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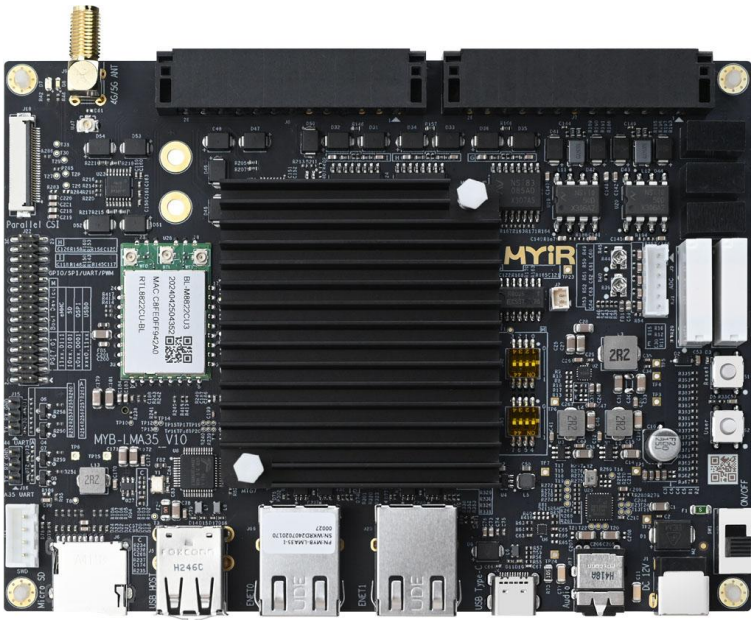
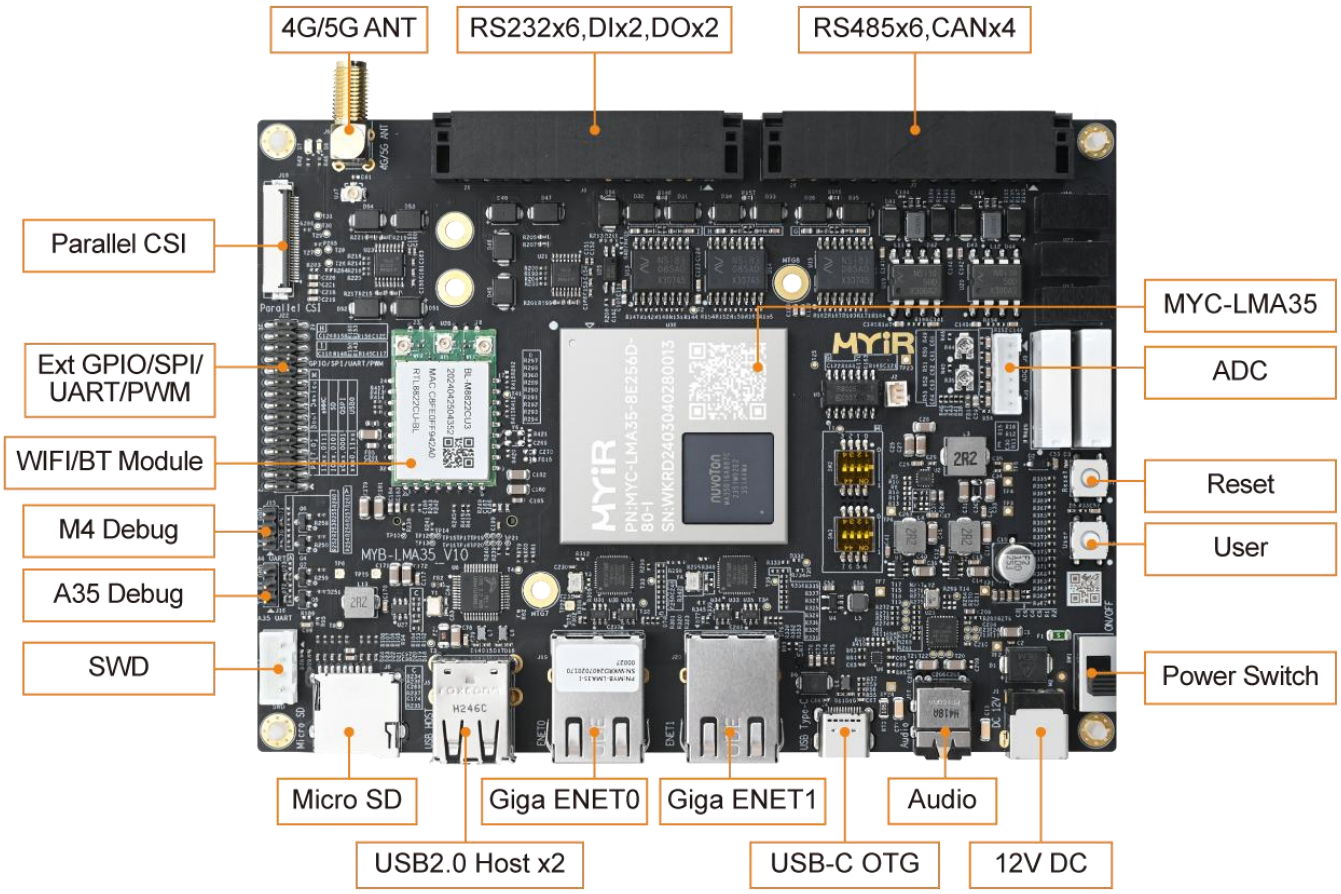
MYD-LMA35 Development Board Overview



