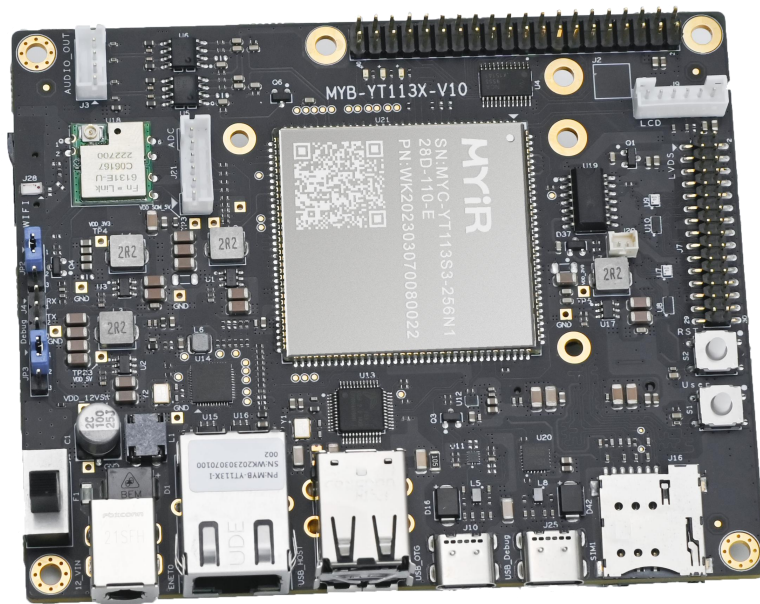




MYD-YT113X Development Board Overview

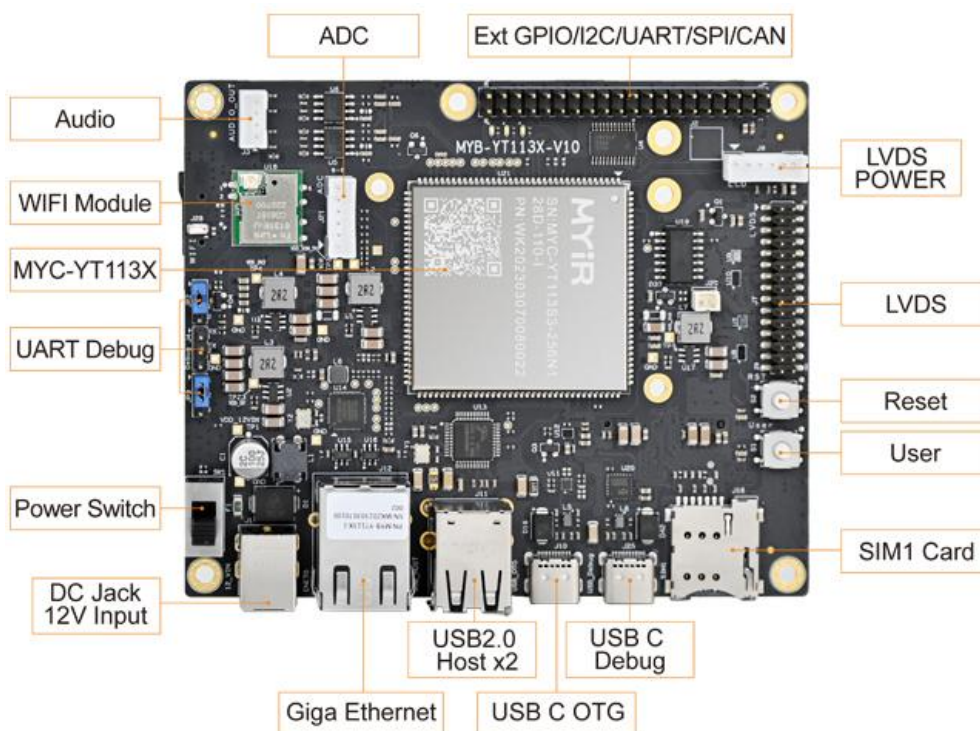


- ✓ MYC-YT113X CPU Module as Controller Board
- ✓ Up to 1.2GHz Allwinner T113-S3 Dual-core ARM Cortex-A7 MPU with 128MB DDR3 and Single-core HiFi4 DSP
- ✓ 4GB eMMC / 256MB Nand FLASH, 32KB EEPROM
- ✓ UARTs, 2 x USB 2.0 HOST, 1 x USB 2.0 OTG, 1 x CAN, 1 x Gigabit Ethernet, WiFi, 4G/5G Module Interface, 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/CAN)

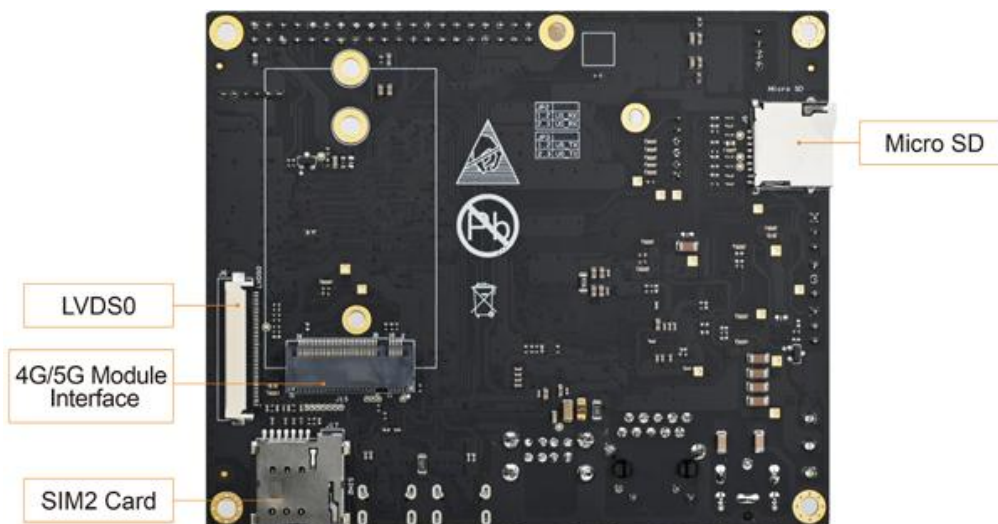


The MYD-YT113X Development Board consists of a compact CPU Module MYC-YT113X and a base board to provide a complete evaluation platform for **ALLWINNER T113-S3** processors which features **dual-core Arm Cortex-A7** operating at up to 1.2GHz, with built-in 128MB DDR3, single-core HiFi4 DSP and Video CODEC Engine, targeting applications such as HMI, industrial automation, display and control terminals.

The MYC-YT113X CPU Module is populated on the MYD-YT113X base board through 1.0mm pitch 140-pin stamp-hole (Castellated-Hole) interface. It is a highly-integrated SoM which combines the T113-S3 processor, 4GB eMMC FLASH or 256MB Nand FLASH, and 32KB EEPROM. 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-YT113X Development Board Top-view



