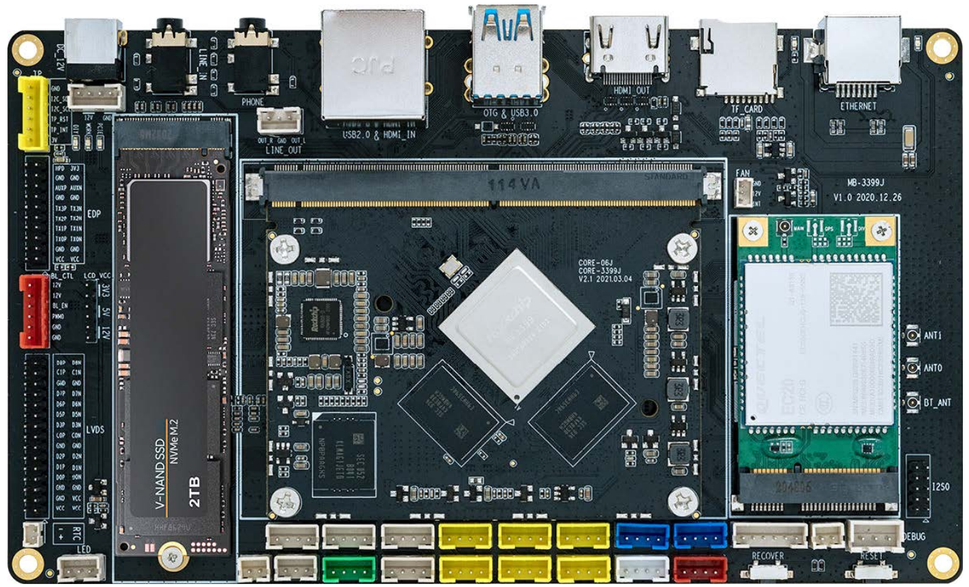
# Six-Core 64-Bit industrial Main board

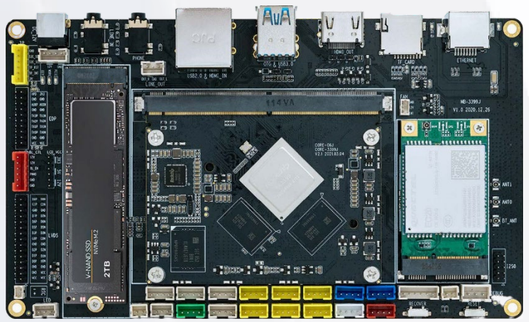
- AIO-3399J（Commercial）
- AIO-3399KJ（Industrial）




V2.1 2023-11-23

T-CHIP INTELLIGENCE TECHNOLOGY

# Product features



## A New Generation  of Six-Core 64-Bit Processor

AIO-3399J uses the newest ARM Cortex-A72 architecture, six core 64 bit CPU,.The frequency up to 1.8GHz. Compared with Cortex-A57, the processing performance is 100%, The speed is faster, and the performance is stronger.

## Compatible with All Mainstream Display

Support LVDS/eDP/MIPI/HDMI interface, Support 5-100 inch displays， can drive the mainstream display screen.

## Precise and Reliable Process

4mil immersion gold process, core board finger anti-corrosion, 7x24 hours stable working ， 4 stud fixed, solid and reliable

