



# MYD-C8MMX-V2

## EVK Hardware User`s Guide

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# History

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# 1. Overview

In response to industry applications and meet customers' demand for high-performance boards, MYIR launched the NXP company i.MX 8M Mini series processor development platform: MYD-C8MMX.

The development board adopts the form of a core board (MYC-C8MMX-V2) + carrier board (MYB-C8MMX), which supports common communication and multimedia interfaces, such as Gigabit Ethernet, MIPI-DSI, MIPI-CSI, USB2.0, I2C, SPI, UART etc. We will provide Linux and Android 9 full package and supporting documentation to help guests reduce development difficulty to accelerate product development and shorten time to market. In the development stage, it is recommended to match the core board supporting evaluation suite MYD-C8MMX to accelerate the development.

## 1.1. EVK Introduction

The MYC-C8MMX-V2 core board is designed with a high-speed circuit board and integrates processor, DDR4, eMMC, Ethernet, QSPI, PMIC power management on a 49x60mm size board.

MYB-C8MMX is an extended carrier board used with MYC-C8MMX-V2 core board, with 12V 2A DC power supply, equipped with Single/double lane LVDS display interface, MIPI-DSI display interface, MIPI-CSI camera interface, USB2.0 interface, Gigabit Ethernet, WIFI + BT, 4G module, audio, TF card, 3 serial port, ESPI interface, M.2 interface, IO extension and other functions.

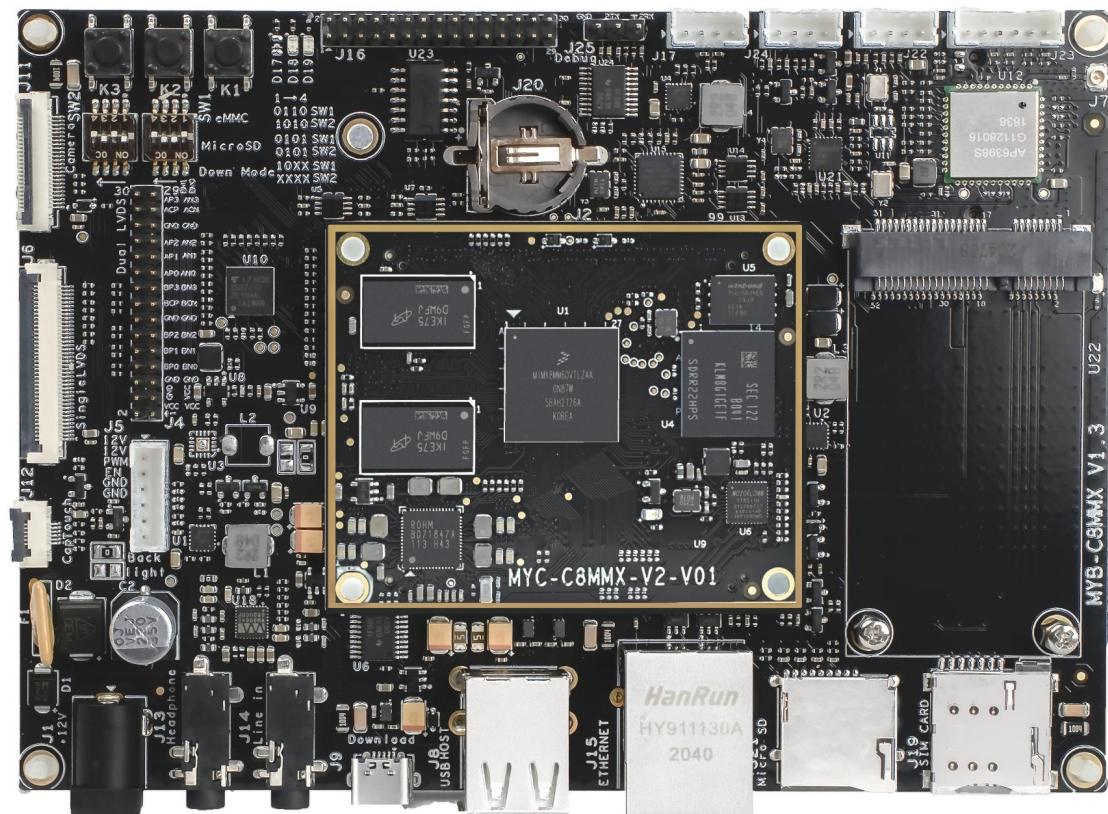


Figure 1- 1 MYD-C8MMX-V2 Kit

## 1.2. Block Diagram

*MYC-C8MMX DDR4-EVK Block Diagram*

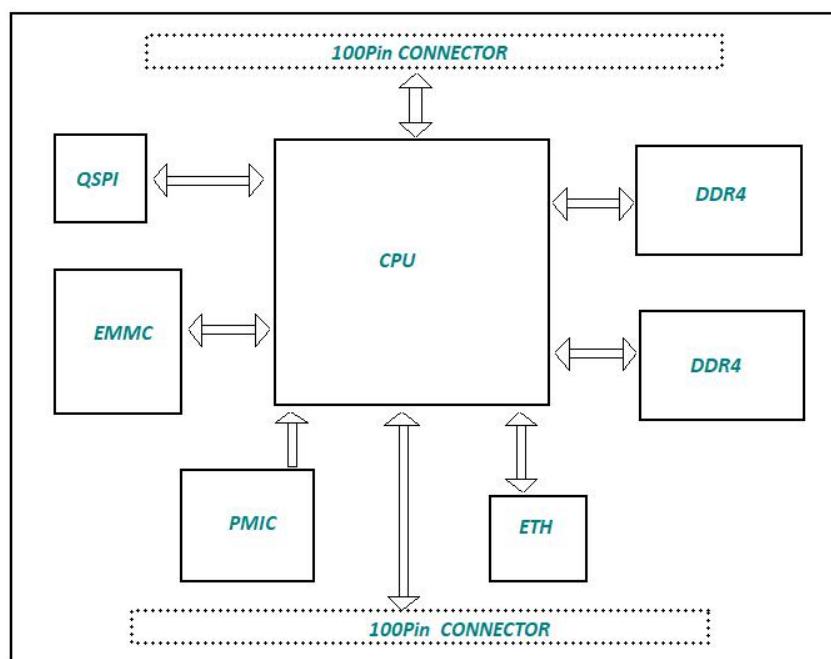


Figure 1- 2 core board diagram

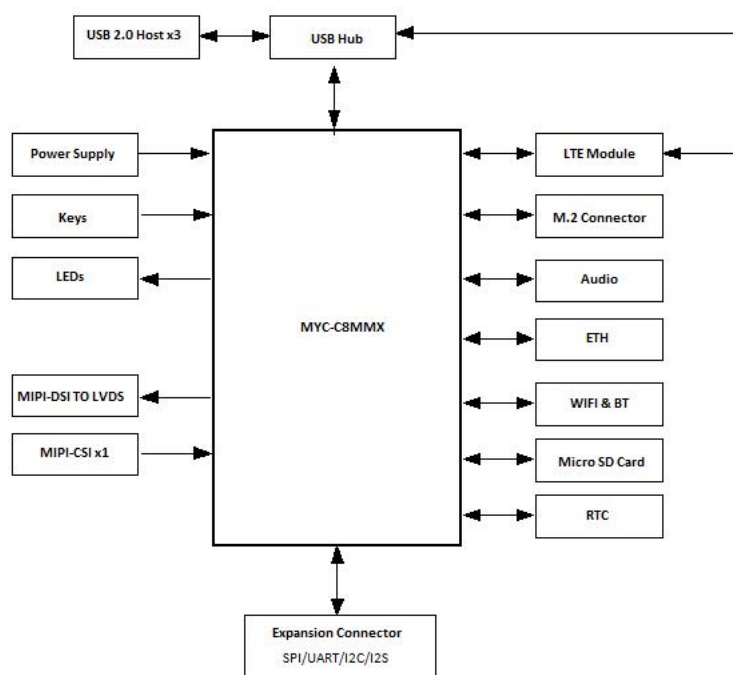


Figure 1- 3 carrier board diagram



Buttons

Expansion Header

Debug

USB2.0

UART3

UART4

ESPI

WIFI/BT ANT

WIFI/BT

Boot Switch

Camera

Dual LVDS LCD

Single LVDS LCD

Backlight

TP

12V POWER IN

Audio Out

Audio In

Micro USB

USB2.0

ETH

Micro SD

SIM Card

3V  
GND  
PM-CK  
PM-D0  
PM-D1  
PM-D3  
NC  
SA1-CK  
SA1-TS  
SA2-TS  
SA2-ID  
SA1-TC  
SA2-TC  
SA3-RS  
SA5-RD  
SA5-RC  
GND  
I2C4-SD  
URT3-RS  
U5B2-ID  
URT3-CS

MIPI Interface

SSD Card

- 8 -



## 1.4. Reference Resource

MYIR Electronics provides supporting hardware and software information, including but not limited to the product manual, hardware design guide, device manual, software development guide, system mirror image, etc. Please go to: <http://d.myirtech.com/MYD-C8MMX/> for download.

## 2. Power Parameters

### 2.1. Power Tree

The system input voltage is 12V, and the power path mainly has 12V to 5V, 3.8V, 3.3V. Select the DC-DC TLV62130 whose maximum output current is 3A. DC-DC can provide a relatively high power conversion efficiency, reduce the whole board work consumption.