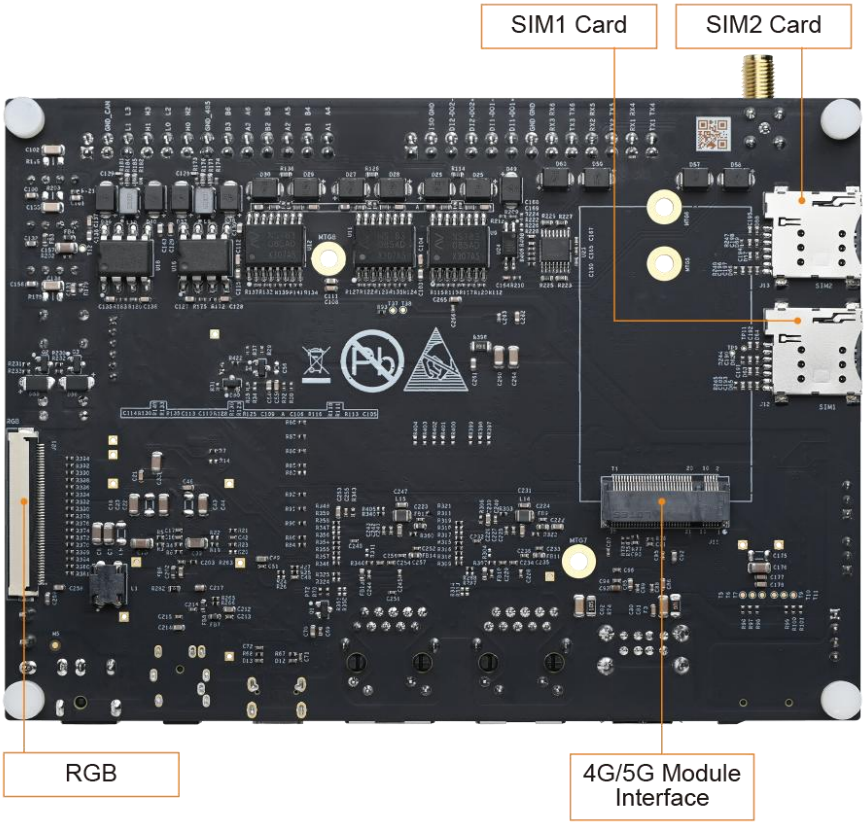
- ✓ *MYC-LMA35 SOM as Controller Board*
- ✓ *Nuvoton NuMicro® MA35D1 Processor (MA35D16A887C/MA35D16AJ87C) in BGA Package with Stacked 256MB/512MB DDR3L*
- ✓ *800MHz Dual ARM Cortex-A35 and 180MHz Cortex-M4 Cores*
- ✓ *256MB Nand Flash/8GB eMMC, 32Kbit EEPROM*
- ✓ *6x RS232, 6x RS485, 2x USB2.0 Host, 1x USB2.0 OTG, 4x CAN, 1x Micro SD Card Slot*
- ✓ *2x Gigabit Ethernet, WiFi/Bluetooth, 4G/5G LTE Module Interface*
- ✓ *Supports RGB Display, Camera Interface, Audio Input and Output*
- ✓ *Supports Linux and Debian OS*

