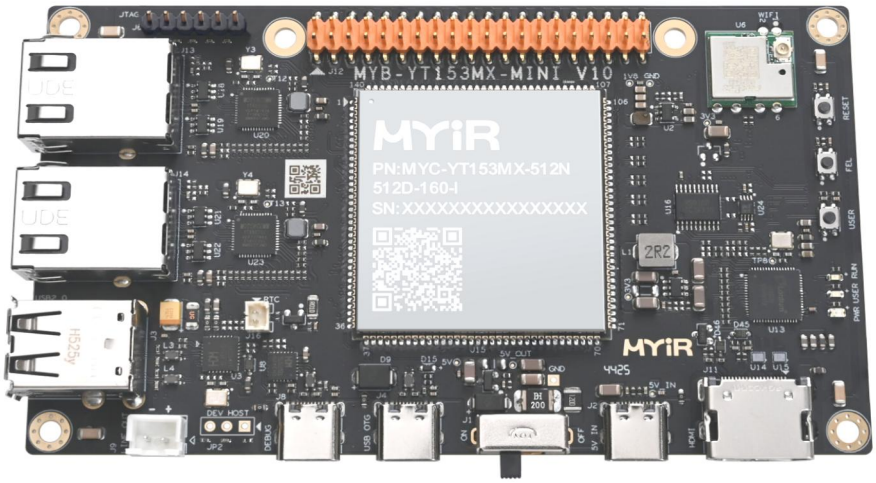
MYiR 米尔电子
Make Your Idea Real

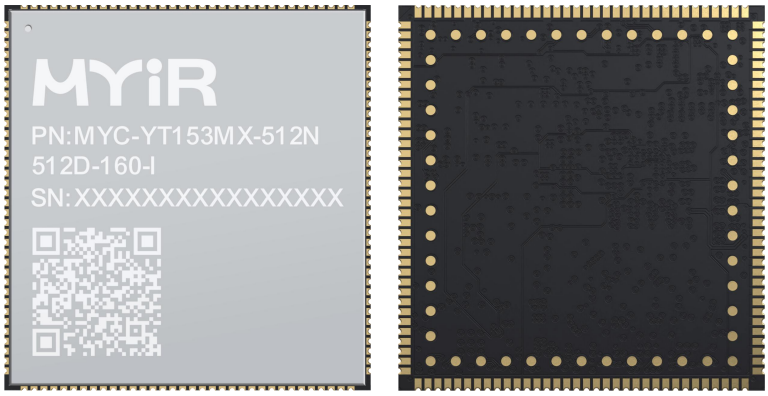
MYD-YT153MX-MINI Development Board Overview



