multiplexing may be involved. The figure below shows the I2C addresses and pull-up power configuration of the K3 CoM260 Development Kit to avoid address conflicts and voltage-level mismatches.

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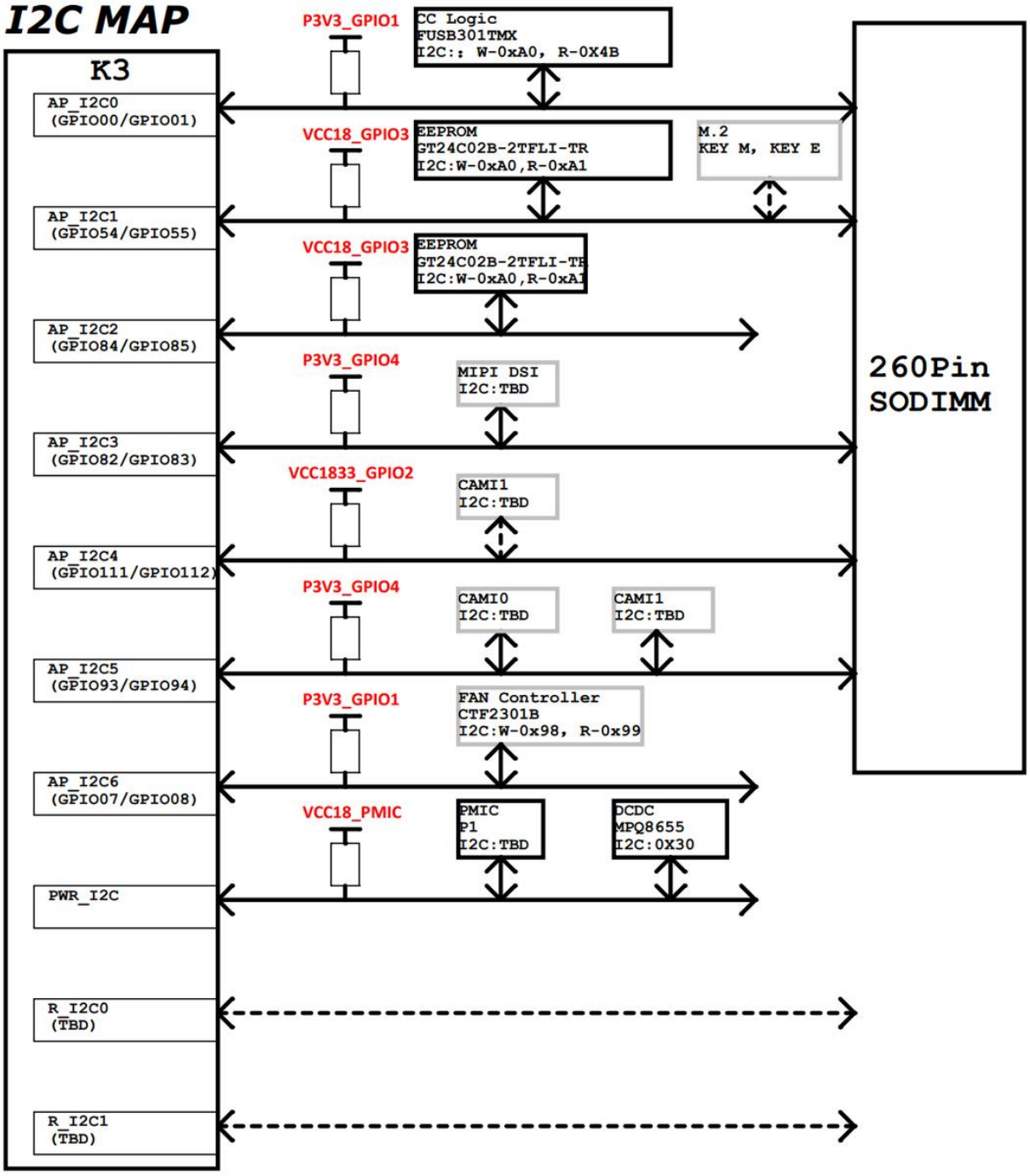

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5. Module Description

5.1. Power Input

The K3 CoM260 Development Kit supports DCIN power input only. The on-board DC Jack connector has an outer diameter of 6.3 mm and an inner diameter of 2.5 mm. A DC Jack power adapter with an output specification of 19 V/2.37 A or 12 V/5 A is required.

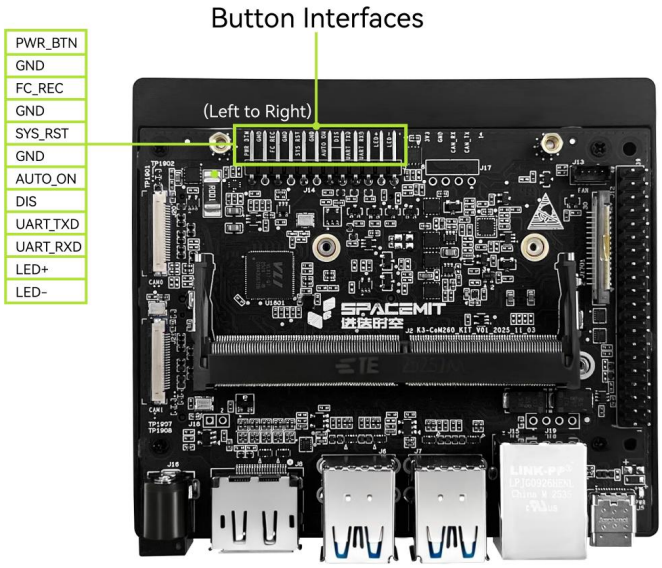
5.2. Memory

The K3 CoM260 module integrates the following four types of memory:

1. UFS2.2: On-board UFS storage, with a default capacity of 128 GB.
2. SPI Flash: On-board SPI Flash.
3. DDR: Two LPDDR5 chips are used, with per-chip capacities of 4 GB / 8 GB / 16 GB, corresponding to total module capacities of 8 GB / 16 GB / 32 GB.
4. EEPROM: Used to store board information.

5.3. Button Interfaces

The K3 CoM260 Development Kit provides multifunction button interfaces, including the power, reset, and download buttons.



Pin	Signal Name	Function
1	PC_LED-	LED negative
2	PC_LED+	LED positive

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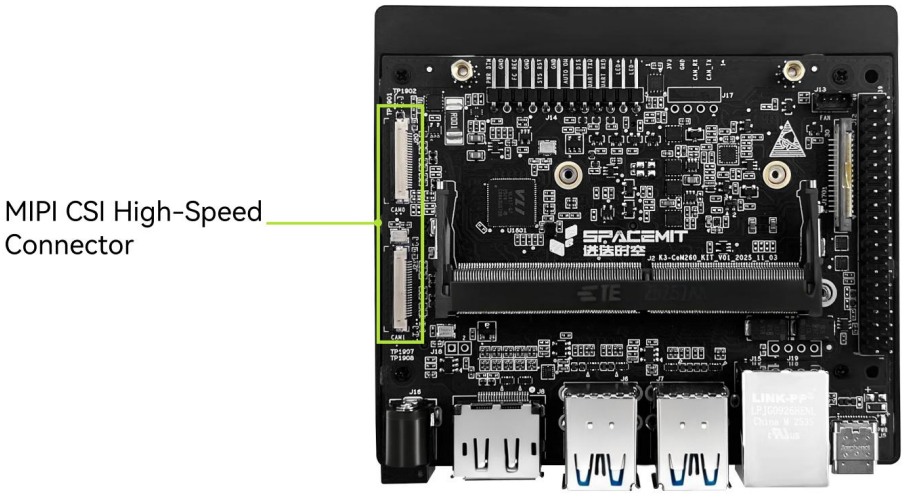
Pin	Signal Name	Function
3	UART0_RXD	DEBUG UART RX
4	UART0_TXD	DEBUG UART TX
5	BMCU_ACOK	Set for button power-on
6	AUTO_ON_DIS	Short with BMCU_ACOK to enable button power-on
7	GND	Power ground
8	PMIC_RST_OUTn	Reset
9	GND	Power ground
10	FORCE_RECOVERY	Download
11	GND	Power ground
12	SLEEP/WAKE	Power on/off

5.4. MIPI CSI High-Speed Connector

The K3-CoM260 is not limited to specific camera module models. Its high-speed connector provides two sets of 4-lane MIPI CSI interfaces, and different link combination modes can be flexibly selected through onboard resistor configuration.

By default, - CAM0 supports 2 lanes - CAM1 supports 2+2 lanes or 4 lanes



The 22 Pin high-speed connector pinout is as follows:

CAM0:

Pin	Signal Name
1	VDD_3V3_SYS
2	I2C4_SDA
3	I2C4_SCL
4	GND
5	CLK_CAMCK

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Pin	Signal Name
6	CAM_PWDN
7	GND
8	MIPI_CSI0_DP1
9	MIPI_CSI0_DN1
10	GND
11	MIPI_CSI0_DP0
12	MIPI_CSI0_DN0
13	GND
14	MIPI_CSI1_CLKP
15	MIPI_CSI1_CLKN
16	GND
17	MIPI_CSI1_DP1
18	MIPI_CSI1_DN1
19	GND
20	MIPI_CSI1_DP0
21	MIPI_CSI1_DN0
22	GND

CAM1:

Pin	Signal Name
1	VDD_3V3_SYS
2	I2C4_SDA
3	I2C4_SCL
4	GND
5	CLK_CAMCK
6	CAM_PWDN
7	GND
8	MIPI_CSI3_DP1
9	MIPI_CSI3_DN1
10	GND
11	MIPI_CSI3_DP0
12	MIPI_CSI3_DN0
13	GND
14	MIPI_CSI2_CLKP
15	MIPI_CSI2_CLKN
16	GND

