MYD-JA5D4X Development Board

➢ *MYC-JA5D4X CPU Module as Controller Board*

➢ *600MHz Atmel SAMA5D44 ARM Cortex-A5 Processor*

➢ *256/512MB DDR2 SDRAM, 256/512MB Nand Flash, 4MB Data Flash, 64KB EEPROM*

➢ *Serial ports, USB, Ethernet, RS485, TF, Audio, LCD, HDMI*

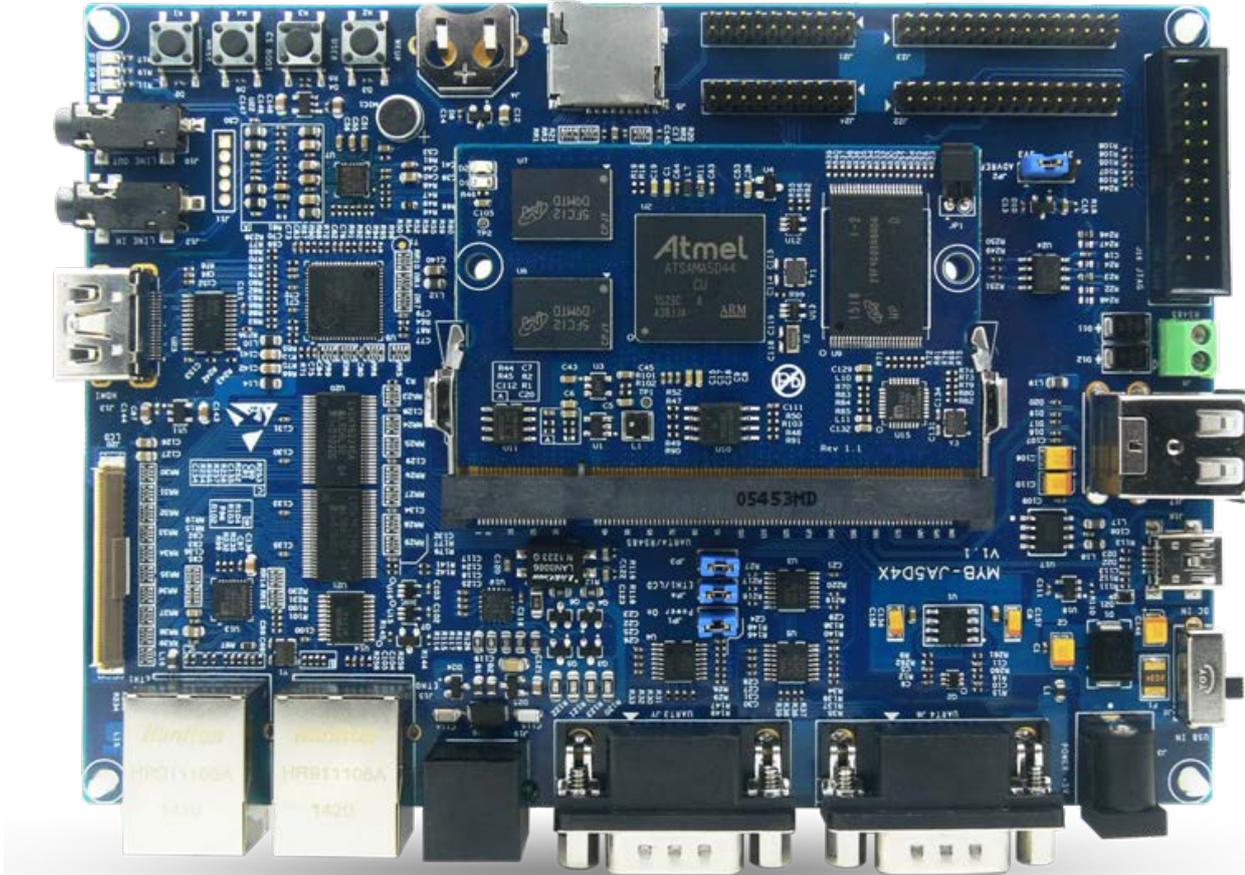➢ *Ready-to-Run Linux 3.18*

Figure 1-1 MYD-JA5D4X Development Board

Description

The MYD-JA5D4X Development Board is a complete evaluation platform for Atmel's ARM Cortex-A5 based SAMA5D42 or SAMA5D44 processor which is among the SAMA5D4 MPU series and can operate at up to 600MHz. Compared to the previous Cortex-A5 SoC from Atmel, the SAMA5D3, the SAMA5D4 brings a L2 cache, NEON, a slightly different clock tree, a hardware video decoder, and Trustzone support. The MYD-JA5D4X board is built around MYIR's MYC-JA5D4X CPU Module and has a specific designed base board which takes full features of SAMA5D4 SOC to extend a rich set of peripherals and interfaces including serial ports, two USB Host ports, one Mini USB Device port, two 10/100Mbps Ethernet ports, RS485, TF card slot, Audio in/out, HDMI, LCD and more.

