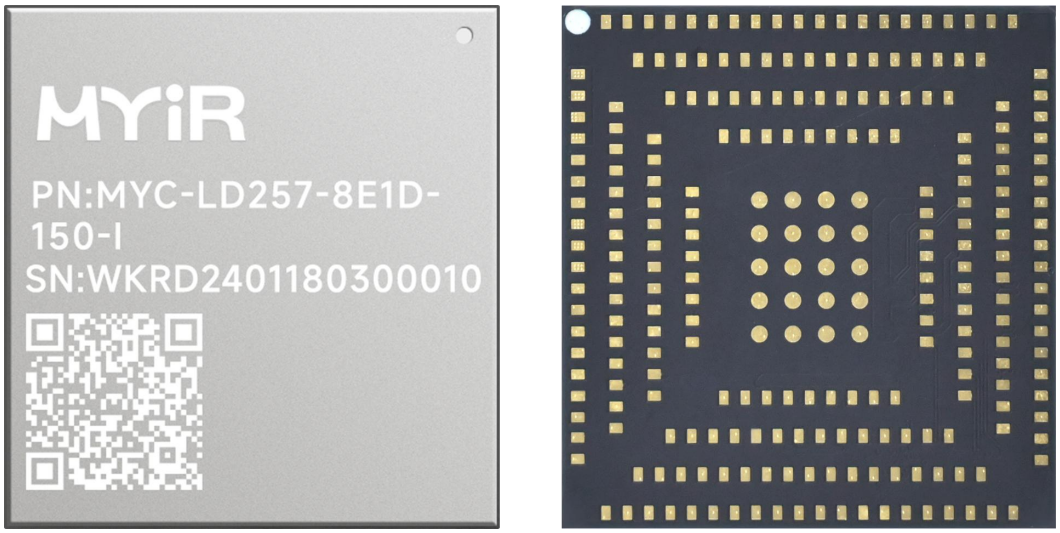
MYiR 米尔电子
Make Your Idea Real

MYC-LD25X/MYC-LF25X System-On-Module Overview

- ✓ *ST STM32MP257 Processor (STM32MP257DAK3/*STM32MP257FAK3*)*
- ✓ *1.5GHz Dual ARM Cortex-A35 and 400MHz Cortex-M33 Cores*
- ✓ *Neural Processing Unit (NPU) operating at up to 1.35 TOPS, 3D GPU*
- ✓ *1GB/2GB LPDDR4, 8GB eMMC, 256Kbit E2PROM*
- ✓ *STPMIC25APQR Power Management IC*
- ✓ *252-pin Expansion Interface with LGA Package*
- ✓ *Supports Working Temperature Ranging from -40° C to 85° C*
- ✓ *Supports Linux (for both MYC-LD25X and MYC-LF25X) and Debian (for MYC-LD25X Only)*

The MYC-LD25X / MYC-LF25X is a robust and compact System-On-Module (SoM), measuring 37mm by 39mm, designed around the ST STM32MP257 processor (STM32MP257DAK3 for MYC-LD25X and STM32MP257FAK3 for MYC-LF25X). This advanced module incorporates a dual-core ARM Cortex-A35 processor operating at up to 1.5GHz and a 400MHz Cortex-M33 core, offering a high-performance solution tailored for industrial applications. It also features an NPU with up to 1.35 TOPS for advanced edge AI capabilities and a 3D GPU, as well as H.264 encoding/decoding support, thus delivering powerful multimedia and artificial intelligence processing capabilities.

