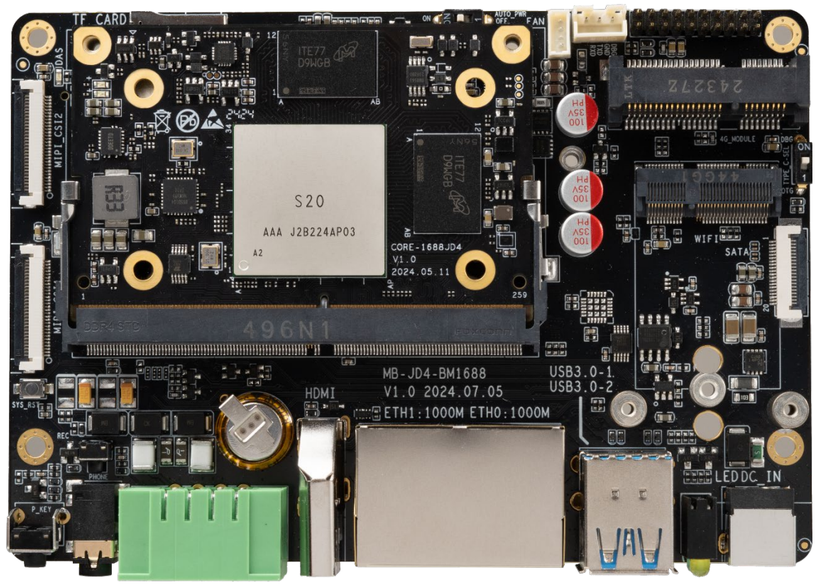
# AIO-1688JD4

## 16T Computing power AI Mainboard




V1.0 2024-12-9

T-CHIP INTELLIGENCE TECHNOLOGY

# Product features

## Computing power up to 16TOPS

Adopt SOPHON AI processor BM1688
32T@INT4 peak computing power, 16T@INT8 peak computing power, 4T@FP16/BF16 computing power, and 0.5T@FP32 computing power.

## AI processing performance for multi-channel video

It supports 16 channels of H.265/H.264 1080P@30fps video decoding and 10 channels of H.265/H.264 1080P@30fps video encoding,1080P@480fps JPEG codec.

## Powerful ISP image processing performance

It supports 6-channel sensor input video, and supports image processing functions such as wide dynamic range, shadow correction, lens distortion correction, purple edge correction, Bayer noise reduction, 3D noise reduction, 3A, dehaze, dynamic contrast enhancement, etc.

## The private deployment of large language models

Support the private deployment of ultra-large-scale parameter models under the Transformer architecture, including large language models such as Gemma-2B, LlaMa2-7B, Qwen1.5-1.8B, ChatGLM3-6B. Support Docker container management technology.

# Product features


## Multiple deep learning frameworks

Support traditional network architectures such as CNN, RNN, and LSTM;
a variety of deep learning frameworks, including TensorFlow, Pytorch, PaddlePaddle, Caffe and ONNX, as well as custom operator development.

## Abundant expansion interfaces

It has MIPI-CSI, MIPI-DSI, HDMI2.0, PCIe3.0, SATA3.0, USB3.0, USB2.0, SDIO, I2C, I2S, SPI, UART, CAN, PWM, ADC, GPIO and other expansion interfaces.

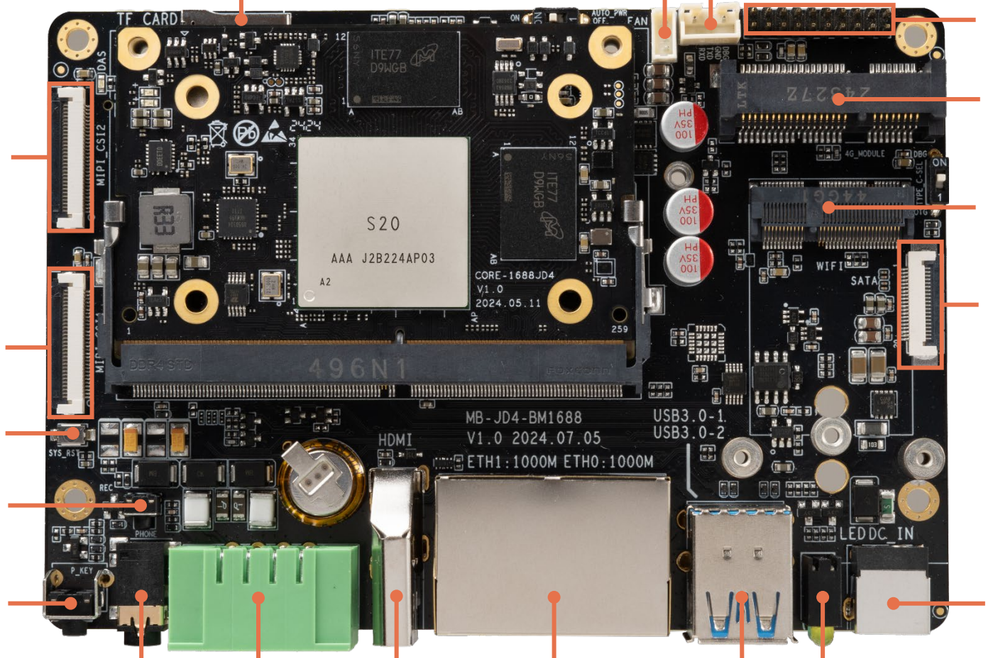
## Wide range of application scenarios

Efficiently adapts to all AI algorithms on the market, and is widely used in: intelligent computing servers, edge intelligent computing boxes, industrial computers, professional intelligent network cameras, AIOT and other types of products, empowering AI for various industries.

