MYiR 米尔电子
Make Your Idea Real

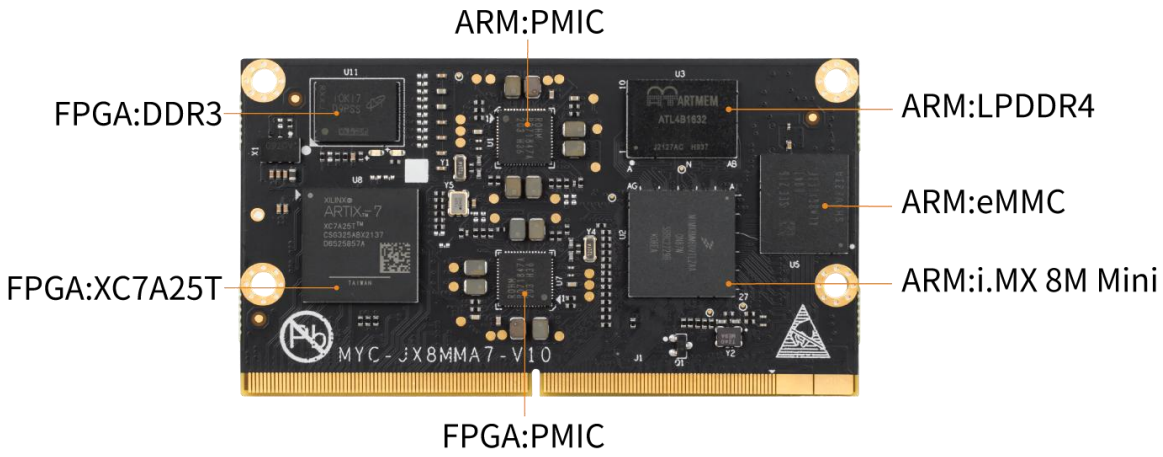
MYC-JX8MMA7 System-On-Module Overview

- ✓ *Up to 1.8GHz NXP i.MX 8M Mini Quad ARM Cortex-A53 and 400MHz Cortex-M4 Cores*
- ✓ *Xilinx XC7A25T Artix-7 FPGA*
- ✓ *2GB LPDDR4, 8GB eMMC and 32MB QSPI Flash for ARM, 256MB DDR3 and 32MB QSPI Flash for FPGA*
- ✓ *Power Management IC*
- ✓ *0.05mm pitch 314-pin MXM 3.0 Gold-finger-edge-card Connector*
- ✓ *Supports Running Linux OS*

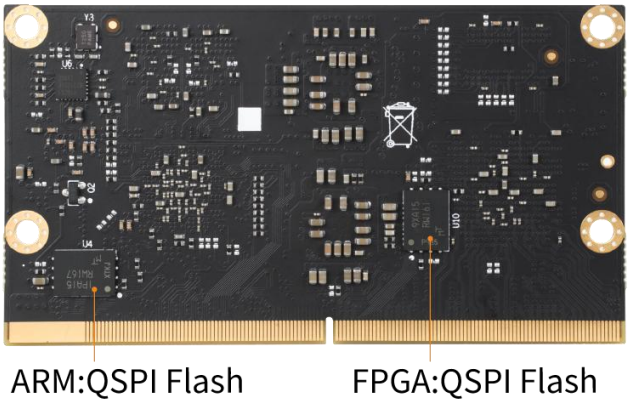
Measuring 82mm by 45mm, the **MYC-JX8MMA7 System-On-Module** adopts the processing architecture of ARM+FPGA embedded system. It is a compact System-on Module (SoM) based on 1.8GHz NXP i.MX 8M Mini quad-core ARM Cortex-A53 plus 400MHz Cortex-M4 processor and an integrated Xilinx XC7A25T Artix-7 FPGA. The CPU Module takes full advantages the ARM MPU to provide powerful multimedia capability for data processing, control, communication and display, as well as enough FPGA resources for high-speed data acquisition, processing and AD module expansion. It can be used in various applications like medical devices, industrial data acquisition systems, power industry, communications and more others.

