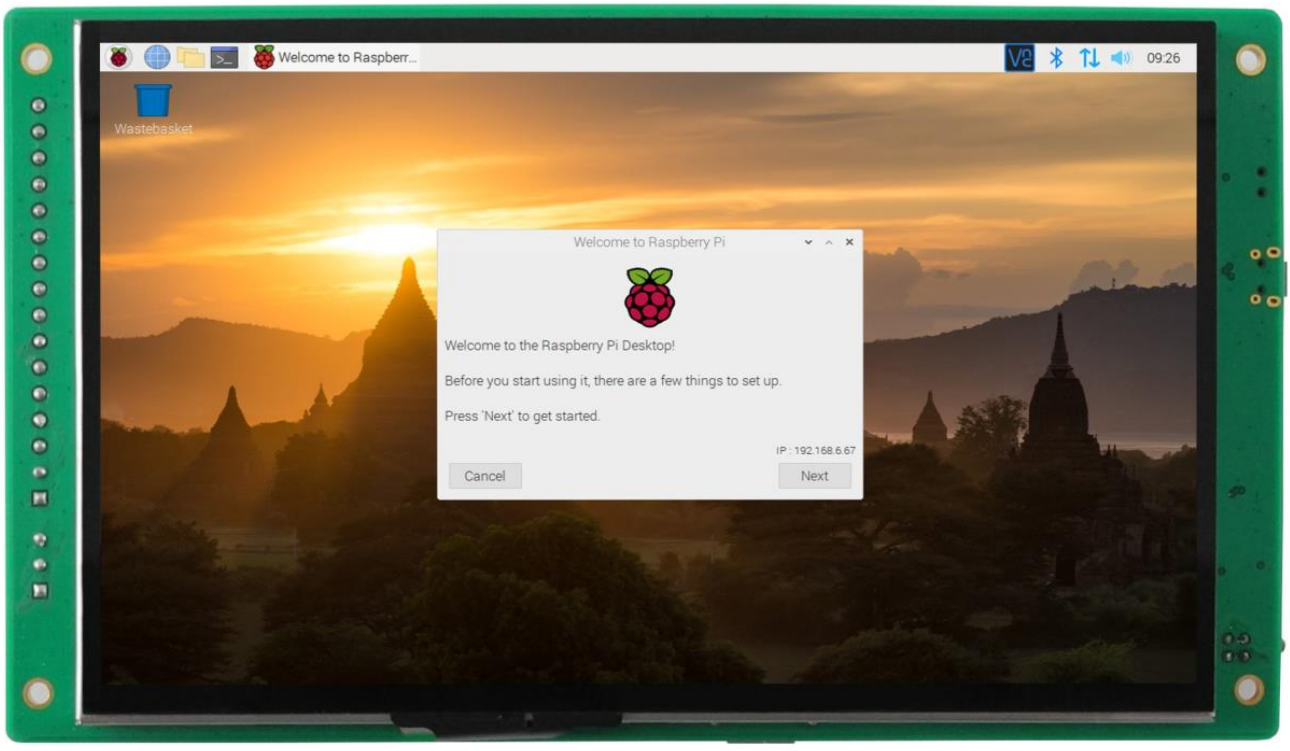
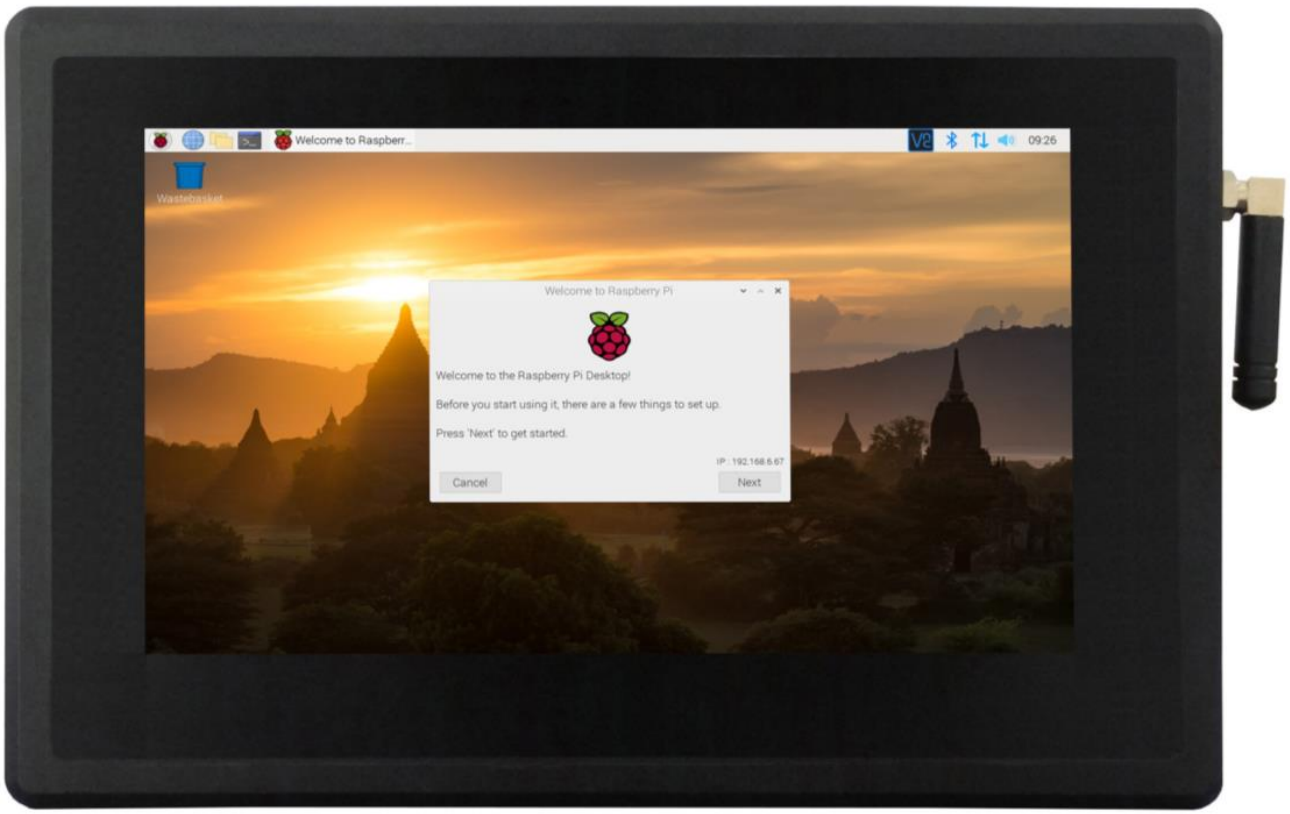
Industrial Pi CM4-70-EM-PA

User Manual

Release 1.0





Chipsee Products Naming Rules

CS10600RA4070E-C111 CS10600RA4070P-C111	
CS	**Chipsee Product Abbreviations**
10	**Horizontal Resolution** **80** Means 800 Pixel **10** Means 1024 Pixel **12** Means 1280 Pixel **14** Means 1440 Pixel **19** Means 1920 Pixel

600	**Vertical Resolution** **480** Means 480 Pixel **600** Means 600 Pixel **768** Means 768 Pixel **800** Means 800 Pixel **900** Means 900 Pixel **102** Means 1024 Pixel **108** Means 1080 Pixel
RA4	**Based on Raspberry Pi CM4**
070	**LCD Dimension** **050** Means 5.0 Inch **070** Means 7.0 Inch **080** Means 8.0 Inch **097** Means 9.7 Inch **101** Means 10.1 Inch **104** Means 10.4 Inch **120** Means 12.0 Inch **150** Means 15.0 Inch **170** Means 17.0 Inch **190** Means 19.0 Inch **215** Means 21.5 Inch
E	**Means Embedded PC or Panel PC** **E** Means Embedded PC without Case **P** Means Panel PC with Case
C	**Means Touch Type** **R** Means Resistive Touch **C** Means Capacitive Touch

