

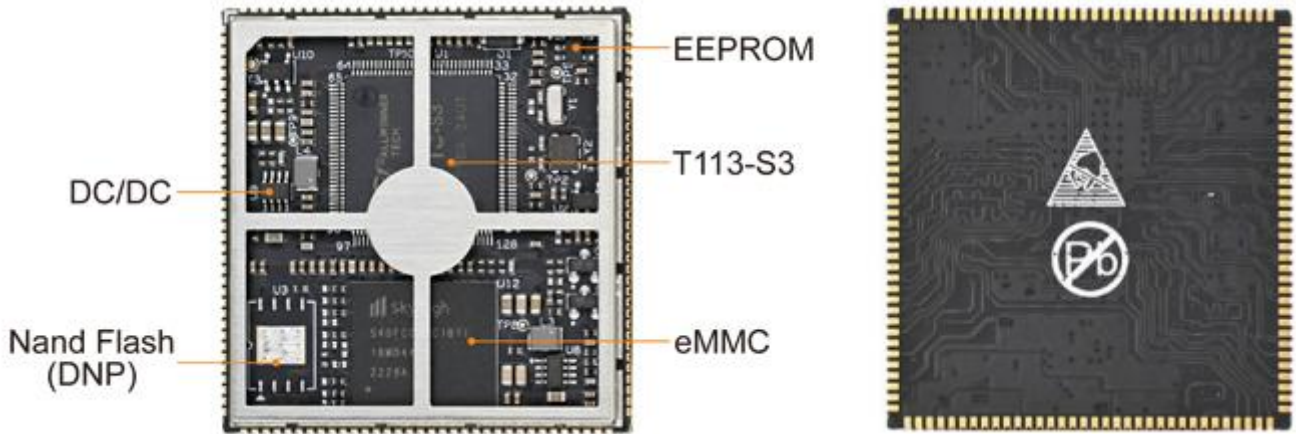
# MYC-YT113X CPU Module Overview



- ✓ 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 CPU Module** is a low-cost embedded ARM 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.



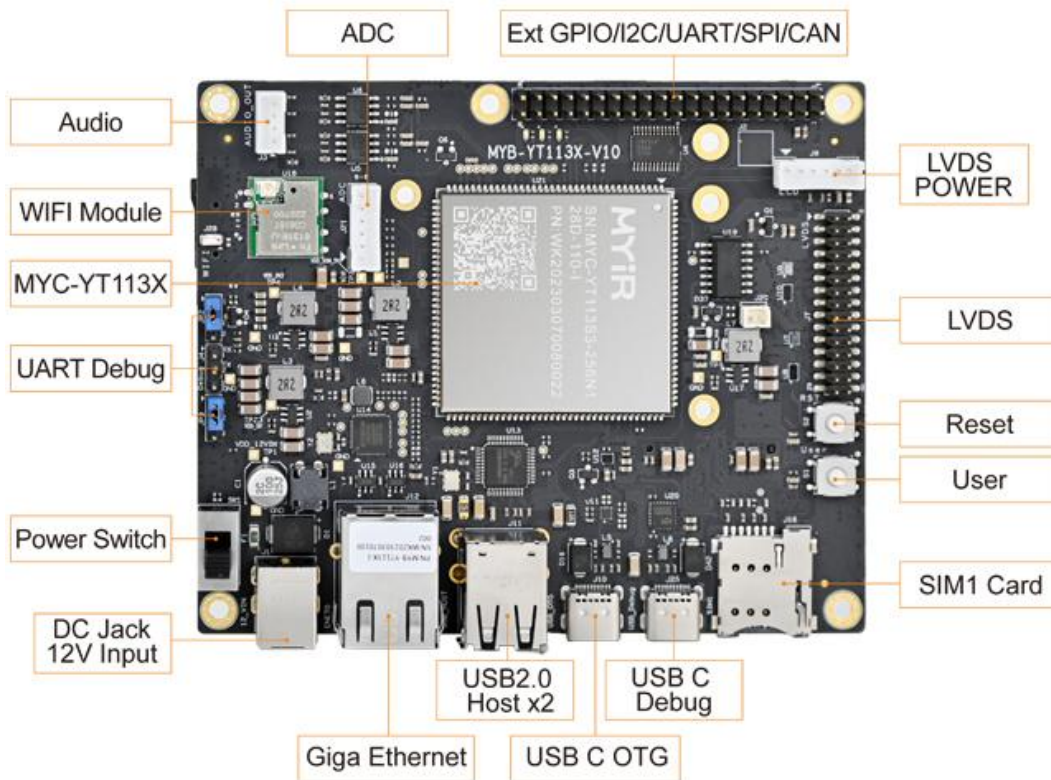
MYC-YT113X CPU Module (Top-view and Bottom-view)



