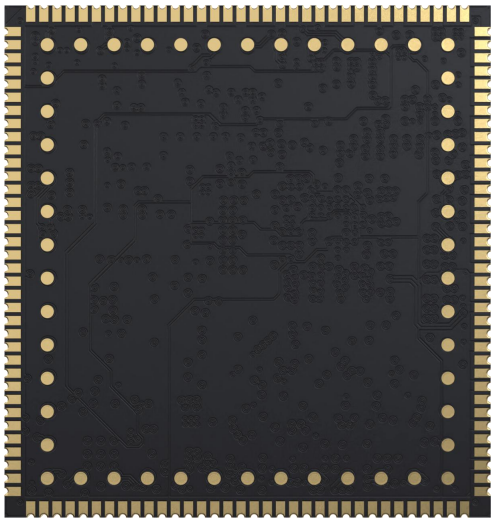
MYiR 米尔电子
Make Your Idea Real

MYC-YT153MX System-On-Module Overview

- ✓ *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*
- ✓ *3x Gigabit Ethernet, 2x CAN-FD, 1x Local Bus, 2x MIPI CSI, 1x Parallel CSI*
- ✓ *Supports RGB, Dual-link LVDS, and MIPI DSI Display*
- ✓ *140-pin Castellated-Hole and 50-pin LGA Expansion Interfaces*
- ✓ *Supports Working Temperature Ranging from -40° C to 85° C*
- ✓ *Supports Linux OS*

MYC-YT153MX System-On-Module

The **MYC-YT153MX** is a 39x37mm compact System-on-Module (SoM) powered by the **Allwinner T153MX-BCX** processor, featuring 1.6GHz quad-core ARM Cortex-A7 and 600MHz RISC-V E907 cores. It includes G2D graphics acceleration and an Image Signal Processor (ISP), supporting RGB/LVDS/MIPI-DSI displays and CSI camera inputs. With 512MB/1GB DDR3(L) and 8GB eMMC/512MB NAND, this 190-pin module offers 3 Gigabit Ethernet ports, USB 2.0, multiple UART/CAN FD/TWI/SPI interfaces, and audio input/output. It is ideal for industrial controllers, Human-Machine Interfaces (HMIs), gateways, robots, and other high-reliability applications.



