OSM-IMX8MM

Open Standard Module

User's Manual

1st Ed – 26 August 2024

Part No. E2047OM8M00R

Document Amendment History

Revision	Date	By	Comment
1st	August 2024	Avalue	Initial Release

Declaration of Conformity

This device complies with part 15 FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class "a" digital device, pursuant to part 15 of the FCC rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE statement

The product(s) described in this manual complies with all application European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

Copyright Notice

Acknowledgements

Intel and Pentium are trademarks of Intel Corporation.

Microsoft Windows is registered trademark of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Disclaimer

This manual is intended to be used as a practical and informative guide only and is subject

to change without notice. It does not represent a commitment on the part of Avalue. This product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

A Message to the Customer

Avalue Customer Services

Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support and Assistance

1. Visit the Avalue website at https://www.avalue.com/ where you can find the latest information about the product.

2. Contact your distributor or our technical support team or sales representative for technical support if you need additional assistance. Please have following information ready before you call:

・Product name and serial number
・Description of your peripheral attachments
・Description of your software (operating system, version, application software, etc.)
・A complete description of the problem
・The exact wording of any error messages

To receive the latest version of the user's manual; please visit our Web site at:
www.avalue.com

Product Warranty (Returns & Warranties policy)

1. Purpose

Avalue establishes the following maintenance specifications and operation procedures for providing the best quality of service and shortened repair time to our customers.

2. Warranty
2.1 Warranty Period

Avalue endeavors to offer customers the most comprehensive post-sales services and protection; besides offering a 2-year warranty for standard Avalue products, an extended warranty service can also be provided based on additional request from the customer. Within the warranty period, customers are entitled to receive comprehensive and prompt repair and warranty.

Standard products manufactured by Avalue are offered a 2-year warranty, from the date of delivery from Avalue. For ODM/OEM products manufactured by Avalue or PCBA with conformal coating, will follow up the define warranty of the agreement, otherwise will be offered 1-year warranty for ODM/OEM products but non-warranty for PCBA with conformal coating. For outsourcing parts kit by Avalue (ex: Motherboard, LCD touch panel, CPU, RAM, HDD) are offered a 6-month warranty, and Mobile/Tablet PC battery are offered a warranty of the half year, from the date of delivery by Avalue. Products before the mass production stage, i.e. engineering samples are not applied in this warranty or service policy. For extended warranty and cross-territory services, product defects resulting from design, production process or material are covered by the pre-set warranty period after the date of delivery from Avalue. For non-Avalue products, the product warranty and repair time shall be based on the service standards provided by the original manufacturer; in principle Avalue will provide these products a warranty service for no more than one year.

2.2 Maintenance services within the warranty period

In the case of Avalue product DOA (Defect-on-Arrival) when the customer finds any defect within 1 month after the delivery, Avalue will replace it with a new product in a soonest way. Except for custom products, once the customer is approved of a Cross-Shipment Agreement, which allows for delivery a new product to the customer before receiving the defective one, Avalue will immediately proceed with new product replacement for the said DOA case. On validation of the confirmed defect, Avalue is entitled to reserve the right whether to provide a new product for replacement. For the returned defective new product, it is necessary to verify that there shall be no bruise, alteration, scratch or marking to the appearance, and that none of the delivered accessories missing; otherwise, the customer will be requested to pay a processing fee. On the other hand, if the new product defect is resulting from incorrect configuration or erroneous use by the user instead of any problem of the hardware itself, the customer will also be requested to pay for relevant handling fees.

As for other conditions, Avalue will handle defects by way of repair. The customer will be requested to send the defective product to an Avalue authorized service center, and Avalue will return the repaired product back to the customer as soon as possible.

2.3 Ruling of an out-of-warranty defect

The following situations are not included in the warranty:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident or other causes. Avalue reserves the right for the ruling of the aforementioned situations.
- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules of non-Avalue products and accessories shall be in accordance with standards set up by the original manufacturer. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiration of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number.
- Products before the mass production stage, i.e. engineering samples.

3. Procedure for sending for repair

3.1 Attain a RMA number

A customer's rejected product returned for repair shall have a RMA (Return Merchandise Authorization) number. Without a RMA number, Avalue will not provide any repair service for the rejected product, and the product will be returned to the customer at customer's cost. Avalue will not issue any notice for the return of the product.

Each returned product for repair shall have a RMA number, which is simply the authorization of the return for repair; it is not a guarantee that the returned goods can be repaired or replaced. For applying for a RMA number, the customer may enter the eRMA webpage of Avalue https://www.avalue.com/en/member and log-in with an account number and a password authorized by Avalue. The system will then automatically issue a RMA number.

When applying for the RMA number, it is essential to fill in basic information of the customer and the product, together with detailed description of the problem encountered. If possible, avoid using ambiguous words such as "does not work" or "problematic". Without a substantial description of the problem, it is hard to start the repair and will cause prolonged repair time. Lacking detailed statement of fault steps also makes the problem hard to be identified, sometimes resulting in second-time repairs.

In case the customer can't define the cause of problem, please contact Avalue application engineers. Sometimes when the problem can be resolved even before the customer sends back the product.

On the other hand, if the customer only returns the key parts to Avalue for repair, it is necessary that the serial number of the entire unit is given in the "Problem Description" field, so that warranty period can be ruled accordingly; or Avalue will handle the case as an Out-of- warranty case.

3.2 Return of faulty product for repair

It is recommended that the customer not to return the accessories (manual, connection cables, etc.) with the products for repair, devices such as CPU, DRAM, CF memory card, etc., shall also be removed from the faulty goods before return for repair. If these devices are relevant to described repair problems and necessary to be returned with the goods; please clearly indicate the items included in the eRMA application form. Avalue shall not be responsible for any item that is not itemized. Moreover, make sure the problem(s) are detailed in the "Problem Description" field.

In the list of delivery, the customer may fill-in a value which is lower than the actual value, to prevent customs levying a higher tax over the excessive value of the return goods. The customer shall be held responsible for extra fees caused by this. We strongly recommend that "Invoice for customs purpose only with no commercial value" be indicated on the delivery note. Also for the purpose of expedited handling, please printout the RMA number and put it in the carton, also indicate the number outside of the carton, with the recipient addressing to Avalue RMA Department.

When returning the defective product, please use an anti-static bag or ESD material to pack it properly. In case of improper packing resulting in damages in the transportation process, Avalue reserves the right to reject the un-repaired faulty good at the customer's costs. Furthermore, it is suggested that the faulty goods shall be sent via a door-to-door courier service. The customer shall be held responsible for any customs clearance fee or extra expenses if Air-Cargo is used for the delivery.

In case of a DOA situation of a new product, Avalue will be responsible for the product and the freight. If the faulty goods are within the warranty period, the sender will take responsibility for the freight. For an out-of-warranty case, the customer shall be responsible for the freight of both trips.

3.3 Maintenance Charge

Avalue will charge a moderate repair fee for the following conditions:
- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident

or other causes. Avalue reserves the right for the ruling of the aforementioned situations.

- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules for non-Avalue products and accessories shall be in accordance with standards set up by the original supplier. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiry of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number
- Products before the mass production stage, i.e. engineering samples.
- In case the products received are examined as NPF (No Problem Found) within the warranty period, the customer shall be responsible for the freight of both trips.
- Please contact your local distributor to examine in advance to prevent unnecessary freight cost.

For system failure of out-of-warranty products, Avalue will provide a quotation prior to repair service. When the customer applies for the cost, please refer to the Quotation number. In case the customer does not return the DOA product that has already been replaced by a new one, or the customer does not sign back the quotation of the out-of-warranty maintenance, Avalue reserves the right of whether or not to provide the repair service. In case the customer does not reply in 3 months, Avalue shall directly scrap or return the product back to customer at customer's cost without further notice to the customer.

3.4 Maintenance service of phased-out products

For servicing phased-out products, Avalue provides an extended period, starting the date of phase-out, as a guaranteed maintenance period of such products, for continuance of the maintenance service to meet customer's requirements. In case of unexpected factors causing Avalue to be unable to repair/replace a warranted but phased-out product, Avalue will, depending on the availability, upgrade the product (free of charge with continued warranty period as of the original product), or, give partial refund (based on the length of the remaining warranty period) to solve this kind of problem.

3.5 Maintenance Report

On completion of repair of a defective product, a Maintenance Report indicating the maintenance result and part(s) replaced (if any) will be sent to the customer together with the product. If the customer demands an additional maintenance analysis report, a service fee of various level will be charged depending on the warranty status. In case the analysis result shows that the defect attributes to Avalue's faulty design or process, the analysis fee will be exempted.