The MYD-LMA35 Development Board is an advanced evaluation platform specifically designed for the Nuvoton MA35D16A887C/*MA35D16AJ87C* processor. The processors boast up to 800MHz Dual ARM Cortex-A35 cores and a 180MHz Cortex-M4 core, belonging to the esteemed NuMicro® MA35D1 family. The board is ready to run the Linux or Debian Operating System and supports an industrial-grade operating temperature range from -40 to +85 degrees Celsius.

The MYD-LMA35 Development Board is built around the MYC-LMA35 System-On-Module (SOM) and has explored many features of the NuMicro® MA35D1 SoC through the 252-pin LGA expansion interface of the SOM to its base board. This board operates on a 12V/2A DC power supply and boasts a rich set of peripherals, including 6x RS232, 6x RS485, 2x USB 2.0 Host, 1x USB 2.0 OTG, 2x Gigabit Ethernet, 4x CAN, a Micro SD card slot, and an integrated WiFi/Bluetooth module. Additionally, it incorporates an M.2 Socket for USB-based 4G/5G LTE Modules, along with two SIM card holders. The board also offers an RGB display interface, a Parallel CSI interface, and an audio interface. Furthermore, the 30-pin extension interface provides access to additional resources such as GPIO, UART, SPI, and PWM, enabling users to customize and enhance their development endeavors.



Top-view of MYD-LMA35 Development Board (delivered with a pre-installed heatsink by default)



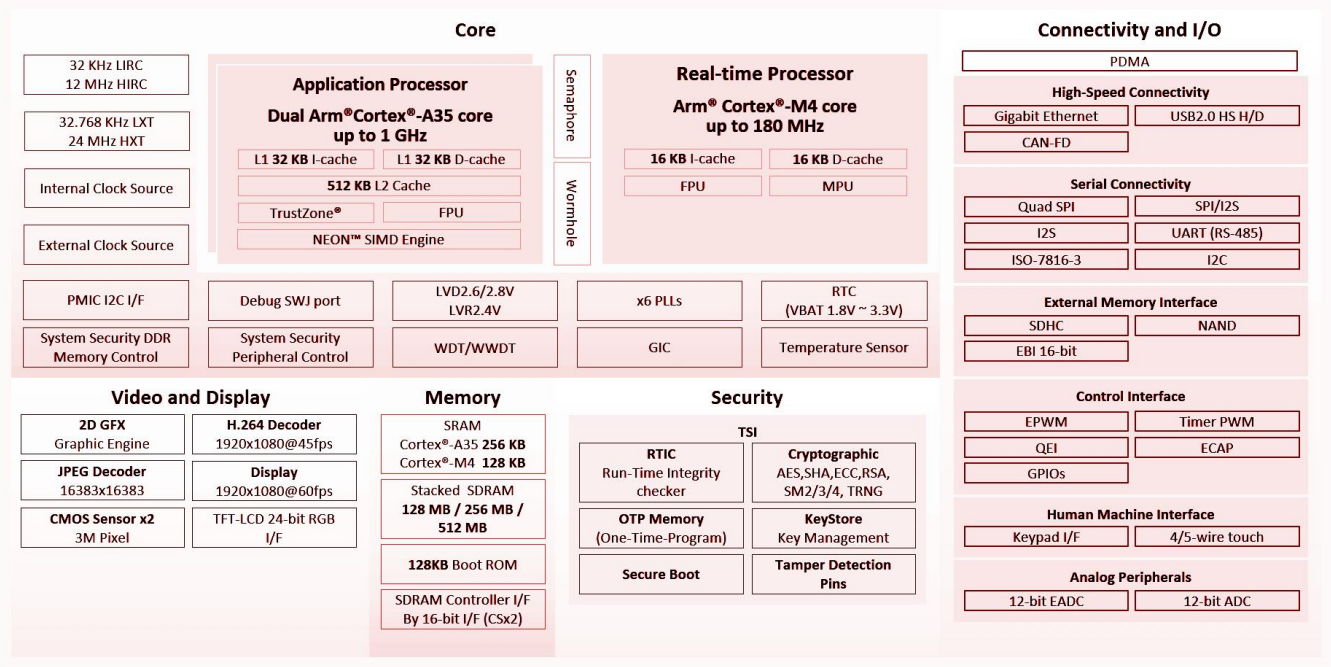
Bottom-view of MYD-LMA35 Development Board