The 5V voltage is mainly used to supply power to the carrier board and core board, and supply USB HUB, MIPI-CSI, MIPI-DSI, LVDS, TF card, etc; 3.8V voltage is mainly supplied to 4G module; 3.3V voltage is mainly supplied to M.2 solid state disk.

The RTC battery input is an optional power input. When the system is powered down, If the RTC does not need to work, and this power supply may not be provided.

The power topology is as follows:

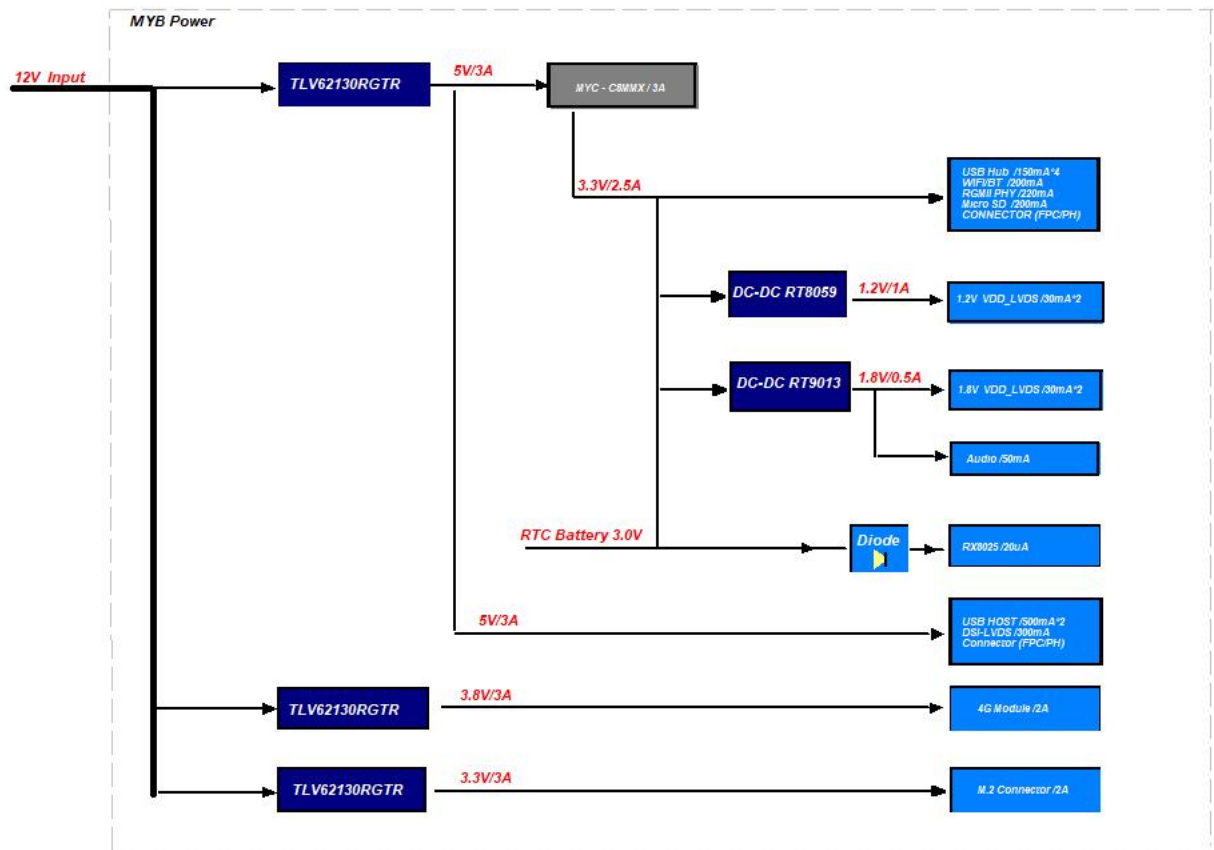


Figure 2 - 1 EVK Power Tree

## 2.2. Power Consumption

Condition	Voltage	Current	Power Consumption
During uboot	12.0V	0.11A	1.32W
Mem state command: echo mem> /sys/power/state	12.0V	0.01A	0.12W
Freeze state command: echo freeze> /sys/power/state	12.0V	0.09A	1.08W
In the linux environment No peripherals	12.0V	0.12A	1.44W
In the linux environment Peripherals fully loaded	12.0V	1.61A	19.36W

**Table 2 - 1 EVK Power Consumpiton**

## 2.3. Requirement of Power Supply

The carrier board standard supply voltage is 12V. If the customer does not want to use 12V power supply, the supply voltage can also be adjusted within 6-17V wide voltage range. Note that if the user uses a non-12V input power supply but satisfies the wide range of power supply, it is necessary to ensure that the power supply capacity is sufficient.

## 3. Boot Config

### 3.1. Boot Mode

The i.MX 8M Mini series processor starts by executing the program in the internal boot ROM of the chip. Boot ROM determines the boot mode by reading the boot mode register and configuring pins. The specific correspondence is as follows:

Boot Mode [1:0]	function	Description
00	Boot from Fuse	Read the start-up information from internal fuses, which is recommended by NXP for mass production.
01	Serial Downloader	Support for downloading program from serial port to flash. It should be noted that in this mode, UART1 and UART2 have a higher priority than the USB1_OTG port. If there is data being checked in UART1 or UART2, the downloader can't load the programme with USB1 port.
10	Internal Boot	Read the boot configuration from the boot pin. This mode is recommended for development phase, and many users also use this mode directly for mass production.
11	Reserved	

**Table 3 - 1 BOOT Start mode configuration**

### 3.2. Boot Device

The i.MX8M Mini series processors support different boot devices. There will also be more pins for starting equipment to be configured, with a total of 16 pins. BOOT\_CFG [7:0] corresponds to pin SAI1\_RXD [7:0], and BOOT\_CFG [15:8] corresponds to pin SAI1\_TXD [7:0].

Before setting up BOOT\_CFG, make sure that boot mode is set correctly. This section uses BOOT MODE as an example to describe how to set the internal BOOT.

BOOT\_CFG[15:0] has no pull-up or pull-down resistors designed on the core board. Therefore, we need add pull-up or pull-down resistors correctly on the carrier board to ensure the boot device is right. Please refer to the corresponding configuration as follows:

BOOT_CFG[15:0]	Boot Device	description
X001 00XX XXX1 000X	SD/eSD (uSDHC1)	
X001 01XX XXX1 000X	SD/eSD (uSDHC2)	

X010 10XX X010 0011	eMMC (uSDHC3)	
X110 X010 XXXX XXXX	QSPI	

**Table 3 - 2 Boot device configuration**

switch	Signal name	Voltage level
SW1-Bit1	BOOT_MODE0	0
SW1-Bit2	BOOT_MODE1	1
SW1-Bit3	SAI1_TXD1	1
SW1-Bit4	SAI1_TXD2	0
SW2-Bit1	SAI1_TXD3	1
SW2-Bit2	SAI1_TXD4	0
SW2-Bit3	SAI1_TXD5	1
SW2-Bit4	SAI1_TXD6	0

**Table 3 - 3 Core board eMMC startup configuration**

switch	Signal name	Voltage level
SW1-Bit1	BOOT_MODE0	0
SW1-Bit2	BOOT_MODE1	1
SW1-Bit3	SAI1_TXD1	0
SW1-Bit4	SAI1_TXD2	1
SW2-Bit1	SAI1_TXD3	0
SW2-Bit2	SAI1_TXD4	1
SW2-Bit3	SAI1_TXD5	0
SW2-Bit4	SAI1_TXD6	1

**Table 3 - 4 Core board SD card startup configuration**

## 4. Interface Layout

The overall interface layout map of the evaluation board is as follows.