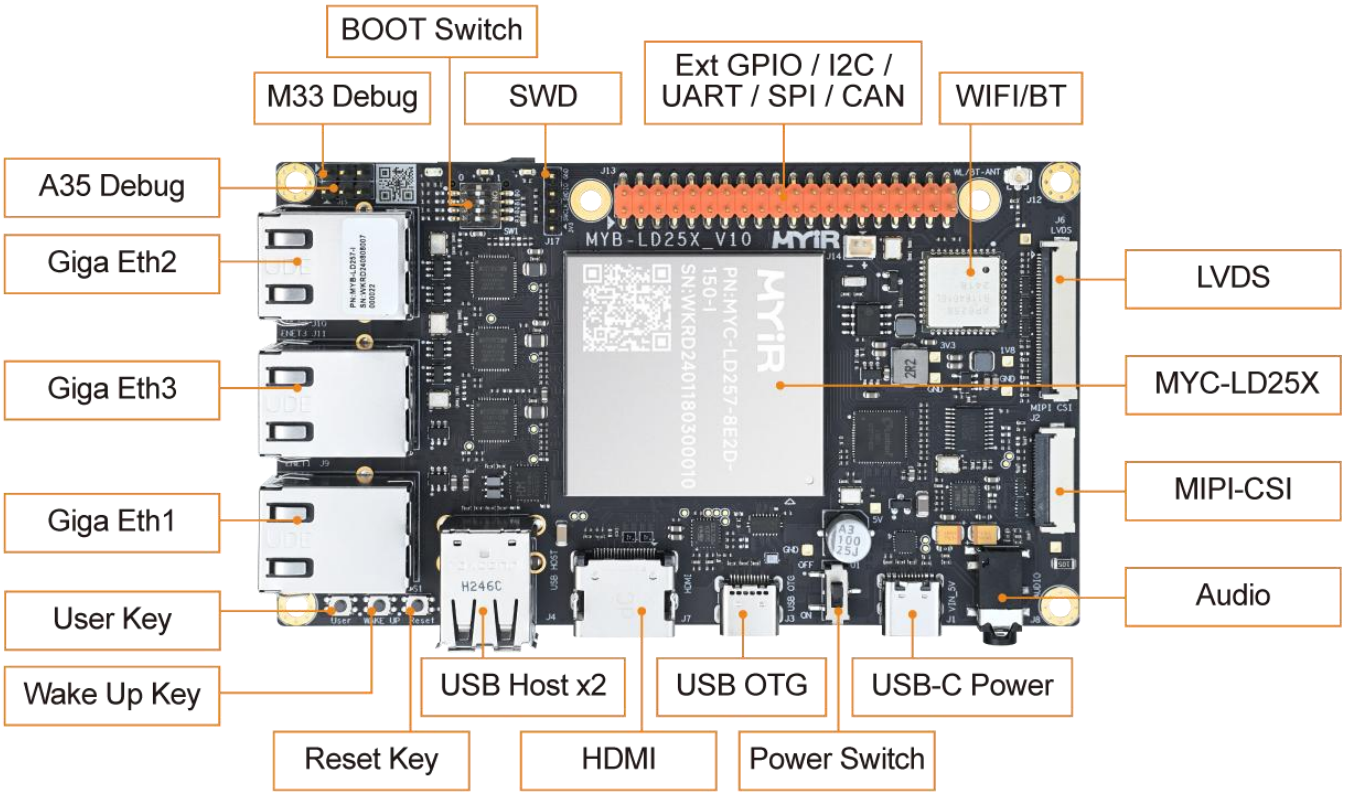
Harnessing the capabilities of the STM32MP257 processor, the MYC-LD25X/MYC-LF25X incorporates a power management IC (PMIC) STPMIC25APQR, 1GB or 2GB LPDDR4 memory, 8GB eMMC storage, and a 256Kbit EEPROM. It provides extensive peripheral and I/O connectivity via a 252-pin LGA package, featuring 3 Ethernet ports, 3 FDCAN interfaces and LVDS/DSI display interfaces, making it suitable for a wide range of applications, including industrial HMI, edge computing gateways, energy storage systems, new energy charging stations, and industrial automation.