The MYD-LMA35 Development Board is delivered with a Quick Start Guide, one USB to TTL cable and one 12V/2A power adapter. MYIR also offers MY-LCD70TP-C LCD Module as add-on option for the board.

The MYD-LMA35 Development Board is capable of running Linux 5.10 Operating System, ensuring a stable and efficient performance. MYIR provides abundant software resources, including kernel and driver source code, as well as detailed documentations and tools that facilitate rapid and easy development for users. These resources provide the necessary support to developers, enabling them to focus on creating innovative and exciting applications.

Hardware Specification

The MYC-LMA35 is using 15 x 15mm, 312-LFBGA package NuMicro MA35D16A887C/MA35D16AJ87C MPU from Nuvoton, which is a heterogeneous multi-core microprocessor among the MA35D1 series targeted to high-end edge IIoT gateway. It is based on dual 64-bit Arm® Cortex®-A35 cores with speed up to 800 MHz, and one 180 MHz Arm® Cortex®-M4 core. Based on the high-performance cores, the MA35D1 series facilitates the tiny AI/ML for edge computing.



MA35D1 Series Processors Block Diagram

✓ Target Applications
- Edge Gateway/Industrial Gateway
- Tiny AI (Artificial Intelligent) / ML (Machine Learning)
- HMI (Human Machine Interface) & Industrial Control
- Construction Machinery Controller/ Motion Controller
- OBD (On-Board Diagnostics) Automotive Diagnostic Tool
- New Energy Applications

✓ Ecosystem
- The NuMicro® MA35D1 platform is a simple and easy-to-use ecosystem with complete software and hardware development tools to shorten the customer's development time in the embedded Linux.
- For graphics library, MA35D1 could support emWin, LVGL, and Qt for users to create stunning GUI.

✓ Packages
- LQFP216 (24 x 24 x 1.4 mm, Pitch 0.4 mm)
- BGA312 (15 x 15 x 1.4 mm, Pitch 0.8 mm)
- BGA364 (14 x 14 x 1.4 mm, Pitch 0.65 mm)

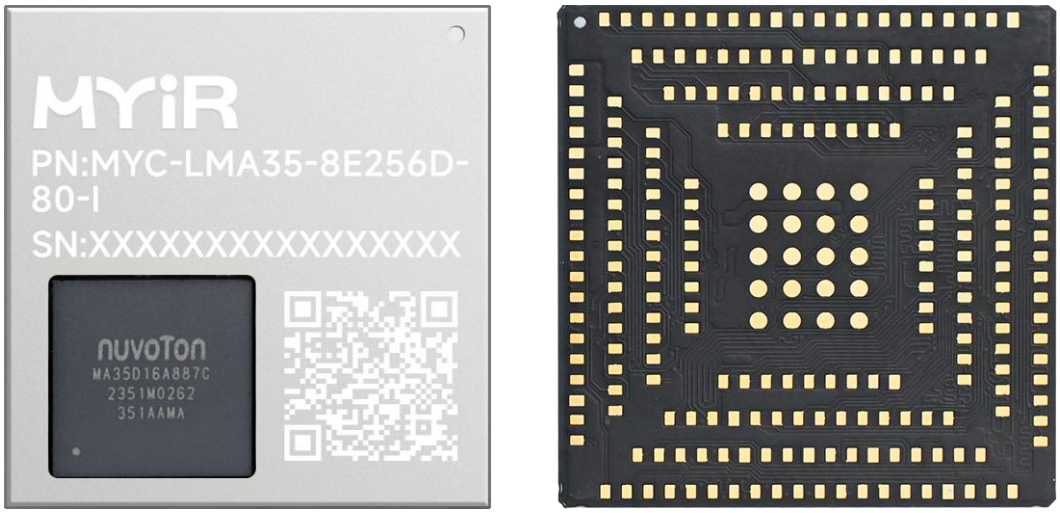
✓ Operating temperature (Tj)
- -40°C ~ +105°C (Industry Grade)