# Specifications

| Specification | | |
|---|---|---|
| Basic Specifications | SOC | SOPHON BM1688 |
| | CPU | Octa-core 64-bit ARM Cortex-A53 @ 1.6GHz |
| | TPU | Built-in SOPHGO neural network acceleration engine TPU, 32T@INT4 peak computing power, 16T@INT8 peak computing power, 4T@FP16/BF16 computing power, 0.5T@FP32 computing power |
| | ISP | Time-sharing multiplexing for up to 6 sensor input videos, with maximum widths of 4608 (non-tile mode) and 8192 (tile mode)<br>Supports Sensor self-band dynamic and 2-frame wide dynamic range, and the maximum performance supports: 12M@30 HDR or 8K@15 SDR or 16M@30 SDR<br>Support RGB-IR, AI ISP interface, 3A (AE/AWB/AF, 3A control user adjustable)<br>Support fixed mode noise removal, dead pixel correction, shadow correction, lens distortion correction, purple edge correction, Bayer noise reduction, 3D denoising, image edge enhancement, dehazing, dynamic contrast enhancement, image video Mirror, Flip and other functions |
| | VPU | Video decoding: H.265/H.264 decoding (maximum performance: 1920×1080@480fps or 8192×4320@30fps)<br>Video encoding: H.265/H.264 encoding (maximum performance: 1920×1080@300fps or 8192×4320@15fps)<br>Image codec: Support JPEG/MJPEG Baseline codec (JPEG codec: 1080P@480fps, maximum resolution 32768×32768) |
| | RAM | 8GB LPDDR4 (4GB/8GB/16GB optional) |
| | Storage | 32GB eMMC (32GB/64GB/128GB/256GB optional) |
| | Expand storage | 1 × TF Card, 1 × SATA3.0 (expandable SATA3.0 SSD), 1 × M.2 (expandable SATA3.0/PCIe NVMe SSD, support 2242/2260/2280) |
| | OS | Linux OS (Ubuntu) |
| | Software Support | · The private deployment of ultra-large-scale parameter models under the Transformer architecture, including large language models such as Gemma-2B, LlaMa2-7B, ChatGLM3-6B, Qwen1.5-1.8B.<br>· Traditional network architectures such as CNN, RNN, and LSTM; a variety of deep learning frameworks, including TensorFlow, Pytorch, PaddlePaddle, Caffe and ONNX, as well as custom operator development<br>· Docker container management technology |
| | Power | DC 12V (5.5mm × 2.1mm, support 9V~24V wide voltage input) |
| | Power consumption | Normal: 8.4W (12V/700mA), Max: 30W (12V/2500mA) |
| | Size | 122.89mm × 85.04mm × 22.7mm |
| | Weight | ≈120g |
| | Environment | Operating Temperature: -20℃ ~ 60℃ , Storage temperature: -20℃~70℃, Storage Humidity: 10% ~ 90%RH(non-condensing) |
| Interface Specifications | Internet | Ethernet: 2 × RJ45 (1000Mbps)<br>WiFi: Extend WiFi/Bluetooth module via M.2 E-KEY (2230) , supports 2.4GHz/5GHz dual band WiFi 6 (802.11a/b/g/n/ac/ax) and Bluetooth 5.2<br>4G: Extend 4G LTE via Mini PCIe (Reused with 5G)<br>5G: Extend 5G via M.2 B-KEY (Reused with 4G and USB3.0(1), not pasted by default) |
| | Video input | 3 × MIPI CSI DPHY (1×4lanes or 2×2lanes, 30Pin-0.5mm) |
| | Video output | 1 × HDMI2.0 (4K@60fps)<br>1 × MIPI DSI DPHY (1×4lanes, 30Pin-0.5mm) |
| | Audio output | 1 × 3.5mm Audio jack (support MIC recording, American standard CTIA) |
| | SATA | 1 × SATA3.0 (expandable SATA3.0 SSD) |
| | USB | 2 × USB3.0 (Max: 1A; UP: USB3.0(1), reused with 5G; DOWN: USB3.0(2)) |
| | Other interfaces | 1 × Type-C (USB2.0/DEBUG), 1 × FAN (4Pin-1.25mm), 1 × SIM Card<br>1 × Double-row pin headers (2×10Pin-2.0mm): USB2.0, SPI, 2×I2C, Line in, Line out, GPIO<br>1 × Phoenix connector (2×4Pin-3.5mm): 1 × RS485, 1 × RS232, 1 × CAN 2.0 |

# Interface description




TF Card

FAN (4Pin-1.25mm)

Debug (3Pin-2.0mm)

Double-row pin headers
(2×10-20PIN-2.0mm)

Mini PCIe
(4G/3G)

M.2 E-KEY
(Extended WiFi/Bluetooth Module)

SATA
SATA SSD

MIPI CSI DPHY
(1×4lanes/2×2lanes, 30Pin-0.5mm)

MIPI CSI DPHY
(1×4lanes/2×2lanes, 30Pin-0.5mm)

Reset

Recovery

Power button

DC 12V
(5.5mm×2.1mm, support 9V~24V wide voltage input)

3.5mm Audio jack
(Support Mic recording)

Phoenix connector
(2×4Pin, 3.5mm Pitch)

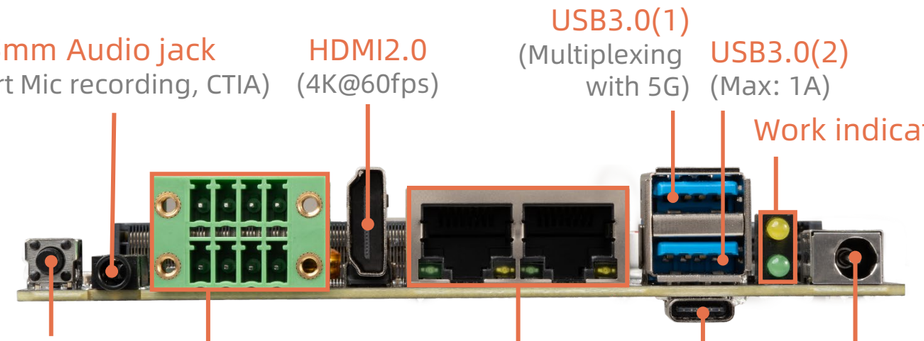
HDMI2.0
(4K@60fps)