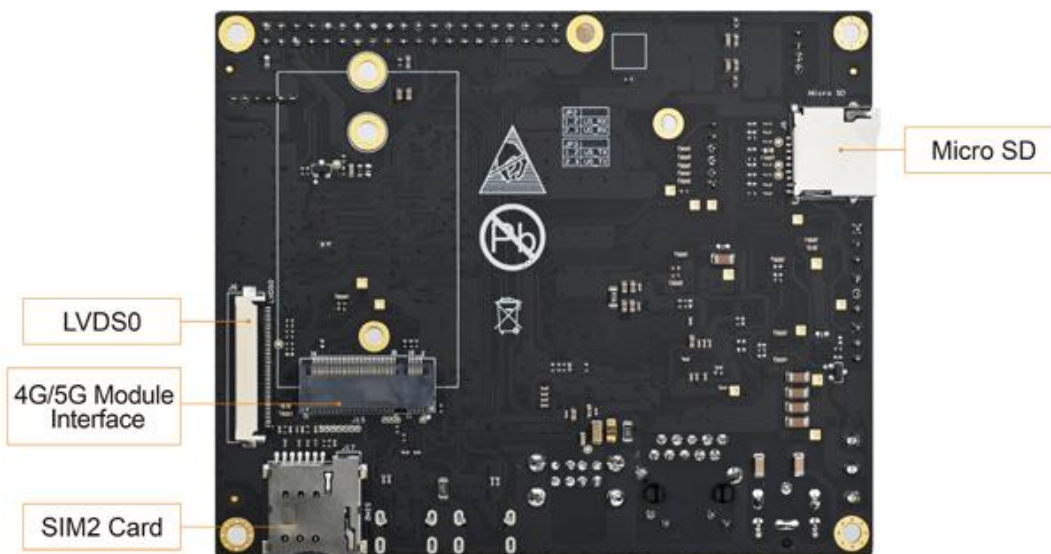
MYC-YT113X Function Block Diagram



MYIR provides [MYD-YT113X Development Board](#) for evaluating the [MYC-YT113X CPU 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/CAN) and [MY-LVDS070C LCD Module](#) as options for the MYD-YT113X Development Board to enhance the functionality of the board.