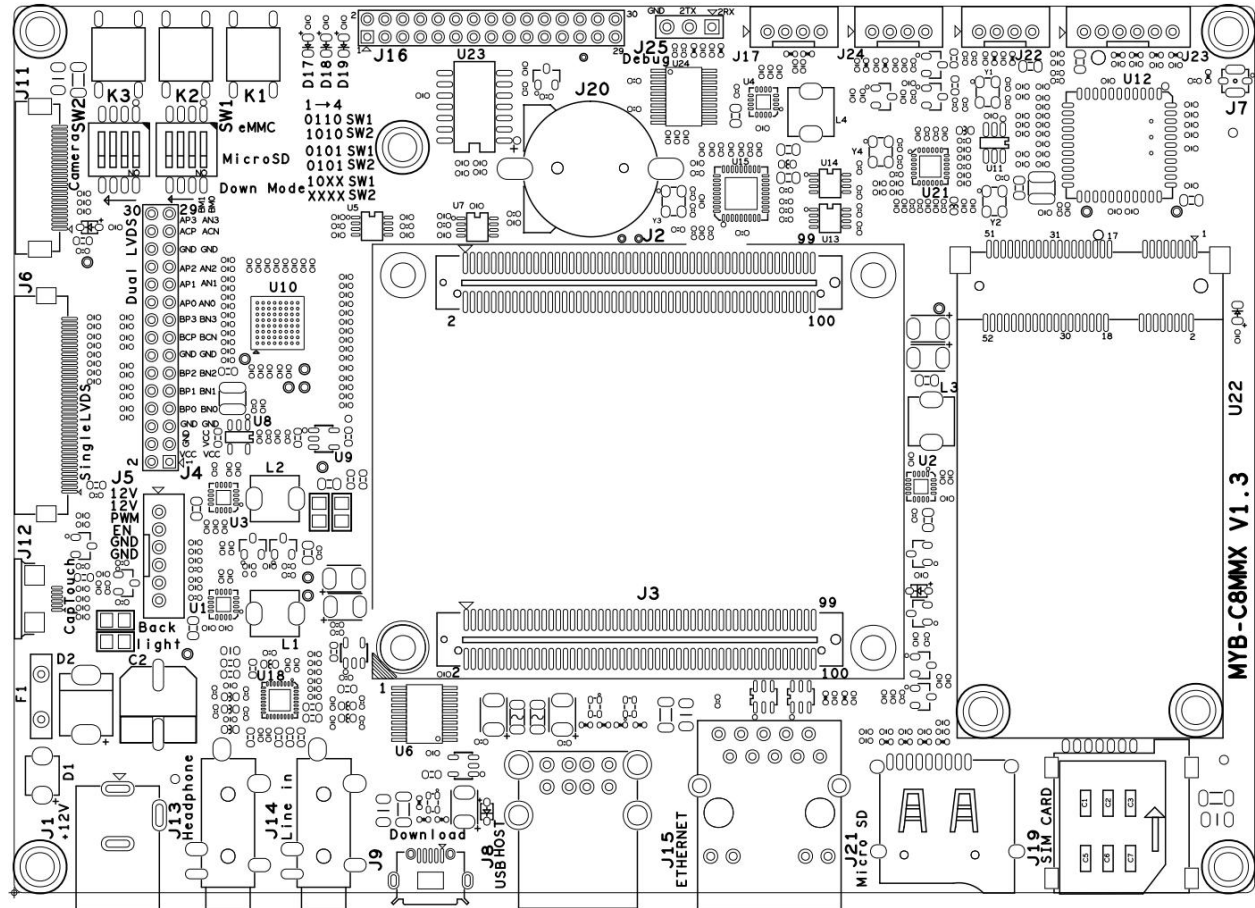


Figure 4 - 1 MYB-C8MMX Interface Layout Top View

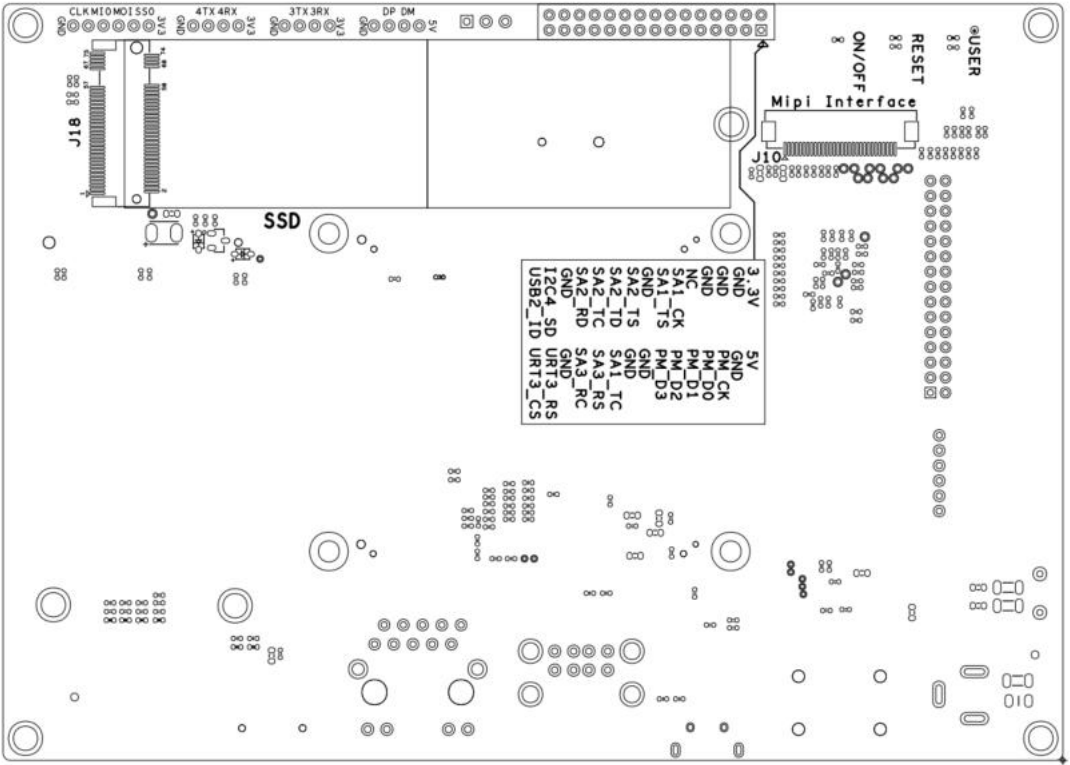


Figure 4 - 2 MYB-C8MMX Interface Layout Bottom View



## 4.1. Power Interface

The power input connector is: DC Jack. Evaluation board power supply has no overvoltage protection, please use the specified operating voltage.

It is recommended to use the 12V 2A DC adapter as the power input, the non-12V DC adapter please refer to the Section 2.3 power consumption and power supply requirements to choose the appropriate power supply.

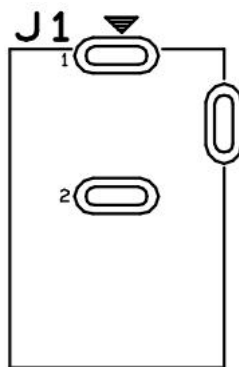


Figure 4 - 3 Connector of Power Input

### 4.1.1. Pin Description

Ref	Pin	Function	Name	Comments
J1	1	System power input, +	12V	DC Jack, recommended DC heads external diameter is 5.6mm, and inner diameter is 1.65mm
	2	GND	DGND	
	3	empty	NC	

Table 4 - 1 Power interface description

## 4.2. UART

The carrier board has a 3 pin 2.54mm pitch header for user debugging, which uses UART2 of CPU, and the reference number is J25. At the same time, the carrier board also reserves UART3 and UART4, which are connected to 4 pin headers as extended interfaces for external devices, the reference numbers are J22 and J24.

When using J22 and J24, note that the voltage level of the uart signals is 3.3V, so don't connect them to a 5V uart port or RS232 port directly. What's more, don't forget to connect the GND signal at the same time.

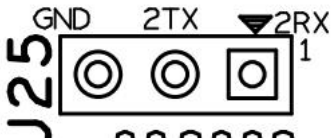


Figure 4 - 4 Debug Uart

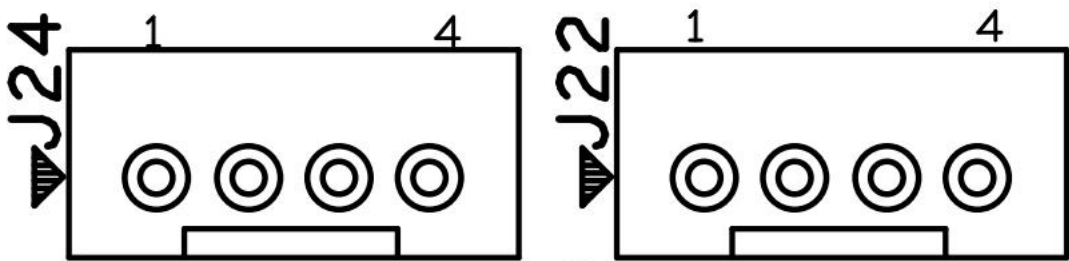


Figure 4 - 5 external Uart

### 4.2.1. Pin Description

Ref	Pin	Function	Name	Comments
J25	1	Serial data receive	UART2_RXD33	
	2	Serial data transmit	UART2_TXD33	
	3	GND	DGND	

Table 4 - 2 Debug Uart description

Ref	Pin	Function	Name	Comments
J22	1	Power 3.3V	VDD_3V3	
	2	Serial data receive	UART4_RXD33	
	3	Serial data transmit	UART4_TXD33	
	4	GND	DGND	

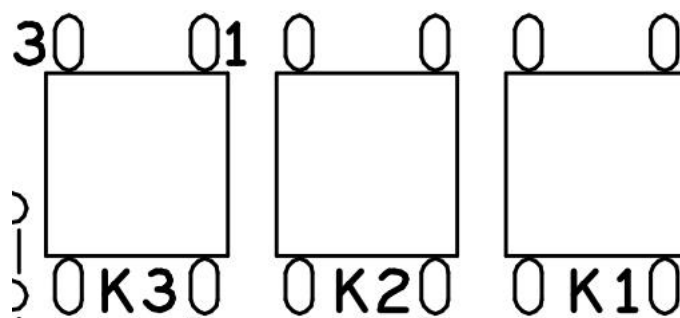
**Table 4 -3 external Uart 4 Description**

Ref	Pin	Function	Name	Comments
J24	1	Power 3.3V	VDD_3V3	
	2	Serial data receive	UART3_RXD33	
	3	Serial data transmit	UART3_TXD33	
	4	GND	DGND	

**Table 4 - 4 external Uart 3 Description**

### 4.3. Key

The evaluation board is designed with 3 buttons. They are ON/OFF buttons, reset buttons, and user-defined buttons.

