MYiR 米尔电子
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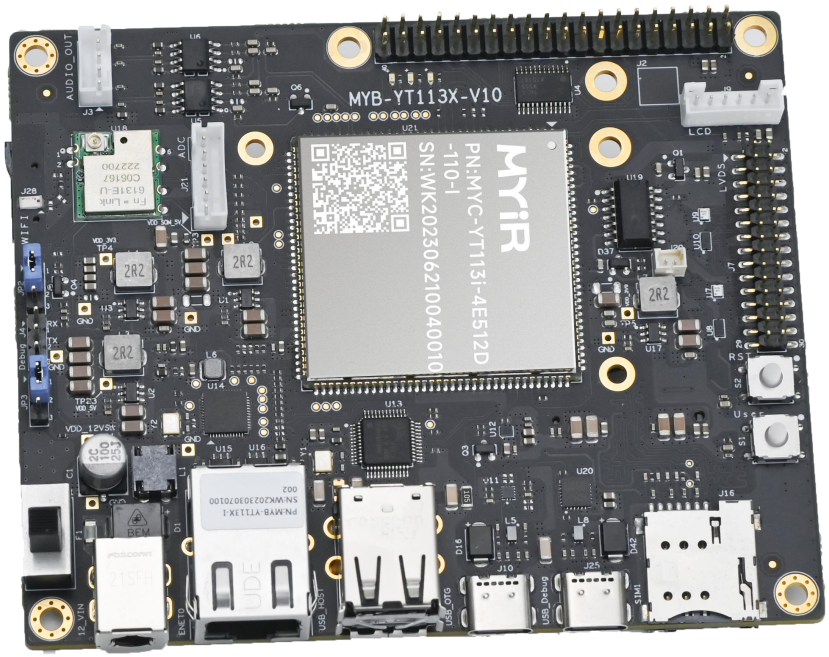
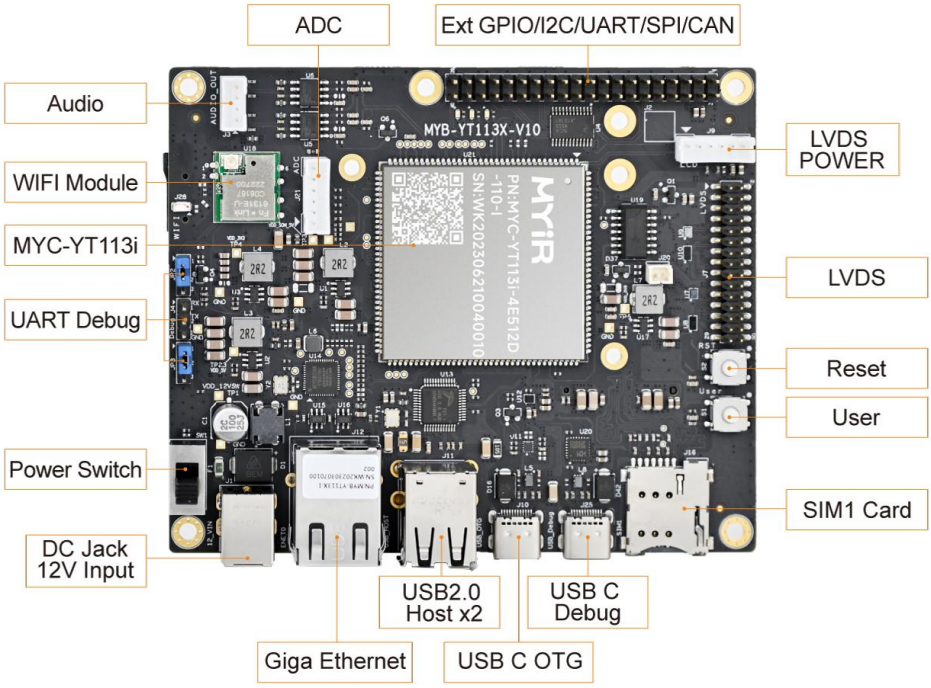
MYD-YT113i Development Board Overview