In addition to the processors, the **MYC-JX8MMA7** has 2GB LPDDR4, 8GB eMMC and 32MB QSPI flash for ARM, 256MB DDR3 and 32MB QSPI flash for FPGA as well as two dedicated PMIC (ROHM BD71847AMWV) respectively for ARM and FPGA. A variety of peripherals and IO signals are available through the 0.05 mm pitch MXM 3.0 gold-finger-edge-card connector to make it easy to connect with MYIR's standard base board of **MYD-JX8MMA7 development board** or customized base boards from users.

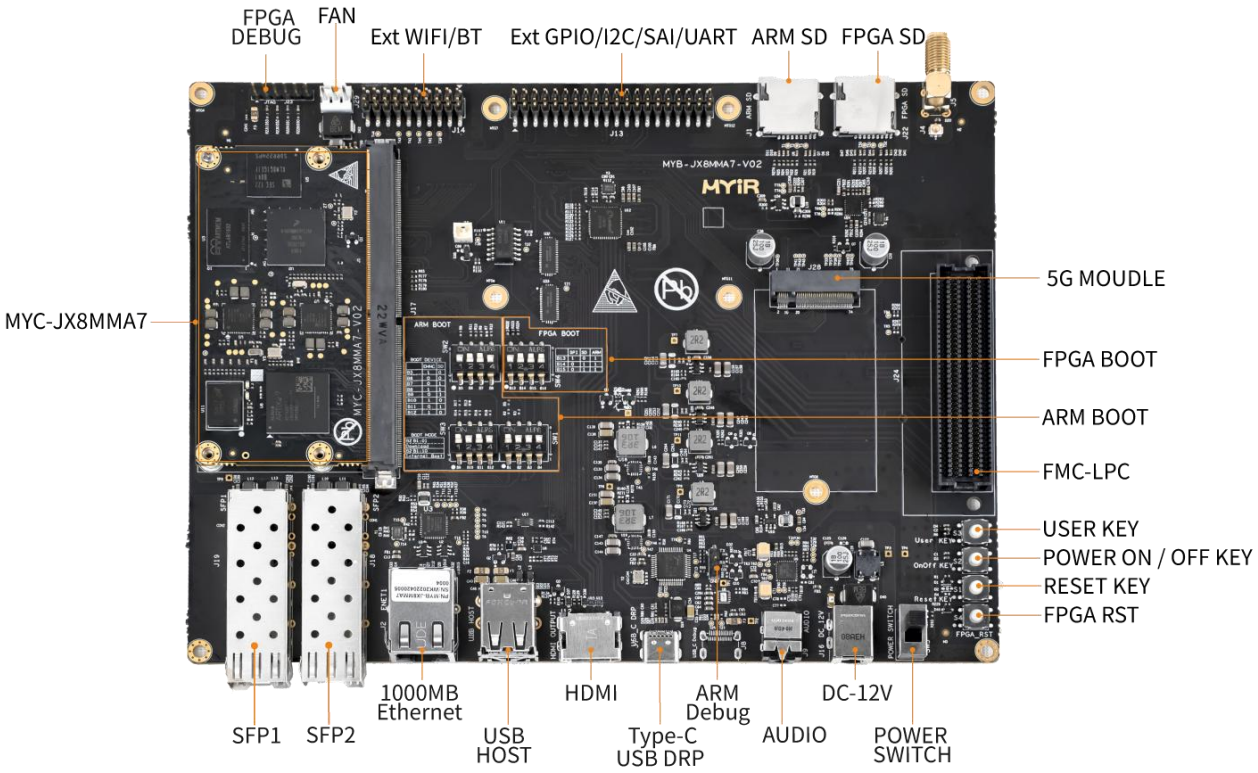
The **MYC-JX8MMA7 Module** runs Linux. It comes with an abundance of software resources including kernel and drivers in source code as well as detailed documentations. The **MYD-JX8MMA7 development board** provides a complete evaluation platform for the CPU Module. A plenty of peripherals interfaces are carried out to the base board like two USB Host and one OTG, one Gigabit Ethernet, two SFP network interfaces, WiFi/Bluetooth module interface, USB 2.0 based M.2 Key B 5G Module interface, LVDS and HDMI display interfaces, MIPI and Parallel CSI interfaces, Audio, one 2 x 20-pin UART/I2C/SPI/GPIO extension header which is compatible with Raspberry Pi interface, etc.