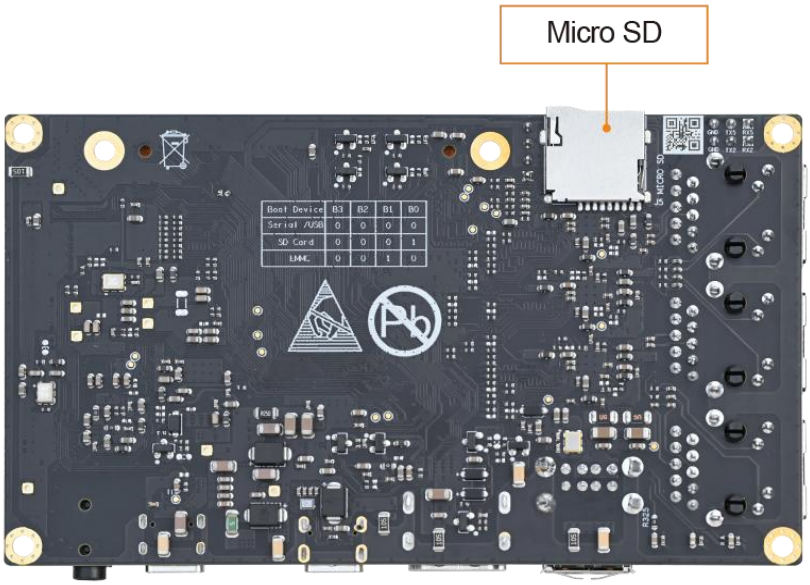
MYC-LD25X Top-view and Bottom-view

Both the MYC-LD25X and MYC-LF25X support Linux 6.1 operating systems. Meanwhile, the MYC-LD25X has also ported Debian 12, ensuring flexibility and adaptability for various project requirements. MYIR provides a comprehensive software bundle, including kernel and driver source codes, along with compilation tools, to facilitate a smooth development process from initial design to final implementation.

The MYD-LD25X/MYD-LF25X development board, based on the MYC-LD25X/MYC-LF25X SOM, provides a wide range of peripherals via the SOM's 252-pin LGA expansion interface. This includes 2x USB 2.0 Host, 1x USB 2.0 OTG, 3x Gigabit Ethernet, a Micro SD card slot, and an integrated WiFi/Bluetooth module. It supports LVDS and HDMI display outputs, incorporates a MIPI-CSI interface, and offers an audio interface. Furthermore, the board features a 2*20-pin RPI extension interface, enabling access to additional resources such as GPIO, I2C, UART, SPI, and CAN. MYIR provides optional add-ons such as the MY-LVDS070C 7-inch LCD Module, MY-CAM003M Camera Module, and MY-WIREDCOM RPI Module, which enhance functionality and versatility.



