

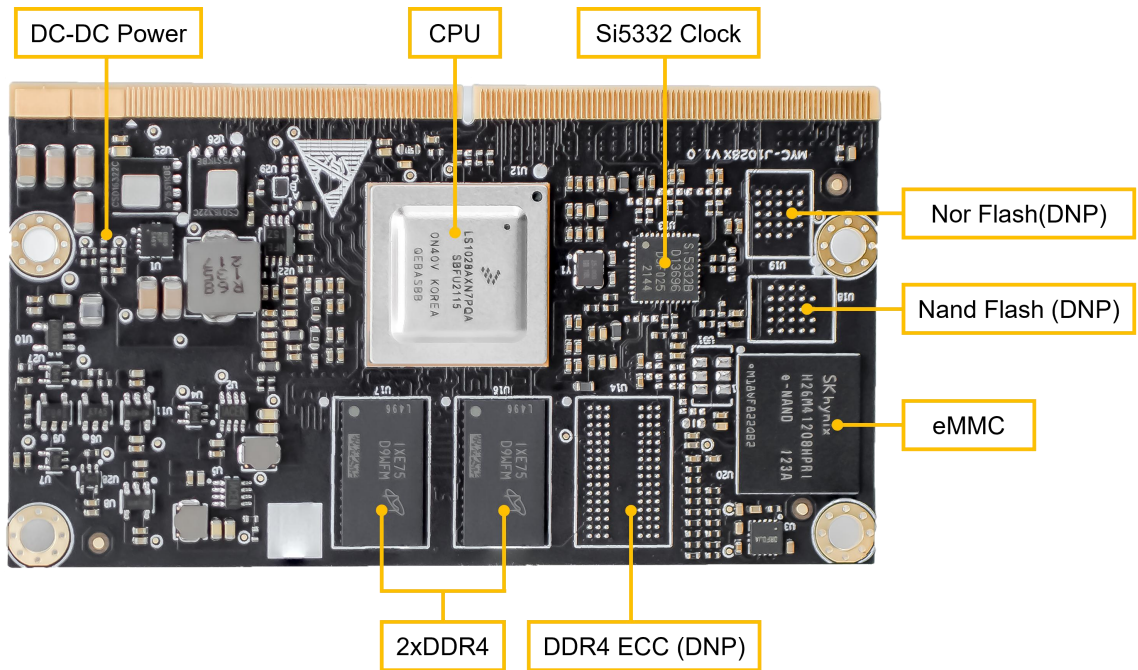


MYC-J1028X System-On-Module Overview

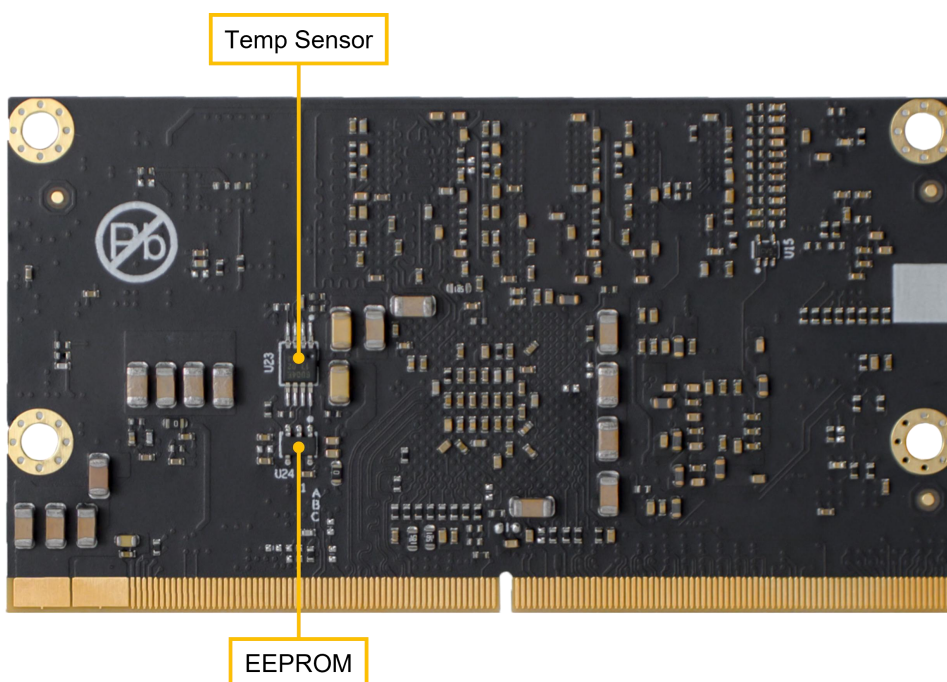


- ✓ 1.5 GHz NXP Layerscape LS1028A Application Processor based on Dual ARM Cortex-A72 Cores
- ✓ 2GB DDR4, 8GB eMMC Flash, 32Kbit EEPROM
- ✓ Temperature Sensor
- ✓ 0.5mm pitch 314-pin MXM 3.0 Gold-finger-edge-card Connector
- ✓ Supports Working Temperature Ranging from -40°C to 85°C
- ✓ Supports Ubuntu and Real-time Edge Images based on Linux Kernel

Measuring 45mm by 82mm, the **MYC-J1028X System-On-Module** is a high-performance embedded core controller board for industrial and automotive applications. It is based on **NXP LS1028A** SoC of the Layerscape family and features 1.5 GHz dual Arm Cortex-A72 cores, with integrated 3D GPU for HMI, and a time-sensitive networking (TSN) -enabled Ethernet switch and Ethernet controllers to support converged IT and OT networks. The MYC-J1028X has 2GB DDR4 and supports multiple external memory options including 8GB eMMC (default), QSPI NAND Flash (DNP) and XSPI NOR Flash (DNP). It has 32Kbit EEPROM and one temperature sensor on the rear of the board. 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 capable of supporting Ubuntu and Real-time Edge images based on Linux kernel.