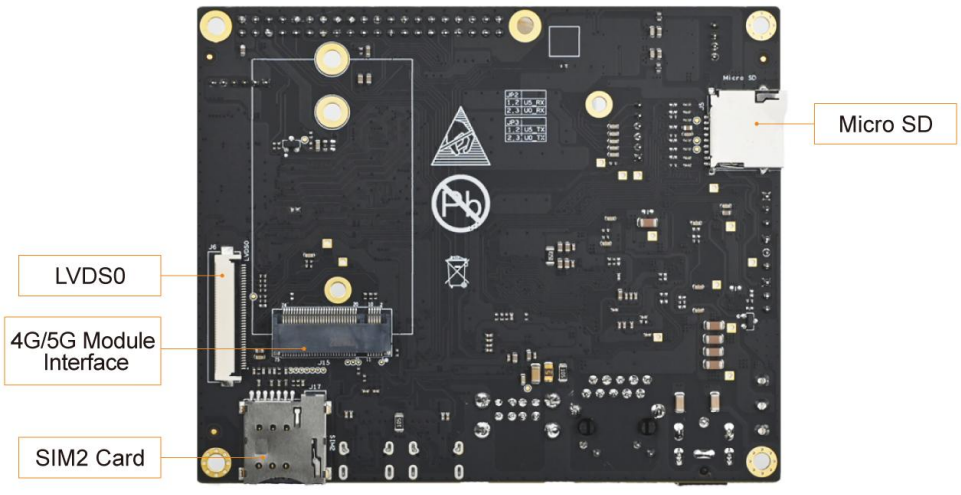


- ✓ *MYC-YT113i System-On-Module as Controller Board*
- ✓ *Up to 1.2GHz Allwinner T113-i Dual-core ARM Cortex-A7 MPU with Single-core HiFi4 DSP*
- ✓ *512MB/1GB DDR3, 4GB/8GB eMMC or 256MB Nand Flash, 32KB EEPROM*
- ✓ *UARTs, 2 x USB 2.0 HOST, 1 x USB 2.0 OTG, 1 x CAN, 1 x Gigabit Ethernet, WiFi, 4G/5G Module Interface, Micro SD card Slot*
- ✓ *1 x Single-channel LVDS , 1 x Dual-channel LVDS, 1 x Audio Output*
- ✓ *Supports Running Linux 5.4 OS*
- ✓ *Optional LCD Module and RPI Module (RS232/RS485/CAN)*

The **MYD-YT113i Development Board** is built around the **MYC-YT113i System-On-Module** to provide a complete evaluation platform for **ALLWINNER T113-i** processor which features up to 1.2GHz Dual-core ARM Cortex-A7 MPU with a RISV slave core and a single-core HiFi4 DSP, targeting applications such as HMI, industrial automation, display and control terminals. It is provided with various RAM and Flash configurations to meet customers' different requirements, supporting 512MB/1GB DDR3, 4GB/8GB eMMC or 256MB Nand Flash. The base board has brought out rich peripherals through connectors and headers such as four UART ports, one Debug port, one Gigabit Ethernet, two USB 2.0 HOST and one USB 2.0 OTG, one Micro SD card slot, one M.2 Socket for 4G/5G LTE Module with two SIM card holders, one WiFi module, one GPIO/I2C/UART/SPI/CAN extension header, one single-channel LVDS and one dual-channel LVDS display interface, as well as audio output interface.