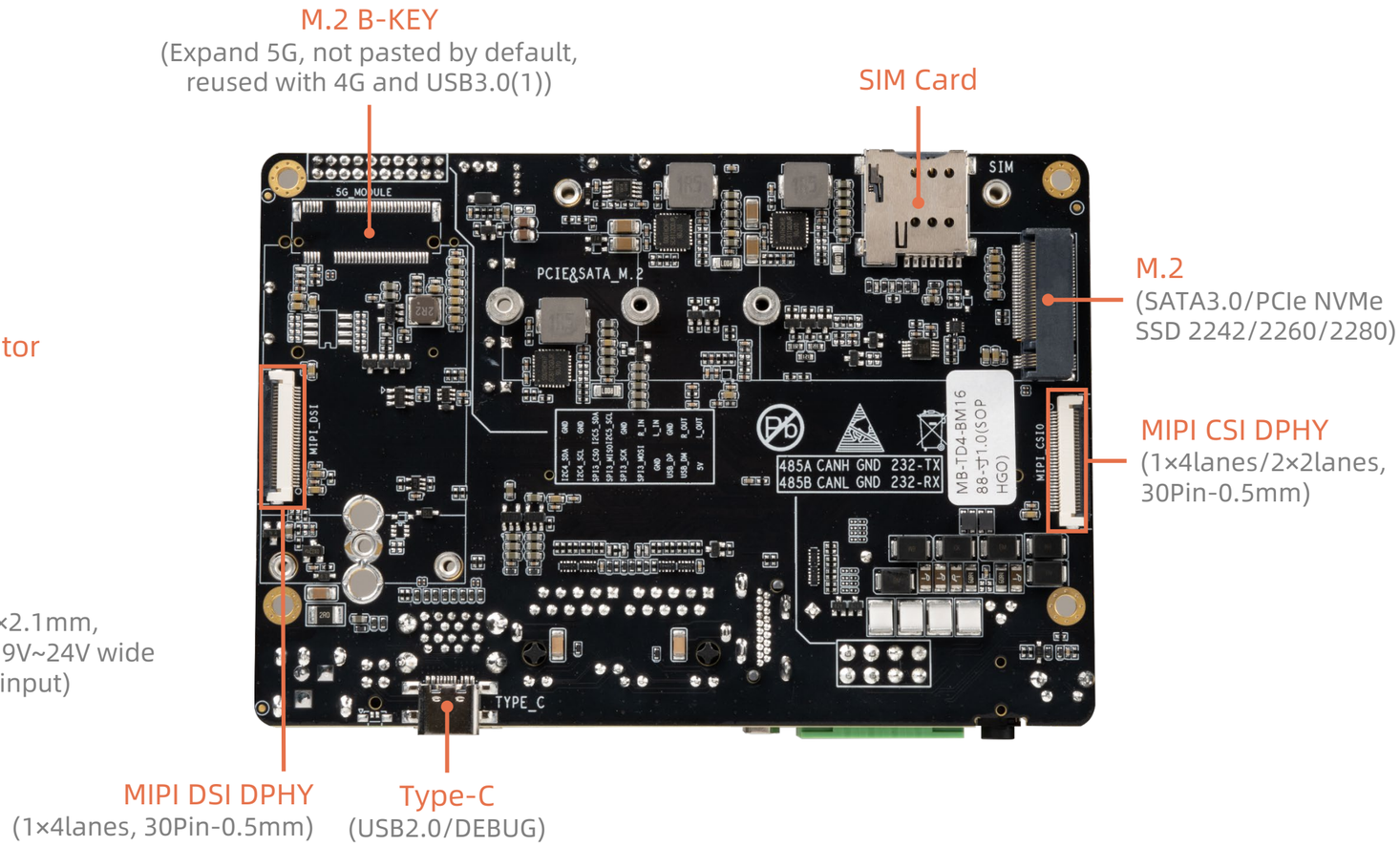
2×Gigabit Ethernet
(RJ45/1000Mbps)