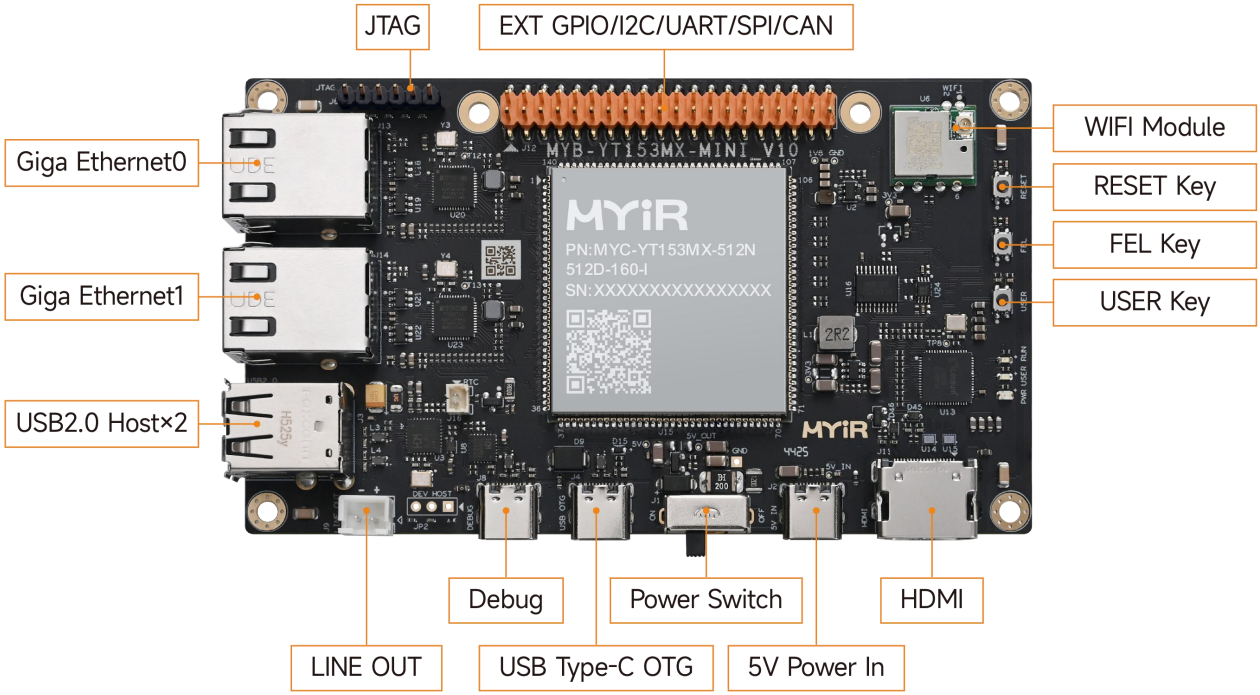
- ✓ *MYC-YT153MX SOM as Controller Board*
- ✓ *Allwinner T153MX-BCX Processor based on 1.6GHz Quad ARM Cortex-A7 and 600MHz RISC-V E907 Cores*
- ✓ *512MB/1GB DDR3(L), 8GB eMMC/512MB NAND FLASH, 32KB EEPROM*
- ✓ *2x Gigabit Ethernet, 2x USB 2.0 Host, 1x USB 2.0 OTG, 1x USB Debug, 1x Micro SD Card Slot, 1x JTAG Interface*
- ✓ *Supports LVDS and HDMI Display, and Audio Line Out*
- ✓ *Supports Linux OS*
- ✓ *Optional 7-inch LCD Module and RPI Module (CAN/I2C/SPI/UART/GPIO)*

The MYD-YT153MX-MINI is designed as a compact and cost-effective variant of the MYD-YT153MX for evaluating and prototyping the Allwinner T153 processor. This processor features a quad-core Arm Cortex-A7 running at 1.6GHz and a single-core RISC-V E907 operating at 600MHz, offering powerful computing performance and fast response capabilities. The T153 supports rich multimedia resources: RGB, LVDS, and MIPI-DSI, and also integrates an ISP image signal processor, supporting one 4-lane sensor. The processor also supports three Gigabit Ethernet interfaces, CAN-FD, LocalBus, 24 GPADCs, 30 PWMs, 6 TWIs, 10 UARTs, and 4 SPIs; suitable for industrial controllers, industrial HMIs, industrial gateways, robots, industrial vision equipment, power terminals, charging piles, and other scenarios.