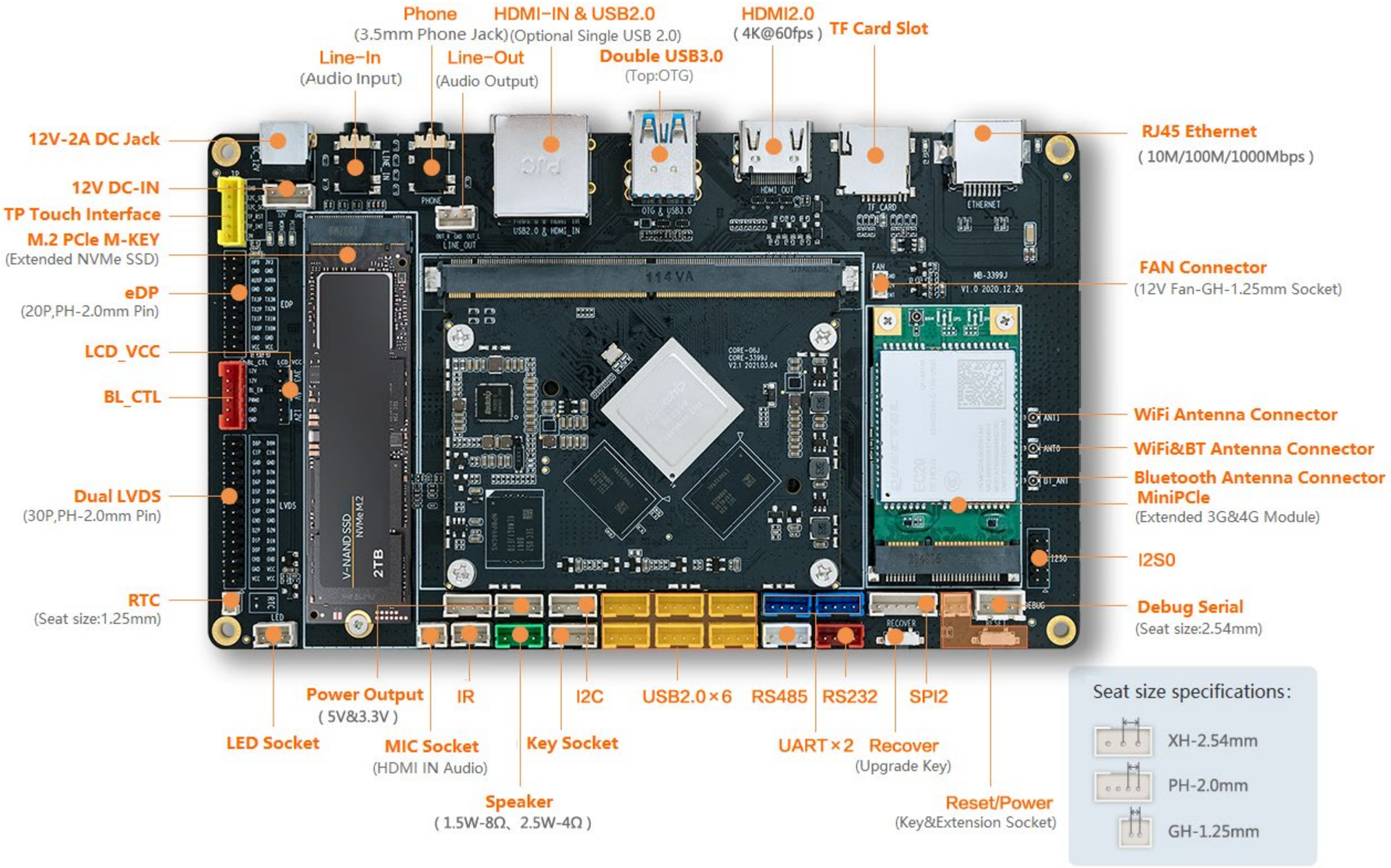
## Extensive connectivity

A wide range of interface options includes PCIe, USB 2.0, USB 3.0, Type-C, MIPI-CSI, MIPI-DSI, I2C, SPI, UART, ADC, PWM, GPIO, SPDIF, and I2S (supporting 8-channel digital microphone array input). These interfaces facilitate the connection of peripheral devices, enabling different product applications across various fields.