2×USB3.0

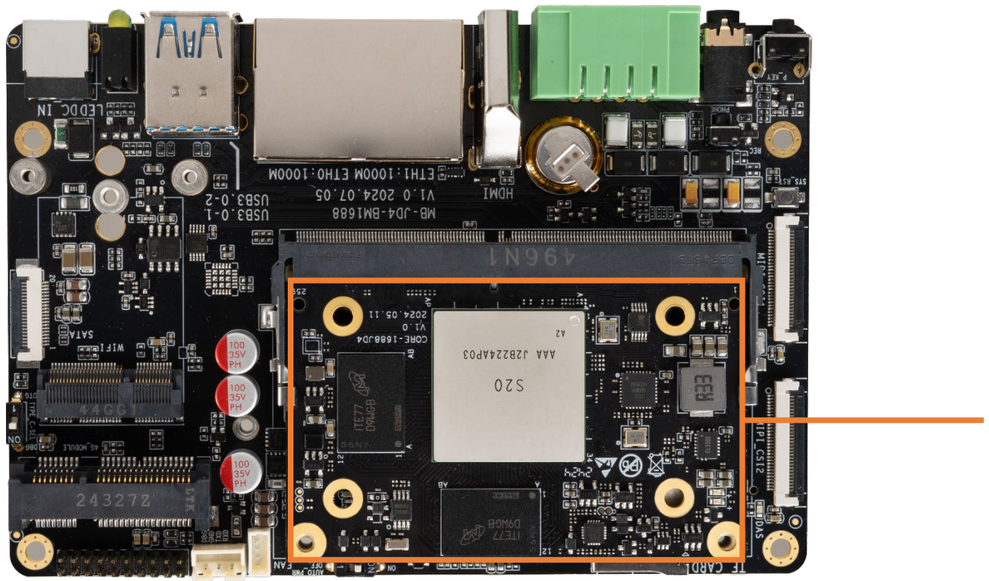
Work indicator

# Interface description



# Interface description

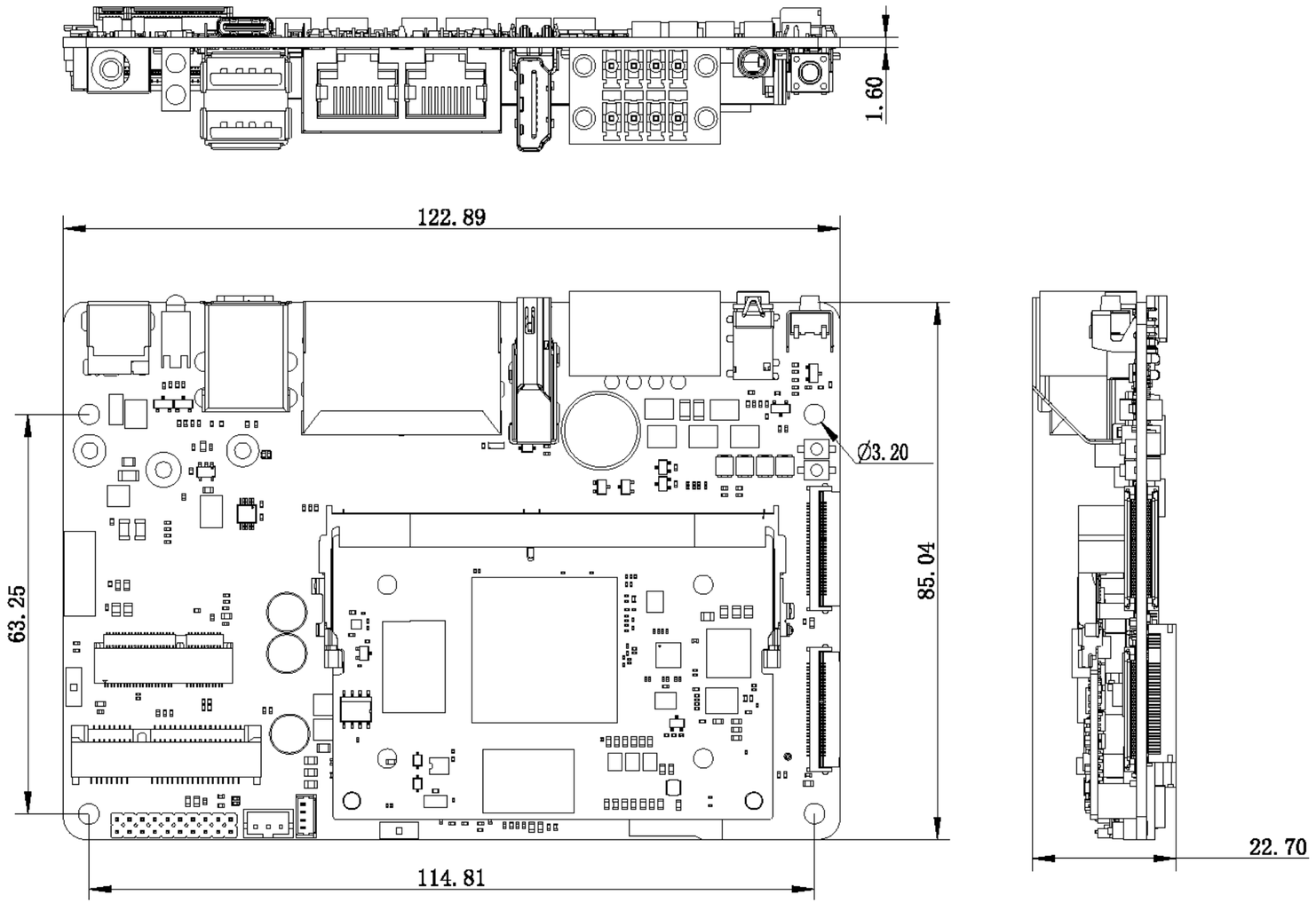


## Compatible with Mainstream Edge Computing Modules

The mainstream edge computing module’s interface standard (260-pin standard SODIMM) ensures compatibility with the following product series for flexible combination and replacement. This meets the needs for customization and is suitable for various edge computing deployment scenarios.

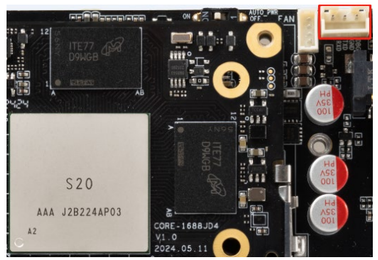
| Core Board (Module) | AI Performance | Manufacturer |
|---|---|---|
| Core-1688JD4 | 16 TOPS | Firefly |
| Core-3576JD4 | 6 TOPS | Firefly |
| Core-3588JD4 | 6 TOPS | Firefly |
| NVIDIA Jetson Orin Nano | 20~40 TOPS | NVIDIA |
| NVIDIA Jetson Orin NX | 70~100 TOPS | NVIDIA |