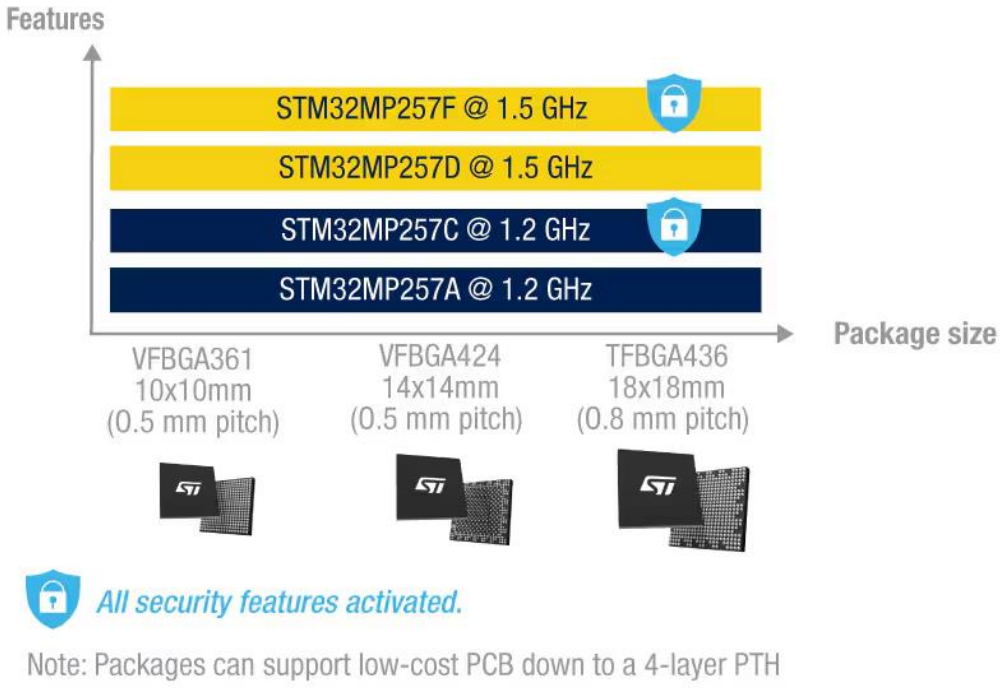
Top-view of MYD-LD25X Development Board



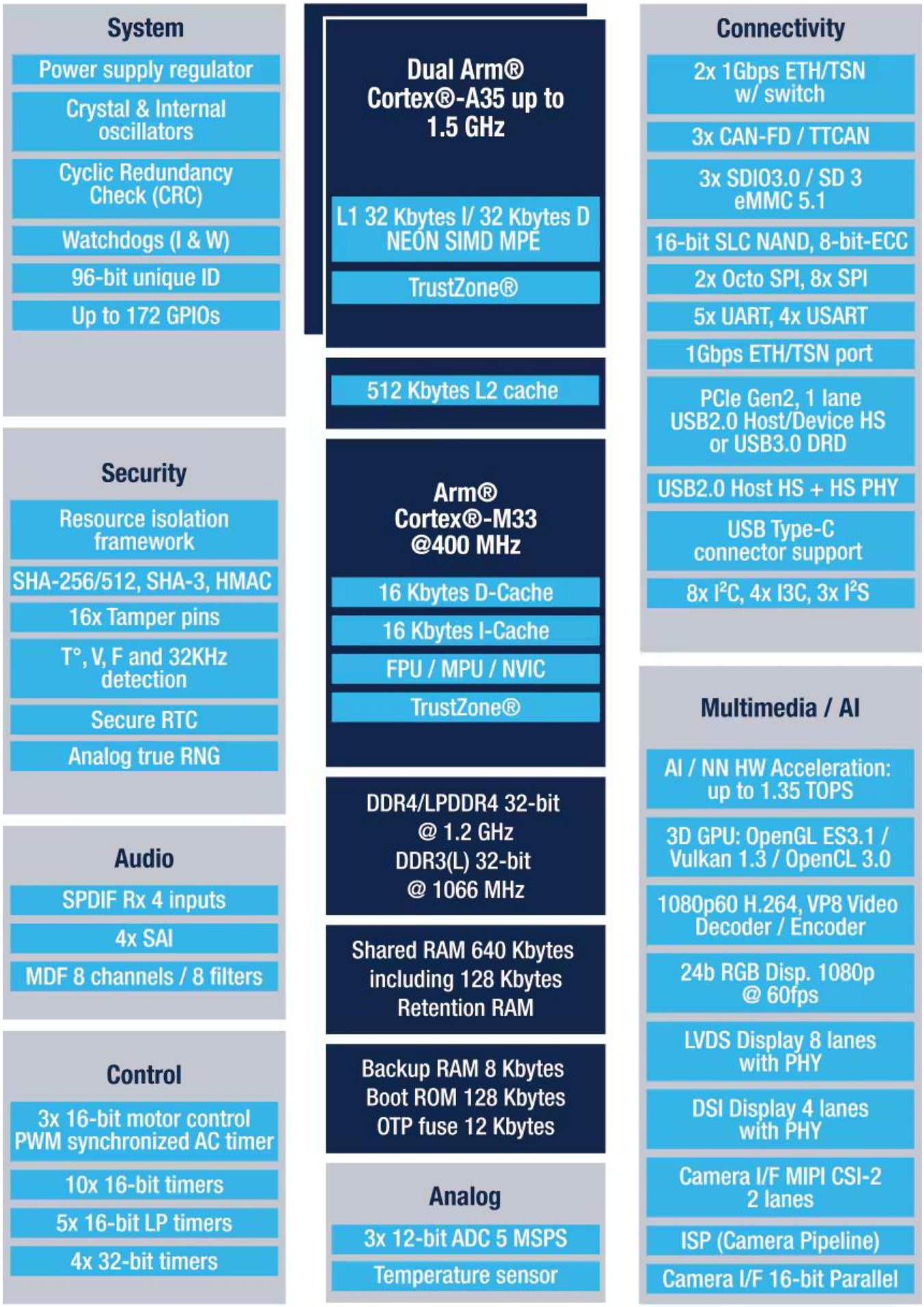
Bottom-view of MYD-LD25X Development Board