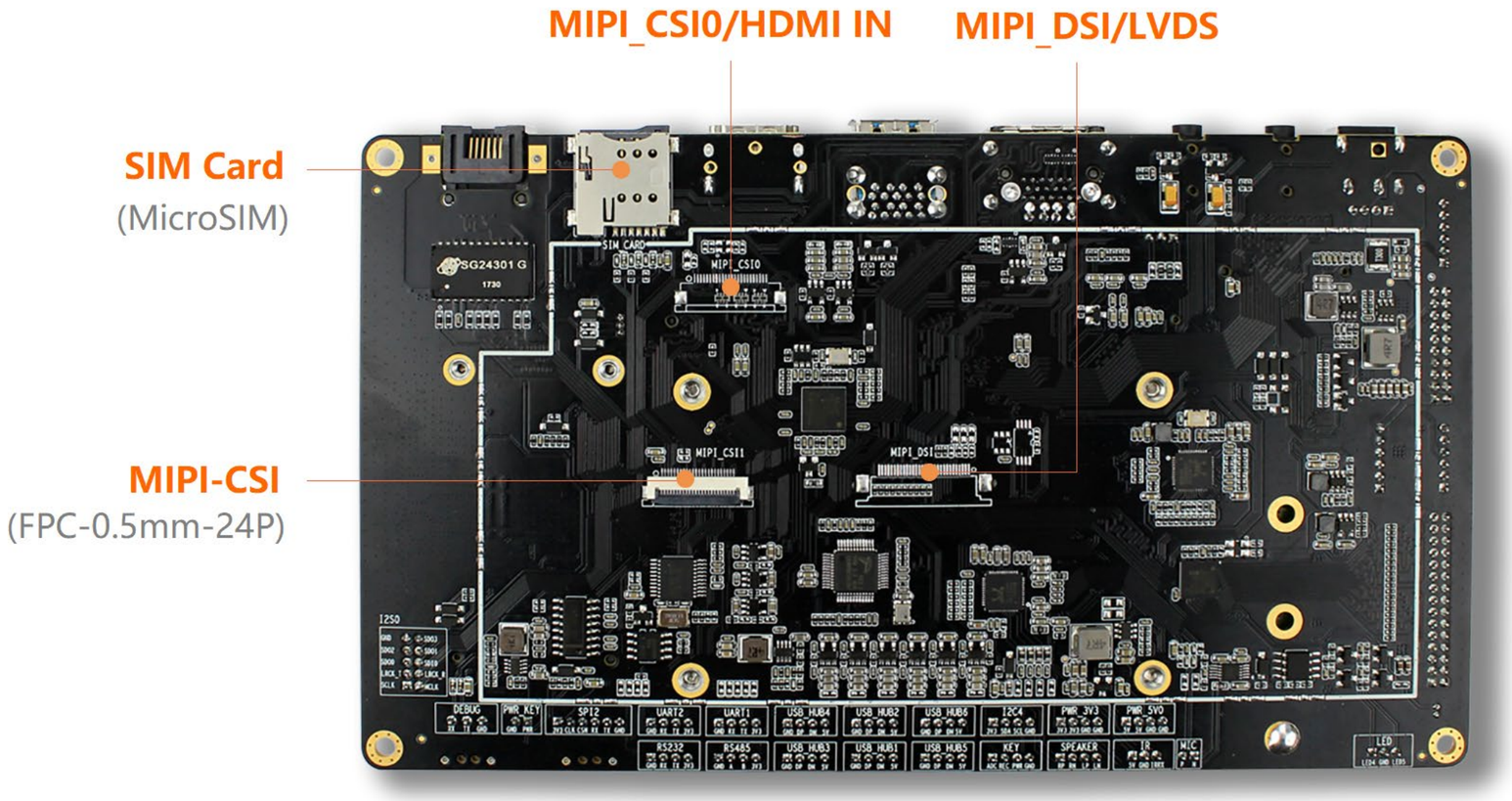
# Specifications

| | | AIO-3399J (Commercial) | AIO-3399KJ (Industrial) |
|---|---|---|---|
| Basic Specifications | CPU | RK3399<br>Hexa-core 64-bit processor (Cortex-A72×2 + Cortex-A53×4), up to 1.8GHz | RK3399K<br>Hexa-core 64-bit processor (Cortex-A72×2 + Cortex-A53×4), up to 2.0GHz |
| | GPU | Mali-T860 MP4 quad-core GPU<br>Support OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11<br>Support AFBC (Frame Buffer Compression) | |
| | ISP | Built-in dual hardware ISP<br>Support up to single 13M pixel or dual 8M pixel | |
| | VPU | Hardware decoding: 4K@60fps H265/H264/VP9 decoding, multi-format decoding of 1080P videos (VC-1, MPEG-1/2/4, VP8)<br>Hardware encoding: 1080P H.264/AVC/VP8<br>Video post processing: deinterlacing, noise reduction, edge/detail/color optimization | |
| | RAM | LPDDR4 (2GB/4GB optional) | |
| | Storage | eMMC (16GB/32GB/64GB/128GB optional) | |
| | Power | DC12V - 2A (DC 5.5*2.1mm jack or 2.54mm wafer) | |
| | OS | Android and Linux OS | |
| | Size | 182.8mm (length) * 107.1mm (width) | |
| | Environment | Operating temperature: -20℃ ~ 60℃<br>Operating humidity: 10% ~ 90%RH (non-condensing) | Operating temperature: -20℃ ~ 70℃<br>Operating humidity: 10% ~ 90%RH (non-condensing) |
| Interface Specifications | Network | 1000Mbps Ethernet (RJ45)<br>2.4GHz/5GHz dual-band WiFi (802.11a/b/g/n/ac, 2*2 MIMO), Bluetooth 4.1 (supporting BLE)<br>Through Mini-PCIe, 3G/4G LTE module expansion is available (WCDMA, EVDO, 4G) | |
| | Video Input | 2 * MIPI-CSI camera interface<br>1 * HDMI-IN (1080P@60fps) | |
| | Video Output | 1 * HDMI 2.0 (4K@60fps), supports HDCP 1.4/2.2<br>1 * dual-channel MIPI-DSI (up to 2560x1600@60fps)<br>1 * dual-channel LVDS (up to 1920x1200 (24-bit)@60pfs)<br>1 * eDP 1.3 (4 lanes with 10.8Gbps)<br>* Support dual-display | |
| | Audio Input | 1 * MIC audio input, 1 * Line-In | |
| | Audio Output | 1 * HDMI audio output, 1 * audio jack (3.5mm)<br>1 * Line-Out (port), 1 * SPDIF digital audio interface, 1 * Speaker (left and right channel, built-in dual 4Ω/2.7W, 8Ω/1.6W amplifier), 1 * I2S (8 channels) | |
| | USB | 1 * USB 2.0 HOST, 2 * USB 3.0 HOST, 6 * USB2.0 ports | |
| | PCIe | 1 * Mini PCIe (LTE 4G expansion), 1 * PCIe M.2 (NVMe SSD expansion) | |
| | Other | 1 * RS232, 1 * RS485, 2 * UART, 1 * Debug, 2 * SPI, 1 * I2C, GPIOs | |