MYD-YT113i Development Board Top-view



MYD-YT113i Development Board Bottom-view

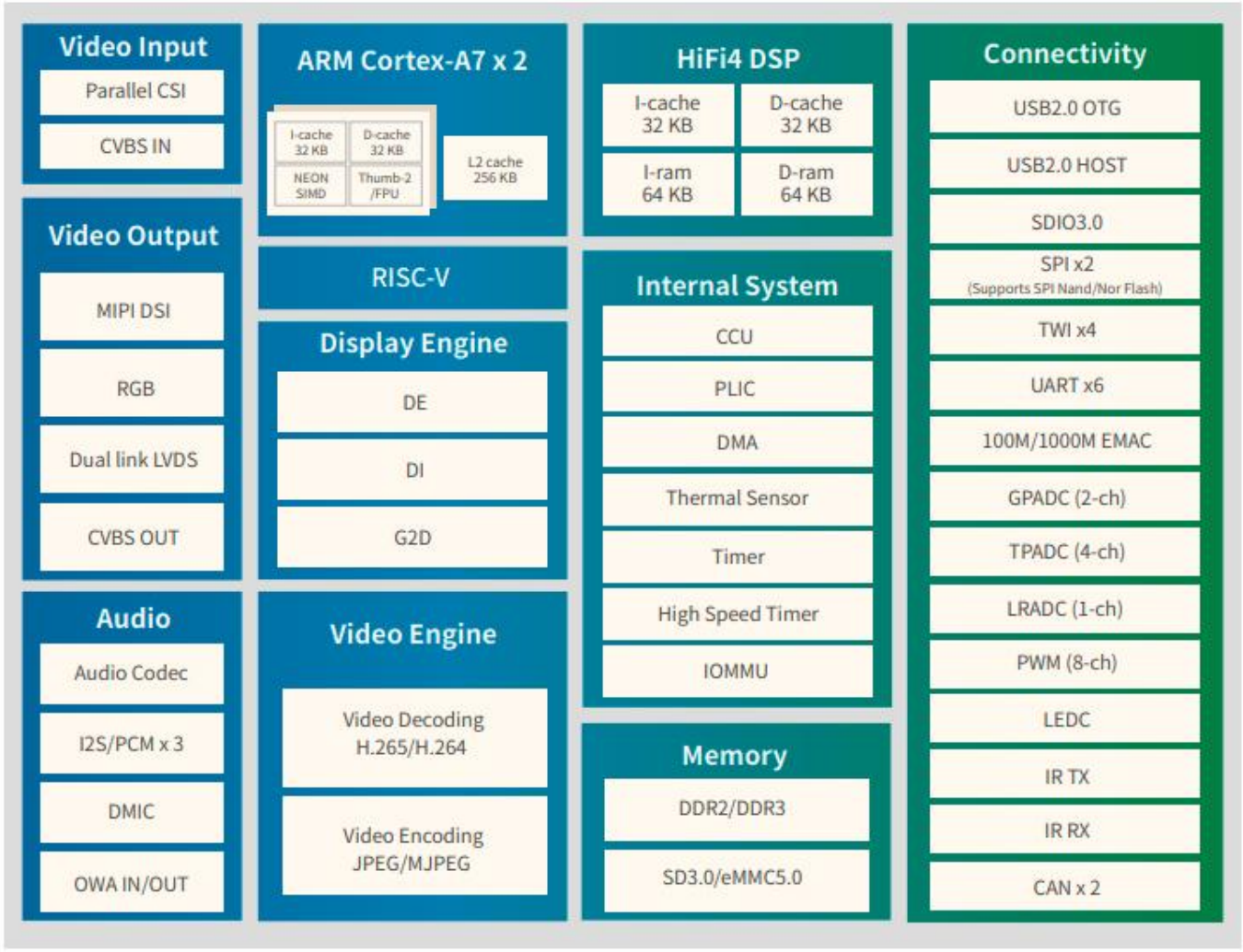
The **MYD-YT113i Development Board** is capable of running Linux OS. MYIR provides abundant software resources including image files, kernel and driver source code, application demos and compilation tools to enable users to start their development rapidly and easily. It is delivered with one Quick Start Guide, one USB to TTL serial cable and one 12V/2A power adapter. MYIR also offers **MY-WIREDCOM RPI Module** (RS232/RS485/CAN) and **MY-LVDS070C 7-inch LCD Module** as add-on options for the board.