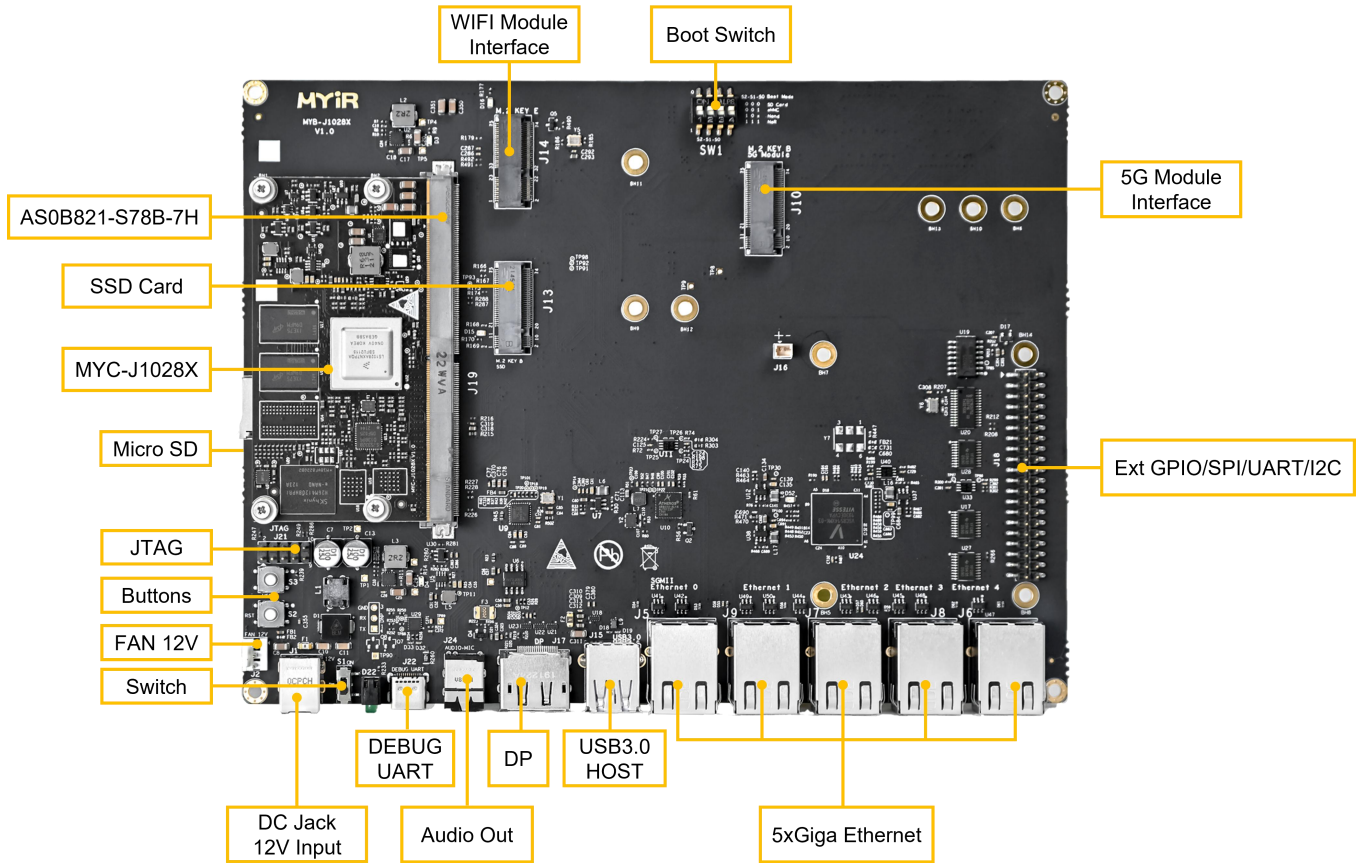
MYC-J1028X Top-view (delivered with heatsink by default)



