



# MYS-8MMX-V2

## Product Manual

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# History

Version	Author	Participant	Date	Description
V1.0	Monsun	Leoric	20210301	Initial version
V2.0	Dana	-	20220510	Replace PHY/USB and other chips

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# 1. Overview

i.MX 8m Mini is NXP's latest multi-core application processor, which is built with advanced 14 LPC FinFET technology to provide faster speed and higher power efficiency. With commercial and industrial level certification and the support of NXP's long-term product delivery plan, the i.MX 8m Mini family can be used for any general industrial and Internet of things application.

Based on the i.MX8m Mini processor, ShenZhen MYIR tech has also developed a new single board product: MYS-8MMX-V2, which concentrates the CPU system and the main peripherals on a single board to facilitate customer development. With industry-leading audio, voice and video processing capabilities, the product is suitable for a wide range of applications from consumer home audio to industrial building automation and mobile computers.

## 1.1. Board Introduction

The MYS-8MMX-V2 single board is designed with high density and high speed circuit board. The 69x95mm board integrates Ethernet, Type-c USB, USB host, TF card, WIFI / BT, m.2 interface, user key, led, LVDS LCD interface, MIPI CSI interface, HDMI output, IO expansion interface and other functions. The standard version is equipped with mimx8mm6cvtkzaa processor, 2GB high-speed DDR4, 8GB EMMC, 256MB QSPI and so on.

The MYS-8MMX-V2 board supports Linux drivers. Along with the development kit, it provides user manual, PDF schematic, peripheral driver, BSP source package, development tools and other related materials. It can effectively help developers improve development efficiency, shorten development cycle, optimize design quality, and speed up product development and time to market.

The MYS-8MMX-V2 series boards are upgraded based on the MYS-8MMX. The hardware interfaces are fully compatible. The appearance of the MYS-8MMX-V2 differs from that of the previous version in the screen printing of PCB and changes in THE USB HUB chip, PHY chip, USB Type-C chip, and DC-DC chip. This is because some chips used in the old products are no longer suitable for use due to supply reasons, so these devices have been replaced in this model upgrade. The replacement components and new products have been fully tested, and customers do not need to worry about the impact of replacement.