1	**Means LCD Brightness** **1** Means Common Brightness **2** Means High Brightness
1	**PCB Version** Baseboard PCB Version Number
1	**PCB Version** CM4 Version Number

Hardware Features

Key Features:	
CPU Module	Raspberry Pi CM4, CM4 Lite; Quad Cortex-A72 at 1.5GHz
Storage	2 TF card slots. One is designed for Lite version that has no eMMC. The other one is designed for storage expansion.
Display	7.0 inch IPS LCD, 1024*600 Pixel Resolution; Brightness: 500nit
Touch	Five-Point Capacitive Touch with 0.7mm Armored Glass
USB	2 x USB 2.0 Host connector, 1 mini USB OTG connector
LAN	1 Channel Giga LAN
Audio	3.5mm Audio Out Connector, 2W Speaker Internal
Buzzer	Onboard Buzzer, driven by GPIO

RTC	High Accuracy RTC with Lithium Button Coin battery (Lithium Battery not included)
RS232	4 Channels at most
RS485	2 Channels at most. The RS485 circuit controls the Input and Output direction automatically, there's no need to control it from within the software.
CAN-BUS	1 Channel
GPIO	Opto-Isolated GPIO, 4 Input, 4 Output, can drive up to 500mA current every Channel at most (external power source needed)
WiFi/BT	The Compute Module 4 that is currently shipped with this product has no WIFI/BT by default.
ZIGBEE	Onboard Zigbee module (NOT mounted by default)
4G/LTE	Support miniPCIe slot for 4G/LTE module (neither miniPCIe Slot nor 4G LTE module is mounted by default.)
Camera	There is a camera connector compatible with the Raspberry Pi Camera connector (the camera is NOT mounted by default).
Power Input	6~36V DC
Current @ 12V	420 mA max
Power Consumption	5W typical
Working Temperature	0°C to +50°C
OS	Debian

Dimension	Without Metal Case: 190*107.8*27.7 mm With Metal Case: 206*135*30.1 mm
Weight	Without Metal Case: 400g With Metal Case: 700g

ATTENTION:

A lithium battery is not installed by default, as it is not allowed to ship products with batteries. We recommend that you buy the battery locally and install it by yourself. The lithium battery part number is CR1220. Do not hesitate to contact us for help.

CS10600RA4070E-C111

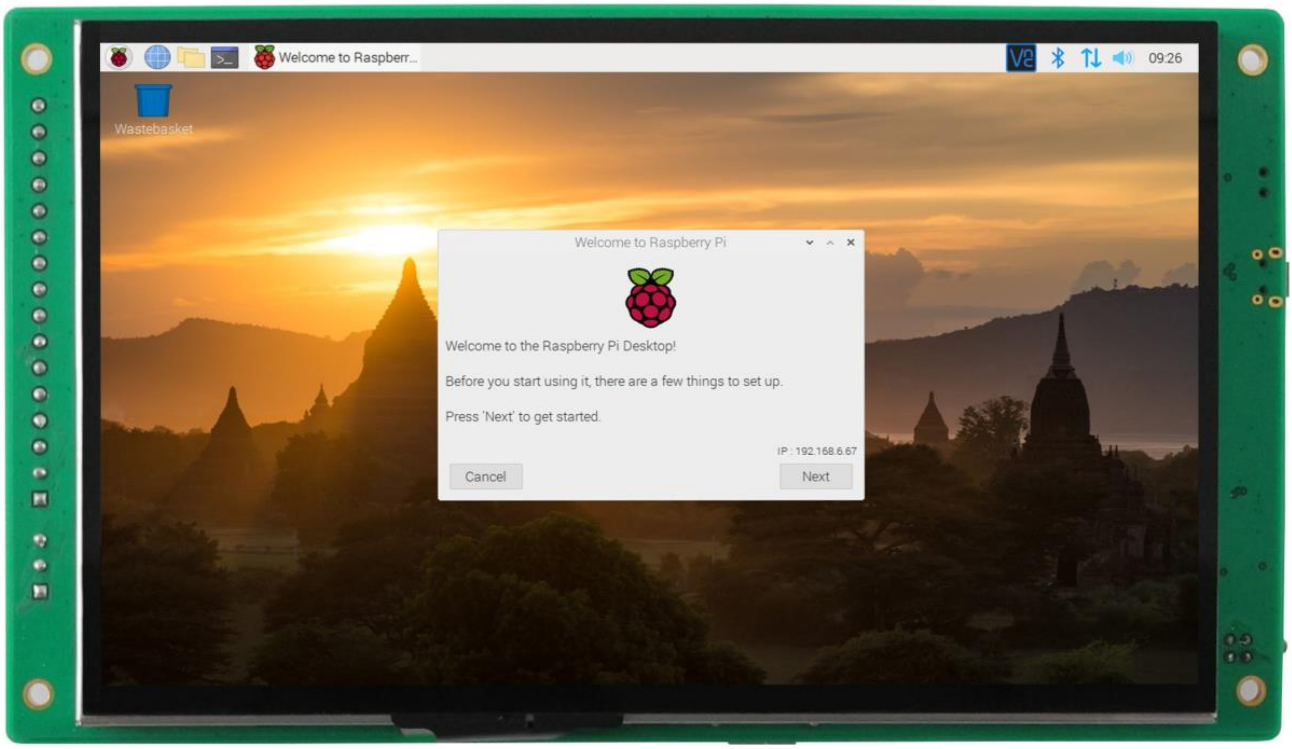


Figure 1: Front View (Debian)

