MYiR 米尔电子
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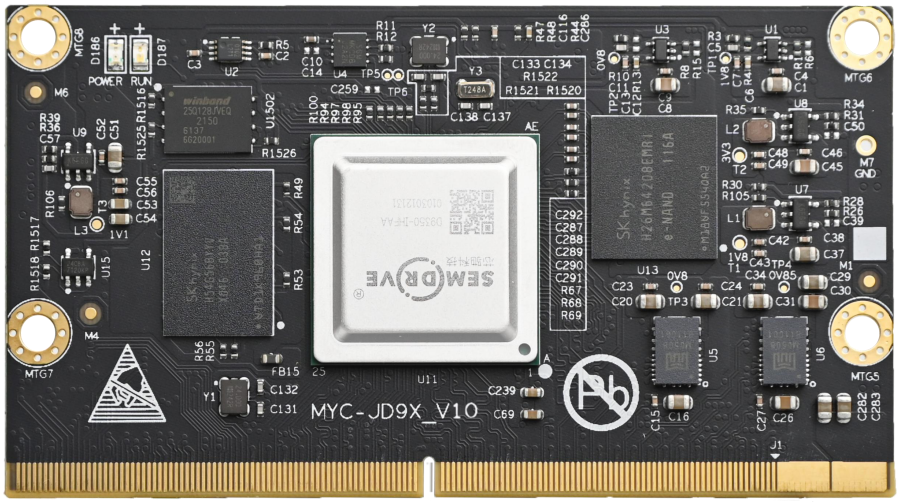
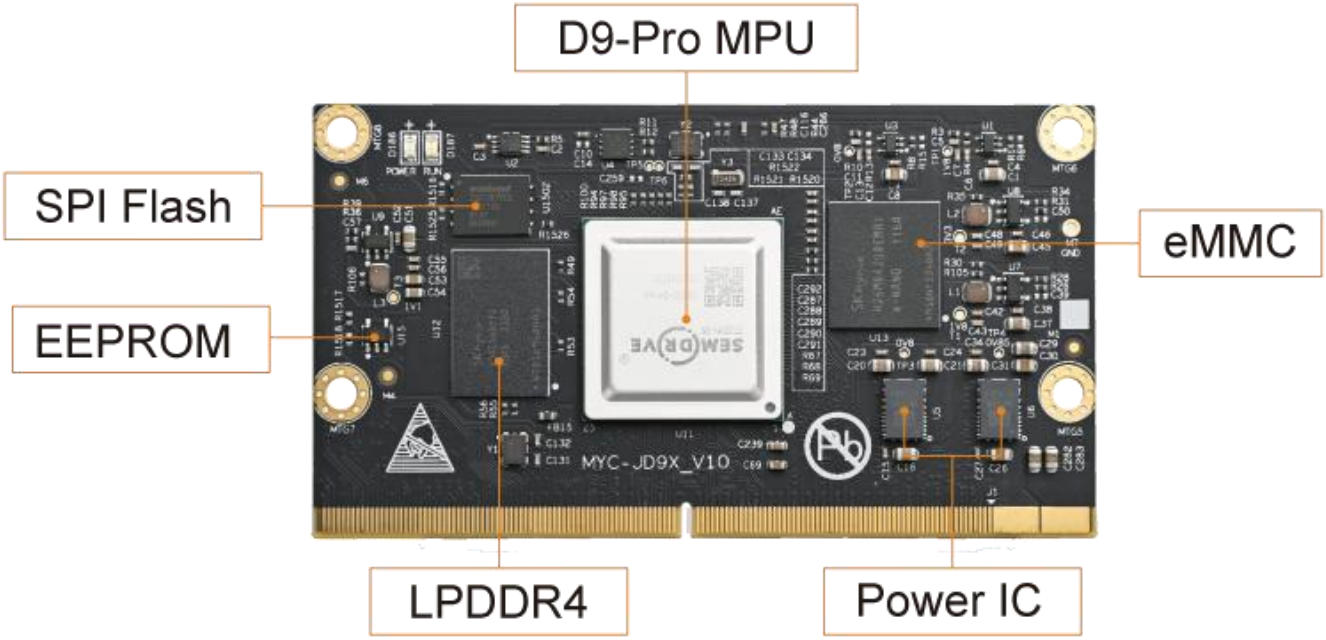
MYC-JD9360
System-On-Module
Overview



