MaaXBoard

(EM-MC-SBC-IMX8M)

Hardware User Manual

V1.0

Copyright Statement:

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- Avnet Manufacturing Services does not take warranty of any kind, either expressed or implied, as to the program source code, software and documents provided along with the products, and including, but not limited to, warranties of fitness for a particular purpose; The entire risk as to the quality or performance of the program is with the user of products.

Regulatory Compliance:

- MaaXBoard single board computer has passed the CE & FCC certification.

Revision History

Rev.	Description	Author	Date
V0.0	Initial version	Hugo	20190430
V1.0	Update description	Hugo	20190815

Catalog

Figure

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Chapter 1 Product Overview

1.1 Brief Introduction

MaaXBoard is a development board for makers, designed by Avnet Manufacturing Services. The MaaXBoard is a single board computer based on NXP IMX8M SOC series, which can be used for the areas such as medical instruments, video surveillance, communications, IOT, makers and so on.

In the design of a compact body size, it is provided with rich resources of peripheral interface, include: Gigabit Ethernet interface, USB 3.0 interface, MIPI-DSI interface, MIPI-CSI interface, HDMI interface, Micro SD Card interface, UART interface, GPIO interface, Wi-Fi/Bluetooth interface, etc.

1.2 System Block Diagram

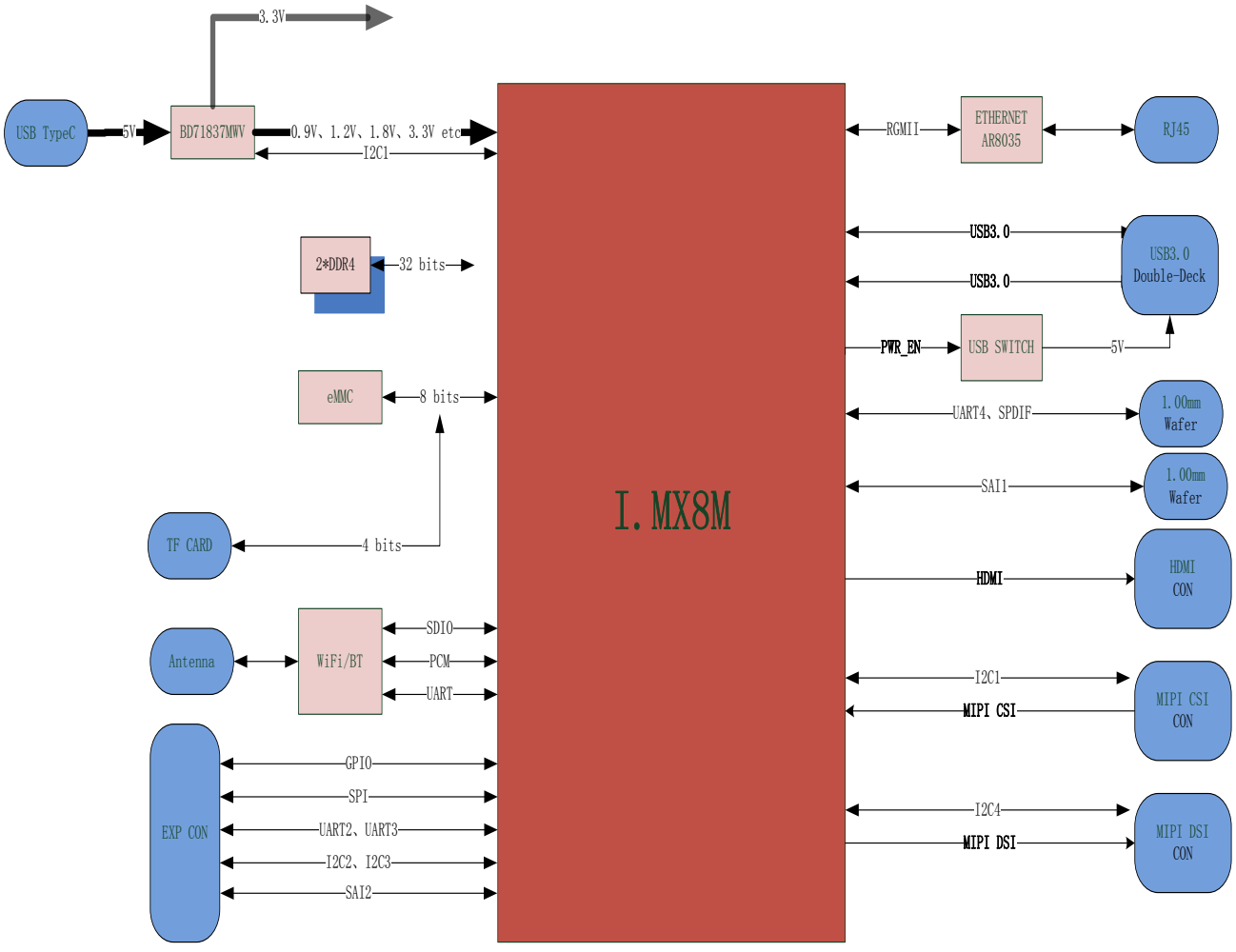


Figure 1.1 MaaXBoard System Block Diagram

1.3 Packing List

- 1 ×MaaXBoard
- 1 × Desiccant
- 1 × Anti-static Bag
- 1 × Safety Flyer
- 1 × Quick Start Guide
- 2 × Electrostatic Foam
- 1 × Box

1.4 Product Specifications

- **General Specifications:**
  - Operating Temperature: 0~70°C (When the CPU loads heavy, need a heatsink)
  - Power Supply: 5V/3A (Power Adapter)
  - Operating Humidity: 20% ~ 90% (non-condensing)
  - Dimensions: 85mm × 55mm
  - PCB Layers：10Layers
- **Communication Interface:**
  - 1 × 40 Pin IO Interface (Expand I2C, SPI, UART, I2S Interface)
  - 1 × MIPI-CSI Camera Interface
  - 1 × MIPI-DSI Display Interface
  - 1 ×Gigabit Ethernet interface (RJ45)
  - 2 × USB3.0 Host
  - 1 × Micro SD Card (TF Card) Interface
  - 1 × 8bits and 1x 7bits GPIO Interface (Support Audio peripheral expand)
  - 1 × HDMI 2.0 Interface
  - 1 × Power Interface (USB Type C Connector)
  - 1 × Power Button
  - 2 × User Button
  - 1 × Wi-Fi/Bluetooth
  - 2 × User LED

1.5 Other Customer Provide Parts

To use the various functions of MaaXBoard, customer should also provide the following parts which are not contained in MaaXBoard Packages.

- 1 × USB to serial cable (TTL)
- 1 × 1Gbps Network Cable
- 1 × Camera Module
- 1 × MIPI-DSI Displayer
- 1 × 5V/3A Power Supply (USB Type C Interface)
- 1 × HDMI Cable
- 1 × HDMI Displayer
- Other tools needed to implement related function