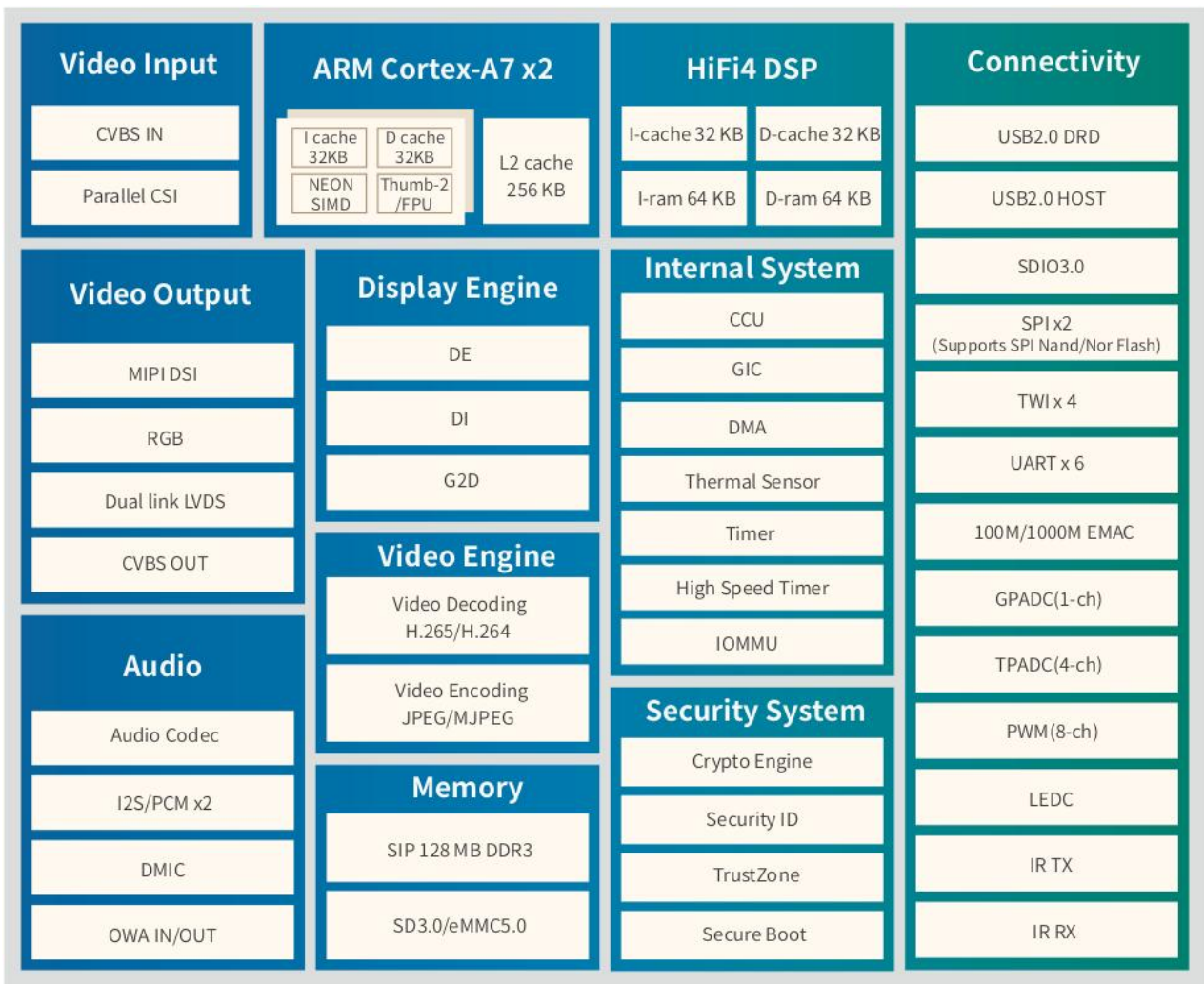
MYD-YT113X Development Board Bottom-view



The MYD-YT113X 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-YT113X CPU Module populated on the MYD-YT113X Development Board is using 14 x 14 mm, eLQFP128 package Allwinner T113-S3 processor which is designed for the automotive and industrial control products. It integrates dual-core Cortex-A7 CPU and single-core HiFi4 DSP to provide the high efficient computing power. T113-S3 supports full format decoding such as H.265, H.264, MPEG-1/2/4, JPEG, VC1, and so on. The independent hardware encoder can encode in JPEG or MJPEG. Integrated multi ADCs/DACs and I2S/PCM/DMIC/OWA audio interfaces can provide the perfect voice interaction solution. T113-S3 comes with extensive connectivity to facilitate product expansion, such as CAN, USB, SDIO, EMAC, TWI, UART, SPI, PWM, GPADC, IR TX&RX, and so on.