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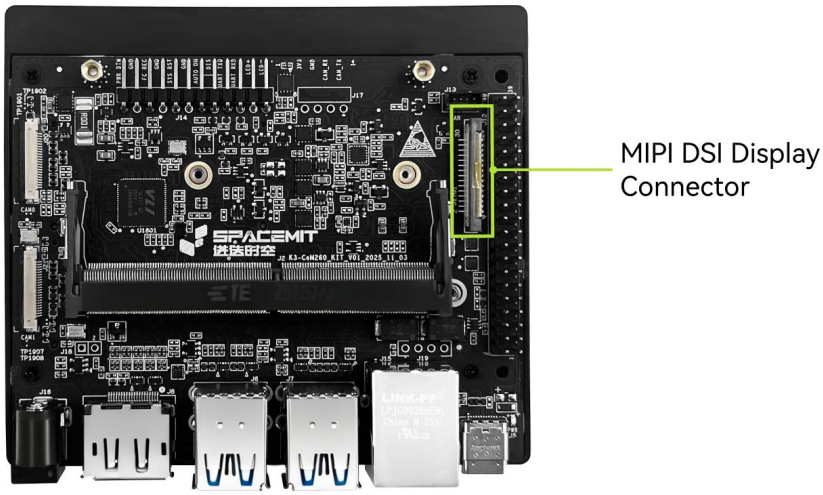
Pin	Signal Name
17	MIPI_CSI2_DP1
18	MIPI_CSI2_DN1
19	GND
20	MIPI_CSI2_DP0
21	MIPI_CSI2_DN0
22	GND

5.5. MIPI DSI Display Connector

K3 CoM260 supports the Raspberry Pi 4.3-inch capacitive touch display.



The display connector pinout is as follows:

Pin	Signal Name	Signal Name	Pin
1	GND	GND	2
3	MIPI_DSI1_LANE1_DN	MIPI_DSI1_LANE1_DN	4
5	MIPI_DSI1_LANE1_DP	MIPI_DSI1_LANE1_DP	6
7	GND	GND	8
9	MIPI_DSI1_CLK_N	MIPI_DSI1_CLK_N	10
11	MIPI_DSI1_CLK_P	MIPI_DSI1_CLK_P	12
13	GND	GND	14
15	MIPI_DSI1_LANE0_DN	MIPI_DSI1_LANE0_DN	16
17	MIPI_DSI1_LANE0_DP	MIPI_DSI1_LANE0_DP	18
19	GND	GND	20

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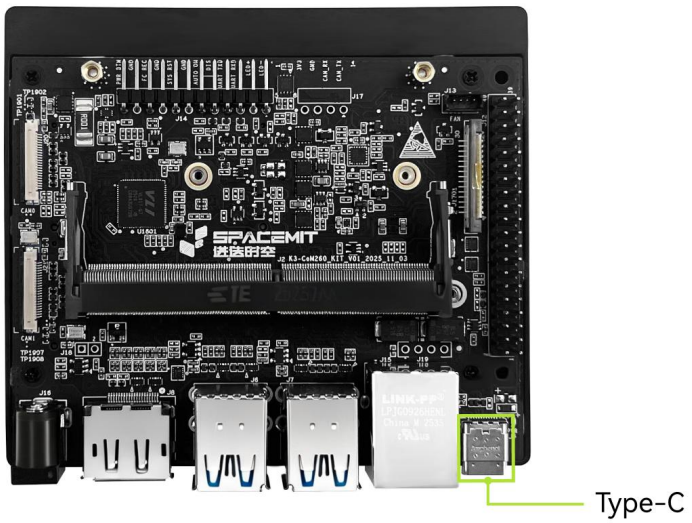
Pin	Signal Name	Signal Name	Pin
21	I2C3_SCL	I2C3_SCL	22
23	I2C3_SDA	I2C3_SDA	24
25	GND	GND	26
27	LCD_VCC33	LCD_VCC33	28
29	LCD_VCC33	LCD_VCC33	30

5.6. Type-C Connector

The Type-C connector on the K3 CoM260 Development Kit supports OTG mode only and does not support power input.



5.7. DP Output Interface

The K3 CoM260 Development Kit provides one DP Type-A output interface, supporting up to DP 1.2 and video output up to 3840 × 2160 @ 60fps.

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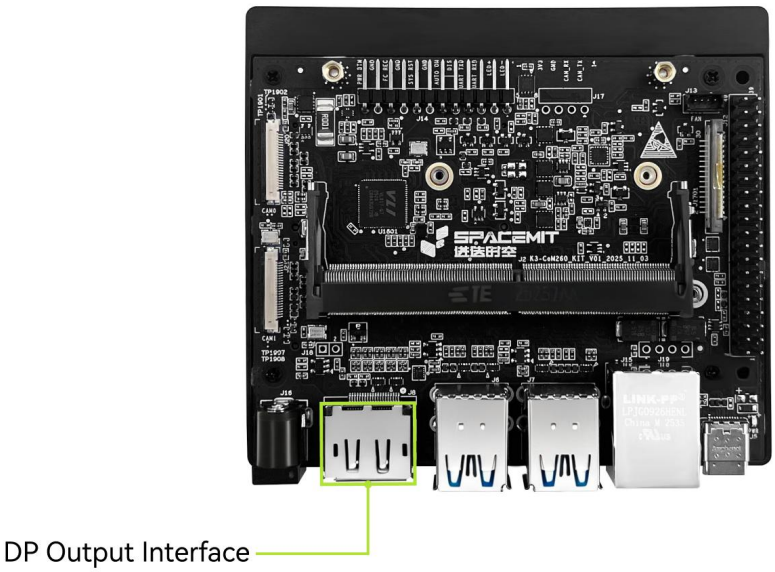

DP display notes:

- The DP connector carries DisplayPort only; there is no HDMI output path on it. Connect a monitor that has a DP input using a DP cable — this is the only way to get a picture on an external display through this port.
- To drive an HDMI monitor, use an active DP-to-HDMI converter, that is, one with a built-in conversion chip. A passive DP-to-HDMI adapter or cable only re-wires the pins and has no chip to convert the signal, so it will not produce a picture. Sample converter: active DP-to-HDMI converter

Note: DP-to-HDMI cables shipped with other development kits are usually passive and will not drive a display through this kit's DP connector. Do not reuse them here — source an active converter as described above.