**Figure 4 - 6 Button used**

#### 4.3.1. Pin Description

Ref	Pin	Function	Name	Comments
K1	ON/OFF	ONOFF button	ONOFF	System On/Off Button
K2	Reset	The reset button	SYS_nRST	reset
K3	User	User defined button	KEY	Button press produces the corresponding event / interruption

**Table 4 - 5 Button description**

## 4.4. LED

The evaluation board is designed with 3 LED lights, their functions are as follows: one CPU running indicator LED, blue, on behalf of the CPU running normally; one user - defined indicator LED, Which is reserved for users and its function can be defined by users; one LTE signal indicator of the 4G module, if the indicator is red, it indicates that the 4G module is running normally.

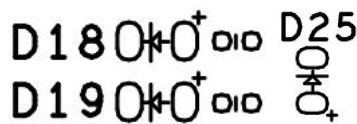


Figure 4 - 7 LED

### 4.4.1. Pin Description

Ref	Function	Name	Comments
D18	indicator LED of CPU running, blue	LED1	On: Cpu is running Off: Cpu is dead
D19	indicator LED of user-defined, green	LED2	Function designed by users
D25	indicator LED of 4G module, red	LED3	On: 4G module is running Off: 4G module is dead

Table 4 - 6 LED description

## 4.5. SD Card

The evaluation board is designed with a Micro SD card circuit, which supports the operation of starting or reading data from Micro SD.

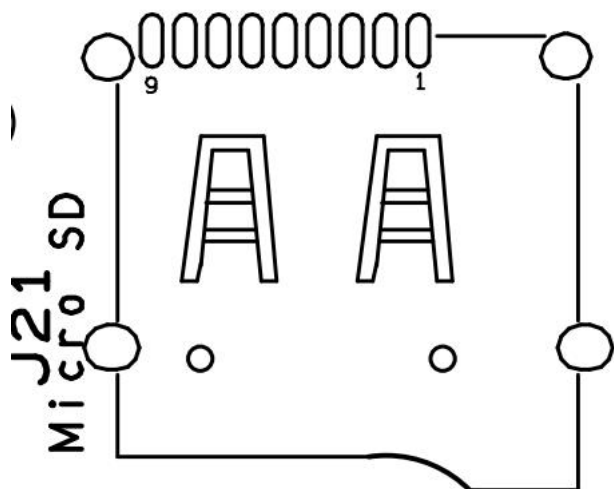


Figure 4 - 8 Micro SD

### 4.5.1. Pin Description

Ref	Pin	Function	Name	Comments
J21	1	data bit 2	DAT2	
	2	data bit 3	DAT3	
	3	order	CMD	
	4	Power 3.3V	VCC	
	5	clock	CLK	
	6	GND	DGND	
	7	data bit 0	DAT0	
	8	data bit 1	DAT1	
	9	Plug card detection	CD	
	10	GND	DGND	
	11	GND	DGND	
	12	GND	DGND	
	13	GND	DGND	

Table 4 - 7 Micro SD description

## 4.6. Extended interface

MYB-C8MMX provides one 30 pin header with 2.0mm pitch to lead all idle GPIO for easy interconnection with other devices. The specific pin is defined as follows.

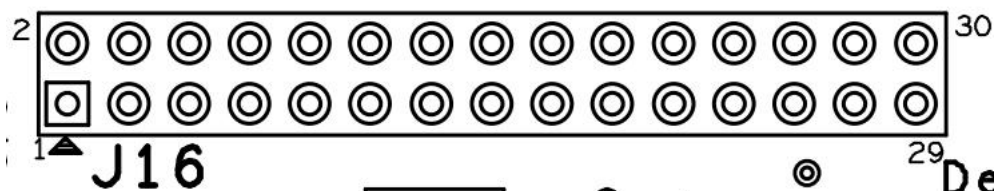


Figure 4 - 9 GPIO/SAI/UART/I2C

### 4.6.1. Pin Description

Ref	Pin	Function	Name	Comments
J16	1	Output power 5V	VCC5V	
	2	Output power 3.3V	VDD_3V3	
	3	GND	DGND	
	4	GND	DGND	
	5	General GPIO	PDM_CLK	
	6	GND	DGND	
	7	General GPIO	PDM_DATA0	
	8	GND	DGND	
	9	General GPIO	PDM_DATA1	
	10	NC	NC	
	11	General GPIO	PDM_DATA2	
	12	General GPIO	SAI1_MCLK	
	13	General GPIO	PDM_DATA3	
	14	General GPIO	SAI1_TXFS	
	15	GND	DGND	
	16	GND	DGND	
	17	GND	DGND	
	18	General GPIO	SAI2_TXFS	
	19	General GPIO	SAI1_TXC	
	20	General GPIO	SAI2_TXD	
	21	General GPIO	SAI3_RXFS	
	22	General GPIO	SAI2_TXC	
	23	General GPIO	SAI3_RXC	
	24	General GPIO	SAI2_RXD	
	25	GND	DGND	

	26	GND	DGND	
	27	General GPIO	UART3_RTS	
	28	I2C4 Bus data	I2C4_SDA	
	29	General GPIO	UART3_CTS	
	30	USB2 ID	USB2_ID	

**Table 4 - 8 double needle interface Description**



## 4.7. USB

LMX 8M Mini chip has two USB2.0 controllers.

One USB1 is directly connected to Micro USB, supports OTG mode, and can also be used as an interface for downloading software. The other USB2 supports only HOST mode and uses the SM SC USB2514BI-AEZ chip to expand four USB HOST ports. Two channels are directly led out through double-layer USB Type A connection socket, the third channel is used to connect LTE module, and the fourth channel is connected to a 4 pin 2.0 mm pitch connector.

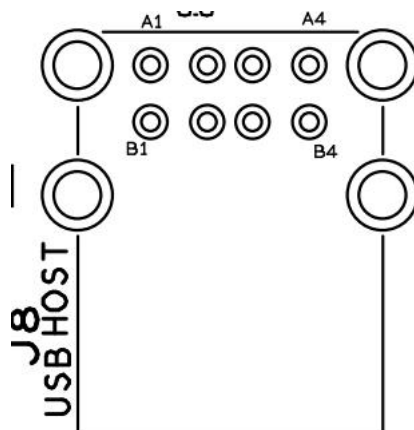


Figure 4 - 10 USB HOST

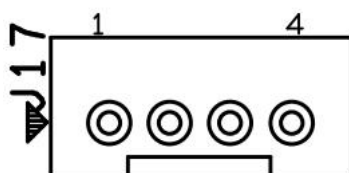


Figure 4 - 11 external USB

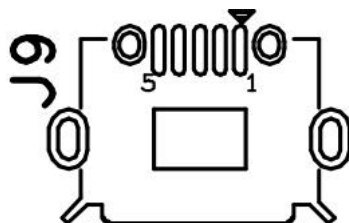


Figure 4 - 12 Micro USB

### 4.7.1. Pin Description

Ref	Pin	Function	Name	Comments
J8	A1	USB 5V Power	VCC5V	
	A2	USB HOST data-	HOST1_USB_DM	
	A3	USB HOST data+	HOST1_USB_DP	
	A4	GND	DGND	GND
	B1	USB 5V Power	VCC5V	
	B2	USB HOST data-	HOST2_USB_DM	

	B3	USB HOST data+	HOST2_USB_DP	
	B4	GND	DGND	
	1	Metal ground	GND_EARTH	Metal shell ground
	2	Metal ground	GND_EARTH	Metal shell ground
	3	Metal ground	GND_EARTH	Metal shell ground
	4	Metal ground	GND_EARTH	Metal shell ground

**Table 4 - 9 USB HOST pin description**

Ref	Pin	Function	Name	Comments
J17	1	USB 5V Power	VCC5V	
	2	USB2 data-	XH_USB_DM	
	3	USB2 data+	XH_USB_DP	
	4	GND	DGND	

**Table 4 - 10 external USB pin description**

Ref	Pin	Function	Name	Comments
J9	1	USB 5V Power	USB_OTG1_VBUS	
	2	USB1 data-	USB_OTG1_DN	
	3	USB1 data+	USB_OTG1_DP	
	4	USB1 ID signal	USB_OTG1_ID	
	5	GND	DGND	

**Table 4 - 11 Micro USB pin description**

## 4.8. Ethernet

The evaluation board is designed with a 10/100/1000Mbps Ethernet interface using RJ45 connectors with network transformers.