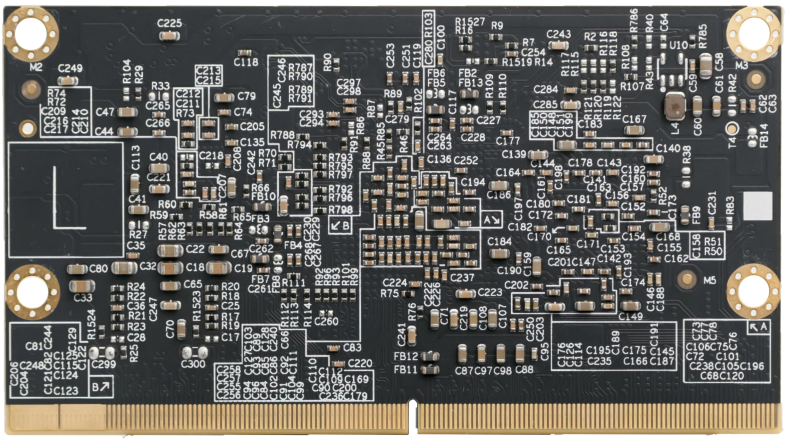
- ✓ *SemiDrive D9-Pro High Performance Processor based on 1.6GHz Six ARM Cortex-A55 and Cortex-R5 Cores*
- ✓ *Supports 100GFLOPS PowerVR 9XM GPU, VPU Codec H.265/H.264 /VP8/VP9 and 0.8Tops NPU*
- ✓ *2GB LPDDR4, 16GB eMMC Flash, 16MB SPI Nor Flash, 256Kbit EEPROM*
- ✓ *0.5mm pitch 314-pin MXM 3.0 Gold-finger-edge-card Connector*
- ✓ *Supports for Linux OS*
- ✓ *Support Working Temperature Ranging from -40 to 85 Celsius*

Measuring 45mm by 82mm, the MYC-JD9360 is a powerful embedded ARM System-On-Module (SOM) based on SemiDrive's 1.6GHz D9-Pro six-core Arm Cortex-A55 smart industrial processor with one real-time Cortex-R5 co-processor. The D9-Pro provides dedicated AI capabilities with integrated NPU, high-performance 3D graphics processing capabilities with Imagination's PowerVR 9XM GPU, high-resolution image processing capabilities with a pretty fast VPU, and an extensive set of peripherals such as PCIe3.0, USB3.0, Gigabit Ethernet, CAN-FD, UART, SPI, etc.

The MYC-JD9360 SOM has integrated D9-Pro processor, 2GB LPDDR4, 16GB eMMC Flash, 16MB SPI Nor Flash, 256Kbit EEPROM and power IC. A number of peripheral and IO signals are access through one 0.5mm pitch 314-pin MXM 3.0 gold-finger-edge-card connector. It is especially suitable for high performance display control machine, industrial robot, construction machinery T-BOX, smart cockpit, car entertainment, intelligent medical equipment and more other applications.