5.8. USB Interfaces

The K3 CoM260 Development Kit provides four USB 3.0 Type-A interfaces for connecting various USB peripherals.

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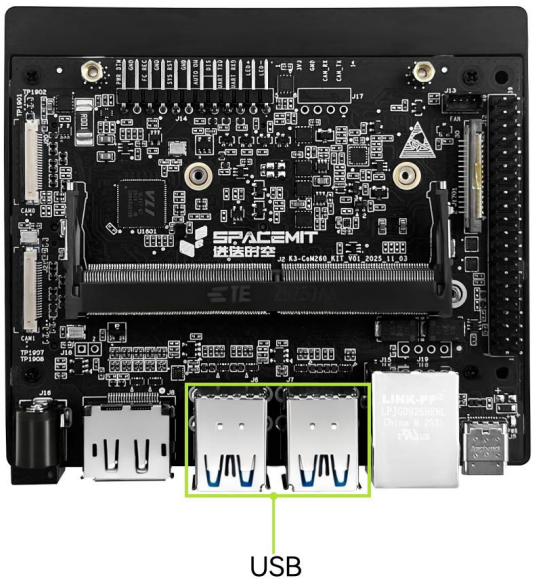
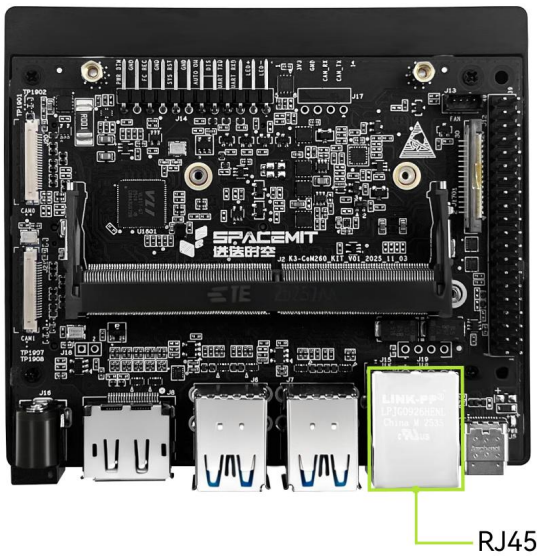


5.9. RJ45 Interface

The K3 CoM260 Development Kit provides one RJ45 Gigabit Ethernet port.



5.10. Wi-Fi/Bluetooth Module

The K3 CoM260 Development Kit supports an M.2 2230 E-Key module for wireless networking and Bluetooth connectivity.

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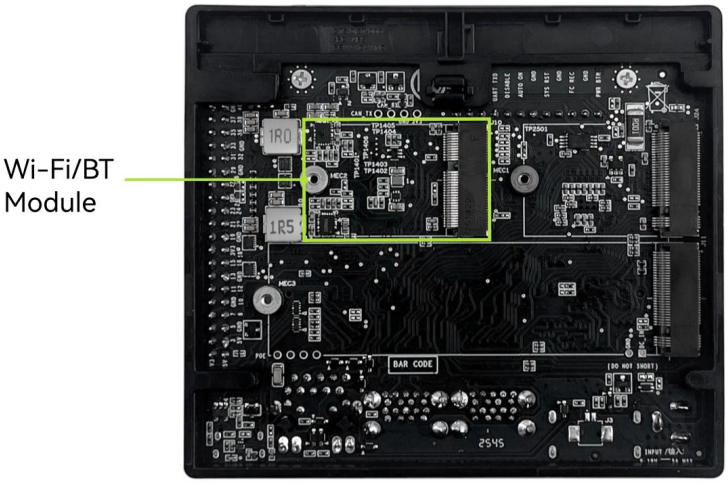
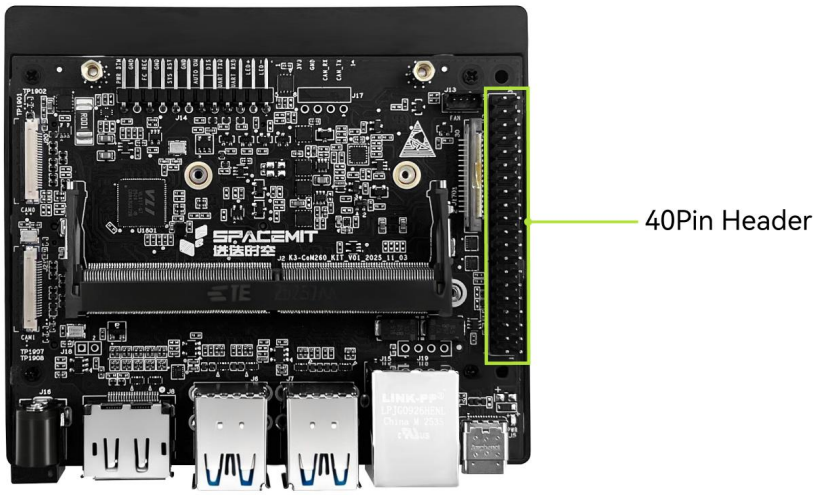


5.11. 40 Pin Header

The K3 CoM260 Development Kit provides a 40 Pin dual-row header. The pinout is shown below:



Note: The IO function can be configured as needed.

