MYD-C8MMX-V2 Development Board

➢ *MYC-C8MMX-V2 CPU Module as Controller Board*

➢ *NXP i.MX 8M Mini Quad Application Processor based on 1.8 GHz Arm Cortex-A53 and 400MHz Cortex-M4 Cores*

➢ *2GB DDR4, 8GB eMMC Flash, 32MB QSPI Flash*

➢ *UARTs, 2 x USB 2.0 Host, 1 x Micro USB Host/Device, NVMe PCIe M.2 2280 SSD Interface, Micro SD Card Slot*

➢ *Supports Gigabit Ethernet, WiFi/Bluetooth and 4G LTE Communications*

➢ *Camera Interface (MIPI-CSI), LVDS, MIPI-DSI, Audio Input/Output*

➢ *Supports Working Temperature Ranging from -40°C to 85°C*

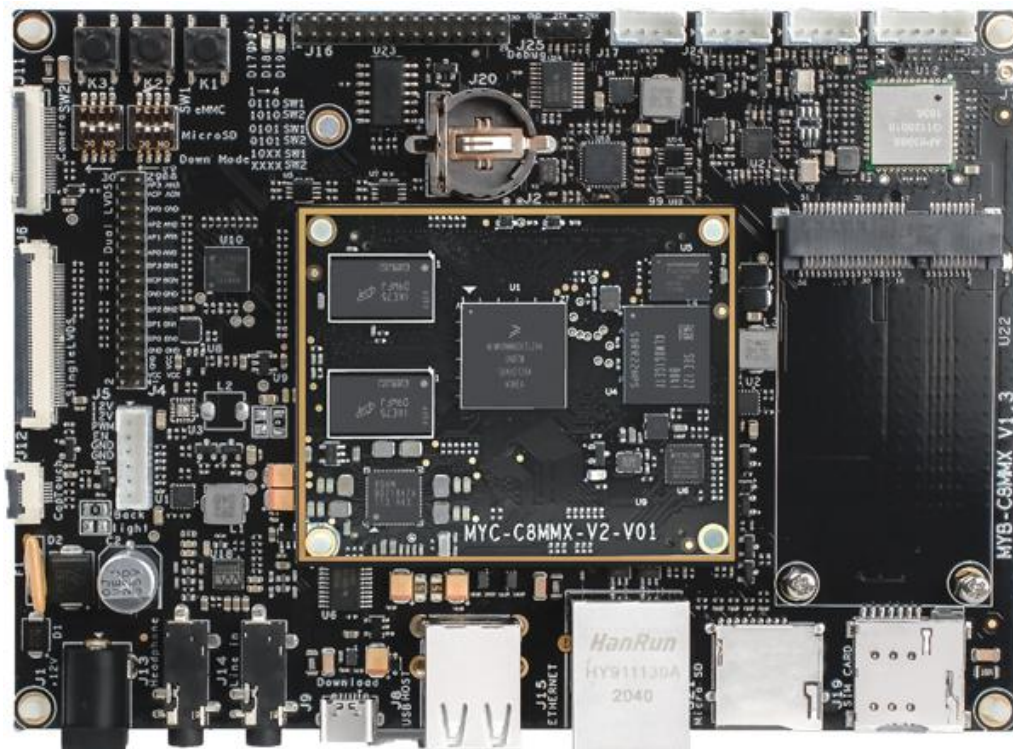➢ *Supports Running Yocto Linux, Ubuntu Linux, Android*

Figure 1-1 MYD-C8MMX-V2 Development Board

The **MYD-C8MMX-V2 Development Board** consists a compact CPU Module **MYC-C8MMX-V2** and a base board to provide a complete evaluation platform for NXP's i.MX 8M Mini application processors which feature up to four Arm Cortex-A53 cores running at up to 1.8 GHz, a 400 MHz Cortex-M4 for low-power real-time processing, 2D/3D GPU and independent hardware video encode and decode engines.

The CPU Module integrates an **NXP i.MX 8M Mini Quad processor**, DDR4, eMMC, QSPI Flash, Gigabit Ethernet PHY and ROHM PMIC. It is mounted on the MYD-C8MMX base board through two 0.8mm pitch 100-pin Board-to-Board Expansion Connectors. The base board has rich peripherals including 2 x USB 2.0 Host ports and 1 x Micro USB 2.0 Host/Device port, Gigabit Ethernet, MicroSD card slot, USB based Mini PCIe interface for 4G LTE Module, WiFi/Bluetooth, Audio In/Out, MIPI-CSI, 2 x LVDS interfaces, NVMe PCIe M.2 2280 SSD Interface, etc.