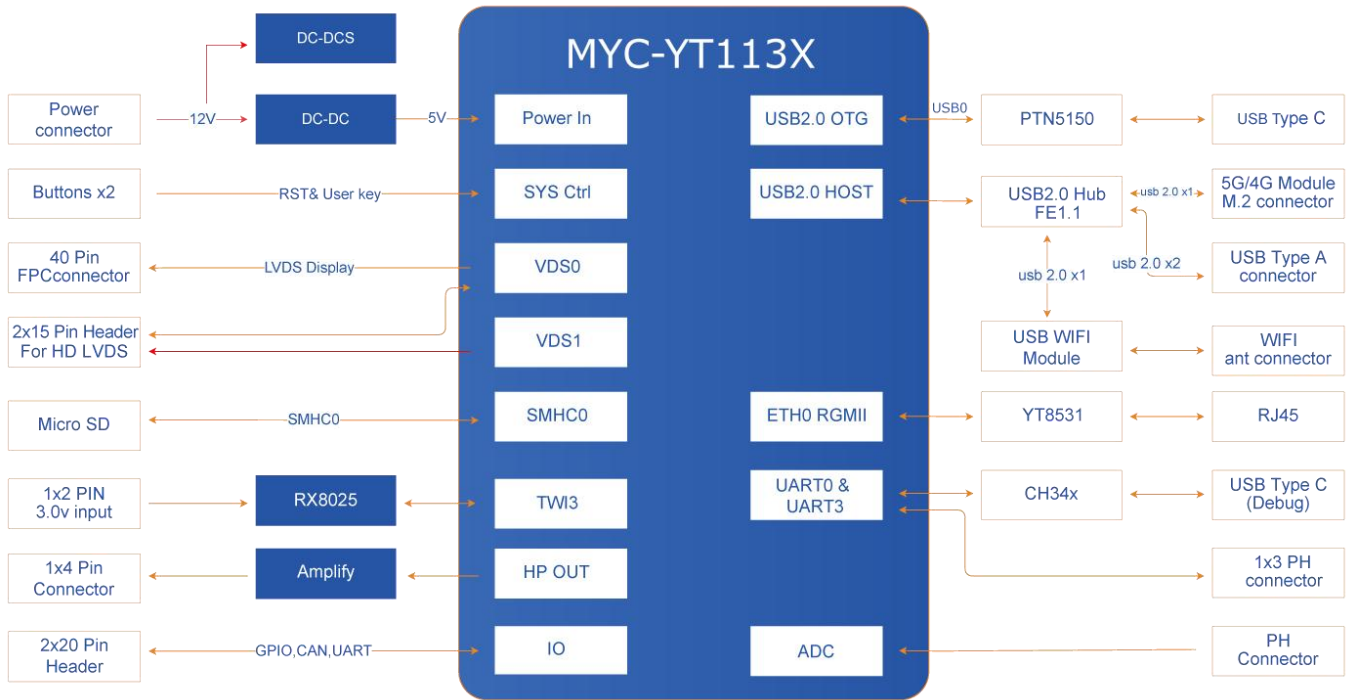


Allwinner T113-S3 Block Diagram

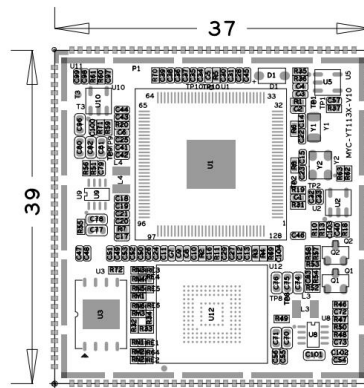


| Features | Description |
|-----------------|--|
| CPU | <ul style="list-style-type: none"> ● Dual-core ARM Cortex-A7 ● 32KB L1 I-cache + 32KB L1 D-cache per core, and 256KB L2 cache |
| DSP | <ul style="list-style-type: none"> ● Single-core HiFi4 ● 32KB I-cache + 32KB D-cache |
| Memory | <ul style="list-style-type: none"> ● SIP 128MB DDR3 ● SD 3.0/eMMC 5.1, SPI Nor/NAND Flash |
| Video Engine | <p>Video decoding</p> <ul style="list-style-type: none"> ● H.265 up to 1080p@60fps ● H.264 up to 1080p@60fps ● H.263, MPEG-1/2/4, JPEG, Xvid, Sorenson Spark, up to 1080p@60fps <p>Video encoding</p> <ul style="list-style-type: none"> ● JPEG/MJPEG up to 1080p@60fps ● Supports input picture scaler up/down |
| Display Engine | <ul style="list-style-type: none"> ● 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 | <ul style="list-style-type: none"> ● 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 1080@60fps ● 4-lane MIPI DSI interface up to 1920 x 1080@60fps |