Pin	Signal Name	Signal Name	Pin
1	VDD_3V3_SYS	VDD_5V_GPIO	2
3	I2C3_SDA	VDD_5V_GPIO	4
5	I2C3_SCL	GND	6
7	GPIO09	UART1_TXD_LS	8
9	GND	UART1_RXD_LS	10
11	UART1_RTS_LS	I2S0_SCLK_LS	12
13	R-SPI0_SCK_LS	GND	14
15	GPIO12_LS	R-SPI0_CS1_LS	16

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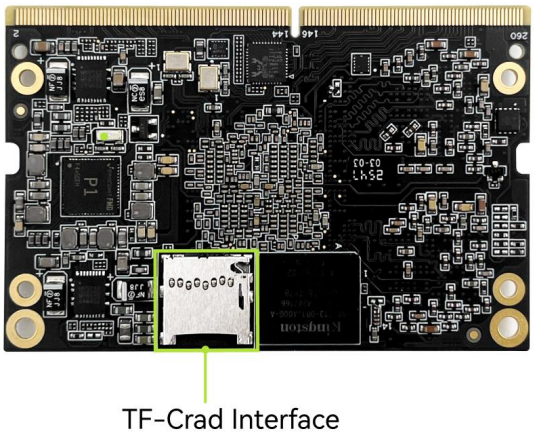
Pin	Signal Name	Signal Name	Pin
17	VDD_3V3_SYS	R-SPI0_CS_LS	18
19	SPI0_MOSI_LS	GND	20
21	SPI0_MISO_LS	R-SPI0_MISO_LS	22
23	SPI0_SCK_LS	SPI0_CS0_LS	24
25	GND	SPI0_CS1_LS	26
27	I2C0_SDA	I2C0_SCL	28
29	GPIO01_LS	GND	30
31	GPIO11_LS	GPIO07_LS	32
33	GPIO13_LS	GND	34
35	I2S0_LRCK_LS	UART1_CTS_LS	36
37	R-SPI0_MOSI_LS	I2S0_SDIN_LS	38
39	GND	I2S0_SDOUT_LS	40

5.12. TF-Card Interface

K3 CoM260 supports TF cards for storage expansion. It also supports a Debug expansion card for JTAG debugging.



5.13. M.2 M-Key Interface

The K3 CoM260 Development Kit provides two M.2 M-Key interfaces, supporting 2280 (the longer SSD shown in the figure) and 2230 (the shorter SSD shown in the figure) NVMe SSD form factors, as well as other M.2 M-Key devices.

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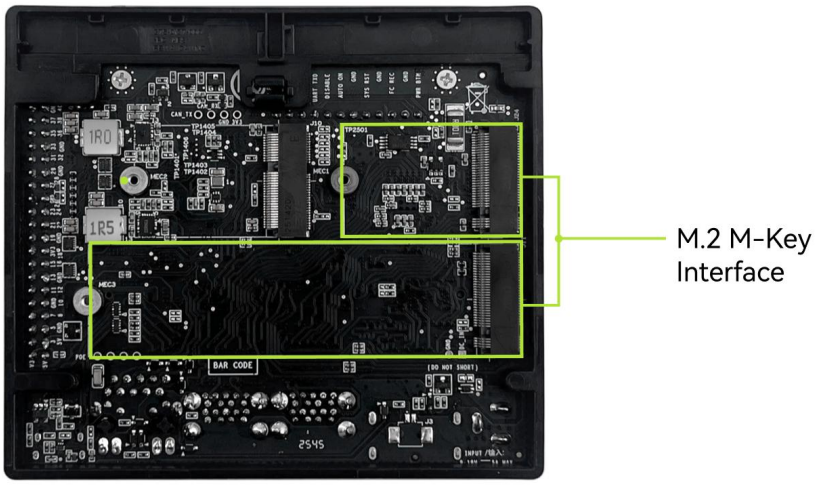
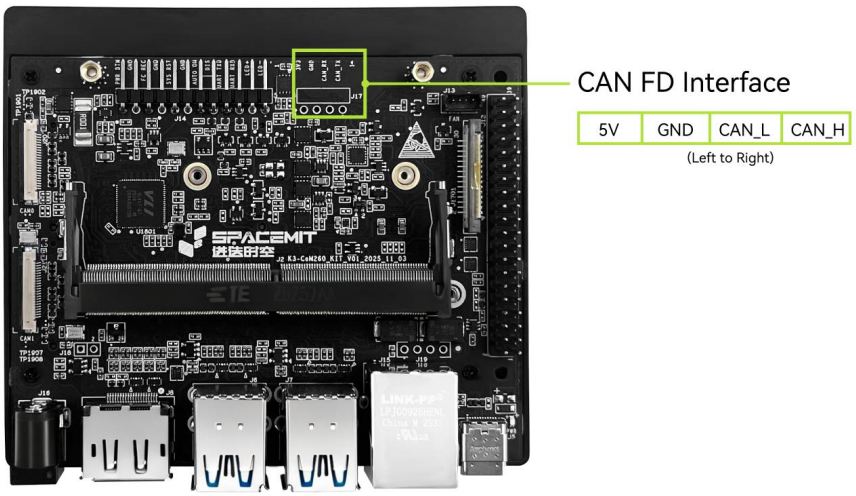


