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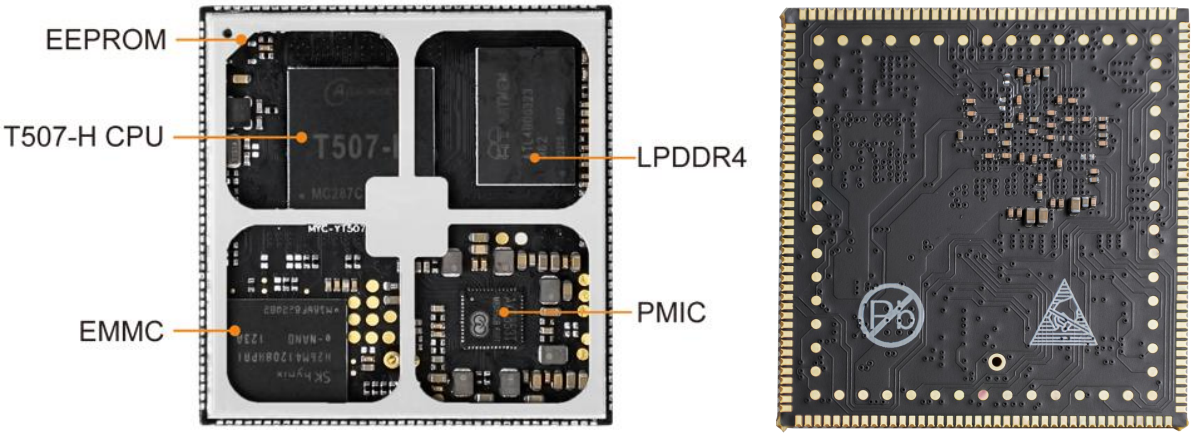
MYC-YT507H System-On-Module Overview

- ✓ *1.5GHz ALLWINNER T507-H Quad-core ARM Cortex-A53 Automotive Grade Processor*
- ✓ *1GB/2GB LPDDR4, 8GB eMMC Flash, 32Kbit EEPROM*
- ✓ *Allwinner AXP853T Power Management IC*
- ✓ *1.0mm pitch 164-pin Castellated-Hole and 58-pin LGA Expansion Interfaces*
- ✓ *Supports Running Linux and Android OS*

Measuring only 43mm by 45mm, the **MYC-YT507H SOM** is a compact System-on Module (SoM) based on Allwinner T507-H industrial processor which among **Allwinner T5** series with a 1.5GHz quad-core Cortex-A53 CPU and a Mali-G31 MP2 GPU. The processor is AEC-Q100 certified and targets the new generation of automotive markets. Additionally, it has onboard 1GB/2GB LPDDR4, 8GB eMMC, 32Kbit EEPROM and Power management IC (PMIC). SMD packaging is adopted to save connector cost. A variety of peripheral and IO signals are accessible via the 1.0 mm pitch 164-pin Castellated-Hole and 58-pin LGA expansion interfaces. With strong performance, extensive peripheral resources and low cost, the MYC-YT507H SOM can be used in a wide range of applications such as power IOT, automotive electronics, commercial display, industrial control, medical devices, intelligent terminals, and more others.