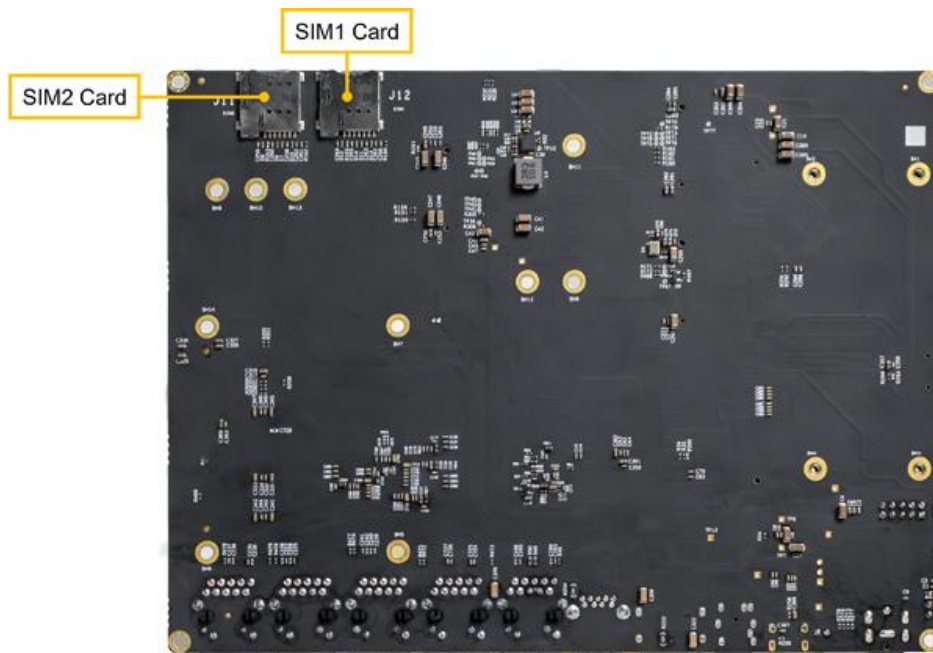
MYC-J1028X Bottom-view



The **MYD-J1028X Development Board** is using the MYC-J1028X as core controller board and has explored the features of the LS1028A processor to serve as an solid reference design for customer’s development. The base board has brought out rich peripherals through connectors and headers such as one USB3.0 Host, five Gigabit TSN Ethernet, one M.2 Key E based WiFi module interface, one USB 3.0 M.2 Key B based 5G Module interface, one M.2 Key B based SSD Module interface, one DP display port, one Audio output port, one Micro SD card slot as well as two SIM card slots and more others.



MYD-J1028X Development Board Top-View