Hardware Specification

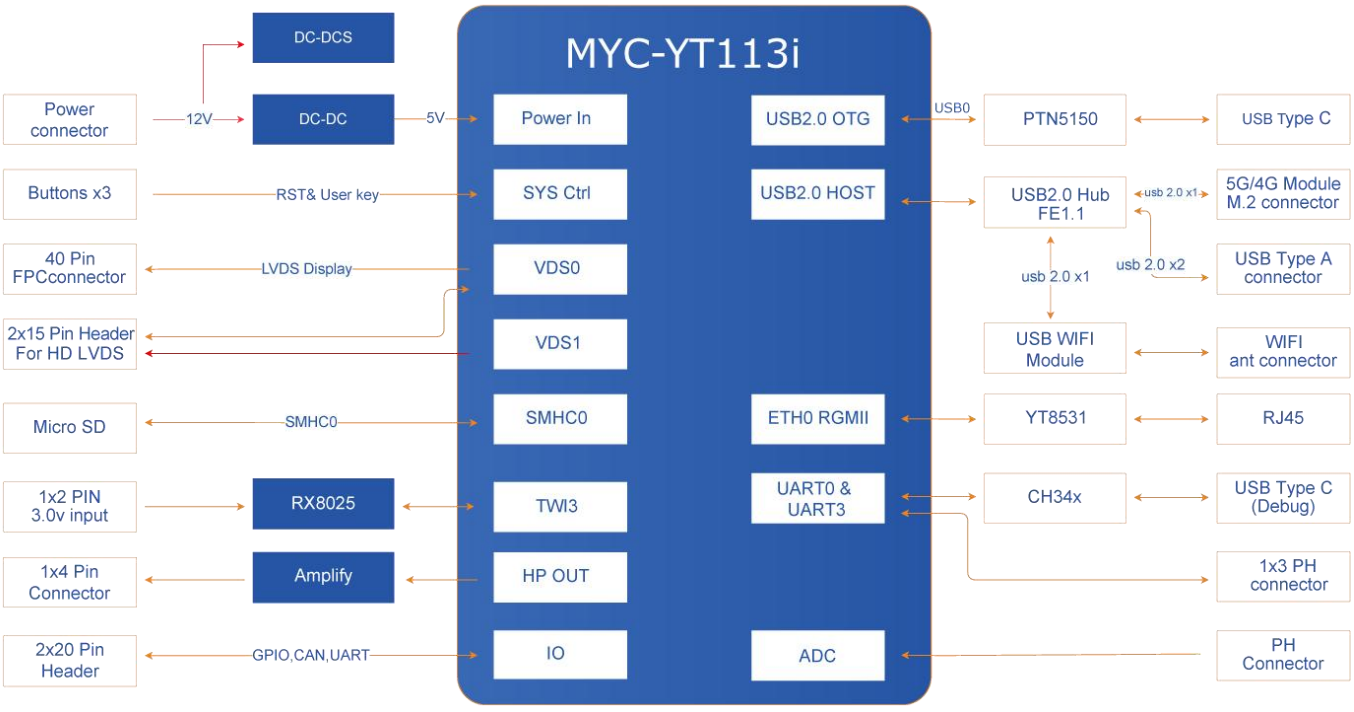
The MYC-YT113i SOM populated on the MYD-YT113i Development Board is using 13 x 13 mm, 337-LFBGA package Allwinner T113-i processor which is the Multi-Media decoding platform. T113-i integrates a 64-bit XuanTie C906 RISC-V CPU, a dual-core Arm Cortex-A7 CPU, and a HiFi4 DSP to provide the high-efficient computing power. It supports the full format decoding such as H.265, H.264, MPEG-1/2/4, JPEG, etc. The independent encoder can encode in JPEG or MJPEG. Integrated multi ADCs/DACs and I2S/PCM/DMIC/OWA audio interfaces can work seamlessly with the CPU to accelerate multimedia algorithms and improve the user experience. T113-i supports RGB/LVDS/MIPI DSI/CVBS OUT display output interfaces to meet the requirements of the different screen display. T113-i comes with extensive connectivity and interfaces, such as USB, SDIO, EMAC, TWI, UART, SPI, PWM, GPADC, LRADC, TPADC, IR TX&RX, etc. Besides, T113-i can connect with other different peripherals like Wi-Fi and BT via SDIO and UART.