The MYD-LMA35 Development Board is using the MYC-LMA35 SOM as core controller board. It takes full features of Nuvoton MA35D1 processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 110mm x 150mm (base board), 37mm x 39mm (SOM)
- PCB Layers: 6-layer design (base board), 10-layer design (SOM)
- Power supply: +12V/2A (base board), +5V/1A (SOM)
- Working temperature: -40~85 Celsius (industrial grade)
  (WiFi/BT Module: -20~70 Celsius)

The MYD-LMA35 Controller Board (MYC-LMA35 SOM)



MYC-LMA35 System-On-Module (Top-view and Bottom-view)

Processor

- Nuvoton NuMicro® MA35D1 Processor (MA35D16A887C/MA35D16AJ87C)
  - Dual Cortex-A35 cores running up to 800 MHz
  - Cortex-M4 processor core running up to 180 MHz
  - On-chip SRAM 384 KB (Cortex-A35 256 KB + Cortex-M4 128 KB)
  - DDR3L (MA35D16A887C with 256MB, MA35D16AJ87C with 512MB)
  - 2D Graphic Engine (GFX), LCD display controller with the resolution up to 1080p@60 FPS
  - H.264 Video Decoder and JPEG Image Decoder

Storage

- 256MB Nand Flash/8GB eMMC
- 32Kbit EEPROM

Peripherals and Signals Routed to Pins

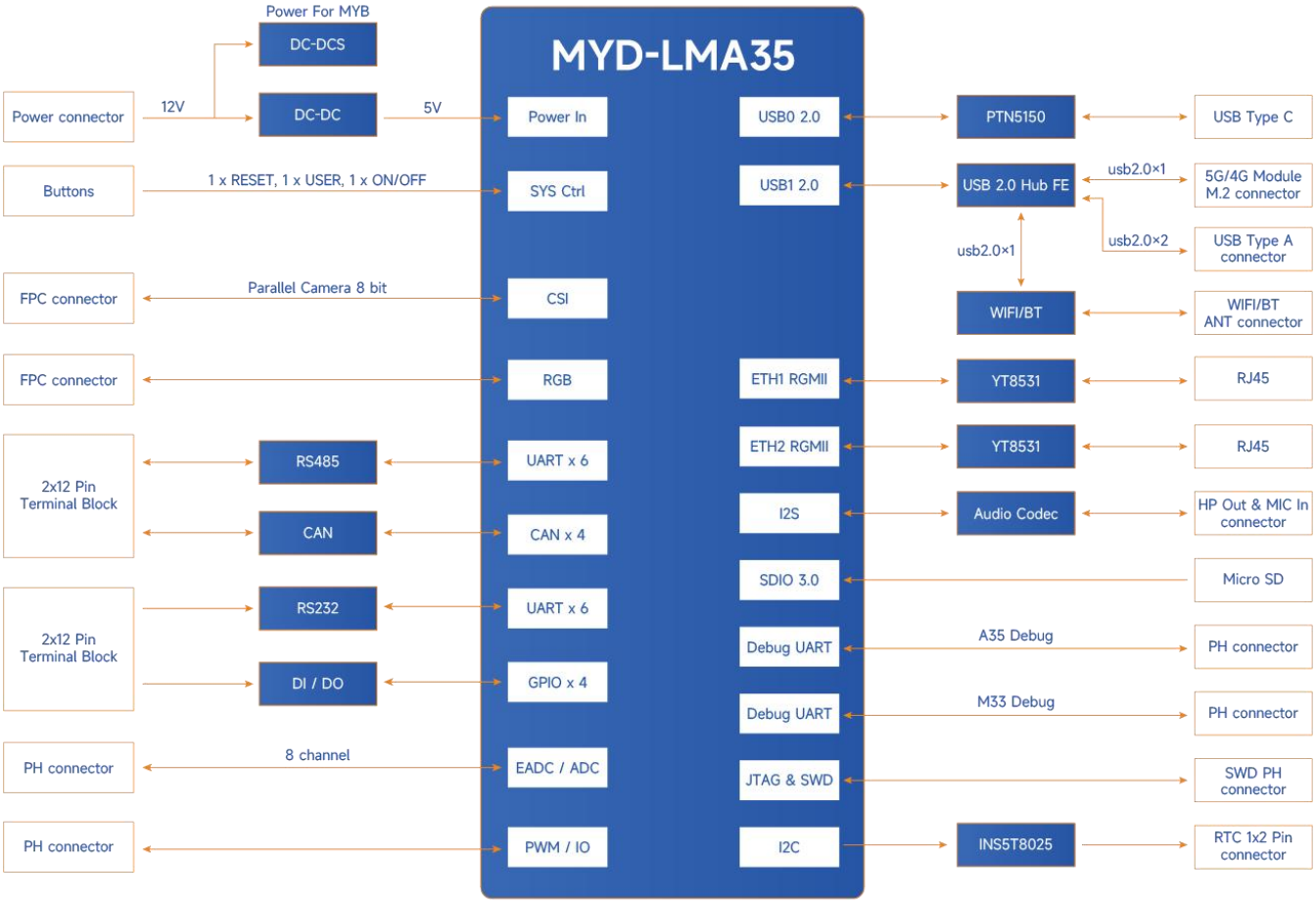
- 252-pin LGA Expansion Interface
  - 2x USB2.0
  - 2x RGMII
  - 1x SDIO 3.0
  - 4x CAN FD
  - 2x I2S