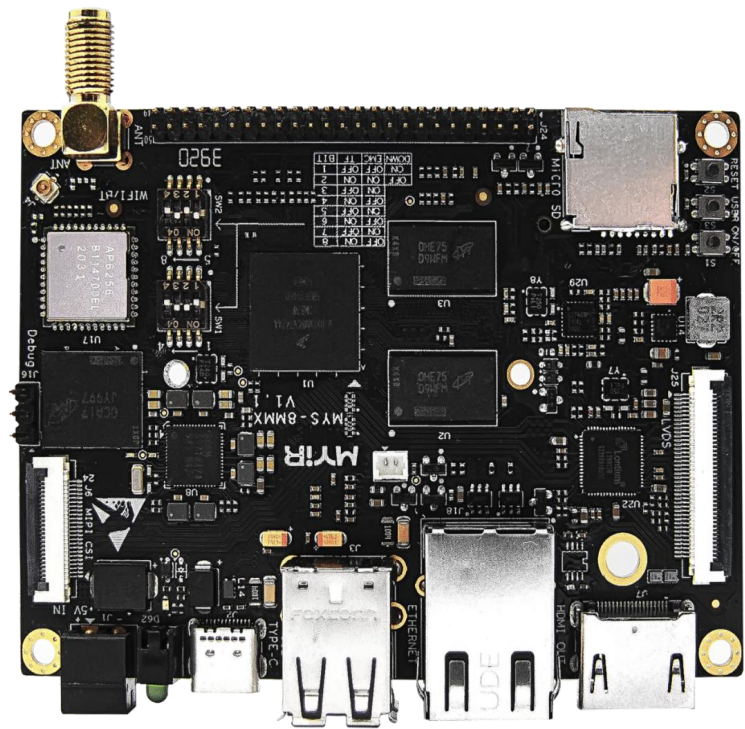


Figure 1-1 MYS-8MMX Product Appearance

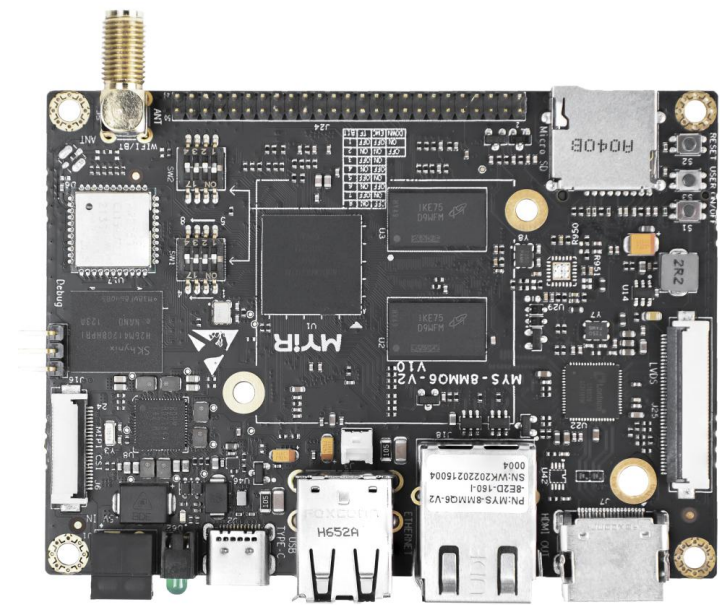


Figure 1-2 MYS-8MMX-V2 Product Appearance

## 1.2. System Block Diagram

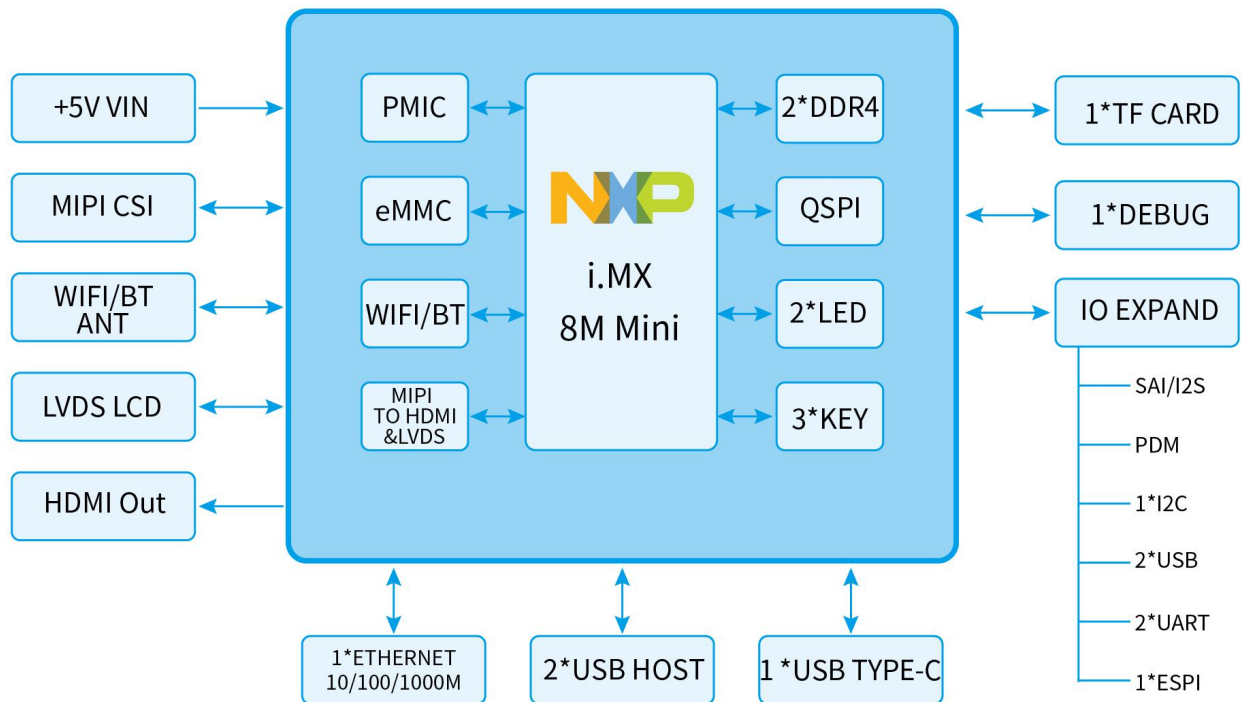


Figure 1-3 System Block Diagram



## 1.3. Physical Annotation Drawing

### 1.3.1. Board Physical Annotation Drawing

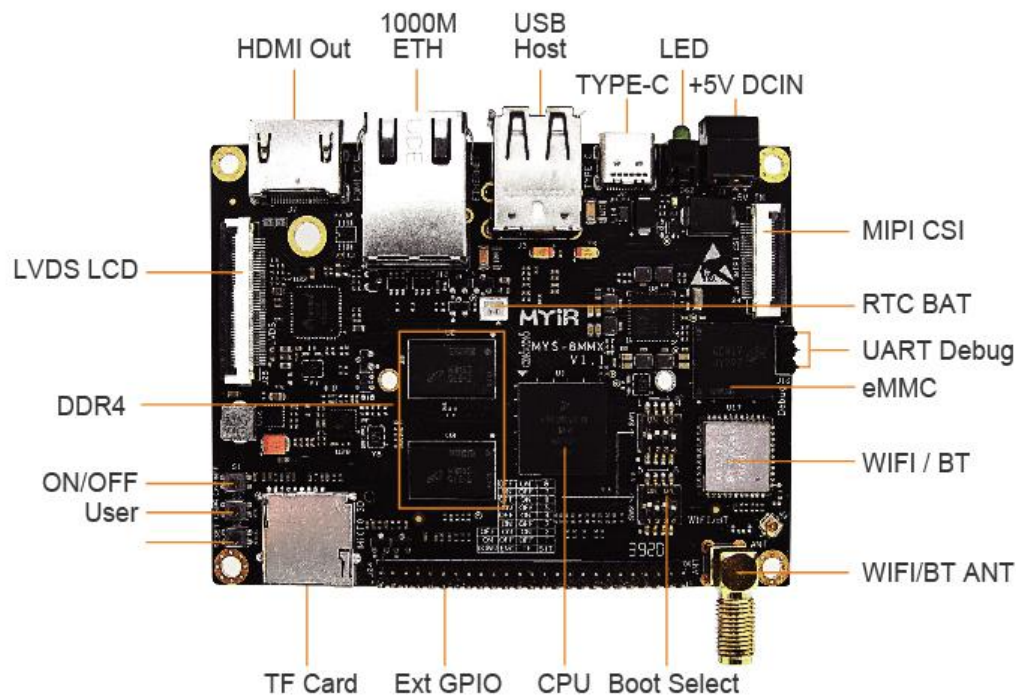


Figure 1-4 MYS-8MMX Front View

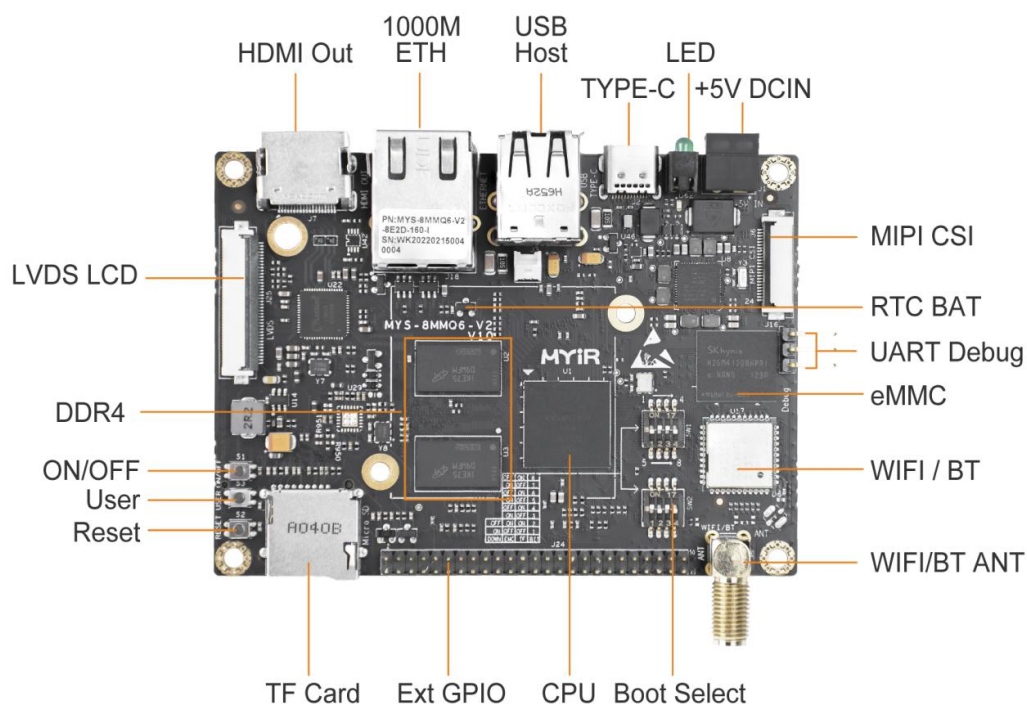
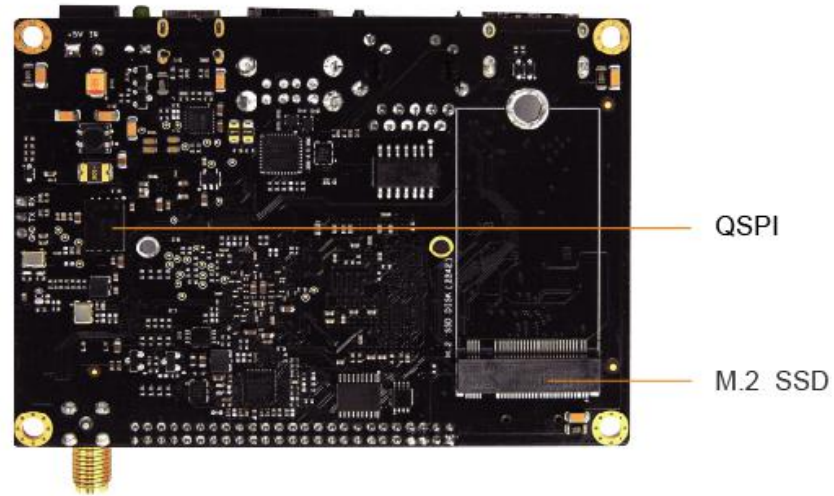
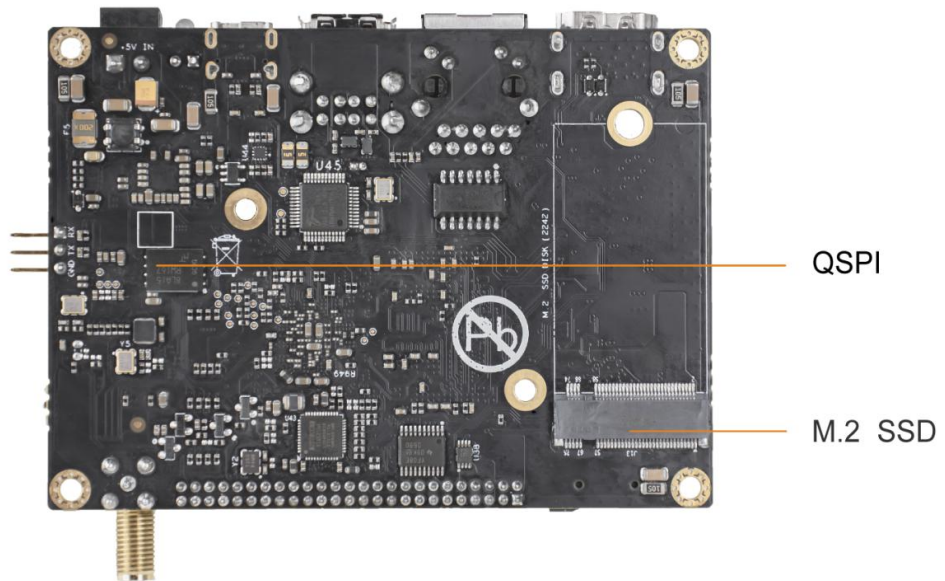


Figure 1-5 MYS-8MMX-V2 Front View



**Figure 1-6 MYS-8MMX Back View**



**Figure 1-7 MYS-8MMX-V2 Back View**

1.3.2. Product Physical Image

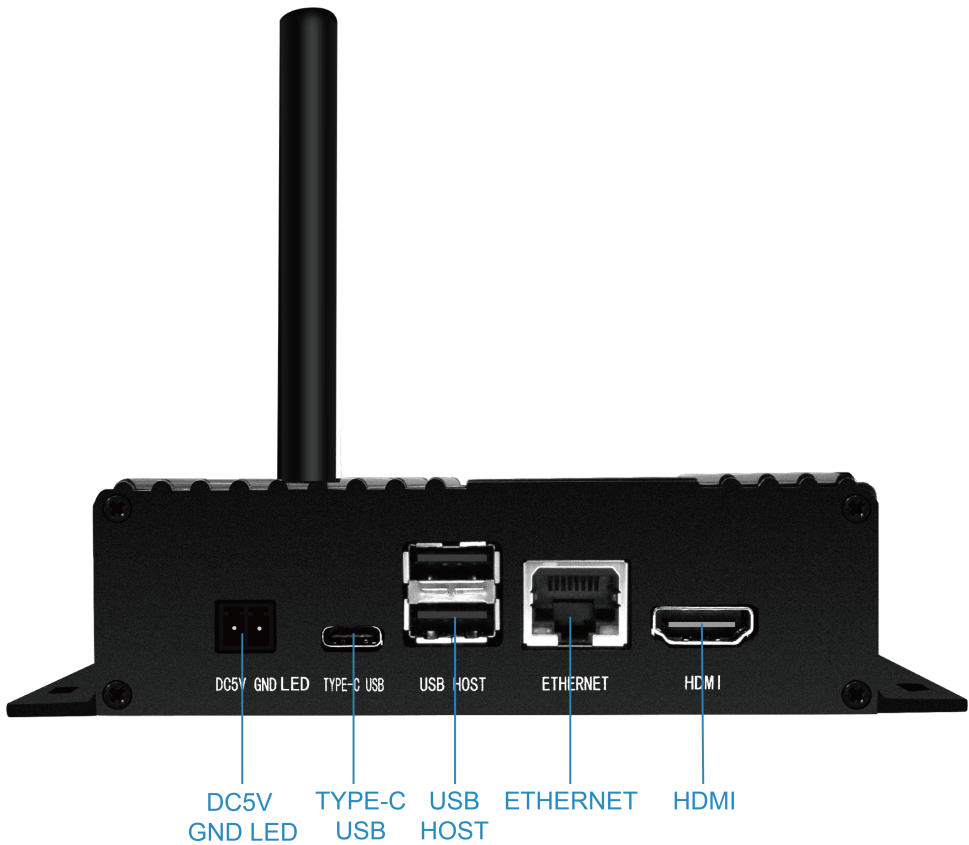


Figure 1-8 Front View of Product Shell



**Figure 1-9 Back View of Product Shell**

## 1.4. Main Features

Item	Description
CPU Series	MIMX8MM6DVTLZAA,1.8GHz
DDR	MT40A512M16LY-062E :E
eMMC	SDINBDG4-8G
Power input	x1Phoenix terminal (2 PIN)
USB	x1 Type-C USB X2 USB 2.0 HOST Type A
Disp&Touch	x1 Single LVDS, 40pin FPCInterface, Support touch capacitive screen x1 HDMI Out
SMA	x1 WIFI/BT ANT SMA
RTC Battery holder	x1 1.25mm Spacing 2pin seat
M.2 Seat	x1 SSD Card 2242
Camer	x1 MIPI Interface digital camera signal, 24pin FPC
Extended Pin Header	x1 2x25_2.0mm Spacing double row needle
Micro SD	x1 Micro SD Solt
Keys	x1 Reset Key x1 ONOFF Key x1 User KEY
Debug UART	x1 3 poles with 2.54mm pin pitch pin header
Work temperature	0°C to 70°C