The MYC-JA5D42 and MYC-JA5D44 CPU modules are sharing the same circuit design with only minor CPU feature difference. The Atmel SAMA5D44 can support 720p resolution hardware video decoder while the SAMA5D42 cannot. The MYC-JA5D4X has integrated the processor, 512MB DDR2, 512MB Nand Flash, 4MB Data Flash, 64KB EEPROM and Ethernet PHY on board. They are served as the core controller of the MYD-JA5D4X development board and connected to the base board through DDR2 SO-DIMM 200-pin connector. They can also be embedded into your products directly which can speed up your time to market.

The MYD-JA5D4X Development Board comes along with Linux 3.18 software packages, necessary cable accessories as well as detailed documents to enable quick start when getting the goods out of box. It is an excellent EVM (Evaluation Module) and a good reference design for extensively evaluation, fast prototyping and creating applications that require video playback, audio, mass storage, networking, connectivity and more. Typical applications are such as control panel/HMI, fitness equipment, smart grid infrastructure, communications gateways, imaging terminals, etc.
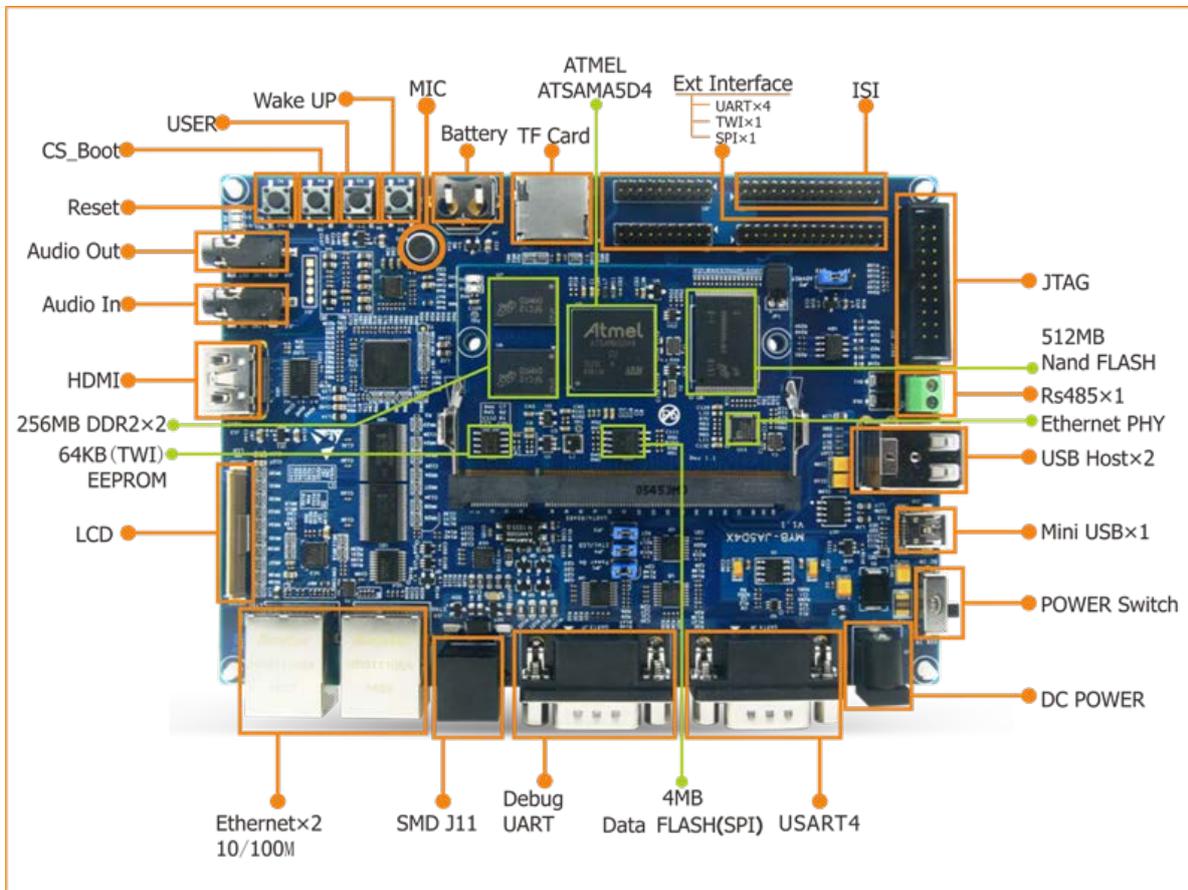