MYD-J1028X Development Board Bottom-View

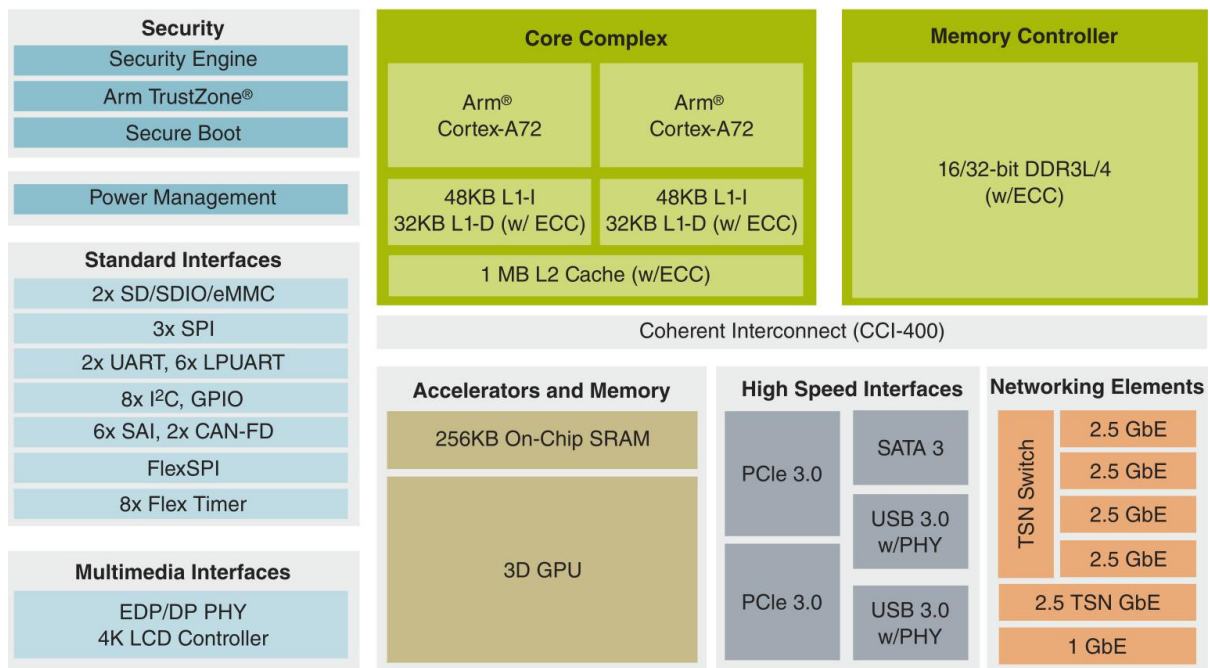


Hardware Specification

The **MYC-I1028X System-On-Module** is using NXP's 17 x 17 x 2.46 mm, 0.75 mm pitch, FBGA448 of fine-pitch ball grid array package **Layerscape LS1028A** dual-core application processor (LS1028AXN7PQA). The LS1028A processor is equipped with TSN-enabled Ethernet switches and Ethernet controllers to support converged IT and OT networks. Two 64-bit Arm v8 cores provide industrial-controlled real-time processing and virtualization support for IoT edge computing. Integrated GPU and LCD controllers enable human-machine interface (HMI) systems to support new high-speed interfaces.