- 17x UART
- 6x I2C
- 8x EADC
- 1x JTAG
- 1x RGB
- 2x Parallel CSI
- 18x EPWM
- 4x SPI
- Up to 190 GPIOs

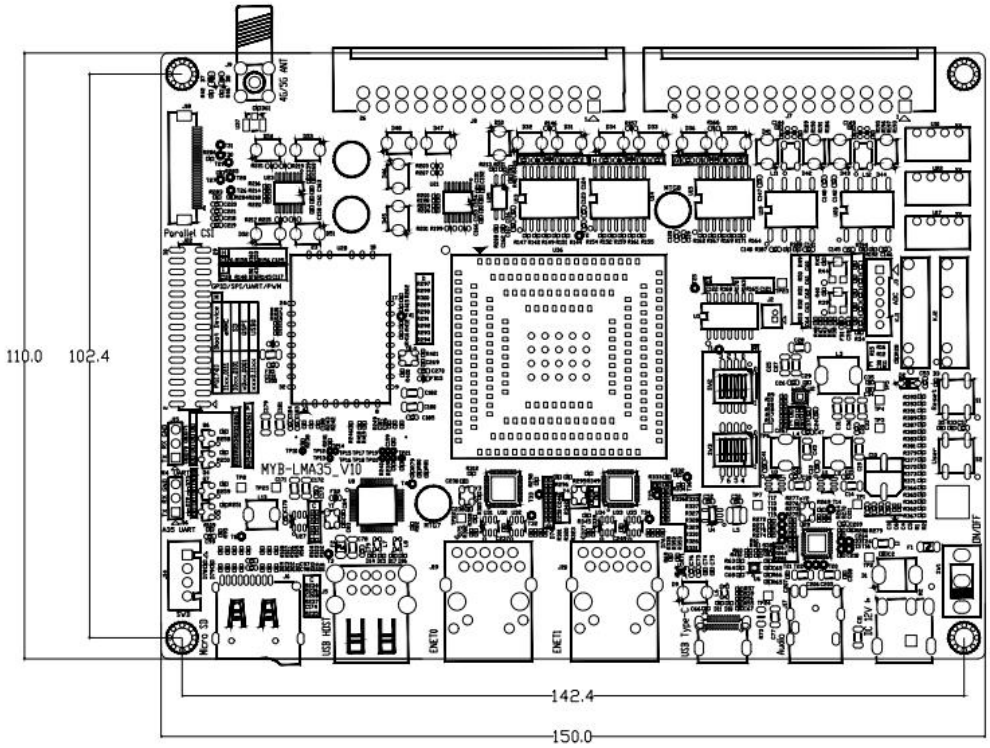
Note: the peripheral signals brought out to the expansion interface are listed in maximum number. Some signals are reused. Please refer to the processor datasheet and the SOM pinout description file.