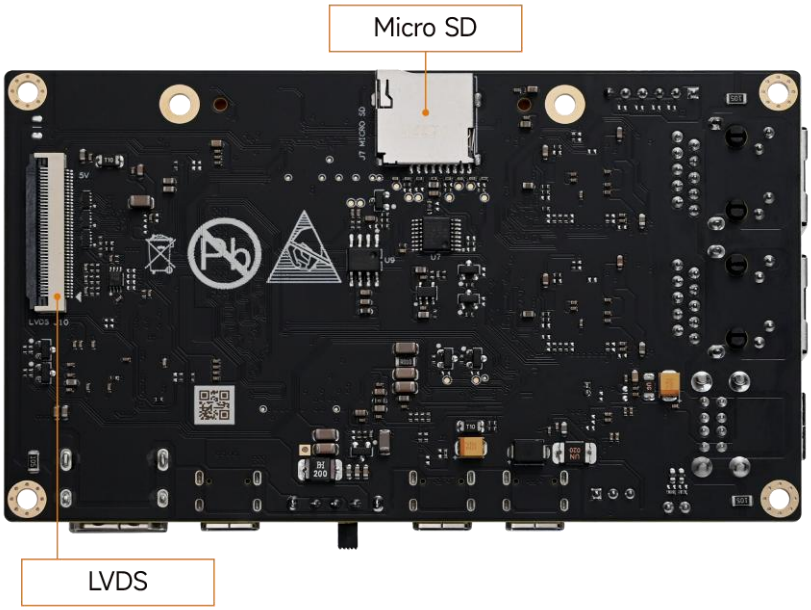
The MYD-YT153MX-MINI development board consists of the MYC-YT153MX System-On-Module (SOM) and the MYB-YT153MX-MINI baseboard, assembled via 140-pin Castellated-Hole and 50-pin LGA expansion interfaces. The core MYC-YT153MX SOM is equipped with the T153MX-BCX processor, 512MB DDR3, 512MB Nand Flash, and 32KB EEPROM. To enable extensive connectivity and evaluation, the carrier board provides a comprehensive set of peripherals including an integrated WiFi module, dual Gigabit Ethernet ports, two USB 2.0 host interfaces, a USB 2.0 debug port, a USB 2.0 OTG interface, a LINE OUT audio port, a JTAG debug interface, and a microSD card slot. The board also features a 40-pin Raspberry Pi compatible expansion header and supports for both HDMI and LVDS displays.



MYC-YT153MX Top-view and Bottom-view



MYD-YT153MX-MINI Development Board (Top-view)



MYD-YT153MX-MINI Development Board (Bottom-view)

To further expand its functionality, MYIR offers the optional MY-LVDS070C 7-inch LVDS display module and the MY-WIREDCOM RPI module to enable extended peripheral connectivity. It supports additional interfaces such as CAN, I2C, SPI, UART, and GPIO for greater application flexibility and more peripheral extension.