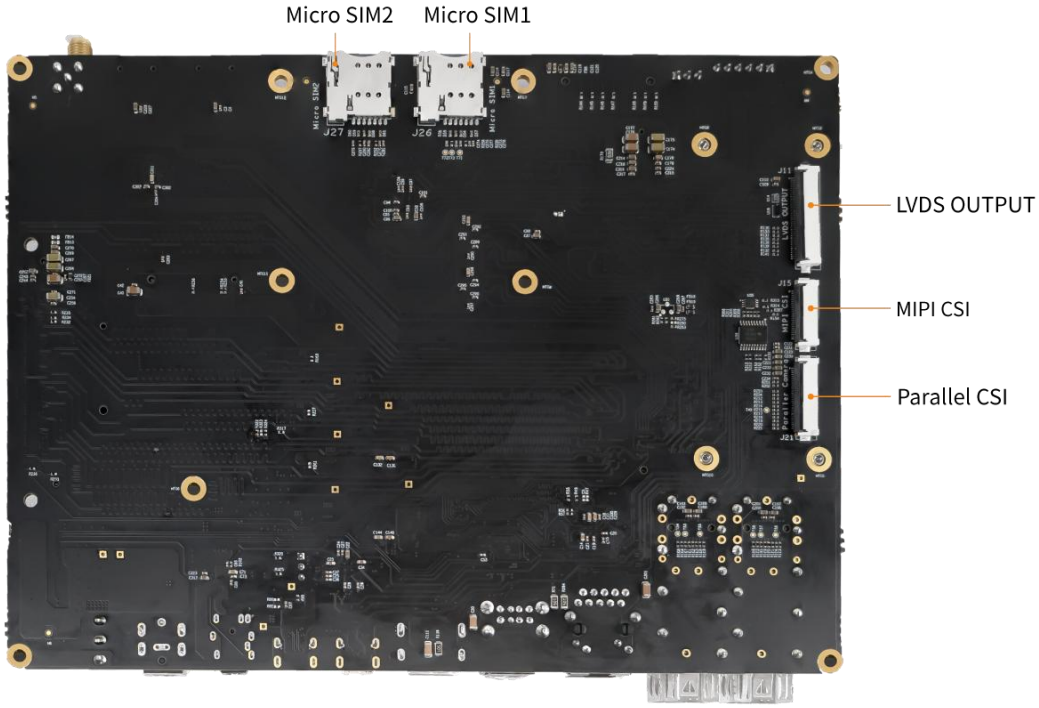
MYC-JX8MMA7 Top-view



MYC-JX8MMA7 Bottom-view



MYD-JX8MMA7 Development Board Top-view



MYD-JX8MMA7 Development Board Bottom-view

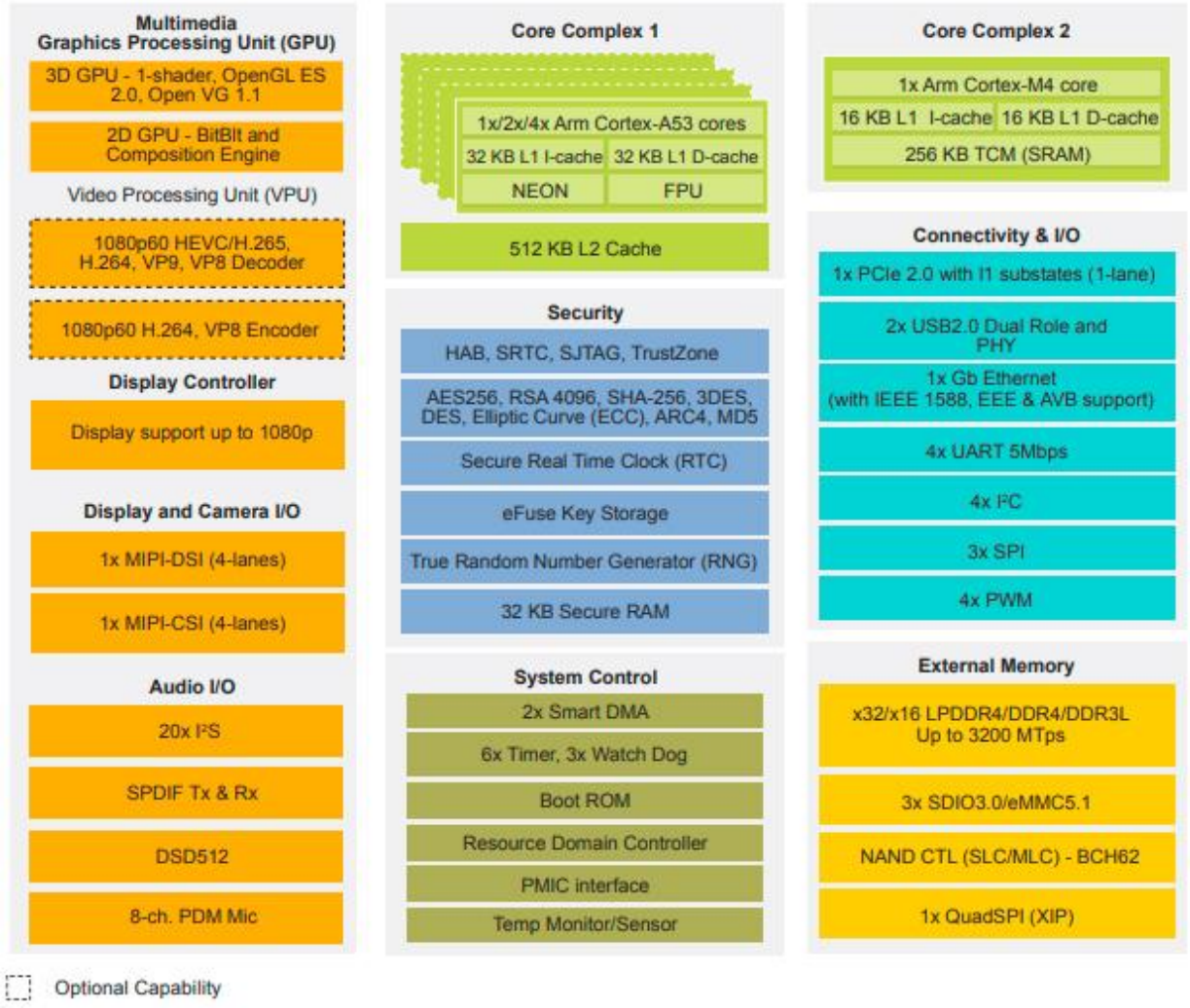
Hardware Specification

The **MYC-JX8MMA7 CPU Module** is using NXP's 14 x 14 mm, 0.5 mm pitch, FCBGA486 package **i.MX 8M Mini** Quad Application Processor (MIMX8MM6DVTLZAA / MIMX8MM6CVTKZAA) and an integrated **Xilinx XC7A25T Artix-7** FPGA.