5.14. CAN FD Interface

The K3 CoM260 Development Kit integrates an on-board CAN transceiver and can be directly connected to CAN devices.



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6. Initial Setup

6.1. Preparation Before Use

6.1.1. Power Adapter

The K3 CoM260 Development Kit is powered through DCIN. A DC Jack power adapter with an output specification of 19 V/2.37 A or 12 V/5 A is required. Refer to Section 5.1 for connector and adapter details.

6.1.2. Keyboard and Mouse

You can connect a wired keyboard, mouse, or USB receiver to any USB-A port on the K3 CoM260 Development Kit. Bluetooth keyboards and mice are also supported.

When a USB 3.0 device and a 2.4 GHz wireless keyboard or mouse receiver are connected to adjacent USB 3.0 ports, you may experience input lag or intermittent stuttering. This is a common physical phenomenon caused by potential interference from USB 3.0 high-speed data transmission with 2.4 GHz wireless signals.

If you encounter this issue, we recommend using a USB extension cable to move the wireless receiver away from the USB 3.0 device. This can help reduce interference and improve the stability of the wireless connection.

6.1.3. Display

K3 CoM260 requires an external display for video output. The product supports both DP and MIPI DSI video interfaces, so either one display or both types of displays can be connected.

Note: If video output is required through the MIPI DSI interface, make sure the display and K3 CoM260 are connected before power-on. The MIPI DSI interface on K3 CoM260 **does not support hot plugging**.

6.1.4. Network Connection

K3 CoM260 supports wired RJ45 network connections and can be connected directly to an Ethernet cable.

It also supports Wi-Fi and Bluetooth wireless connections. An external antenna can be installed for stronger signal reception.

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6.2. Power-On

Complete the following connections before powering on the device:

- Connect the device to a display using a video cable, and connect the keyboard and mouse.
- Last, connect the power cable and power on the device.
    - On first power-up: the device powers on automatically.
    - After software shutdown: press the power button briefly to power on again.

After startup:

- The red power indicator on the K3 CoM260 Development Kit lights up.
- The cooling fan on the K3 CoM260 module starts moving.

6.3. Configure K3-CoM260 on First Boot

K3 CoM260 comes preinstalled with the Bianbu operating system. A setup wizard runs automatically on first boot, and a display, keyboard, and mouse are required to complete the configuration.

For detailed configuration instructions, refer to LXQt Startup Wizard (Initial Setup).

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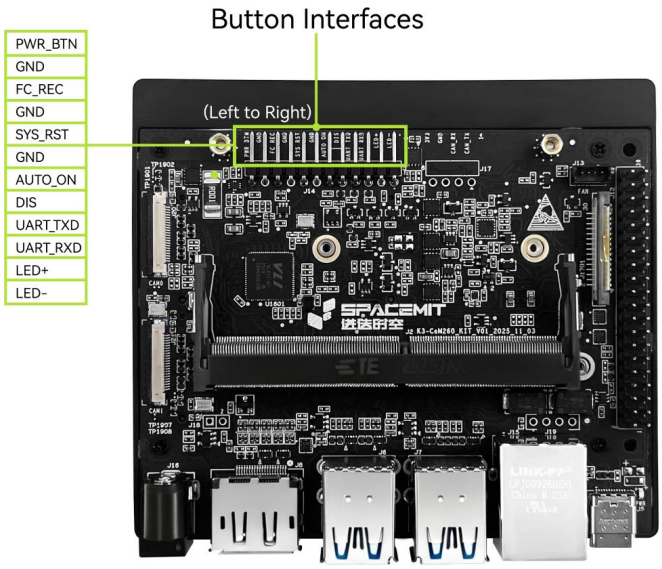
7. Firmware Flashing

7.1. Enter Flashing Mode

Before entering flashing mode, prepare two push buttons: one for shorting FC_REC to GND, and the other for shorting SYS_RST to GND.

1. When the device is powered off
   - Press and hold the FC_REC button.
   - Connect the power adapter to power on the device.
   - Release the FC_REC button.
   - Use a Type-C data cable to connect the Type-C port on the development board to the host computer.
   - Use the SpacemiT Titan flashing tool or run the fastboot command to flash the firmware.
2. When the device is already powered on and running
   - Press and hold the FC_REC button.
   - Briefly press the RST button.
   - Release the FC_REC button.
   - Use a Type-C data cable to connect the Type-C port on the development board to the host computer.
   - Use the SpacemiT Titan flashing tool or run the fastboot command to flash the firmware.