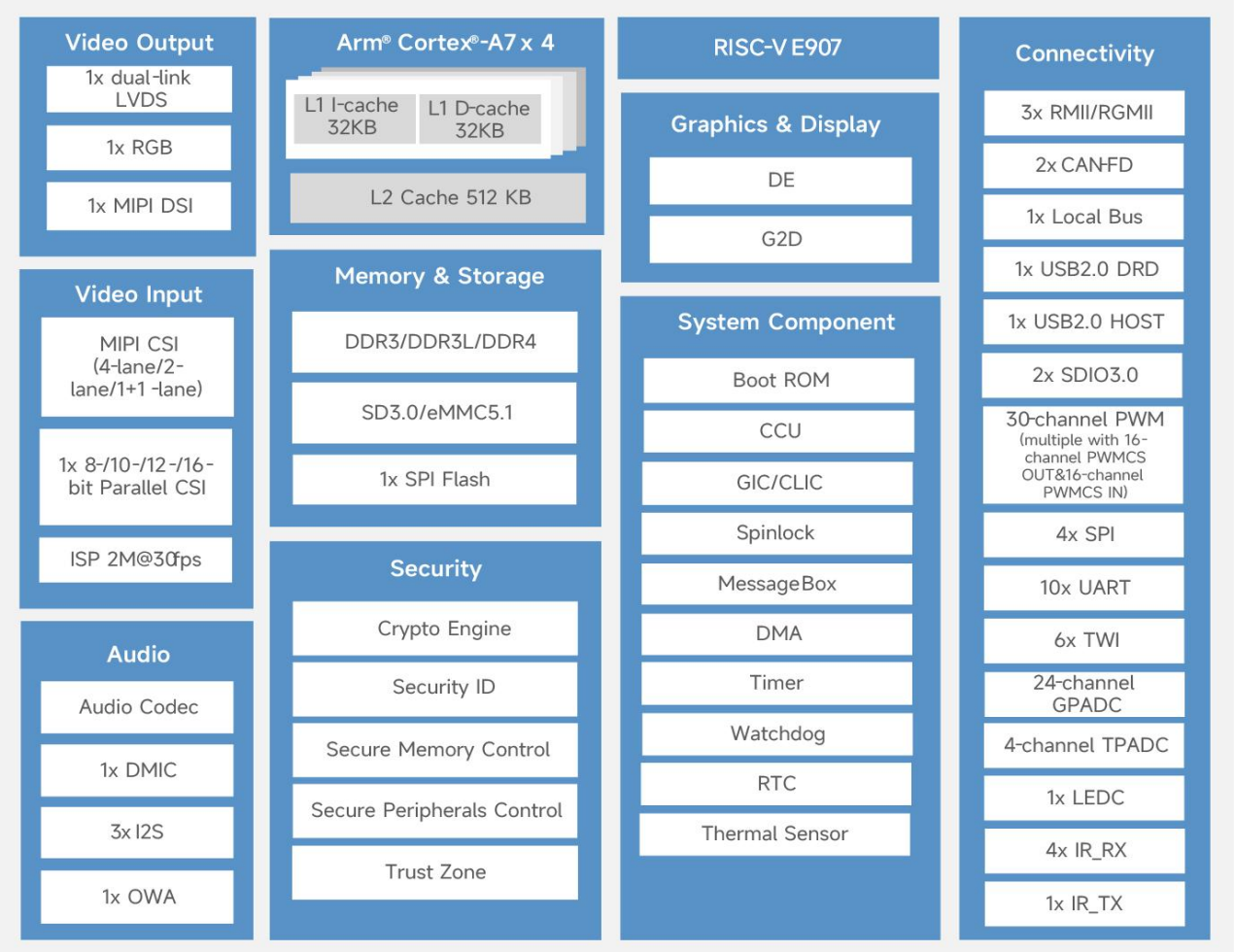
The MYD-YT153MX-MINI development board supports Linux OS and is backed by extensive software resources and documentation, enabling customers to start development right out of the box.

Hardware Specification

The MYC-YT153MX System-on-Module (SOM) integrated on the MYD-YT153MX Development Board is powered by the Allwinner T153MX-BCX microprocessor with a 1.0mm ball pitch and a clock speed of 1.6 GHz. The processor combines a quad-core ARM Cortex-A7 (up to 1.6 GHz) with a real-time co-processor RISC-V E907 (up to 600 MHz). Designed specifically for automation applications such as PLCs and HMIs, the Allwinner T153 delivers robust computing performance and rapid responsiveness through its multi-core architecture and support for DDR3/DDR3L/DDR4 memory.

The chip further enhances automation system capabilities with three Gigabit Ethernet interfaces, two CAN-FD interfaces, and a 16-/32-bit local bus, supporting high-throughput networking for complex data-driven scenarios. Integrated imaging and display processing enables clear real-time visual feedback, essential for monitoring and managing sophisticated manufacturing processes.

With extensive peripheral support including a 16-channel GPADC, 5 TWIs, and 22 PWM channels, the Allwinner T153 provides the flexibility needed for diverse automation applications, ensuring easy integration and scalability within modern industrial systems.