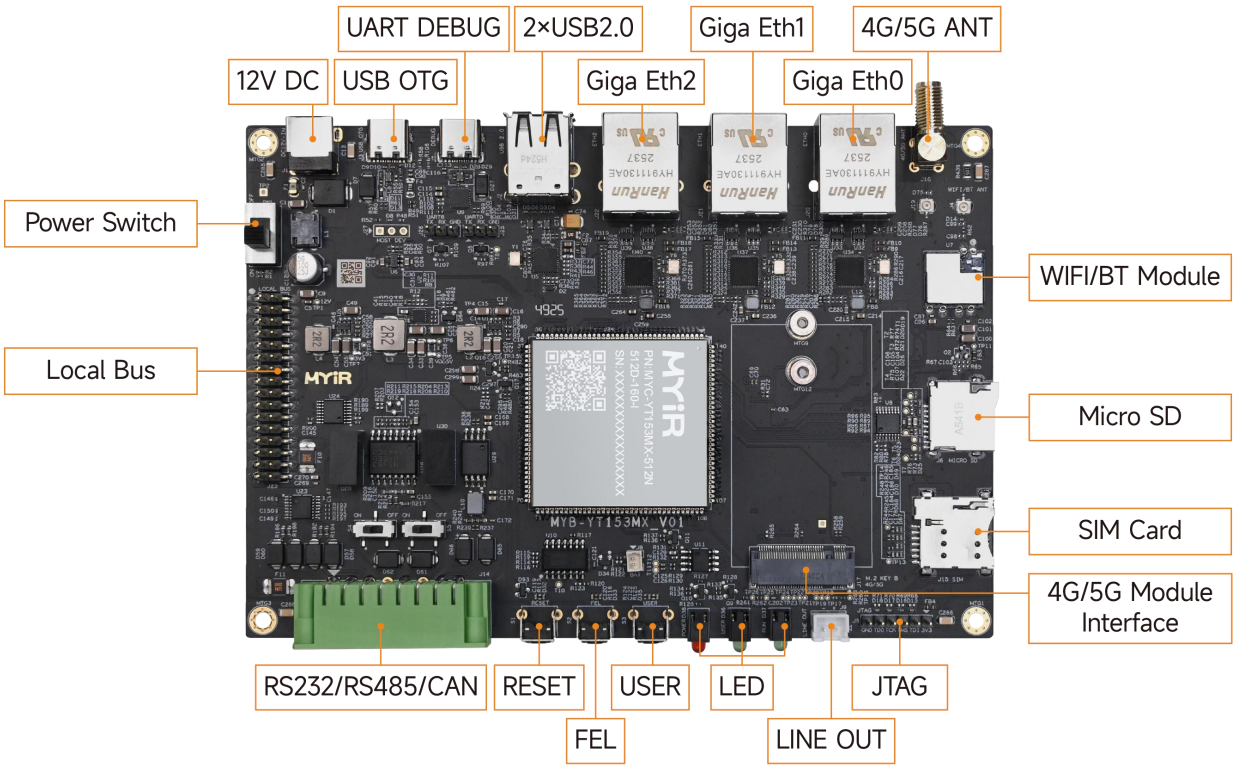
MYC-YT153MX Top-view and Bottom-view

The MYC-YT153MX supports the Linux 6.1 operating system, offering flexibility and adaptability to meet diverse project needs. To facilitate a smooth development process from design to deployment, MYIR provides a comprehensive software bundle, which includes kernel and driver source code, as well as essential compilation tools.

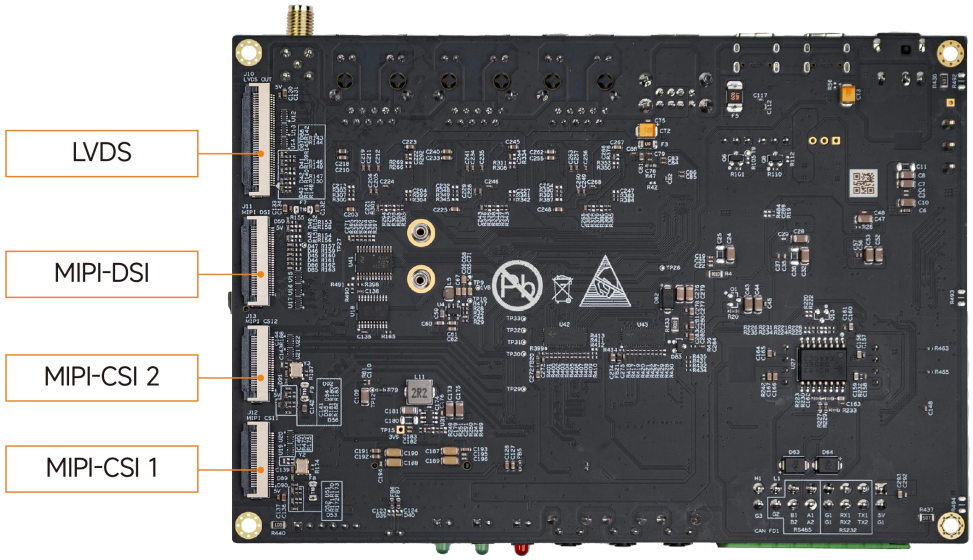
MYIR offers two development boards, **MYD-YT153MX** and **MYD-YT153MX-MINI**, for evaluating and prototyping based on Allwinner T153 processors. Both boards are built around the MYC-YT153MX System-on-Module (SOM), which delivers extensive connectivity through its 140-pin castellated-hole and 50-pin LGA expansion interface.