**Table 1-1 Commercial Board Interface Description**

Item	Description
CPU Series	MIMX8MM6CVTKZAA 1.6GHz
DDR	MT40A512M16LY-062E IT:E
eMMC	MTFC8GAKAJCN-4M IT
Power input	x1Phoenix terminal (2 PIN)
USB	x1 Type-C USB X2 USB 2.0 HOST Type A
Disp&Touch	x1 Single LVDS, 40pin FPC Interface, Support touch capacitive screen x1 HDMI Out
SMA	x1 WIFI/BT ANT SMA
RTC Battery holder	x1 1.25mm Spacing 2pin seat
M.2 Seat	x1 SSD Card 2242
Camer	x1 MIPI Interface digital camera signal, 24pin FPC
Extended Pin Header	x1 2x25_2.0mm Spacing double row needle
Micro SD	x1 Micro SD Solt
Keys	x1 Reset Key x1 ONOFF Key x1 User KEY
Debug UART	x1 3 poles with 2.54m pin pitch pin header
Work temperature	-40°C to 85°C

Table 1-2 Industrial Board Interface Description

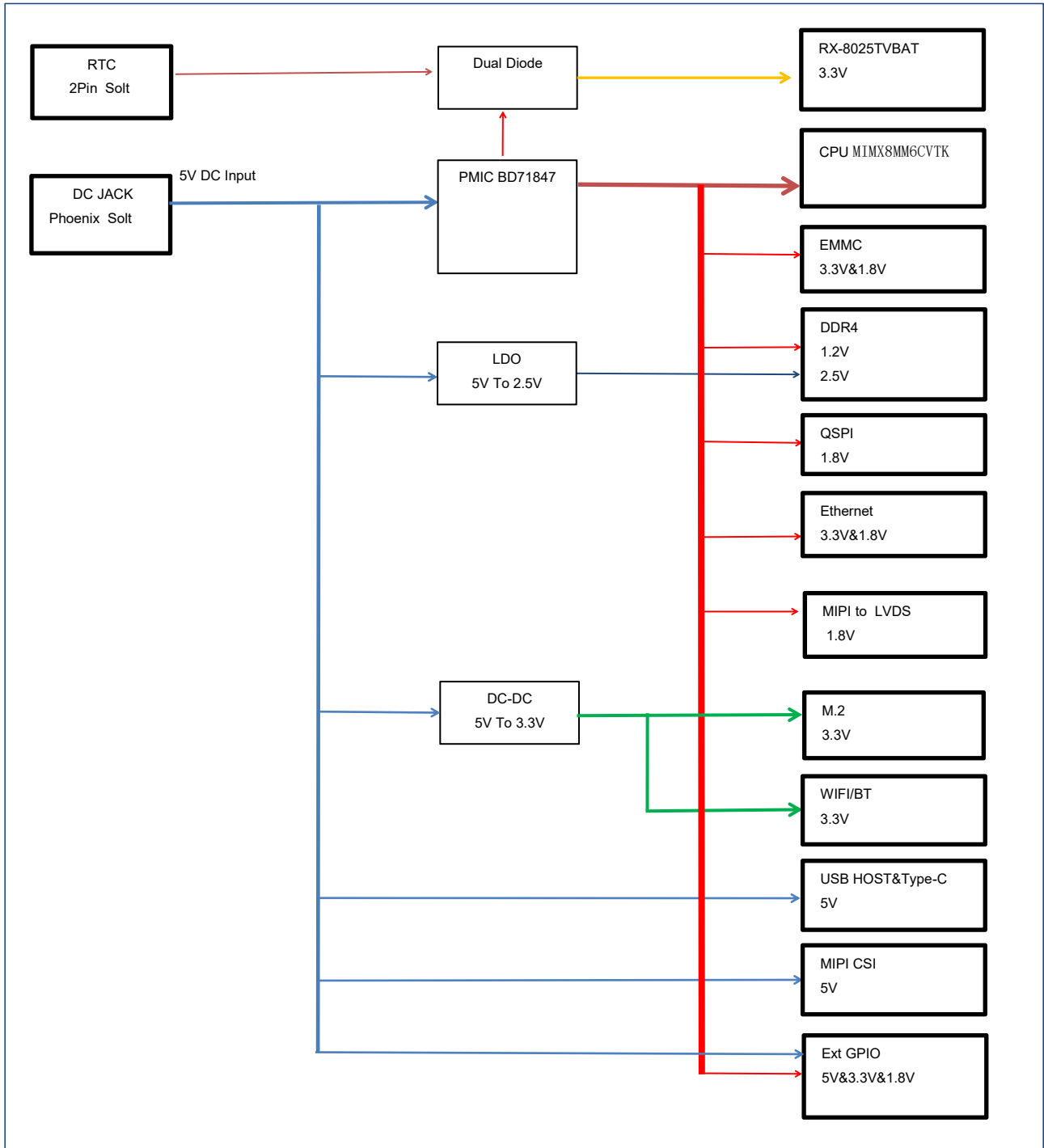
## 1.5. Reference Index

MYIR Electronics provides supporting software and hardware documents and related design resources, including but not limited to product manuals, hardware design guides, device manuals, software development guides, system images, etc., please visit the following links to obtain:

<http://down.myir-tech.com/MYS-8MMX>

## 2. Power Parameters

### 2.1. Power Tree



## 2.2. Power Consumption

Working conditions	Voltage	Current	Power Consumption
Core board in sleep mode 1 echo mem> /sys/power/state	5.0V	0.03A	0.15W
Core board in sleep mode 2 echo freeze> /sys/power/state	5.0V	0.17A	0.85W
Linux environment (no-load)	5.0V	0.41A	2.05W
Linux environment (HDMI、PHY、USB*2、Type-C)	5.0V	0.92A	4.6W

**Table 2-1 Board Power Consumption**

## 2.3. Power Supply Requirements

The power supply of MYS-8MMX-V2 is designed according to 5V standard, and the input voltage range is  $5V \pm 10\%$ . Please note that if you use a non-5V input power supply, you need to ensure that the power supply has sufficient carrying capacity. That is to say, the total power consumed by the board remains unchanged. The lower the power supply voltage you provide, the greater the output current requirement of the power supply will be.



## 3. Minimum System

### 3.1. CPU Characteristics

i. MX 8m mini series is based on high-performance 2x or 4x cortex-a53 + cortex-m4 core processor, which runs at 1.8GHz and supports 16 / 32-bit lpddr4 / DDR4 / ddr3l. Its internal integration of power management, security unit and rich interconnection interface, with high performance, low power consumption, flexible memory options and high-speed interface, as well as industry-leading audio and video functions. It provides a safe and high-performance solution for Internet of things applications.

i.MX 8M Mini structure diagram is as follows:

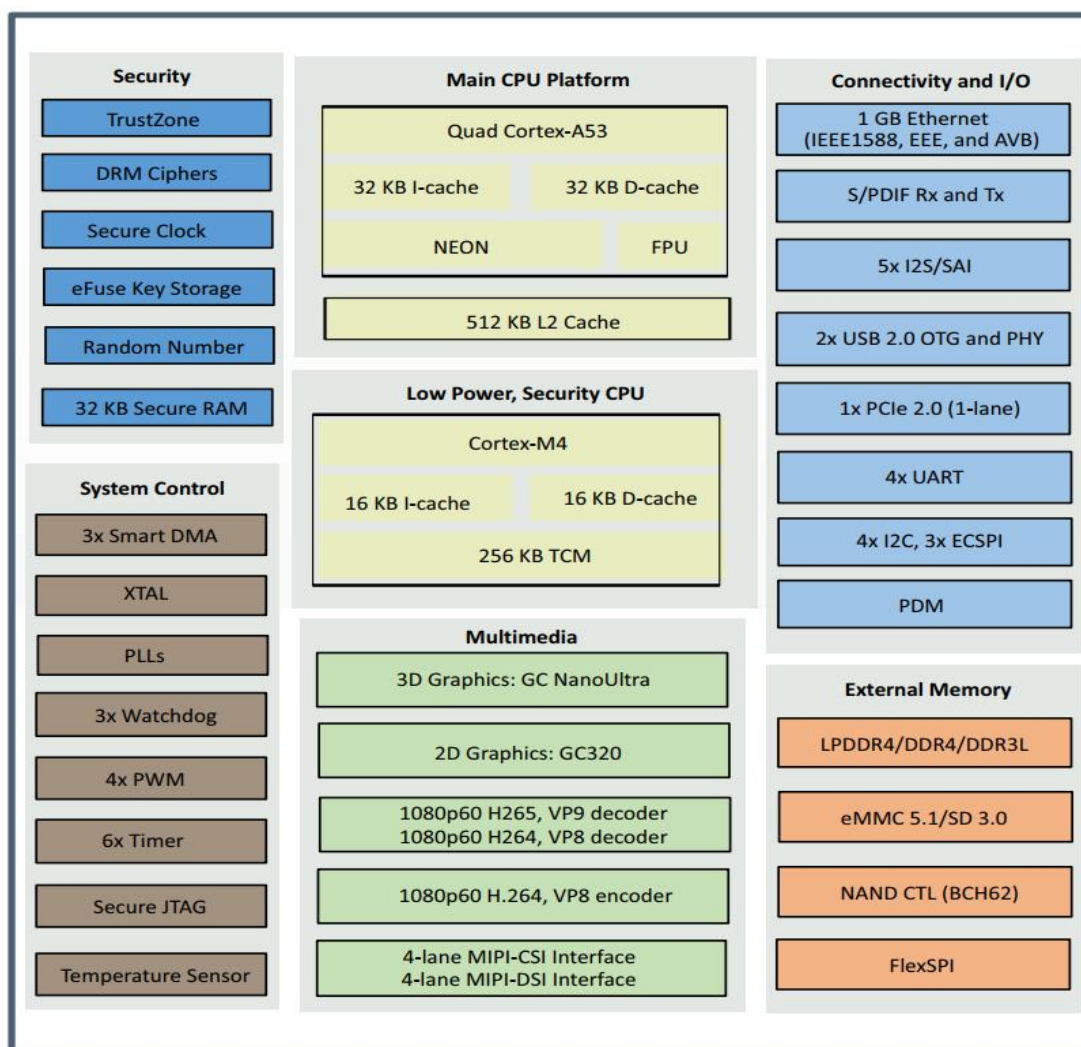


Figure 3-1 i.MX 8M Mini Block Diagram

For more information about i.MX 8m mini, please visit the following website:

[www.nxp.com/products/processors-and-microcontrollers/arm-based-processors-and-mcus/i.mx-applications-processors/i.mx-8-processors/i.mx-8m-mini-arm-cortex-a53-cortex-m4-audio-voice-video:i.MX8MMINI](http://www.nxp.com/products/processors-and-microcontrollers/arm-based-processors-and-mcus/i.mx-applications-processors/i.mx-8-processors/i.mx-8m-mini-arm-cortex-a53-cortex-m4-audio-voice-video:i.MX8MMINI)

The following is the main functions of i.MX 8m Mini dual / 8m Mini Quad / quadlite chip:

Feature	i.MX 8M Mini Quad/QuadLite
	i.MX 8M Mini Dual
Main CPU	2x or 4x Cortex-A53 @ 1.8GHz, 512kB L2
Microcontroller	Cortex-M4 400MHz
DDR	x16/x32 LPDDR4/DDR4/DDR3L
GPU	GC NanoUltra 3D (1 shader) + GC320 2 OpenGL ES 2.0
Display Features	LCDIF
Display Interfaces	1x MIPI-DSI
Video Decode	1080p60 HEVC H.265, VP8, H.264, VP9
Video Encode	1080p60 H.264 VP8
Audio Interface	5x SAI (12Tx + 16Rx external I2S lanes) Each lane up to 24.576MHz BCLK (32-bit, 2-ch 384KHz, up to 32-ch TDM); 4Tx + 4Rx support 49.152MHz BCLK for 768KHz
Digital Mic Input	8ch PDM DMIC input
Camera Interface	1x MIPI-CSI (4-lanes each)
USB	2x USB2.0
PCIe	1x PCIe 2.0
Ethernet	1x GbE
SDIO/eMMC	3x SDIO/eMMC
I2C	4
Process	Samsung 14LPC FinFET
Packages	14x14mm, 0.5p
Temperature	-40°C to 105°C (Tj)

**Figure 3-1 i.MX8M Mini Processor Resources**

## 3.2. Clock Resources

i.MX8M Mini processor is designed with a 24MHz crystal , which's load capacitor is 18pF.

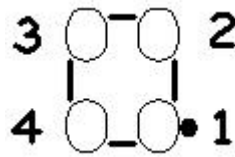


Figure 3-2 Crystal Oscillator Diagram

## 3.3. DDR4

i. MX 8m mini series processors can support 16 or 32-bit lpddr4, DDR4 and ddr3l. My-8mmx board uses two 16 bit DDR4 chips by default. For related device manuals, please visit the following links

<http://down.myir-tech.com/MYS-8MMX>

## 3.4. eMMC

eMMC is an embedded flash chip solution with standardized interface. It simplifies the interface design and solves the driver compatibility problem caused by different flash manufacturers' standards. EMMC on my-8mmx is connected to the processor's mmc3 controller, with 8-bit MMC data line width. The default carrying capacity of single board is 8GB, and the specific model is mtfc8gakajcn-4m it. 4GB, 16GB, 32GB, 64GB and 128GB can be selected. For related device manuals, please visit the following links

<http://down.myir-tech.com/MYS-8MMX>

## 3.5. QSPI FLASH

MYS-8MMX-V2 is equipped with a memory with SPI interface. The chip uses mt25qu256aba1ew9-0sit of Micron Technology, which is connected to the processor's ESPI interface. For related device manuals, please visit the following links

<http://down.myir-tech.com/MYS-8MMX>

## 4. BOOT Configure

When the i.mx8m Mini is powered on and started, the program in the ROM inside the chip will be executed first, and the ROM will read the boot first Mode [1:0] register value, different boot\_ The mode value determines that the processor enters a specific execution process.

In boot\_ In the aspect of mode selection, if the serial down loader mode is selected, you need to use the download tool to load the program through the USB interface. In this mode, you do not need to select boot\_Device.

If you select internal boot mode, you also need to select boot\_Device to decide whether to boot from eMMC or SD card. Please refer to table 4-1 and Table 4-2 to set the dial switch to the correct position.

For details of boot configuration, please refer to the official Manual of i.mx.8m-mini

[https://www.nxp.com.cn/products/processors-and-microcontrollers/arm-processors/i-mx-applications-processors/i-mx-8-processors/i-mx-8m-mini-arm-cortex-a53-cortex-m4-audio-voice-video:i.MX8MMINI?tab=Documentation\\_Tab](https://www.nxp.com.cn/products/processors-and-microcontrollers/arm-processors/i-mx-applications-processors/i-mx-8-processors/i-mx-8m-mini-arm-cortex-a53-cortex-m4-audio-voice-video:i.MX8MMINI?tab=Documentation_Tab)

### 4.1. BOOT Mode Selection

SW1		BOOT Mode
BIT1	BIT2	
ON	ON	Boot From Fuses
ON	OFF	Serial Download
OFF	ON	Internal Boot

Table 4-1 BOOT Mode Selection

### 4.2. BOOT Device Select

SW1	BIT1	BIT2	BIT3	BIT4	BIT5	BIT6	BIT7	BIT8
SD Card	OFF	ON	OFF	ON	OFF	ON	OFF	ON
eMMC	OFF	ON	ON	OFF	ON	OFF	ON	OFF

Table 4-2 BOOT Device Select

## 5. Interface Description

The overall interface layout of the board is as follows. The schematic diagram of the subsequent local interface circuit in this chapter completely corresponds to this layout.

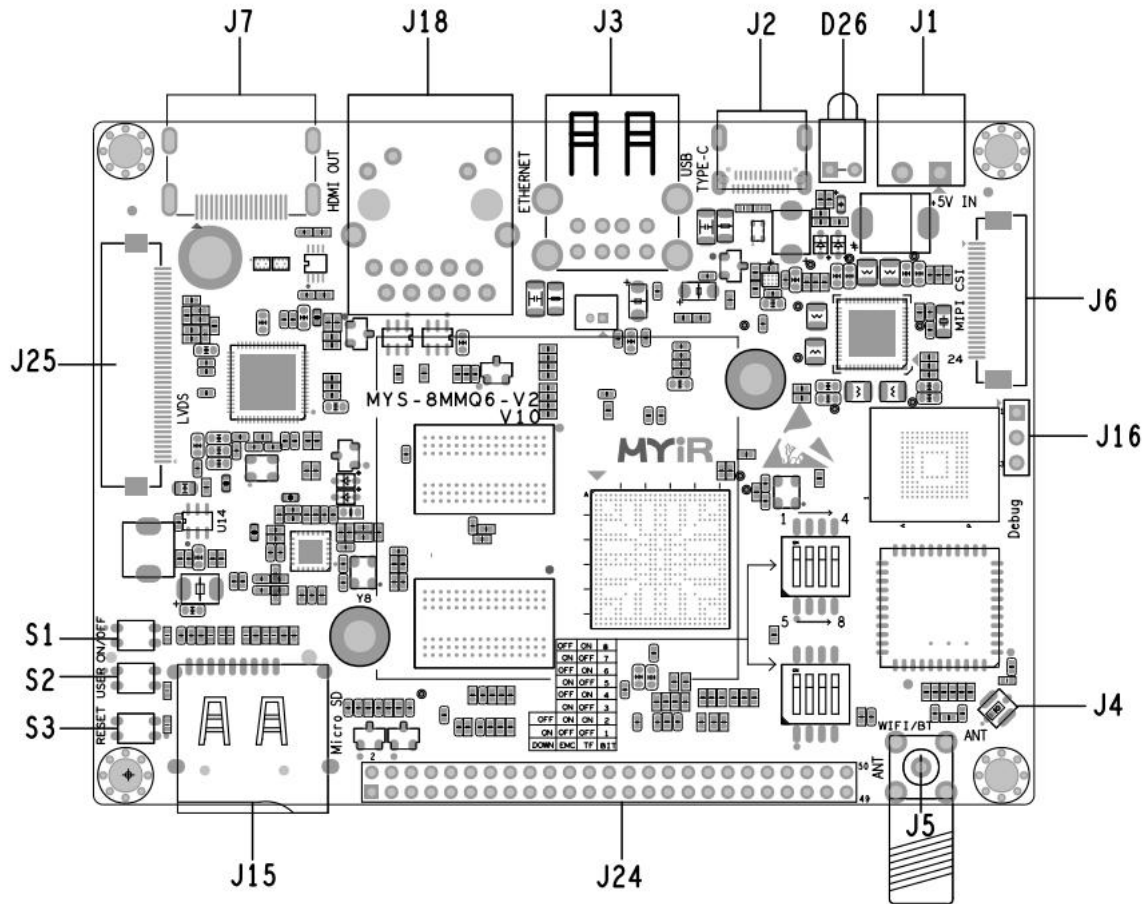


Figure 5-1 MYS-8MMX-V2 Interface Description

## 5.1. Power Interface

Power input connector: 2pin Phoenix terminal. Mill company provides a 2pin power conversion line. Red is the positive pole of the power supply and black is the negative pole of the power supply. Please note that the positive and negative poles of single board power supply should not be connected reversely.