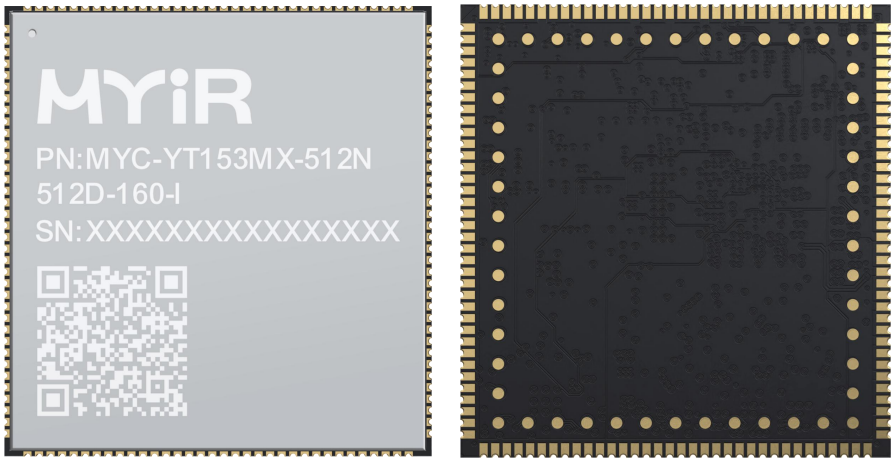
T153 Processor Block Diagram

The MYD-YT153MX-MINI Development Board features the MYC-YT153MX System-On-Module as its core controller and is equipped with the Allwinner T153 processor. Its primary characteristics are as follows:

Mechanical Parameters

- Dimensions: 120mm x 70mm (base board), 37mm x 39mm (SOM)
- PCB Layers: 6-layer design (base board), 10-layer design (SOM)
- Power supply: 5V/3A (base board), 5V/2A (SOM)
- Working temperature: 0~70 Celsius (Development board), -40~85 Celsius (SOM)

The MYD-YT153MX-MINI Controller Board (MYC-YT153MX System-On-Module)



MYC-YT153MX Top-view and Bottom-view

Processor

- Allwinner T153 processor (T153MX-BCX)
  - Quad-Core Arm Cortex-A7, up to 1.6GHz
  - RISC-V XuanTie E907, up to 600MHz
  - Display Enable (DE) and Graphics 2D (G2D) acceleration

Memory

- 512MB DDR3 (Optional 1GB DDR3L)
- 512MB NAND FLASH (Optional 8GB eMMC)
- 32KB EEPROM

