



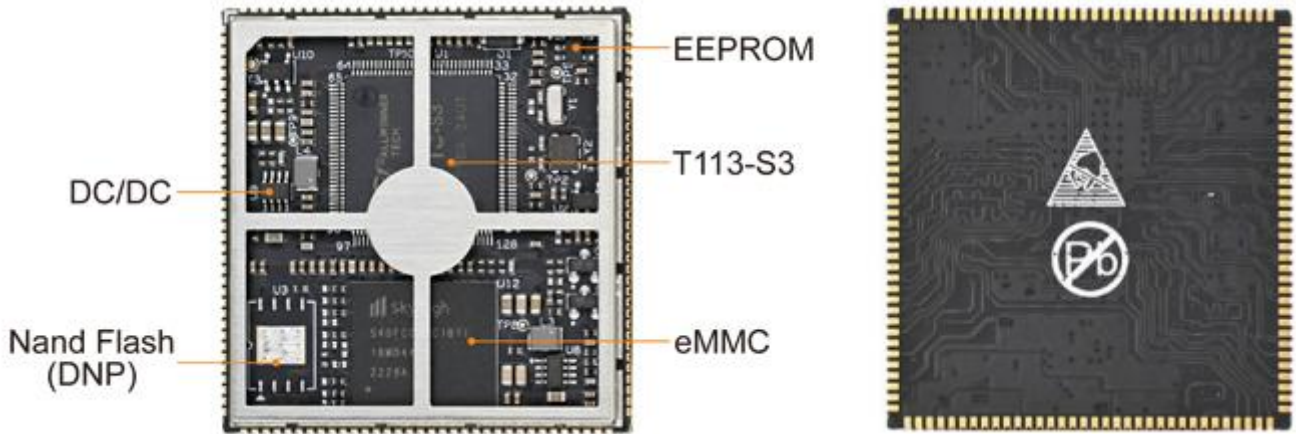
MYC-YT113X System-On-Module Overview



- ✓ 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
- ✓ 1.0mm pitch 140-pin Stamp Hole Expansion Interface
- ✓ Supports Running Linux 5.4 OS



Measuring only 37mm by 39mm, the MYC-YT113X is a low-cost embedded ARM System-On-Module (SoM) based on **Allwinner T113-S3** processor which features up to **1.2GHz Dual-core ARM Cortex-A7** MPU with built-in 128MB DDR3, single-core HiFi4 DSP, Robust Video Engine and a broad range of peripherals like Gigabit Ethernet, 2 x CAN, 2 x USB2.0, 6 x UART, etc. The MYC-YT113X takes full features of the T113-S3 processor and has standard configurations for 256MB Nand Flash or 4GB eMMC external memory options. A number of peripheral and IO signals are access through 1.0mm pitch 140-pin stamp-hole (Castellated-Hole) expansion interface. It is capable of running Linux and suitable for applications such as HMI, industrial automation, display and control terminals.



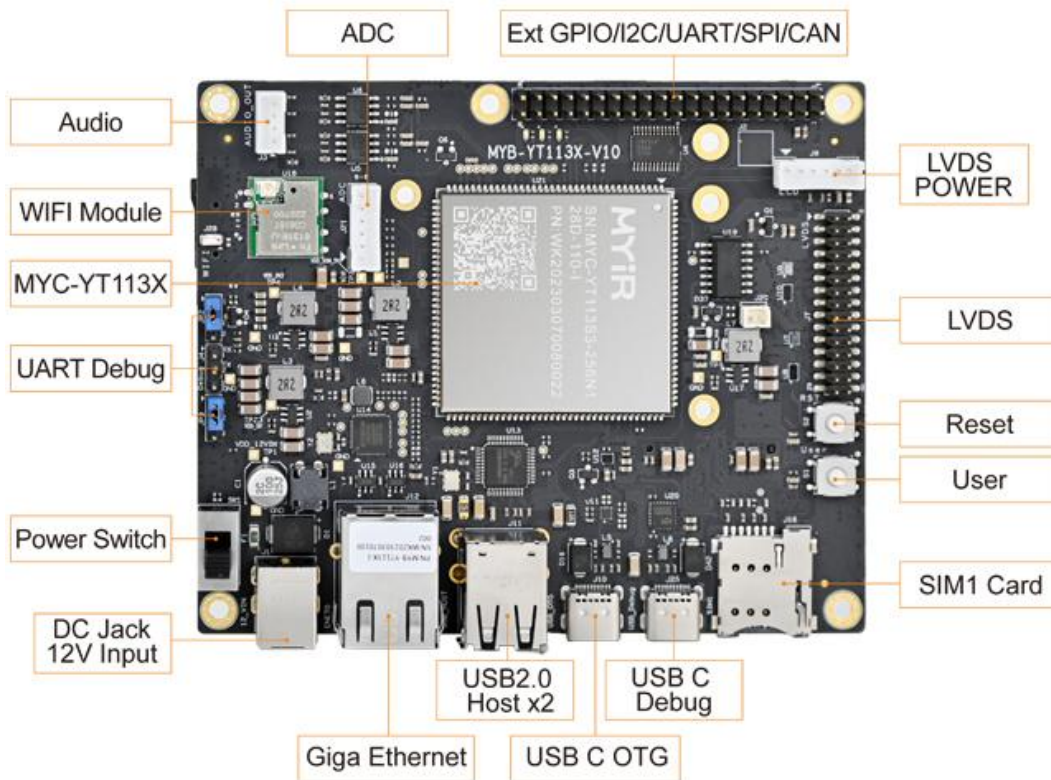
MYC-YT113X SOM (Top-view and Bottom-view)