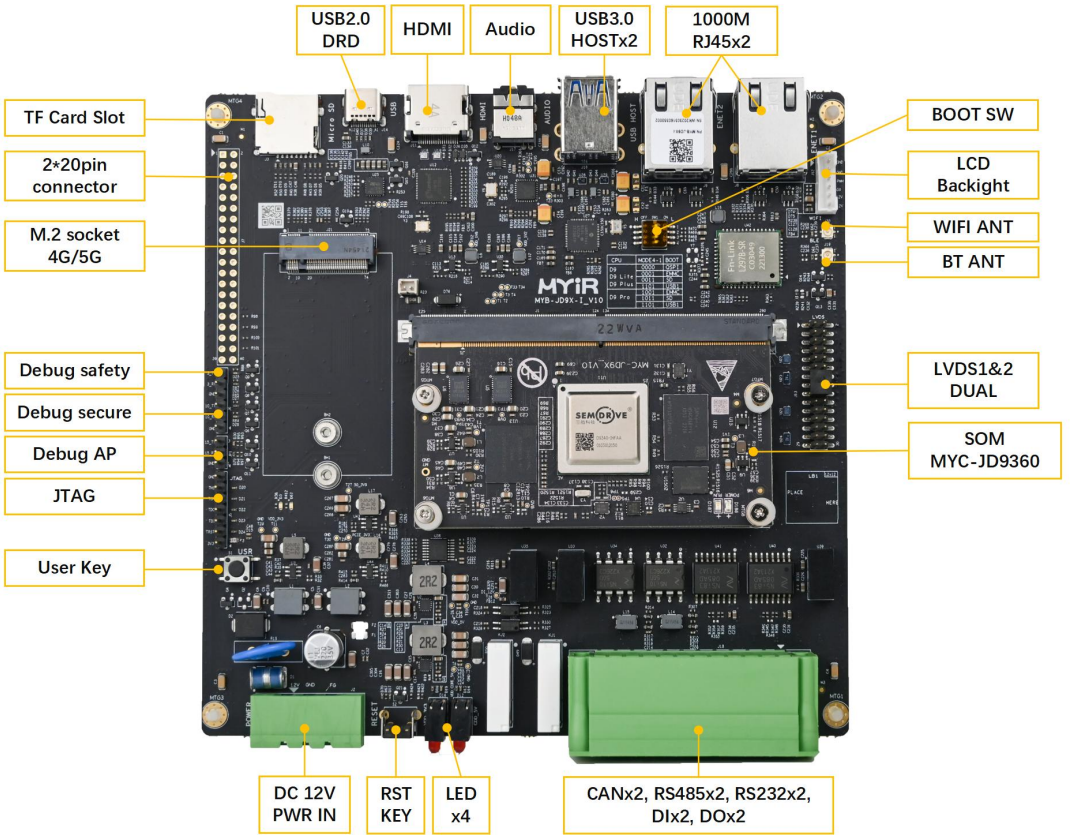
MYC-JD9360 SOM (Top-view)



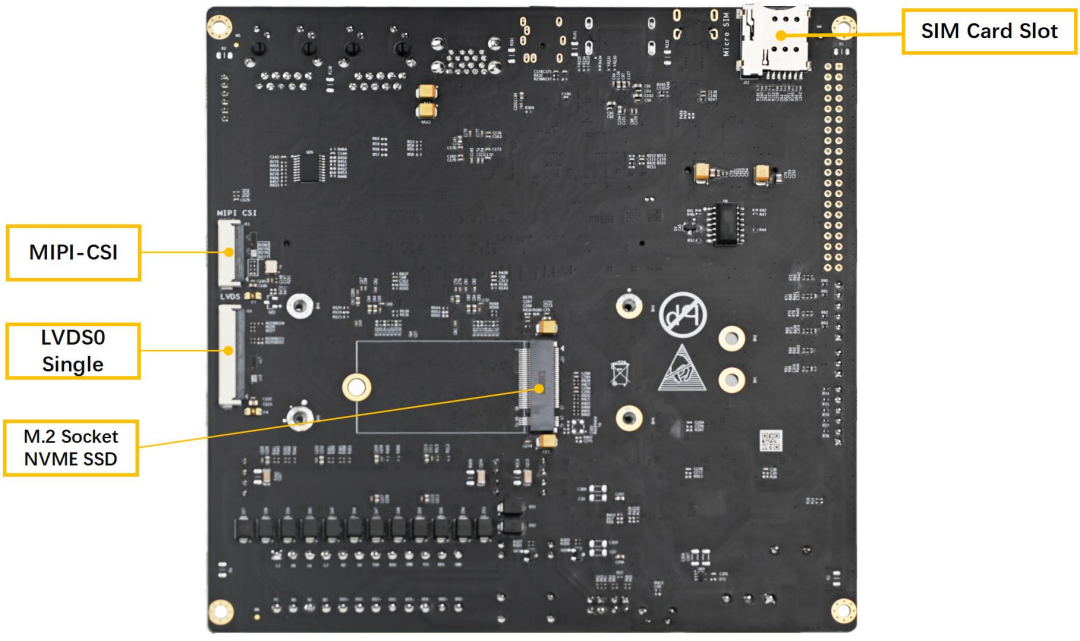
MYC-JD9360 SOM (Bottom-view)

MYIR provides complete software package for Linux Operating System support on the MYC-JD9360 SOM to help users launch their development quickly and easily.