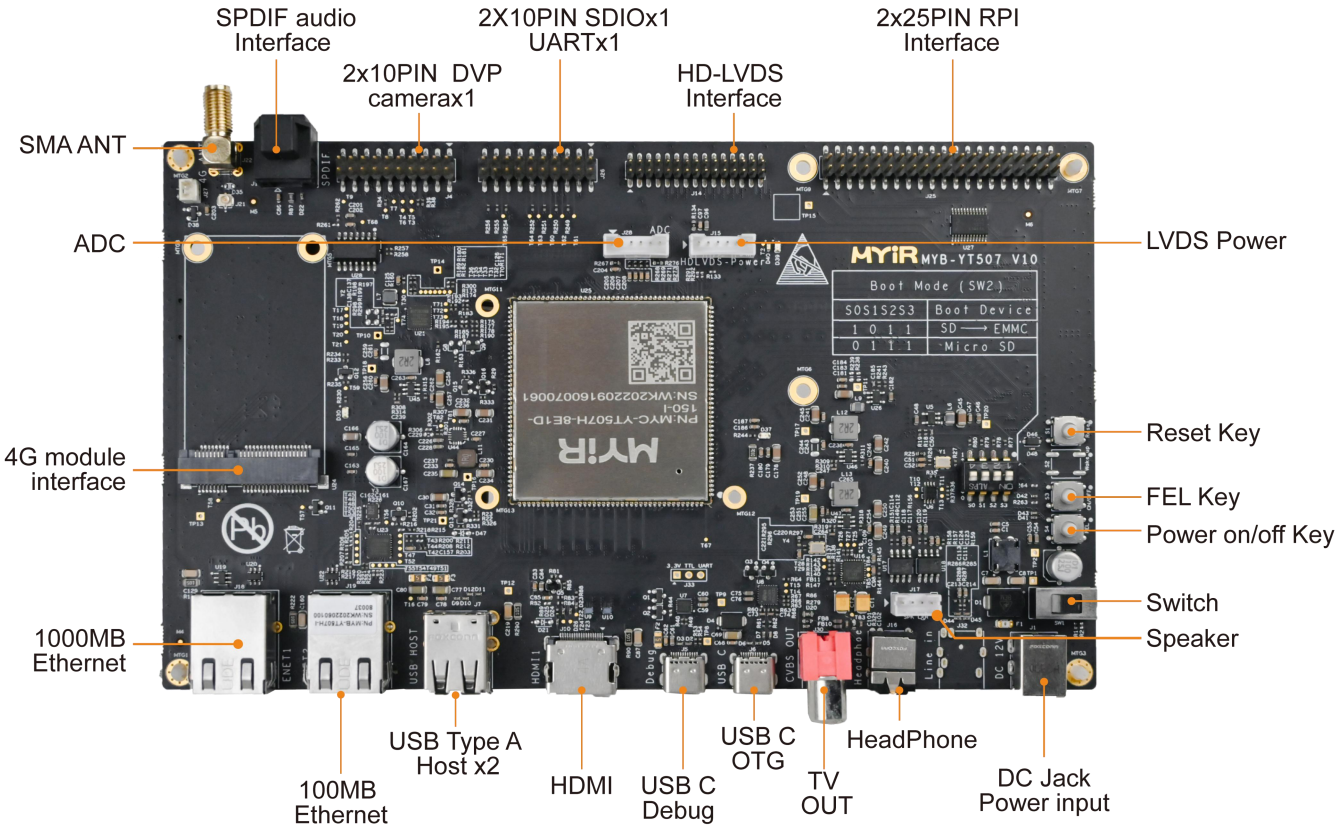
MYC-YT507H SOM Top-view and Bottom-view (delivered with shielding cover installed by default)

The MYC-YT507H is running Linux and Android OS. MYIR provides abundant software resources for Linux 4.9 based MYIR MEasy HMI V2.0 system with QT5.12.5, Ubuntu 18.04.5 system and Android10 system, including kernel, driver source codes and compilation tools to enable users to start their development rapidly and easily.