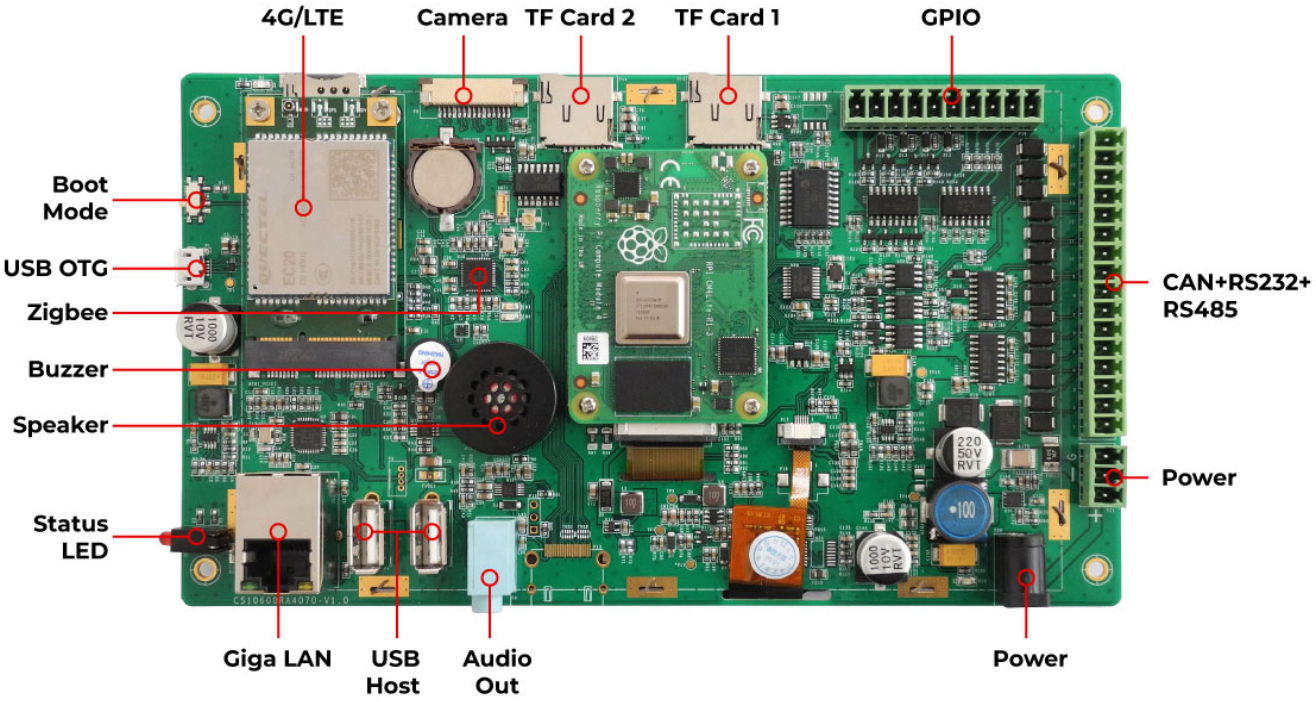


Figure 2: Back View

CS10600RA4070P-C111

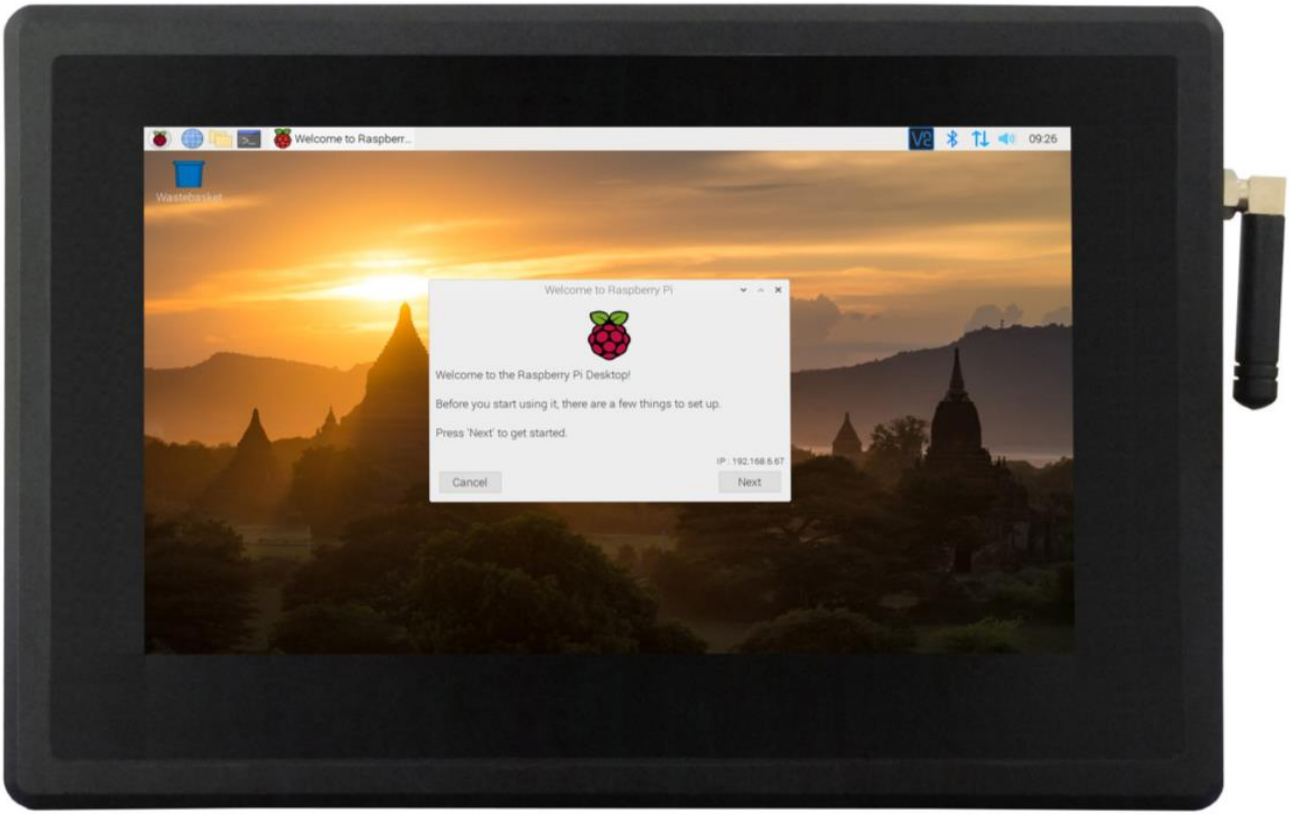


Figure 3: Front View (Debian)

Figure 4: Back View

Power Input Connector

The product CS10600RA4070E/CS10600RA4070P uses a wide-range power input **DC 6~36V**. The total power consumption is normally about **5W**. There are two types of power input interface onboard. One is a 3 Pin 3.81mm screw terminal connector, as shown in Figure 5. The other is the 2.1mmDC input head, as shown in figure 6. A detailed description of the power input connector pins is provided in Table 1.

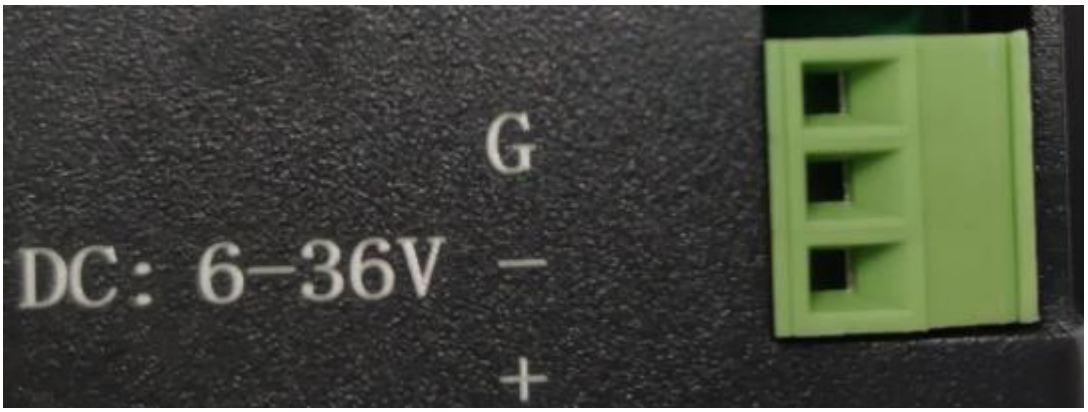


Figure 5: 3 Pin 3.81mm Screw Terminal Connector

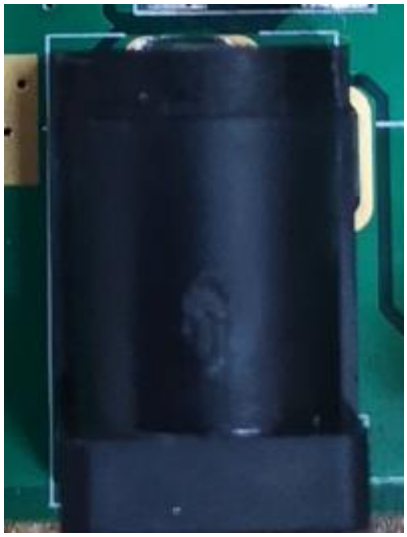


Figure 6: 2.1mm DC input head

Table 1

Power Input Pin Definition:		
Pin Number	**Definition**	**Description**
Pin 1	Positive Input	Connect to DC Power **Positive Terminal**
Pin 2	Negative Input	Connect to DC Power **Negative Terminal**
Pin 3	Ground	Connect to **Power System Ground**

ATTENTION:

*The system ground **"GND"** has been connected to power negative **"-"** on board.*
The central pin is positive.