Peripherals and Signals Routed to Pins

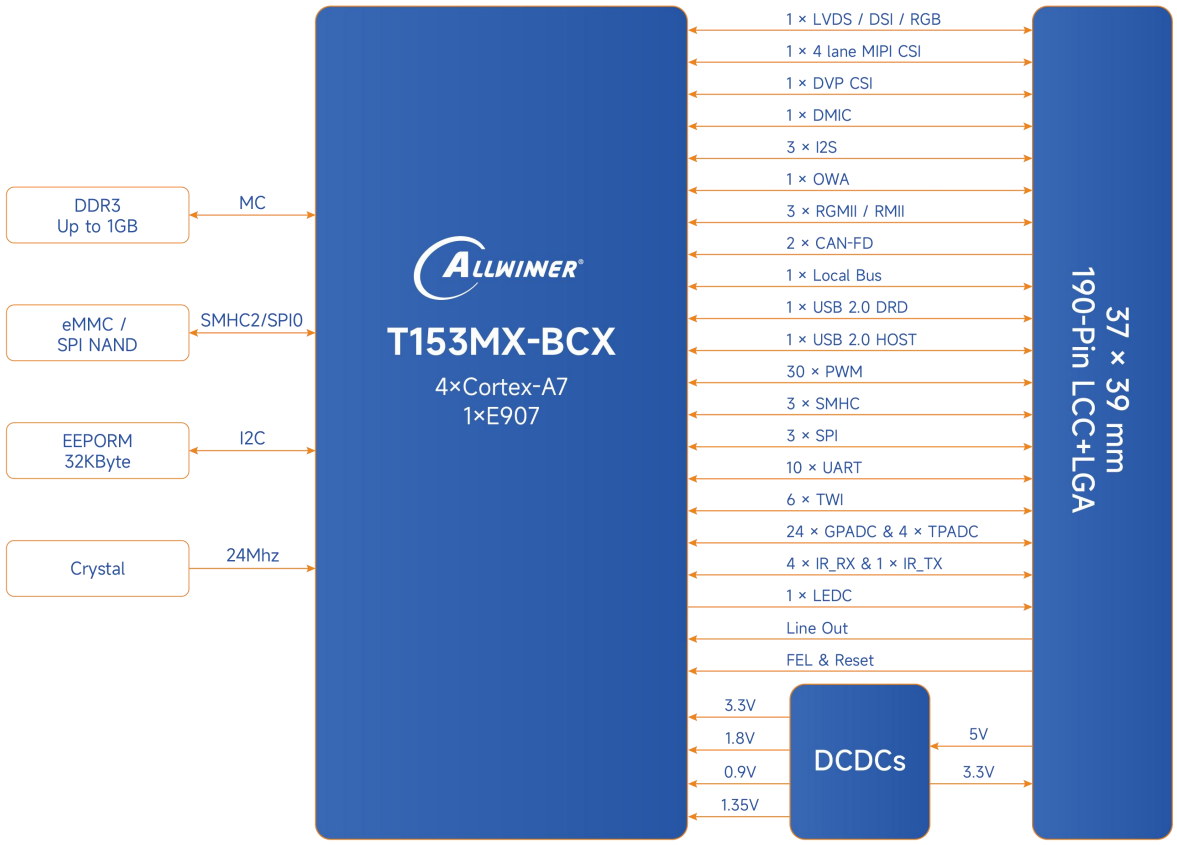
- 140-pin Castellated-Hole and 50-pin LGA Expansion Interfaces
  - 3x RMII/RGMII
  - 1x USB2.0 HOST
  - 1x USB2.0 DRD
  - 3x SMHC (SMHC0/SMHC1/SMHC3)
  - 1x Local Bus
  - 10x UART
  - 2x CAN FD
  - 6x TWI

- 30x PWM
- 3x SPI
- 1x DSMC Master, 1x DSMC Master
- 1x IR-TX
- 4x IR-RX
- 1x LEDC
- 24x GPADC (12-bit resolution, a sampling frequency of up to 1MHz, and an analog input range of 0~1.8V.)
- 4x TPADC (12-bit resolution and a sampling frequency of up to 750KHz.)
- 2x MIPI CSI (Supports 1x 4Lane or 2x 2Lane)
- 1x Parallel CSI (Supports 8/10/12/16 bit width)
- 1x MIPI DSI (Supports 4 lanes, maximum support 1920x1080@60fps)
- 1x dual-link LVDS (Dual LVDS, maximum resolution 1920x1080@60fps; Single channel LVDS, maximum resolution support 1366x768@60fps)
- 1x LCD (Supports 24 bit RGB interface mode, maximum resolution supported 1920x1080@60fps Supports RGB888, RGB666, RGB565 pixel formats, etc)
- 1x DMIC
- 1x OWA
- 3x I2S
- 1x Audio Codec
- 1x Differential LINEOUTP/LINEOUTN output