4. Service Products

Avalue provides service products to manage with different customer needs. Should you have any need, please consult to Avalue Sales Department.

Defect Analysis Report (DAR)

Avalue provides DAR (Defect Analysis Report) services aiming to elevating customer satisfaction. A DAR includes defect cause identification/verification/suggestion and improvement precautions, with instructions on correct usage for the avoidance of any reoccurrence.

Upgrade Service

Avalue is capable to provide system upgrade service for customization requirements. This upgrade service is applicable for main parts, such as CPU, memory, HDD, SSD, storage devices; also replacements motherboards of systems. Please contact Avalue sales for details to evaluate the possibility of system upgrade service and obtain information of lead time and price.

Safety Instructions

Safety Precautions

Before installing and using this device, please note the following precautions.

1. Read these safety instructions carefully.

2. Keep this User's Manual for future reference.

3. Disconnected this equipment from any AC outlet before cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.

7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

8. Use a power cord that has been approved for using with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to

avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel. If one of the following situations arises, get the equipment checked by service personnel:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well, or you cannot get it work according to the user's manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.

14. CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

15. Equipment intended only for use in a RESTRICTED ACCESS AREA.

Explanation of Graphical Symbols

	Warning	A WARNING statement provides important information about a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Caution	A CAUTION statement provides important information about a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.
	Note	A NOTE provides additional information intended to avoid inconveniences during operation.
DC		Direct current.
AC		Alternating current
		Stand-by, Power on
FC		FCC Certification
CE		CE Certification
		Follow the national requirements for disposal of equipment.
3		Stacking layer limit
		This side up

		Fragile Packaging
		Beware of water damage, moisture-proof
		Carton recyclable
		Handle with care
		Follow operating instructions of consult instructions for use.

Disposing of your old product

WARNING:

There is danger of explosion if the battery is mishandled or incorretly replaced. Replace only with the same type of battery. Do not disassemble it or attempt to recharge it outside the system. Do not crush, puncture, dispose of in fire, short the external contacts, or expose to water or ther liquids. Dispose of the battery in accordance with local regulations and instructions from your service provider.

CAUTION:

- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type. Dispose batteries according to manufacturer's instructions.
- Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION
- Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas.
- A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.

Mise en garde!

AVERTISSEMENT : Il existe un risque d'explosion si la batterie est mal manipulée ou remplacée de manière incorrecte. Remplacez uniquement par le même type de batterie. Ne le démontez pas et ne tentez pas de le recharger en dehors du système. Ne pas écraser, percer, jeter au feu, court-circuiter les contacts externes ou exposer à l'eau ou à d'autres liquides. Jetez la batterie conformément aux réglementations locales et aux instructions de votre fournisseur de services.

MISE EN GARDE:

- Pile au lithium Attention : Danger d'explosion si la pile n'est pas remplacée correctement. Remplacer uniquement par un type identique ou équivalent. Jetez les piles conformément aux instructions du fabricant.
- L'élimination d'une BATTERIE dans le feu ou dans un four chaud, ou l'écrasement ou le découpage mécanique d'une BATTERIE, pouvant entraîner une EXPLOSION
- Laisser une BATTERIE dans un environnement à température extrêmement élevée pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.
- UNE BATTERIE soumise à une pression d'air extrêmement basse pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.

Content

1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

Caution!

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	OSM-IMX8MM	1

If any of the above items is damaged or missing, contact your retailer.

1.3 Manual Objectives

This manual describes in details Avalue Technology OSM-IMX8MM Open Standard Module.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up OSM-IMX8MM or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.4 System Specifications

| System	
CPU	4xCortex-A53 core up to 1.8GHz per core 1x Cortex-M4 core up to 400MHz
System Chipset	NXP iMX8M Mini
System Memory	4GB (1G-4G optional)LPDDR4
Storage	
eMMC	16GB eMMC5.1(8-32GB Optional)
I/O Interface	
UART	4(UART4-Console)
Ethernet	1 RGMII
SDIO	2
USB2.0	2
I2C	4
PWM	3
SAI	3
SPI	2
JTAG	1
MIPI DSI	1
MIPI CSI	1(4 Lanes)
PCIe	1
GPIO	29
Mechanical & Environmental Specification	
Power Mode	5V 3A(PMIC:BD71847MWV)
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40~80C
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Size (L x W)	45*45mm(Size-L)
OS Information	Yocto 4.0

Note: Specifications are subject to change without notice.
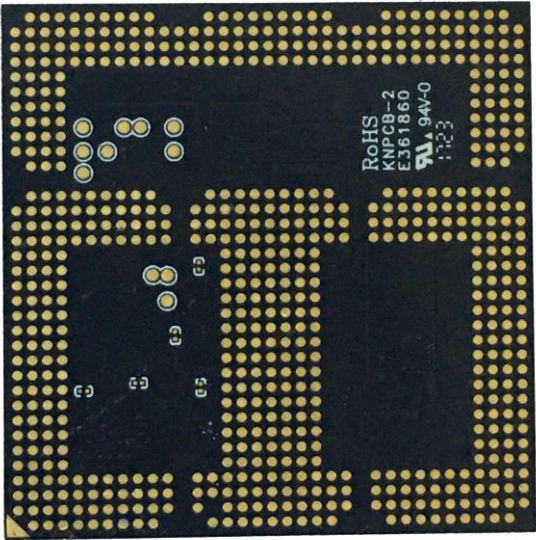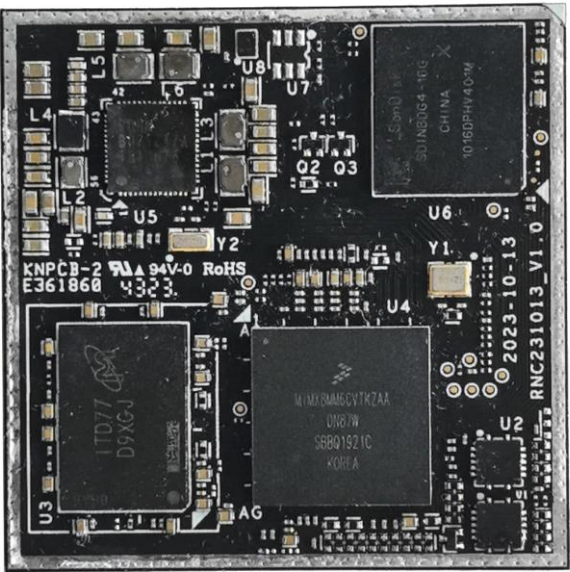
User condition suggestion:

User should consider overall power consumption including CPU and devices add-on, to choose suitable power adapter.
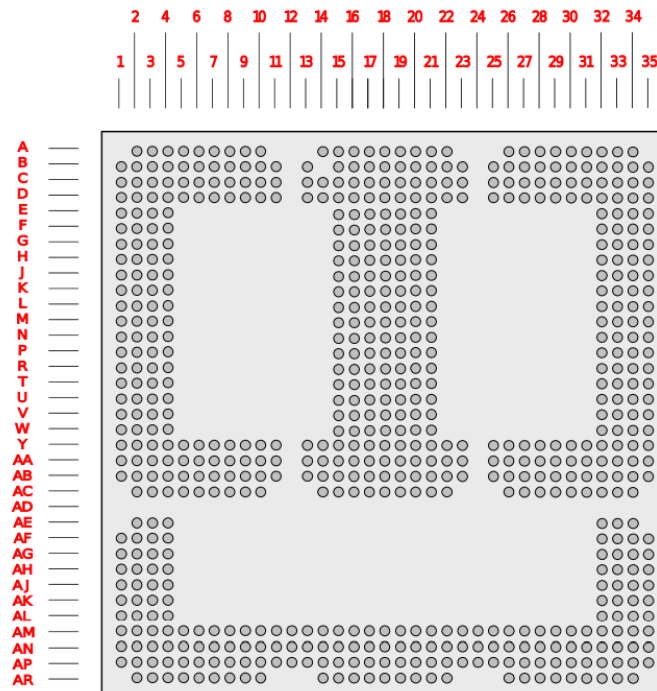
1.5 Architecture Overview—Block Diagram
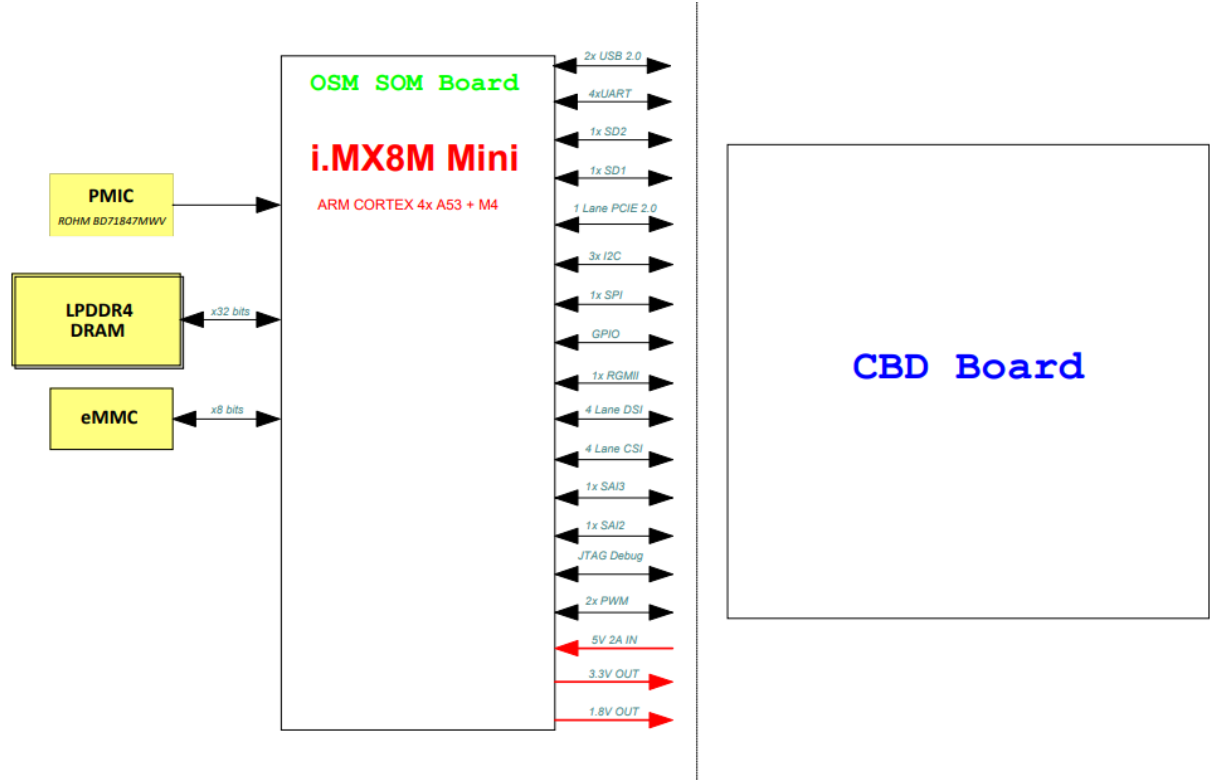
2. Hardware Configuration

2.1 Product Overview

2.2 Function & Pin define

Function	Contact Name	Contact Acronym	Function	Contact Name	Contact Acronym
JTAG	JTAG_TCK	N17	**I2C**	I2C2_SCL	AA15
	JTAG_TMS	N19		I2C2_SDA	AA16
	JTAG_TDI	P17		I2C4_SCL	AA20
	JTAG_TDO(SWO)	R17		I2C4_SDA	AA21
	JTAG_nTRST	R19	**ENET**	ENET_TD0	H15
	POR_B	C18		ENET_TD1	G15
UART	UART1_RXD	A14		ENET_TD2	H16
	UART1_TXD	B13		ENET_TD3	G16
	UART1_RTS	C13		ENET_TX_CTL	K16
	UART1_CTS	C14		ENET_TXC	J15
	UART3_RXD	D14		ENET_RD0	K15
	UART3_TXD	D13		ENET_RD1	L15
	UART3_RTS	D15		ENET_RD2	N15
	UART3_RTS	D16		ENET_RD3	P15
	UART2_RXD	A22		ENET_RX_CTL	M15
UART	UART2_TXD	B23	**ENET**	ENET_RXC	R15
UART	UART4_RXD	D22		ENET_MDIO	T15
Console	UART4_TXD	D23		ENET_MDC	T16

Function	Contact Name	Contact Acronym	Function	Contact Name	Contact Acronym
SDIO	SD2_CMD	E20	**USB**	USB1_DN	AB13
	SD2_CLK	F21		USB1_DP	AC14
	SD2_DATA0	G20		USB1_ID	AB14
	SD2_DATA1	G21		USB2_DN	AB23
	SD2_DATA2	H20		USB2_DP	AC22
	SD2_DATA3	H21		USB2_ID	AB22
	SD2_nCD	J21	**I2S**	SAI1_RXD0	V21
	SD2_WP	D20		SAI1_TXD0	W21
	SD2_nRST	D21		SAI1_RXD1	V19
	SD1_CLK	K20		SAI1_TXD1	W19
	SD1_CMD	K21		SAI1_MCLK	V18
	SD1_DATA0	L20		SAI1_TXFS	W18
	SD1_DATA1	L21		SAI1_TXC	W20
	SD1_DATA2	M21	**SPI**	ECSPI2_MISO	Y22
	SD1_DATA3	N20		ECSPI2_MOSI	Y23
	SD1_DATA4	N21		ECSPI2_SS0	AA23
	SD1_DATA5	P20		ECSPI2_SCLK	Y21
	SD1_DATA6	P21	**PWM**	SPDIF_EXT_CLK	F18
	SD1_DATA7	R21		SPDIF_RX	G18
	SD1_RESET_B	T20		SPDIF_TX	H18
	SD1_STROBE	U21			
MIPI-DSI	DSI_DN0	AB11	**MIPI-CSI**	CSI_DN0	C1
	DSI_DP0	AB10		CSI_DP0	B1
	DSI_DN1	AC9		CSI_DN1	A2
	DSI_DP1	AC8		CSI_DP1	A3
	DSI_DN2	AC6		CSI_DN2	A5
	DSI_DP2	AC5		CSI_DP2	A6
	DSI_DN3	AB5		CSI_DN3	B6
	DSI_DP3	AB4		CSI_DP3	B7
	DSI_CKN	AB8		CSI_CKN	B3
	DSI_CKP	AB7		CSI_CKP	B4
PCIE	PCIE_RXP	AB1		GPIO1_IO01	C2
	PCIE_RXN	AB2		I2C3_SDA	C3
	PCIE_TXP	AC2		I2C3_SCL	C4
	PCIE_TXN	AC3		CSI0_PWDN	G3
PCIE	PCIE_CLKP	W1	**MIPI-CSI**	CSI0_nRST	G4
	PCIE_CLKN	Y1	**GPIO**	GPIO1_IO05	D17
Vendor	SAI1_RXD2	C6		GPIO1_IO00	E17

Function	Contact Name	Contact Acronym	Function	Contact Name	Contact Acronym
Defined	SAI1_RXD3	C7		BOOT_MODE0	F17
	SAI1_RXD4	D6		GPIO1_IO08	G17
	SAI1_RXD5	D7		GPIO1_IO09	H17
	SAI1_TXD2	B22		GPIO1_IO10	J17
	SAI1_RXC	C16		GPIO1_IO11	K17
	SAI1_RXFS	P16		GPIO1_IO12	L17
	SAI3_MCLK	Y29		GPIO1_IO13	D19
	SAI3_TXFS	Y30		GPIO1_IO14	E19
	SAI3_TXC	Y31		GPIO1_IO15	F19
	SAI3_TXD	AA29		SAI1_TXD7	G19
	SAI3_RXFS	AA30		SAI1_TXD6	H19
	SAI3_RXC	AA31		SAI1_TXD5	J19
	SAI3_RXD	AK32		SAI1_TXD4	K19
	SAI2_MCLK	AK33		SAI1_TXD3	L19
	SAI2_TXFS	AL32		GPIO3_IO01	D3
	SAI2_TXC	AL33		GPIO3_IO00	D4
	SAI2_TXD	AM32		GPIO3_IO06	E3
	SAI2_RXD	AM33		GPIO3_IO07	E4
GPIO	SAI1_RXD6	AF32		GPIO3_IO08	F3
	SAI1_RXD7	AF33		GPIO3_IO09	F4
	SAI2_RXFS	AG32		SAI5_RXD3	U32
	SAI2_RXC	AG33		SAI5_RXD2	U33
	SAI5_RXC	W32		SAI5_RXD1	V32
	SAI5_RXFS	W33		SAI5_RXD0	V33
	SAI5_MCLK	Y32			
POWER	VDD_3V3	M17,M19,Y16,Y20, AA33,B29	**POWER**	BOOT_MODE1	U19
	VSYS_5V	Y17,Y25,Y26,Y27,Y 2 8, AE4, AF4, AG4, AH3, AH4, AJ3, AJ4, AK4, Y8, Y9, Y10, Y11		SYS_nRST	U17
	VDD_1V8	Y3,C5			
Ground	GND	D18, E15, E21, F16, F20, J16, J20, L18, M16, M20, P18, R16, R20, V16, V20, Y18, AA14, AA17, AA19, AA22, AB15, AB21，A4, A7, A10, B2, B5,			