Features	Description
CPU	● 64-bit Xuantie C906 RISC-V ● Dual-core ARM Cortex -A7 - 32 KB L1 I-cache + 32 KB L1 D-cache per core, and 256 KB L2 cache
DSP	● Single-core HiFi4 ● 32 KB I-cache + 32 KB D-cache ● 64 KB I-ram + 64 KB D-ram
Memory	● DDR2/DDR3, up to 2 GB ● SD3.0/eMMC 5.0, SPI Nor/NAND Flash
Video Engine	● Video decoding - H.265 up to 4K@30fps - H.264 up to 4K@24fps - H.263, MPEG-1/2/4, JPEG, Xvid, Sorenson Spark, up to 1080p@60fps ● Video encoding - JPEG/MJPEG up to 1080p@60fps - Supports input picture scaler up/down
Display Engine	● Allwinner SmartColor2.0 post processing for an excellent display experience ● Supports de-interlace (DI) up to 1080p@60fps ● Supports G2D hardware accelerator including rotate, mixer, lbc decompression
Video OUT	● CVBS OUT interface, supporting NTSC and PAL format ● RGB LCD output interface up to 1920 x 1080@60fps ● Dual link LVDS interface up to 1920 x 1200@60fps ● 4-lane MIPI DSI interface up to 1920 x 1080@60fps
Video IN	● 8-bit parallel CSI interface ● CVBS IN interface, supporting NTSC and PAL format
Audio	● 2 DACs and 3 ADCs ● Analog audio interfaces: MICIN1P/N, MICIN2P/N, MICIN3P/N, FMINL/R, LINEINL/R, LINEOUTLP/N, LINEOUTRP/N, HPOUTL/R ● Digital audio interfaces: 12S/PCM, DMIC, OWA IN/OUT
Connectivity	● USB2.0 0TG, USB2.0 Host ● SDIO 3.0, SPI x 2, UART x 6, TWI x 4, CAN x 2 ● PWM (8-ch), GPADC (2-ch), LRADC (1-ch), TPADC (4-ch), IR TX&RX ● 10/100/1000M EMAC with RMII and RGMII interfaces
Package	● LFBGA 337 balls, 13 mm x 13 mm