The **MYD-C8MMX-V2 Development Board** is ready to run Linux and Android OS. It has two variants to supports both commercial grade and industrial grade that may be used in any general purpose industrial and IoT applications. MYIR offers **MY-LVDS070C LCD Module**, **MY-CAM003M MIPI Camera Module** and **MY-CAM002U USB Camera Module** as options for the board.
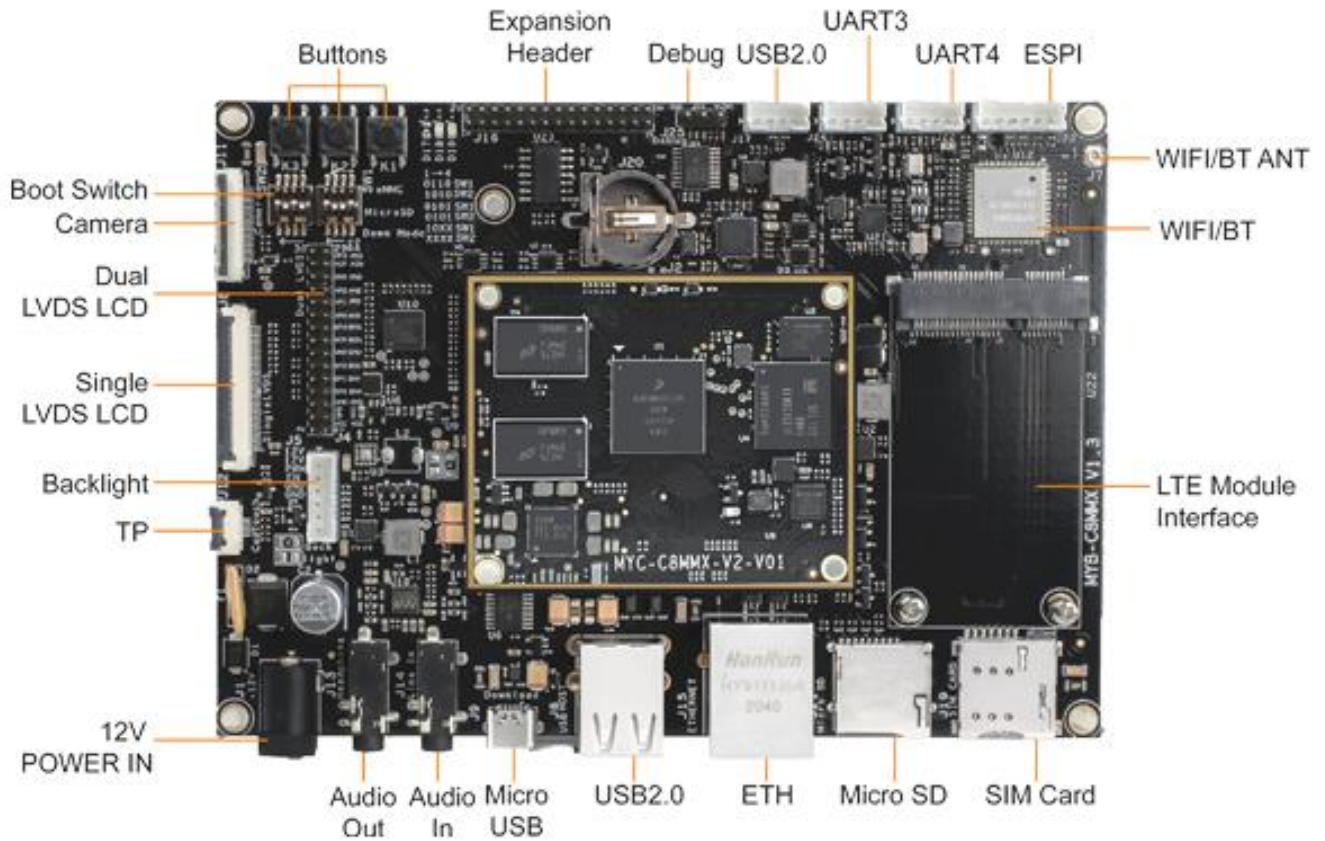
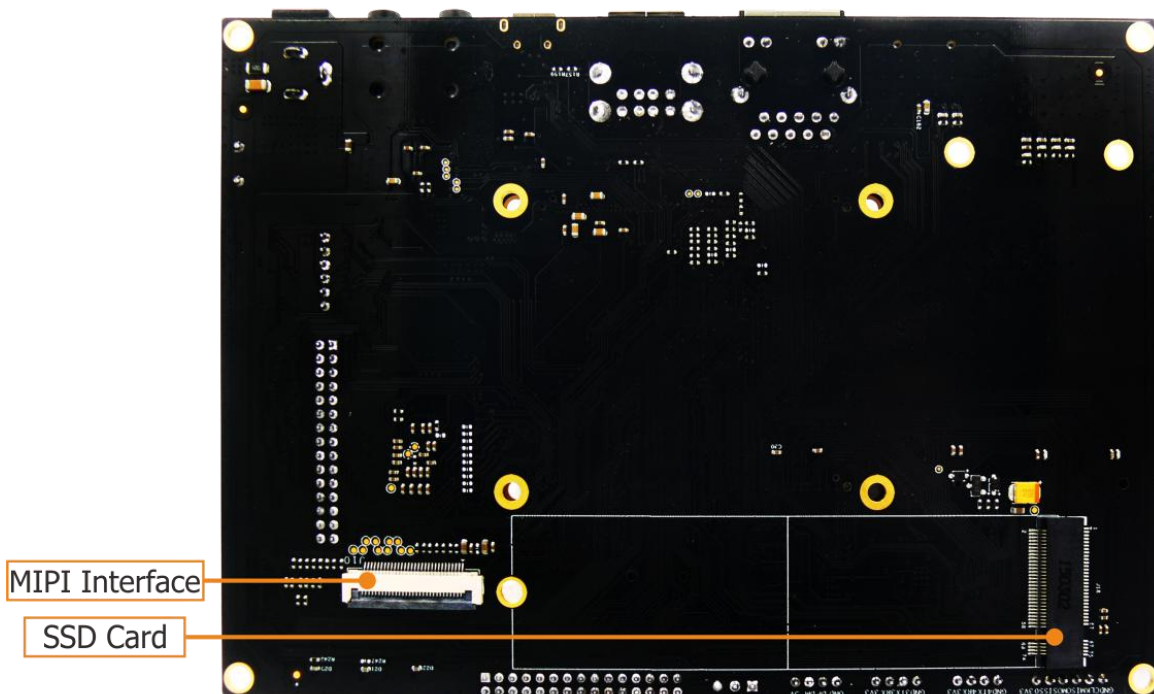*Figure 1-2 MYD-C8MMX-V2 Development Board Top-view*