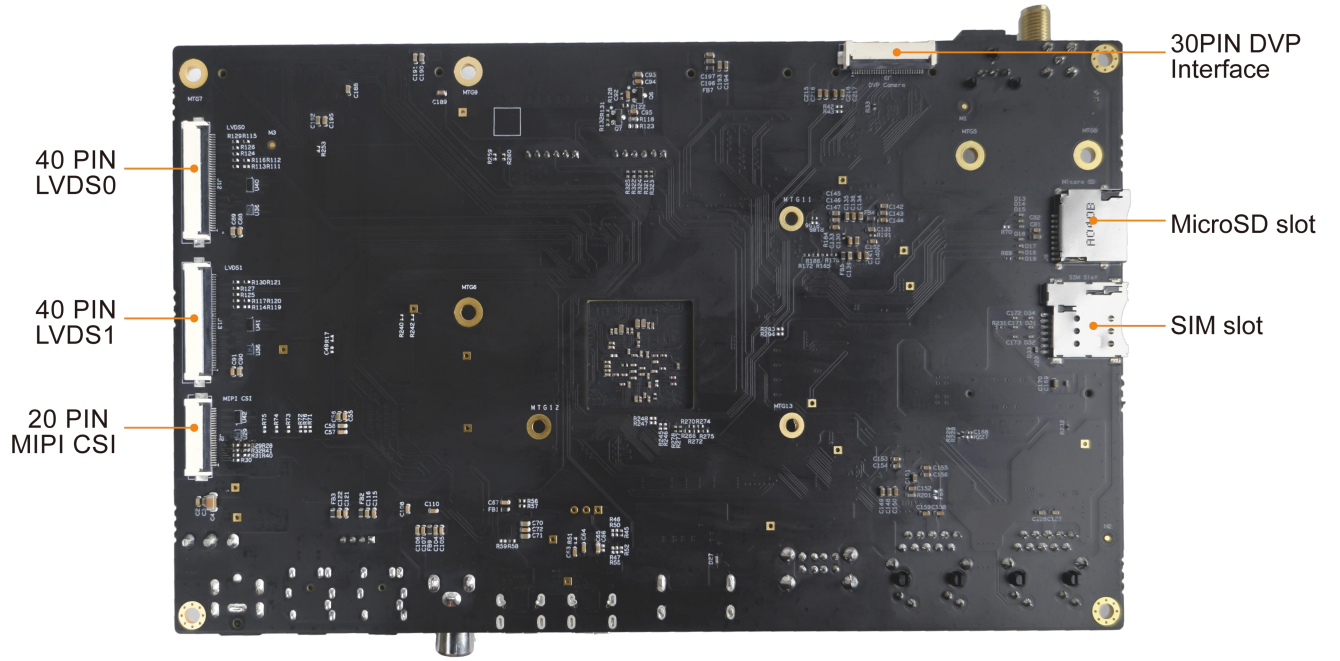
MYIR provides MYD-YT507H development board for evaluating the MYC-YT507H SOM. It takes full advantages of the Allwinner T5 MPU to explore a rich set of peripherals and interfaces to the base board including

Serial ports, one Gigabit Ethernet and one 10/100M bps Ethernet, two USB 2.0 HOST and one USB 2.0 OTG, one TF card slot as well as a USB based 4G Mini PCIE interface. It has a DVP camera interface and a MIPI-CSI interface to allow connecting with camera modules. It also supports multi video output interfaces such as dual LVDS, HDMI and CVBS OUT, to achieve different display in dual screens.

MYIR also offers MY-CAM002U USB Camera Module, MY-CAM011B DVP Camera Module, MY-CAM003M MIPI Camera Module, MY-WIREDCOM RPI Module (RS232/RS485), MY-WF005S WiFi/BT Module and MY-LVDS070C LCD Module as options for the board which have greatly enhanced the functionality of the board.