# Dimension



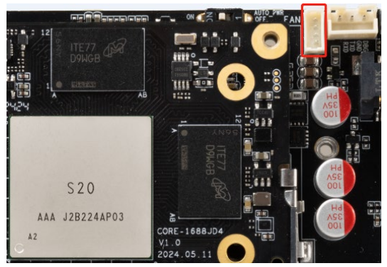
# Interface definition

### 1. (J19) DEBUG: 3 PIN 2.0mm pitch wafer



| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | UART0_RXD | 3.3 | 3 | GND | |
| 2 | UART0_TXD | 3.3 | | | |

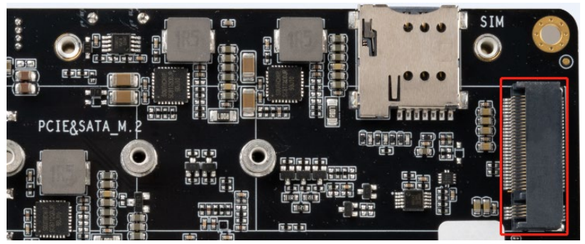
### 2. (J6)FAN: 4PIN 1.25mm pitch wafer



| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 2 | FAN+ (5V Output) | 5 |
| 3 | FG Input 【PWR_GPIO1】 | 3.3 | 4 | PWM11 Output 【GPIO114】 | 3.3 |

# Interface definition

### 3. (U4)M.2 PCIE/SATA M-KEY



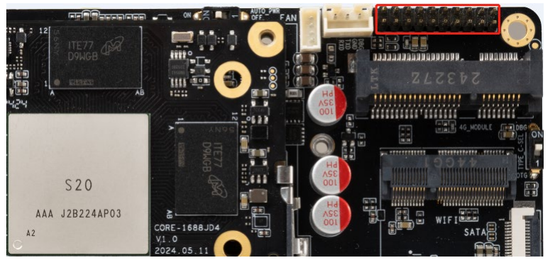

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 2 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 3 | GND | | 4 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 5 | NC | | 6 | NC | |
| 7 | NC | | 8 | NC | |
| 9 | GND | | 10 | DAS/DSS<br>[pull up resistor10K] | 3.3 |
| 11 | NC | | 12 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 13 | NC | | 14 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 15 | NC | | 16 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 17 | NC | | 18 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 19 | NC | | 20 | NC | |
| 21 | GND | | 22 | NC | |
| 23 | NC | | 24 | NC | |
| 25 | NC | | 26 | NC | |
| 27 | GND | | 28 | NC | |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 29 | NC | | 30 | NC | |
| 31 | NC | | 32 | NC | |
| 33 | GND | | 34 | NC | |
| 35 | NC | | 36 | NC | |
| 37 | NC | | 38 | DEVSLP<br>[pull up resistor10K] | 3.3 |
| 39 | GND | | 40 | NC | |
| 41 | PCIE0_RX0_P / SATA_RX0_P | - | 42 | NC | |
| 43 | PCIE0_RX0_N / SATA_RX0_N | - | 44 | NC | |
| 45 | GND | | 46 | NC | |
| 47 | PCIE0_TX0_N / SATA_TX0_N (Series capacitor 100nF) | - | 48 | NC | |
| 49 | PCIE0_TX0_P / SATA_TX0_P (Series capacitor 100nF) | - | 50 | PCIE0_RST* (GPIO40) | 3.3 |
| 51 | GND | | 52 | PCIE0_CLKREQ* (GPIO42) | 3.3 |
| 53 | PCIE0_EP_CLK_N | - | 54 | PCIE_WAKE*(GPIO41) | 3.3 |
| 55 | PCIE0_EP_CLK_P | - | 56 | NC | |
| 57 | GND | | 58 | NC | |
| 67 | NC | | 68 | NC | |
| 69 | GND | | 70 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 71 | GND | | 72 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 73 | GND | | 74 | VCC3V3_PCIE (3.3V Output) | 3.3 |
| 75 | GND | | | | |

# Interface definition

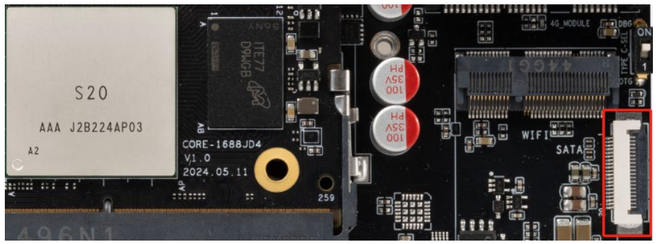
### 4. (J15) Double-row pin headers Extension Interface  2*10PIN



| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC5V0_SYS (5.0V OUTPUT) | 5.0<br>(MAX:500mA) | 2 | Left output 2<br>(40mW from ES8388) | 3.3 |
| 3 | USB_HOST0_DM | - | 4 | Right output 2<br>(40mW from ES8388) | 3.3 |
| 5 | USB_HOST0_DP | - | 6 | GND | |
| 7 | GND | | 8 | Right channel input 1  (to ES8388) | 3.3 |
| 9 | SPI3_SDO<br>(IIC5_SDA / KEY_ROW2 / GPIO103 / UART6_TX ) | 1.8 | 10 | Left channel input 1  (to ES8388) | 3.3 |
| 11 | SPI3_SCK<br>(IIC5_SCL / KEY_ROW3 / GPIO104 / UART6_RX) | 1.8 | 12 | GND | |
| 13 | SPI3_SDI<br>(IIC4_SCL / KEY_ROW1 / GPIO102 / UART5_RX) | 1.8 | 14 | I2C5_SCL  (PWM18 / GPIO65 / UART7_TX)<br>(Pull-up resistor 4.7K) | 3.3 |
| 15 | SPI3_CS0<br>(IIC4_SDA / KEY_ROW0  / GPIO101 / UART5_TX) | 1.8 | 16 | I2C5_SDA (PWM17 / GPIO64)<br>(Pull-up resistor 4.7K) | 3.3 |
| 17 | I2C4_SCL (PWM16 / GPIO63 )<br>(Pull-up resistor 4.7K) | 3.3 | 18 | GND | |
| 19 | I2C4_SDA  (PWM15 / GPIO62)<br>(Pull-up resistor 4.7K) | 3.3 | 20 | GND | |