It is recommended to use 5V, 2A DC adapter as power input. If the peripheral interface is connected with many loads, please use 5V, 3A DC adapter. For example: 7 inch screen and camera power consumption is relatively large, according to the actual situation to choose the appropriate power supply.

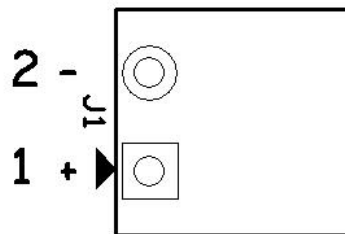


Figure 5-2 Power Interface Diagram

### 5.1.1. Pin Definition

Item	Pin Num	Functional	Single	Description
J1	1	System power input positive	5V	3.81mm spacing Phoenix terminals, Power 5V input
	2	System power input negative	DGND	

Table 5-1 Power Pin Definition

## 5.2. Debug UART

The system debugging serial port uses UART2, MYS-8MMX-V2 to design 3-pin pin pin interface, the signal is RXD, TXD, GND.

Debug serial port TXD, RXD is 3.3V io. The use of 3.3V serial module needs cross connection, that is, TXD directly connected to RXD, RXD directly connected to TXD. Don't forget to connect the two together.

It can't be directly connected with 5V serial module or RS232. It can be connected through USB to serial chip. MY-UART012U USB to com cable is recommended. The website is as follows:  
[http://www.myir-tech.com/product/my\\_uart012u.htm](http://www.myir-tech.com/product/my_uart012u.htm)

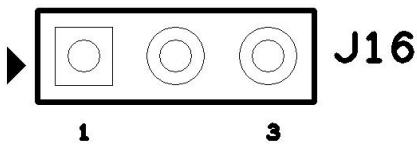


Figure 5-3 Debug UART Diagram

5.2.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J16	1	RXD UART receive	RXD	
	2	TXD UART transmission	TXD	
	3	DGND	GND	

Table 5-2 Debug UART Description

5.3. KEY

The board has three buttons. There are onoff button, reset button and user-defined button.

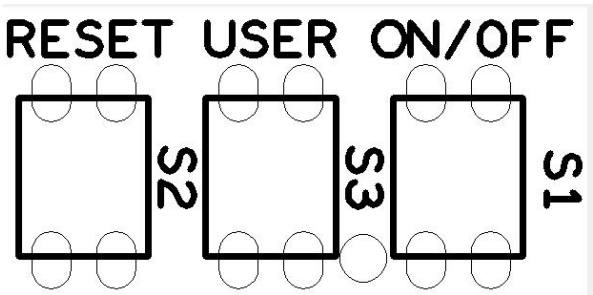


Figure 5-4 Key Diagram

5.3.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
S1	ON/OFF	ON/OFF	ON/OFF	The signal is directly led out from the processor, and the input signal is received through the key to realize the power on and power off
S2	Reset	Reset	SYS_nRST	Press the key to reset
S3	User	User definition IO	GPIO3_IO19	Press the key to generate the corresponding event / interrupt

Table 5-3 Key Description

### 5.4. LED

Two LED lights are designed on the board, which are user-defined indicator lights, and the light is blue. The system operation indicator is green.

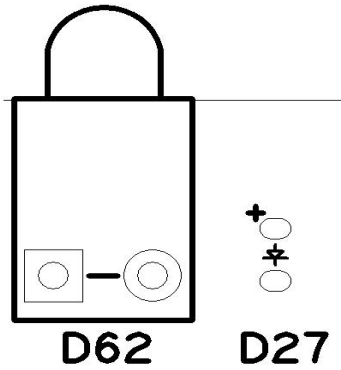


Figure 5-5 LED Diagram

#### 5.4.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
D27	User	User Definition, Blue	GPIO5_IO4	lights on: The device has power lights off: The device has no power
D62	RUN	System operation status light, Green	GPIO5_IO3	twinkle: The system is running normally On / off: System crash

Table 5-4 LED Description

### 5.5. SD Interface

A micro SD card slot circuit is designed to support micro SD startup, machine brushing and other operations.

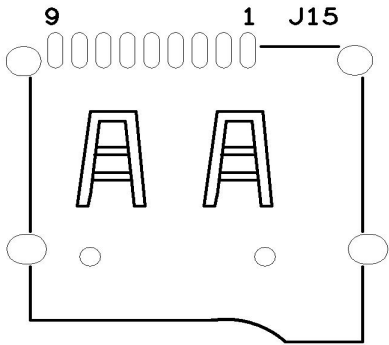


Figure 5-6 Micro SD Diagram



5.5.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J15	1	Data bit 2	DATA2	
	2	Data bit 3	DATA3	
	3	Command	CMD	
	4	3.3V power supply	VCC	
	5	Clock	CLK	
	6	DGND	VSS	
	7	Data bit 0	DATA0	
	8	Data bit 1	DATA1	
	9	Card detection	CD	

Table 5-5 Micro SD Interface Description

5.5.2. Interface Performance

Parameter	Test method	Min	Typical	Max	Unit	Description
Write Speed	time & dd	-	17.2	-	MB/s	time dd if=/dev/zero of=test_file bs=120M count=1 conv=fsync
Read Speed	time & dd	-	16.1	-	MB/s	time dd if=test_file of=/dev/null bs=120M count=1 conv=fsync

Table 5-6 SD Interface Performance

5.6. GPIO/I2C/SPI/UART Etc Signal Expansion Interface

The single board is designed with two rows of pins with 2.0 mm spacing, on which 5V power supply, 3.3V power supply, one SPI, one I2C, two UART signals and so on are defined. The interface diagram is as follows.



Figure 5-7 Double row pin interface signal diagram

### 5.6.1. Pin Definition

Item	Pin Num	Functional	Signal	Level	I/O	Description
J24	1	VDD_5V	Out 5V	5V	O	
	2	VDD_3V3	Out 3.3V	3.3V	O	
	3	VDD_5V	Out 5V	5V	O	
	4	VDD_3V3	Out 3.3V	3.3V	O	
	5	DGND	DGND	0V		
	6	VDD_1V8	Out1.8V	1.8V	O	
	7	DGND	DGND	0V		
	8	DGND	DGND	0V		
	9	4G_USB_DM	4G_USB_DM	3.3V	O	USB signal data-
	10	GPIO1_IO09_33	GPIO1_IO09_33	3.3V	I/O	
	11	4G_USB_DP	4G_USB_DP	3.3V	O	USB signal data+
	12	GPIO4_IO31	SAI3_TXFS	3.3V	I/O	
	13	DGND	DGND	0V		
	14	GPIO5_IO02	SAI3_MCLK	3.3V	I/O	
	15	XH_USB_DM	XH_USB_DM	3.3V	O	
	16	GPIO5_IO01	SAI3_TXD	3.3V	I/O	
	17	XH_USB_DP	XH_USB_DP	3.3V	O	
	18	GPIO4_IO30	SAI3_RXD	3.3V	I/O	
	19	GPIO5_IO00	SAI3_TXC	3.3V	I/O	
	20	GPIO4_IO28	SAI3_RXFS	3.3V	I/O	
	21	GPIO4_IO29	SAI3_RXC	3.3V	I/O	
	22	I2C2_SCL33	I2C2_SCL33	3.3V	O	
	23	GPIO1_IO05	GPIO1_IO05	1.8V	I/O	
	24	I2C2_SDA33	I2C2_SDA33	3.3V	I/O	
	25	GPIO3_IO23	PDM_DATA2	3.3V	I/O	
	26	DSI_BL_EN	DSI_BL_EN	3.3V	I/O	
	27	PDM_CLK	PDM_CLK	3.3V	I/O	
	28	GPIO3_IO24	PDM_DATA3	3.3V	I/O	
	29	GPIO3_IO22	PDM_DATA1	3.3V	I/O	
	30	GPIO3_IO21	PDM_DATA0	3.3V	I/O	
	31	GPIO4_IO11	SAI1_TXC	3.3V	I/O	
	32	GPIO3_IO25	SAI5_MCLK	3.3V	I/O	
	33	GPIO4_IO10	SAI1_TXFS	3.3V	I/O	

Item	Pin Num	Functional	Signal	Level	I/O	Description
	34	GPIO4_IO20	SAI1_MCLK	3.3V	I/O	
	35	GPIO4_IO26	SAI2_TXD	1.8V	I/O	
	36	GPIO4_IO26	SAI2_TXC	1.8V	I/O	
	37	GPIO4_IO23	SAI2_RXD	1.8V	I/O	
	38	GPIO4_IO24	SAI2_TXFS	1.8V	I/O	
	39	USB2_ID	USB2_ID	3.3V	I/O	
	40	UART4_RXD	UART4_RXD	3.3V	I	
	41	I2C4_SDA	I2C4_SDA	3.3V	I/O	
	42	UART4_TXD	UART4_TXD	3.3V	O	
	43	ECSPI2_SCLK	ECSPI2_SCLK	3.3V	O	
	44	UART3_RXD	UART3_RXD	3.3V	I	
	45	ECSPI2_MOSI	ECSPI2_MOSI	3.3V	I	
	46	GPIO5_IO08	UART3_CTS	3.3V	I/O	
	47	GPIO5_IO09	UART3_RTS	3.3V	I/O	
	48	ECSPI2_MISO	ECSPI2_MISO	3.3V	O	
	49	UART3_TXD	UART3_TXD	3.3V	O	
	50	GPIO5_IO13	ECSPI2_SS0	3.3V	O	

I: input, O: output, I/O: input/output.