1.6 Interface Locations

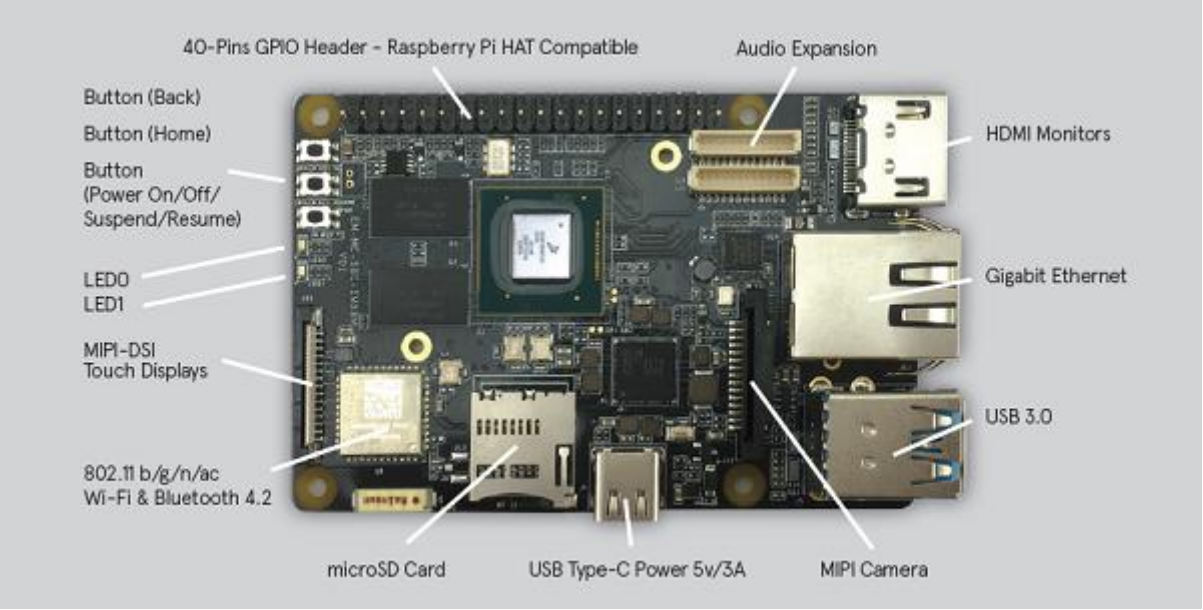


Figure 1.2 MaaXBoard Top View

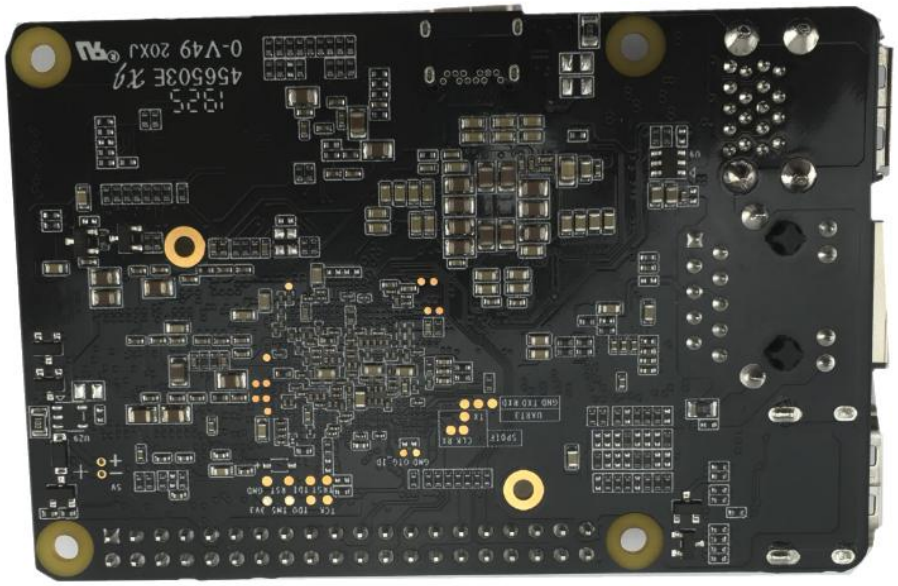


Figure 1.3 MaaXBoard Bottom View

1.7 Product Dimensions (mm)

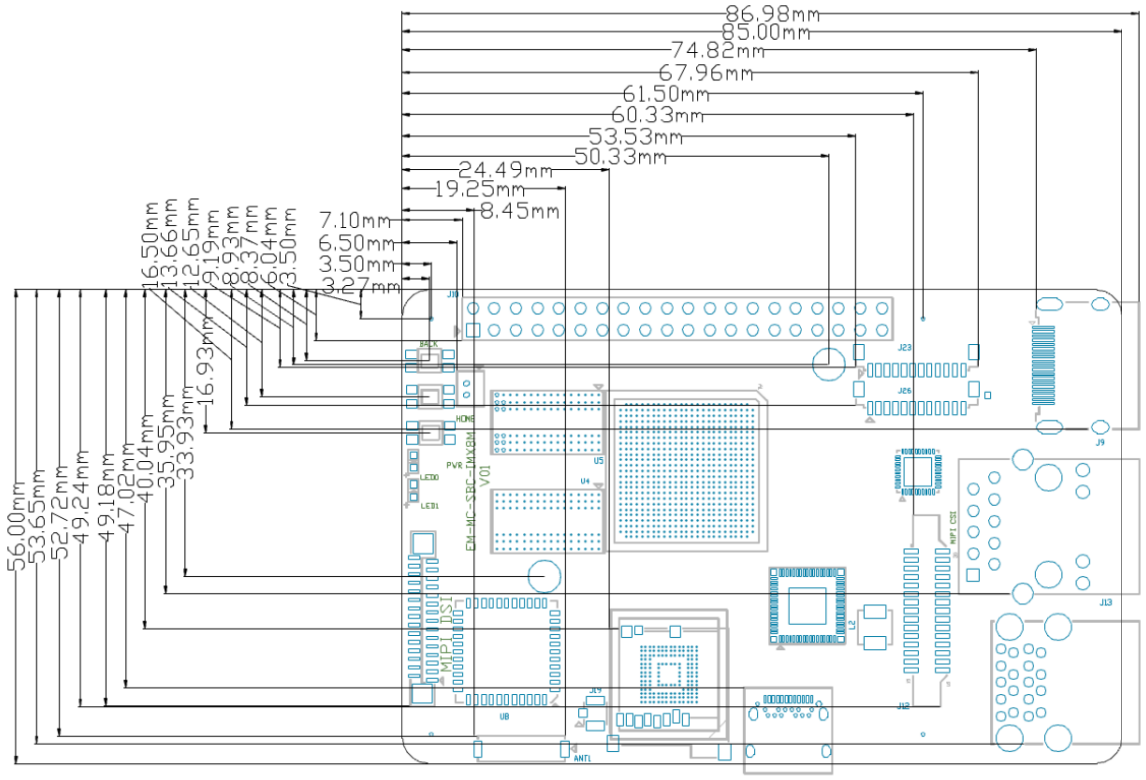


Figure 1.4 Product Dimensions

1.8 Height Distribution (mm)

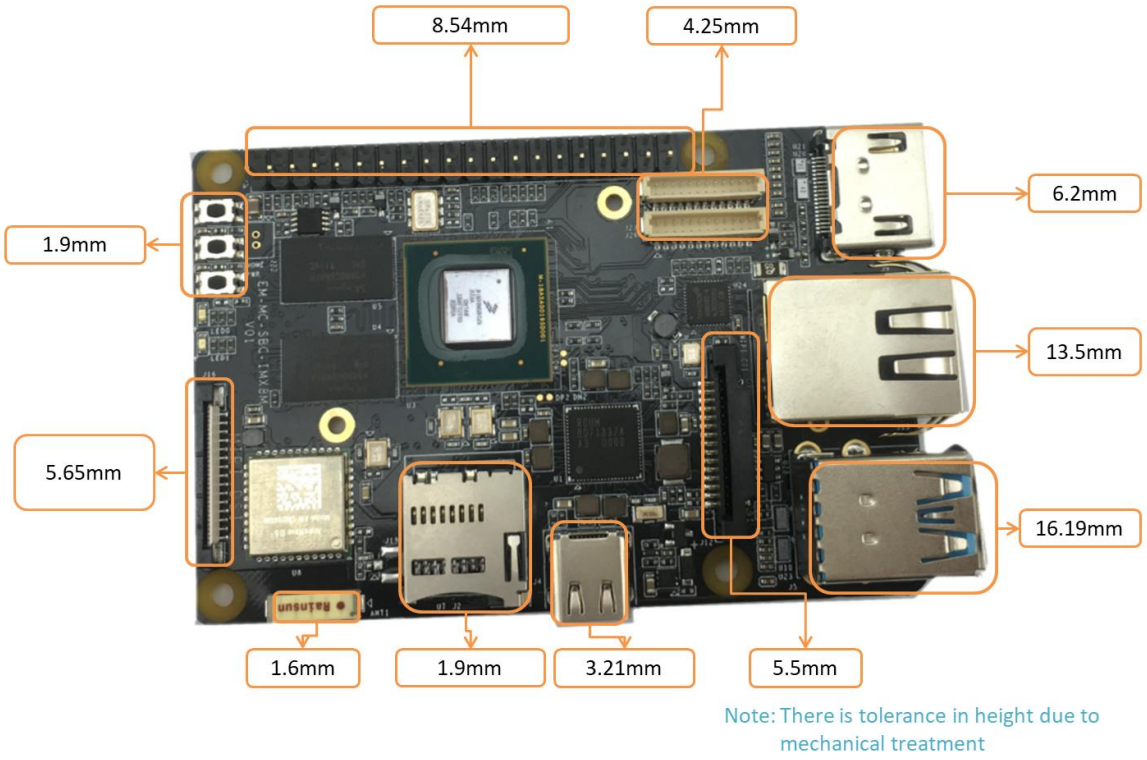


Figure 1.5 Height Distribution

Note: There is tolerance in height due to mechanical treatment.

Chapter 2 Introduction of Hardware System

This chapter will introduce the structure, expansion and peripheral interfaces of MaaXBoard hardware system in details.

2.1 MaaXBoard Hardware Installation and Start up

2.1.1 Installation

Before power up MaaXBoard, you need to connect all necessary peripheral devices, then power on the board.

2.1.2 Booting Configuration

According to the manufactured configuration, MaaXBoard supports two boot mode: boot from Micro SD card or boot from eMMC. These two boot mode is mutual exclusion. If users choose to boot from Micro SD card, they should burn the latest image to the card on PC, then install the card to the board, refer to the software user manual. If users choose to boot from eMMC, just power on the board.

Note: If the eMMC firmware is destroyed by accident, users could update the eMMC image in USB Download mode. Please operate carefully and follow the steps in software user manual strictly to avoid damaging the product.

2.2 Details of Interfaces

This section will introduce the constructions, principles, interface definitions and considerations of use of MaaXBoard peripherals in detail, so that users may have a deep understanding of the hardware circuitry of the board.

2.2.1 POWER IN

MaaXBoard use a USB Type C interface as the +5V power in. Note that the USB Type C interface only provides power supply function, do not support data communication.

The Power adapter should support 3A or above current output.

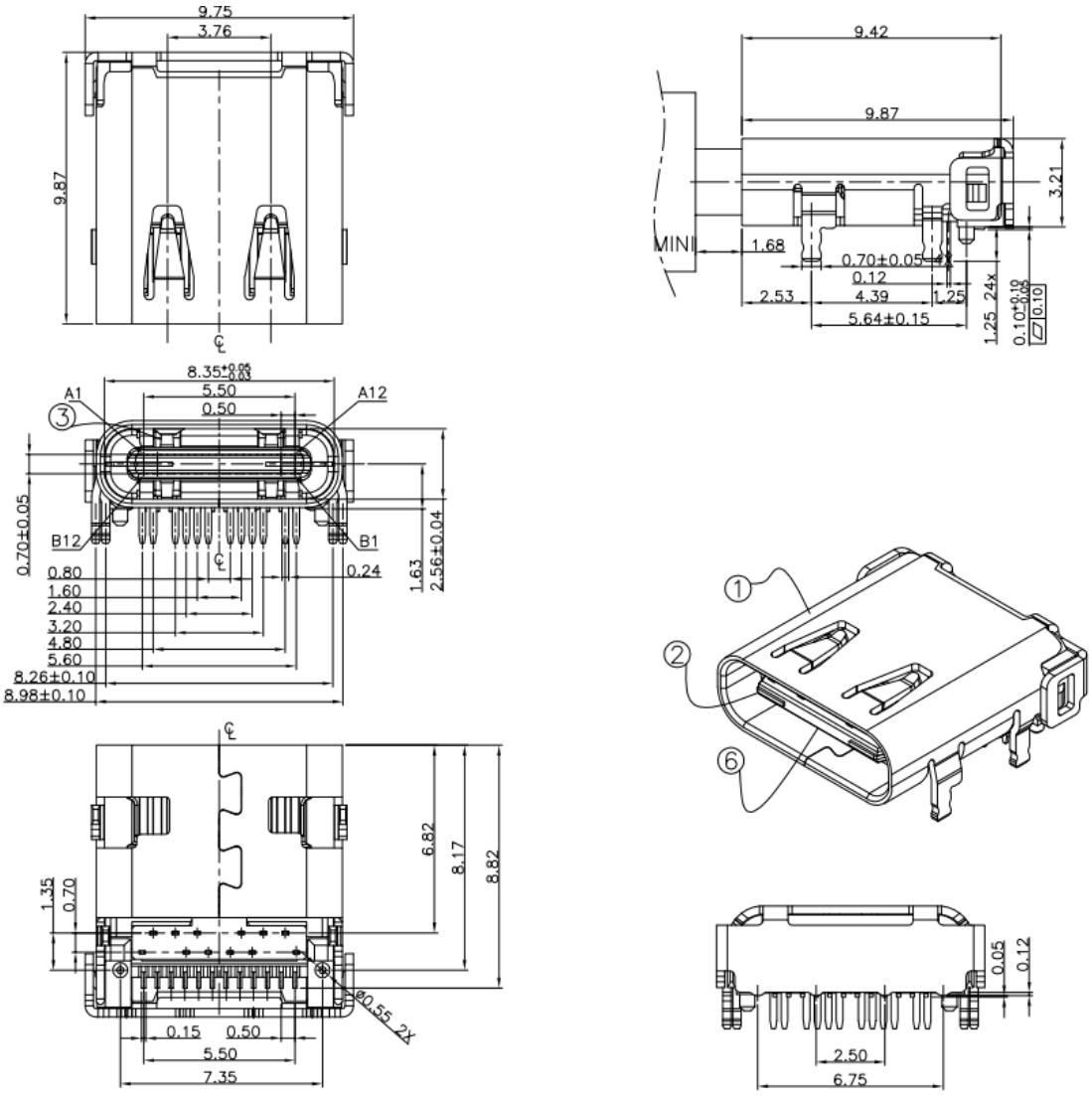


Figure 2.1 USB Type C Slot

2.2.2 Button

There are 3 buttons on the MaaXBoard, S2 as the system power button for the board, S3 and S4 as user button.