| Video IN | <ul style="list-style-type: none"> ● 8-bit parallel CSI interface ● CVBS IN interface, supporting NTSC and PAL format |
| Audio | <ul style="list-style-type: none"> ● 2 DACs and 3 ADCs ● Analog audio interfaces: MICIN3P/N,LINEINL/R, FMINL/R,HPOUTL/R ● Digital audio interfaces: 12S/PCM, DMIC, OWA |
| Security System | <ul style="list-style-type: none"> ● AES, DES, 3DES encryption and decryption algorithms ● RSA signature verification algorithm ● MD5/SHA and HMAC tamper proofing ● Hardware random number generator ● Integrated 2Kbits OTP storage space |
| Connectivity | <ul style="list-style-type: none"> ● USB2.0 OTG,USB2.0 Host ● SDIO 3.0,SPI x 2,UART x 6, TWI x 4, CAN x 2 ● PWM (8-ch),GPADC(1-ch),TPADC(4-ch),IR TX&RX ● 10/100/1000M EMAC with RMII and RGMII interfaces |
| Package | <ul style="list-style-type: none"> ● eOFP128, 14 mm x 14 mm |

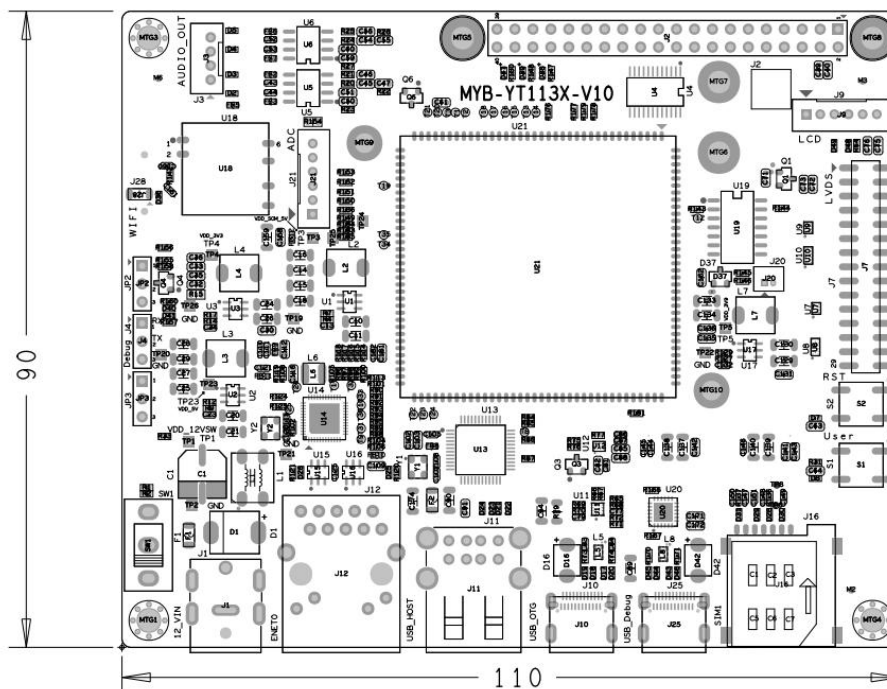
Features of T113-S3 Processor



MYD-YT113X Development Board Function Block Diagram



MYC-YT113X Dimensions Chart (Unit: mm)