Figure 1-2 MYD-JA5D4X Development Board

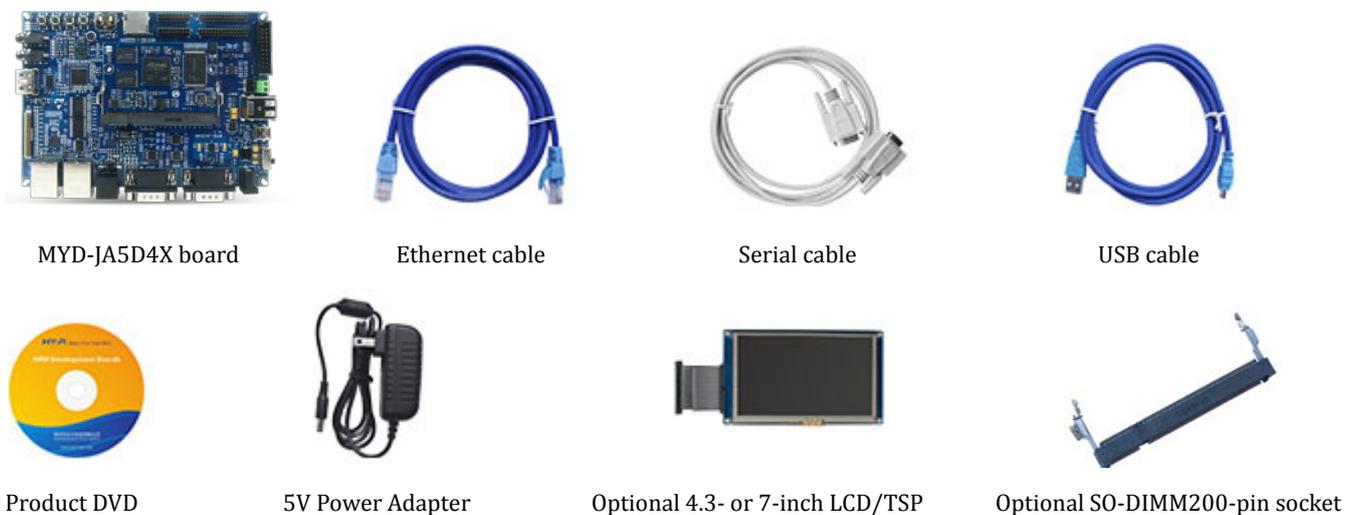The MYD-JA5D4X Development Kit includes following items and add-on options:

MYD-JA5D4X board	Ethernet cable	Serial cable	USB cable
Product DVD	5V Power Adapter	Optional 4.3- or 7-inch LCD/TSP	Optional SO-DIMM200-pin socket

Figure 1-3 MYD-JA5D4X Development Kit

Hardware Specification

The Atmel | SMART SAMA5D4 MPU is ideal for any high-performance, secure, and cost-sensitive industrial application. High-speed computing needs are supported by ARM Neon and a 128kB L2 cache that increases the overall system performance. The SAMA5D4 is an ideal fit for low-cost user interface applications that require video playback. The high-grade security features allow you to protect any system against counterfeiting and software theft, while also enabling you to securely store and transfer data.