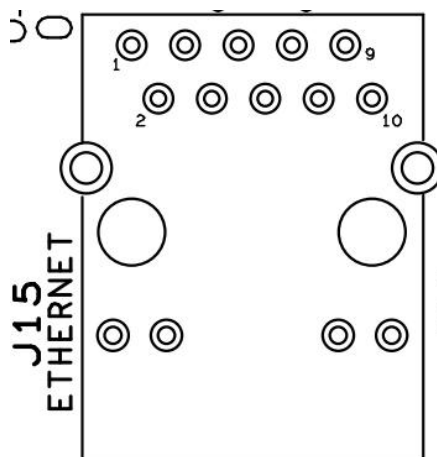


Figure 4 - 13 Ethernet interface

### 4.8.1. Pin Description

Ref	Pin	Function	Name	Comments
J15	1	GND	DGND	
	2	ETH1 signal 0+	ETH_TRP0	
	3	ETH1 signal 0-	ETH_TRN0	
	4	ETH1 signal 1+	ETH_TRP1	
	7	ETH1 signal 1-	ETH_TRN1	
	5	ETH1 signal 2+	ETH_TRP2	
	6	ETH1 signal 2-	ETH_TRN2	
	8	ETH1 signal 3+	ETH_TRP3	
	9	ETH1 signal 3-	ETH_TRN3	
	12	ENET1 LINK LED	ENET_LED_1000	
	13	ENET1 Activity LED	ENET_LED_ACT	
	11	ETH1 Power 3.3V	VDD_3V3	
	14	ETH1 Power 3.3V	VDD_3V3	
	10	Metal ground	GND_EARTH	
	15	Metal ground	GND_EARTH	
	16	Metal ground	GND_EARTH	

Table 4 - 12 Ethernet pin description

## 4.8.2. performance

Parameter	Test method	Min	Typical	Max	Unit	Test Command
TCP mode speed	iperf3 tests the performance of TCP delivery for connecting different objects and at different negotiation speeds.	-	893	-	Mb/s	client: root@myd-imx8mm:~# iperf3 -c 192.168.40.80 -i 2 -t 20
		-	883	-	Mb/s	Client reverse: root@myd-imx8mm:~# iperf3 -c 192.168.40.80 -i 2 -t 20 -R
UDP mode speed	iperf3 tests the performance of UDP delivery for connecting different objects and at different negotiation speeds.	-	1000	-	Mb/s	client : iperf3 -c 192.168.40.80 -u -i 2 -t 60 -b 1G Client reverse : iperf3 -c 192.168.40.80 -u -i 2 -t 60 -b 1G -R

**Table 4 - 13 Ethernet performance**

## 4.9. CSI

I.M X 8M Mini processor supports one MIPI camera. The camera interface adopts a 0.5mm FPC pitch socket, and the user can choose the MY-CAM003M camera module of MYIR Technology. Please visit [http://www.myir-tech.com/product/my\\_cam003m.htm](http://www.myir-tech.com/product/my_cam003m.htm) to get detailed information about the module.



Figure 4 - 14 CSI connector

### 4.9.1. Pin Description

Ref	Pin	Function	Name	Comments
J11	1	Power 5V	VB_5V	Camera module power 5V input
	2	CSI Power control	CSI_P1_IO1	
	3	NC	NC	
	4	I2C2 data	I2C2_SDA	
	5	I2C2 clock	I2C2_SCL	
	6	CSI reset signal	CSI_nRST	
	7	CSI Enable control	CSI_PWDN	
	8	GND	DGND	
	9	CSI master clock	CLKO1	
	10	GND	DGND	
	11	MIPI-CSI lane 3+	CSI_DP3	
	12	MIPI-CSI lane 3-	CSI_DN3	
	13	GND	DGND	
	14	MIPI-CSI lane 2+	CSI_DP2	
	15	MIPI-CSI lane 2-	CSI_DN2	
	16	GND	DGND	
	17	MIPI-CSI clock+	CSI_CKP	
	18	MIPI-CSI clock-	CSI_CKN	
	19	GND	DGND	
	20	MIPI-CSI lane 1+	CSI_DP1	
	21	MIPI-CSI lane 1-	CSI_DN1	
	22	GND	DGND	
	23	MIPI-CSI lane 0+	CSI_DP0	
	24	MIPI-CSI lane 0-	CSI_DN0	

Table 4 - 14 CSI pin description

## 4.10. LVDS

The original display interface of i.MX 8M Mini processor is DSI interface, but LVDS interface is not supported. In order to facilitate the use of customers, we use Toshiba's TC358775XBG chip in the design of MYB-C8MMX carrier board to convert the MIPI-DSI signal of the core board into LVDS signal, support LVDS interface display. LVDS signals correspond to two interfaces on the carrier board, J4 and J6. J4 interface is used to connect to dual channel LVDS large screen, and J6 interface is used to connect to single channel LVDS small screen. J4 and J6 cannot be used at the same time. Customers can choose according to their own requirements.

By default, the J4 port supports 1920x1080 resolution (21.5 inch screen), and the J6 port supports 1280x800 resolution (10.1 inch capacitive touch screen).

In addition, when we use J4 interface, also should use J5 interface, J5 is the backlight interface of the external screen, using 6pin 2.0mm spacing public Socket ; If the J6 port is connected to the touchscreen, the J12 port should also be used. The J12 port is a touchscreen signal port and adopts a 6pin 0.5mm spacing FPC socket .

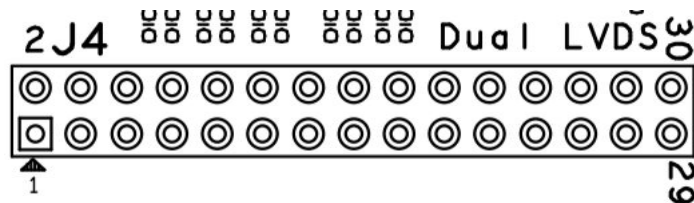


Figure 4 - 15 Dual LVDS connector



Figure 4 - 16 simplex LVDS connector

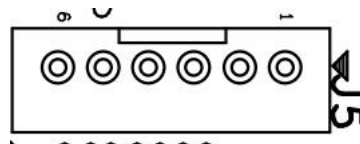


Figure 4 - 17 External screen backlight connector

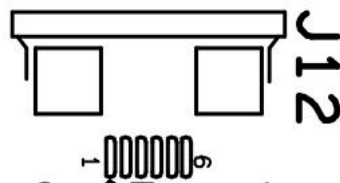


Figure 4 - 18 External capacitive touch screen connector

### 4.10.1. Pin Description

Ref	Pin	Function	Name	Comments
J4	1	Power 5V	Panel_VCC	
	2	Power 5V	Panel_VCC	
	3	Power 5V	Panel_VCC	
	4	GND	DGND	
	5	GND	DGND	
	6	GND	DGND	
	7	MIPI-DSI lane 0-	BLVDS_DN0	
	8	MIPI-DSI lane 0+	BLVDS_DP0	
	9	MIPI-DSI lane 1-	BLVDS_DN1	
	10	MIPI-DSI lane 1+	BLVDS_DP1	
	11	MIPI-DSI lane 2-	BLVDS_DN2	
	12	MIPI-DSI lane 2+	BLVDS_DP2	
	13	GND	DGND	
	14	GND	DGND	
	15	LVDS Clock signal-	BLVDS_CKN	
	16	LVDS Clock signal+	BLVDS_CKP	
	17	MIPI-DSI lane 3-	BLVDS_DN3	
	18	MIPI-DSI lane 3+	BLVDS_DP3	
	19	MIPI-DSI lane 0-	ALVDS_DN0	
	20	MIPI-DSI lane 0+	ALVDS_DP0	
	21	MIPI-DSI lane 1-	ALVDS_DN1	
	22	MIPI-DSI lane 1+	ALVDS_DP1	
	23	MIPI-DSI lane 2-	ALVDS_DN2	
	24	MIPI-DSI lane 2+	ALVDS_DP2	
	25	GND	DGND	
	26	GND	DGND	
	27	LVDS Clock signal-	ALVDS_CKN	
	28	LVDS Clock signal+	ALVDS_CKP	
	29	MIPI-DSI lane 3-	ALVDS_DN3	
	30	MIPI-DSI lane 3+	ALVDS_DP3	

**Table 4 - 15 Dual LVDS pin description**



Ref	Pin	Function	Name	Comments
J6	1	NC	NC	
	2	Power 5V	VDD_5V	
	3	Power 5V	VDD_5V	
	4	NC	NC	
	5	NC	NC	
	6	NC	NC	
	7	GND	DGND	
	8	LVDS receive data 0 -	RXO0-	
	9	LVDS receive data 0 +	RXO0+	
	10	GND	DGND	
	11	LVDS receive data 1 -	RXO1-	
	12	LVDS receive data 1 +	RXO1+	
	13	GND	DGND	
	14	LVDS receive data 2 -	RXO2-	
	15	LVDS receive data 2 +	RXO2+	
	16	GND	DGND	
	17	LVDS receive Clock -	RXOC-	
	18	LVDS receive Clock +	RXOC+	
	19	GND	DGND	
	20	LVDS receive data 3 -	RXO3-	
	21	LVDS receive data 3 +	RXO3+	
	22	GND	DGND	
	23	NC	NC	
	24	NC	NC	
	25	GND	DGND	
	26	NC	NC	
	27	LCD Backlight adjust	DSI_BL_PWM	
	28	General GPIO1_IO12	DSI_TP_RST	
	29	NC	NC	
	30	GND	DGND	
	31	NC	NC	
	32	NC	NC	
	33	I2C3 Bus data transmission	I2C3_SDA33	
	34	I2C3 bus clock	I2C3_SCL33	
	35	NC	NC	

	36	Interruption of touch screen	DSI_TS_nINT	
	37	NC	NC	
	38	NC	NC	
	39	NC	NC	
	40	NC	NC	
	41	GND	DGND	
	42	GND	DGND	

**Table 4 - 16 simplex LVDS pin description**

Ref	Pin	Function	Name	Comments
J5	1	Power 12V	VDD_12V	
	2	Power 12V	VDD_12V	
	3	DSI Backlight enabling signal	DSI_BL_EN	
	4	DSI Backlight control signal	DSI_BL_PWM	
	5	GND	GND	
	6	GND	GND	

**Table 4 - 17 External screen backlight pin description**

Ref	Pin	Function	Name	Comments
J12	1	TP Disruption	DSI_TS_nINT	
	2	I2C3 Bus data transmission	I2C3_SDA33	
	3	I2C3 bus clock	I2C3_SCL33	
	4	General GPIO1_IO12	DSI_TP_RST	
	5	GND	GND	
	6	Power 3.3V	VDD_3V3	

**Table 4 - 18 External capacitive TP pin description**

## 4.11. AUDIO

The evaluation board is designed with the audio coding chip WM8904CGEFL/V circuit, and equipped with a 3.5mm earphone output and an audio linear input. The I2S terminal of WM8904CGEFL/V is connected to SAI2 controller of the processor, and the I2C terminal is connected to I2C2 interface.