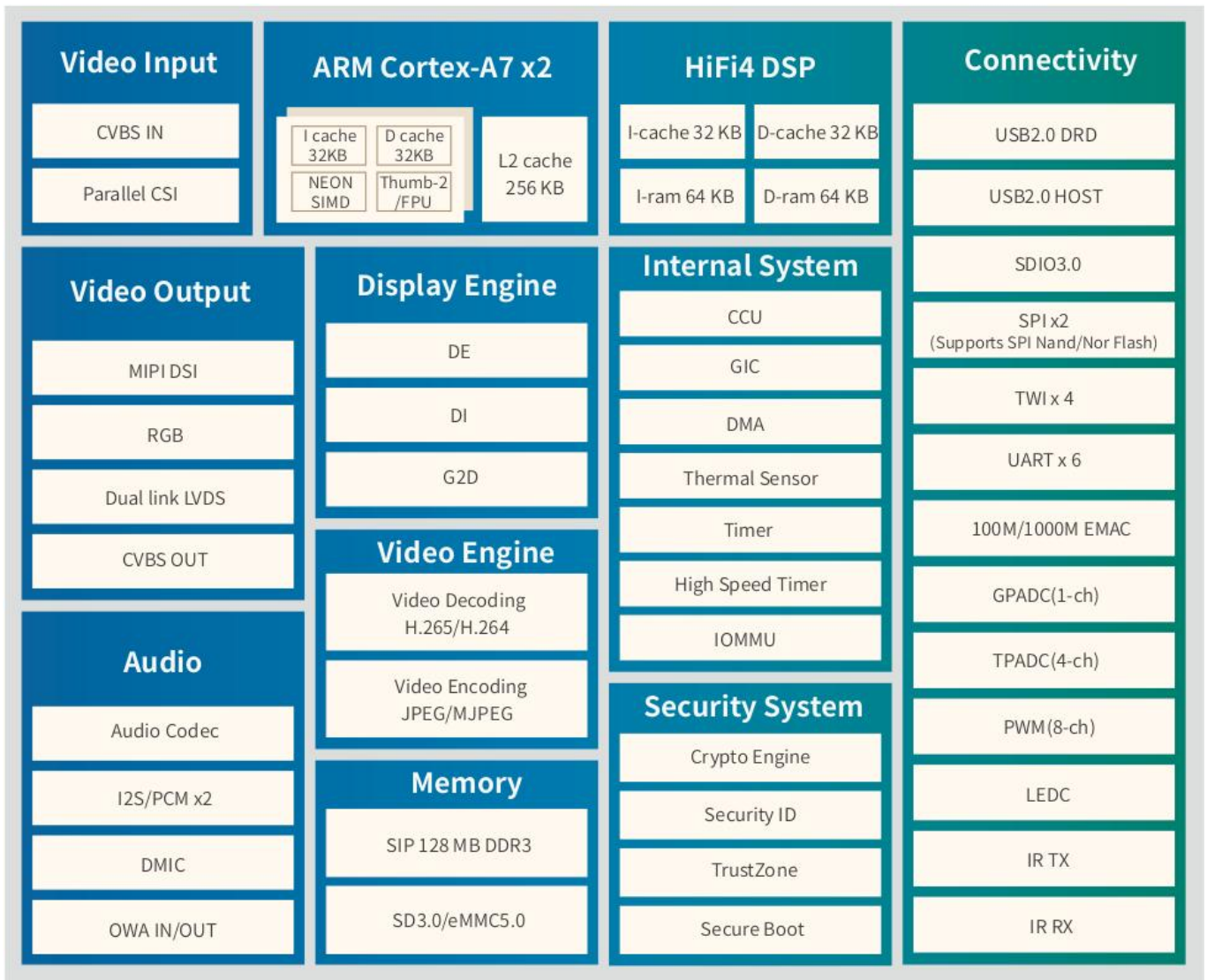
## Hardware Specification

The MYC-YT113X CPU 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.