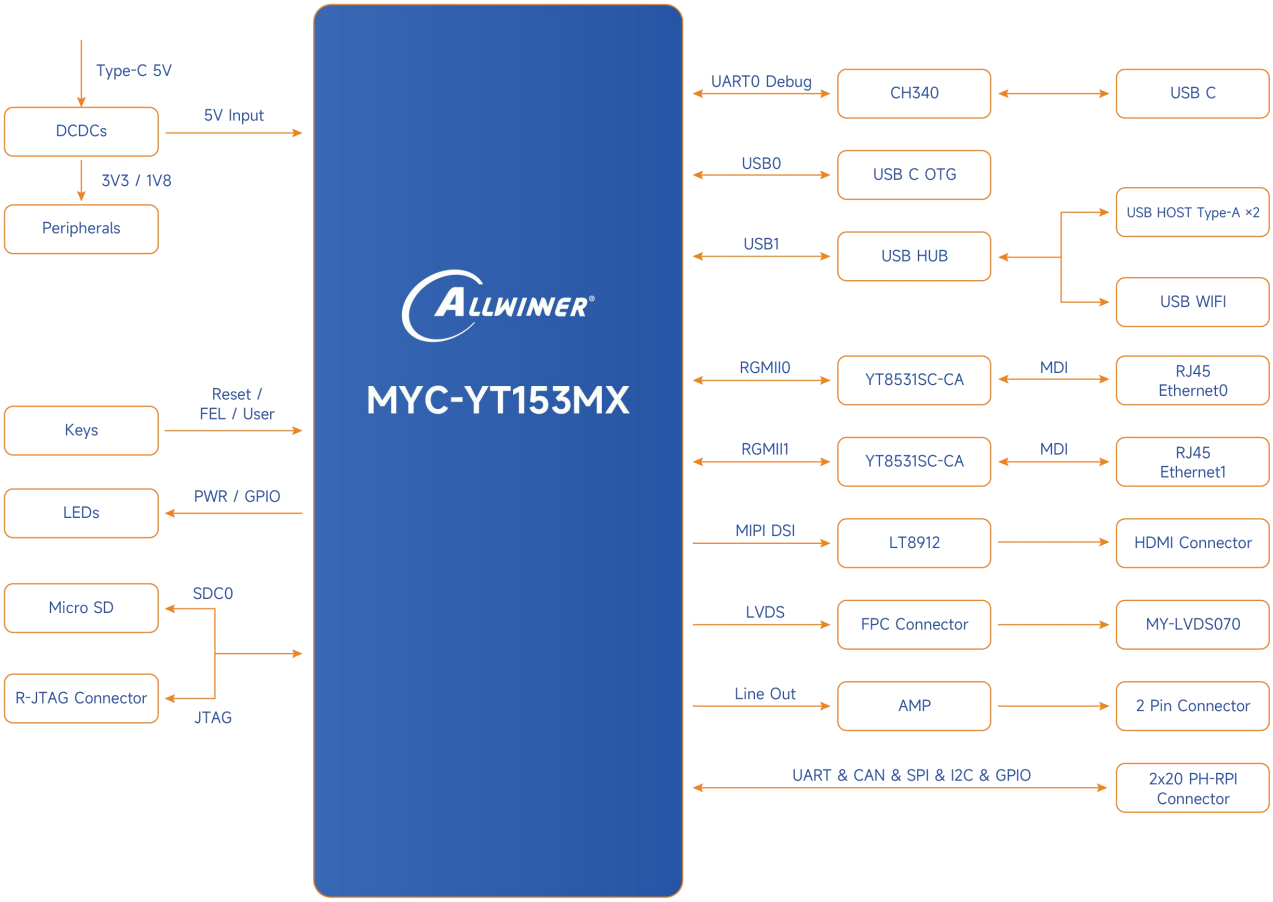
Note: the peripheral signals brought out to the expansion interface are listed in maximum number. Some signals are reused. Please refer to the processor datasheet and the SOM pinout description file.

The MYD-YT153MX-MINI Development Board Base Board

- 1x Power Switch (On/OFF)
- 1x USB Power Supply Interface (5V/3A, Type-C)
- 1x USB Debug Port (TTL to USB, Type-C)
- 2x USB 2.0 Host (Type-A)
- 1x USB 2.0 OTG (Type-C)
- 2x Gigabit Ethernet
- 1x WIFI module
- 1x Micro SD card slot
- 1x JTAG interface
- 1x LVDS interface
- 1x HDMI interface
- 1x Audio interface (Line out)
- 1x Battery backed RTC Socket
- 3x Buttons (1x USER, 1x RESET, 1x FEL)
- 3x LEDs (1x PWR, 1x RUN, 1x USER)
- 1x RPI Expansion Interface: one 2.54mm pitch 2x 20-pin header (CAN/I2C/SPI/UART/GPIO)