Ground	GND	B8, B9, C11, D1, D5, D8, E2, H2, H4, L2, L4, P2, P4, R1, U2, U4, V1, W3, Y2, AA1, AA4, AA7, AA8, AA10, AA11, AB3, AB6, AB9, AC4, AC7, AC10，A26, A29, A32, B27, B28, B30, B33, C25, C32, C35, D28, D34, F33, F35, G34, H32, J33, J35, K34, M35, N34, T34, W34, AA25, AA26, AA27, AA28, AA32, AB28, AB31, AB34, AC27, AC30, AC33，AE2, AE34, AF35, AG3, AH2, AH34, AJ35, AK3, AL2, AL34, AM13, AM16, AM19, AM22, AM35, AN3, AN6, AN9, AN11, AN15, AN18, AN21, AN33, AP2, AP5, AP8, AP13, AP16, AP19, AP22, AP25, AP28, AP31, AP34, AR14, AR17, AR20, AR26, AR29, AR32

3. Mechanical Drawing
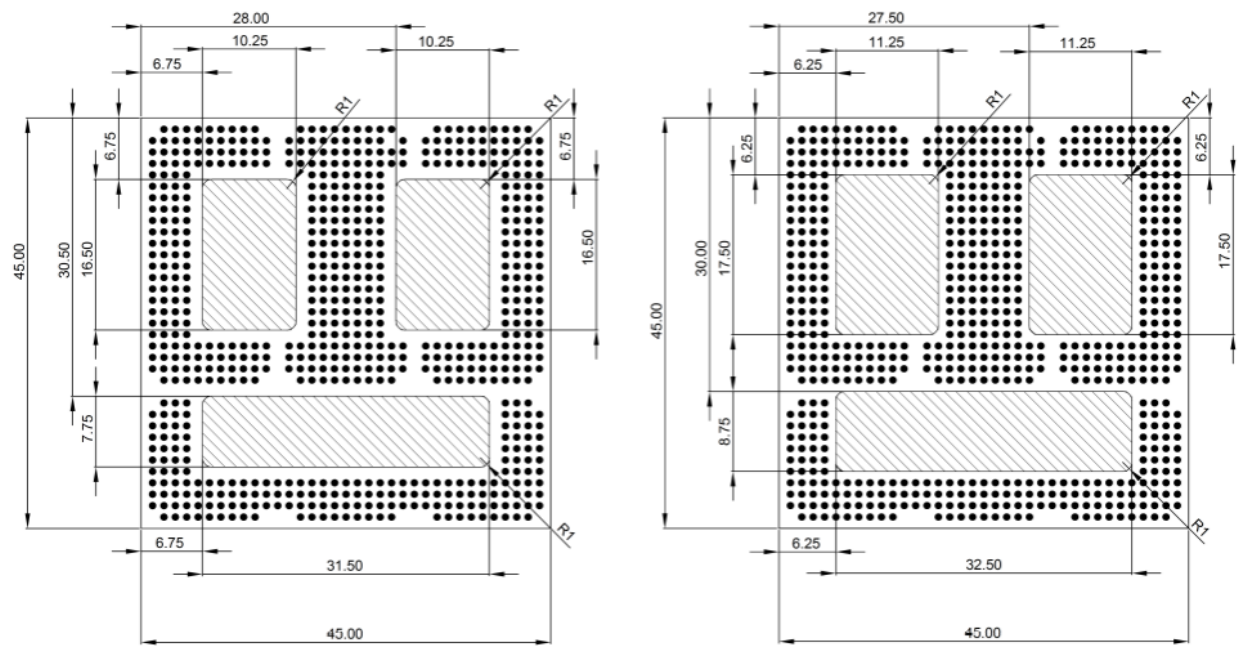
Unit: mm

4. Carrier Board

4.1   System Specifications

OSM-Module	
CPU	4 x Cortex-A53 core up to 1.8GHz per core 1 x Cortex-M4 core up to 400MHz
System Chipset	NXP iMX8M Mini
System Memory	1 x 2GB（1G-8G optional）
Storage	
TF Slot	1 x TF Slot
SIM Card Slot	1 x SIM Card Slot
Mini-PCIE	1 x Mini-PCIE (support 4G module)
eMMC	1x 8GB eMMC5.1 (8-32GB Optional)
SD / Micro Card	1
Edge I/O	
Gigabit Ethernet	1 x 2 Port (J15 Support POE PD 12V Function with POE Module)
USB	3 x USB2.0 (2* USB2.0 TypeA, 1* USB Touch)
HDMI	1 x HDMI
TYPE-C	1 x TYPE-C
Audio Slot	1 x 3.5mm Audio Slot
DC INPUT	1 x DC INPUT
Onboard I/O	
Speaker	1 x speaker
PoE PD Input	1 x PoE PD Input
Wi-Fi/BT	AP6275S module, support 802.11 a/b/g/n/ac
Mic In	1 x Mic In
USB	1 x USB2.0
CAN	2 x Can
Expand Slot	1 x Expand Slot (The UART signal come from UART3 of the OSM)
Debug	1 x Debug (Use The UART4 from the OSM)
FPC Slot	3 x FPC Slot
PoE PD	1 x PoE PD 12V Out
IR Receiver	1 x IR Receiver
Expand Connector	1 x Expand Connector
Button	1 x Button for Recovery key
Mechanical & Environmental Specification	

Power Mode	12V2A
Operating Temp.	-40℃ ~ +85℃
Storage Temp.	-40~80C
Operating Humidity	40°C @ 95% Relative Humidity, Non-condensing
Size (L x W)	125*120mm
OS Information	Yocto 4.0

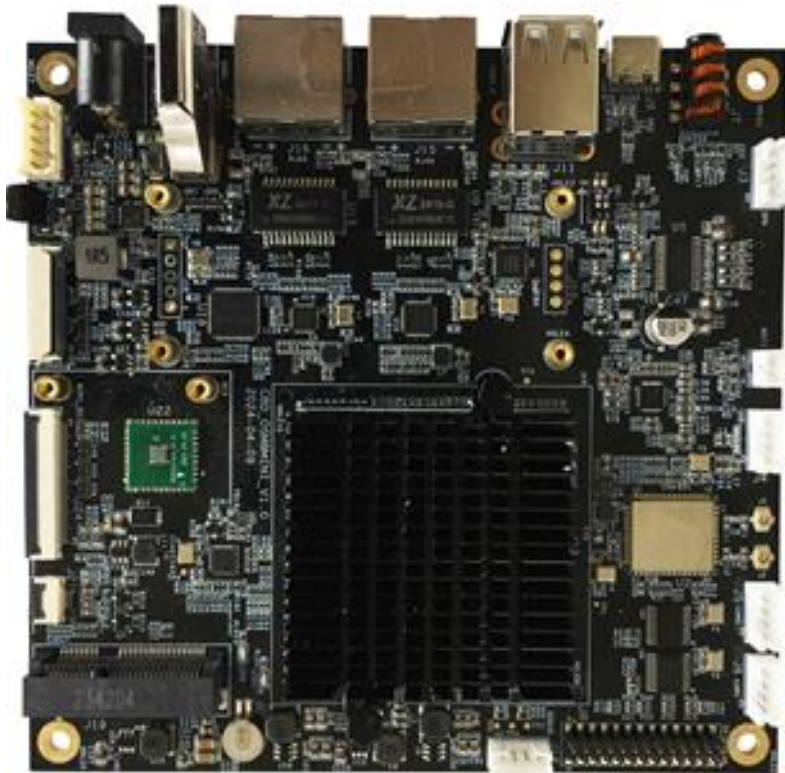**Note:** Specifications are subject to change without notice.