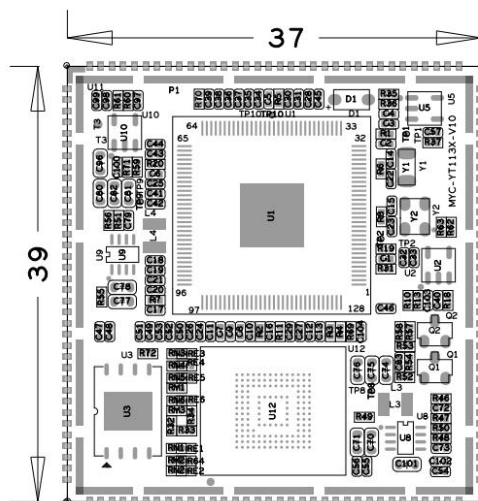
Features	Description
CPU	<ul style="list-style-type: none"> <li>● Dual-core ARM Cortex-A7</li> <li>● 32KB L1 I-cache + 32KB L1 D-cache per core, and 256KB L2 cache</li> </ul>
DSP	<ul style="list-style-type: none"> <li>● Single-core HiFi4</li> <li>● 32KB I-cache + 32KB D-cache</li> </ul>
Memory	<ul style="list-style-type: none"> <li>● SIP 128MB DDR3</li> <li>● SD 3.0/eMMC 5.1, SPI Nor/NAND Flash</li> </ul>
Video Engine	<p><b>Video decoding</b></p> <ul style="list-style-type: none"> <li>● H.265 up to 1080p@60fps</li> <li>● H.264 up to 1080p@60fps</li> <li>● H.263, MPEG-1/2/4, JPEG, Xvid, Sorenson Spark, up to 1080p@60fps</li> </ul> <p><b>Video encoding</b></p> <ul style="list-style-type: none"> <li>● JPEG/MJPEG up to 1080p@60fps</li> <li>● Supports input picture scaler up/down</li> </ul>
Display Engine	<ul style="list-style-type: none"> <li>● Allwinner SmartColor2.0 post processing for an excellent display experience</li> <li>● Supports de-interlace (DI) up to 1080p@60fps</li> <li>● Supports G2D hardware accelerator including rotate, mixer, lbc decompression</li> </ul>
Video OUT	<ul style="list-style-type: none"> <li>● CVBS OUT interface, supporting NTSC and PAL format</li> <li>● RGB LCD output interface up to 1920 x 1080@60fps</li> <li>● Dual link LVDS interface up to 1920 x 1080@60fps</li> <li>● 4-lane MIPI DSI interface up to 1920 x 1080@60fps</li> </ul>
Video IN	<ul style="list-style-type: none"> <li>● 8-bit parallel CSI interface</li> <li>● CVBS IN interface, supporting NTSC and PAL format</li> </ul>
Audio	<ul style="list-style-type: none"> <li>● 2 DACs and 3 ADCs</li> <li>● Analog audio interfaces: MICIN3P/N,LINEINL/R, FMINL/R,HPOUTL/R</li> <li>● Digital audio interfaces: I2S/PCM, DMIC, OWA</li> </ul>
Security System	<ul style="list-style-type: none"> <li>● AES, DES, 3DES encryption and decryption algorithms</li> <li>● RSA signature verification algorithm</li> <li>● MD5/SHA and HMAC tamper proofing</li> <li>● Hardware random number generator</li> <li>● Integrated 2Kbits OTP storage space</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>● USB2.0 OTG,USB2.0 Host</li> <li>● SDIO 3.0,SPI x 2,UART x 6, TWI x 4, CAN x 2</li> <li>● PWM (8-ch),GPADC(1-ch),TPADC(4-ch),IR TX&amp;RX</li> <li>● 10/100/1000M EMAC with RMII and RGMII interfaces</li> </ul>

Package	● eOFP128, 14 mm x 14 mm
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*Features of T113-S3 Processor*



*Allwinner T113-S3 Block Diagram*



*MYC-YT113X Dimensions Chart (Unit: mm)*



The [MYC-YT113X CPU 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 TRADC
  - 1 x MIPI DSI
  - 1 x Single-channel LVDS and 1 x Dual-channel LVDS or 24-bit RGB (supports up to 1080p@60fps)
  - 1x RGB
  - 1 x Parallel CSI
  - 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.*



## Software Features

The [MYC-YT113X CPU 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
	4G/5G	4G/5G driver	YES
	PWM	PWM control driver	YES
	ADC	ADC driver	YES
	CVBS OUT	CVBS display driver	YES
	Linout	audio output driver	YES
	SPDIF	SPDIF audio output driver	YES
	audio	Sgtl5000 audio driver	YES
	4G	4G driver	YES
	PWM	PWM control	YES
	RTC	RTC driver	YES
	GPIO	Universal GPIO driver	YES
	UART	RS232/TTL driver	YES
	CAN	CAN driver	YES
WIFI	FG6188EUFX-05 driver	YES	
File system	myir-image-core	Image built with Buildroot, excluding GUI interface	YES
	myir-image-full	A fully functional image built with Buildroot	YES

### MYC-YT113X Software Features


**Order Information**

Product Item	Part No.	Packing List
MYC-YT113X CPU Module	MYC-YT113S3-256N128D-110-I	✓ One MYC-YT113X CPU Module
	MYC-YT113S3-4E128D-110-I	
MYD-YT113X Development Board	MYD-YT113S3-256N128D-110-I	✓ One MYD-YT113X Development Board (including MYC-YT113X CPU Module) ✓ 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	
MY-LVDS070C 7-inch LCD Module	MY-LVDS070C	<b>Add-on Options</b> MY-LVDS070C 7-inch LCD Module MY-WIREDCOM Module
MY-WIREDCOM RPI Module	MY-WIREDCOM	
<p><i>Note:</i></p> <p>1. One MYD-YT113X Development Board includes one CPU module MYC-YT113X mounted on the base board. If you need more CPU module, you can order extra ones.</p> <p>2. Discounts are available for bulk orders.</p> <p>3. We provide OEM/ODM services to reduce time and save cost for customers.</p>		


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