Figure 1-3 MYD-C8MMX-V2 Development Board Bottom-view

Hardware Specification

The **MYC-C8MMX-V2 CPU Module** on the **MYD-C8MMX-V2 Development Board** is using NXP's 14 x 14 mm, 0.5 mm pitch, FCBGA486 package i.MX 8M Mini Quad Application Processor (MIMX8MM6DVTLZAA / MIMX8MM6CVTKZAA) which is among the **i.MX 8M Mini family** and features as in below table.

Feature	MIMX8MM6CVTKZAA	MIMX8MM6DVTLZAA
Marketing Description	i.MX 8M Mini Quad	i.MX 8M Mini Quad
Core: Number of cores (SPEC)	4	4
Core Type	Arm Cortex-A53	Arm Cortex-A53
Operating Frequency [Max] (MHz)	1600	1800
Co Processor Type	Arm Cortex-M4F	Arm Cortex-M4F
Co Processor Frequency (MAX) (MHz)	400	400
External Memory Supported	DDR3L SDRAM, DDR4 SDRAM, ECC, LPDDR4 DRAM, NAND FLASH, NOR FLASH, QSPI	
L2 Cache (Max) (KB)	512	
Ethernet Type	1 Gbps + IEEE 1588 + AVB	
Serial Communication	3 x SPI, 4 x I²C, 4 x UART	
PCIe 2.0	1	
USB Controllers	2	
Video Decode Acceleration	HD1080p60, H.265, H.264, VP8, VP9	
Video Encode Acceleration	HD1080p60, H.264, VP8	
Display	1 x MIPI-DSI	
Camera	1 x MIPI-CSI	
GPU 2D / GPU 3D	1x shader, Vivante GC320, Vivante GCNanoUltra	
Audio Specific Modules	8-ch PDM input, SAI/I2S	
Junction Temperature (Min) (℃)	-40	0
Junction Temperature (Max) (℃)	105	95