The i.MX 8M Mini processors used are among the i.MX 8M Mini family (i.MX 8M Mini Quad/QuadLite, i.MX 8M Mini Dual/DualLite, i.MX8M Mini Solo/SoloLite) which 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. 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. The main features are 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 I^2C, 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

Features of i.MX 8M Mini processor



i.MX 8M Mini Processors Family Block Diagram

The **Xilinx XC7A25T** devices (XC7A25T-2CSG325C / XC7A25T-2CSG325I) used are among the Artix-7 devices family which provides high performance-per-watt fabric, transceiver line rates, DSP processing, and AMS integration in a cost-optimized FPGA, featuring the MicroBlaze™ soft processor and 1,066Mb/s DDR3 support, and is the best value for a variety of cost and power-sensitive applications including software-defined radio, machine vision cameras, and low-end wireless backhaul. The main features are as in below table:

Artix-7 XC7A25T-2CSG325	Parameter
Logic Cells	23,360
Slices	3,650
CLB Flip-Flops	29,200
Maximum Distributed RAM (Kb)	313
Block RAM/FIFO w/ ECC (36 Kb each)	45
Total Block RAM (Kb)	1,620
CMTs (1 MMCM + 1 PLL)	3
Maximum Single-Ended I/O	150
Maximum Differential I/O Pairs	72
DSP Slices	80
Analog Mixed Signal (AMS) / XADC	1
Configuration AES / HMAC Blocks	1
GTP Transceivers (6.6 Gb/s Max Rate)	4
Temperature Grade	XC7A25T-2CSG325C (-2 speed grade, 0°C to +85°C) XC7A25T-2CSG325I (-2 speed grade, –40°C to +100°C)

Features of Artix-7 XC7A25T FPGA

Mechanical Parameters

- Dimensions: 82mm x 45mm
- PCB Layers: 10-layer design
- Power supply: +5V/2A
- Working temperature: 0~70 Celsius (commercial grade) or 40~85 Celsius (industrial grade)

Processor

- NXP i.MX 8M Mini Processor
  - Up to 1.8 GHz Quad-core ARM Cortex-A53 CPU
  - 400MHz Real-time Cortex-M4 co-processor
  - Integrated 2D/3D GPU and 1080p VPU
- Xilinx Artix-7 XC7A25T-2CSG325 FPGA

Memory

- ARM: 2GB LPDDR4, 8GB eMMC, 32MB QSPI Flash
- FPGA: 256MB DDR3, 32MB QSPI Flash

Power Management IC

- Two PMIC ROHM BD71847AMWV (one for ARM and one for FPGA)