Button connection diagram for entering flashing mode

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For the flashing procedure, refer to the Flashing Tool User Guide.

7.2. Firmware Download and Installation

7.2.1. Bianbu

Bianbu is an operating system deeply optimized by SpacemiT for processors based on the RISC-V architecture.

Click K3 Bianbu to download the installation package.

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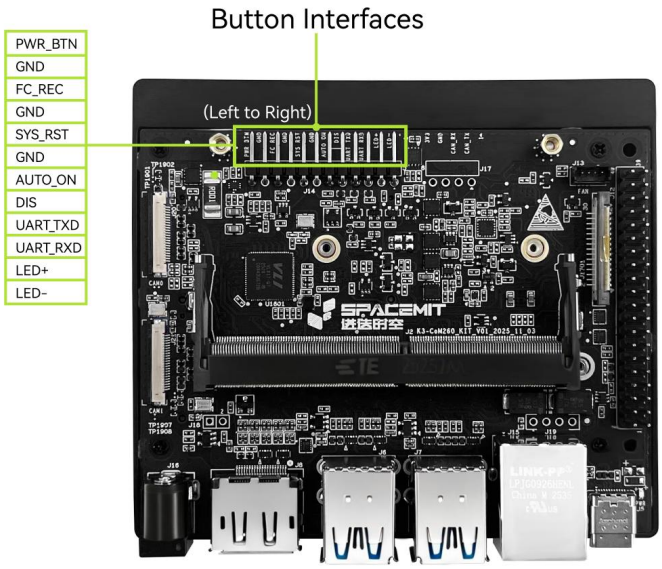
8. Serial Debugging

8.1. Interface Connection

Connect the host PC to the TX, RX, and GND pins of the 12 Pin interface on the K3-CoM260 carrier board through a USB-to-TTL adapter. The interface signals are shown below:



8.2. Debugging on Windows

MobaXterm is used as an example below:

First, connect the serial hardware correctly, and then confirm under Ports in Windows Device Manager that the corresponding COM port can be recognized, as shown below.