Table 1-1 Features of i.MX 8M Mini Quad Application Processor

MYIR TECH LIMITED

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The i.MX 8M Mini family of applications processors (i.MX 8M Mini Quad/QuadLite, i.MX 8M Mini Dual/DualLite, i.MX8M Mini Solo/SoloLite) represent NXP's latest video and audio experience combining state-of-the-art media-specific features with high-performance processing while optimized for lowest power consumption. The i.MX 8M Mini family of processors feature advanced implementation of a quad Arm® Cortex®-A53 core, which operates at speeds of up to 1.8GHz. A general-purpose Cortex®-M4 400 MHz core processor is for low-power processing. The DRAM controller supports 32-bit/16-bit LPDDR4, DDR4, and DDR3L memory. A wide range of audio interfaces are available, including I2S, AC97, TDM, and S/PDIF. There are a number of other interfaces for connecting peripherals, such as USB, PCIe, and Ethernet. It is NXP's first embedded multicore applications processor built using advanced 14LPC FinFET process technology, providing more speed and improved power efficiency. With commercial and industrial level qualification and backed by NXP's product longevity program, the i.MX 8M Mini family may be used in any general purpose industrial and IoT application.
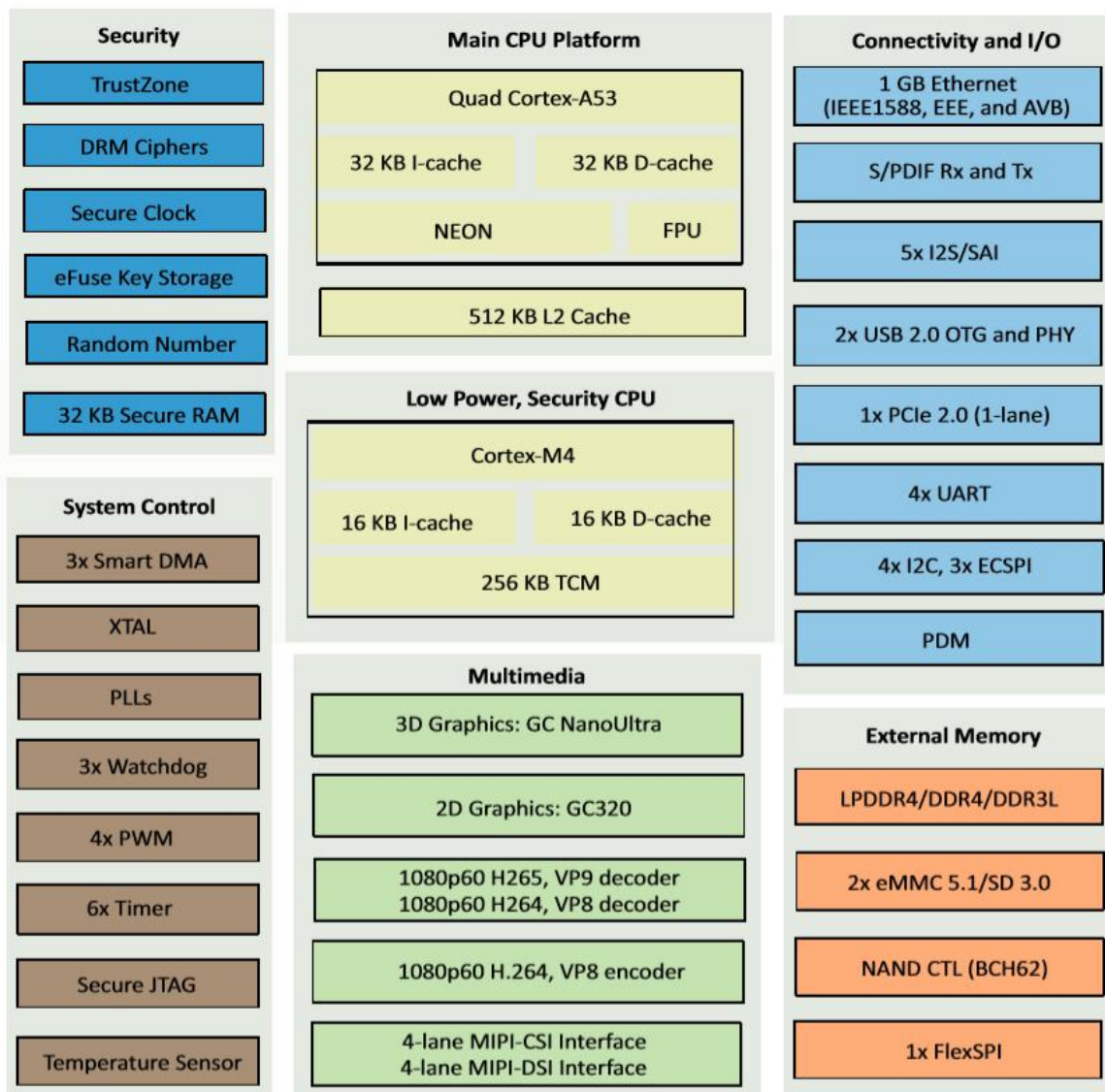

Figure 1-4 i.MX 8M Mini System Block Diagram

The **MYD-C8MMX-V2 Development Board** is using **MYC-C8MMX-V2 CPU Module** as core controller board. It takes full features of i.MX 8M Mini Quad processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 140mm x 100mm (base board), 60mm x 49mm (CPU Module)
- PCB Layers: 4-layer design (base board), 8-layer design (CPU Module)
- Power supply: +12V/2A (base board), 5V/0.23A (CPU Module)
- Working temperature: 0~70 Celsius (commercial grade) or -40~85 Celsius (industrial grade)
-

The MYD-C8MMX-V2 Controller Board (MYC-C8MMX-V2 CPU Module)
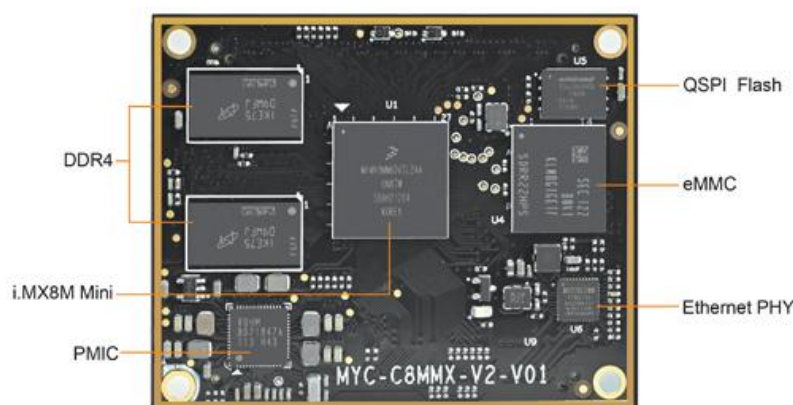