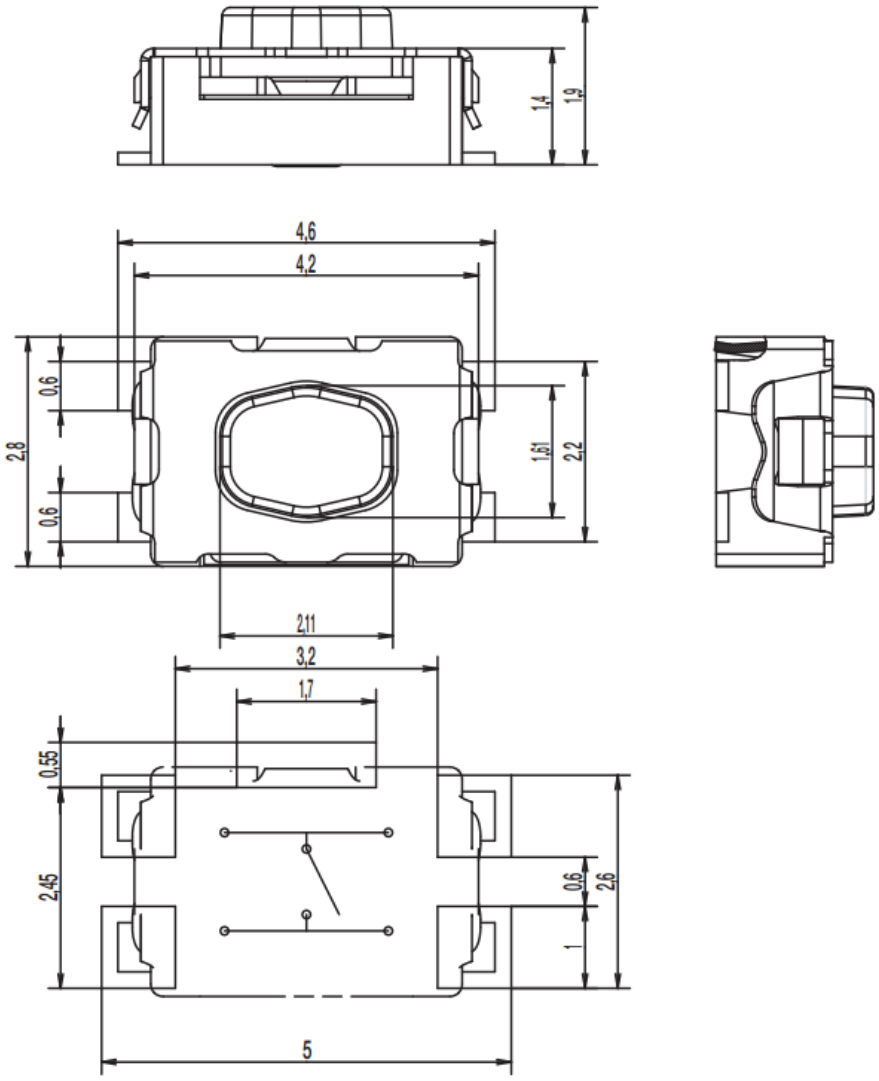


Figure 2.2 Button

2.2.3 HDMI

Powerful video display is an important feature of MaaXBoard. The HDMI 2.0 interface support up to 4096 x 2160 at 60Hz display output.

J9 is the interface for connecting an HDMI display device on the MaaXBoard, which is a standard HDMI 19Pin connector. Its specification and dimension as follows:

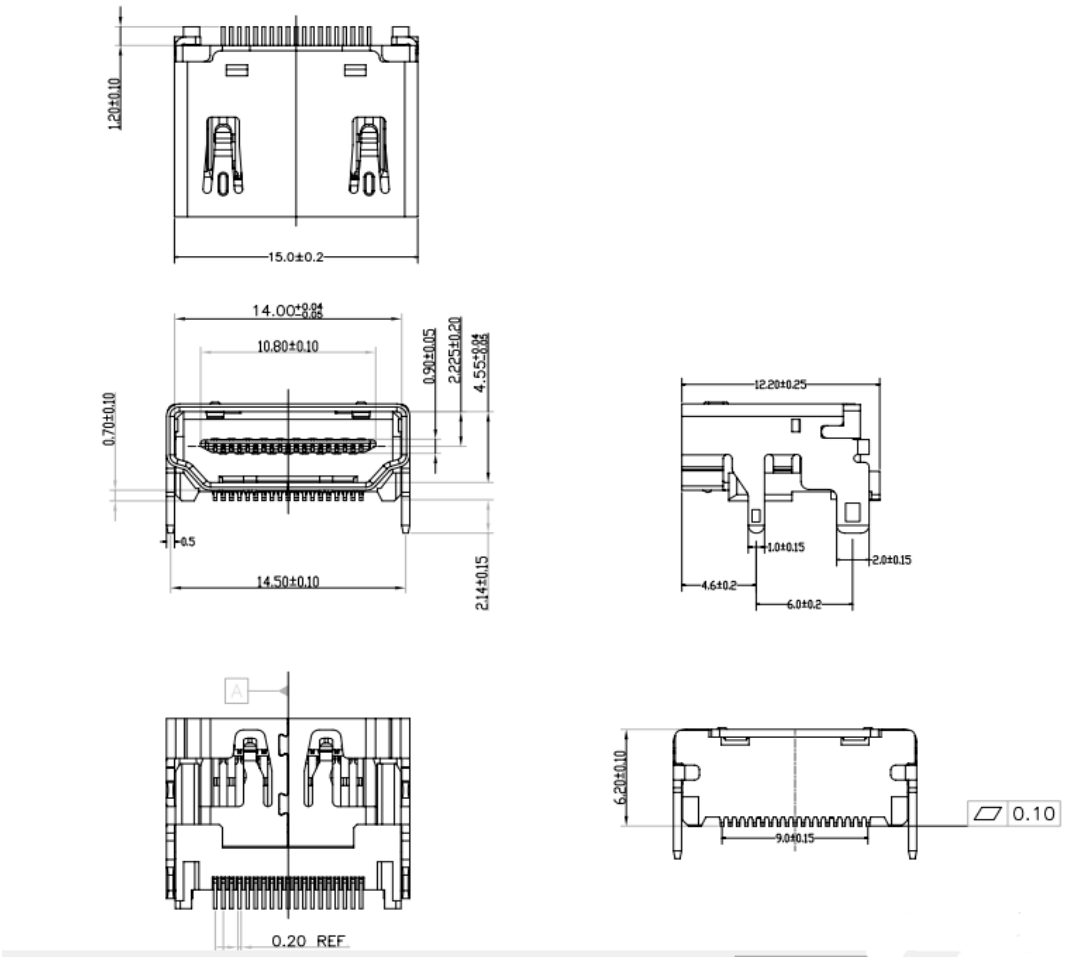


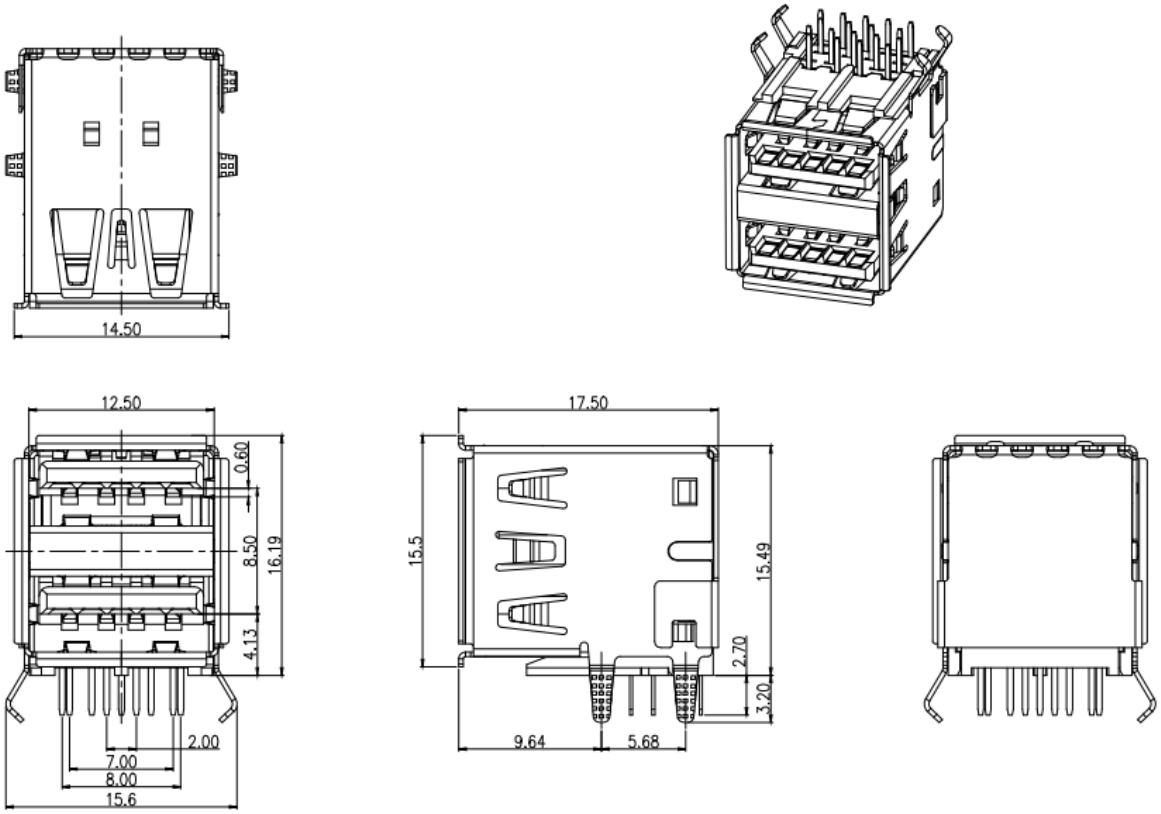
Figure 2.3 HDMI Connector

Table 2.1 HDMI Pin Definitions

HDMI(J9)				
Pin	Signal Name	Ball	Description	Signal Type
1	HDMI_TX2+	K4	HDMI data 2 differential positive	Differential Data
2	GND			Ground
3	HDMI_TX2-	K3	HDMI data 2 differential negative	Differential Data
4	HDMI_TX1+	J4	HDMI data 1 differential positive	Differential Data
5	GND			Ground
6	HDMI_TX1-	J3	HDMI data 1 differential negative	Differential Data
7	HDMI_TX0+	K6	HDMI data 0 differential positive	Differential Data
8	GND			Ground
9	HDMI_TX0-	K5	HDMI data 0 differential negative	Differential Data
10	HDMI_CLK+	J6	HDMI clock differential positive	Differential Data
11	GND			Ground
12	HDMI_CLK-	J5	HDMI clock differential negative	Differential Data
13	HDMI_CEC	W4	HDMI consumer electronic control	IO
14	NC		No Connection	
15	HDMICONN_I2CSCL	U5	HDMI display data channel clock	IO
16	HDMICONN_I2CSDA	T7	HDMI display data channel data	
17	GND		Ground	Ground
18	5V_VDD			Power
19	HDMICONN_HPLG	K1	HDMI display hot plug detect	IO
20	GND_SHELDS			Ground
21	GND_SHELDS			
22	GND_SHELDS			
23	GND_SHELDS			

2.2.4 USB Host

MaaXBoard provides a Double-layer USB Host connector (J5), the two USB port are two independent controllers, and each one could provide full speed USB3.0 data communication function, used to extend external devices in USB protocol.



Pin Number	Signal Name	Pin Number	Signal Name
1	VBUS	10	VBUS
2	D−	11	D−
3	D+	12	D+
4	GND	13	GND
5	StdA_SSRX−	14	StdA_SSRX−
6	StdA_SSRX+	15	StdA_SSRX+
7	GND_DRAIN	16	GND_DRAIN
8	StdA_SSTX−	17	StdA_SSTX−
9	StdA_SSTX+	18	StdA_SSTX+
Shell	Shield		

Figure 2.4 Double-layer USB Host connector

Table 2.2 USB Interface Pin Definition

USB Connector(J5)				
Pin	Signal Name	Ball	Description	Signal Type
1	VBUS1	D14		Power
2	USB1_HOST_DN	B14	USB1 PHY USB2.0 differential signal pair negative	Differential signal
3	USB1_HOST_DP	A14	USB1 PHY USB2.0 differential signal pair positive	
4	GND			Ground
5	USB1_HOST_RXN	B12	USB1 PHY USB3.0 received differential signal pair negative	Differential signal
6	USB1_HOST_RXP	A12	USB1 PHY USB3.0 received differential signal pair positive	
7	GND			Ground
8	USB1_HOST_TXN	B13	USB1 PHY USB3.0 transmit differential signal pair negative	Differential signal
9	USB1_HOST_TXP	A13	USB1 PHY USB3.0 transmit differential signal pair positive	
10	VBUS2	D9		Power
11	USB2_HOST_DN	B10	USB2 PHY USB2.0 differential signal pair negative	Differential signal
12	USB2_HOST_DP	A10	USB2 PHY USB2.0 differential signal pair positive	
13	GND			Ground
14	USB2_HOST_RXN	B8	USB2 PHY USB3.0 received differential signal pair negative	Differential signal
15	USB2_HOST_RXP	A8	USB2 PHY USB3.0 received differential signal pair positive	
16	GND			Ground
17	USB2_HOST_TXN	B9	USB2 PHY USB3.0 transmit differential signal pair negative	Differential signal
18	USB2_HOST_TXP	A9	USB2 PHY USB3.0 transmit differential signal pair positive	Differential signal
S1	Case Earth			Earth Ground

USB Connector(J5)				
Pin	Signal Name	Ball	Description	Signal Type
S2	Case Earth			Earth Ground
S3	Case Earth			
S4	Case Earth			

2.2.5 RJ-45

J13 is the physical interface of Gigabit Ethernet, the interface information is shown in the following picture:

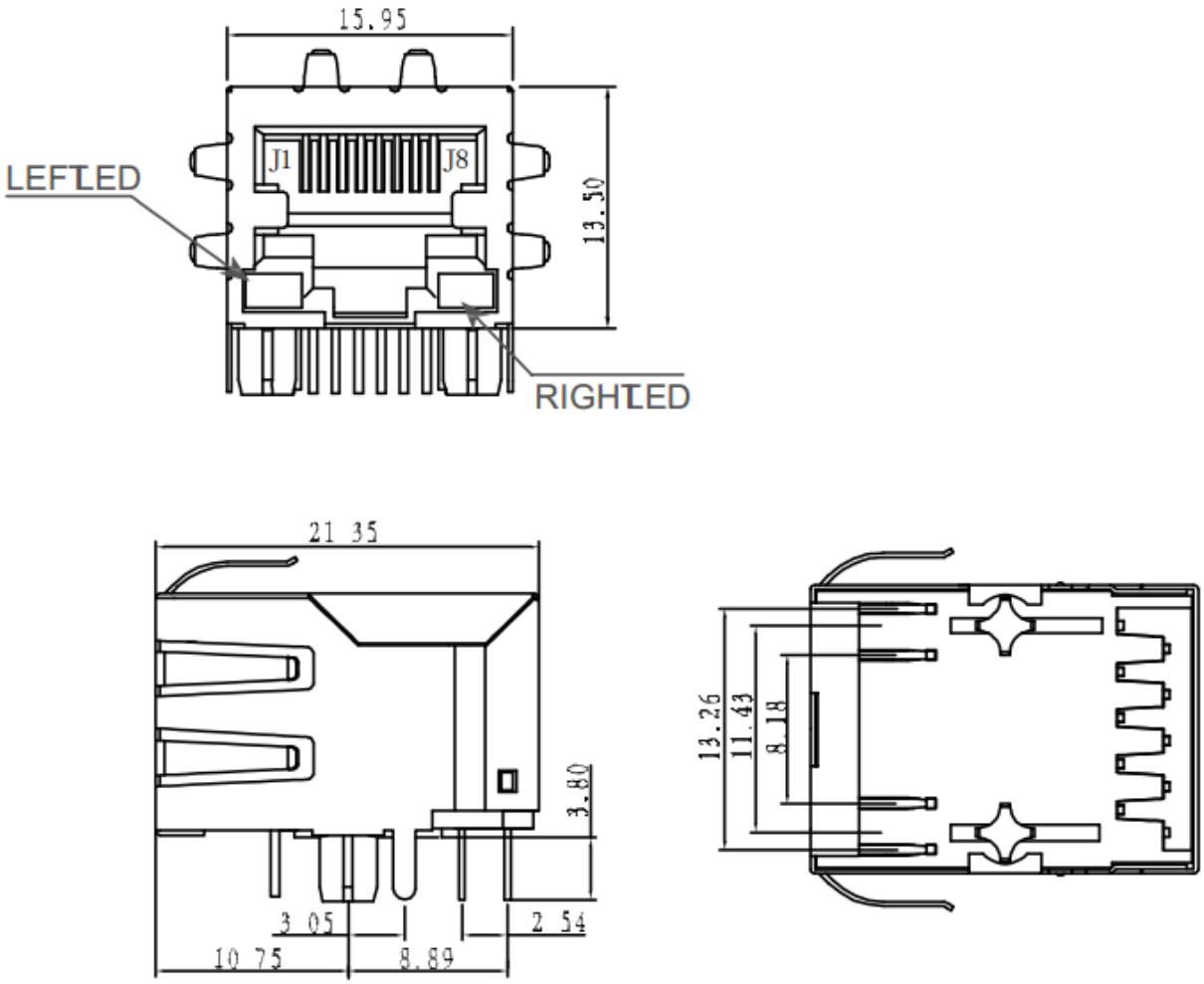


Figure 2.5 RJ45 Connector

Table 2.3 Ethernet Interface Pin Definition

RJ45 Ethernet(J13)				
Pin	Signal Name	Ball	Description	Signal Type
1	MIIA_TRP0		Media-dependent interface 0 positive	Differential signal
2	MIIA_TRN0		Media-dependent interface 0 negative	
3	MIIA_TRP1		Media-dependent interface 1 positive	
4	MiIA_TRN1		Media-dependent interface 1 negative	
5	NC		No connection	
6	NC		No connection	
7	MIIA_TRP2		Media-dependent interface 2 positive	Differential signal
8	MIIA_TRN2		Media-dependent interface 2 negative	
9	MIIA_TRP3		Media-dependent interface 3 positive	
10	MIIA_TRN3		Media-dependent interface 3 negative	
11	MIIA_LED_LINK/ Pull-up		Parallel LED output for data transmit	IO
12	Pull-down/ MIIA_LED_LINK			
13	MIIA_LED_ACT		Parallel LED output for 10/100/1000 BASE-T activity, active blinking	
14	Pull-up			
15	GND		Ground	Ground
16	GND		Ground	

2.2.6 Camera

J12 on the MaaXBoard is a 30-pin FPC connector that supports MIPI 2Lane Camera input.