CAN+RS485+RS232 Connector

The RS485+RS232+CAN connector is a 16 Pin 3.81mm screw terminal connector, as Figure 7 shows. As for the definition of every pin, please refer to Table 2.

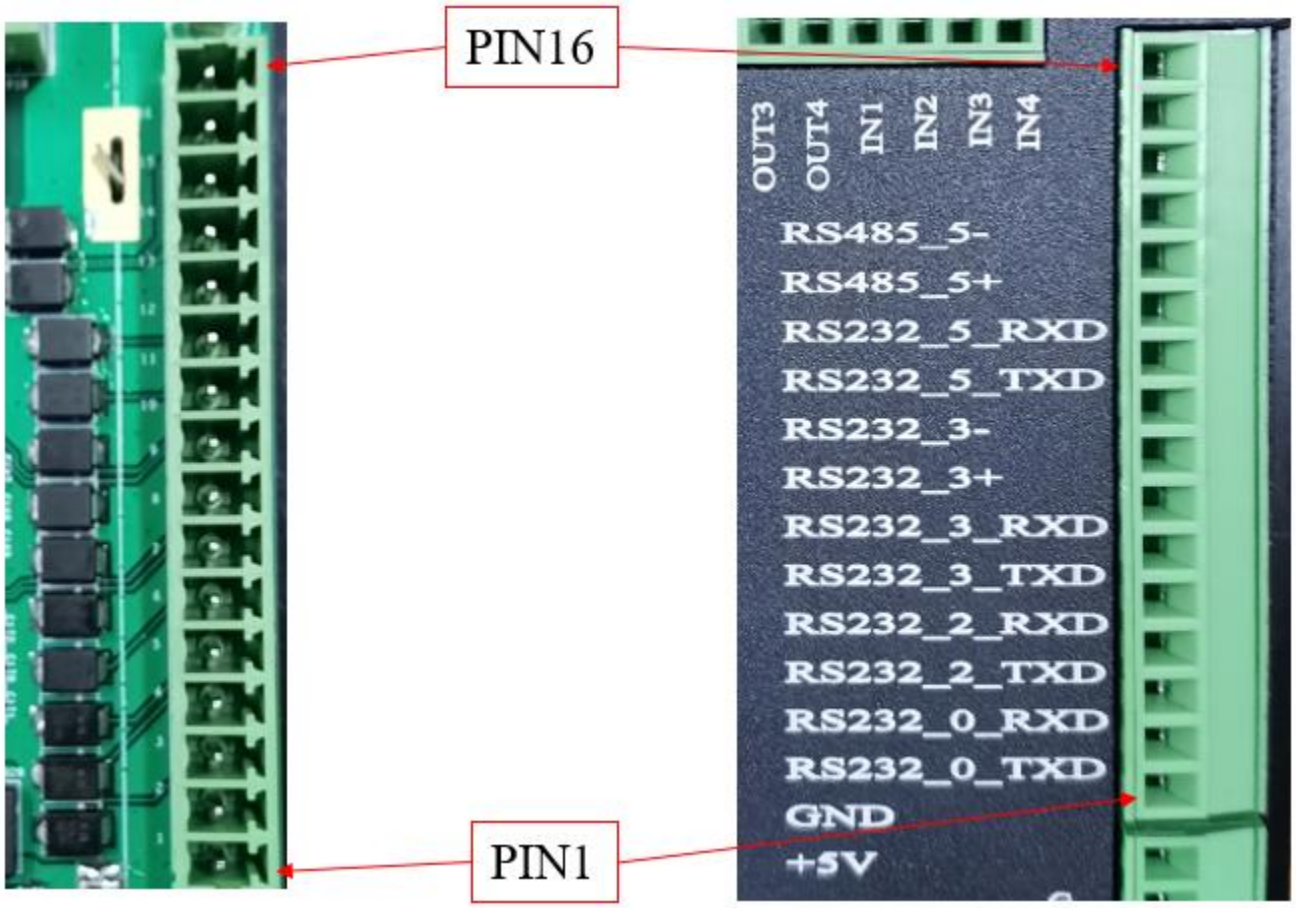


Figure 7: RS485+RS232+CAN Connector

Table 2

RS232 / RS485 Pin Definition:		
Pin Number	**Definition**	**Description**
Pin 16	CAN_H	CAN BUS “H” signal
Pin 15	CAN_L	CAN BUS “L” signal
Pin 14	RS485_5-	CPU UART5, RS485 –(B) signal
Pin 13	RS485_5+	CPU UART5, RS485 +(A) signal
Pin 12	RS232_5_RXD	CPU UART5, RS232 RXD signal
Pin 11	RS232_5_TXD	CPU UART5, RS232 TXD signal
Pin 10	RS485_3-	CPU UART3, RS485 –(B) signal
Pin 9	RS485_3+	CPU UART3, RS485 +(A) signal
Pin 8	RS232_3_RXD	CPU UART3, RS232 RXD signal
Pin 7	RS232_3_TXD	CPU UART3, RS232 TXD signal
Pin 6	RS232_2_RXD	CPU UART2, RS232 RXD signal
Pin 5	RS232_2_TXD	CPU UART2, RS232 TXD signal
Pin 4	RS232_0_RXD	CPU UART0, RS232 RXD signal
Pin 3	RS232_0_TXD	CPU UART0, RS232 TXD signal
Pin 2	GND	System Ground
Pin 1	+5V	System +5V Power Output, No more than 1A Current output.

ATTENTION:

(1) RS485_3 and RS232_3 share the same channel UART3, so they cannot be used at the same time;

(2) RS485_5 and RS232_5 share the same channel UART5, so they cannot be used at the same time;

(3) RS485_3 and RS485_5 can control the input and output direction automatically. There's no need to control it from within the software.
(4) The 120Ω match resistor for the RS232 and CAN bus is NOT mounted by default.

GPIO Connector

There is a GPIO interface as shown in Figure 8.
As for the definition of every pin, please refer to Table 3.