MYD-YT153MX Development Board

The MYD-YT153MX is equipped with an integrated WiFi/BT module and features versatile connectivity options, including three Gigabit Ethernet ports, two USB 2.0 Host interfaces, one USB 2.0 OTG interface, two RS232, two RS485, and one CAN interface via Phoenix terminals. It also has LVDS, MIPI-DSI, and dual MIPI-CSI interfaces for display and camera integration, along with a LINE OUT audio port. Additionally, there is a microSD card slot, a SIM card slot, a Localbus interface, and a 5G/4G module interface with a USB based M.2 Type B socket, as well as dedicated Debug and JTAG interfaces. To enhance its capabilities, MYIR provides optional accessories such as the MY-LVDS070C 7-inch LVDS Display Module and the MY-CAM003M MIPI Camera Module.



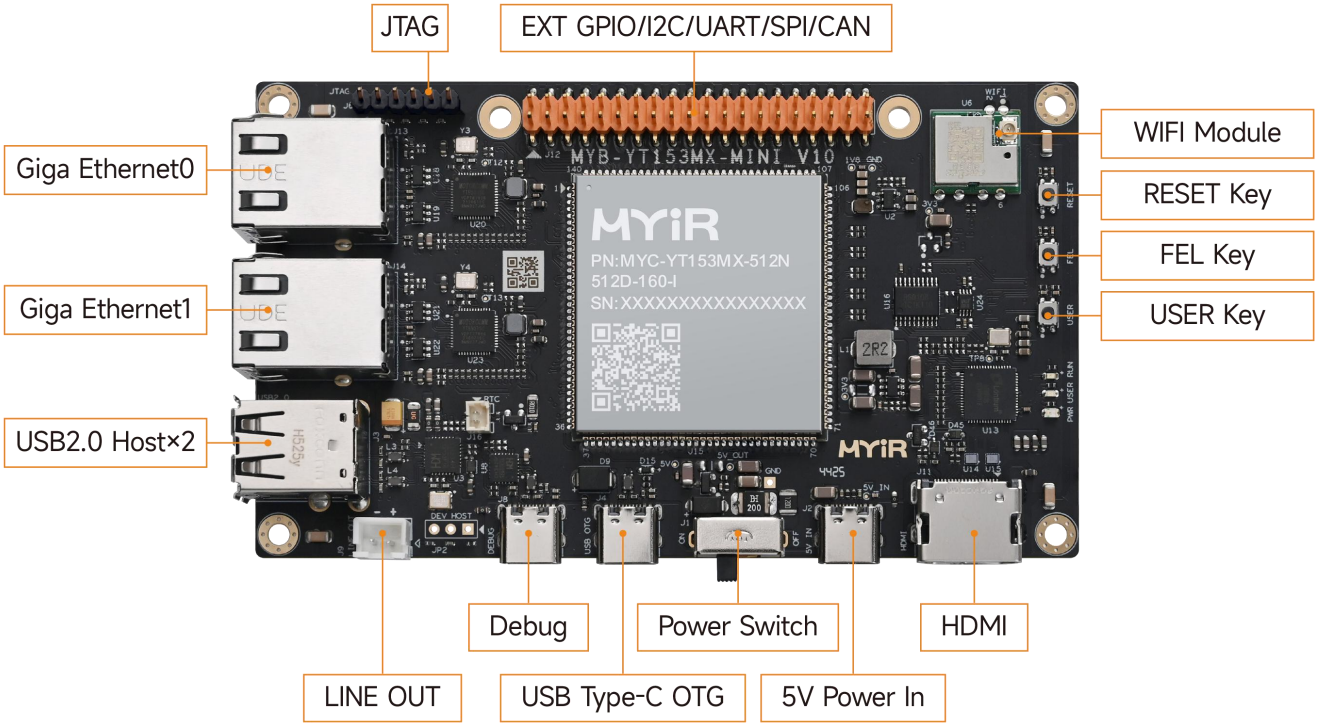
Top-view of MYD-YT153MX Development Board