**Table 5-7 Double row pin interface signal Description**

## 5.7. USB HOST Interface

The single board uses four USB hub chips to expand the original USB interface, which can only be used as host. Two USB signals are connected to a double stacked USB type a female connector (as shown in Figure 5-8), and the other two signals are connected to a 50pin expansion socket.

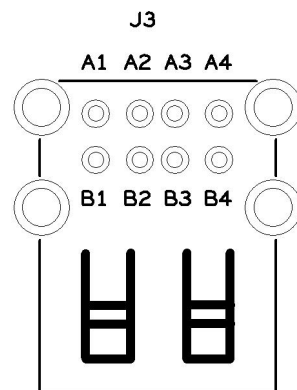


Figure 5-8 USB HOST Interface Diagram

### 5.7.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J3	A1	USB 5V Power	5V_VBUS	Power 5V Out
	A2	USB HOST Data-	USB_HOST1_DN	
	A3	USB HOST Data+	USB_HOST1_DP	
	A4	DGND	DGND	
	B1	USB 5V Power	5V_VBUS	
	B2	USB HOST Data-	USB_HOST2_DN	
	B3	USB HOST Data+	USB_HOST1_DP	
	B4	DGND	DGND	

Table 5-8 USB HOST Pin Definition

### 5.7.2. Interface Performance

Parameter	Test method	Min	Typical	Max	Unit	Description
Write Speed	time & dd	-	8.6	-	MB/s	time dd if=/dev/zero of=test_file bs=120M count=1 conv=fsync

Table 5-9 USB HOST Interface Performance

### 5.8. USB OTG Interface

A USB interface supporting OTG function is designed, and the USB base adopts the type-C USB interface.

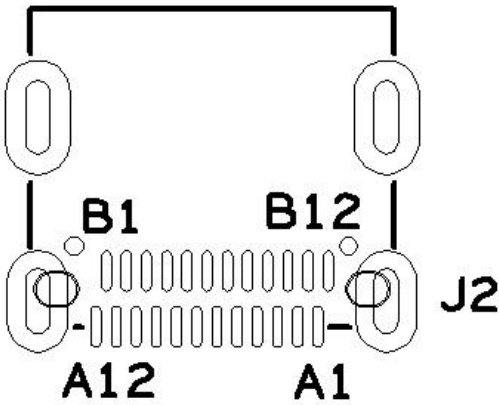


Figure 5-9 USB OTG Interface Diagram

#### 5.8.1 Pin Definition

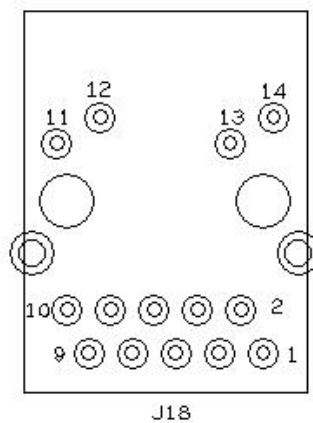
Item	Pin Num	Functional	Signal	Description
J2	A1	DGND	DGND	
	A2	SSTXP1	SSTXP1	
	A3	SSTXN1	SSTXN1	
	A4	USB 5V	VBUS1	
	A5	CC1	CC1	
	A6	DP1	DP1	
	A7	DN1	DN1	
	A8	SBU1	SBU1	
	A9	VBUS2	VBUS2	
	A10	SSRXN2	SSRXN2	
	A11	SSRXP2	SSRXP2	
	A12	DGND	DGND	
	B1	DGND	DGND	
	B2	SSTXP2	SSTXP2	
	B3	SSTXN2	SSTXN2	
	B4	VBUS4	VBUS4	
	B5	CC2	CC2	
	B6	DP2	DP2	
	B7	DN2	DN2	

	B8	SBU2	SBU2	
	B9	VBUS3	VBUS3	
	B10	SSRXN1	SSRXN1	
	B11	SSRXP1	SSRXP1	
	B12	DGND	DGND	

**Table 5-10 USB OTG Interface Definition**

## 5.9. Ethernet Interface

A 1000m Ethernet interface is designed for the single board, and integrated network transformer RJ45 connector is used. The corresponding signal of J18 network port comes from the enet1 resource of i.mx8m Mini.

**Figure 5-10 Ethernet Interface Diagram**

### 5.9.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J18	1	Send positive data1	TD1+	
	2	Send negative data1	TD1-	
	3	Send positive data2	TD2+	
	4	Send negative data2	TD2-	
	5	Transformer center tap, transmit	CT_TX	
	6	Transformer center tap, receiving	CT_RX	
	7	Send positive data3	TD3+	
	8	Send negative data3	TD3-	
	9	Send positive data4	TD4+	
	10	Send negative data4	TD4-	
	11	Positive pin of communication yellow LED	YELLOW+	
	12	Negative pin of communication yellow LED	YELLOW-	
	13	Positive pin of communication green LED	GREEN+	
	14	Negative pin of communication green LED	GREEN-	

**Table 5-11 Ethernet Pin Definition**

### 5.9.2. Interface Performance

Parameter	Test method	Min	Typical	Max	Unit	Description
TCP Bandwidth	iperf3	-	933	-	Mb/s	Server: iperf3 -s Cline: iperf3 -c 192.168.30.3 -i 2 -t 60
UDP Bandwidth	iperf3	-	944	-	Mb/s	Server: iperf3 -s Cline: iperf3 -c x.x.x.x -u -i 2 -t 60 -b 1G

**Table 5-12 Ethernet Interface Performance**

## 5.10. CSI Camer Interface

A 24 pin FPC camera interface is designed to support 4 Lane MIPI data mode.

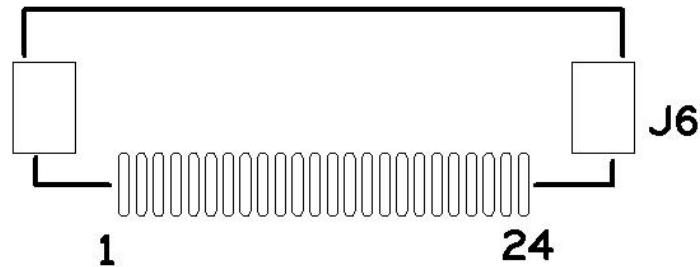


Figure 5-11 Camer Interface Diagram

### 5.10.1. Pin Definition

Table 5-13 Camer Interface Definition

Item	Pin Num	Functional	Signal	Description
J6	1	Mipi CSI data signal bit 0 negative	CSI_DN0	
	2	Mipi CSI data signal bit 0 positive	CSI_DP0	
	3	DGND	DGND	
	4	Mipi CSI data signal bit 1 negative	CSI_DN1	
	5	Mipi CSI data signal bit 1 positive	CSI_DP1	
	6	DGND	DGND	
	7	Mipi CSI signal clock negative	CSI_CKN	
	8	Mipi CSI signal clock positive	CSI_CKP	
	9	DGND	DGND	
	10	Mipi CSI data signal bit 2 negative	CSI_DN2	
	11	Mipi CSI data signal bit 2 positive	CSI_DP2	
	12	DGND	DGND	
	13	Mipi CSI data signal bit 3 negative	CSI_DN3	
	14	Mipi CSI data signal bit 3 positive	CSI_DP3	
	15	DGND	DGND	
	16	MIPI CSI Main Clock Input	CAM_P1_MCLK	
	17	DGND	DGND	
	18	CSI_PWDN	CSI_PWDN	GPIO Control CSI Power
	19	CAM_RST	CAM_RST	GPIO Control CSI Reset
	20	I2C2_SCL	I2C2_SCL	CSI Load I2C2 Clock
	21	I2C2_SDA	I2C2_SDA	CSI Load I2C2 Data
	22	NC	NC	
	23	CSI_PWR_IO1	CSI_PWR_IO1	CSI Control Power
	24	VDD_5V	VDD_5V	Camer Power Input 5V



## 5.11. LCD Display Interface

The single board designs a 40 pin FPC interface, which mainly includes 4 Lane LVDS and touch signals. The i.mx8m Mini processor outputs Mipi signal, and then our company converts Mipi signal to LVDS signal through lt8912b.

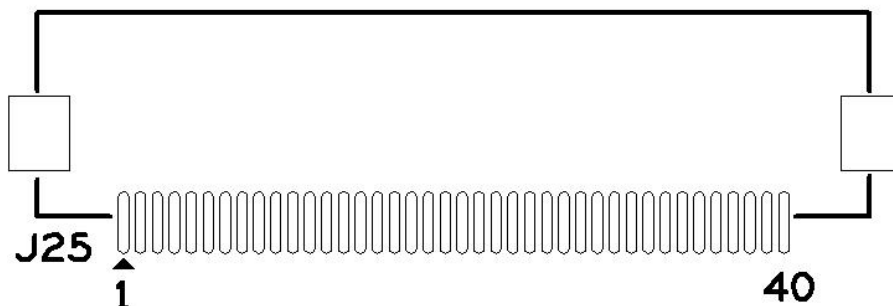


Figure 5-12 LCD Interface Diagram

### 5.11.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J25	1	NC	NC	
	2	VDD_5V	VDD_5V	
	3	VDD_5V	VDD_5V	
	4	NC	NC	
	5	NC	NC	
	6	NC	NC	
	7	DGND	DGND	
	8	LVDS_D0-	LVDS_D0-	
	9	LVDS_D0+	LVDS_D0+	
	10	DGND	DGND	
	11	LVDS_D1-	LVDS_D1-	
	12	LVDS_D1+	LVDS_D1+	
	13	DGND	DGND	
	14	LVDS_D2-	LVDS_D2-	
	15	LVDS_D2+	LVDS_D2+	
	16	DGND	DGND	
	17	LVDS_CLK-	LVDS_CLK-	
	18	LVDS_CLK+	LVDS_CLK+	
	19	DGND	DGND	
	20	LVDS_D3-	LVDS_D3-	
	21	LVDS_D3+	LVDS_D3+	
	22	DGND	DGND	
	23	NC	NC	
	24	NC	NC	

Item	Pin Num	Functional	Signal	Description
	25	DGND	DGND	
	26	NC	NC	
	27	DSI_BL_PWM	DSI_BL_PWM	Control Backlight
	28	DSI_TP_RST	DSI_TP_RST	Touch Reset
	29	NC	NC	
	30	DGND	DGND	
	31	NC	NC	
	32	NC	NC	
	33	I2C3_SDA33	I2C3_SDA33	
	34	I2C3_SCL33	I2C3_SCL33	
	35	NC	NC	
	36	TP_in	TP_in	Touch Interrupt
	37	NC	NC	
	38	NC	NC	
	39	NC	NC	
	40	NC	NC	

**Table 5-14 LCD Interface Pin Definition**

## 5.12. HDMI Interface Out

The single board designs the HDMI output seat, the i.mx8m Mini processor outputs Mipi signal, and then our company converts Mipi signal to LVDS signal and HDMI output signal through lt8912b. Support resolution 1080p 60.