The main features of Layerscape LS1028A processor are as follows:

- Dual Arm v8 Processors for Industrial Applications
- 4 port Time-Sensitive Networking enabled switch
- 2 Time-Sensitive Networking-capable Ethernet controllers
- GPU and LCD Controller
- Configurable cryptographic offload engines
- Integrated trust architecture
- PCI Express
- CAN Bus



Layerscape LS1028A System Block Diagram



Mechanical Parameters

- Dimensions: 45mm x 82mm
- PCB Layers: 12-layer design
- Power supply: +5V/2A
- Working temperature: -40~+85 Celsius (industrial grade)

Processor

- NXP Layerscape LS1028A Dual-core Processor
 - 1.5 GHz Dual-core ARM Cortex-A72 CPU (LS1028AXN7PQA, industrial grade)
 - Integrated TSN Ethernet switches and Ethernet controllers
 - Integrated GPU and LCD controller

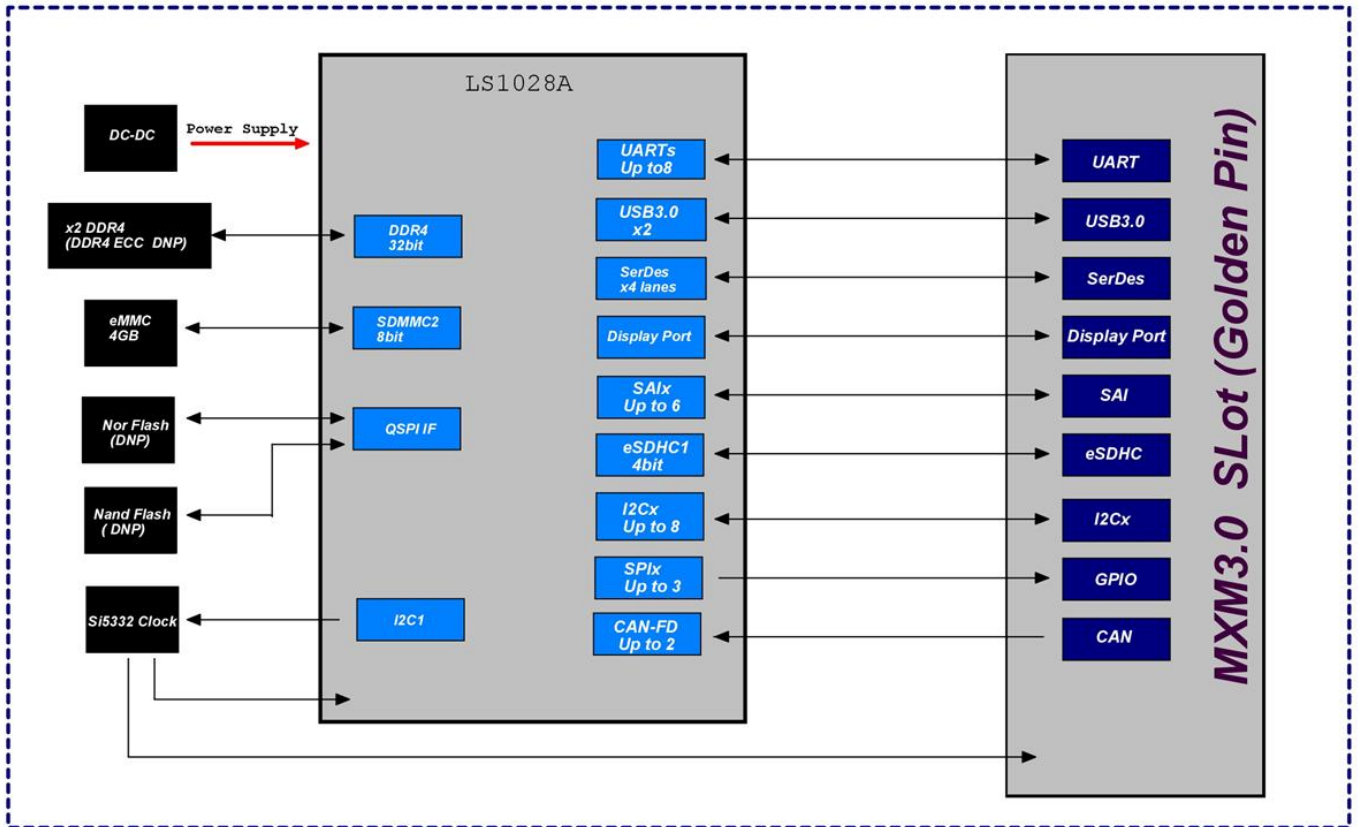
Memory

- 2GB DDR4 (supports 3GB / 4GB DDR4)
- 8GB eMMC Flash (supports 16GB / 32GB eMMC)
- 32Kbit EEPROM
- QSPI Nand Flash (DNP by default)
- XSPI NOR Flash (DNP by default)