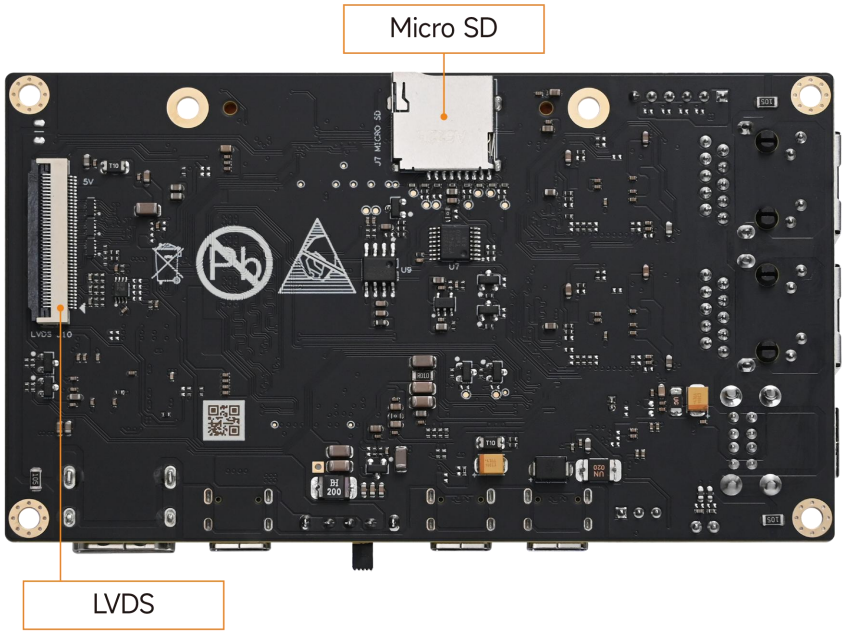
Bottom-view of MYD-YT153MX Development Board

MYD-YT153MX-MINI Development Board

The MYD-YT153MX-MINI is designed as a compact and cost-effective variant of the MYD-YT153MX. This board features dual Gigabit Ethernet ports, two USB 2.0 Host interfaces, a USB 2.0 OTG interface, and a USB 2.0 debug port. It supports both HDMI and LVDS displays, along with a LINE OUT audio port. It has a microSD card slot and a 40-pin Raspberry Pi compatible expansion header, as well as an integrated Wi-Fi module and a JTAG interface for development. MYIR offers optional MY-LVDS070C 7-inch LVDS Display Module and the MY-WIREDCOM Expansion Module for the board.