MYD-YT113X Dimensions Chart (Unit: mm)

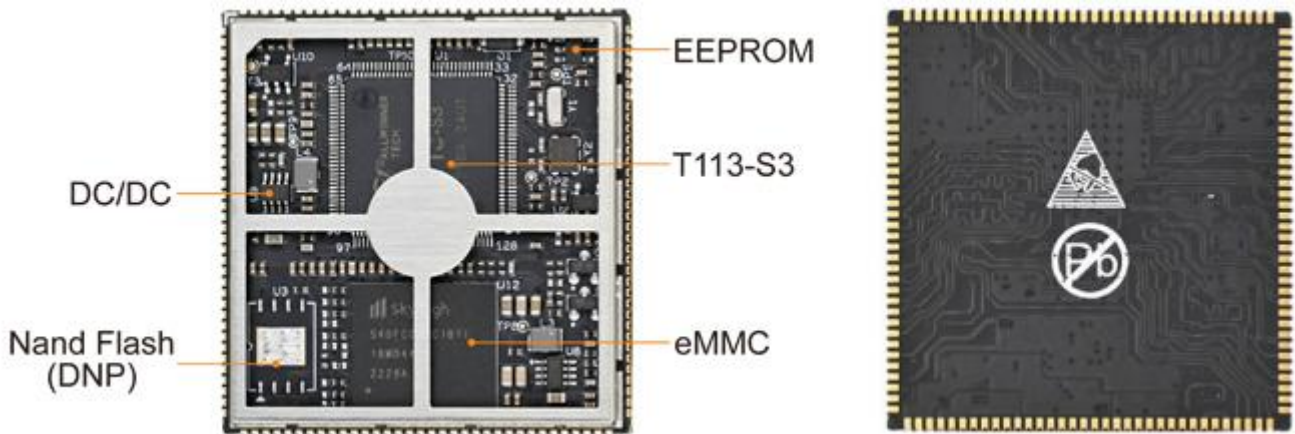


The MYD-YT113X Development Board is using MYC-YT113X CPU Module as core controller board. It takes full features of T113-S3 processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 110mm x 90mm (base board), 37mm x 39mm (CPU Module)
- PCB Layers: : 4-layer design (base board), 6-layer design (CPU Module)
- Power supply: +12V/2A (base board), 5V/1A (CPU Module)
- Working temperature: -40~85 Celsius (industrial grade)
(WiFi Module: -20~70 Celsius)

The MYD-YT113X Controller Board (MYC-YT113X CPU Module)



MYC-YT113X CPU Module (Top-view and Bottom-view)

Processor

- ALLWINNER T113-S3 Processor
 - Up to 1.2GHz Dual-core Arm Cortex-A7 with built-in 128MB DDR3
 - Single-core HiFi4 DSP
 - Supports H.265/H.264 video decoding up to 1080p@60fps and JPEG/MJPEG video encoding up to 1080p@60fps

External Memory

- 4GB eMMC / 256MB Nand FLASH
- 32KB EEPROM

Peripherals and Signals Routed to Pins

- 1.0mm pitch 140-pin Stamp Hole Expansion Interface
 - 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
 - 1x RGB



- 1 x CVBS Out (TV Out)
- 1 x Parallel CSI
- 2 x CVBS In (TV In)
- 2 x I2S
- Up to 59 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 CPU Module pinout description file.

The MYD-YT113X 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-YT113X 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 | |
| File system | t113_linux_myir_emmc_core | Image built with Buildroot, excluding GUI interface | YES |
| | t113_linux_myir_emmc_full | A fully functional image built with Buildroot | YES |
| | t113_linux_myir_nand | Image built with Buildroot, excluding GUI interface, used for Nand Flash version | YES |

MYD-YT113X Software Features