The MYD-LMA35 Development Board Base Board

- 1x Power Jack
- 1x Power Switch
- Serial Ports
  - 6x RS232
  - 6x RS485 (with isolation)
  - 3x Debug Interfaces (one for Cortex-A35 core, one for Cortex-M4 core, one for SWD)
- USB
  - 2x USB 2.0 Host ports
  - 1x USB 2.0 OTG port
  - 1x M.2 socket for USB based 4G/5G LTE Module
- 2x SIM card slots
- 1x Micro SD card slot
- 2x 10/100/1000Mbps Ethernet interfaces
- 1x WiFi/BT Module (complies with lEEE 802.11 a/b/g/n/ac standard and supports Bluetooth V5.0)
- 4x CAN interfaces (with isolation)
- 1x ADC interface
- 2x Digital Input (DI) ports
- 2x Digital Output (DO) ports
- 1x Audio Input and Output Interface
- 1x RGB Display Interface (J21, 0.5mm pitch 50-pin FPC connector)
- 1x Parallel CSI Camera Interface (J20, 0.5mm pitch 24-pin FPC connectors)
- 1x Expansion I/O Interface (GPIO/UART/SPI/PWM)
- 3x Buttons (one for Reset, one for User, one for ON/OFF)



MYD-LMA35 Development Board Function Block Diagram



MYD-LMA35 Dimensions Chart (Unit: MM)

Software Features

The MYD-LMA35 development board supports for Linux and Debian OS, and comes with comprehensive software packages. To help clients in accelerate 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	Description	Source Code
Bootloader	ATF	First bootstrap ATF2.3	YES
	SPL	Second bootstrap SPL	YES
	U-boot	Third bootstrap uboot_2020.07	YES
Kernel	Linux Kernel	Customized based on official kernel_5.10.140 version	YES
Device driver	EEPROM	BL24C32FF 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
	RGB	RGB display driver	YES
	Audio	SGTL5000 Audio Driver	YES
	4G/5G	4G/5G driver	YES
	ADC	ADC driver	YES
	RTC	rx8025t driver	YES
	GPIO	GPIO driver	YES
	UART	RS485/RS232/TTL drivers	YES
	CAN	CAN driver	YES
	WiFi/Bluetooth	BL-M8822CU3-A driver	YES
File system	myir-image-core	Image built with Yocto, excluding GUI interface, and supports rt-Linux	YES
	myir-image-full	A fully functional image built with Yocto, including QT and HMI	YES
	myir-image-debian	Compiled and constructed based on Debian 12 SDK	YES

MYD-LMA35 Software Features

Order Information

Product Item	Part No.	Packing List
MYD-LMA35 Development Board	MYD-LMA35-256N256D-80-I	✓ One MYD-LMA35 Development Board (including MYC-LMA35 SOM) ✓ One USB-to-TTL cable ✓ One 12V/2A Power adapter ✓ One Quick Start Guide
	MYD-LMA35-8E256D-80-I	
	MYD-LMA35-8E512D-80-I	
MYC-LMA35 System-On-Module	MYC-LMA35-256N256D-80-I	**Add-on Options** ✓ One MYC-LMA35 SOM ✓ MY-LCD70TP-C LCD Module
	MYC-LMA35-8E256D-80-I	
	MYC-LMA35-8E512D-80-I	
MY-LCD70TP-C LCD Module	MY-TFT070CV2	

Note:

1. One MYD-LMA35 Development Board comprises one MYC-LMA35 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-LMA35, whether it involves reducing, adding or modifying the existing hardware components to suit the customers' specific needs.

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: www.myirtech.com
Email: sales@myirtech.com
Tel: +86-755-22984836