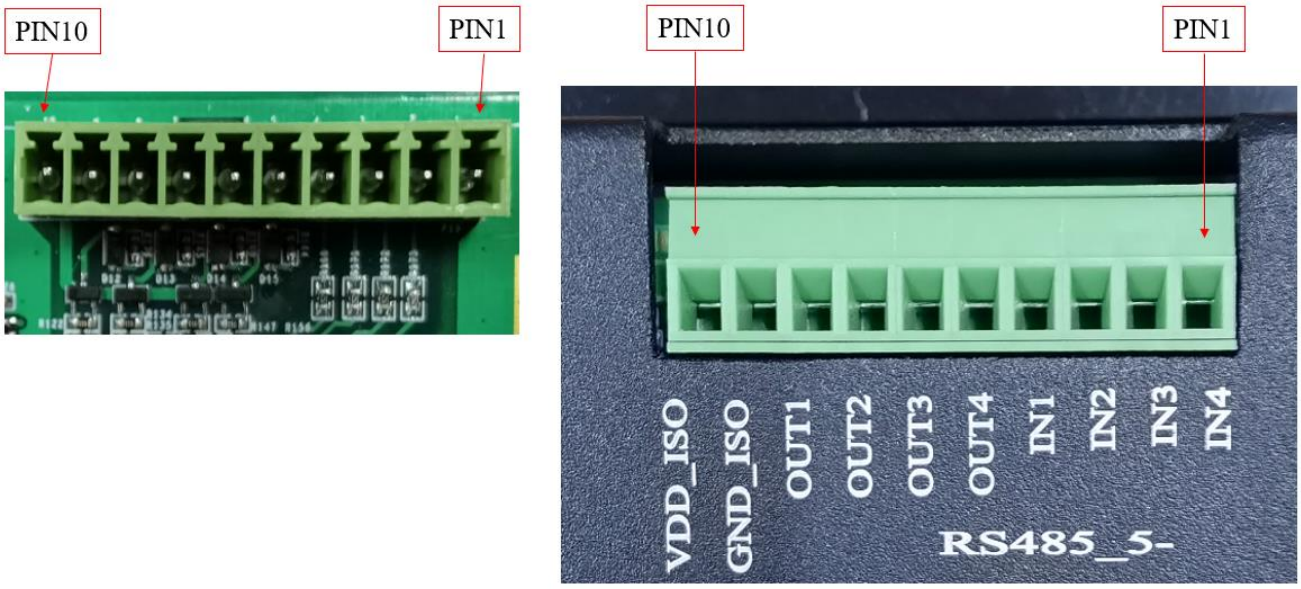


Figure 8: GPIO Connector

Table 3

RS232 / RS485 Pin Definition:		
Pin Number	**Define**	

Pin 1	IN4
Pin 2	IN3
Pin 3	IN2
Pin 4	IN1
Pin 5	OUT4
Pin 6	OUT3
Pin 7	OUT2
Pin 8	OUT1
Pin 9	GND_ISO, Isolated Ground
Pin 10	VDD_ISO, Isolated Power Input

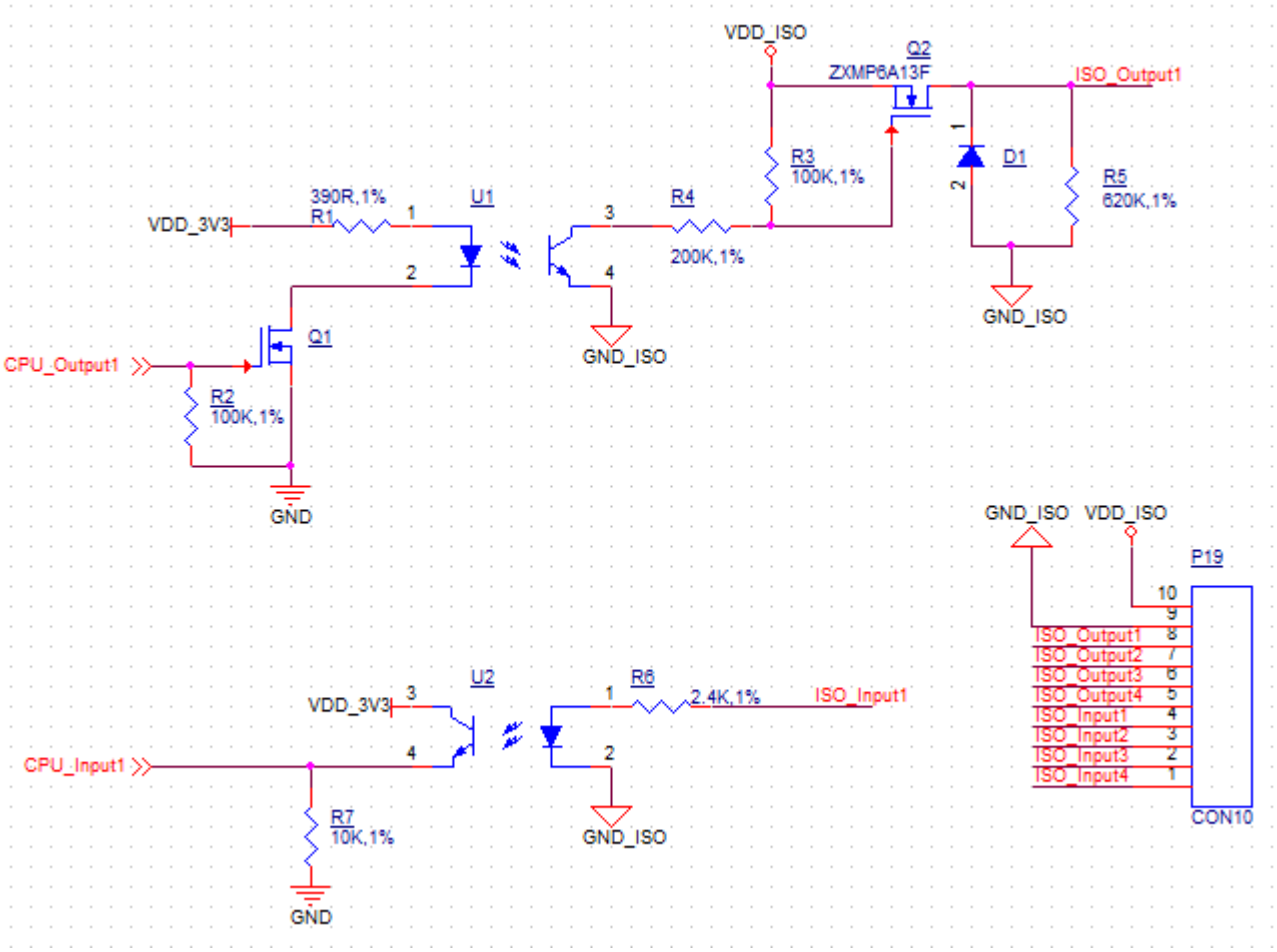


Figure 9: Isolated GPIO reduced schematic

ATTENTION:

(1) In order to use the Isolated Output, you need to add an external Isolated Power to the VDD_ISO and GND_ISO. The power voltage should not exceed 24V;

(2) The output current can achieve 500mA for every channel, but it also depends on the Isolated power that is connected.

(3) In order to use the Isolated Input, you need to add a signal to the ISO_InputX and GND_ISO. A 2.4KΩ resistor, as R6 in Figure 9, has been added to limit the input current. This resistor should work well for the 5-24V input signal. If your input signal is less than 5V, please change this input

resistor.

Capacitive Touch

The product CS10600RA4070E/CS10600RA4070P uses Five-Point capacitive touch, as Figure 10 shows. However, the Debian OS supports only One-Point touch.

Figure 10: Capacitive Touch Connector

ATTENTION:
The capacitive touch panel is very sensitive to the power adapter system noise. Please use a high-quality power adapter. It is also recommended to connect the product power connector "G" pin to your AC system Ground.

USB HOST Connector

The product CS10600RA4070E/CS10600RA4070P has two USB2.0 HOST connectors as Figure 11 shows.

Figure 11: USB HOST Connector

ATTENTION:

(1) These two USB hosts come from the same USB HUB. The Zigbee and 4G/LTE signals come from the same USB HUB;

(2) These two USB host connectors can drive 500mA for each channel at most.

(3) When connecting this product to the HOST PC by a mini USB cable, the USB HUB will be disabled, so these 2 USB host connectors Zigbee and 4G/LTE will not work.

Mini USB Connector

There is one Mini USB port, as shown in Figure 12, that is used to download the system to the eMMC of the CM4 module.