# Interface definition

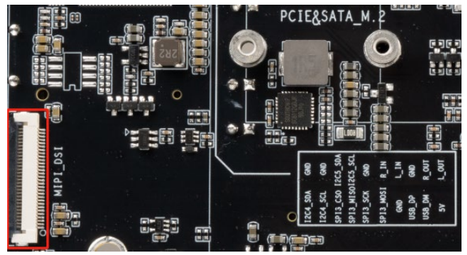
### 5. (J12)SATA 20pin 0.5mm pitch




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 11 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |
| 2 | SATA_TX1_P (Series capacitor 10nF) | - | 12 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |
| 3 | SATA_TX1_N (Series capacitor 10nF) | - | 13 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |
| 4 | GND | | 14 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |
| 5 | SATA_RX1_N (Series capacitor 10nF) | - | 15 | GND | |
| 6 | SATA_RX1_P (Series capacitor 10nF) | - | 16 | GND | |
| 7 | GND | | 17 | GND | |
| 8 | SATA_LED (GPIO112) | 3.3 | 18 | VSYS_12V (12.0V OUTPUT) | 12.0 |
| 9 | GND | | 19 | VSYS_12V (12.0V OUTPUT) | 12.0 |
| 10 | GND | | 20 | VSYS_12V (12.0V OUTPUT) | 12.0 |

# Interface definition

### 6. (J11) MIPI DSI 30PIN 0.5mm pitch

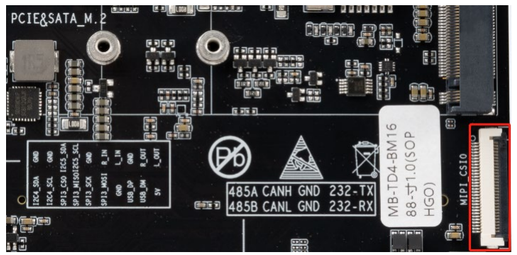



| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 | 16 | DSI_D0_P | - |
| 2 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 | 17 | DSI_D0_N | - |
| 3 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 | 18 | GND | |
| 4 | GND | | 19 | DSI_D1_P | - |
| 5 | NC | | 20 | DSI_D1_N | - |
| 6 | VCC3V3_SYS (3.3V OUTPUT) | 3.3 | 21 | GND | |
| 7 | I2C4_SDA【GPIO62】<br>Pull-up resistor 10K | 3.3 | 22 | DSI_CLK_P | - |
| 8 | I2C4_SCL 【GPIO63】<br>Pull-up resistor 10K | 3.3 | 23 | DSI_CLK_N | - |
| 9 | LCD_EN【Extended IO】 | 3.3 | 24 | GND | |
| 10 | TP_INT【GPIO75】 | 3.3 | 25 | DSI_D2_P | - |
| 11 | BL_EN【GPIO68】 | 3.3 | 26 | DSI_D2_N | - |
| 12 | BL_PWM1【GPIO76】 | 3.3 | 27 | GND | |
| 13 | LCD_RESET【Extended IO】 | 3.3 | 28 | DSI_D3_P | - |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 14 | TP_RESET【Extended IO】 | 3.3 | 29 | DSI_D3_N | - |
| 15 | GND | | 30 | GND | |

### 7. (J7) MIPI CSI0 30PIN 0.5mm pitch




| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | I2C0_SDA【GPIO184】<br>Pull-up resistor 10K (switch: GPIO80->H) | 1.8 | 16 | GND | |
| 2 | I2C0_SCL【GPIO128】<br>Pull-up resistor 10K (switch: GPIO80->H) | 1.8 | 17 | CSI0_CLK_P | - |
| 3 | CAM0_PWDN【GPIO69】 | 1.8 | 18 | CSI0_CLK_N | - |
| 4 | CAM0_RESET_H【Extended IO】 | 1.8 | 19 | GND | |
| 5 | GND | | 20 | CSI1_D0_P | - |
| 6 | CAM0_MCLK【GPIO46】 | 1.8 | 21 | CSI1_D0_N | - |
| 7 | CAM3_PWDN【PWR_GPIO4】 | 1.8 | 22 | GND | |
| 8 | CAM0_RESET_H【Extended IO】 | 1.8 | 23 | CSI1_D1_P | - |
| 9 | CAM0_MCLK【GPIO46】 | 1.8 | 24 | CSI1_D1_N | - |
| 10 | GND | | 25 | GND | |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 11 | CSI0_D0_P | - | 26 | CSI1_CLK_P | - |
| 12 | CSI0_D0_N | - | 27 | CSI1_CLK_N | - |
| 13 | GND | | 28 | GND | |
| 14 | CSI0_D1_P | - | 29 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |
| 15 | CSI0_D1_N | - | 30 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |

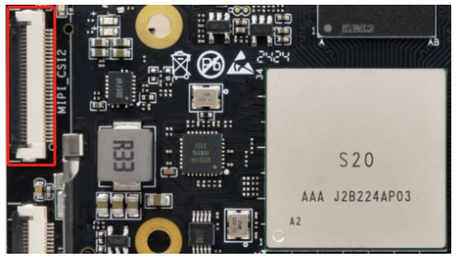
### 8. (J13) MIPI CSI1 30PIN 0.5mm pitch


| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | I2C0_SDA【GPIO184】<br>Pull-up resistor 10K (switch: GPIO80->L) | 1.8 | 16 | GND | |
| 2 | I2C0_SCL【GPIO128】<br>Pull-up resistor 10K (switch: GPIO80->L) | 1.8 | 17 | CSI2_CLK_P | - |
| 3 | CAM1_PWDN【GPIO70】 | 1.8 | 18 | CSI2_CLK_N | - |
| 4 | CAM1_RESET_H【Extended IO】 | 1.8 | 19 | GND | |
| 5 | GND | | 20 | CSI3_D0_P | - |
| 6 | CAM1_MCLK【GPIO47】 | 1.8 | 21 | CSI3_D0_N | - |
| 7 | CAM4_PWDN 【PWR_GPIO4】 | 1.8 | 22 | GND | |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 8 | CAM1_RESET_H【Extended IO】 | 1.8 | 23 | CSI3_D1_P | - |
| 9 | CAM1_MCLK【GPIO47】 | 1.8 | 24 | CSI3_D1_N | - |
| 10 | GND | | 25 | GND | |
| 11 | CSI2_D0_P | - | 26 | CSI3_CLK_P | - |
| 12 | CSI2_D0_N | - | 27 | CSI3_CLK_N | - |
| 13 | GND | | 28 | GND | |
| 14 | CSI2_D1_P | - | 29 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |
| 15 | CSI2_D1_N | - | 30 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |

### 9. (J16) MIPI CSI2 30PIN 0.5mm pitch



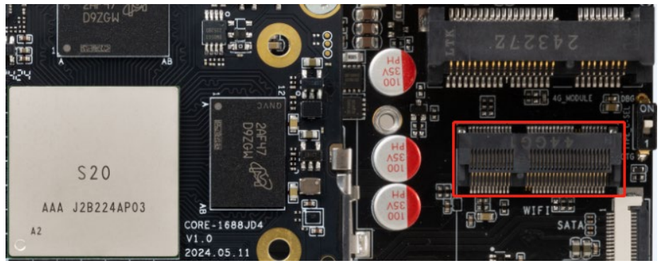

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | I2C4_SDA【GPIO62】<br>Pull-up resistor 10K | 1.8 | 16 | GND | |
| 2 | I2C4_SCL【GPIO63】<br>Pull-up resistor 10K | 1.8 | 17 | CSI4_CLK_P | - |
| 3 | CAM2_PWDN【GPIO51】 | 1.8 | 18 | CSI4_CLK_N | - |
| 4 | CAM2_RESET_H【Extended IO】 | 1.8 | 19 | GND | |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 5 | GND | | 20 | CSI5_D0_P | - |
| 6 | CAM2_MCLK【GPIO50】 | 1.8 | 21 | CSI5_D0_N | - |
| 7 | CAM5_PWDN【GPIO177】 | 1.8 | 22 | GND | |
| 8 | CAM2_RESET_H【Extended IO】 | 1.8 | 23 | CSI5_D1_P | - |
| 9 | CAM2_MCLK【GPIO50】 | 1.8 | 24 | CSI5_D1_N | - |
| 10 | GND | | 25 | GND | |
| 11 | CSI4_D0_P | - | 26 | CSI5_CLK_P | - |
| 12 | CSI4_D0_N | - | 27 | CSI5_CLK_N | - |
| 13 | GND | | 28 | GND | |
| 14 | CSI4_D1_P | - | 29 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |
| 15 | CSI4_D1_N | - | 30 | VCC5V0_SYS (5.0V OUTPUT) | 5.0 |

# Interface definition

### 10. (U16) M.2 Module E-KEY



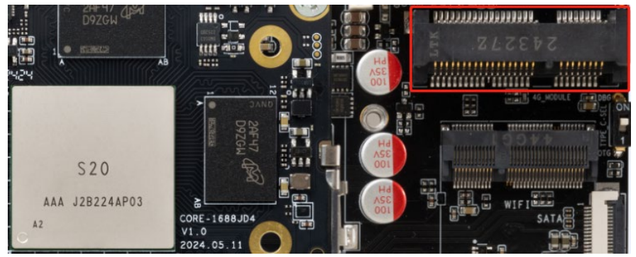

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | GND | | 2 | WIFI_3V3 (3.3V Output) | 3.3 |
| 3 | HUB_HOST20_DP3 | - | 4 | WIFI_3V3 (3.3V Output) | 3.3 |
| 5 | HUB_HOST20_DM3 | - | 6 | NC | |
| 7 | GND | | 8 | NC | |
| 9 | NC | | 10 | NC | |
| 11 | NC | | 12 | NC | |
| 13 | NC | | 14 | NC | |
| 15 | NC | | 16 | NC | |
| 17 | NC | | 18 | GND | |
| 19 | NC | | 20 | BT_M2_WAKE_AP (PWR_GPIO2) | 3.3 |
| 21 | NC | | 22 | NC | |
| 23 | NC | | 32 | NC | |
| 33 | GND | | 34 | NC | |
| 35 | PCIE1_TX0_P(Series capacitor 100nF) | - | 36 | NC | |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 37 | PCIE1_TX0_N(Series capacitor 100nF) | - | 38 | AP_M2_WAKE_BT(Extended IO) | 3.3 |
| 39 | GND | | 40 | NC | |
| 41 | PCIE1_RX0_P | - | 42 | NC | |
| 43 | PCIE1_RX0_N | - | 44 | NC | |
| 45 | GND | | 46 | NC | |
| 47 | PCIE1_EP_CLK_P | - | 48 | NC | |
| 49 | PCIE1_EP_CLK_N | - | 50 | 32KOUT_WIFI (GPIO176) | 3.3 |
| 51 | GND | | 52 | PCIE1_RST* (GPIO43) | 3.3 |
| 53 | PCIE1_CLKREQ* (GPIO45) | | 54 | BT_DISABLE_L (GPIO61) | 3.3 |
| 55 | PCIE_WAKE* (GPIO41) | | 56 | WIFI_DISABLE_L (GPIO79) | 3.3 |
| 57 | GND | | 58 | NC | |
| 59 | NC | | 60 | NC | |
| 61 | NC | | 62 | NC | |
| 63 | GND | | 64 | NC | |
| 65 | NC | | 66 | NC | |
| 67 | NC | | 68 | NC | |
| 69 | GND | | 70 | NC | |
| 71 | NC | | 72 | WIFI_3V3 (3.3V Output) | 3.3 |
| 73 | NC | | 74 | WIFI_3V3 (3.3V Output) | 3.3 |
| 75 | GND | | | | |