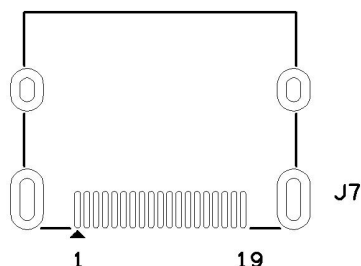


Figure 5-13 HDMI Interface Diagram

### 5.12.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J7	1	TX2_DP_OUT	TX2_DP_OUT	
	2	DGND	DGND	
	3	TX2_DN_OUT	TX2_DN_OUT	
	4	TX1_DP_OUT	TX1_DP_OUT	
	5	DGND	DGND	
	6	TX1_DN_OUT	TX1_DN_OUT	
	7	TX0_DP_OUT	TX0_DP_OUT	
	8	DGND	DGND	
	9	TX0_DN_OUT	TX0_DN_OUT	
	10	TX_CKP_OUT	TX_CKP_OUT	
	11	DGND	DGND	
	12	TX_CKN_OUT	TX_CKN_OUT	
	13	NC	NC	
	14	NC	NC	
	15	TX_DSCL	TX_DSCL	
	16	TX_DSDA	TX_DSDA	
	17	DGND	DGND	
	18	HDMI_5V	HDMI_5V	
	19	HPD_DET	HPD_DET	

Table 5-15 HDMI Interface Pin Definition

### 5.13. RTC Interface

The single board is designed with 2pin1.25 spacing seat, which needs to be equipped with 2pin plug wire button battery. Button battery with rated output voltage of 3.0V is required.

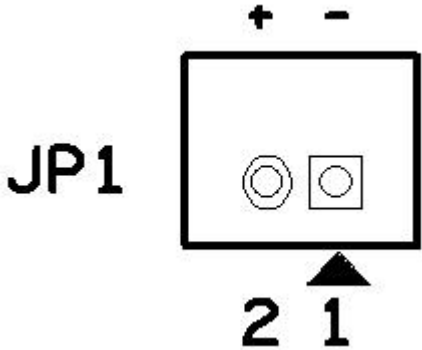


Figure 5-14 RTC Battery Connector Diagram

#### 5.13.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
JP1	1	DGND	DGND	Button battery negative
	2	Button battery positive	VDD_BAT	Button battery positive

Table 5-16 RTC Battery Pin Definition

### 5.14. Antenna Interface

Because of the design of WiFi module circuit , there must be corresponding antenna interface in order to support normal data transmission and receiving.

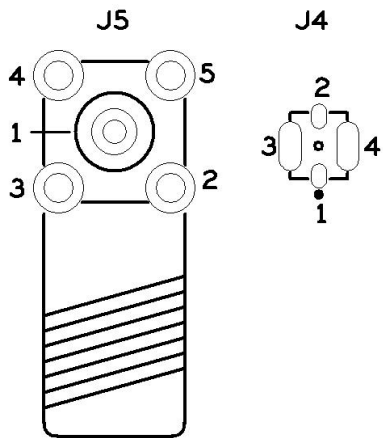


Figure 5-15 Antenna Interface Diagram

#### 5.14.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J5	1	Antenna Signal	WL_ANT	WIFI Module antenna
	2	DGND	DGND	
	3	DGND	DGND	
	4	DGND	DGND	
	5	DGND	DGND	
	5	DGND	DGND	
J4	1	NC	NC	
	2	Antenna Signal	WL_ANT	
	3	DGND	DGND	
	4	DGND	DGND	

Table 5-17 Antenna Interface Definition

## 6. Module Description

### 6.1. WIFI Module

One way of WiFi module is designed in the board. The communication interface is SDIO. The WiFi module adopts Taiwan Zhengji brand ap6256. The module supports 2.4G & 5g dual channel and Bluetooth 5.0.

Parameter	Test Condition	Min	Typical	Max	Unit	Description
Communication distance	Open space	0	5	-	m	Board as AP, mobile phone connected to AP
Throughput	1M In	-	30	-	Mb/s	WiFi as AP mode
Throughput	1M In	-	17	-	Mb/s	WiFi as station mode

Table 6-1 WIFI Wireless index

### 6.2. M.2 Interface (NVMe Agreement)

A m.2 physical card slot is designed to install SSD NVMe protocol 2242. Supporting software information.

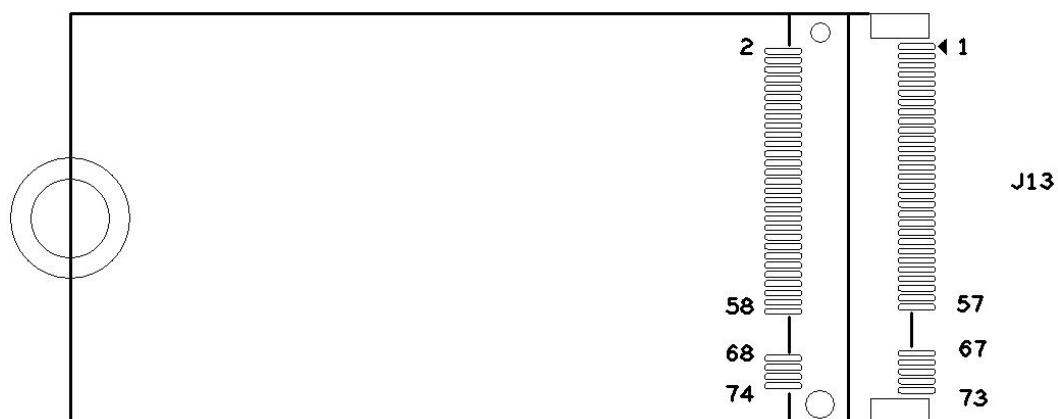


Figure 6-1 M.2 Interface Diagram

#### 6.2.1. Pin Definition

Item	Pin Num	Functional	Signal	Description
J13	1	DGND	DGND	
	2	VDD_M2_3V3	VDD_M2_3V3	Power Input
	3	DGND	DGND	
	4	VDD_M2_3V3	VDD_M2_3V3	Power Input

Item	Pin Num	Functional	Signal	Description
	5	NC	NC	
	6	NC	NC	
	7	NC	NC	
	8	NC	NC	
	9	DGND	DGND	
	10	NC	NC	
	11	NC	NC	
	12	VDD_M2_3V3	VDD_M2_3V3	Power Input
	13	NC	NC	
	14	VDD_M2_3V3	VDD_M2_3V3	Power Input
	15	DGND	DGND	
	16	VDD_M2_3V3	VDD_M2_3V3	Power Input
	17	NC	NC	
	18	VDD_M2_3V3	VDD_M2_3V3	Power Input
	19	NC	NC	
	20	NC	NC	
	21	DGND	DGND	
	22	NC	NC	
	23	NC	NC	
	24	NC	NC	
	25	NC	NC	
	26	NC	NC	
	27	DGND	DGND	
	28	NC	NC	
	29	NC	NC	
	30	NC	NC	
	31	NC	NC	
	32	NC	NC	
	33	DGND	DGND	
	34	NC	NC	
	35	NC	NC	
	36	NC	NC	
	37	NC	NC	
	38	NC	NC	
	39	DGND	DGND	
	40	NC	NC	
	41	PCIE_RXN	PCIE_RXN	
	42	NC	NC	
	43	PCIE_RXP	PCIE_RXP	
	44	NC	NC	
	45	DGND	DGND	

Item	Pin Num	Functional	Signal	Description
	46	NC	NC	
	47	PCIE_TXN	PCIE_TXN	
	48	NC	NC	
	49	PCIE_TXP	PCIE_TXP	
	50	PCle_nRST	PCle_nRST	
	51	DGND	DGND	
	52	PCle_nCLKREQ_DEV	PCle_nCLKREQ_DEV	
	53	PCIE2_REF_CLKN_CN	PCIE2_REF_CLKN_CN	
	54	PCle_nWAKE	PCle_nWAKE	
	55	PCIE2_REF_CLKP_CN	PCIE2_REF_CLKP_CN	
	56	NC	NC	
	57	DGND	DGND	
	58	NC	NC	
	67	NC	NC	
	68	REF_CLK_32K_3V3	REF_CLK_32K_3V3	
	69	NC	NC	
	70	VDD_M2_3V3	VDD_M2_3V3	Power Input
	71	DGND	DGND	
	72	VDD_M2_3V3	VDD_M2_3V3	Power Input
	73	DGND	DGND	
	74	VDD_M2_3V3	VDD_M2_3V3	Power Input

**Table 6-2 M.2 Interface Pin Definition**



# 7. Mechanical Dimension

## 7.1. Board Size

Board Technology: 95x69x1.6mm, 8 layer, FR4 plate, surface gold precipitation treatment.