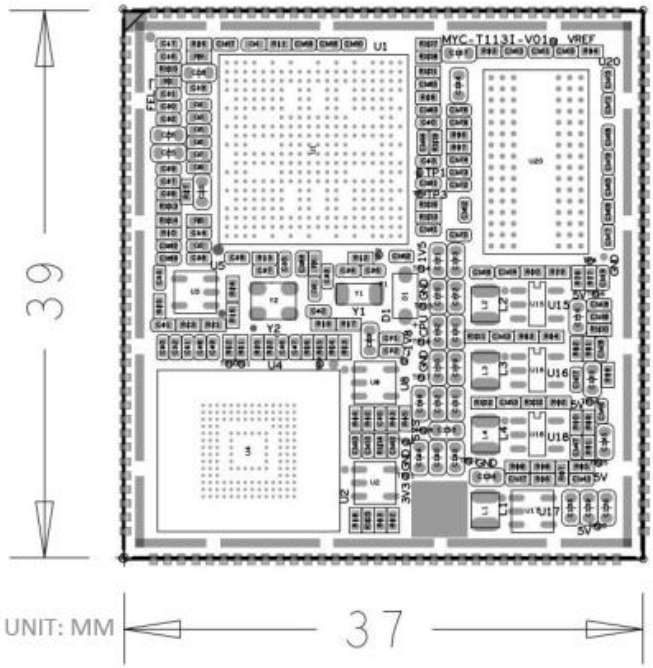
Features of T113-i Processor



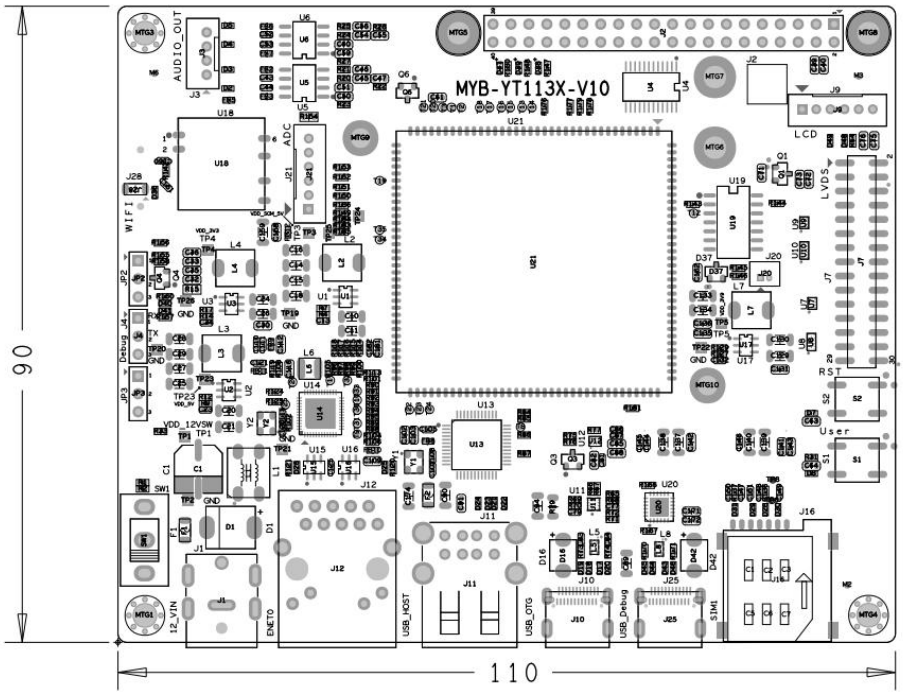
Allwinner T113-i Block Diagram



MYD-YT113i Development Board Function Block Diagram



MYC-YT113i Dimensions Chart (Unit: mm)



MYD-YT113i Dimensions Chart (Unit: mm)

The MYD-YT113i Development Board is using MYC-YT113i SOM as core controller board. It takes full features of T113-i processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 110mm x 90mm (base board), 37mm x 39mm (SOM)
- PCB Layers: : 4-layer design (base board), 8-layer design (SOM)
- Power supply: +12V/2A (base board), 5V/1A (SOM)
- Working temperature: -40~85 Celsius (industrial grade)
  (WiFi Module: -20~70 Celsius)

The MYD-YT113i Controller Board (MYC-YT113i System-On-Module)

MYC-YT113i (Top-view and Bottom-view)

Processor

- Allwinner T113-i processor
  - Up to 1.2GHz Dual-core Arm Cortex-A7 CPU
  - Single-core HiFi4 DSP
  - Supports H.265/H.264 4K video decoding

External Memory

- 512MB/1GB DDR3
- 4GB/8GB eMMC or 256MB Nand Flash
- 32KB EEPROM

Peripherals and Signals Routed to Pins

- 1.0mm pitch 140-pin Stamp Hole Expansion Interface + 50-pin LGA
  - 1 x RGMII/RMII
  - 2 x USB2.0
  - 6 x UART
  - 2 x CAN
  - 4 x TWI
  - 2 x SPI
  - 1 x GPADC and 4 x TPADC
  - 1 x MIPI DSI
  - 2 x LVDS
  - 1 x RGB
  - 1 x CVBS Out (TV Out)
  - 1 x Parallel CSI
  - 2 x CVBS In (TV In)
  - 2 x I2S
  - Up to 81 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-YT113i Development Board Base Board