# Interface definition

## 11. (U21)MINI PCIe 4G



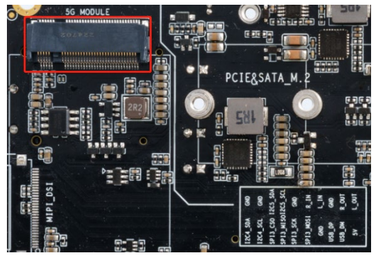

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | NC | | 2 | VCC3V8_4G (3.8V Output) | 3.8 |
| 3 | NC | | 4 | GND | |
| 5 | NC | | 6 | NC | |
| 7 | NC | | 8 | UIM_PWR | 1.8 |
| 9 | GND | | 10 | UIM_DAT | 1.8 |
| 11 | NC | | 12 | UIM_CLK | 1.8 |
| 13 | NC | | 14 | UIM_RST | 1.8 |
| 15 | GND | | 16 | NC | |
| 17 | NC | | 18 | GND | |
| 19 | NC | | 20 | NC | |
| 21 | GND | | 22 | 4G_RESET | 3.8 |
| 23 | NC | | 24 | NC | |
| 25 | NC | | 26 | GND | |
| 27 | GND | | 28 | NC | |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 29 | GND | | 30 | NC | |
| 31 | NC | | 32 | NC | |
| 33 | NC | | 34 | GND | |
| 35 | GND | | 36 | 4G_HOST20_DM3 | - |
| 37 | GND | | 38 | 4G_HOST20_DP3 | - |
| 39 | VCC3V8_4G (3.8V Output) | 3.8 | 40 | GND | |
| 41 | VCC3V8_4G (3.8V Output) | 3.8 | 42 | NC | |
| 43 | GND | | 44 | SIM_DET | 1.8 |
| 45 | NC | | 46 | NC | |
| 47 | NC | | 48 | NC | |
| 49 | GND | | 50 | GND | |
| 51 | NC | | 52 | VCC3V8_4G (3.8V Output) | 3.8 |

# Interface definition

## 12. (U26) 5G NGFF-M.2-B-KEY **(Defult:NC)**



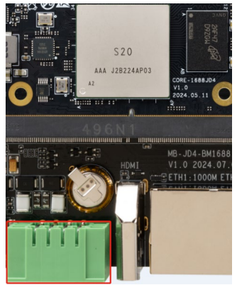

| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | NC | | 2 | VCC3V8_4G (3.5V Output) | 3.5 |
| 3 | GND | | 4 | VCC3V8_4G (3.5V Output) | 3.5 |
| 5 | GND | | 6 | FUL_CARD_POWER_OFF# | 3.5 |
| 7 | 5G_HOST20_DP3 | - | 8 | NC | |
| 9 | 5G_HOST20_DM3 | - | 10 | NC | |
| 11 | GND | | 20 | NC | |
| 21 | NC | | 22 | NC | |
| 23 | NC | | 24 | NC | |
| 25 | NC | | 26 | NC | |
| 27 | GND | | 28 | NC | |
| 29 | 5G_USB30_RX_N | - | 30 | UIM_RST | 1.8 |
| 31 | 5G_USB30_RX_P | - | 32 | UIM_CLK | 1.8 |
| 33 | GND | | 34 | UIM_DAT | 1.8 |
| 35 | 5G_USB30_TX_N (Series capacitor 100nF) | - | 36 | UIM_PWR | 1.8 |
| 37 | 5G_USB30_TX_P (Series capacitor 100nF) | - | 38 | NC | |

# Interface definition

| | | | | | |
|---|---|---|---|---|---|
| 39 | GND | | 40 | NC | |
| 41 | NC | | 42 | NC | |
| 43 | NC | | 44 | NC | |
| 45 | GND | | 46 | NC | |
| 47 | NC | | 48 | NC | |
| 49 | NC | | 50 | NC | |
| 51 | GND | | 52 | NC | |
| 53 | NC | | 54 | NC | |
| 55 | NC | | 56 | NC | |
| 57 | GND | | 58 | NC | |
| 59 | NC | | 60 | NC | |
| 61 | NC | | 62 | NC | |
| 63 | GND | | 64 | NC | |
| 65 | NC | | 66 | SIM_DET | 1.8 |
| 67 | 4G_RESET | 3.5 | 68 | NC | |
| 69 | NC | | 70 | VCC3V8_4G (3.5V Output) | 3.5 |
| 71 | GND | | 72 | VCC3V8_4G (3.5V Output) | 3.5 |
| 73 | GND | | 74 | VCC3V8_4G (3.5V Output) | 3.5 |
| 75 | NC | | | | |

# Interface definition

### 13. (J3)RS485/RS232/CAN  2*4PIN 3.5mm pitch seat  (GREEN)



| NO. | Definition | Power/V | NO. | Definition | Power/V |
|---|---|---|---|---|---|
| 1 | RS485_A | | 2 | RS485_B | 5.0 |
| 3 | CAN_H | - | 4 | CAN_L | - |
| 5 | GND | | 6 | GND | |
| 7 | RS232_TX (from UART6) | - | 8 | RS232_RX (from UART6) | - |

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