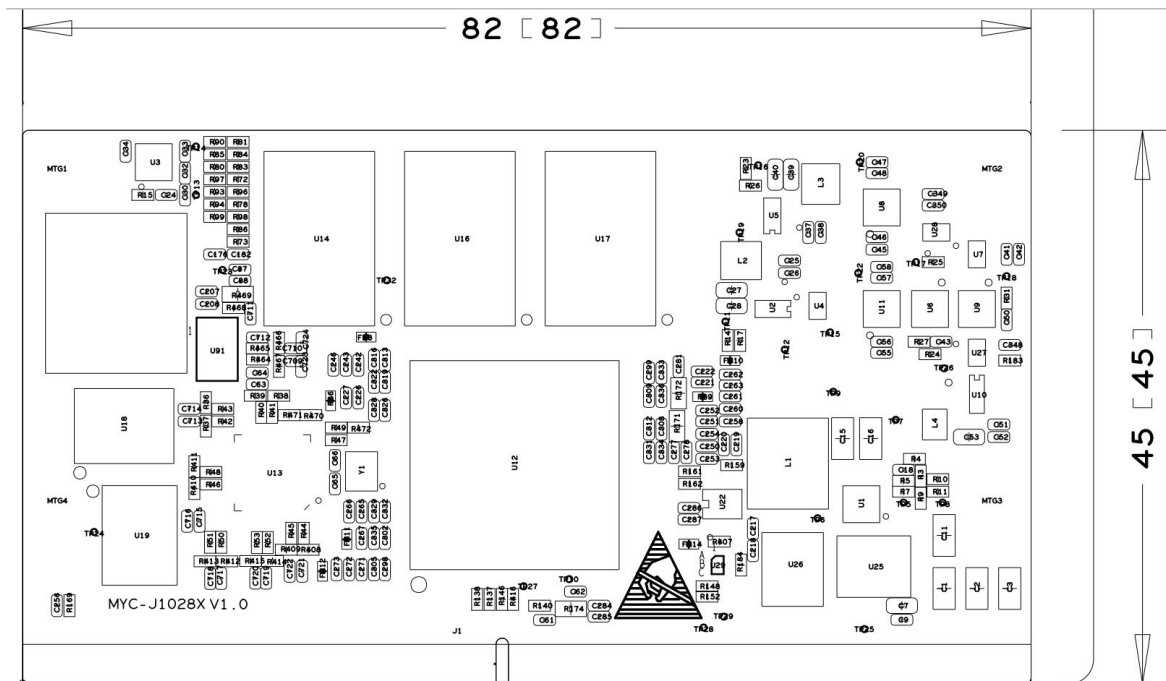
Peripherals and Signals Routed to Pins

- Temperature Sensor
- 0.5mm pitch 314-pin MXM 3.0 Gold-finger-edge-card Connector
 - 1 x SGMII signal
 - 1 x QSGMII signal
 - 2 x PCIe 3.0
 - 1 x SATA 3.0
 - 2 x CAN-FD
 - 2 x USB3.0
 - 8 x I2C
 - 3 x SPI
 - 2 x SDIO
 - 2 x UART
 - 6 x LPUART
 - 1 x DP1.3/eDP1.4 (supports 4K@60fps)
 - 1 x JTAG
 - 6 x SAI
 - 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.



MYC-J1028X Function Block Diagram



MYC-J1028X Dimensions Chart (Unit: MM)



Software Features

MYIR's MYC-J1028X SOM is ready to run Linux which is provided with software package. Many peripheral drivers are in source code to help accelerate customer's designs. The software package provided is characterized as following:

| Item | Features | Description | Source Code Provided |
|---------------------|-----------------|--|----------------------|
| Bootstrap program | RCW | Initializing system clocks, PIN MUX | YES |
| | ATF | Switching between secure and unsafe environments, DDR initialization | YES |
| | uboot | u-boot 2020.04 | YES |
| Linux kernel | Image | Customized based on official Kernel_5.4.47 (Ubuntu) | YES |
| | | Custom based on official Kernel 5.10.9 (Edge) | YES |
| Drivers | MMC | eSDHC driver | YES |
| | SPI | SPI driver | YES |
| | I2C | I2C driver | YES |
| | USB Host | USB driver | YES |
| | Ethernet | Gigabit Ethernet driver | YES |
| | DSA Switch | Switch driver | YES |
| | TSN | TSN driver | YES |
| | XPSI | XPSI driver | YES |
| | UART | Serial driver | YES |