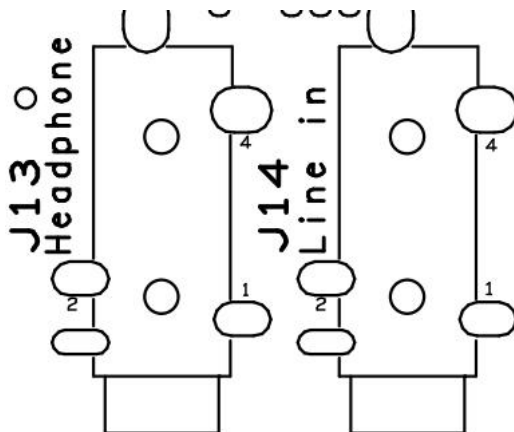


Figure 4 - 19 Audio connector

### 4.11.1. Pin Description

Ref	Pin	Function	Name	Comments
J13	1	Audio GND	AUDIO_GND	
	2	Audio left-channel data output	HPOUTL	
	3	NC	NC	
	4	Audio right-channel data output	HPOUTR	
	5	NC	NC	
J14	1	Audio GND	AUDIO_GND	
	2	Audio left-channel data input	IN2L	
	3	NC	NC	
	4	Audio right-channel data input	IN2R	
	5	NC	NC	

Table 4 - 19 Audio pin description

## 4.12. RTC battery

The evaluation board is equipped with a back-up battery holder that can connect to the CR1225 button battery. When the system is powered off, it can be used to maintain the operation of RTC. Its circuit structure is shown in the figure below:

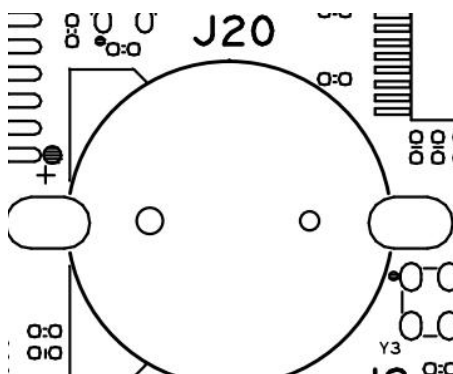


Figure 4 - 20 RTC battery

### 4.12.1. Pin Description

Ref	Pin	Function	Name	Comments
J20	1	GND	DGND	
	2	Power 3.3V	VDD_3V3	

Table 4 - 20 RTC battery pin description

## 4.13. ESPI

The evaluation board is designed with an external ESPI interface and a 6pin 2.0mm pitch male socket .

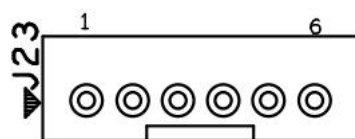


Figure 4 - 22 external ESPI

### 4.13.1. Pin Description

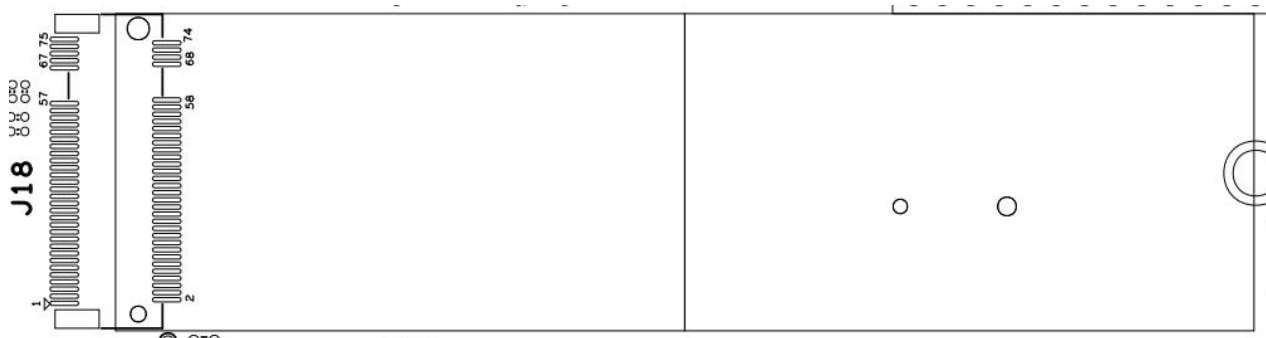
Ref	Pin	Function	Name	Comments
J23	1	Power 3.3V	VDD_3V3	
	2	SPI2 chip select	ECSPi2_SS0	
	3	SPI2 data input	ECSPi2_MOSI	

	4	SPI2 data output	ECSPI2_MISO	
	5	SPI2 clock	ECSPI2_SCLK	
	6	GND	DGND	

**Table 4 - 22 external ESPI pin description**

## 4.14. M.2

The evaluation board provides standard M.2 interfaces and supports one PCIE SSD Card.

**Figure 4 - 23 M.2 interface**

### 4.14.1. Pin Description

Ref	Pin	Function	Name	Comments
J18	1	GND	DGND	
	2	Power 3.3V	VDD_M2	
	3	GND	DGND	
	4	Power 3.3V	VDD_M2	
	5	NC	NC	
	6	NC	NC	
	7	NC	NC	
	8	NC	NC	
	9	GND	DGND	
	10	NC	NC	
	11	NC	NC	
	12	Power 3.3V	VDD_M2	
	13	NC	NC	
	14	Power 3.3V	VDD_M2	
	15	GND	DGND	
	16	Power 3.3V	VDD_M2	
	17	NC	NC	
	18	Power 3.3V	VDD_M2	

19	NC	NC	
20	NC	NC	
21	GND	DGND	
22	NC	NC	
23	NC	NC	
24	NC	NC	
25	NC	NC	
26	NC	NC	
27	GND	DGND	
28	NC	NC	
29	NC	NC	
30	NC	NC	
31	NC	NC	
32	NC	NC	
33	GND	DGND	
34	NC	NC	
35	NC	NC	
36	NC	NC	
37	NC	NC	
38	NC	NC	
39	GND	DGND	
40	NC	NC	
41	PCIE data receive -	PCIE_RXN	
42	NC	NC	
43	PCIE data receive +	PCIE_RXP	
44	NC	NC	
45	GND	DGND	
46	NC	NC	
47	PCIE data send -	PCIE_TXN	
48	NC	NC	
49	PCIE data send +	PCIE_TXP	
50	PCIe Interface reset	PCIe_nRST	
51	GND	DGND	
52	PCIE Clock request	PCIe_nCLKREQ_DEV	
53	PCIE Reference clock -	PCIE2_REF_CLKN_CN	
54	PCIe Awake	PCIe_nWAKE	
55	PCIE Reference clock +	PCIE2_REF_CLKP_CN	

	56	NC	NC	
	57	GND	DGND	
	58	NC	NC	
	59	NC	NC	
	60	NC	NC	
	61	NC	NC	
	62	NC	NC	
	63	NC	NC	
	64	NC	NC	
	65	NC	NC	
	66	NC	NC	
	67	NC	NC	
	68	Reference clock	REF_CLK_32K_3V3	
	69	NC	NC	
	70	Power 3.3V	VDD_M2	
	71	GND	DGND	
	72	Power 3.3V	VDD_M2	
	73	GND	DGND	
	74	Power 3.3V	VDD_M2	
	75	GND	DGND	

**Table 4 - 23 M.2 pin description**



## 4.15. DSI

The J10 port on the carrier board is used to connect the MIPI-DSI display screen, using 30 pin 0.5mm spacing FPC socket.