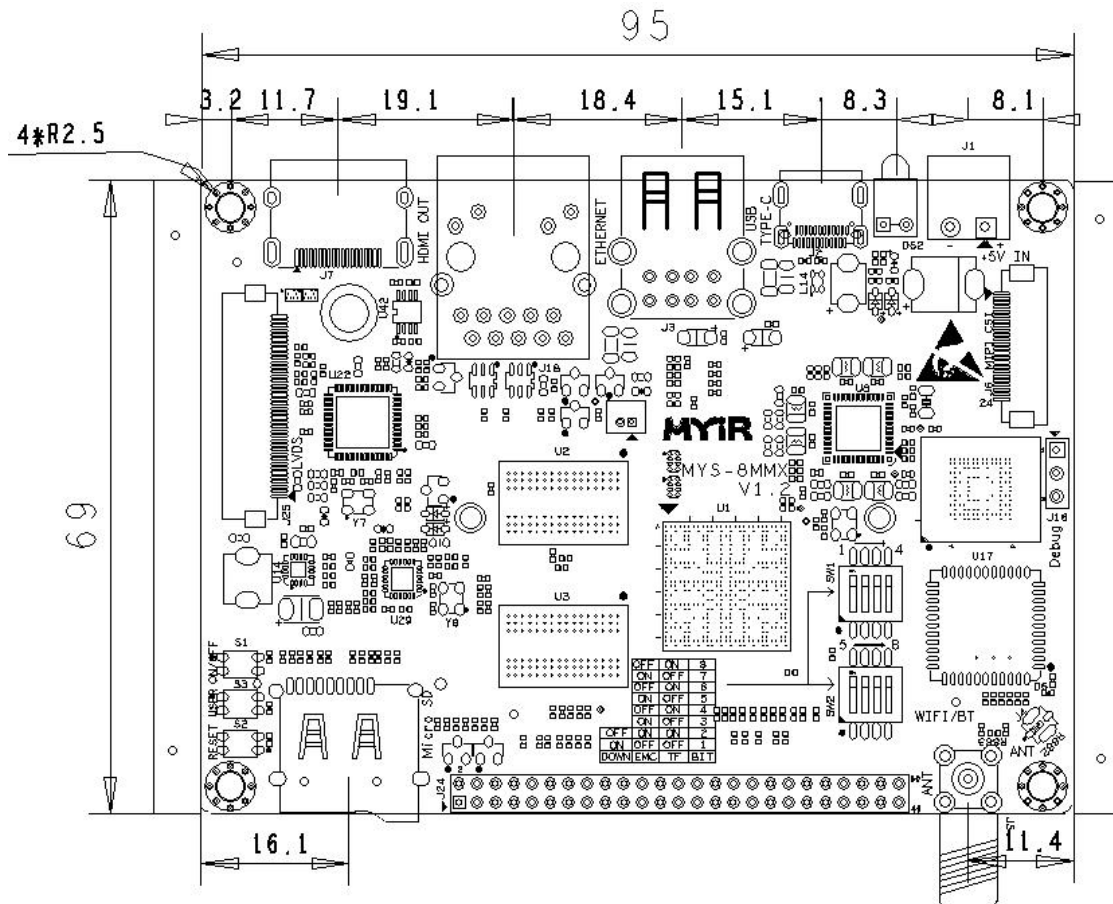


Figure 7-1 Board Size Diagram

7.2. Shell size

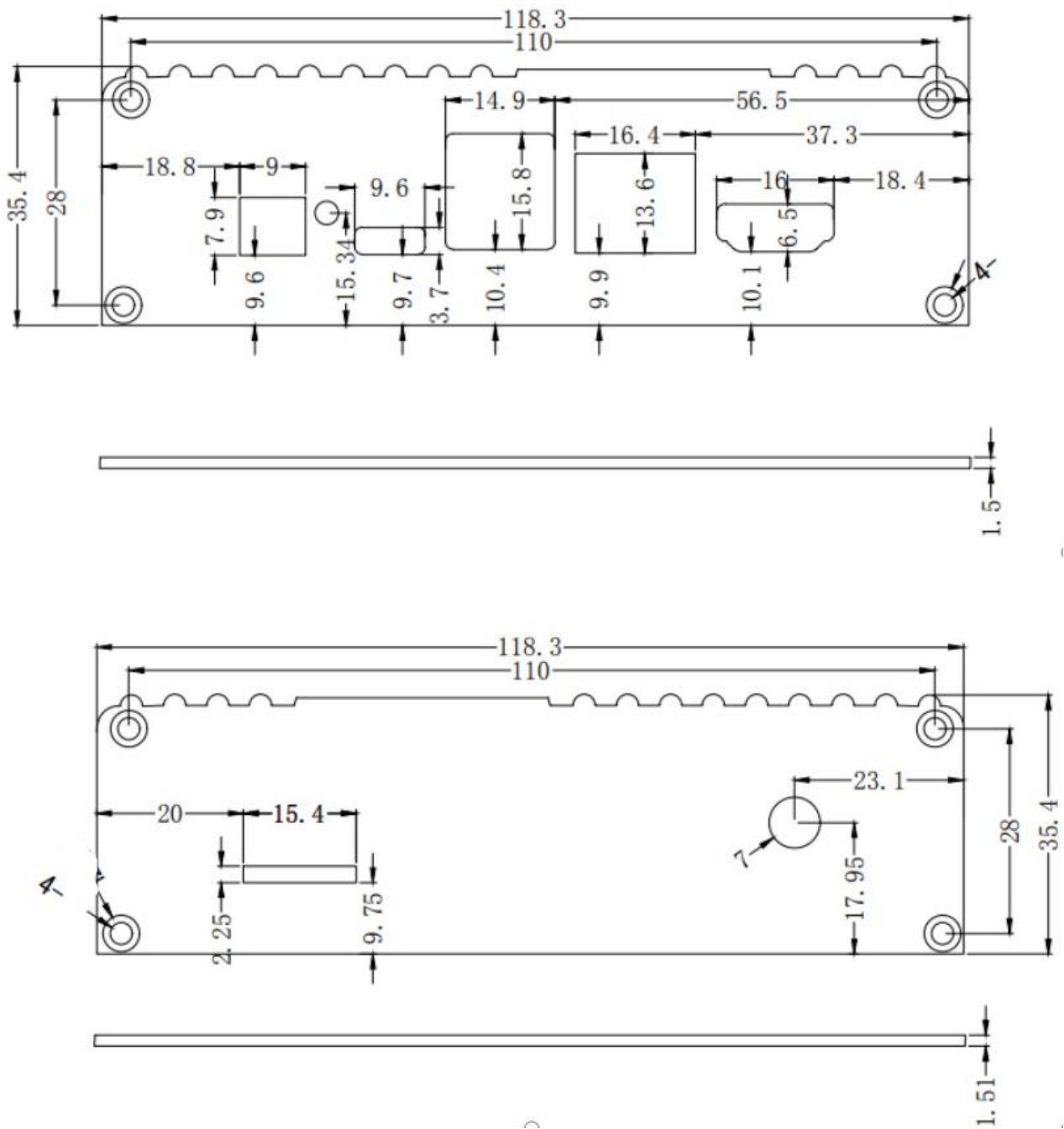


Figure 7-2 Shell Size Diagram

## 8. Ordering Information

### 8.1. 1. Product without shell

Product Model	MYS-8MMQ6-V2-8E2D-180-C	MYS-8MMQ6-V2-8E2D-160-I
Main Chip	MIMX8MM6DVTLZAA	MIMX8MM6CVTKZAA
Main Frequency	1.8Ghz	1.6Ghz
Work Temperature	0~+70°C	-40~+85°C
DDR	2GB DDR4	2GB DDR4
Memory	8GB eMMC	8GB eMMC

**Table 8-1 Optional board**

### 8.1. 2. Product with shell

Product Model	MYS-8MMQ6-V2-8E2D-180-C-B	MYS-8MMQ6-V2-8E2D-160-I-B
Main Chip	MIMX8MM6DVTLZAA	MIMX8MM6CVTKZAA
Main Frequency	1.8Ghz	1.6Ghz
Work Temperature	0~+70°C	-40~+85°C
DDR	2GB DDR4	2GB DDR4
Memory	8GB eMMC	8GB eMMC

**Table 8-2 Optional single board with shell**

## 8.2. Board Packing List

Item	Description
Board	x1 Board
Data	x1 Quick User Manual
Wire Rod	x1 2PIN Power transfer line x1 XJH-2.4G-110-SAMZ

**Table 8-3 Board Packing List**

### 8.3. Board Support Accessory Modules

Accessory model	Description
MY-CAM002U	200W Pixel USB Camera
MY-CAM003	500W Pixel MIPI Interface OV5640 Camera
MY-LVDS070C	7 inch capacitive touch screen LVDS interface LCD screen

**Table 8-4 Option Accessory**

### 8.4. Connector Manufacture Model

Material name	Brand	Reference	Description
ULO-TB13-15RC/3.81-02P-3000A	ULO	J1	Power Input
UT12111-B1609-7F	Foxconn	J2	Type-C USB
UB11121-8FDE-4F	Foxconn	J3	USB HOST
FC-SMA271	FLY-CORE	J5	WIFI/BT ANT
59222441101J	Leyconn	J6	MIPI CSI Interface
44020411232W	Leyconn	J7	HDMI Out Interface
APCI0146-P001A	LOTES	J13	M.2 Interface
WQ21801-B2180-7F	Foxconn	J15	TF Card Solt
3131035311161	Leyconn	J16	Debug UART
S11-ZZ-0319	UDE	J18	Ethernet Interface
3222255810881	Leyconn	J24	50PIN Ext Solt
59224041101J	Leyconn	J25	40PIN LVDS Interface

**Table 8-5 Connector Manufacture model**

# 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](mailto: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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