| | CAN | CAN driver | YES |
| | GPIO | GPIO driver | YES |
| | RTC | RTC driver | YES |
| | SATA | SATA driver | YES |
| | PCIE | PCIE driver | YES |
| | SAI | SAI driver | YES |
| DP | DP driver | YES | |
| File System | Ubuntu | Ubuntu file system built on LSDK 20.12 | YES |
| | myir-image-full | Edge file system built on Yocto 3.2.1 | YES |
| Compiler Tool Chain | Cross compiler | aarch64-linux-gnu-gcc | BINARY |

Linux Software Features



Order Information

| Product Item | Part No. | Packing List |
|---|-----------------------|---|
| MYC-J1028X System-On-Module | MYC-J1028N-8E2D-150-I | ✓ One MYC-J1028X SOM |
| MYD-J1028X Development Board | MYD-J1028N-8E2D-150-I | <ul style="list-style-type: none"> ✓ One MYD-J1028X Development Board (including MYC-J1028X SOM) ✓ One USB TYPE-A to TYPE-C cable ✓ One 12V/2A Power adapter ✓ One DC Power jack adapter ✓ One Quick Start Guide |
| MY-CAM002U USB Camera Module | MY-CAM002U | <p>Add-on Options</p> <ul style="list-style-type: none"> ✓ MYD-J1028X Development Board ✓ MY-CAM002U USB Camera Module ✓ MY-WIREDCOM RPI Module |
| MY-WIREDCOM RPI Module (RS232/RS485/CAN) | MY-WIREDCOM | |



MYIR Electronics Limited

Headquarter Address: Room 04, 6th Floor, Building No.2, Fada Road, Yunli Smart Park, Bantian, Longgang District, Shenzhen, Guangdong, China 518129

Factory Address: Room 201, Block C, Shengjianli Industrial Park, Dafu Industrial Zone, Guanlan, Longhua District, Shenzhen, 518110, China

Website: en.myir.cn

Email: sales@myir.cn

Tel: +86-755-22984836