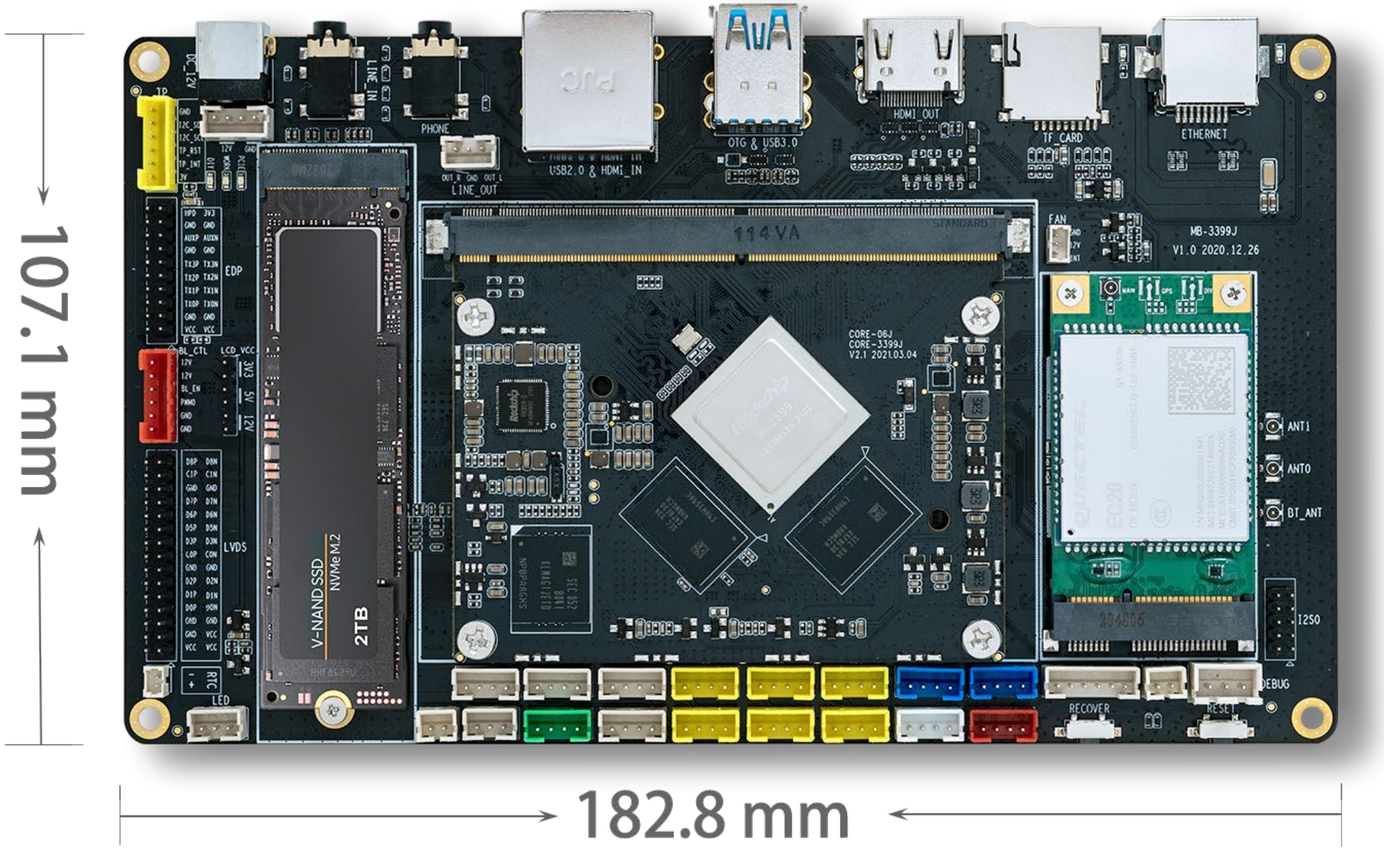
# Interface description



# Interface description

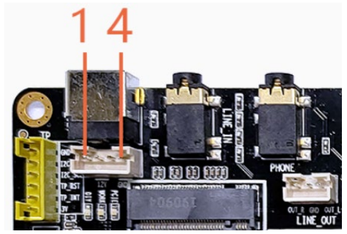


# Dimension


107.1 mm
182.8 mm
DC_12V
LINE_IN
PHONE
USB2.0 & HDMI_IN
OTG & USB3.0
HDMI_OUT
TF_CARD
ETHERNET
LINE_OUT
114VA
FAN
MB-3399J
V1.0 2020.12.26
CORE-06J
CORE-3399J
V2.1 2021.03.04
EDP
LVDS
V-NAND SSD
NVMe M.2
2TB
ANT1
ANT0
BT_ANT
12S0
DEBUG
RECOVER
RESET
LED
RTC

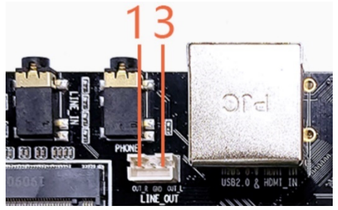
# Interface Definition

## 1. (J2) DC_IN 4 PIN 2.0 Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | DC_12V | 12 | 3 | GND | |
| 2 | DC_12V | 12 | 4 | GND | |

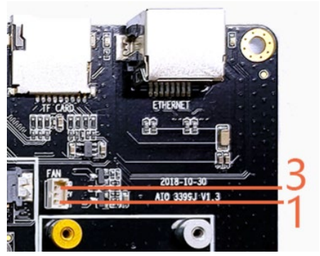
## 2. (J44) LINE-OUT 3 PIN 2.0 Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | LINE_OUT_R | 3.0 | 3 | LINE_OUT_L | 3.0 |
| 2 | GND | | | | |

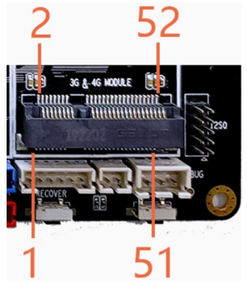
# Interface Definition

### 3. (J25) FAN 3 PIN 1.25  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | FAN_INT | 12 | 3 | GND | |
| 2 | FAN_12V | 12 | | | |