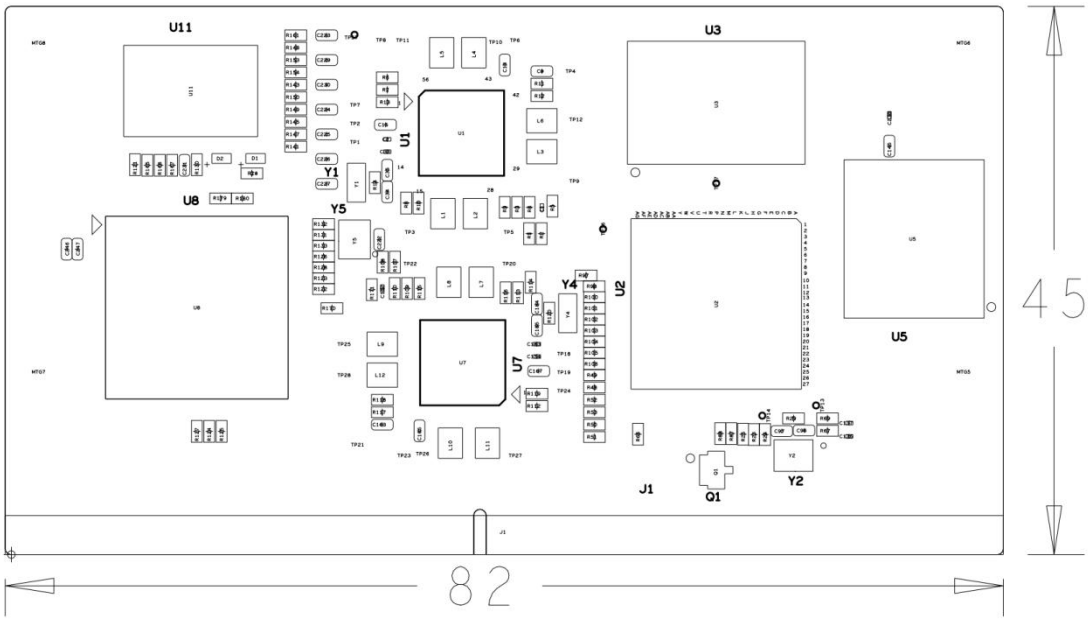
Peripherals and Signals Routed to Pins

- 0.5mm pitch 314-pin MXM 3.0 Gold-finger-edge-card Connector

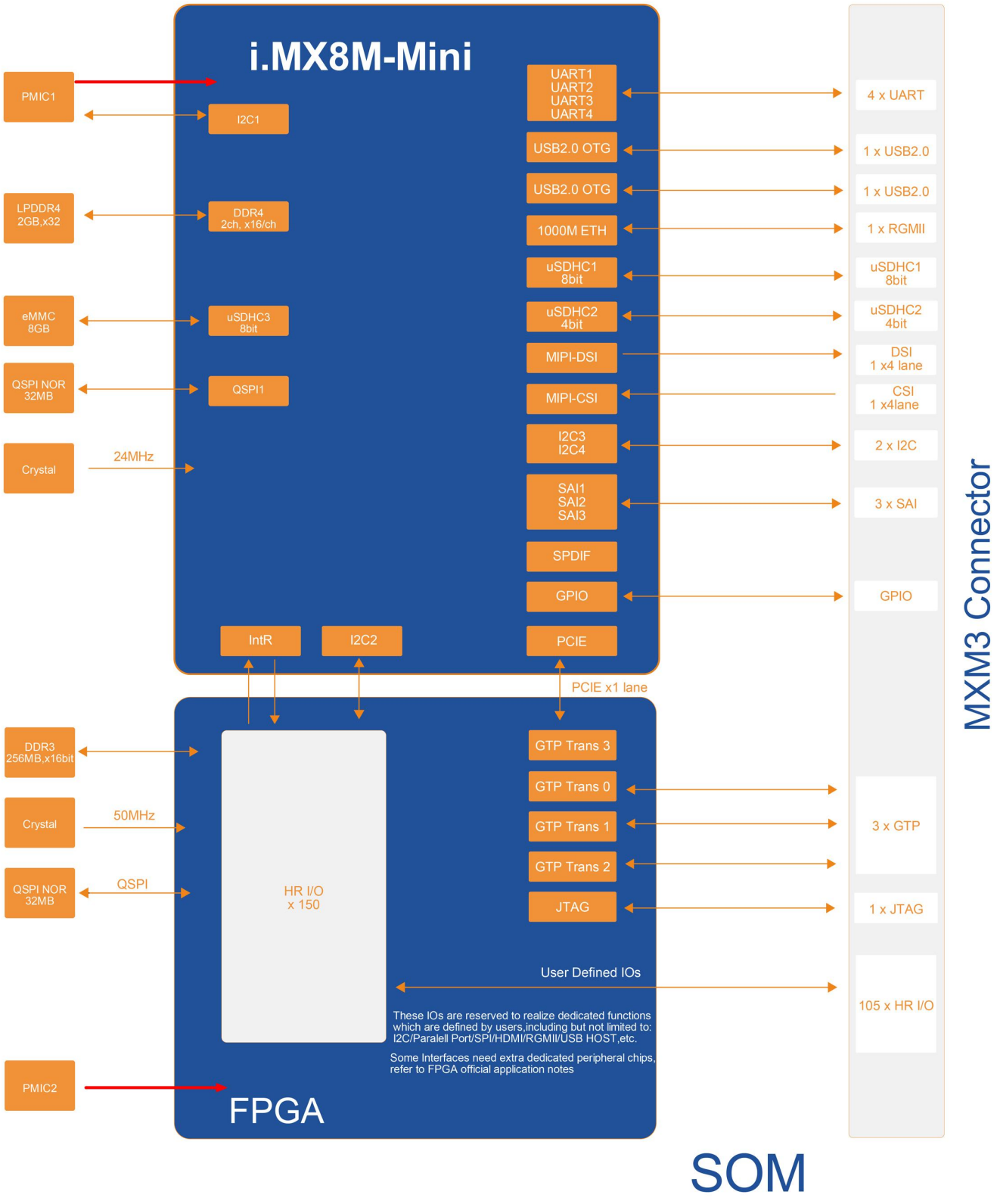
Item	Features
ARM	
Ethernet	1*RGMII
USB2.0	2* USB2.0
Camera	1* MIPI CSI
SDIO	2*SDIO
UART	4*UART
I2C	2*I2C
SPI	3*SPI
Display Output	1*MIPI-DSI
Audio	3* I2S
Note: the peripheral signals brought out to the expansion interface are listed in maximum number. Some signals are reused. Please refer to the processor datasheet and the CPU Module pinout description file.	