The MYD-JD9360 Development Board is built around the MYC-JD9360 SOM to serve as a complete development platform for evaluation or prototyping purposes. Its base board provides rich communication interfaces such as two RS232, two RS485, two USB3.0 HOST and one USB2.0 OTG, two TSN enabled Gigabit Ethernet, two CAN, one Micro SD card slot, one SDIO/UART based WiFi/BT module, one M.2 Socket for USB3.0 based 4G/5G LTE Module with one SIM card holder and one M.2 Socket for PCIE3.0 based SSD module. The board has also implemented advanced multi-media capabilities of D9-Pro to support HDMI, LVDS, MIPI CSI and Audio. MYIR offers MY-CAM003M MIPI Camera Module and MY-LVDS070C LCD Module as options for the MYD-JD9360 board which allows customers to acquire better development experience.



MYD-JD9360 Development Board (Top-view)



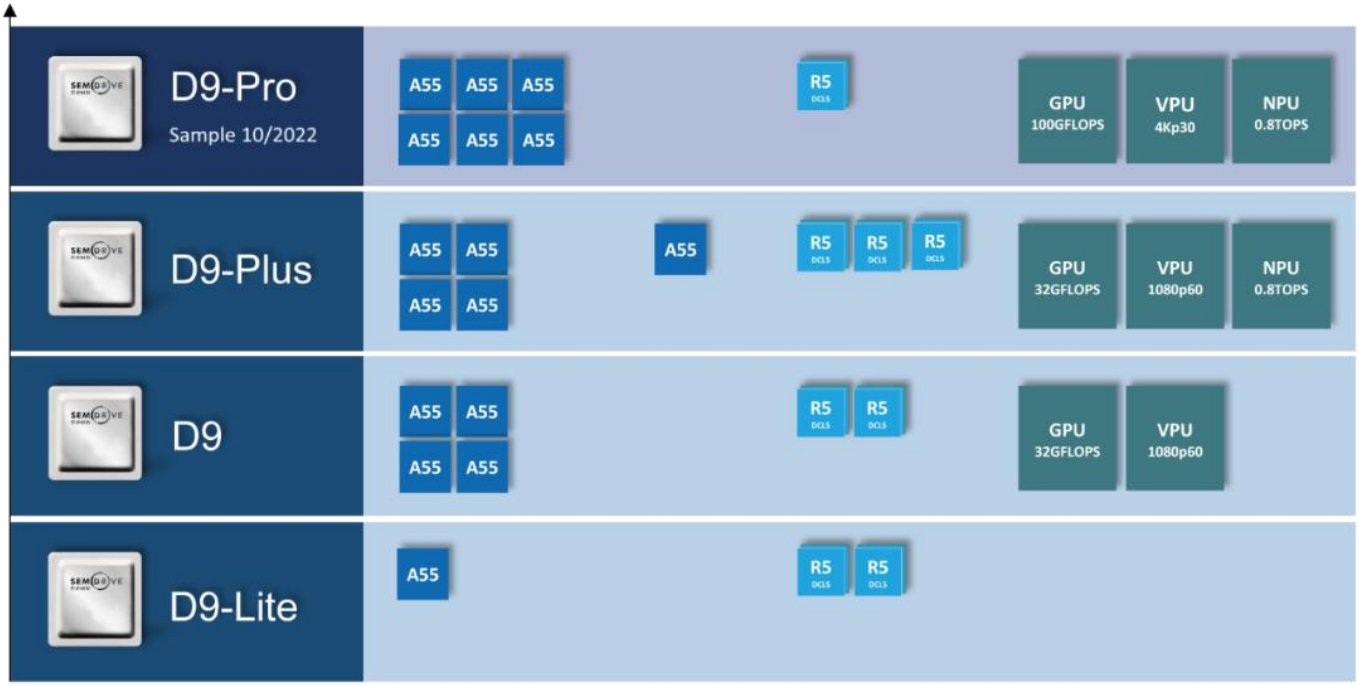
MYD-JD9360 Development Board (Bottom-view)