### 4. (J27) MINI PCIE-3G/4G



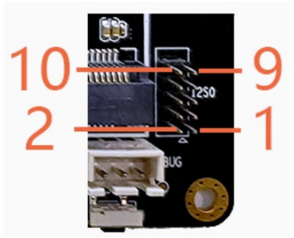

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | NC | | 2 | VCC3V8_3G | 3.8 |
| 3 | NC | | 4 | GND | |
| 5 | NC | | 6 | NC | |

# Interface Definition

| | | | | | |
|---|---|---|---|---|---|
| 9 | GND | | 10 | UIM_DAT | 1.8 |
| 11 | NC | | 12 | UIM_CLK | 1.8 |
| 13 | NC | | 14 | UIM_RST | 1.8 |
| 15 | GND | | 16 | NC | |
| 17 | NC | | 18 | GND | |
| 19 | NC | | 20 | NC | |
| 21 | GND | | 22 | PE_RST | 3.3 |
| 23 | NC | | 24 | NC | |
| 25 | NC | | 26 | GND | |
| 27 | GND | | 28 | NC | |
| 29 | GND | | 30 | NC | |
| 31 | NC | | 32 | NC | |
| 33 | NC | | 34 | GND | |
| 35 | GND | | 36 | HOST0_DM | 3.3 |
| 37 | GND | | 38 | HOST0_DP | 3.3 |
| 39 | VCC3V8_3G | 3.8 | 40 | GND | |
| 41 | VCC3V8_3G | 3.8 | 42 | NC | |
| 43 | GND | | 44 | NC | |
| 45 | NC | | 46 | NC | |
| 47 | NC | | 48 | NC | |
| 49 | NC | | 50 | GND | |
| 51 | NC | | 52 | VCC3V8_3G | 3.8 |