User condition suggestion:

User should consider overall power consumption including CPU and devices add-on, to choose suitable power adapter.
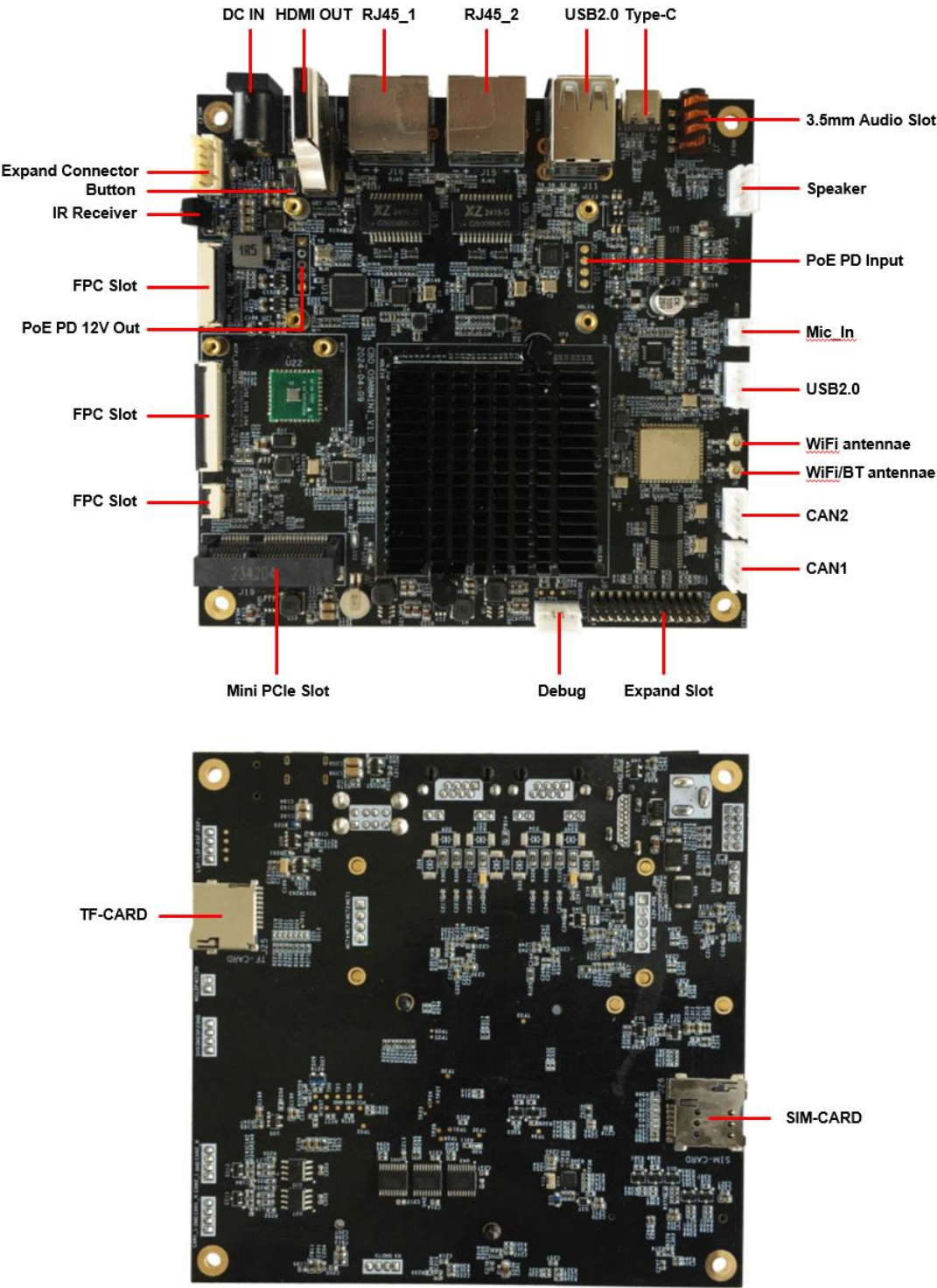
4.2 Architecture Overview—Block Diagram
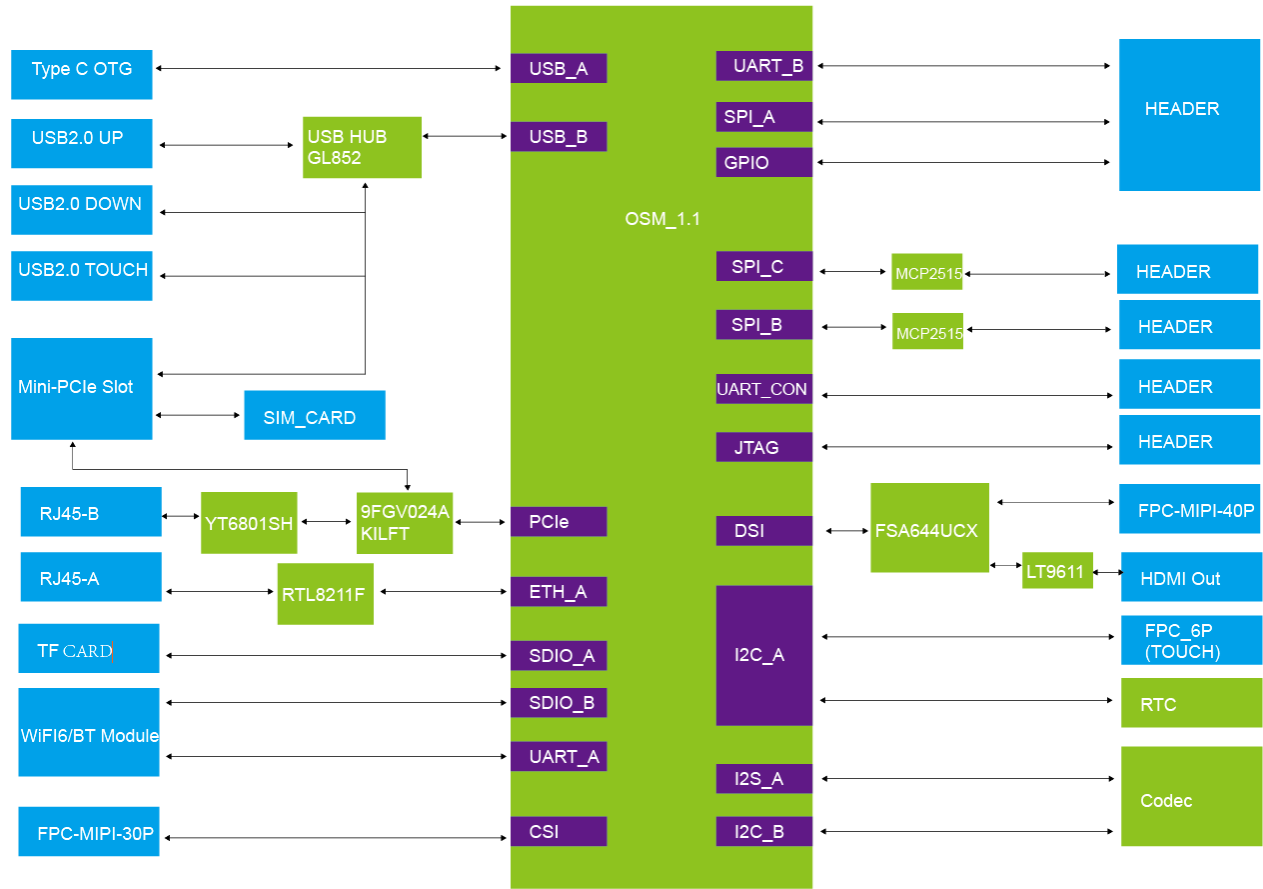
4.3   Product Oveview
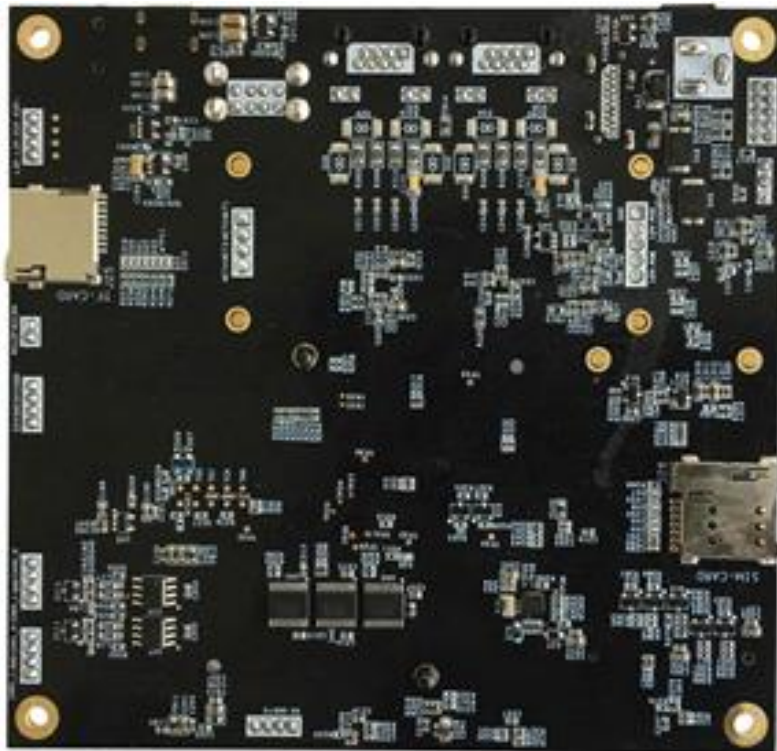
4.4   Product Overview