Top-view of MYD-YT153MX-MINI Development Board



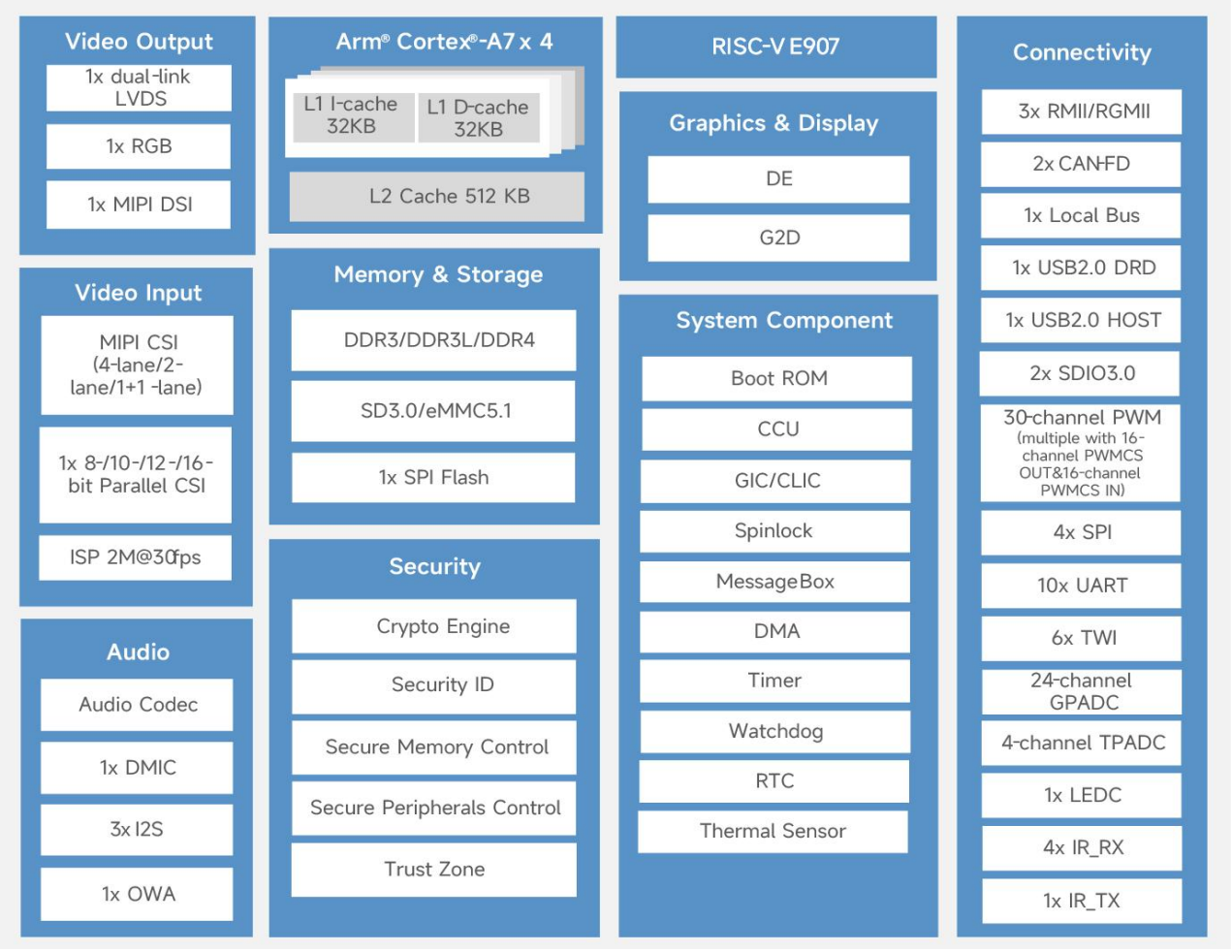
Bottom-view of MYD-YT153MX-MINI Development Board

Hardware Specification

The MYC-YT153MX System-on-Module (SOM) 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 MYC-YT153MX takes full features of AllWinner T153MX-BCX processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 39mm x 37mm
- PCB Layers: 10-layer design
- Power supply: 5V/2A
- Working temperature: -40~85 Celsius (industrial grade)

Processor

- Allwinner T153MX-BCX Processor
  - Quad-core Arm Cortex-A7 operating at up to 1.6 GHz
  - Co-processor RISC-V E907 Core operating at up to 600 MHz
  - Display Enable (DE) and Graphics 2D (G2D) acceleration