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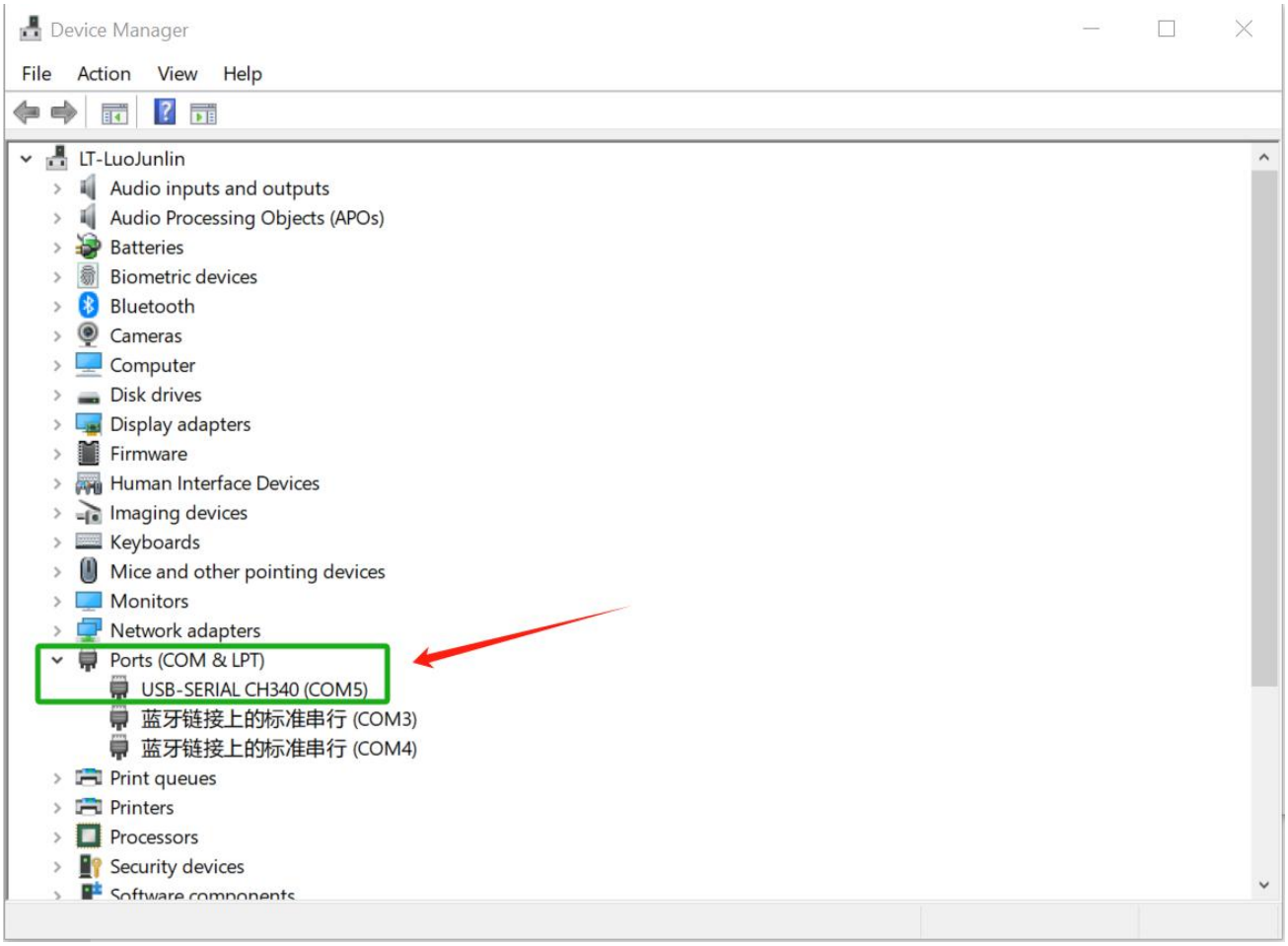
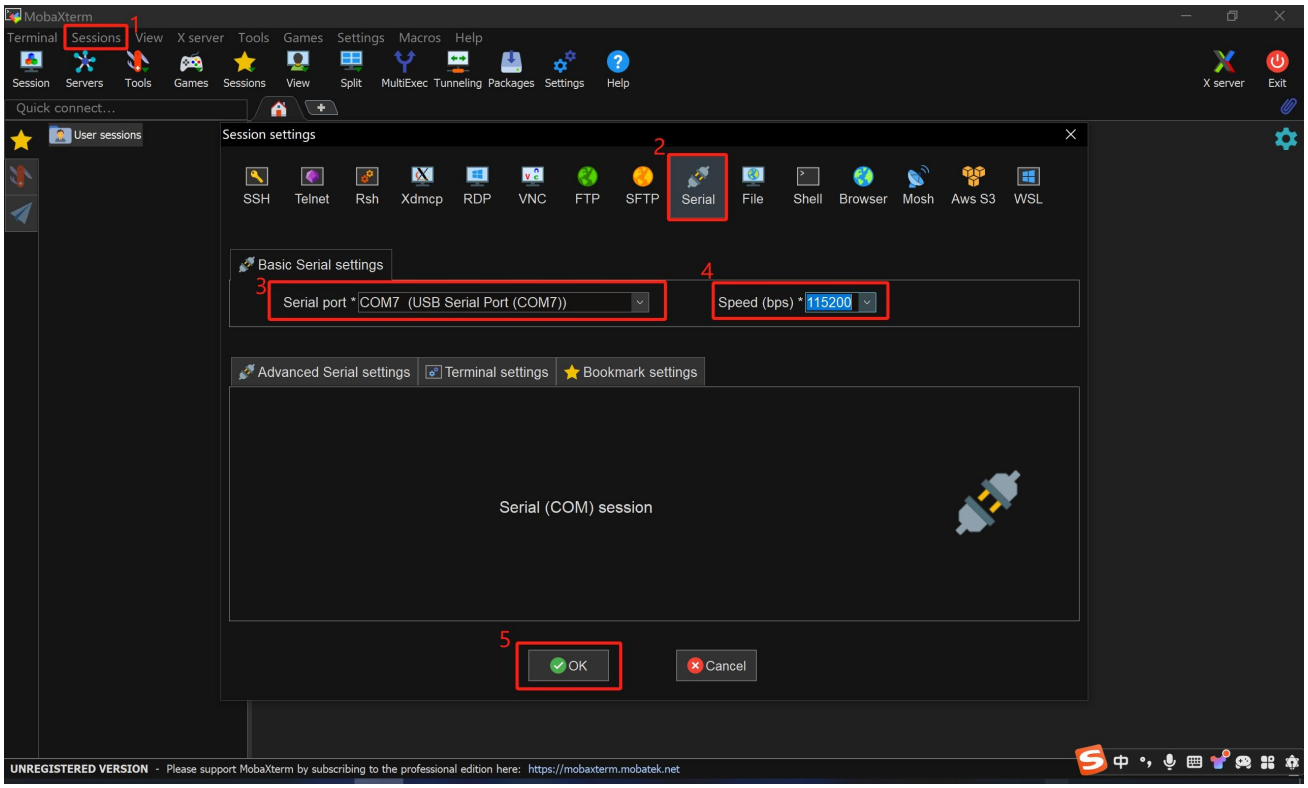


Windows Device Manager COM port recognition

1. Open MobaXterm, then select Sessions → New Session.



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2. In the dialog box that appears, select **Serial**.
3. In the **Serial port** drop-down list, select the recognized COM port.
4. Set **Speed** to **115200.**
5. Click **OK** to enter the serial log output page.

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9. Precautions

K3 CoM260 is intended for laboratory or engineering environments. Before use, read the following precautions carefully:

1. Do not hot-plug the display interface, CSI interface, or expansion board under any circumstances.
2. Before unpacking and installation, take necessary anti-static precautions to avoid damage to the development board caused by electrostatic discharge (ESD).
3. When handling the development board, hold the board edges and avoid touching exposed metal parts to prevent ESD damage to components.
4. Place the development board on a dry, flat surface, and keep it away from heat sources, electromagnetic interference sources, radiation sources, and electromagnetically sensitive equipment such as medical devices.

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