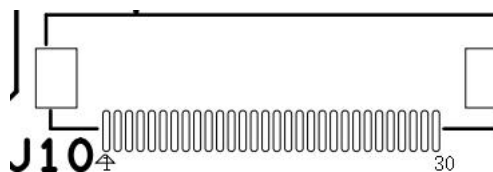


Figure 4 - 24 DSI connector

### 4.15.1. Pin Description

Ref	Pin	Function	Name	Comments
J10	1	Power 5V	VDD_5V	
	2	Power 5V	VDD_5V	
	3	Power 5V	VDD_5V	
	4	GND	DGND	
	5	GND	DGND	
	6	Power 3.3V	VDD_3V3	
	7	I2C3 data	I2C3_SDA33	
	8	I2C3 clock	I2C3_SCL33	
	9	DSI enable	LVDS_IRQ	
	10	DSI Interrupt signal	DSI_TS_nINT	
	11	DSI Backlight enable signal	DSI_BL_EN	
	12	DSI Backlight control signal	DSI_BL_PWM	
	13	LVDS Reset signal	LVDS_RST	
	14	DSI Touch screen reset signal	DSI_TP_RST	
	15	GND	DGND	
	16	MIPI-DSI lane 0+	DSI_DP0	
	17	MIPI-DSI lane 0-	DSI_DN0	
	18	GND	DGND	
	19	MIPI-DSI lane 1+	DSI_DP1	
	20	MIPI-DSI lane 1-	DSI_DN1	
	21	GND	DGND	
	22	DSI Clock signal+	DSI_CKP	
	23	DSI Clock signal-	DSI_CKN	
	24	GND	DGND	
	25	MIPI-DSI lane 2+	DSI_DP2	
	26	MIPI-DSI lane 2-	DSI_DN2	

	27	GND	DGND	
	28	MIPI-DSI lane 3+	DSI_DP3	
	29	MIPI-DSI lane 3-	DSI_DN3	
	30	GND	DGND	

**Table 4 - 24 DSI pin description**

## 5. Module description

### 5.1. 4G LTE

One LTE module interface is reserved for the evaluation board, which can support general Mini PCI-E LTE modules. MYB-C8MMX development board provides Linux driver support and code samples based on Shanghai Mobile Communication EC20 LTE module. The Mini PCIE connector is from LOTES, the model is AAA PCI-047 PCI-E , the modules and boards are fixed with screw, with good earthquake resistance. The default power supply voltage of the module is 3.8V, and the control signal is USB2.0 signal, provided by the USB HUB chip. The carrier board provides one SIM card slot for the 4G module.

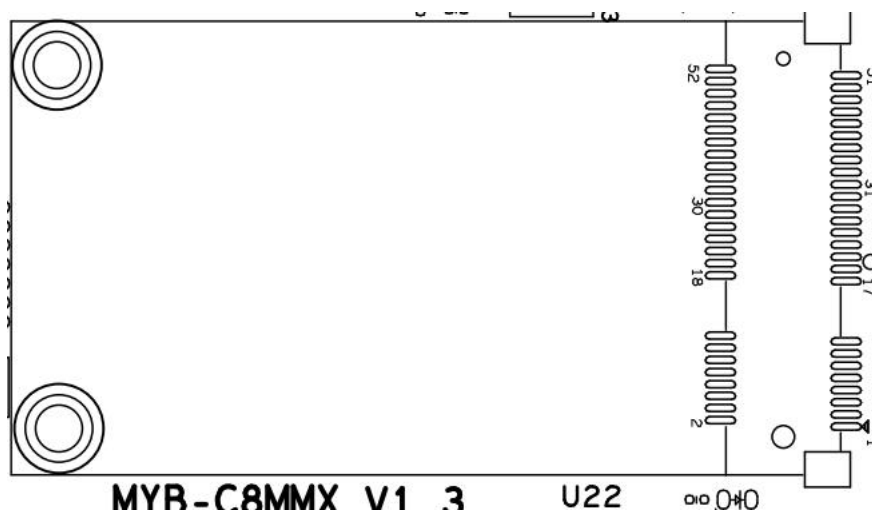


Figure 5 - 1 4G LTE connector

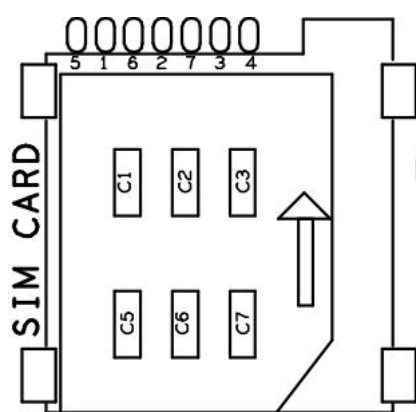


Figure 5 - 2 SIM Card connector

#### 5.1.1. Pin Description

Ref	Pin	Function	Name	Comments
	36	USB2 HOST data-	4G_USB_DM	
	38	USB2 HOST data+	4G_USB_DP	

U22	22	4G Module reset	4G_RST	
	42	LTE Module indicator	LED	
	8	SIM Card Power	USIM_VDD	
	10	SIM Card data	USIM_DATA	
	14	SIM Card Reset	USIM_RST	
	12	SIM Card clock	USIM_CLK	
	33	4G Module reset	4G_RSTIN	
	24	4G Module Power 3.8V	VDD_LTE	
	2	4G Module Power 3.8V	VDD_LTE	
	39	4G Module Power 3.8V	VDD_LTE	
	41	4G Module Power 3.8V	VDD_LTE	
	52	4G Module Power 3.8V	VDD_LTE	
	4	GND	DGND	
	18	GND	DGND	
	26	GND	DGND	
	40	GND	DGND	
	34	GND	DGND	
	9	GND	DGND	
	15	GND	DGND	
	21	GND	DGND	
	27	GND	DGND	
	29	GND	DGND	
	35	GND	DGND	
	37	GND	DGND	
	43	GND	DGND	
	50	GND	DGND	

Table 5- 1 4G LTE pin description

Ref	Pin	Function	Name	Comments
J19	1	SIM Card Power	USIM_VDD	
	2	SIM Card Reset	USIM_RST	
	3	SIM Card clock	USIM_CLK	
	4	NC	NC	
	5	GND	DGND	
	6	NC	NC	
	7	SIM Card data	USIM_DATA	
	8	GND	DGND	
	9	GND	DGND	
	10	GND	DGND	
	11	GND	DGND	

Table 5- 2 SIM Cardpin description

5.2. WIFI/BT

The MYB-C8MMX evaluation board reserves one WiFi+Bluetooth 4.1 module, which uses AMPAK AP6212 module. The communication and data interface is UART and SDIO.

The standard SMA antenna interface is reserved on the board, which can be used with the complimentary WIFI antenna.

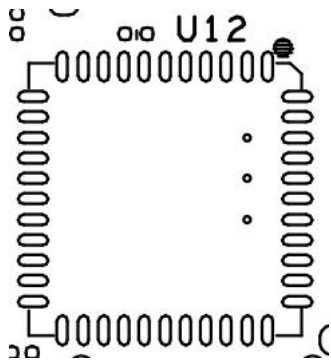


Figure 5 - 3 WIFI/BT connector

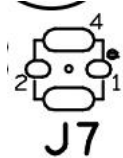


Figure 5 - 4 WIFI/BT connector

## 5.2.1. Pin Description

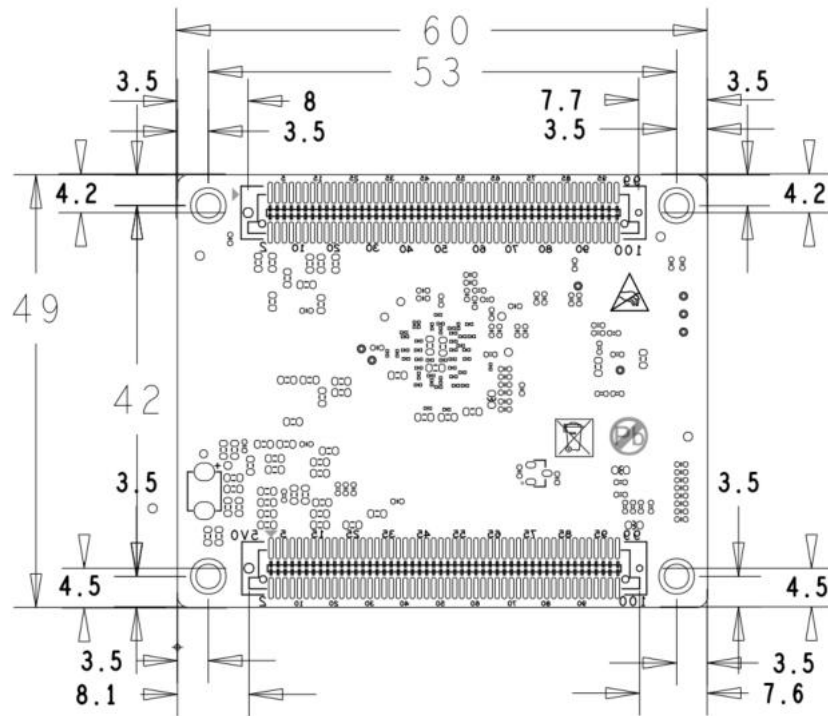
Ref	Pin	Function	Name	Comments
U12	1	GND	DGND	
	2	WIFI/BT Antenna interface	WL_BTANT	
	3	GND	DGND	
	4	NC	NC	
	5	NC	NC	
	6	BT awake signal	BT_WAKE_DEV	
	7	BT to Host awake signal	BT_WAKE_HOST	
	8	WIFI Clock request	CLK_REQ	
	9	power input	VDD_WLBT	
	10	Crystal input	XTAL_IN	
	11	Crystal output	XTAL_OUT	
	12	WIFI Internal power control signal	WL_REG_ON	
	13	WIFI to Host awake signal	WL_WAKE_HOST	
	14	WIFI data 2	SD1_DATA2	
	15	WIFI data 3	SD1_DATA3	
	16	WIFI command signal	SD1_CMD	
	17	WIFI Clock signal	SD1_CLK	
	18	WIFI data 0	SD1_DATA0	
	19	WIFI data 1	SD1_DATA1	
	20	GND	DGND	
	21	Internal voltage output	VIN_LDO_OUT	
	22	Power 3.3V input	+3V3_WIFIBT	
	23	Internal voltage input	VIN_LDO	
	24	External clock input	32.7K_CLK	
	25	NC	NC	
	26	NC	NC	
	27	NC	NC	
	28	NC	NC	
	29	Voltage selection	SDIO_VSEL	
	30	Main clock input	MCLK_IN	
	31	GND	DGND	
	32	NC	NC	
	33	GND	DGND	
	34	BT Internal power control signal	BT_REG_ON	