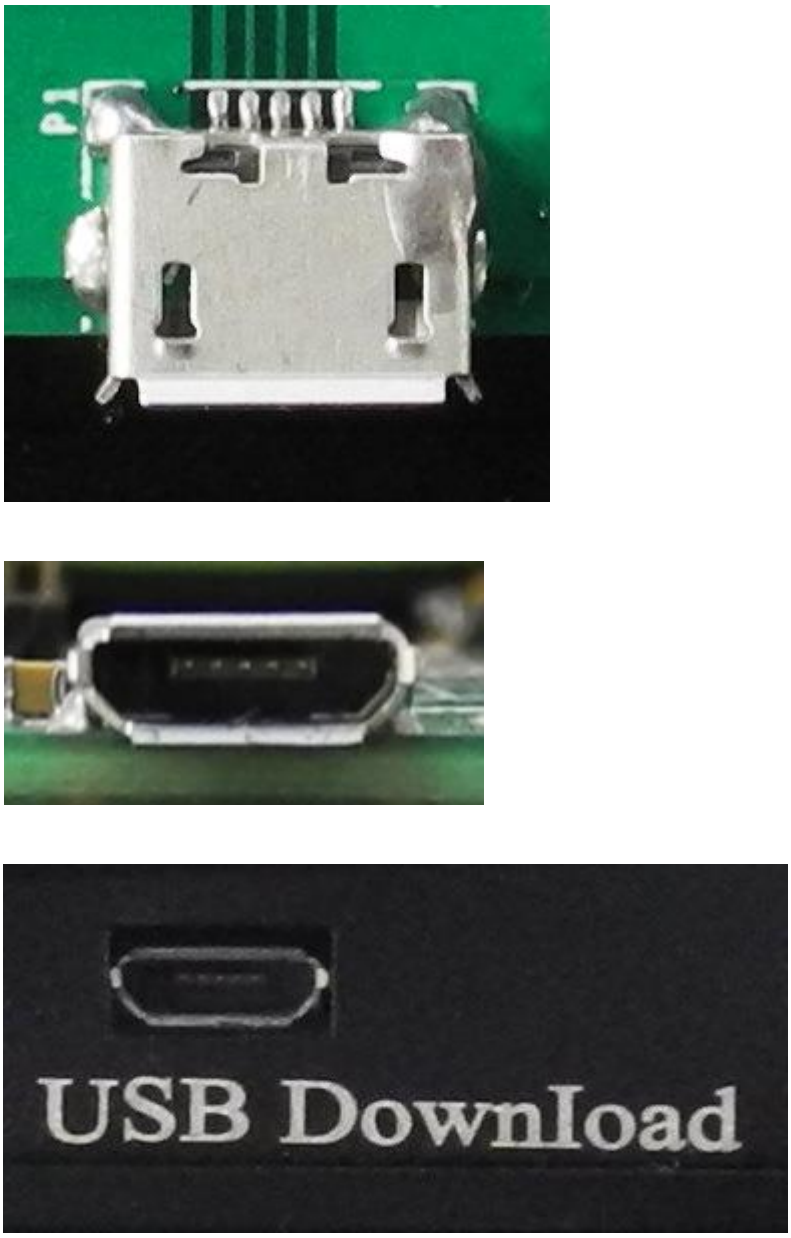


Figure 12: Mini USB Connector

LAN Connector

There’s also one channel 1000Mbit Ethernet connector, as Figure 11 shows. These Giga LAN signals come from the CM4 module directly.

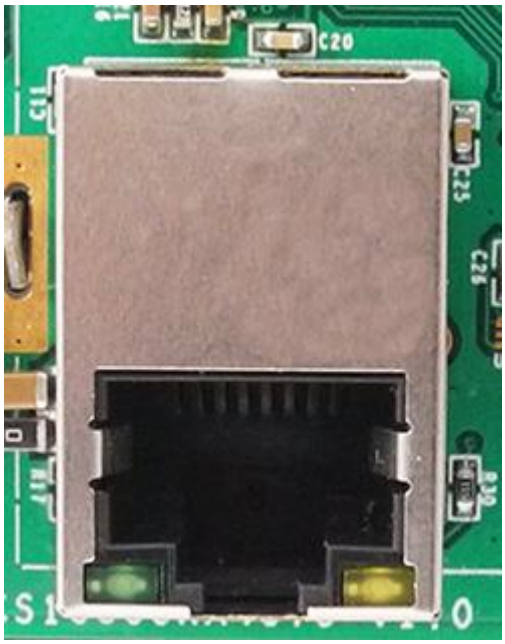


Figure 13: LAN Connector

Audio Output Connector

The product CS10600RA4070E/CS10600RA4070P has one audio output, as Figure 14 shows, as well as an internal 2W speaker.

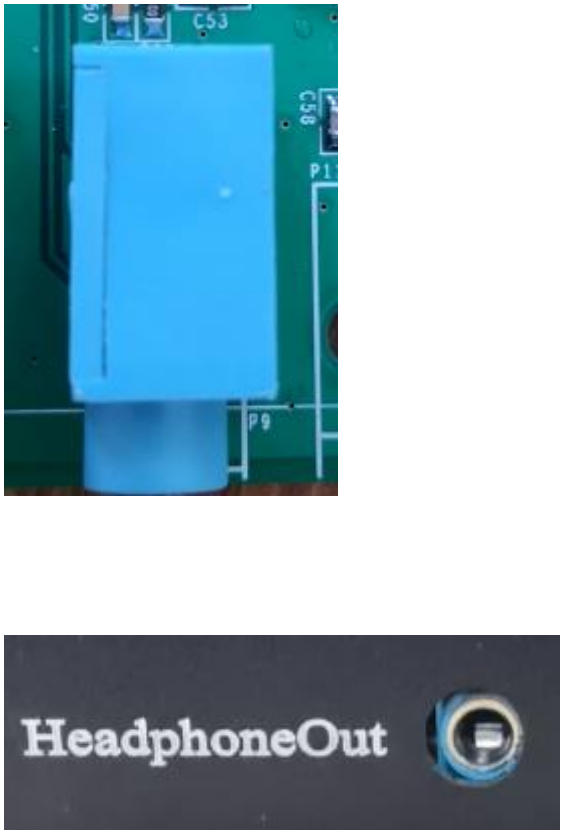


Figure 14: Audio Connector

ATTENTION:

By plugging in the headphone cable, the internal speaker will be disabled automatically.

TF Card

The product CS10600RA4070E/CS10600RA4070P has two TF (uSD) card connectors, as Figure 15 shows. Each supports a TF (uSD) card up to 32GB.