Hardware Specification

The MYC-LD25X/MYC-LF25X System-on-Module (SOM) mounted on the MYD-LD25X/MYD-LF25X Development Board uses the 14 x 14mm, 0.5mm ball pitch, 424-ball VFBGA packaged 1.5 GHz ST STM32MP257 microprocessor (STM32MP257DAK3/STM32MP257FAK3). This processor belongs to the ST STM32MP25x product line, which features a dual-core Arm Cortex-A35 (operating at up to 1.5 GHz) and a single-core Arm Cortex-M33 (running at up to 400 MHz). Additionally, it includes a neural processing unit (NPU) with 1.35 TOPS and a 3D graphics processing unit (GPU). The processor is further enhanced with an integrated video encoder and decoder. A rich set of interfaces is supported by the processor, such as three Ethernet ports with switch and TSN capabilities, FD-CAN, PCIe/USB3.0, and others. It also supports Parallel and MIPI CSI-2 for camera connections and Parallel, LVDS, and MIPI DSI for display connectivity. These features make STM32MP25x devices well-suited for a wide range of consumer, industrial, white goods and medical applications.



STM32MP257 Application Processors



STM32MP257 Circuit Diagram

The MYC-LD25X/MYC-LF25X takes full features of STM32MP257 processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 37mm x 39mm
- PCB Layers: 12-layer design
- Power supply: +5V/3A
- Working temperature: -40~85 Celsius (industrial grade)

Processor

- ST STM32MP257 Processor (STM32MP257DAK3 for MYC-LD25X, STM32MP257FAK3 for MYC-LF25X)
  - Dual-core Arm Cortex-A35 64-bit RISC core operating at up to 1.5 GHz
  - A Cortex-M33 32-bit RISC core operating at up to 400 MHz
  - Neural Processing Unit (NPU) operating at up to 1.35 TOPS and 3D GPU
  - H.264 encoding/decoding