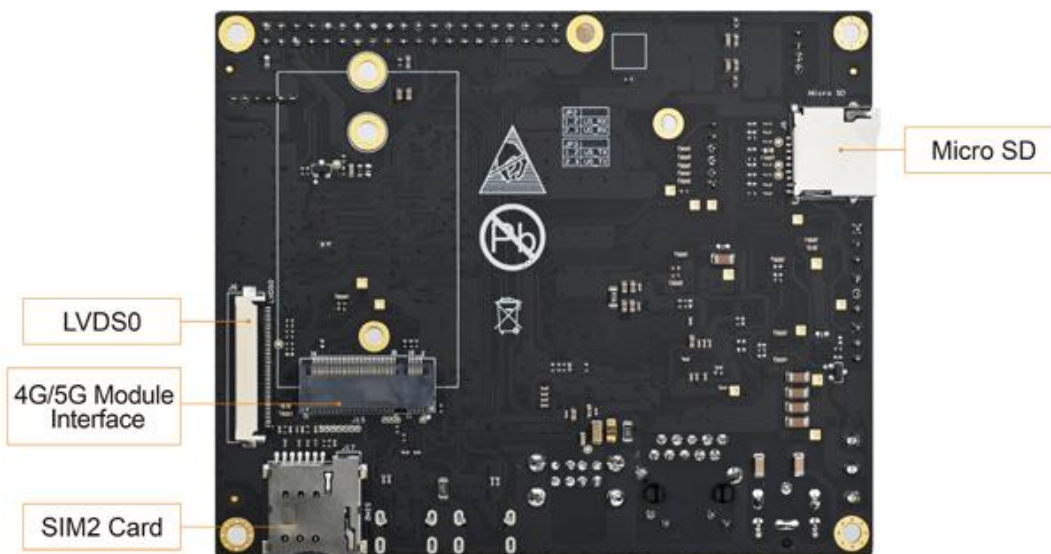
MYC-YT113X Function Block Diagram



MYIR provides MYD-YT113X Development Board for evaluating the MYC-YT113X System-On-Module. It takes full advantages of the Allwinner T113-S3 MPU to explore a rich set of peripherals and interfaces to the base board including serial ports, one Gigabit Ethernet, two USB 2.0 HOST and one USB 2.0 OTG, one Micro SD card slot, one M.2 Socket for USB based 4G/5G LTE Module with two SIM card holders, one USB2.0 based WiFi module, one GPIO/I2C/UART/SPI/CAN extension header, Audio input/output and LVDS display interface.



MYD-YT113X Development Board Top-view



MYD-YT113X Development Board Bottom-view

MYIR also offers MY-WIREDCOM RPI Module (RS232/RS485/CAN) and MY-LVDS070C LCD Module as options for the MYD-YT113X Development Board to enhance the functionality of the board.