4.5 Jumper and Connector List

Connectors

Label	Function	Note
DC IN	12V/2A DC Power input	
HDMI OUT	*1, up to 1080P60	
RJ45_1	1000M Ethernet Port	
RJ45_2	1000M Ethernet Port Support PoE PD 12V	
USB2.0	USB2.0 Type A	
Type-C	For OTG	
3.5mm Audio Slot	1* HeadPhone	
Speaker	4 Pin 2.0mm PH2.0	
PoE PD Input	4 Pin 2.0mm PH2.0	
Mic_In	2 Pin 2.0mm PH2.0	
USB2.0	4 Pin 2.0mm PH2.0 for USB Touch panel connector	
WiFi antennae	IPEX-1	
WiFi/BT antennae	IPEX-1	
CAN2	4 Pin 2.0mm PH2.0	
CAN1	4 Pin 2.0mm PH2.0	
Expand Slot	26 * GPIO(SPI*1/UART*1/3.3V*1/5V*1)	
Debug	4 Pin 2.0mm PH2.0 UART for Debug	
Mini PCIe Slot	*1 (Support 4G module)	
FPC Slot	6Pin 0.5mm for Touch Panel	
FPC Slot	40 Pin 0.5mm for MIPI DSI	
FPC Slot	30 Pin 0.5mm for MIPI CSI	
PoE PD 12V Out	5 Pin 2.0mm PH2.0	
IR Receiver	*1 Infrared remote control reception	
Button	*1 Recovery Key	
Expand Connector	For Keypad/LED 10 Pin 2.0mm	
TF-CARD	1*TF-CARD	
SIM-CARD	1* SIM-CARD	

4.6   OSM-IMX8MM Setting Connectors

4.6.1 SPEAKER(J3)
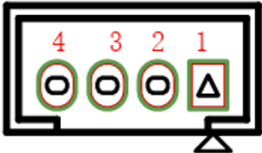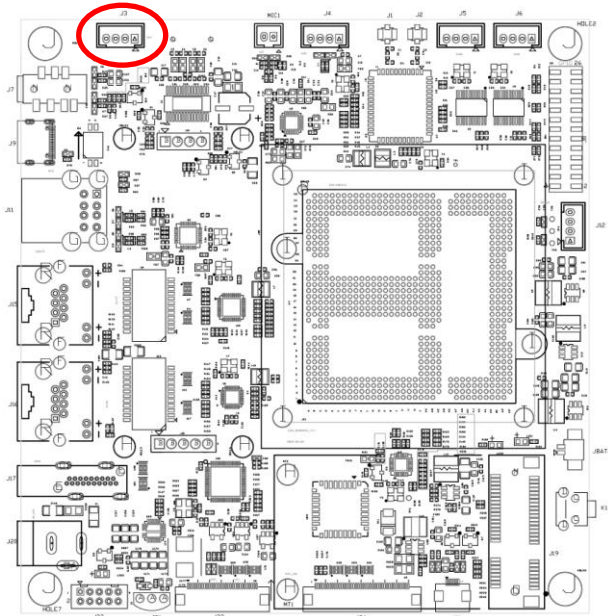
Signal	PIN
AL-	1
AL+	2
AR-	3
AR+	4

4.6.2 MIC(MIC1)
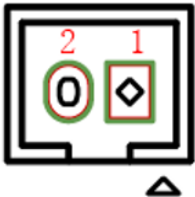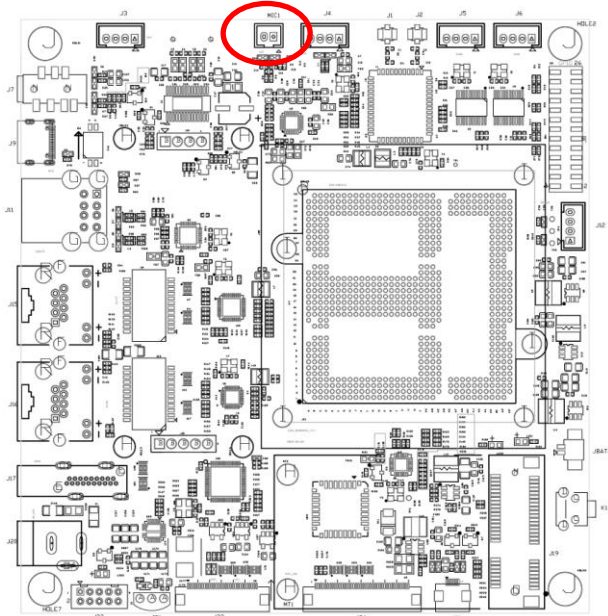
Signal	PIN
MIC_P	1
MIC_N	2

4.6.3 USB 2.0 Slot (J4)
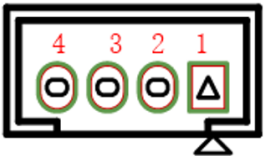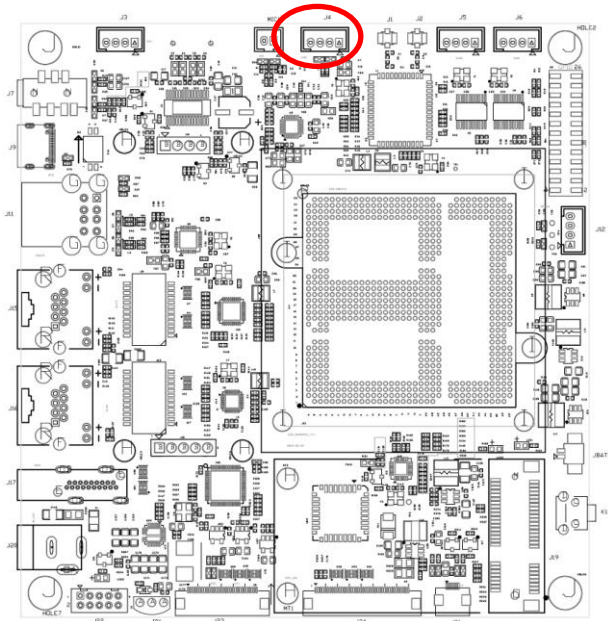
Signal	PIN
+5V	1
Data-	2
Data+	3
GND	4

4.6.4 CAN Bus(J5(CAN2)/J6(CAN1))
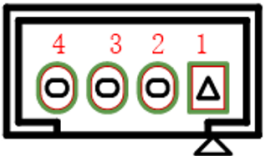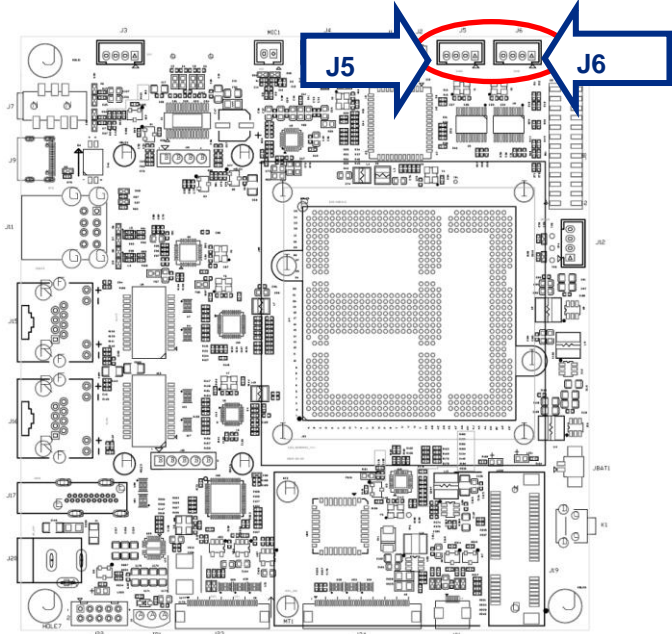
Signal	PIN
CAN_L	1
GND	2
CAN_H	3
NC	4