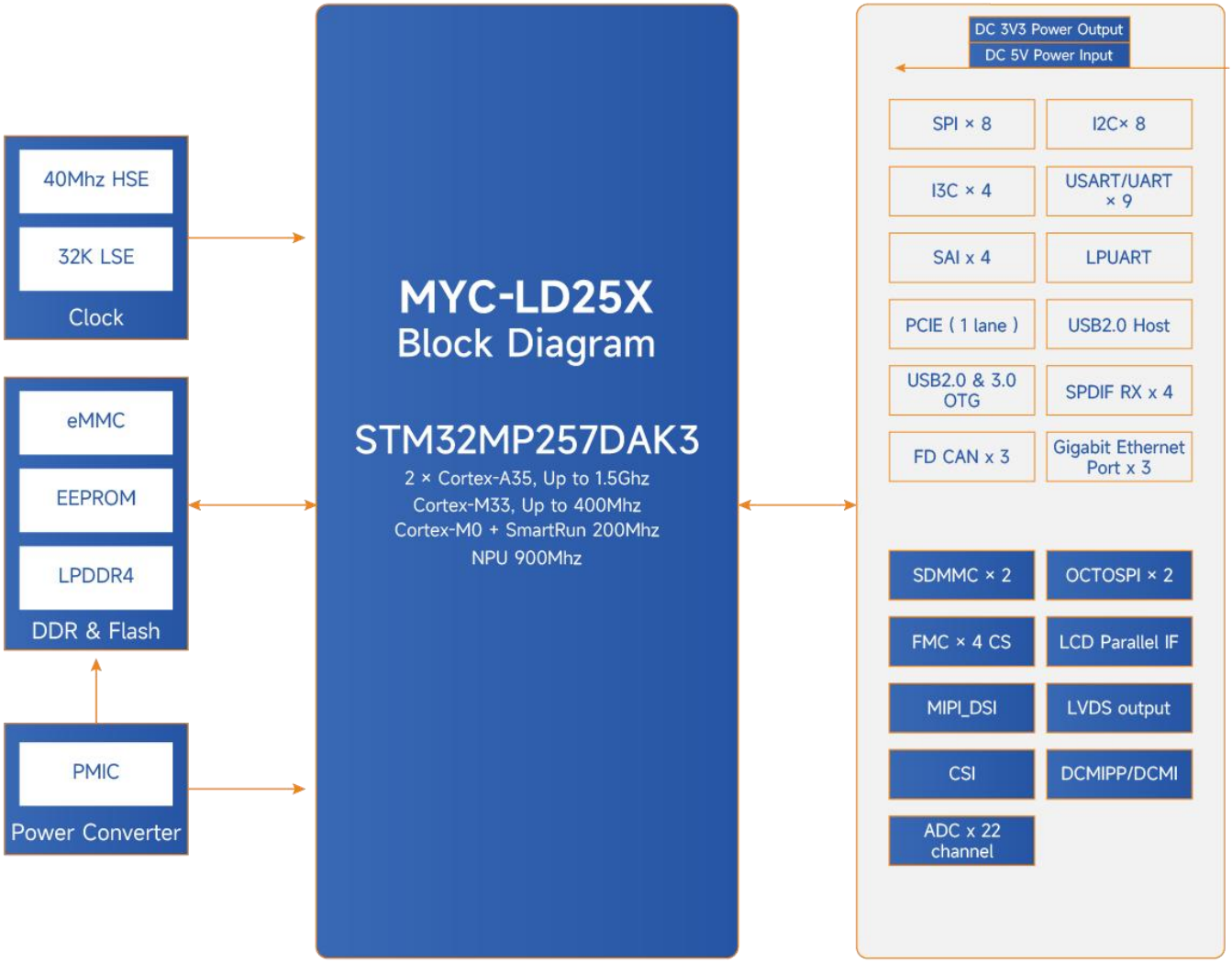
Memory

- 1GB/2GB LPDDR4
- 8GB eMMC
- 256Kbit EEPROM

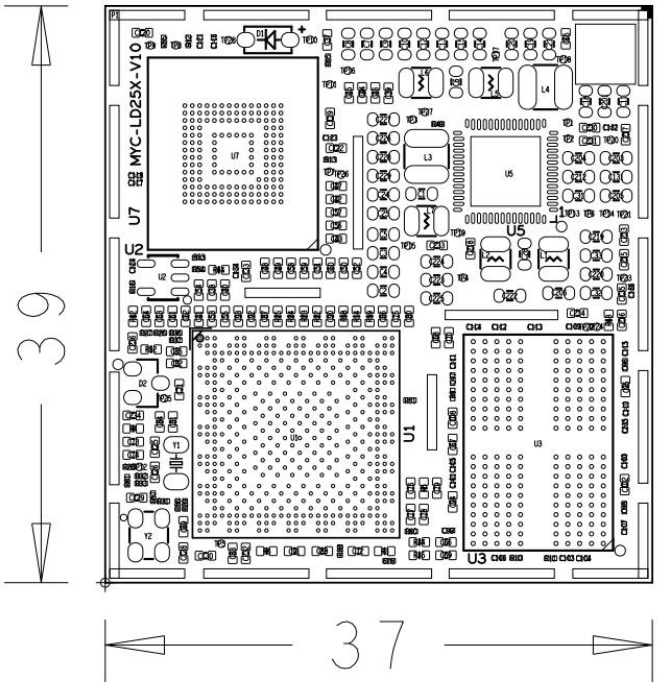
Peripherals and Signals Routed to Pins

- Power Management IC (STPMIC25APQR)
- 252-pin LGA Expansion Interface
  - 3x RGMII
  - 1x USB2.0 HOST
  - 1x USB 3.0 OTG
  - 4x USART
  - 5x UART
  - 8x SPI
  - 7x I2C
  - 4x I3C
  - 3x CAN FD
  - 2x SD/MCC
  - 4x SAI
  - 1x Parallel RGB
  - 1x MIPI DSI
  - 2x LVDS
  - 1x MIPI CSI
  - 1x DCMI
  - 1x JTAG
  - 1x SWD
  - Up to 128x 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.