Figure 1-5 MYC-C8MMX-V2 CPU Module Top-view

Figure 1-6 MYC-C8MMX-V2 CPU Module Bottom-view

Processor

- NXP i.MX 8M Mini Processor
- - Up to 1.8GHz Quad-core ARM Cortex-A53 CPU
- - 400MHz Real-time ARM Cortex-M4 co-processor
- - Integrated 2D/3D GPU and 1080p VPU

Memory

- 2GB DDR4 (supports up to 4GB DDR4)
- 8GB eMMC Flash (supports up to 64GB)
- 32MB QSPI Flash

Peripherals and Signals Routed to Pins

📄 MYC-C8MMX-V2 Pinouts Description

- One 10/100/1000M Ethernet PHY
- Power Management IC (ROHM BD71847MWV)
- Two 0.8mm pitch 100-pin Board-to-Board Expansion Connectors
- - 1 x 10/100/1000Mbps Ethernet
  - 3 x Serial ports
  - 3 x I2C
  - 3 x SPI
  - 4 x PWM
  - 2 x USB 2.0
  - 1 x PCIe
  - 5 x I2S / SAI

- 1 x MIPI-CSI
- 1 x MIPI-DSI
- Up to 103 GPIOs

Note: the peripheral signals brought out to the expansion interface are listed in maximum number. Some signals are reused. Please refer to the processor data sheet.

The MYD-C8MMX-V2 Development Board Base Board

Figure 1-7 MYD-C8MMX-V2 Development Board Base Board

- Serial ports
- - Debug serial port (TTL)
- - 2 x TTL serial ports (UART3, UART4)
- USB
- - 2 x USB2.0 Host ports
- - 1 x Micro USB Host/Device port
  - 1 x 4-pin 2.0mm pitch header connector
  - 1 x Mini-PCIe interface (for 4G LTE Module)
- 1 x SIM card slot
- 1 x 10/100/1000 Mbps Ethernet interface (RJ45)
- WiFi/Bluetooth Module (complies with IEEE 802.11 b/g/n and supports Bluetooth V4.1+HS)
- 1 x external antenna connector (for WiFi/Bluetooth)
- 1 x NVMe PCIe M.2 2280 SSD Interface
- 1 x TF card slot
- 1 x MIPI-CSI Camera interface (J11, 24-pin 0.5mm pitch FPC connector)
- 1 x MIPI-DSI Display Interface (J10, 30-pin 0.5mm pitch FPC connector)
- 1 x LVDS LCD interface (J6, 40-pin 0.5mm pitch FPC connector)
- 1 x LVDS LCD interface (J4, 30-pin 2.0mm pitch header connector)
- 1 x Capacitive touch screen interface (J12, 6-pin 0.5mm pitch FPC connector)
- 1 x Backlight interface (J5, 6-pin 2.0mm pitch header connector)
- Audio Input/Output
- Battery backed RTC
- 3 x Buttons (one for RESET, one for ON/OFF and one for USER)
- 1 x 2.0mm 2*15-pin male expansion header (J16)