Memory

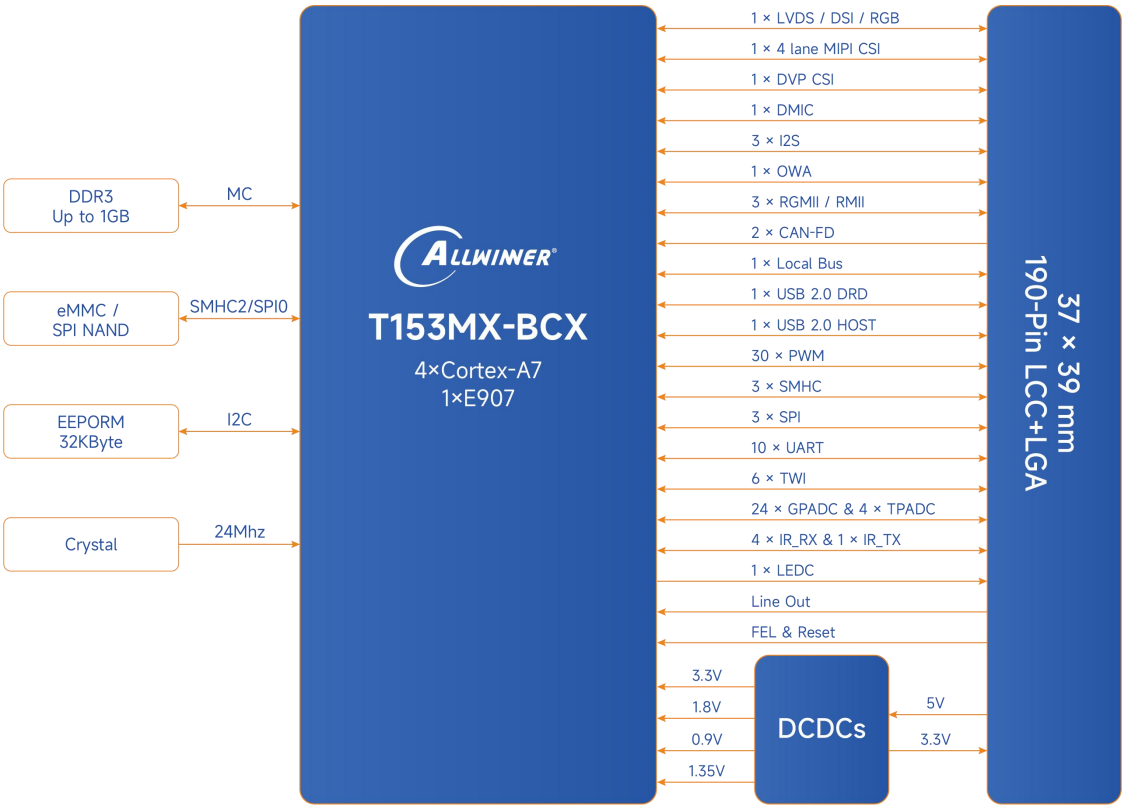
- 512MB DDR3 (Optional 1GB DDR3L)
- 512MB NAND FLASH (Optional 8GB eMMC)
- 32KB EEPROM

Peripherals and Signals Routed to Pins

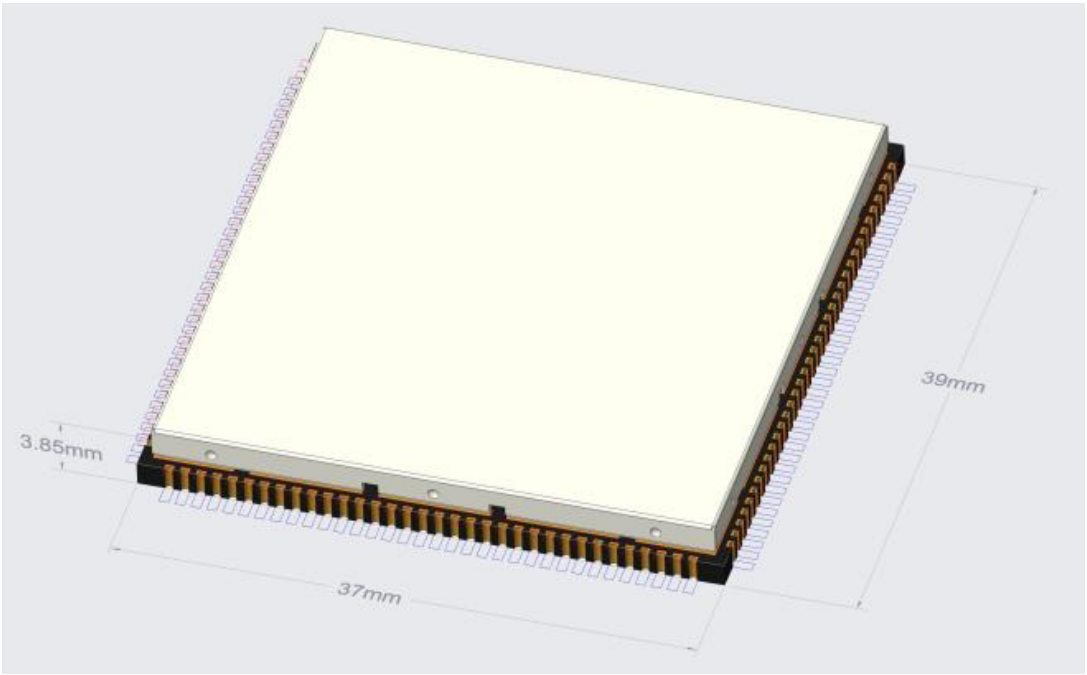
- 140-pin Castellated-Hole and 50-pin LGA Expansion Interfaces
  - 3x RMII/RGMII
  - 1x USB2.0 HOST
  - 1x USB2.0 DRD
  - 3x SMHC (SMHC0/SMHC1/SMHC3)
  - 1x Local Bus
  - 10x UART
  - 2x CAN FD
  - 6x TWI
  - 30x PWM
  - 3x SPI
  - 1x DSMC Master, 1x DSMC Master
  - 1x IR-TX
  - 4x IR-RX
  - 1x LEDC
  - 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.