4.6.5 Expand slot(J8)
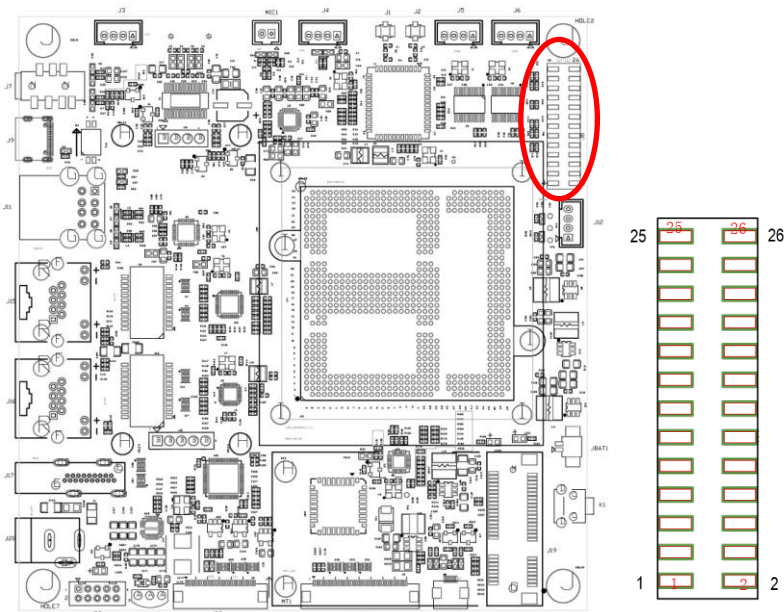
Signal	PIN	PIN	Signal
GND	25	26	GND
SPI_A_SCK_3V3	23	24	PWM3/GPIO_C2
SPI_A_CS0#_3V3	21	22	PWM2/GPIO_C1
GND	19	20	GND
SPI_A_D3/HOLD_3V3	17	18	UART0_RTS
SPI_A_D2/WP_3V3	15	16	UART0_RX
GND	13	14	GND
SPI_A_D1_3V3	11	12	UART0_TX
SPI_A_D0_3V3	9	10	UART0_CTS
GND	7	8	GND
+3.3V	5	6	+3.3V
GND	3	4	GND
+5V	1	2	+5V

4.6.6 Debug(J12)
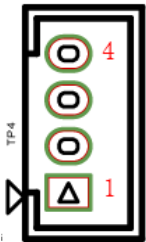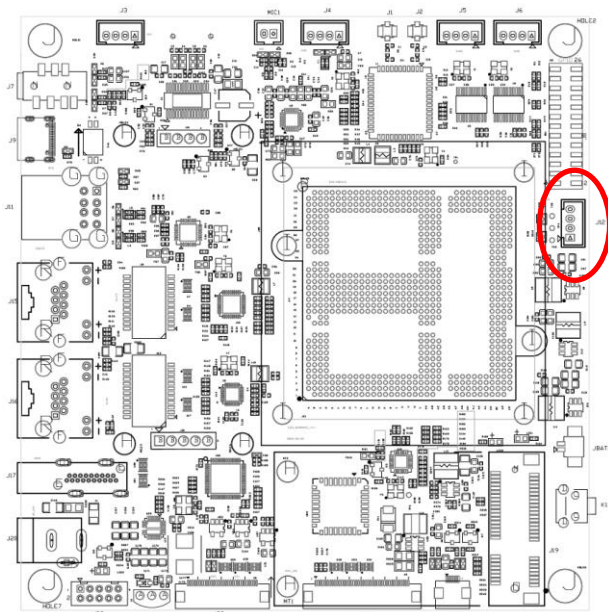
Signal	PIN
NC	4
TX	3
GND	2
RX	1

4.6.7 RTC Battery interface(JBAT1)
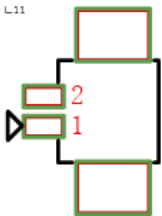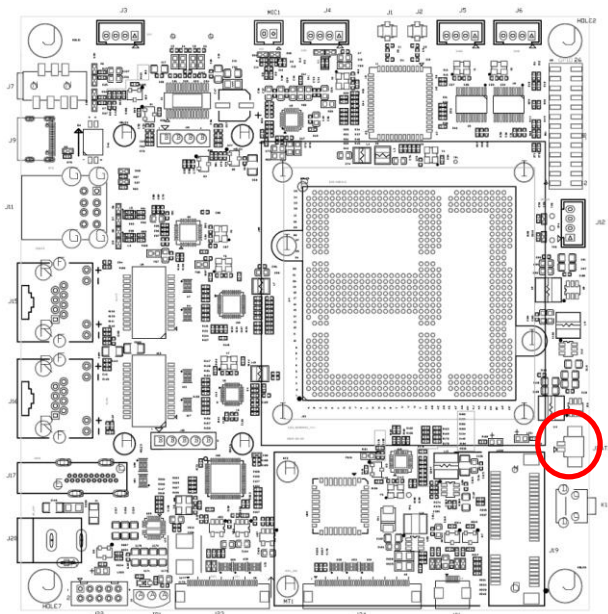
Signal	PIN
GND	2
VDD_RTC	1

4.6.8 I2C for TP(J21)
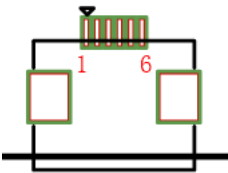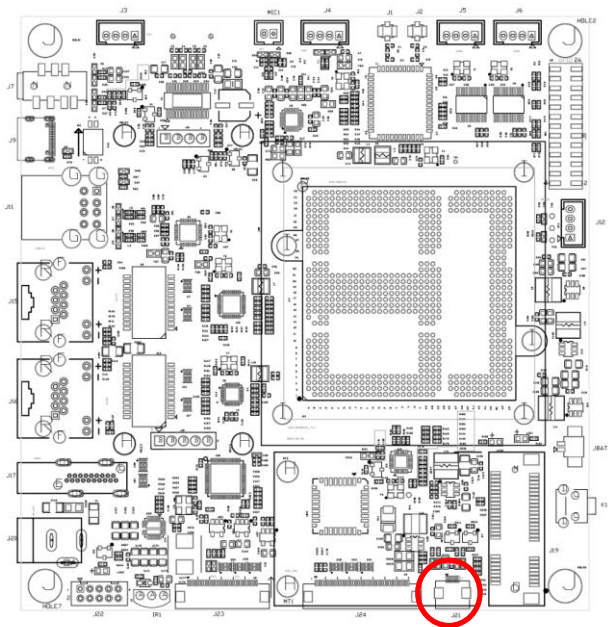
Signal	PIN
SCL	1
SDA	2
VCC	3
RESET	4
INT	5
GND	6

4.6.9   MIPI DSI(J24)
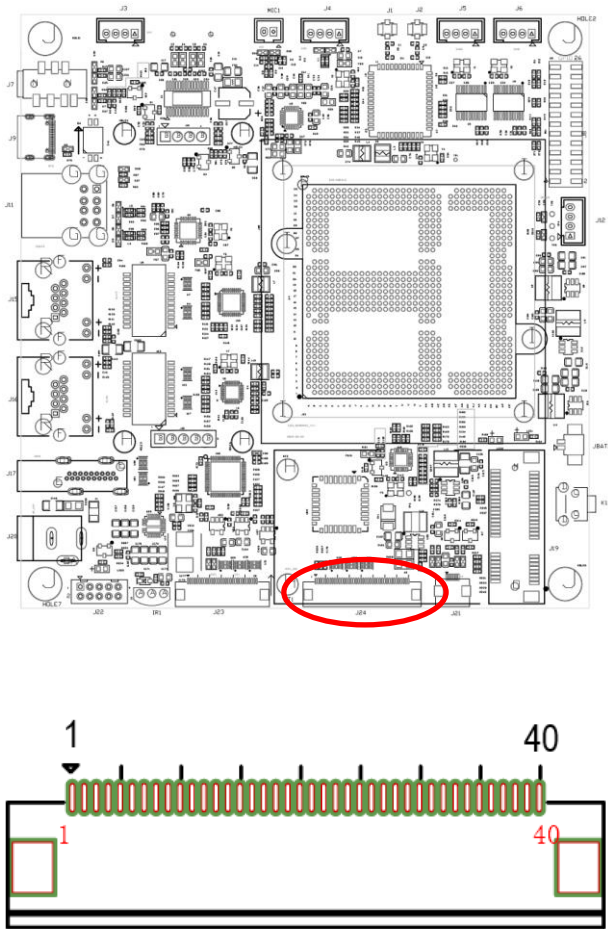
Signal	PIN
NC	1
+3.3V	2
+1.8V	3
GND	4
RESET	5
NC	6
GND	7
DN0	8
DP0	9
GND	10