The following picture shows the information of J12:

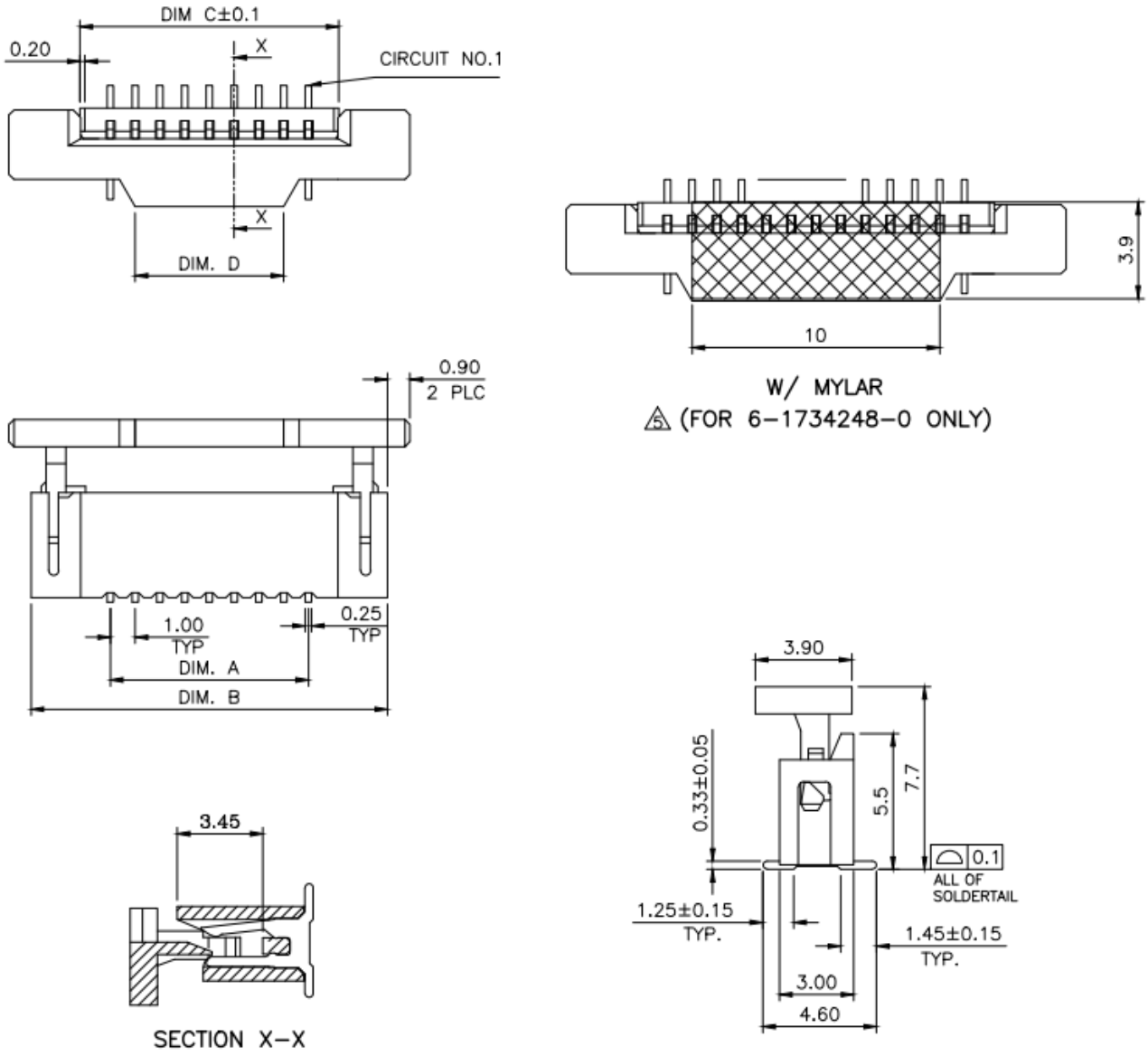


Figure 2.6 Camera Connector

Table 2.4 Camera Connector Pin Definition

Camera(J12)				
Pin	Signal Name	Ball	Description	Signal Type
1	GND			Ground
2	CAM1_DN0	A23	MIPI CSI 1 received differential signal 0 pair negative	Differential signal
3	CAM1_DP0	B23	MIPI CSI 1 received differential signal 0 pair positive	
4	GND			Ground
5	CAM1_DN1	C22	MIPI CSI 1 received differential signal 1 pair negative	Differential signal
6	CAM1_DP1	D22	MIPI CSI 1 received differential signal 1 pair positive	
7	GND			Ground
8	CAM1_CN	A22	MIPI CSI 1 received differential clock pair negative	Differential signal
9	CAM1_CP	B22	MIPI CSI 1 received differential clock pair positive	
10	GND			Ground
11	GPIO3_IO18	K21	Output for powering sensor	Output
12	GPIO3_IO14	M20	Output for resetting sensor	Output
13	I2C1_SCL		I2C1 clock output	Output
14	I2C1_SDA		I2C1 data	IO
15	NVCC_3V3			Power
16	NC		No connection	
17	NC		No connection	
18	NC		No connection	
19	NC		No connection	
20	NC		No connection	
21	NC		No connection	
22	NC		No connection	
23	NC		No connection	

Camera(J12)				
Pin	Signal Name	Ball	Description	Signal Type
24	NC		No connection	
25	NC		No connection	
26	NC		No connection	
27	NC		No connection	
28	NC		No connection	
29	NC		No connection	
30	NC		No connection	

2.2.7 40 Pin Expansion Pin Header

J10 on the MaaXBoard is a 40 pin Extend Interface, used to support external devices.

The following picture shows the information of the 40 Pin expansion connector J10:

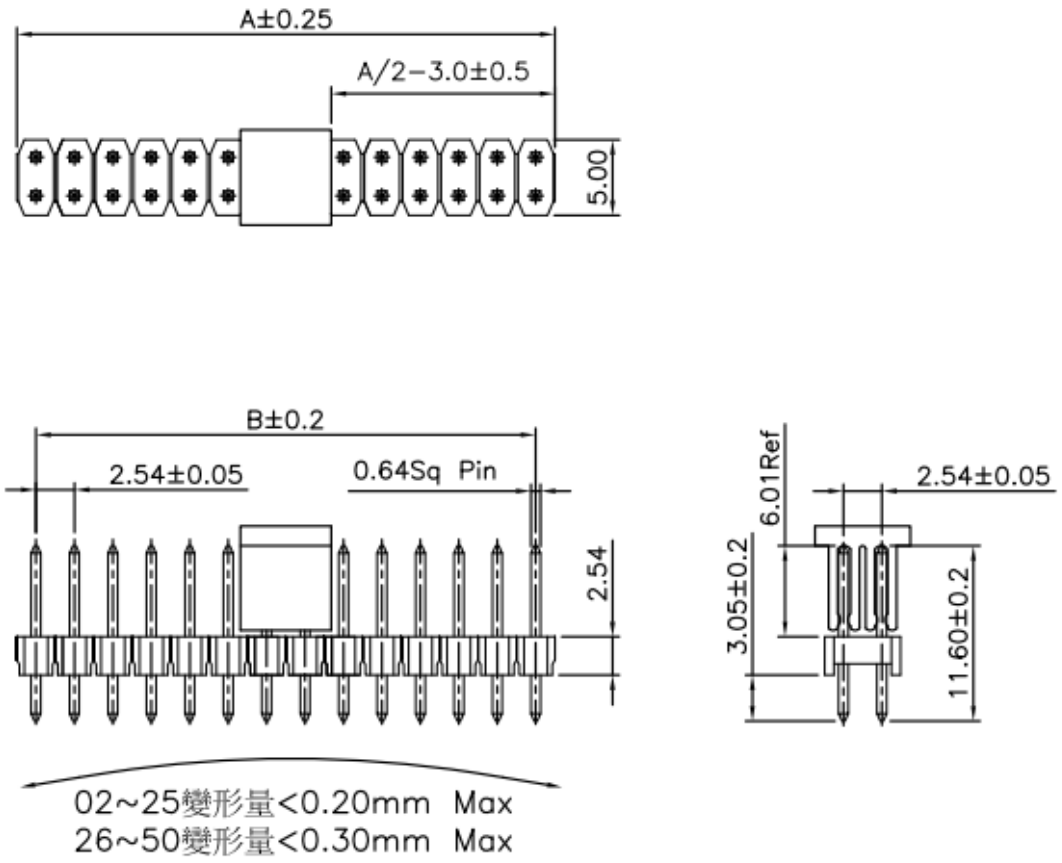


Figure 2.7 2.54mm Double Row Pin Header

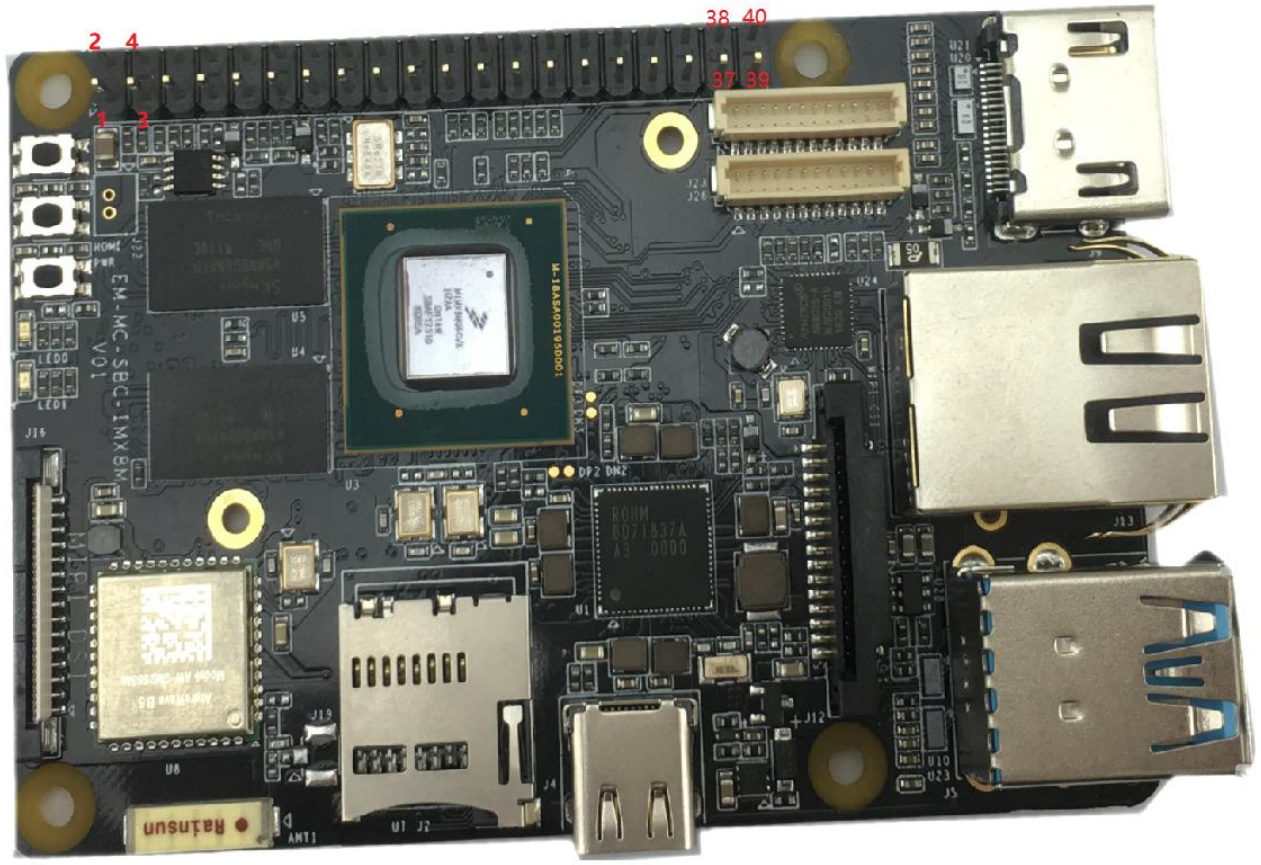


Figure 2.8 40Pin Pin Header Pin1 Position

Table 2.5 40 Pin Expansion Pin Header Definition

Expansion(J10)				
Pin	Signal Name	Ball	Description	Signal Type
1	NVCC_3V3		3.3V/500mA output	Power
2	5V_IN		5V power supply input or output	Power
3	I2C2_SDA	F7	General-purpose input/output	IO
4	5V_IN		5V power supply input or output	Power
5	I2C2_SCL	G7	General-purpose input/output	IO
6	GND		Ground	Ground
7	GPIO3_IO16	K20	General-purpose input/output	IO
8	UART1_TXD	A7	General-purpose input/output	

Expansion(J10)				
Pin	Signal Name	Ball	Description	Signal Type
9	GND		Ground	Ground
10	UART1_RXD	C7	General-purpose input/output	IO
11	GPIO3_IO17	K22	General-purpose input/output	
12	SAI2_TXC	J5	General-purpose input/output	
13	GPIO3_IO08	H22	General-purpose input/output	
14	GND		UART5 transmit Data	Ground
15	GPIO3_IO09	J21	General-purpose input/output	IO
16	UART2_RXD	B6	General-purpose input/output	
17	NVCC_3V3		3.3V/500mA output	Power
18	UART2_TXD	D6	General-purpose input/output	IO
19	ECSPI1_MOSI	A4	General-purpose input/output	
20	GND		Ground	Ground
21	ECSPI1_MISO	B4	General-purpose input/output	IO
22	GPIO3_IO15	K19	General-purpose input/output	
23	ECSPI1_SCLK	D5	General-purpose input/output	
24	ECSPI1_SS0	D4	General-purpose input/output	
25	GND		Ground	Ground
26	GPIO3_IO02	G21	General-purpose input/output	IO
27	I2C3_SDA	E9	General-purpose input/output	
28	I2C3_SCL	G8	General-purpose input/output	
29	GPIO3_IO05	H21	General-purpose input/output	
30	GND		Ground	Ground
31	GPIO3_IO10	L20	General-purpose input/output	IO
32	GPIO1_IO15	J6	General-purpose input/output	

Expansion(J10)				
Pin	Signal Name	Ball	Description	Signal Type
33	GPIO1_IO13	K6	General-purpose input/output	
34	GND		Ground	Ground
35	SAI2_RXFS	J4	General-purpose input/output	IO
36	GPIO1_IO03		General-purpose input/output	
37	GPIO3_IO11	J22	General-purpose input/output	
38	SAI2_RXD	H6	General-purpose input/output	
39	GND		Ground	Ground
40	SAI2_TXD	G6	General-purpose input/output	IO

2.2.8 Wi-Fi/Bluetooth (Optional)

MaaXBoard employs a Wi-Fi/Bluetooth module to support Wi-Fi 2.4G/5G Frequency, and Bluetooth V4.2 standard. The Wi-Fi/Bluetooth antennas have two type: onboard ceramic antenna or IPEX antenna.

- IPEX antenna (customized version)
  IPEX antenna is empty welding in default, if the customer needs to use this interface, please contact the Avnet Manufacturing Services to customize.

  IPEX antenna connector's specification as follows:

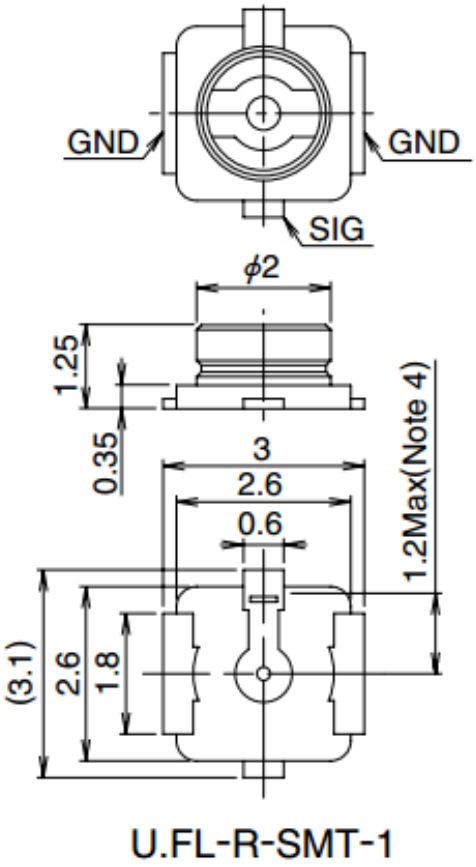


Figure 2.9 IPEX Antenna Connector

Table 2.6 Antenna Connector Pin Definition

Antenna(J19)			
Pin	Signal Name	Description	Signal Type
1	IN	Data transmit	Antenna
2	GND		Ground
3	GND		

- Onboard Ceramic Antenna (Default)
  Onboard Ceramic Antenna's specification as follows:

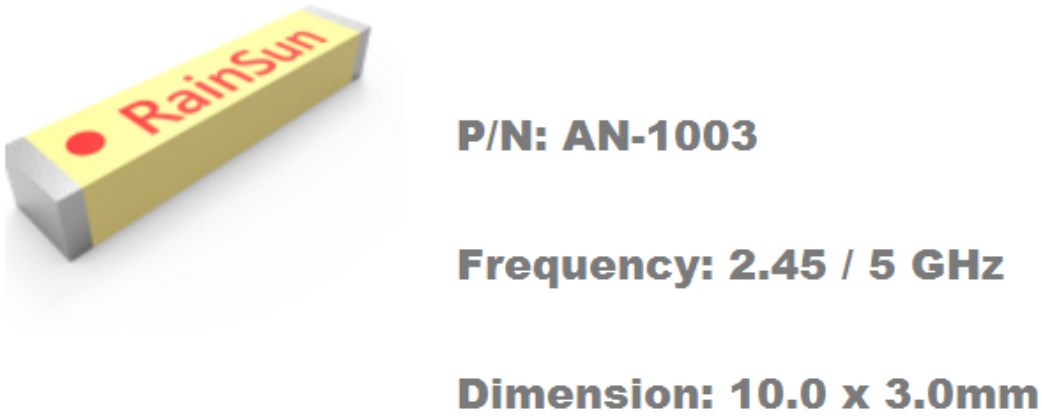


Figure 2.10 Onboard Ceramic Antenna

2.2.9 Micro SD Card (TF Card)

Micro SD card (TF Card) is used to start the code, the program system curing storage, or provide external storage function.

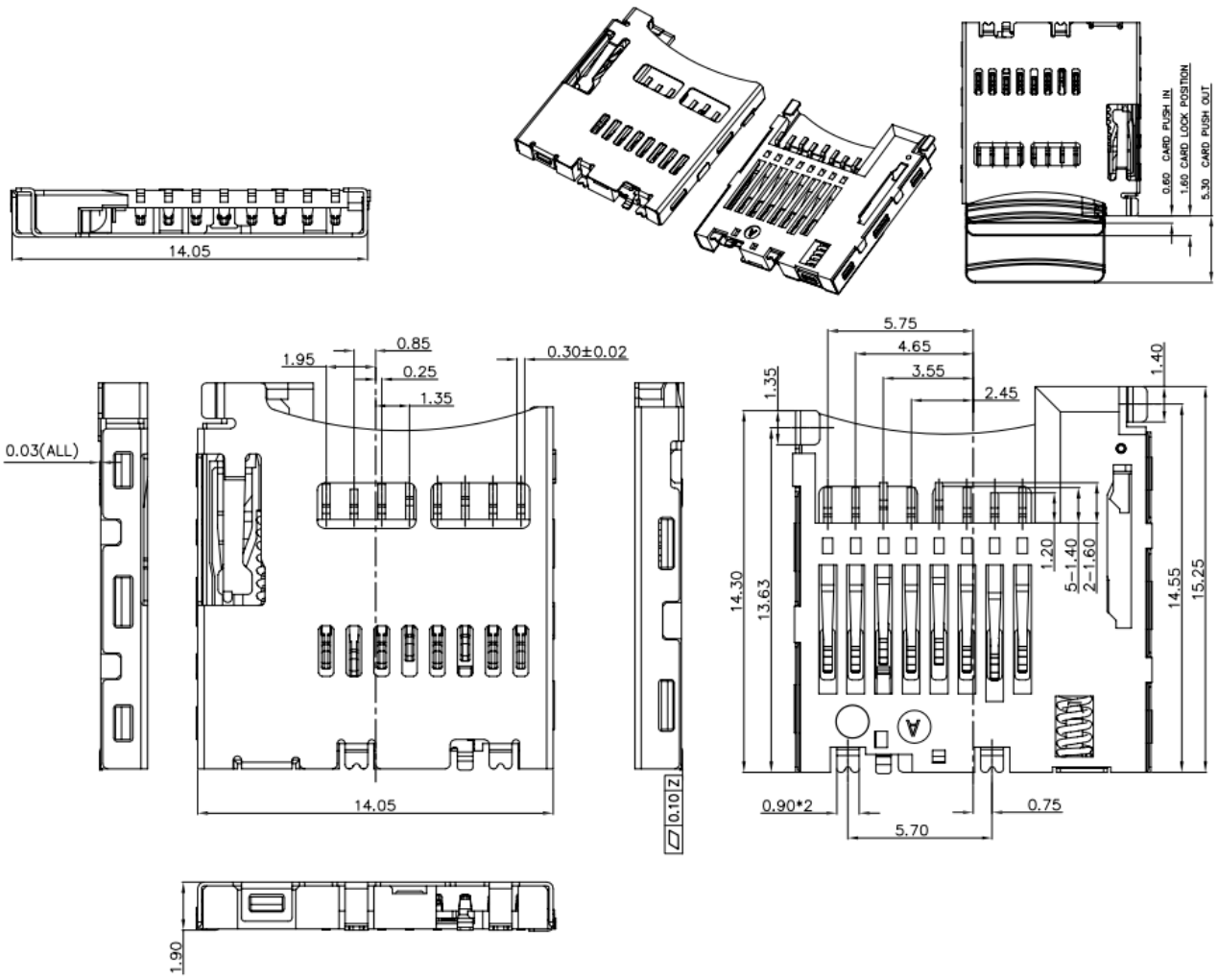


Figure 2.11 Micro SD Card Slot

Table 2.7 Micro SD Card Slot Pin Definition

TF card connector(J2)				
Pin	Signal Name	Ball	Description	Signal Type
1	MMC_DAT2	A23	MMC Data bit2	IO
2	MMC_DAT3	B22	MMC Data bit3	
3	MMC_CMD	F19	MMC command	
4	3.3V_VDD		3.3V power supply	Power
5	MMC_CLK	C21	MMC reference clock	IO
6	GND			Ground
7	MMC_DAT0	A22	MMC Data bit0	IO
8	MMC_DAT1	E20	MMC Data bit1	
9	MMC_CD	R6	MMC card detect	
10	SHELL			SHELL
11	SHELL			
12	SHELL			
13	SHELL			