Benefits

- ARM® Cortex®-A5 running at 600Mhz (945DMIPS).
- ARM Neon for high-precision computing and acceleration of complex algorithms including multimedia.
- 128KB of L2 cache for system performance.
- 720p hardware video decoder supporting H264/263, VP8, JPEG.
- Graphic LCD TFT controller with overlays for image composition.
- CMOS image sensor interface.
- Three High Speed USB ports (configurable as three hosts or two hosts and one device port).
- Dual EMAC 10/100 with IEEE1588 support.
- Advanced security features to prevent counterfeiting, secure external communication, and authenticate the system:
    - On-the-fly encryption/decryption of code from external DDR.
    - Encryption engines supporting AES/3DES, RSA, ECC - TRNG, SHA.
    - Tamper detection pins.
    - Memory content protection (secure key storage).
- BGA289 and BGA361 in 0.8mm pitch.

Device	Package	Video Decoder	DDR Databus Width
ATSAMA5D44	TFBGA361 (16 x 16, 0.8mm)	Yes	16-bit/32- bit
ATSAMA5D43	LFBGA289 (14 x 14, 0.8mm)	Yes	16-bit
ATSAMA5D42	TFBGA361 (16 x 16, 0.8mm)	No	16-bit/32-bit
ATSAMA5D41	LFBGA289 (14 x 14, 0.8mm)	No	16-bit

Table 1-1 SAMA5D4 Series Devices

The MYD-JA5D4X development board is based on the Atmel SAMA5D42/44 processor. It includes one MYC-JA5D4X CPU module mounted on the base board. It exposes many of the Atmel SAMA5D4 features to the user in support of developing specific solutions. This board is characterized as below:

Mechanical Parameters

- Dimensions: 153.92mm x 109.73mm (base board), 67.6mm x 45mm (CPU Module)
- PCB Layers: 4-layer design (base board), 8-layer design (CPU Module)
- Power supply: +5V/2A (base board), +3.3V/2A (CPU Module)
- Working temperature: 0~70 Celsius (commercial grade) or -40~85 Celsius (industrial grade)

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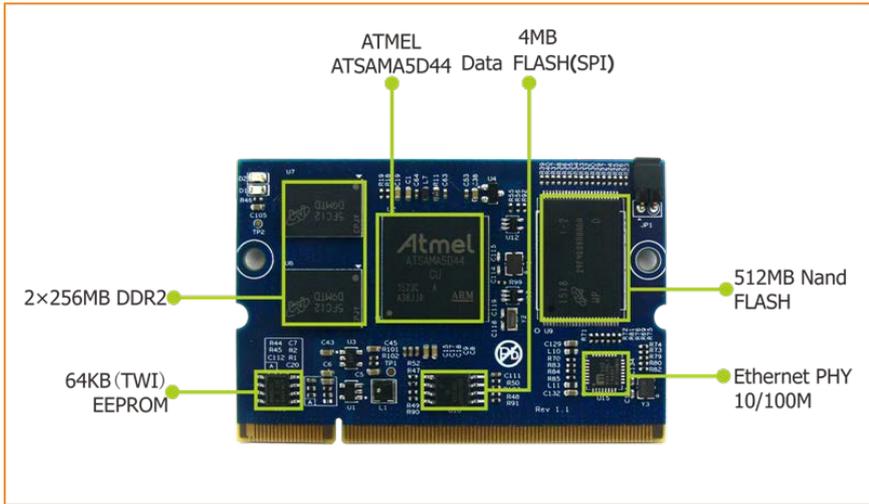### The MYD-JA5D4X Controller Board (MYC-JA5D4X CPU Module)