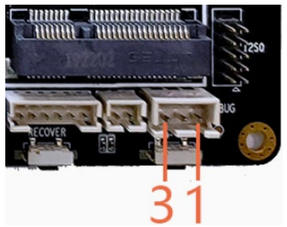
# Interface Definition

### 5. (J34) I2S0 10 PIN Dual  2.0 Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | FAN_INT | 12 | 3 | GND | |
| 2 | FAN_12V | 12 | | | |
| 5 | I2S0_SDO0 | 1.8 | 6 | I2S0_SDI0 | 1.8 |
| 7 | I2S0_SDO2 | 1.8 | 8 | I2S0_SDO1 | 1.8 |
| 9 | GND | | 10 | I2S0_SDO3 | 1.8 |

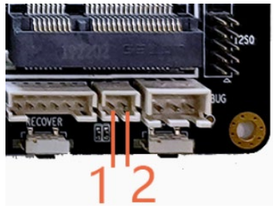
### 6. (J26)DEBUG 3 PIN 2.54  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | UART2_RXD | 3.0 | 3 | GND | |
| 2 | UART2_TXD | 3.0 | | | |

# Interface Definition

### 7. (J7)POWER KEY 2 PIN 2.0  Pitch Interface



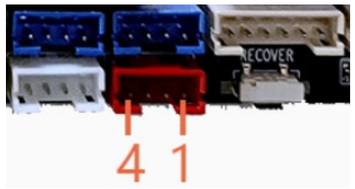

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | PWR | 5.0 | 2 | GND | |

### 8. (J18)SPI2 6 PIN 2.0  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC3V3_SYS | 3.3 | 4 | GPIO2_B1/SPI2_RXD | 1.8 |
| 2 | GPIO2_B3/SPI2_CLK | 1.8 | 5 | GPIO2_B2/SPI2_TXD | 1.8 |
| 3 | GPIO2_B4/SPI2_CSN0 | 1.8 | 6 | GND | |

# Interface Definition

### 9. (J5) RS232 4 PIN 2.0  Pitch Interface



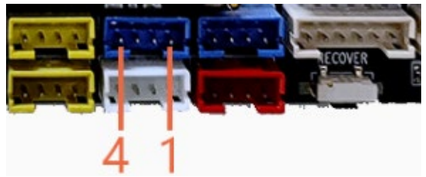

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | RS232_TX | 3.3 |
| 2 | RS232_RX | 3.3 | 4 | VCC3V3_UART | 3.3 |

### 10. (J6) RS485 4 PIN 2.0  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | RS485_B | 3.3 |
| 2 | RS485_A | 3.3 | 4 | VCC3V3_UART | 3.3 |

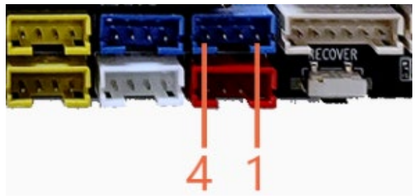
# Interface Definition

### 11. (J108) UART1 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | RXD | 3.3 |
| 2 | RXD | 3.3 | 4 | VCC3V3_UART | 3.3 |

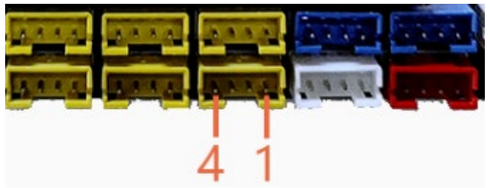
### 12. (J107) UART2 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | TX_C | 3.3 |
| 2 | RX_C | 3.3 | 4 | VCC3V3_UART | 3.3 |

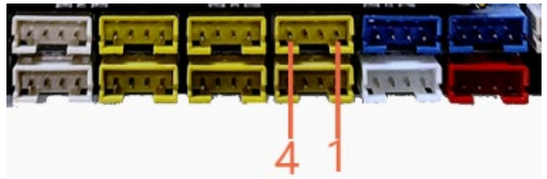
# Interface Definition

### 13. (J12) USB-HUB3 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | HUB_DM3 | 3.3 |
| 2 | HUB_DP3 | 3.3 | 4 | VCC5V0_HOST3 | 5.0 |

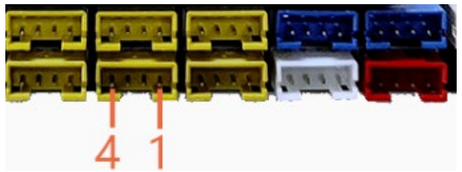
### 14. (J13) USB-HUB4 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | HUB_DM4 | 3.3 |
| 2 | HUB_DP4 | 3.3 | 4 | VCC5V0_HOST4 | 5.0 |