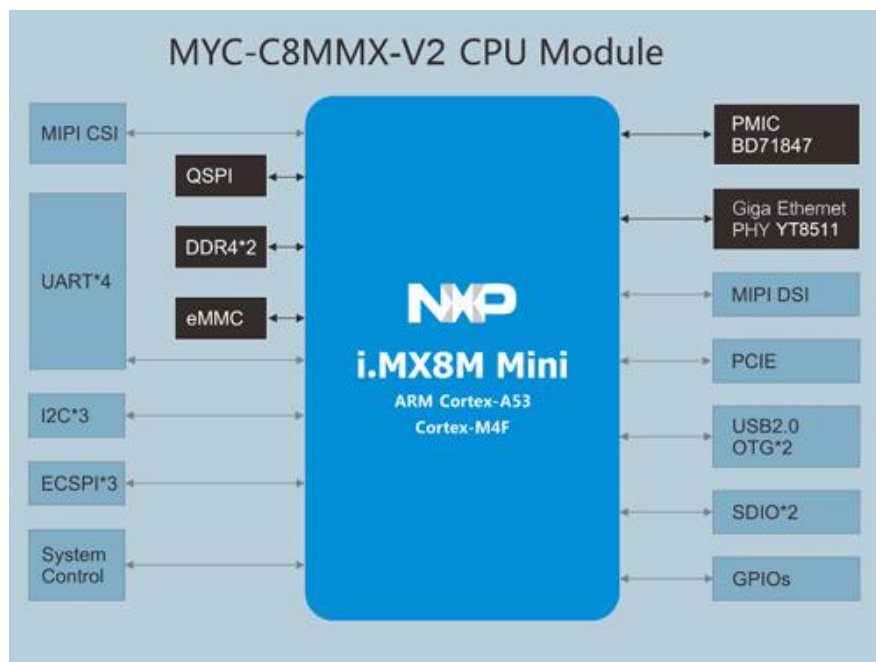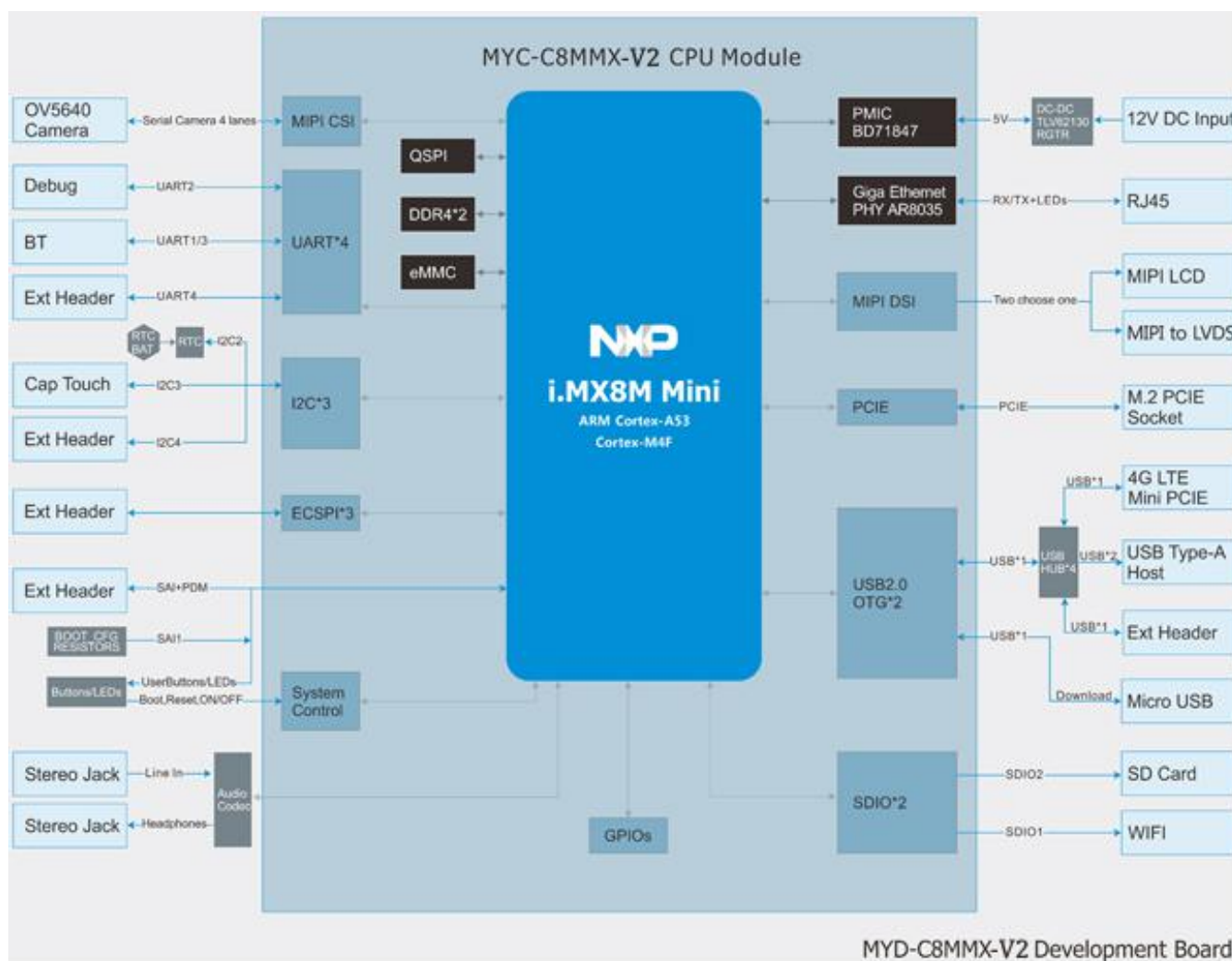*Figure 1-8 MYC-C8MMX-V2 CPU Module Function Block Diagram*