Figure 1-4 MYC-JA5D4X CPU Module

Processor
- Atmel SAMA5D42 or SAMA5D44 ARM Cortex-A5 Processor

Memory
- 512MB DDR2 SDRAM
- 512MB Nand Flash
- 4MB Data Flash
- 64KB EEPROM

Peripherals and Signals Routed to Pins
- On-board Ethernet PHY
- One power indicator (Red LED)
- One user LED (Blue)
- DDR2 SO-DIMM 200-pin connector brings out below peripheral signals:
  - 2 x Ethernet
  - 3 x USB2.0 Host
  - 8 x Serial ports
  - 4 x TWI
  - 3 x SPI
  - 5 x 12-bit ADC
  - 1 x SMD
  - 4 x 4-bit SDIO
  - 1 x LCD
  - 1 x ISI
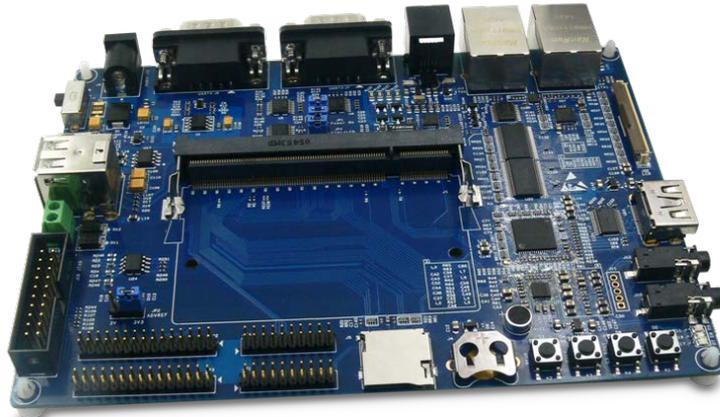 - 7 x GPIOs

The MYD-JA5D4X Base Board

Figure 1-5 MYD-JA5D4X Base Board

- Serial ports
  - 1 x 5-wire RS232 Debug serial port (DB9, J7, USART3)
  - 1 x 5-wire RS232 serial port (DB9, J8, USART4)
  - 1 x RS485 (with isolation, J6)
- USB
  - 2 x USB2.0 Host ports
  - 1 x Mini USB2.0 Device port
- 2 x 10/100Mbps Ethernet interfaces (RJ45)
- 1 x TF card slot
- 1 x HDMI interface
- 1 x LCD interface (24-bit true color, supports optional 4.3-inch and 7-inch TFT LCD)
- 1 x 4-wire resistive touch screen interface
- 1 x ISI Camera interface (2.0mm pitch, 30-pin header, J23)
- 1 x Audio input port (3.5mm jack)
- 1 x Stereo Audio output port (3.5mm jack)
- 1 x MIC
- 1 x JTAG interface (2.54mm pitch, 20-pin connector, J16)
- 1 x battery backed RTC socket
- 4 x Buttons (1 x RESET, 1 x Wake Up, 1 x CS_BOOT, 1 x USER)
- 1 x 2.0mm pitch 30-pin expansion header (J22, GPIOs)
- 1 x 2.0mm pitch 20-pin expansion header (J21, 1 x TWI, 1 x SPI, 2 x UART, etc.)
- 1 x 2.0mm pitch 20-pin expansion header (J24, 2 x UART, 8 x secured IOs)
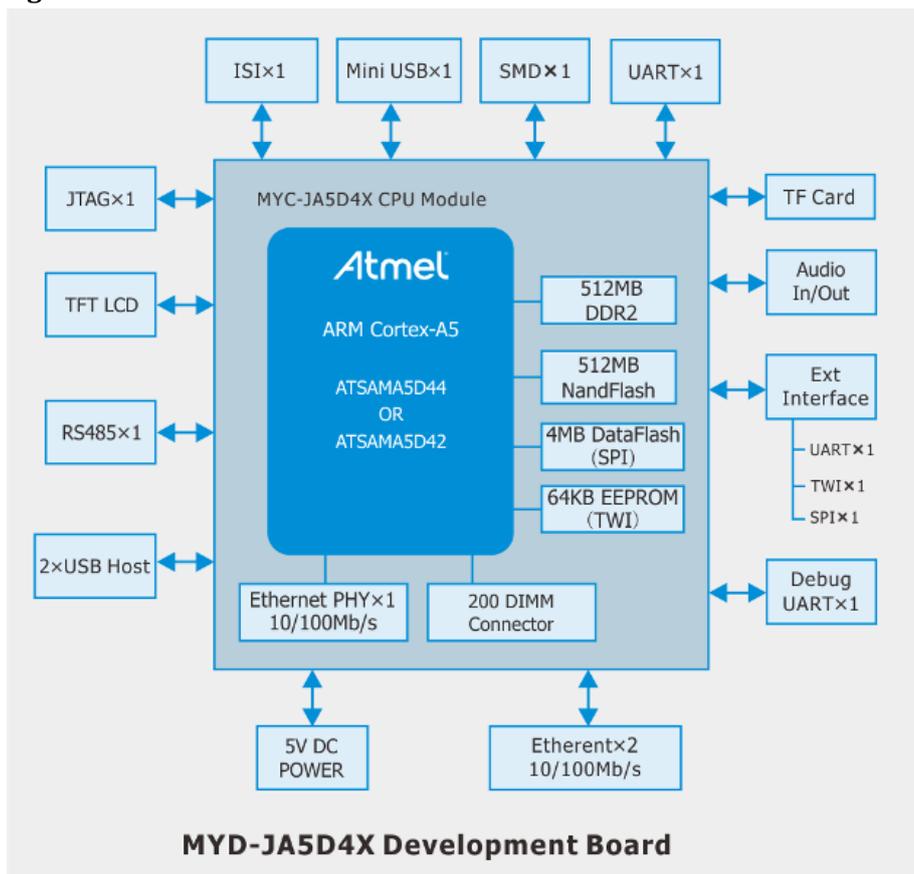- 2 x LEDs