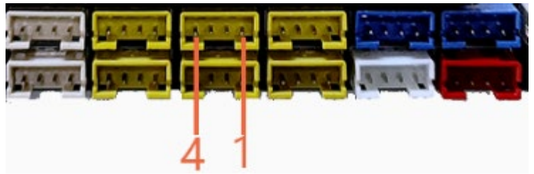
# Interface Definition

### 15. (J10) USB-HUB1 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | HUB_DM1 | 3.3 |
| 2 | HUB_DP1 | 3.3 | 4 | VCC5V0_HOST1 | 5.0 |

### 16. (J11) USB-HUB2 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | HUB_DM5 | 3.3 |
| 2 | HUB_DP2 | 3.3 | 4 | VCC5V0_HOST5 | 5.0 |

# Interface Definition

### 17. (J105) USB-HUB5 4 PIN 2.0  Pitch Interface

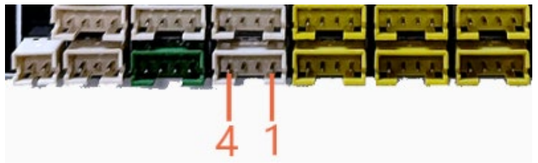

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | HUB_DM5 | 3.3 |
| 2 | HUB_DP5 | 3.3 | 4 | VCC5V0_HOST5 | 5.0 |

### 18. (J104) USB-HUB6 4 PIN 2.0  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 3 | HUB_DM6 | 3.3 |
| 2 | HUB_DP6 | 3.3 | 4 | VCC5V0_HOST6 | 5.0 |

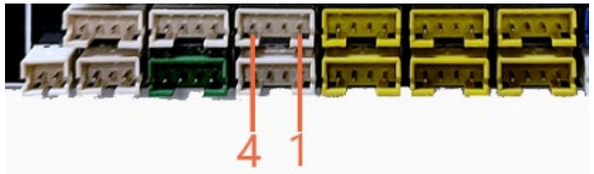
# Interface Definition

### 19. (J109) KEY 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | ADC_IN0 | 1.8 | 3 | PWR_ON | 5.0 |
| 2 | RECOVER_KEY | 1.8 | 4 | GND | |

### 20. (J47) I2C4 4 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC3V3_SYS | 3.3 | 3 | I2C4_SCL | 3.0 |
| 2 | I2C4_SDA | 3.0 | 4 | GND | |

# Interface Definition

### 21. (J17) SPEAKER 4 PIN 2.0  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | SPK_RN | 10W@8Ω | 3 | SPK_LN | 10W@8Ω |
| 2 | SPK_RP | | 4 | SPK_LP | |

### 22. (J41) PWR_3V3 4 PIN 2.0  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC3V3_SYS | 3.3 | 3 | GND | |
| 2 | VCC3V3_SYS | 3.3 | 4 | GND | |

# Interface Definition

### 23. (J42) PWR_5V0 4 PIN 2.0  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC_SYS | 5.0 | 3 | GND | |
| 2 | VCC_SYS | 5.0 | 4 | GND | |

### 24. (J43) IR Receiver 4 PIN 2.0  Pitch Interface

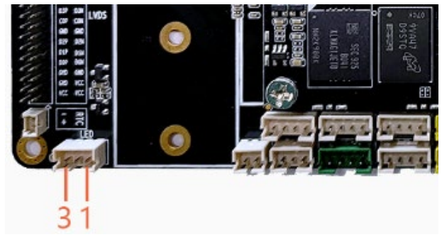

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | IR_VCC | 5.0 | 3 | IR_INT | 1.8 |
| 2 | GND | | | | |

# Interface Definition

### 25. (J14) MIC 2 PIN 2.0  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | MIC_IN1N | 3.0 | 2 | MIC_IN1P | 3.0 |

### 26. (J102) LED 3 PIN 2.0  Pitch Interface



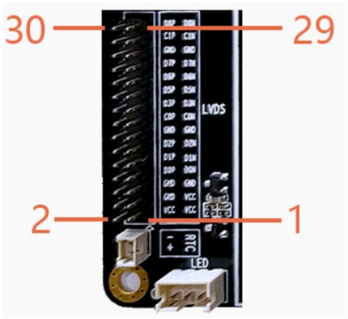

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | LED4 | 3.3 | 3 | LED5 | 3.3 |
| 2 | GND | | | | |