Function Block Diagram



MYC-LD25X Dimensions Chart (Unit: MM)

Software Features

The MYC-LD25X/MYC-LF25X System-On-Module supports Linux. Meanwhile, the MYC-LD25X has also ported Debian OS, and comes with comprehensive software packages. To assist clients in accelerating their projects, the kernel and various peripheral drivers are provided in source code format. Here is a brief overview of the key software features:

Item	Features	Features	Source Code
Bootloader	TFA	First bootloader 2.10.5	YES
	U-boot	The second boot program uboot_2023.10	YES
Linux kernel	Linux kernel	Customized based on official kernel_6.6.48 version	YES
Device driver	EEPROM	BL24C256A 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-CA driver	YES
	LVDS	LVDS display driver	YES
	HDMI	LT9611 driver	YES
	Audio	ES8388 Audio Driver	YES
	MIPI CSI	OV5640	YES
	RTC	LK8563T driver	YES
	GPIO	General purpose GPIO driver	YES
	UART	RS232/RS485 driver	YES
	CAN	CAN driver	YES
	WiFi	AP6256 driver	YES
	BT	AP6256 driver	YES
File system (MYC-LD25X)	myir-image-core	Image without GUI interface built with Yocto that supports rt Linux	YES
	myir-image-full	A fully functional QT and HMI image built with Yocto	YES
	myir-image-debian	Image built with debian system	YES
File system	myir-image-full	A fully functional QT and HMI image built with Yocto	YES

MYC-LD25X/MYC-LF25X Software Features

Order Information

<table>
<tr><th>Product Item</th><th>Part No.</th><th>Packing List</th></tr>
<tr><td rowspan="2">MYC-LD25X
System-On-Module</td><td>MYC-LD257-8E1D-150-I</td><td rowspan="2">✓ One MYC-LD25X SOM</td></tr>
<tr><td>MYC-LD257-8E2D-150-I</td></tr>
<tr><td>MYC-LF25X
System-On-Module</td><td>MYC-LF257-8E1D-150-I</td><td>✓ One MYC-LF25X SOM</td></tr>
<tr><td rowspan="2">MYD-LD25X
Development Board</td><td>MYD-LD257-8E1D-150-I</td><td rowspan="2">✓ One MYD-LD25X Development Board (including MYC-LD25X SOM)
✓ One USB-to-TTL cable
✓ One Quick Start Guide</td></tr>
<tr><td>MYD-LD257-8E2D-150-I</td></tr>
<tr><td>MYD-LF25X
Development Board</td><td>MYD-LF257-8E1D-150-I</td><td>✓ One MYD-LF25X Development Board (including MYC-LF25X SOM)
✓ One USB-to-TTL cable
One Quick Start Guide</td></tr>
<tr><td>MY-LVDS070C
7-inch LCD Module</td><td>MY-LVDS070C</td><td rowspan="3">Add-on Options
✓ MY-LVDS070C 7-inch LCD Module
✓ MY-CAM003M Camera Module
✓ MY-WIREDCOM RPI Module</td></tr>
<tr><td>MY-CAM003M
Camera Module</td><td>MY-CAM003M</td></tr>
<tr><td>MY-WIREDCOM
RPI Module</td><td>MY-WIREDCOM</td></tr>
<tr><td colspan="3">Note:

1. One MYD-LD25X/MYD-LF25X Development Board comprises one MYC-LD25X/MYC-LF25X SOM mounted onto the base board. If you require additional SOMs, you may place order for extras.

2. Bulk discounts are available. For inquiries, kindly contact MYIR.

3. We cater to custom design requests based on the MYD-LD25X, whether it involves reducing, adding or modifying the existing hardware components to suit the customers' specific needs.</td></tr>
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