Hardware Specification

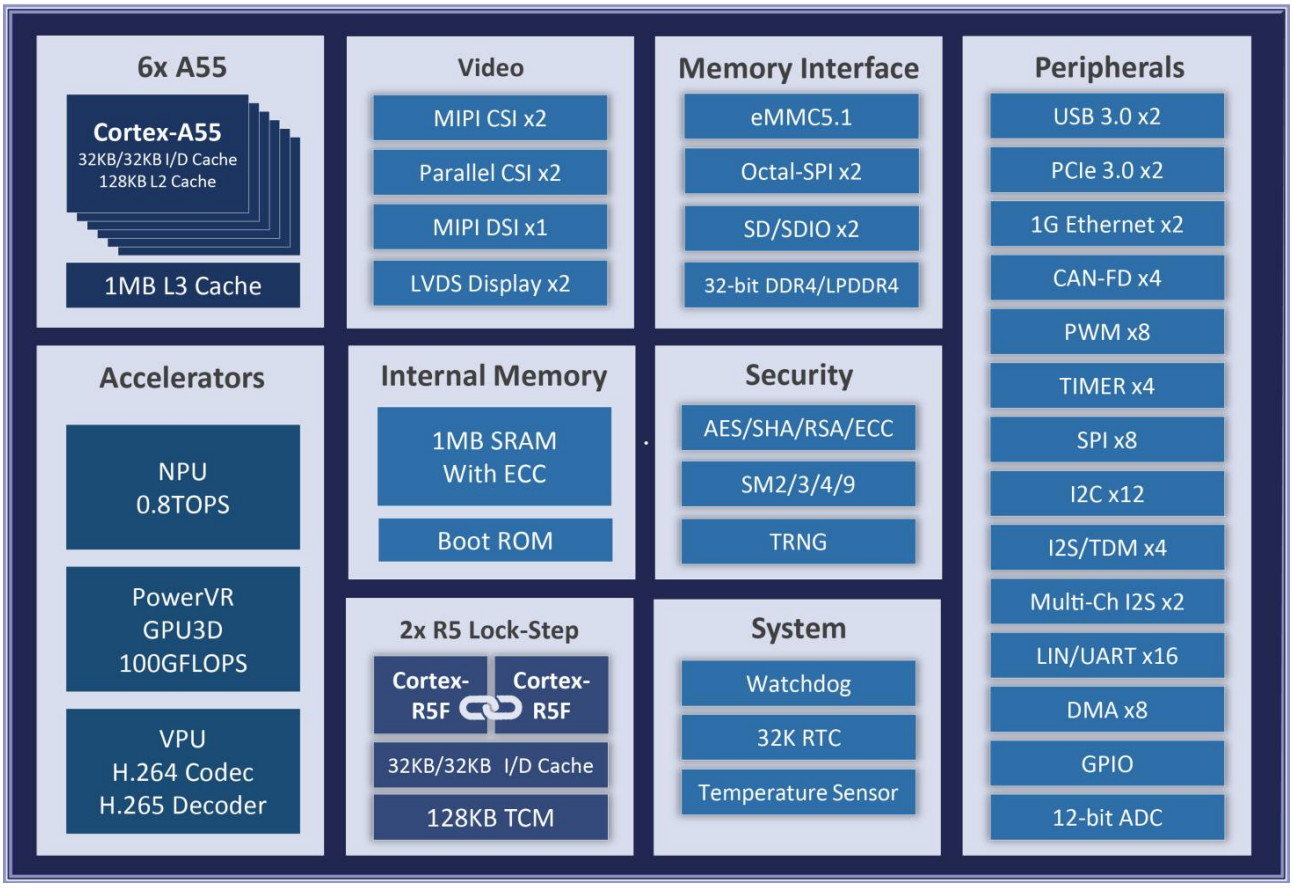
The MYC-JD9360 SOM is an SoM solution for SemiDrive D9-Pro (D9360) application chip which is among the high-reliability, high-security, high real-time and high-performance D series industrial chips. The D9-Pro integrates the high-performance ARM Cortex-A55 CPU and real-time ARM Cortex-R5 CPU. It includes 3D GPU, AI Accelerator, and H.264 video encoder/decoder. D9-Pro processor also supports various connectivity interfaces, including PCIe3.0, USB3.0, Giga-bit Ethernet, CAN-FD, UART, SPI for seamless integration into industry system at a minimal BOM cost. It is designed specially for motion control and various industrial applications.