# Interface Definition

### 27. (J3) RTC 2 PIN 1.25  Pitch Interface


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 2 | VCC_RTC | 3.3~5.0 |

### 28. (CON40) LVDS Dual 30 PIN 2.0 Pitch Interface

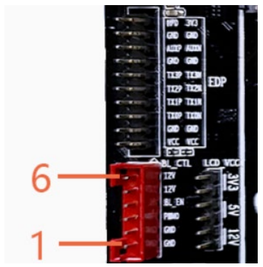



*VCC_LCD通过跳帽J101 选择

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC_LCD | 3.3V/5V/12VOptional* | 2 | VCC_LCD | 3.3V/5V/12VOptional* |
| 3 | VCC_LCD | 3.3V/5V/12VOptional* | 4 | GND | |
| 5 | GND | | 6 | GND | |
| 7 | LVDS_D0N | 3.3 | 8 | LVDS_D0P | 3.3 |

| | | | | | |
|---|---|---|---|---|---|
| 9 | LVDS_D1N | 3.3 | 10 | LVDS_D1P | 3.3 |
| 11 | LVDS_D2N | 3.3 | 12 | LVDS_D2P | 3.3 |
| 13 | GND | | 14 | GND | |
| 15 | LVDS_CLK0N | 3.3 | 16 | LVDS_CLK0P | 3.3 |
| 17 | LVDS_D3N | 3.3 | 18 | LVDS_D3P | 3.3 |
| 19 | LVDS_D5N | 3.3 | 20 | LVDS_D5P | 3.3 |
| 21 | LVDS_D6N | 3.3 | 22 | LVDS_D6P | 3.3 |
| 23 | LVDS_D7N | 3.3 | 24 | LVDS_D7P | 3.3 |
| 25 | GND | | 26 | GND | |
| 27 | LVDS_CLK1N | 3.3 | 28 | LVDS_CLK1P | 3.3 |
| 29 | LVDS_D8N | 3.3 | 30 | LVDS_D8P | 3.3 |

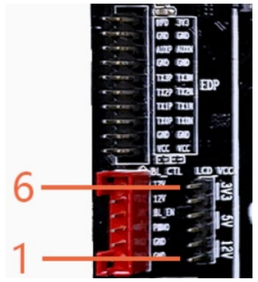
### 29. (J45) BL_CTL 6 PIN 2.0 Pitch Interface(GPIO)




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 4 | BL_EN | 3.0 |
| 2 | GND | | 5 | DC_12V | 12 |
| 3 | LCD_BL_PWM0 | 3.0 | 6 | DC_12V | 12 |

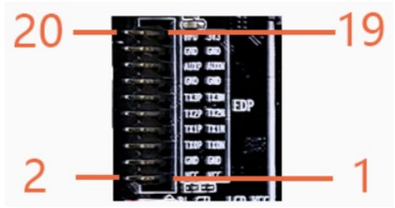
# Interface Definition

### 30. (J101) LCD_VCC 6 PIN 2.0  Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | DC_12V | 12V | 4 | VCC_LCD_S | 3.3V/5.0V/12VOptional |
| 2 | VCC_LCD_S | 3.3V/5.0V/12VOptional | 5 | VCC3V3_SYS_S3 | 3.3V |
| 3 | VCC_SYS | 5V | 6 | VCC_LCD_S | 3.3V/5.0V/12VOptional |

### 31. (JP1)EDP  Dual 20 PIN 2.0 Pitch Interface(GPIO)

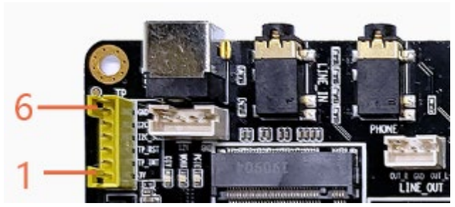



*VCC_LCD通过跳帽J101选择

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC_LCD | 3.3V/5.0V/12VOptional | 2 | VCC_LCD | 3.3V/5.0V/12VOptional |
| 3 | GND | | 4 | GND | |
| 5 | EDP_TX0N | 1.8 | 6 | EDP_TX0P | 1.8 |

| | | | | | |
|---|---|---|---|---|---|
| 7 | EDP_TX1N | 1.8 | 8 | EDP_TX1P | 1.8 |
| 9 | EDP_TX2N | 1.8 | 10 | EDP_TX2P | 1.8 |
| 11 | EDP_TX3N | 1.8 | 12 | EDP_TX3P | 1.8 |
| 13 | GND | | 14 | GND | |
| 15 | EDP_AUXN | 1.8 | 16 | EDP_AUXP | 1.8 |
| 17 | GND | | 18 | GND | |
| 19 | VCC_3V0 | 3.0 | 20 | LCD_HPD | 3.0 |

### 32. (J24) TP 6 PIN 2.0 Pitch Interface




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC_3V0 | 3.0 | 2 | TP_INT | 3.0 |
| 3 | TP_RST | 3.0 | 4 | I2C4_SCL_TP | 3.0 |
| 5 | I2C4_SDA_TP | 3.0 | 6 | GND | |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