MYC-YT153MX System-On-Module Function Block Diagram



MYD-YT153MX-MINI Development Board Function Block Diagram

Software Features

The MYD-YT153MX-MINI development board is fully compatible with Linux and comes with a complete set of software packages. To assist clients in speeding up their projects, the source code for the kernel and various peripheral drivers is included. Below is a summary of the main software features:

Item	Features	Description	Source Code
Bootloader	U-boot	Second bootloader uboot 2023.04	YES
Kernel	Linux kernel	Customized base on official kernel_5.10.198 version	YES
Drivers	EEPROM	BL24C32F Driver	YES
	USB OTG	USB OTG Driver	YES
	Ethernet	YT8531SC-CA Driver	YES
	HDMI	LT8912B Driver	YES
	LVDS	LVDS Driver	YES
	Audio	Audio Driver	YES
	RTC	RTC Driver	YES
	GPIO	GPIO driver	YES
	CAN	CAN Driver	YES
	WiFi	FG6131EUXX-00 Driver	YES
File system	myd_yt153_mini_nand_hdmi	Image built with buildroot displaying an LVGL interface via HDMI	YES
	myd_yt153_mini_nand_lvds	Image built with buildroot displaying an LVGL interface via LVDS	YES
	myd_yt153_mini_nand_hdmi_rt	Image built with buildroot displaying an LVGL interface via HDMI, kernel patched with RT patch	YES
	myd_yt153_mini_nand_lvds_rt	Image built with buildroot displaying an LVGL interface via LVDS, kernel patched with RT patch	YES
	myd_yt153_mini_sdcard_hdmi	Image built with buildroot displaying a Qt5.15.11 interface via HDMI and booting from an SD card	YES
	myd_yt153_mini_sdcard_lvds	Image built with buildroot displaying a Qt5.15.11 interface via LVDS and booting from an SD card	YES

MYD-YT153MX-MINI Software Features

Order Information

<table>
<tr><th>Product Item</th><th>Part No.</th><th>Packing List</th></tr>
<tr><td rowspan="2">MYD-YT153MX-MINI
Development Board</td><td>MYD-YT153MX-MINI-512N512D-160-C</td><td rowspan="2">✓ One MYD-YT153MX-MINI Board (including MYC-YT153MX SOM)
✓ One Quick Start Guide
✓ One USB Type A to Type-C cable</td></tr>
<tr><td>MYD-YT153MX-MINI-8E1D-160-C</td></tr>
<tr><td rowspan="3">MYC-YT153MX
System-On-Module</td><td>MYC-YT153MX-512N512D-160-I</td><td rowspan="3">✓ One MYC-YT153MX SOM</td></tr>
<tr><td>MYC-YT153MX-8E512D-160-I</td></tr>
<tr><td>MYC-YT153MX-8E1D-160-I</td></tr>
<tr><td>MY-LVDS070C
7-inch LCD Module</td><td>MY-LVDS070C</td><td rowspan="2">Add-on Options
MY-LVDS070C 7-inch LCD Module
MY-WIREDCOM Module</td></tr>
<tr><td>MY-WIREDCOM
RPI Module</td><td>MY-WIREDCOM</td></tr>
<tr><td colspan="3">Note:

1. One MYD-YT153MX-MINI Development Board comprises one MYC-YT153MX SOM mounted onto the base board. If you require additional SOMs, you may place order for extras.

2. Bulk discounts are available. Please contact MYIR for inquiries.

3. We accept custom design based on the MYD-YT153MX-MINI, whether reducing, adding or modifying the existing hardware according to customer's requirement.</td></tr>
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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