The main features of D9-Pro chip are as follows:

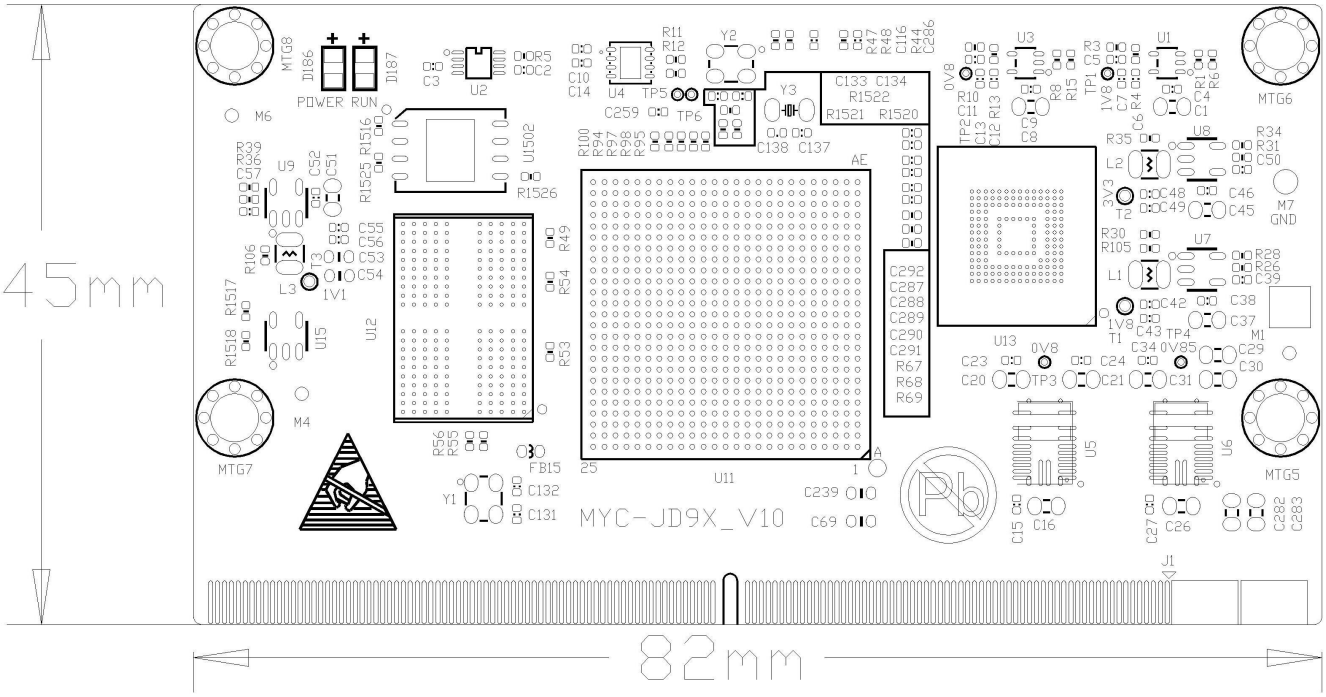
1) Low power consumption: TSMC's 16nm FinFET advanced process guarantees relatively low power consumption
2) High performance CPU: 45.2KDMIPS (6*Cortex-A55) +1.6KDMPIS (Cortex-R5)
3) Built-in large Cache, large bandwidth DDR4 2400MT/S
4) High performance 3D graphics processing: 100GFLOPS PowerVR 9XM GPU
5) High efficiency accelerator for AI: 0.8Tops NPU
6) HD vision processing unit (VPU): H.264 video encoding/decoding at 4Kp30, H.265 decoding at 4Kp30
7) Multi-screen display: support dual display at 1080p resolution of different contents; support the third HMI display through Cortex-R5 co-processor control