Function Block Diagram

Figure 1-6 Function Block Diagram of MYD-JA5D4X
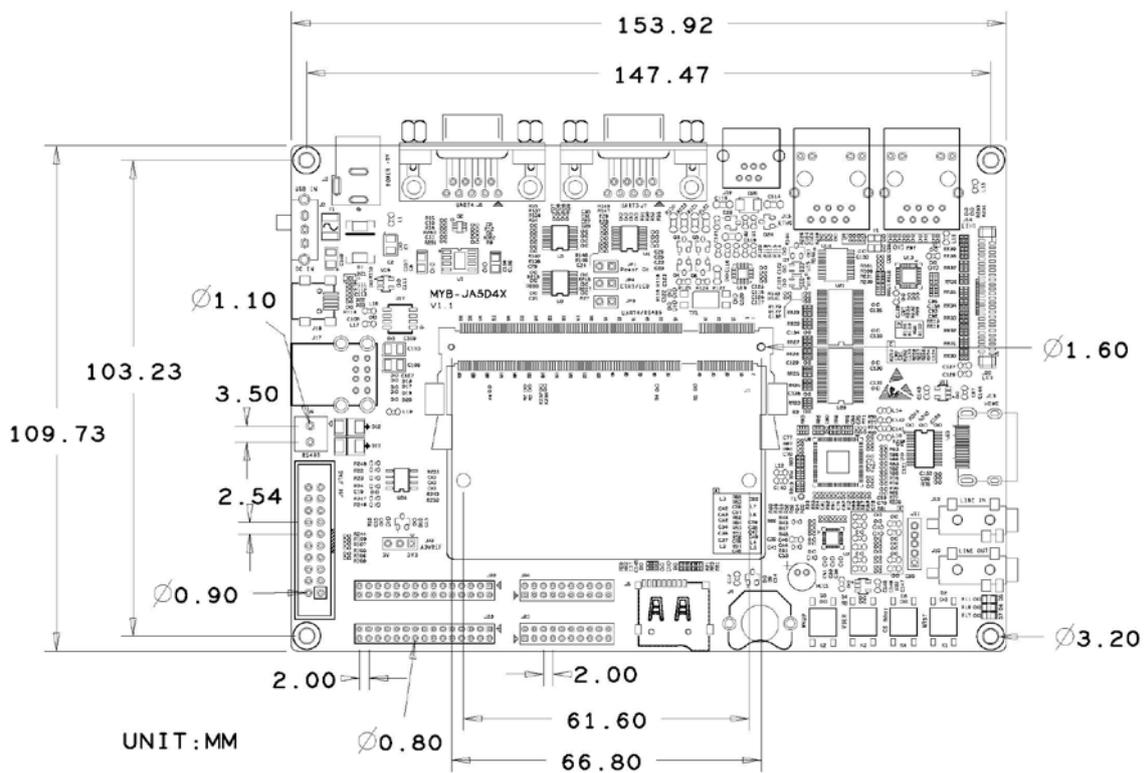
Dimension Chart of MYD-JA5D4X