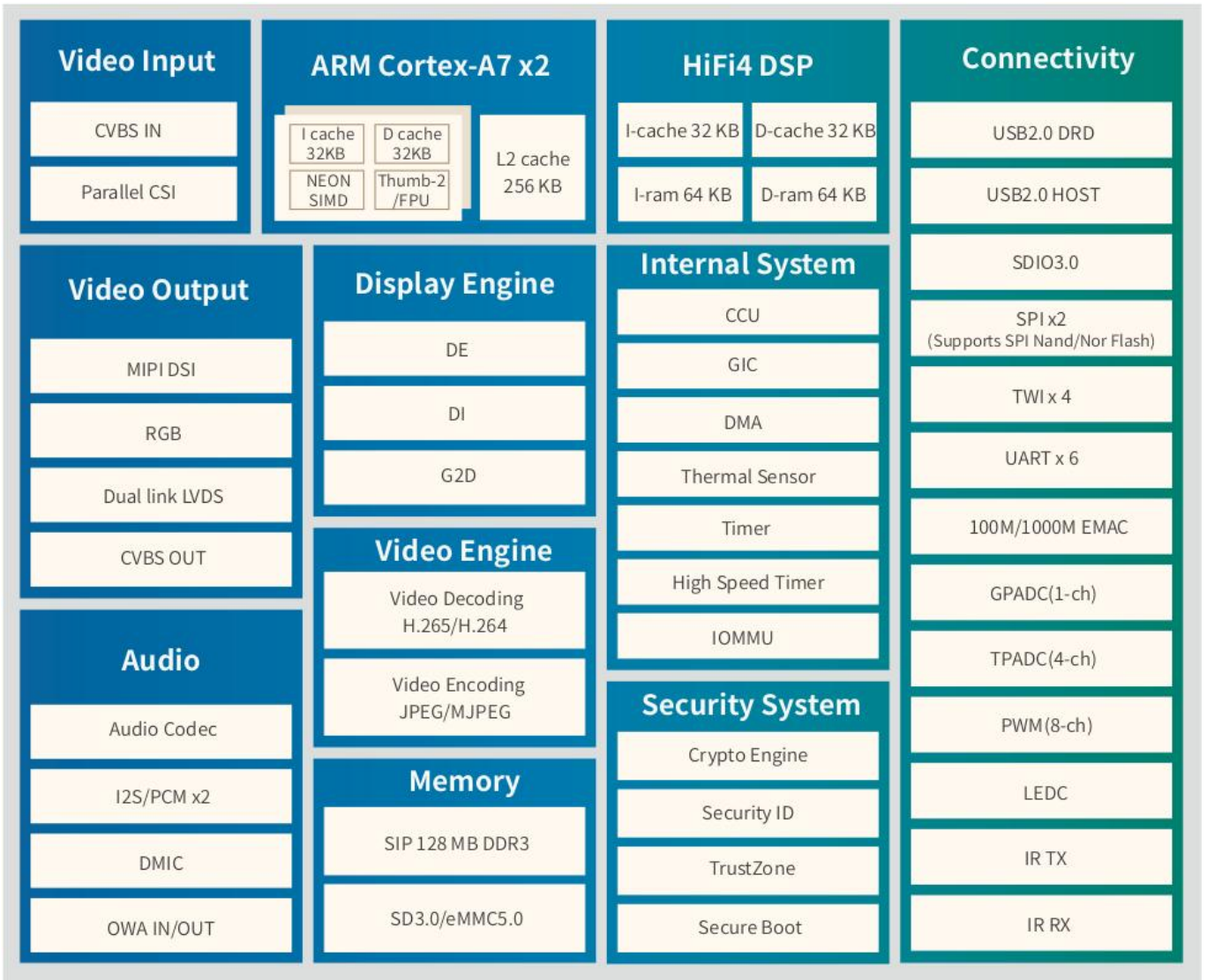


Hardware Specification

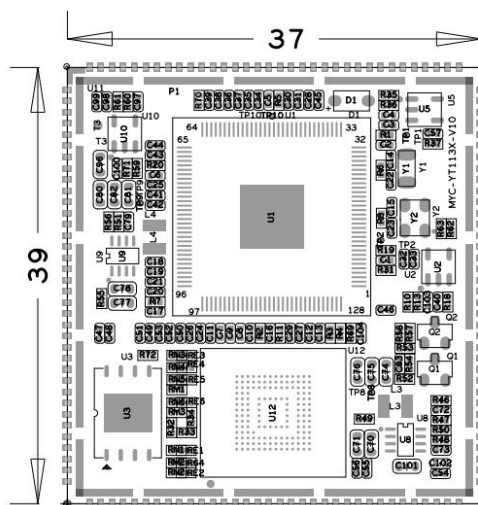
The MYC-YT113X Module is using 14 x 14 mm, eLQFP128 package Allwinner T113-S3 processor which is designed for the automotive and industrial control products. It integrates dual-core Cortex-A7 CPU and single-core HiFi4 DSP to provide the high efficient computing power. T113-S3 supports full format decoding 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.

| 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: I2S/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"> ● eLQFP128, 14 mm x 14 mm |

Features of T113-S3 Processor



Allwinner T113-S3 Block Diagram



MYC-YT113X Dimensions Chart (Unit: mm)



The MYC-YT113X System-On-Module takes full features of T113-S3 processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 37mm x 39mm
- PCB Layers: 6-layer design
- Power supply: +5V/1A
- Working temperature: -40~85 Celsius (industrial grade)

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 or 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 SOM pinout description file.



Software Features

The MYC-YT113X System-On-Module 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 |

MYC-YT113X Software Features


Order Information

| Product Item | Part No. | Packing List |
|--|----------------------------|--|
| MYC-YT113X System-On-Module | MYC-YT113S3-256N128D-110-I | ✓ One MYC-YT113X System-On-Module |
| | MYC-YT113S3-4E128D-110-I-G | |
| MYD-YT113X Development Board | MYD-YT113S3-256N128D-110-I | ✓ One MYD-YT113X Development Board (including MYC-YT113X SOM) ✓ One USB to UART Debug cable ✓ One 12V/2A Power adapter ✓ One DC Power jack adapter ✓ One Quick Start Guide |
| | MYD-YT113S3-4E128D-110-I-G | |
| 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 | |
| <p><i>Note:</i></p> <ol style="list-style-type: none"> One MYD-YT113X Development Board includes one System-On-Module MYC-YT113X mounted on the base board. If you need more SOMs, you can order extra ones. Discounts are available for bulk orders. We provide OEM/ODM services to reduce time and save cost for customers. | | |


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