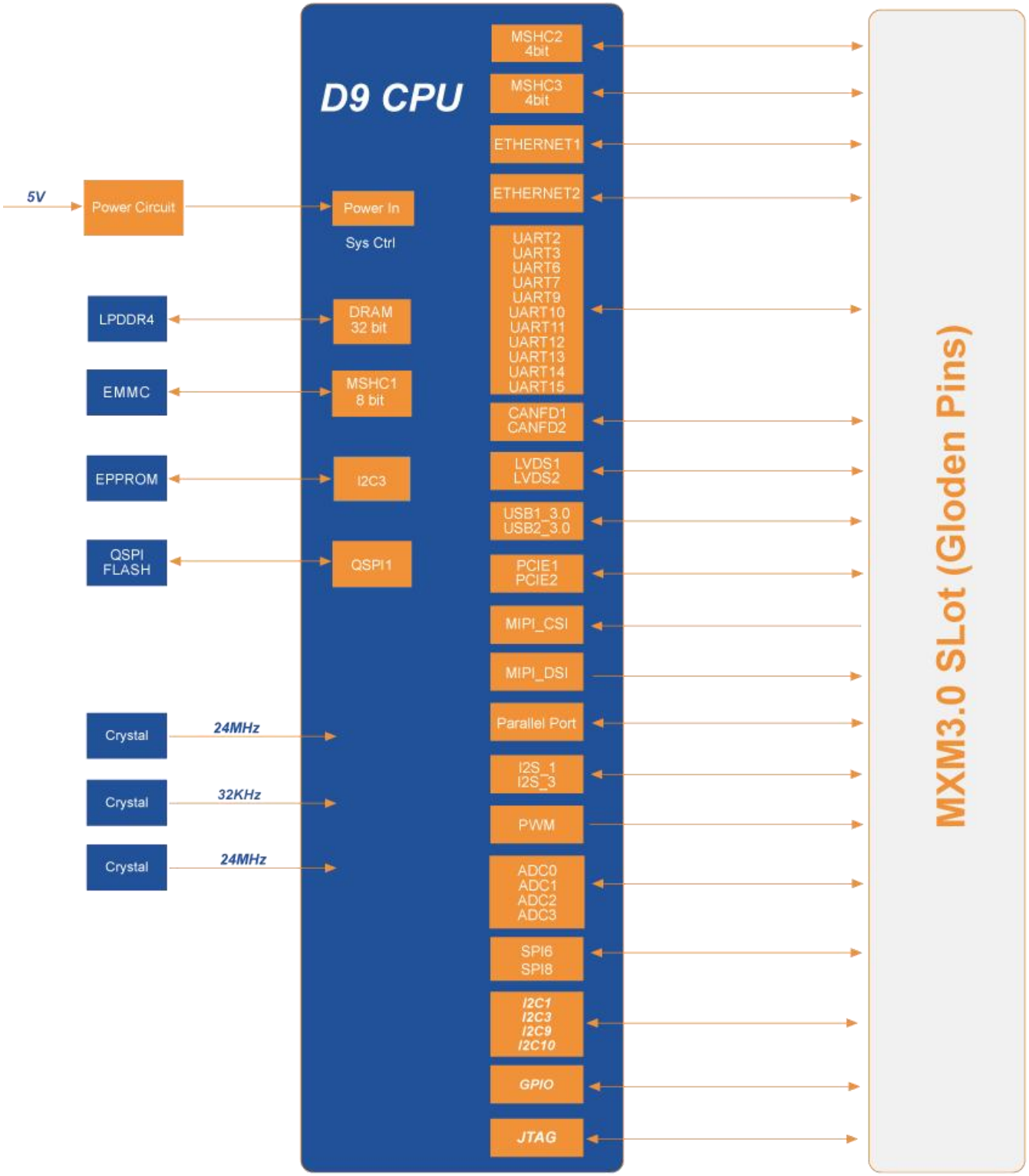
D9 Series Comparison



D9-Pro Block Diagram



MYC-JD9360 Dimensions Chart



MYC-JD9360 SOM Function Block Diagram

The MYC-JD9360 SOM takes full features of SemiDrive D9-Pro chip and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 45mm x 82mm
- PCB Layers: 8-layer design
- Power supply: +5V/5A
- Working temperature: -40~85 Celsius (industrial grade)

Processor

- SemiDrive D9-Pro Processor (D9360)
  - 6 * Cortex-A55 @ 1.6GHz
  - 1 * Cortex-R5 @ 800MHz, dual-core Lock-step
  - IMG PowerVR 9XM GPU, 100GFLOPS
  - VPU H.264 Video Encoder/Decoder, H.265/VP8/VP9 Video Decoder
  - 0.8Tops NPU (SemiDrive SlimAI Engine)

Memory

- 2GB LPDDR4 (supports up to 4GB)
- 16GB eMMC (supports up to 128GB)
- 256Kbit EEPROM
- 16MB QSPI Nor Flash