Item	Features
FPGA	
GTP	3
Logic Cells	23360
Slices	3,650
CLB Flip-Flops	29,200
DSP Slices	80

Peripherals and Signals Routed to 314-pin Expansion Connector



MYC-JX8MMA7 Dimensions Chart (Unit: mm)



MYC-JX8MMA7 Block Diagram

Software Features

The **MYC-JX8MMA7 System-On-Module** from MYIR is equipped with Linux software packages and prepared to run Linux. To speed up customers' designs, many peripheral drivers are provided in the source code. The software package provided is characterized as following:

Item	Feature	Description	Source Code
Bootloader	U-boot	Boot program U-boot 2021.04	YES
Linux kernel	Linux kernel	Customized based on official kernel_5.10.72	YES
Device driver	MMC	eSDHC driver	YES
	SPI	SPI driver	YES
	I2C	i2c driver	YES
	USB Host	USB driver	YES
	Ethernet	Gigabit Ethernet driver	YES
	USB OTG	USB driver	YES
	UART	Serial driver	YES
	GPIO key	Key driver	YES
	Wifi&bt	Brcm driver	YES
	RTC	RTC driver	YES
	Gpio Led	Led driver	YES
	MIPI DSI	Mipi driver	YES
	CSI	CSI driver	YES
	Touch	Touch driver	YES
File system	myir-image-full	File system with GUI interface built with Yocto	YES
	myir-image-core	File system without QT built with Yocto	YES

Linux Software Features

Order Information

Product Item	Part No.	Packing List
MYC-JX8MMA7 System-On-Module	MYC-JX8MMA7-8E2D-32Q256D-160-I	✓ One MYC-JX8MMA7 SOM
	MYC-JX8MMA7-8E2D-32Q256D-180-C	
MYD-JX8MMA7 Development Board	MYD-JX8MMA7-8E2D-32Q256D-160-I	✓ One MYD-JX8MM7A Board (including MYC-JX8MMA7 SOM) ✓ One USB TYPE-A to TYPE-C cable ✓ One 12V/2A Power adapter ✓ One DC Power jack adapter ✓ One Quick Start Guide
	MYD-JX8MMA7-8E2D-32Q256D-180-C	
MY-CAM011B BUS Camera Module	MY-CAM011B	**Add-on Options** ✓ MY-CAM011B Module ✓ MY-CAM003M Module ✓ MY-LVDS070C Module ✓ MY-WIREDCOM Module ✓ MY-WF005S Module
MY-CAM003M MIPI Camera Module	MY-CAM003M	
MY-LVDS070C 7-inch LCD Module	MY-LVDS070C	
MY-WIREDCOM RPI Module	MY-WIREDCOM	
MY-WF005S WiFi/BT Module	MY-WF005S	

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