MYC-YT153MX Function Block Diagram



MYC-YT153MX Dimensions Chart (Unit: MM)

Software Features

The MYC-YT153MX System-On-Module supports Linux 6.1, 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	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 for MYD-YT153MX-MINI	YES
	myd_yt153_mini_nand_lvds	Image built with buildroot displaying an LVGL interface via LVDS for MYD-YT153MX-MINI	YES
	myd_yt153_mini_nand_hdmi_rt	Image built with buildroot displaying an LVGL interface via HDMI for MYD-YT153MX-MINI, kernel patched with RT patch	YES
	myd_yt153_mini_nand_lvds_rt	Image built with buildroot displaying an LVGL interface via LVDS for MYD-YT153MX-MINI, 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, for MYD-YT153MX-MINI	YES
	myd_yt153_mini_sdcard_lvds	Image built with buildroot displaying a Qt5.15.11 interface via LVDS and booting from an SD card, for MYD-YT153MX-MINI	YES
	myd_yt153_emmc_dsi	Image built with buildroot, displayed via DSI, for MYD-YT153MX	YES
	myd_yt153_emmc_lvds	Image built with buildroot, displayed via LVDS, for MYD-YT153MX	YES
	myd_yt153_emmc_rgmii2	Image built with buildroot for multi ethernet interfaces, no display, for MYD-YT153MX	YES

MYC-YT153MX Software Features

Order Information

Product Item	Part No.	Packing List
MYC-YT153MX System-On-Module	MYC-YT153MX-512N512D-160-I	✓ One MYC-YT153MX SOM
	MYC-YT153MX-8E512D-160-I	
	MYC-YT153MX-8E1D-160-I	
MYD-YT153MX Development Board	MYD-YT153MX-512N512D-160-I	✓ One MYD-YT153MX Board (including MYC-YT153MX SOM) ✓ One USB Type A to Type C cable ✓ 12V/2A power adapter ✓ One Quick Start Guide
	MYD-YT153MX-8E512D-160-I	
	MYD-YT153MX-8E1D-160-I	
MYD-YT153MX-MINI Development Board	MYD-YT153MX-MINI-512N512D-160-C	✓ One MYD-YT153MX-MINI Board (including MYC-YT153MX SOM) ✓ One USB Type A to Type C cable ✓ One Quick Start Guide
	MYD-YT153MX-MINI-8E1D-160-C	
MY-LVDS070C LCD Module	MY-LVDS070C	**Add-on Options** ✓ MY-LVDS070C 7-inch LCD Module ✓ MY-CAM003M Camera Module (for MYD-YT153MX) ✓ MY-WIREDCOM Module (for MYD-YT153MX-MINI)
MY-CAM003M Camera Module	MY-CAM003M	
MY-WIREDCOM RPI Module	MY-WIREDCOM	

Note:

1. One MYD-YT153MX/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. For inquiries, kindly contact MYIR.

3. We cater to custom design requests based on the MYD-YT153MX/MYD-YT153MX-MINI, whether it involves reducing, adding or modifying the existing hardware components to suit the customers' specific needs.

MYIR Electronics Limited

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