Peripherals and Signals Routed to Pins

- 0.5mm pitch 314-pin MXM 3.0 Gold-finger-edge-card Connector
  - 2 x Gigabit Ethernet
  - 2 x PCIe3.0
  - 2 x USB3.0 (DRD)
  - 2 x SDIO
  - 11 x UART (supports up to 16 x UART)
  - 2 x CAN-FD (supports up to 4 x CAN-FD)
  - 4 x I2C (supports up to 12 x I2C)
  - 2 x SPI (supports up to 8 x SPI)
  - 4 x 12bit ADC
  - 1 x MIPI-DSI
  - 2 x LVDS
  - 1 x Parallel CSI
  - 1 x MIPI CSI
  - 4 x Single-channel I2S/TDM
  - 2 x Multi-channel I2S
  - 1 x JTAG
  - Up to 135 x 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 datasheet and the SOM pinout description file.

Software Features

The MYC-JD9360 SOM support for Linux, Ubuntu and Android operations systems. The kernel and many peripheral drivers are available in source code to assist clients to expedite their development. The following are a summary of the software features:

Item	Feature	Description	Source code
Bootloader	U-boot	Boot Program uboot_2021.04	YES
Linux kernel	Linux kernel	Based on the official kernel_4.14.61 version customization	YES
Device driver	QSPI	W25Q128JVEIQ driver	YES
	Watchdog	SGM820B 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	YT8531SH driver	YES
	SDHI	eMMC/SD card storage driver	YES
	HDMI	LT8912 driver	YES
	LVDS	LT8912 driver	YES
	Dual LVDS	Dual LVDS driver	YES
	Audio	SGTL5000 audio driver	YES
	4G/5G	4G/5G driver	YES
	PWM	PWM control	YES
	ADC	ADC driver	YES
	RTC	RTC driver	YES
	GPIO	Universal GPIO driver	YES
	UART	RS232/RS485/TTL driver	YES
	CAN	CAN driver	YES
	Camera (MIPI)	OV5640 camera driver	YES
	WiFi	L297B-SR driver	YES
File system	myir-image-full	Full function image built with Yocto	YES
Industry DEMO	Application of Charging pile	Refer to the State grid charging pile program to realize the meter Modbus protocol, IEC104 platform communication protocol and charging demonstration interface. Integrate into the MeasyHMI V2.0 version and demonstrate through full image.	YES
	PLC controller	Port the open source Ethercat master IGH, Linux real-time patch PREEMPT-RT or XENOMAI (real-time response speed and real-time jitter time measured data), and write a console application to control EtherCAT slave and servo motor by command.	YES
	Engineering Machinery Scenarios	Four AHD cameras capture four images and display them on the screen. The Analog instrument information is displayed on the screen, and the video picture and instrument information are displayed on split screens. Integrate into the MeasyHMI V2.0 version and demonstrate through full image.	YES

MYC-JD9360 Software Features

Order Information

<table>
<tr><th>Product Item</th><th>Part No.</th><th>Packing List</th></tr>
<tr><td>MYC-JD9360 SOM</td><td>MYC-JD9360-16E2D-160-I</td><td>✓ One MYC-JD9360 SOM</td></tr>
<tr><td>MYD-JD9360 Development Board</td><td>MYD-JD9360-16E2D-160-I</td><td>✓ One MYD-JD9360 Development Board
✓ One USB to TTL cable
✓ One 12V/2A Power adapter
✓ One DC Power jack adapter
✓ One Quick Start Guide</td></tr>
<tr><td>MY-CAM003M Camera Module</td><td>MY-CAM003M</td><td rowspan="2">Add-on Options
✓ MY-LVDS070C 7-inch LCD Module
✓ MY-CAM003M MIPI Camera Module</td></tr>
<tr><td>MY-LVDS070C LCD Module</td><td>MY-LVDS070C</td></tr>
<tr><td colspan="3">Note:

1. One MYD-JD9360 Development Board includes one SOM MYC-JD9360 mounted on the base board. If you need more SOMs, you can order extra ones.

2. Discounts are available for bulk orders.

3. The MYC-JD9360 SOM and the MYD-JD9360 development board are delivered with heatsink by default.

4. We provide OEM/ODM services to reduce time and save cost for customers.</td></tr>
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