	35	NC	NC	
	36	GND	DGND	
	37	NC	NC	
	38	Power 3.3V input	+3V3_WIFIBT	
	39	NC	NC	
	40	NC	NC	
	41	Bluetooth flow control	UART1_RTS33	
	42	Bluetooth data receive	UART1_RXD33	
	43	Bluetooth data send	UART1_TXD33	
	44	Bluetooth flow control	UART1_CTS33	
	45	NC	NC	
	46	NC	NC	
	47	NC	NC	

**Table 5- 3 WIFI/BT pin description**

## 6. Mechanical Size

Core board : 49mm\*60mm, the board adopts 8-layer high-density PCB design, Immersion gold process production, independent grounding signal layer, lead-free.



### Figure 6 - 1 Core board size



Figure 1: PCB layout of the MFB-CBMX V1.1. The diagram shows a detailed top-down view of the printed circuit board with various components like chips, capacitors, and connectors. Dimensions are provided in millimeters (mm) around the perimeter and between internal features. Key dimensions include a total width of 140 mm and a total height of 100 mm. Specific component labels like 'MFB-CBMX V1.1', 'USB HOST', 'ETH-ENC', and 'SMA CABLE' are visible.

### Figure 6 - 2 Evaluation board size

## 7. EVK Ordering Informaiton

### 7.1. EVK Part Number

Item	MYD-C8MMQ6-V2-8E2D-160-I	MYD-C8MMQ6-V2-8E2D-180-C
CPU	MIMX8MM6CVTKZAA	MIMX8MM6DVTLZAA
Operatiing Temperature	-40°C - +75°C	0°C - +70°C
DDR	2GB DDR	2GB DDR
EMMC	8GB EMMC	8GB EMMC
WIFI	support	support

Table 7 - 1 Ordering Information

### 7.2. Package List

Item	Description
board	x1 EVK board
data	x1 quick start guide
wire	x1 2.4G antenna x1 4G antenna SSR-1612027 x1 12V@2A Switching power adapter

Table 7 - 2 Packing List

### 7.3. Modules supported by EVK

Part Number	Description
MY-CAM003M	500M pixel MIPI camera module
MY-CAM002U	USB Camera module
MY-WF003U	USB WIFI module
MY-LVDS070C	7 inch LVDS screen

Table 7 - 3 Supported Modules

## 8. List of Connector

Part Number	Part Name	Manufacture	Ref
DC Jack	49103020000X-DC-Jack	Leyconn	J1
Micro SD	MR01A-01211	ATOM	J21
USB HOST	DOUBLE-USB-A	Leyconn	J8
External USB	B6B-PH-K-S	JST	J17
Micro USB	JYJUSB-MB001G	JYJ	J9
Ethernet	HY911130A	HanRun	J15
CSI	5922-0.5-FPC	Leyconn	J11
Dual LVDS	322-2.0-ma	Leyconn	J4
Single LVDS	5922-0.5-FPC	Leyconn	J6
Audio Out	PJ-328	Best	J13
Audio In	PJ-328	Best	J14
RTC	469123-BatteryHolder_1225	Leyconn	J20
WIFI/BT ANT	1566230-1	TE	J7
ESPI	B6B-PH-K-S	JST	J23
M.2	APCI0146-P001A	LOTES	J18
MIPI-DSI	5922-0.5-FPC	Leyconn	J10

**Table 8 - 1 Bom of connectors**

# Appendix A

## Warranty & Technical Support Services

**MYIR Electronics Limited** is a global provider of ARM hardware and software tools, design solutions for embedded applications. We support our customers in a wide range of services to accelerate your time to market.

MYIR is an ARM Connected Community Member and work closely with ARM and many semiconductor vendors. We sell products ranging from board level products such as development boards, single board computers and CPU modules to help with your evaluation, prototype, and system integration or creating your own applications. Our products are used widely in industrial control, medical devices, consumer electronic, telecommunication systems, Human Machine Interface (HMI) and more other embedded applications. MYIR has an experienced team and provides custom design services based on ARM processors to help customers make your idea a reality.

The contents below introduce to customers the warranty and technical support services provided by MYIR as well as the matters needing attention in using MYIR's products.

### Service Guarantee

MYIR regards the product quality as the life of an enterprise. We strictly check and control the core board design, the procurement of components, production control, product testing, packaging, shipping and other aspects and strive to provide products with best quality to customers. We believe that only quality products and excellent services can ensure the long-term cooperation and mutual benefit.

### Price

MYIR insists on providing customers with the most valuable products. We do not pursue excess profits which we think only for short-time cooperation. Instead, we hope to establish long-term cooperation and win-win business with customers. So we will offer reasonable prices in the hope of making the business greater with the customers together hand in hand.

### Delivery Time

MYIR will always keep a certain stock for its regular products. If your order quantity is less than the amount of inventory, the delivery time would be within three days; if your order quantity is greater than the number of inventory, the delivery time would be always four to six weeks. If for any urgent delivery, we can negotiate with customer and try to supply the goods in advance.

## Technical Support

MYIR has a professional technical support team. Customer can contact us by email (support@myirtech.com), we will try to reply you within 48 hours. For mass production and customized products, we will specify person to follow the case and ensure the smooth production.

## After-sale Service

MYIR offers one year free technical support and after-sales maintenance service from the purchase date. The service covers:

### Technical support service

MYIR offers technical support for the hardware and software materials which have provided to customers;

- To help customers compile and run the source code we offer;
- To help customers solve problems occurred during operations if users follow the user manual documents;
- To judge whether the failure exists;
- To provide free software upgrading service.
- However, the following situations are not included in the scope of our free technical support service:
  - Hardware or software problems occurred during customers' own development;
  - Problems occurred when customers compile or run the OS which is tailored by themselves;
  - Problems occurred during customers' own applications development;
  - Problems occurred during the modification of MYIR's software source code.

### After-sales maintenance service

The products except LCD, which are not used properly, will take the twelve months free maintenance service since the purchase date. But following situations are not included in the scope of our free maintenance service:

- The warranty period is expired;
- The customer cannot provide proof-of-purchase or the product has no serial number;
- The customer has not followed the instruction of the manual which has caused the damage the product;
- Due to the natural disasters (unexpected matters), or natural attrition of the components, or unexpected matters leads the defects of appearance/function;

- Due to the power supply, bump, leaking of the roof, pets, moist, impurities into the boards, all those reasons which have caused the damage of the products or defects of appearance;
- Due to unauthorized weld or dismantle parts or repair the products which has caused the damage of the products or defects of appearance;
- Due to unauthorized installation of the software, system or incorrect configuration or computer virus which has caused the damage of products.

### **Warm tips:**

- MYIR does not supply maintenance service to LCD. We suggest the customer first check the LCD when receiving the goods. In case the LCD cannot run or no display, customer should contact MYIR within 7 business days from the moment get the goods.
- Please do not use finger nails or hard sharp object to touch the surface of the LCD.
- MYIR suggests user purchasing a piece of special wiper to wipe the LCD after long time use, please avoid clean the surface with fingers or hands to leave fingerprint.
- Do not clean the surface of the screen with chemicals.
- Please read through the product user manual before you using MYIR's products.
- For any maintenance service, customers should communicate with MYIR to confirm the issue first. MYIR's support team will judge the failure to see if the goods need to be returned for repair service, we will issue you RMA number for return maintenance service after confirmation.

### **Maintenance period and charges**

MYIR will test the products within three days after receipt of the returned goods and inform customer the testing result. Then we will arrange shipment within one week for the repaired goods to the customer. For any special failure, we will negotiate with customers to confirm the maintenance period.

For products within warranty period and caused by quality problem, MYIR offers free maintenance service; for products within warranty period but out of free maintenance service scope, MYIR provides maintenance service but shall charge some basic material cost; for products out of warranty period, MYIR provides maintenance service but shall charge some basic material cost and handling fee.

### **Shipping cost**

During the warranty period, the shipping cost which delivered to MYIR should be responsible by user; MYIR will pay for the return shipping cost to users when the product is repaired. If the warranty period is expired, all the shipping cost will be responsible by users.

### **Products Life Cycle**

MYIR will always select mainstream chips for our design, thus to ensure at least ten years continuous supply; if meeting some main chip stopping production, we will inform customers in time and assist customers with products updating and upgrading.

### **Value-added Services**

- MYIR provides services of driver development base on MYIR's products, like serial port, USB, Ethernet, LCD, etc.
- MYIR provides the services of OS porting, BSP drivers' development, API software development, etc.
- MYIR provides other products supporting services like power adapter, LCD panel, etc.
- ODM/OEM services.

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