Figure 1-7 Dimension Chart of MYD-JA5D4X

Software Features

The MYD-JA5D4X is a Linux ready-to-run development board. The software features are summarized as below:

Category	Name	Description	Source code provided
Boot loader	Bootstrap	First boot program, init RAM and load u-boot	yes
	U-boot	Secondary boot program, is responsible for system initialization and boot kernel 1. Support network to download images 2. Support settings, save the environment variable 3. Support memory content display, contrast, modify 4. Support bootcmd, bootargs	yes
Kernel	Linux 3.18	Custom for MYD-JA5D4X hardware	yes
Drivers	USB Host	USB Host driver, support OHCI and EHCI	yes
	USB Device	USB Device driver	yes
	Ethernet	Ethernet driver	yes
	MMC/SD	MMC/SD driver	yes
	Nand Flash	Nand Flash driver	yes
	I2C(TWI)	I2C driver	yes
	SPI	SPI driver	yes
	WDI	Watch Dog driver	yes
	LCD Controller	LCD driver, for 4.3 inch, 7 inch	yes
	RTC	RTC clock driver	yes
	Touch Screen	Resistive/capacitive touch screen driver	yes
	PWM	PWM (Pulse Width Modulation) driver	yes
	UART	Serial driver	yes
	ADC	ADC driver	yes
	LED	LED driver, GPIO LED and PWM LED	yes
	GPIO	GPIO driver	yes
	HDMI	HDMI driver	yes
Filesystem	rootfs	Base on build root	Bin
	rootfs-qt	Qt file system	Bin
Applications	Key&LED	Key&LED test program	yes
	NET	TCP/IP Sokect C/S test program	yes
	RTC	RTC clock testing experiment	yes
	I2C(TWI)	i2c-dev application interface demo	yes
	EEPROM	EEPROM Application interface demo	yes
	RS485	RS485 test program	yes
	RS232	RS232 test program	yes
	Audio	Audio test program	yes
	Framebuffer	Display demo	yes

Table 1-2 MYD-JA5D4X Software Features

Order Information

Product Item	Part No.	Packing List
MYD-JA5D44 Development Board	MYD-JA5D44-512N512D-C	➢ One MYD-JA5D4X Development Board ➢ One DB9-to-DB9 Serial cable ➢ One Net cable ➢ One USB cable ➢ One 5V/2A Power adapter ➢ One Product DVD (including user manual, datasheet, base board schematic in PDF format and software packages) **Add-on Options** ➢ MY-WF003U USB WiFi Module ➢ MY-LCD70TP 7-inch LCD Module ➢ MY-LCD70TP-C 7-inch LCD Module ➢ MY-SODIMM200 Socket ➢ MYC-JA5D4X CPU Module
	MYD-JA5D44-512N512D-I	
	MYD-JA5D44-256N256D-I	
MY-WF003U USB WiFi Module	MY-WF003U	
MY-LCD70TP 7-inch LCD Module	MY-TFT070RV2	
MY-LCD70TP-C 7-inch LCD Module	MY-TFT070CV2	
MY-SODIMM200 Socket	MY-SODIMM200	
MYC-JA5D44 CPU Module	MYC-JA5D44-512N512D-C	
	MYC-JA5D44-512N512D-I	
	MYC-JA5D44-256N256D-I	

Remark:
1. *One MYD-JA5D4X Development Board includes one CPU module MYC-JA5D4X mounted on the base board. If you need more CPU module, you can order extra ones.*
2. *If customer needs boards with other RAM, Flash configurations, please inquire MYIR for availability and prices.*
3. *We accept custom design based on the MYD-JA5D4X, whether reducing, adding or modifying the existing hardware according to customer's requirement.*

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