Signal	PIN
DN1	11
DP1	12
GND	13
CLKN	14
CLKP	15
GND	16
DN2	17
DP2	18
GND	19
DN3	20
DP3	21
GND	22
NC	23
NC	24
GND	25
NC	26
PWM_OUT	27
NC	28
NC	29
GND	30
LED-	31
LED-	32
NC	33
NC	34
NC	35
NC	36
NC	37
NC	38
LED+	39
LED+	40

4.6.10 CSI(J23)
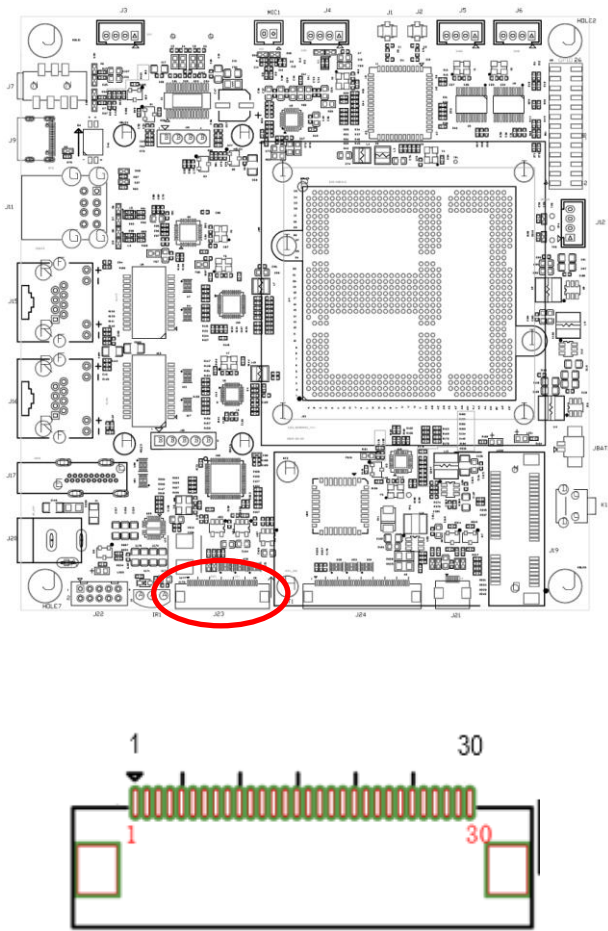
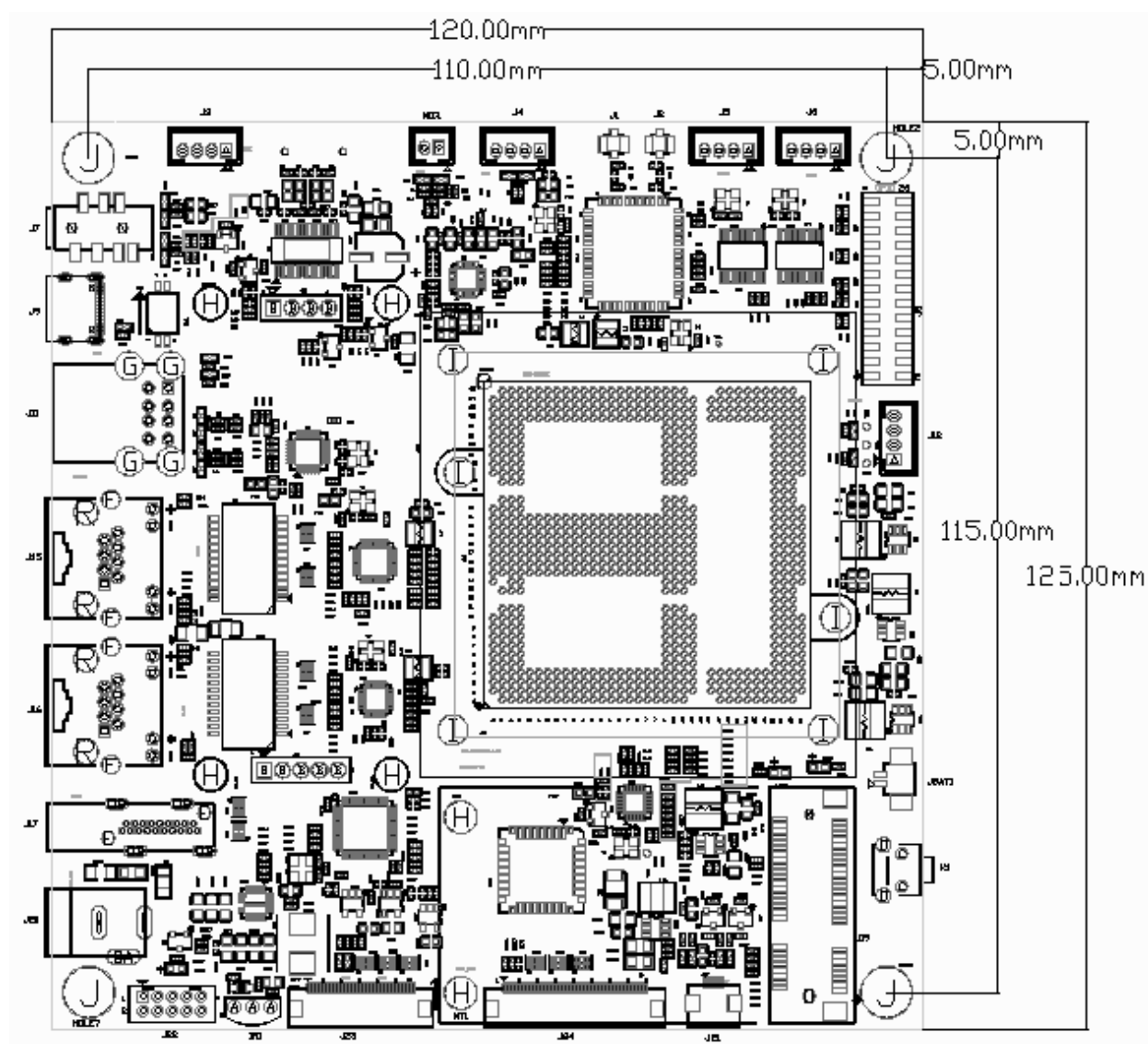| Signal	PIN
NC	1
+2.8V	2
+1.2V	3
+1.8V	4
NC	5
GND	6
+2.8V	7
GND	8
SDA	9
SCL	10
RESET	11
+1.8V	12
GND	13
MCLK	14
GND	15
DP3	16
DN3	17
GND	18
DP2	19
DN2	20
GND	21
DP1	22
DN1	23
GND	24
CLKP	25
CLKN	26
GND	27
DP0	28
DN0	29
GND	30

4.6.11 KeyPad(J22)
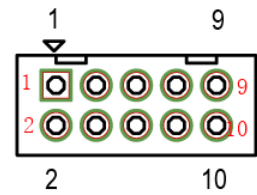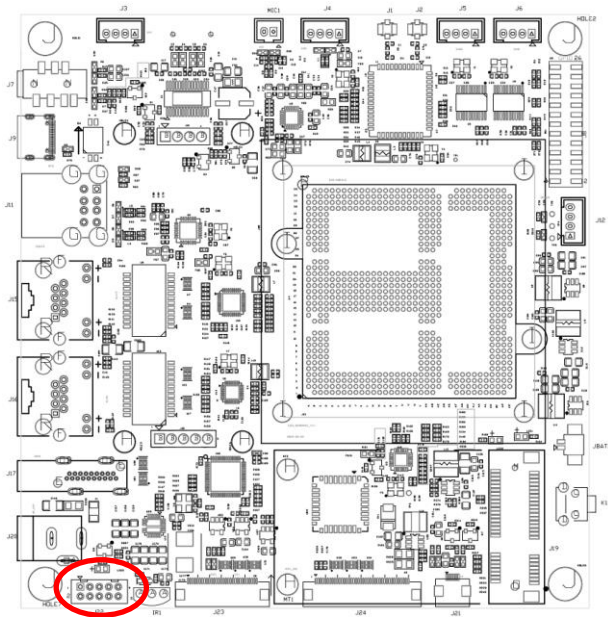
Note: To Use the IR receiver function, in addition to connecting pin9 and pin10, please make sure to also connect a GND pin to complete the circuit.

PIN	Signal	Funtion
1	SYS_RST#	Reset button
2	GND	
3	PWR_KEY	Power button
4	GND	
5	Update	Update Key
6	GND	
7	Power_LED+	Power LED
8	Power_LED-	
9	+3.3V	IR receiver
10	IR_IN	

4.7   Mechanical Drawing

Unit: mm