2.2.10 Extend Interface J26

J26 on the MaaXBoard is a 12 pin Wafer connector, used to support GPIO function.

The following picture shows the information of the 12 pin Wafer connector J26:

No. of Contacts	DIMENSIONS	
	DIM A	DIM B
02	1.00	4.50
03	2.00	5.50
04	3.00	6.50
05	4.00	7.50
06	5.00	8.50
07	6.00	9.50
08	7.00	10.50
09	8.00	11.50
10	9.00	12.50
11	10.00	13.50
12	11.00	14.50
13	12.00	15.50
14	13.00	16.50
15	14.00	17.50
16	15.00	18.50
17	16.00	19.50
18	17.00	20.50
19	18.00	21.50
20	19.00	22.50

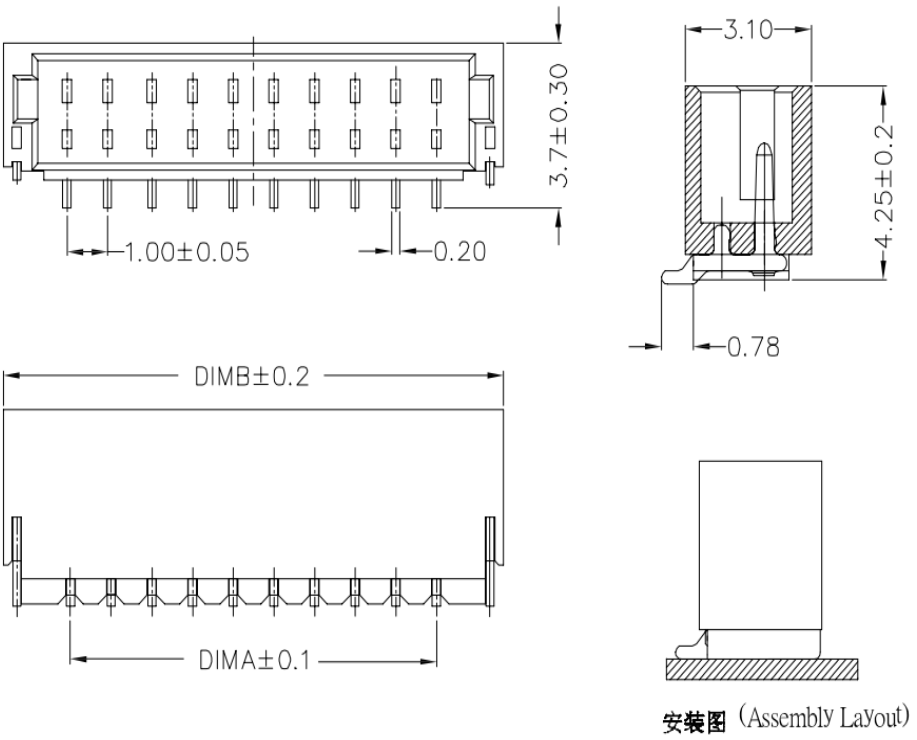


Figure 2.12 12Pin Wafer Connector

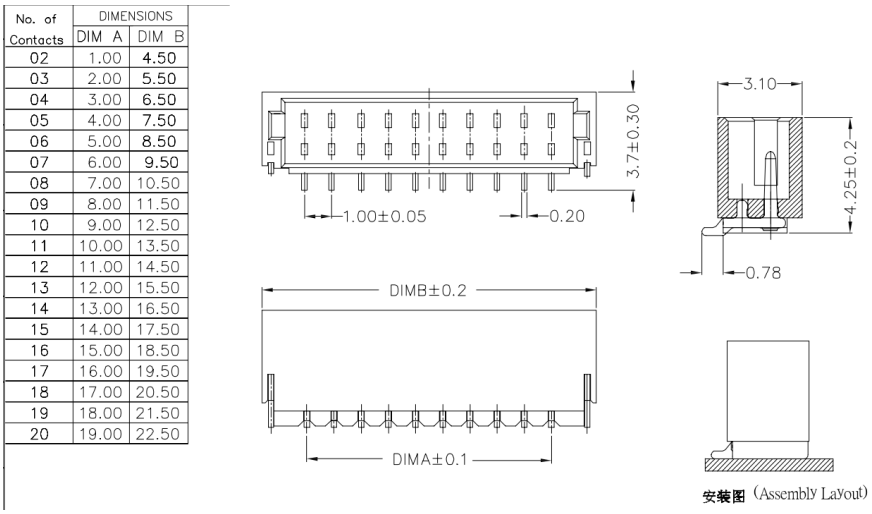
Table 2.8 12Pin Definition

Expansion Interface1 (J26)				
Pin	Signal Name	Ball	Description	Signal Type
1	SAI1_MCLK	A3	SAI1 master clock output	IO
2	GND		Ground	Ground
3	SAI1_TXD7	C1	SAI1 transmit data bit7	IO
4	SAI1_TXD6	B3	SAI1 transmit data bit6	
5	SAI1_TXD5	C2	SAI1 transmit data bit5	
6	SAI1_TXD4	D2	SAI1 transmit data bit4	
7	SAI1_TXD3	D1	SAI1 transmit data bit3	
8	SAI1_TXD2	B2	SAI1 transmit data bit2	
9	SAI1_TXD1	E2	SAI1 transmit data bit1	
10	SAI1_TXD0	F2	SAI1 transmit data bit0	
11	SAI1_TXFS	H1	SAI1 transmit L/R clock	
12	SAI1_TXC	E1	SAI1 transmit bit clock	

2.2.11 Extend Interface J23

J23 on the MaaXBoard is a 12 pins Wafer connector, used to support GPIO function.

The following picture shows the information of the 12 pins Wafer connector J23:



No. of Contacts	DIMENSIONS	
	DIM A	DIM B
02	1.00	4.50
03	2.00	5.50
04	3.00	6.50
05	4.00	7.50
06	5.00	8.50
07	6.00	9.50
08	7.00	10.50
09	8.00	11.50
10	9.00	12.50
11	10.00	13.50
12	11.00	14.50
13	12.00	15.50
14	13.00	16.50
15	14.00	17.50
16	15.00	18.50
17	16.00	19.50
18	17.00	20.50
19	18.00	21.50
20	19.00	22.50

Figure 2.13 12Pin Wafer Connector

Table 2.9 J23 Pin Definition

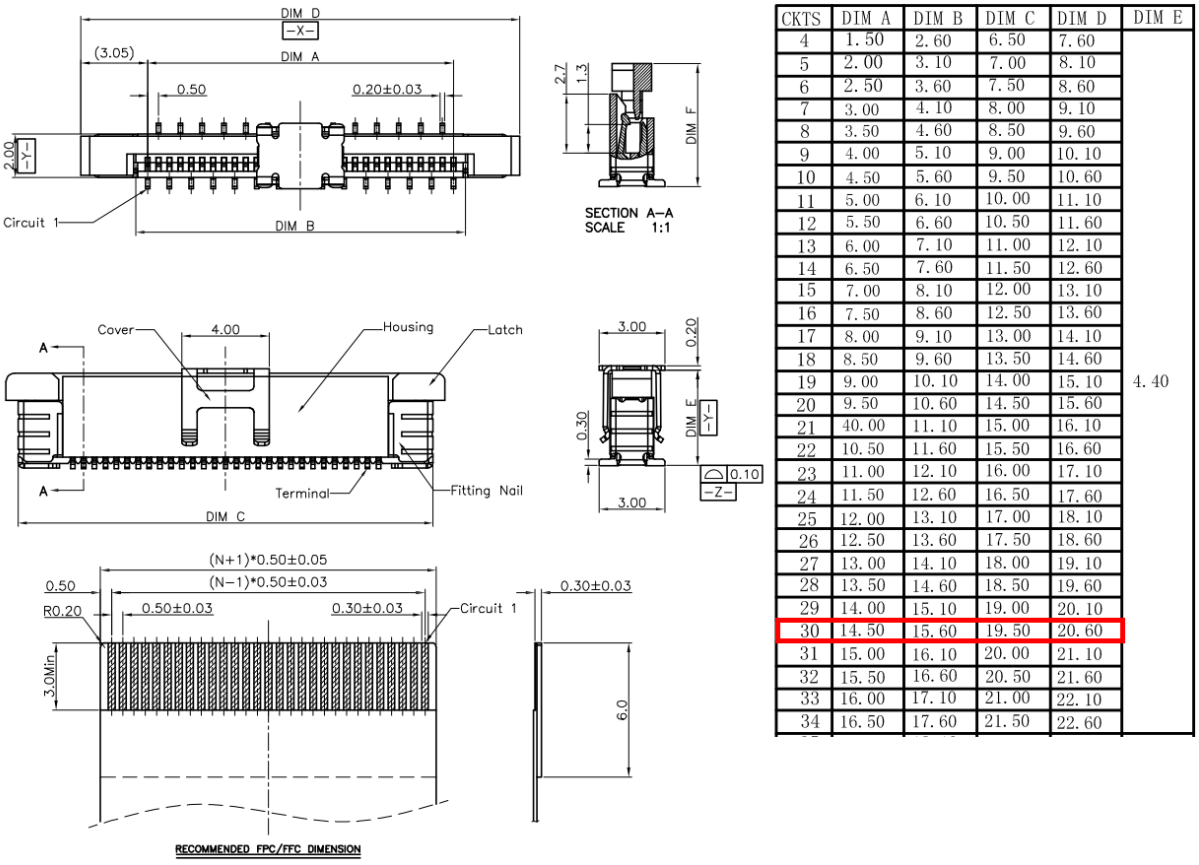
Expansion Interface1 (J23)				
Pin	Signal Name	Ball	Description	Signal Type
1	NVCC_3V3		3.3V/500mA power output	Power
2	GND		Ground	Ground
3	SAI1_MCLK	A3	SAI1 master clock output	IO
4	SAI1_RXD0	K2	SAI1 receive data bit0	
5	SAI1_RXD1	L2	SAI1 receive data bit1	
6	SAI1_RXD2	H2	SAI1 receive data bit2	
7	SAI1_RXD3	J2	SAI1 receive data bit3	
8	SAI1_RXD4	J1	SAI1 receive data bit4	
9	SAI1_RXD5	F1	SAI1 receive data bit5	
10	SAI1_RXD6	G2	SAI1 receive data bit6	
11	SAI1_RXFS	L1	SAI1 receive L/R clock	