- 1 x Power Switch
- Serial ports
  - 1 x Debug UART (TTL)
  - 4 x TTL serial ports
- USB
  - 2 x USB2.0 Host ports (Type-A)
  - 1 x USB 2.0 OTG port (Type-C)
  - 1 x USB based WiFi Module
  - 1 x USB based M.2 socket for 4G/5G LTE Module
- 2 x SIM card slots
- Ethernet
  - 1 x 10/100/1000 Mbps Ethernet interface (RJ45)
- 1 x Micro SD card slot
- Display Interface
  - 1 x Single-channel LVDS interface

  *Supports MYIR's **MY-LVDS070C LCD Module** with Capacitive Touch Screen through the LCD interface*
  - 1 x Dual-channel LVDS interface
- 1 x Audio output port
- 1 x 2.54mm 2 x 20-pin male expansion header

  (GPIO/I2C/UART/SPI/CAN, compatible with Raspberry PI standard 40-pin extension interface)

  *Supports MYIR's **MY-WIREDCOM RPI Module** to extend CAN / RS232 / RS485 functions*
- 2 x Buttons (one for Reset and one for User)

Software Features

The MYD-YT113i Development Board supports Linux OS and comes with complete software package. The kernel and many peripheral drivers are available in source code to assist clients to expedite their development. The following are a summary of the software features:

Item	Feature	Description	Source Code
Bootloader	U-boot	Boot boot program uboot_2018.05	YES
Linux kernel	Linux kernel	Customized base on official kernel_5.4.61 version	YES
Device driver	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
	LVDS	LCD driver	YES
	Touch	Touch screen driver	YES
	Audio	SPDIF driver	YES
	Watchdog	Watchdog driver	YES
	4G/5G	4G/5G driver	YES
	PWM	PWM control driver	YES
	ADC	ADC driver	YES
	RTC	RTC driver	YES
	GPIO	Universal GPIO driver	YES
	UART	RS232/RS485/TTL driver	YES
	CAN	CAN driver	YES
	WIFI	RTL8731BU driver	YES
Images	t113i_linux_myir_emmc_core	Image built with Buildroot, excluding GUI interface	YES
	t113i_linux_myir_emmc_full	A fully functional image built with Buildroot	YES

MYD-YT113i Software Features

Order Information

Product Item	Part No.	Packing List
MYD-YT113i Development Board	MYD-YT113i-256N256D-110-I	✓ One MYD-YT113i Development Board (including MYC-YT113i SOM) ✓ One USB to UART Debug cable ✓ One 12V/2A Power adapter ✓ One DC Power jack adapter ✓ One Quick Start Guide
	MYD-YT113i-4E512D-110-I	
	MYD-YT113i-8E512D-110-I	
	MYD-YT113i-8E1D-110-I	
MYC-YT113i System-On-Module	MYC-YT113i-256N256D-110-I	✓ One MYC-YT113i Module
	MYC-YT113i-4E512D-110-I	
	MYC-YT113i-8E512D-110-I	
	MYC-YT113i-8E1D-110-I	
MY-LVDS070C 7-inch LCD Module	MY-LVDS070C	**Add-on Options** MY-LVDS070C 7-inch LCD Module MY-WIREDCOM Module
MY-WIREDCOM RPI Module	MY-WIREDCOM	

Note:
1. One MYD-YT113i Development Board comprises one MYC-YT113i SOM mounted onto the base board. If you require additional SOMs, you may place orders for extras.
2. Discounts are available for bulk orders.
3. We provide OEM/ODM services to reduce time and save cost for customers.

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