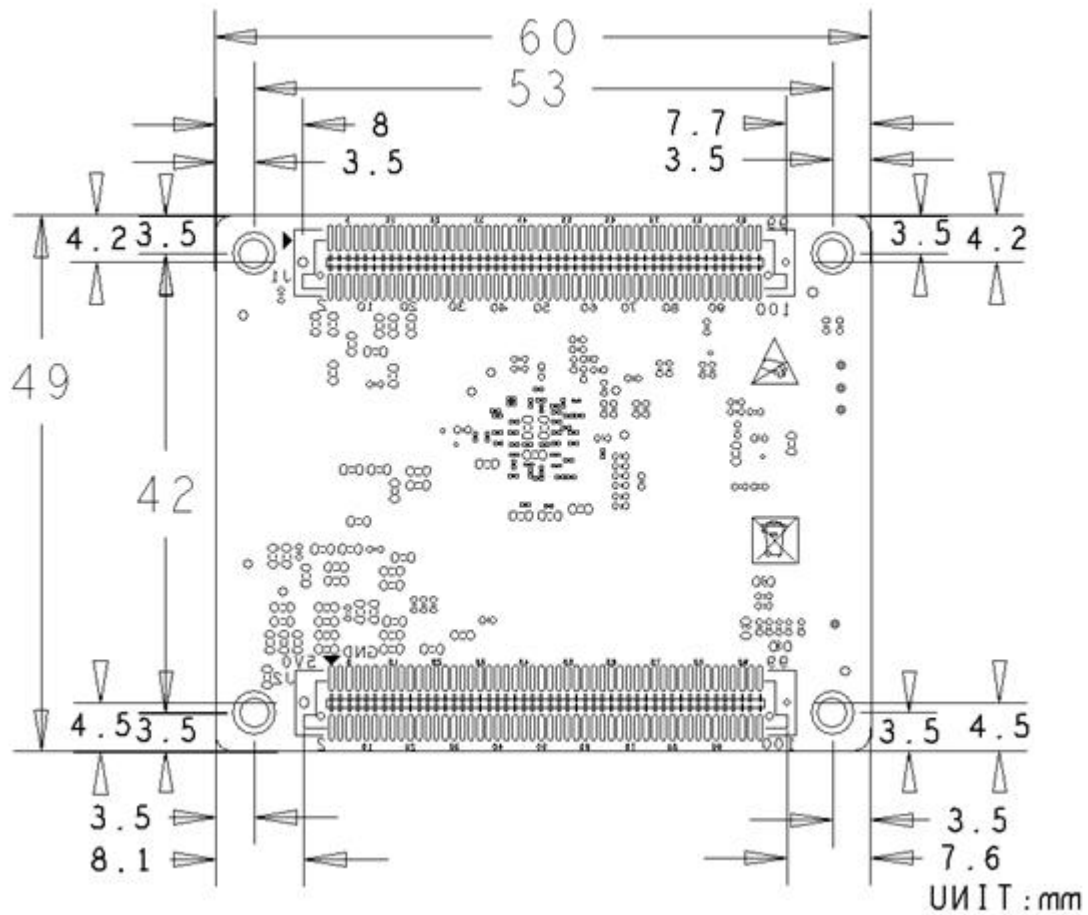*Figure 1-9 MYD-C8MMX-V2 Development Board Function Block Diagram*
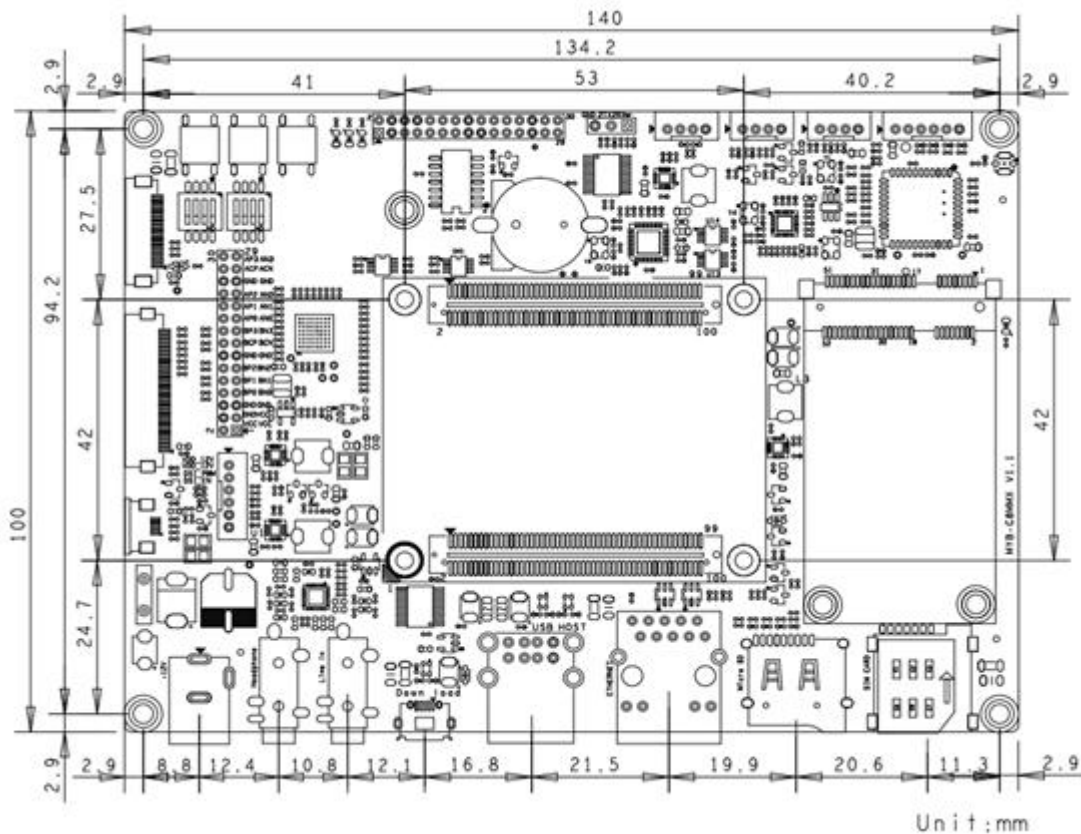
Figure 1-10 MYC-C8MMX-V2 Dimensions Chart

Figure 1-11 MYD-C8MMX-V2 Dimensions Chart

Software Features

The MYD-C8MMX-V2 supports running Linux Operation System, Android OS and is provided with software packages. Many peripheral drivers are in source code to help accelerate customers' designs. The software package provided is characterized as following:

Item	Features	Description	Source Code Provided
Bootstrap program	U-boot	The primary bootstrap based on U-boot 2019.04	YES
Linux kernel	Image	Based on Linux 5.4.3	YES
Drivers	PMIC	BD71847MWV PMIC driver	YES
	USB Host	USB Host driver	YES
	USB OTG	USB OTG driver	YES
	I2C	I2C Bus driver	YES
	SPI	SPI Bus driver	YES
	Ethernet	10/100/1000M Ethernet driver	YES
	MMC	MMC/eMMC/TF card driver	YES
	LCD	MIPI-LVDS driver	YES
	PWM	PWM driver	YES
	RTC	RTC driver	YES
	IO	GPIO driver	YES
	Touch	Capacitive touch screen driver	YES
	Audio	WM8904 driver	YES
	Camera	Ov5640 driver	YES
	WiFi & BT	AP6212 driver	YES
	Watchdog	Watchdog driver	YES
	4G LTE Module	Supports Quectel's EC20 using USB driver	YES
	M.2	NVME driver	YES
File System	Yocto rootfs	Yocto 3.0, including QT5.13.2	YES
		Common file system for terminal	YES
Application Programs	GPIO KEY	Key example	YES
	GPIO LED	LED example	YES
	NET	TCP/IP Sokect C/S example	YES
	RTC	RTC example	YES
	UART	UART example	YES
	Audio	Audio example	YES
	LCD	LCD example	YES
	Camera	Camera display example	YES
Compiler Tool Chain	Cross compiler	Yocto GCC 7.3.0 Hardfloat	BINARY

Table 1-2 Yocto Linux Software Features

Item	Features	Description	Source Code Provided
Bootstrap program	U-boot	The primary bootstrap	YES
Linux kernel	Boot	Based on NXP official android_9.0.0_2.3.0 version	YES
Drivers	PMIC	BD71847MWV PMIC driver	YES
	USB Host	USB Host 2.0 driver	YES
	I2C	I2C Bus driver	YES
	SPI	SPI Bus driver	YES
	Ethernet	10/100/1000M Ethernet driver	YES
	MMC	MMC/eMMC/TF card driver	YES
	LVDS	LVDS driver	YES
	PWM	PWM driver	YES
	RTC	RTC driver	YES
	GPIO	GPIO driver	YES
	Audio	WM8904 driver	YES
	Camera	Ov5640 driver	YES
	WiFi & BT	AP6212 driver	YES
	Watchdog	Watchdog driver	YES
	4G LTE Module	Supports Quectel's EC20 using USB driver	NO
	M.2	NVME driver	YES
File System	Android system	Based on Android 9	YES
Compiler Tool Chain	Cross compiler	Gcc version 4.9 x 20150123 (prerelease) (GCC)	YES

Table 1-3 Android Software Features

Item	Features	Description	Source Code Provided
Bootstrap program	U-boot	The primary bootstrap	YES
Linux kernel	Image	Based on NXP official imx_4.14.98_2.0.0_ga version	YES
Drivers	PMIC	BD71847MWV PMIC driver	YES
	USB Host	USB Host driver	YES
	USB OTG	USB OTG driver	YES
	I2C	I2C Bus driver	YES
	SPI	SPI Bus driver	YES
	Ethernet	10/100/1000M Ethernet driver	YES
	MMC	MMC/eMMC/TF card driver	YES
	LCD	MIPI-LVDS driver	YES
	PWM	PWM driver	YES
	RTC	RTC driver	YES
	IO	GPIO driver	YES
	Touch	Capacitive touch screen driver	YES
	Audio	WM8904 driver	YES
	Camera	Ov5640 driver	YES
	Watchdog	Watchdog driver	YES
	4G LTE Module	Supports Quectel's EC20 using USB driver	YES
	M.2	NVME driver	YES
File System	Ubuntu base	Ubuntu18.04 Rootfs	YES
Compiler Tool Chain	Cross compiler	Yocto GCC 7.3.0 Hardfloat	BINARY

Table 1-4 Ubuntu Linux Software Features

Order Information

Product Item	Part No.	Packing List
MYD-C8MMX-V2 Development Board	MYD-C8MMQ6-V2-8E2D-180-C	➢ One MYD-C8MMX-V2 Development Board ➢ One 12V/2A Power adapter ➢ One WiFi/Bluetooth Antenna ➢ One 4G LTE Antenna ➢ One Quick Start Guide
	MYD-C8MMQ6-V2-8E2D-160-I	
MYC-C8MMX-V2 CPU Module	MYC-C8MMQ6-V2-8E2D-180-C	**Add-on Options** ➢ MYC-C8MMX-V2 CPU Module ➢ MY-LVDS070C LCD Module ➢ MY-CAM003M Camera Module ➢ MY-CAM002U Camera Module
	MYC-C8MMQ6-V2-8E2D-160-I	
MY-LVDS070C LCD Module	MY-LVDS070	
MY-CAM003M MIPI Camera Module	MY-CAM003M	
MY-CAM002U USB Camera Module	MY-CAM002U	

![MYIR logo]

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