Expansion Interface1 (J23)				
Pin	Signal Name	Ball	Description	Signal Type
12	SAI1_RXC	K1	SAI1 receive bit clock	

2.2.12 MIPI-DSI

J16 on the MaaXBoard is a 30 pin FPC connector that supports MIPI-DSI high-definition and small size screen.

The following picture shows the information of 30-pin FPC connector J16:



CKTS	DIM A	DIM B	DIM C	DIM D	DIM E
4	1.50	2.60	6.50	7.60	
5	2.00	3.10	7.00	8.10	
6	2.50	3.60	7.50	8.60	
7	3.00	4.10	8.00	9.10	
8	3.50	4.60	8.50	9.60	
9	4.00	5.10	9.00	10.10	
10	4.50	5.60	9.50	10.60	
11	5.00	6.10	10.00	11.10	
12	5.50	6.60	10.50	11.60	
13	6.00	7.10	11.00	12.10	
14	6.50	7.60	11.50	12.60	
15	7.00	8.10	12.00	13.10	
16	7.50	8.60	12.50	13.60	
17	8.00	9.10	13.00	14.10	
18	8.50	9.60	13.50	14.60	
19	9.00	10.10	14.00	15.10	4.40
20	9.50	10.60	14.50	15.60	
21	40.00	11.10	15.00	16.10	
22	10.50	11.60	15.50	16.60	
23	11.00	12.10	16.00	17.10	
24	11.50	12.60	16.50	17.60	
25	12.00	13.10	17.00	18.10	
26	12.50	13.60	17.50	18.60	
27	13.00	14.10	18.00	19.10	
28	13.50	14.60	18.50	19.60	
29	14.00	15.10	19.00	20.10	
30	14.50	15.60	19.50	20.60	
31	15.00	16.10	20.00	21.10	
32	15.50	16.60	20.50	21.60	
33	16.00	17.10	21.00	22.10	
34	16.50	17.60	21.50	22.60	

Figure 2.14 30 Pin FPC Connector (MIPI-DSI)

Table 2.10 J16 Pin Definition

30Pin FPC Connector (J16)				
Pin	Signal Name	Ball	Description	Signal Type
1	GND		Ground	Ground
2	DSI_DP3	B15	MIPI DSI transmit differential signal 3 pair positive	Differential output
3	DSI_DN3	A15	MIPI DSI transmit differential signal 3 pair negative	
4	GND		Ground	Ground
5	DSI_DP2	B18	MIPI DSI transmit differential signal 2 pair positive	Differential output
6	DSI_DN2	A18	MIPI DSI transmit differential signal 2 pair negative	
7	GND		Ground	Ground
8	DSI_DP1	B16	MIPI DSI transmit differential signal 1 pair positive	Differential output
9	DSI_DN1	A16	MIPI DSI transmit differential signal 1 pair negative	
10	GND		Ground	Ground
11	DSI_DP0	B17	MIPI DSI transmit differential signal 0 pair positive	Differential output
12	DSI_DN0	A17	MIPI DSI transmit differential signal 0 pair negative	
13	GND		Ground	Ground
14	DSI_CKP	D16	MIPI DSI clock differential signal pair positive	Differential output
15	DSI_CKN	C16	MIPI DSI clock differential signal pair negative	
16	GND		Ground	Ground
17	DSI_TS_RST	P5	Touch screen reset output	Output
18	DSI_TS_nINT	A4	Touch screen interrupt input	Input
19	I2C4_SDA	F9	I2C port 4 data	IO
20	I2C4_SCL	F8	I2C port 4 clock	Output
21	DSI_EN	D5	MIPI DSI backlight enable output	Output
22	DSI_BL_PWM	T7	MIPI DSI backlight PWM output	Output
23	GND		Ground	Ground

30Pin FPC Connector (J16)				
Pin	Signal Name	Ball	Description	Signal Type
24	NC		No connection	
25	NC		No connection	
26	GND		Ground	Ground
27	NC		No connection	
28	VSYS		5V power output	Power
29	VSYS		5V power output	
30	VSYS		5V power output	

2.3 Introduction of Peripheral Chips

2.3.1 AR8035

AR8035 Integrated 10/100/1000 Mbps Ethernet Transceiver. The AR8035 is a single port 10/100/1000 Mbps Tri-speed Ethernet PHY, which provides a low power, low BOM (Bill of Materials) cost solution for comprehensive applications including consumer, enterprise, carrier and home networks, etc.

AR8035 supports IEEE 802.3az Energy Efficient Ethernet (EEE) standard and Atheros proprietary SmartEEE, which allows legacy MAC/SoC devices without 802.3az support to function as the complete 802.3az system.

2.3.2 BD71837

BD71837MWV integrated all the power voltage for iMX8M, include the peripheral power voltage, which significantly reduce the difficulty when customer develop the system, shorten the development cycle and the manufacture period of the product.

BD71837MWV is Power Management IC specially designed for iMX8M by ROHM Semiconductor. It integrates 8 Buck regulators and 7 LDOs, support the processor to dynamically adjust the power to achieve the goal of energy saving. The chip provides 1.8V/3.3V optional MMC card power supply at the same time. Users could choose 1.8V or 3.3V output by change the resistor, to fit multimedia card with various type and protocol. It provides a 32.768 kHz Crystal Oscillator Driver which could power to the clock circuit directly. It also provides several protection modes: output short circuit, output over voltage/current, over thermal protection, etc.

2.3.3 AW-CM256SM

The AW-CM256SM wireless module is compliant with the IEEE 802.11a/b/g/n/ac standard, support connection up to 433.3Mbps transmit/receive (connect to WLAN using 802.11 ac protocol).
AW-CM256SM module provide SDIO interface Wi-Fi, UART/PCM interface Bluetooth Function. It enables a low power consumption and high performance solution that fit for IOT and other application field.

Chapter 3 Appendix

3.1 Software

MaaXBoard support Linux Yocto system and Android system, for the detail software introduction, please refer to related user manual.

- **Linux**
  - MaaXBoard Linux Software Release Note
  - MaaXBoard Linux Software User Manual
  - MaaXBoard Linux Software Development Guide

- **Android**
  - MaaXBoard Android Software Release Note
  - MaaXBoard Android Software User Manual
  - MaaXBoard Android Development Guide

Chapter 4 Technical Support and Warranty

4.1 Technical Support

- Avnet Manufacturing Services provides its product with one-year free technical support including:
- Providing software and hardware resources related to the embedded products of Avnet Manufacturing Services;
- Helping customers properly compile and run the source code provided by Avnet Manufacturing Services;
- Providing technical support service if the embedded hardware products do not function properly under the circumstances that customers operate according to the instructions in the documents provided by Avnet Manufacturing Services;
- Helping customers troubleshoot the products.
- The following conditions will not be covered by our technical support service. We will take appropriate measures accordingly:
  - Customers encounter issues related to software or hardware during their development process;
  - Customers encounter issues caused by any unauthorized alter to the embedded operating system;
  - Customers encounter issues related to their own applications;
  - Customers encounter issues caused by any unauthorized alter to the source code provided by Avnet Manufacturing Services.

4.2 Warranty Conditions

- 12-month free warranty on the PCB under normal conditions of use since the sales of the product;
- The following conditions are not covered by free services; Avnet Manufacturing Services will charge accordingly:
  - Customers fail to provide valid purchase vouchers or the product identification tag is damaged, unreadable, altered or inconsistent with the products;
  - Not according to the user's manual operation causes damage to the product;
  - Products are damaged in appearance or function caused by natural disasters (flood, fire, earthquake, lightning strike or typhoon) or natural aging of components or other force majeure;
  - Products are damaged in appearance or function caused by power failure, external forces, water, animals or foreign materials;
  - Products malfunction caused by disassembly or alter of components by customers or, products disassembled or repaired by persons or organizations unauthorized by Avnet Manufacturing Services, or altered in factory specifications, or configured or expanded with the components

that are not provided or recognized by Avnet Manufacturing Services and the resulted damage in appearance or function;

- Product failures caused by the software or system installed by customers or inappropriate settings of software or computer viruses;
- Products purchased from unauthorized sales;
- Warranty (including verbal and written) that is not made by Avnet Manufacturing Services and not included in the scope of our warranty should be fulfilled by the party who committed. Avnet Manufacturing Services has no any responsibility.

- Within the period of warranty, the freight for sending products from customers to Avnet Manufacturing Services should be paid by customers; the freight from Avnet Manufacturing Services to customers should be paid by us. The freight in any direction occurs after warranty period should be paid by customers;
- Please contact technical support if there is any repair request.

- **Avnet Manufacturing Services will not take any responsibility on the products sent back without the permission of the company.**

Chapter 5 Contact Information

- Tel: +86-755-33190846/33190847/33190848
- E-mail:
  - Technical support: support@embest-tech.com
  - Sales contact: chinasales@embest-tech.com
- Fax: +86-755-25616057
- Website: http://www.embest-tech.com/
- Address: Tower B 4/F, Shanshui Building, Nanshan Yungu Innovation Industry Park, Liuxian Ave.No.4093,Nanshan District, Shenzhen, Guangdong, China