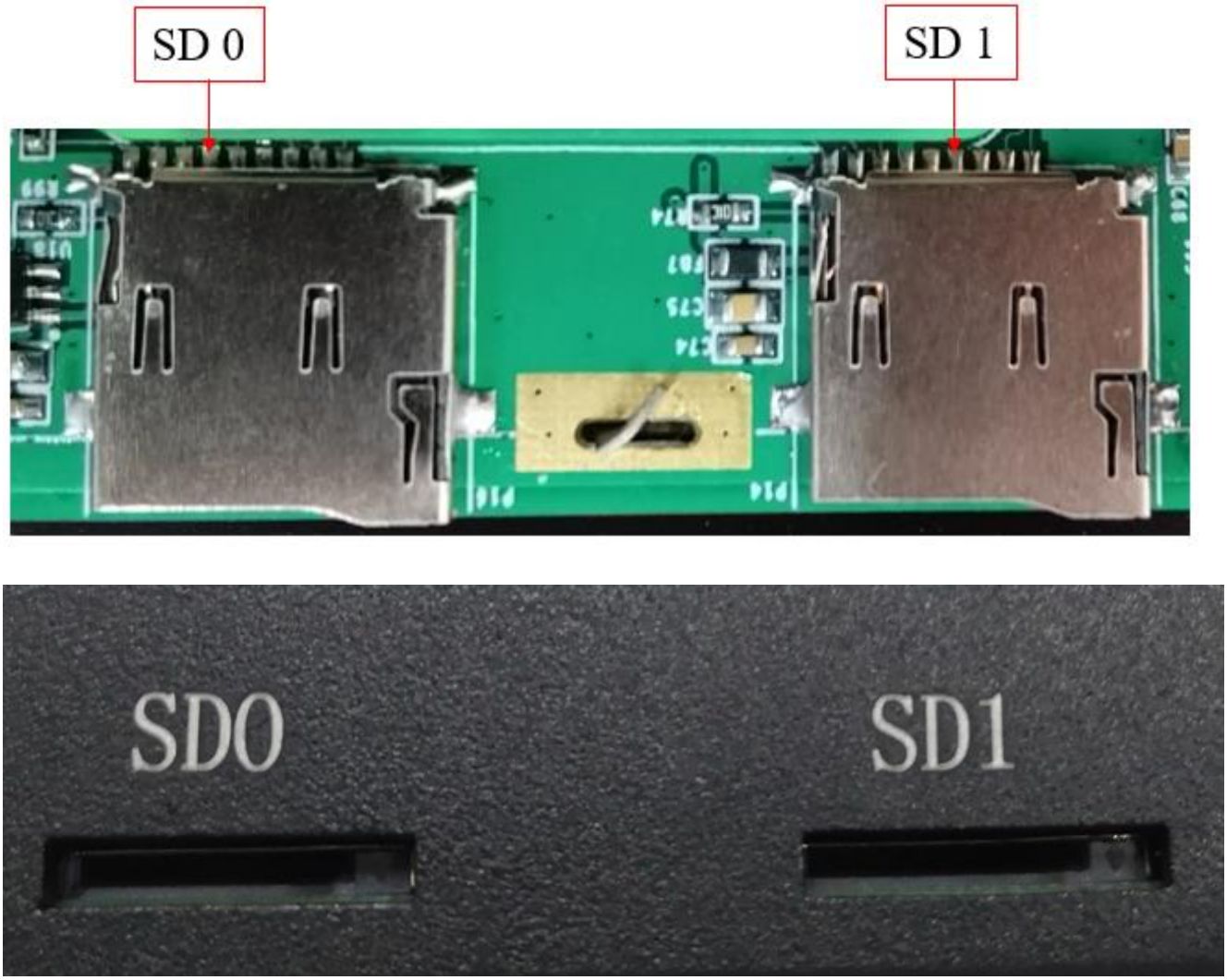


Figure 15: TF Card Connector

ATTENTION:

(1) The SD0 is only used for the CM4 Lite version which has no onboard eMMC. If you use CM4 with eMMC, this SD0 will be disabled.
(2) The SD1 is used for memory extension. It can't be used for system boot-up.
(3) The TF card doesn't come with the product by default.

BOOT Switch

There is a boot switch, marked as SW1 on the silkscreen. A toggle switch can change the boot sequence. The booth switch has two positions USB and eMMC. When in the USB position, the Raspberry Pi will boot from the USB connector. This function is used to download the software to the internal eMMC. When in the eMMC position, the Raspberry Pi will boot from internal eMMC.

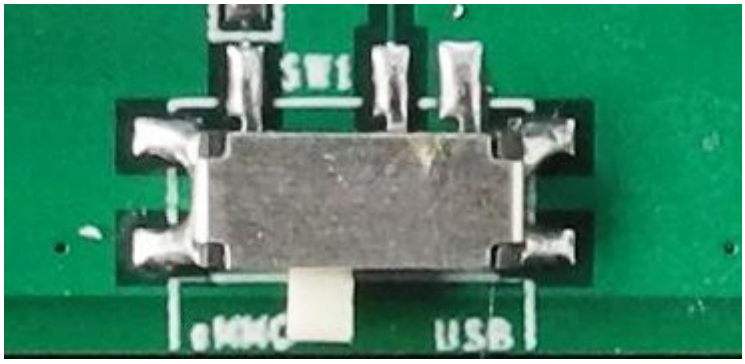


Figure 16: Boot Switch

SIM Card Holder

There is a mini-PCIe connector inside the CS10600RA4070E/CS10600RA4070P that can be used to mount a 4G module. If you want to add the 4G module, then you will need the SIM card holder, as shown in Figure 18. There is a connector on the backside of the case used to connect an external 4G antenna shown in Figure 19.

Figure 17: mini-PCIe Connector&4G Module

Figure 18: SIM Card Holder

Figure 19: 4G/LTE antenna

ATTENTION:

This product doesn’t come with the 4G module by default.

ZIGBEE

The product CS10600RA4070E/CS10600RA4070P supports an onboard Zigbee module. The Zigbee controller is TI CC2531 and is supported on the Raspberry Pi forum. For CS10600RA4070P, there is a connector on the backside of the case that is used to connect the external Zigbee antenna, as Figure 21 shows.

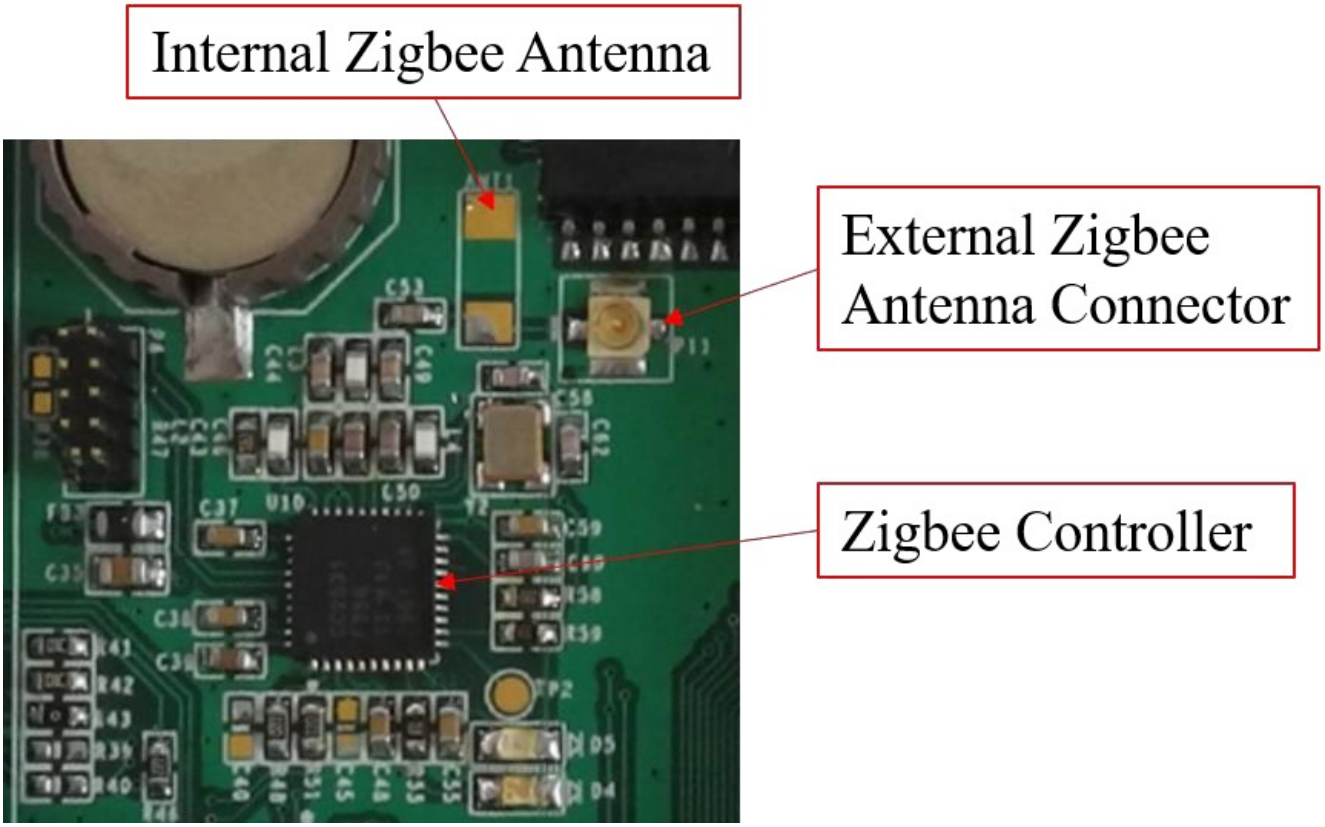


Figure 20: Zigbee controller

Figure 21: Zigbee Antenna

ATTENTION:

This product doesn’t come with the Zigbee circuit by default.

Camera Connector

There is a camera connector, as Figure 22 shows. The camera signals come from CAM1. As for the pin definition of this connector, please refer to Table 4.

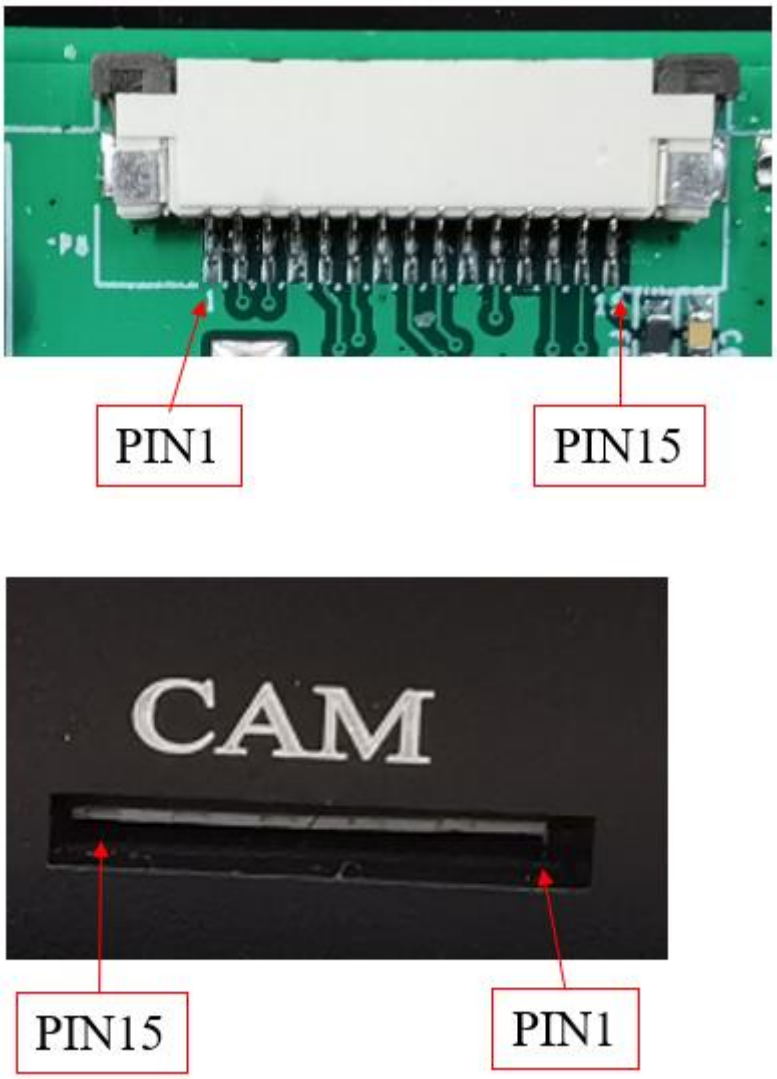


Figure 22: Camera Connector

Table 4

Camera Connector Pin Definition:		
Pin Number	**Definition**	**Description**
Pin 1	GND	Power Ground
Pin 2	CAM1_DN0	CAM1_DN0
Pin 3	CAM1_DP0	CAM1_DP0
Pin 4	GND	Power Ground
Pin 5	CAM1_DN1	CAM1_DN1
Pin 6	CAM1_DP1	CAM1_DP1
Pin 7	GND	Power Ground
Pin 8	CAM1_CN	CAM1 Clock signal Negative
Pin 9	CAM1_CP	CAM1 Clock signal Positive
Pin 10	GND	Power Ground
Pin 11	CAM GPIO	CAM GPIO, use for disable camera power and module.
Pin 12	NC	Not connected
Pin 13	SCL0	CPU I2C SCL0 signal
Pin 14	SDA0	CPU I2C SDA0 signal
Pin 15	+3.3V	System +3.3V Power, No more than 500mA Current output.

Dimensions and Mounting

The dimensions of CS10600RA4070E -C111 are 190*107.8*27.7 mm, as Figure 23 shows.

The product can be mounted by using the 4 screw holes on the PCB as shown in Figure 23. Please make sure the display is not exposed to high pressure when mounting into an enclosure.

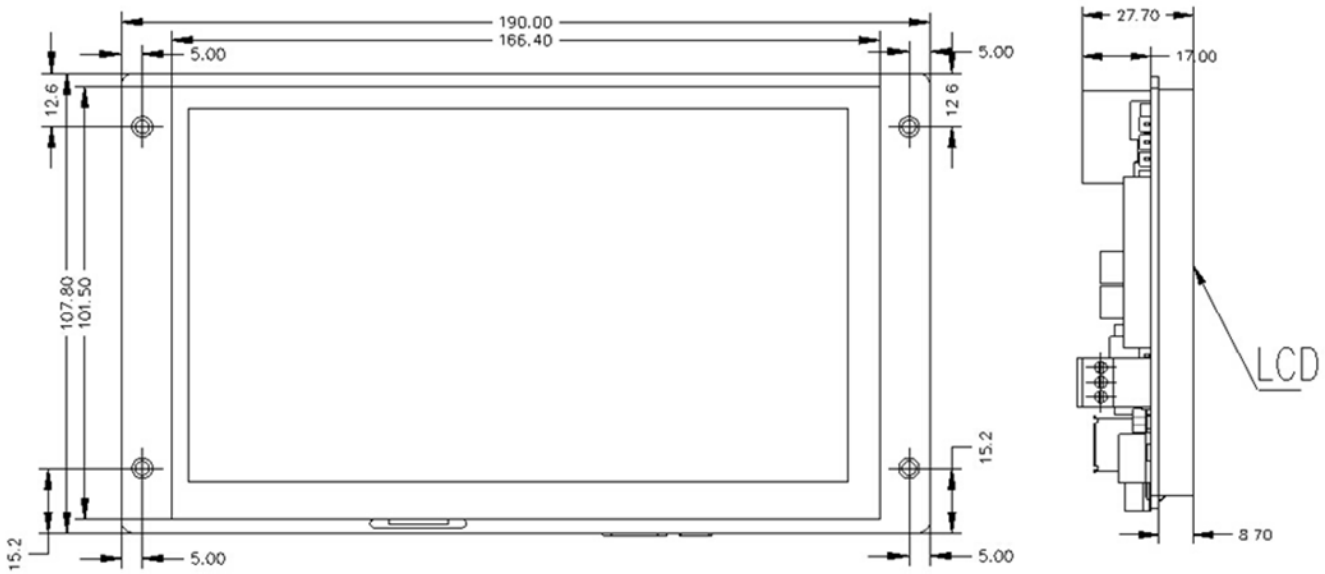


Figure 23: Dimensions and Mounting

The dimensions of CS10600RA4070P -C111 are 206*135*30.1 mm.

This product CS10600RA4070P can be mounted using the panel and VESA mounting methods. Please make sure the display is not exposed to high pressure when mounting into an enclosure.

Figure 24: Mounting Method

How to Get Support

Please feel free to contact us with any questions, queries or suggestions.
If your question is about technical support or troubleshooting for one of our products, we kindly ask you to first check our documentation for a possible solution.
If you cannot find the solution you are looking for then please write to service@chipsee.com providing all possible details.