MYD-YT507H Development Board Top-view



MYD-YT507H Development Board Bottom-view

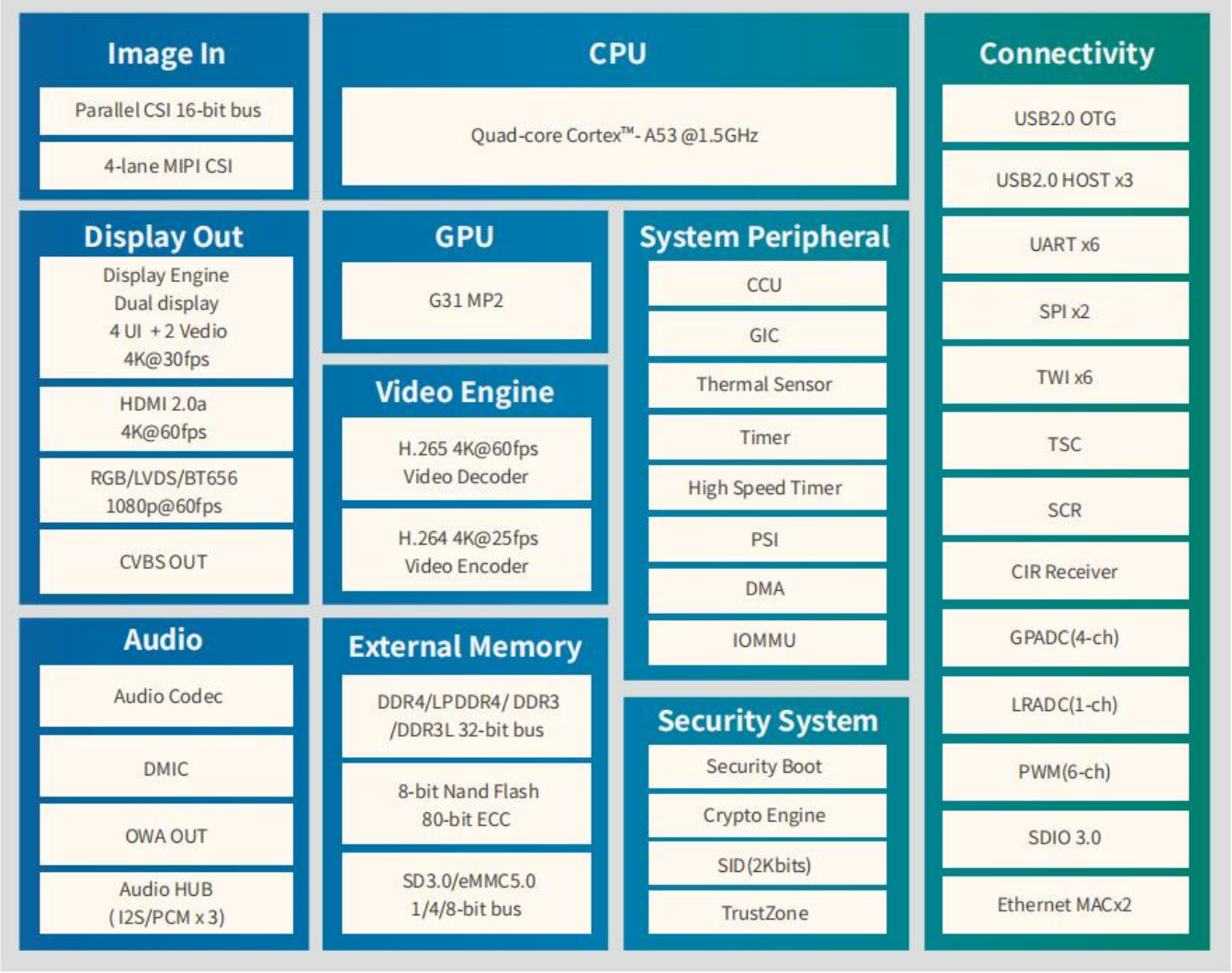
Hardware Specification

The MYC-YT507H SOM is using Allwinner T507-H Microprocessor with 15 mm x 15 mm size,0.65 mm ball pitch,0.35 mm ball size, TFBGA 421balls. The chip family integrates Cortex-A53 quad-core CPU, G31 MP2 GPU, 32-bit DDR3/LPDDR3/DDR4/LPDDR4 DRAM, multi video output interfaces (RGB/2*LVDS/ HDMI/CVBS OUT), and multi video input interfaces (MIPI CSI/BT656/BT1120). The chip family supports 4K@60fps H.265 decoder, 4K@25fps H.264 encoder, DI, 3D noise reduction, SmartColor system, and keystone correction module, which provides smooth user experience and professional visual effect. Supports 4 x USB, 2 x Ethernet MAC, 6 x UART, 6 x TWI, 4 x GPADC, greatly facilitating product expansion.

Resources	Parametric Description
CPU	● Quad-core ARM Cortex™-A53@1.5Ghz
GPU	● G31 MP2 ● Supports OpenGL ES 3.2/2.0/1.0, Vulkan 1.1, OpenCL 2.0
External Storage	● 32-bit DDR4/DDR3/DDR3L/LPDDR3/LPDDR4 interface, supporting maximum capacity of 4GB ● SD3.0/eMMC5.0 interface ● 8-bit Nand flash interface with maximum 80-bit/1KB ECC
Video Engine	**Video decoder** ● H.265 MP decoder up to 4K@60fps ● H.264 BL/MP/HP decoder up to 4K@30fps ● VP9 decoder up to 4K@60fps ● AVS2 decoder up to 4K@60fps ● Multi-format 1080p@60fps video playback, including VP8, MPEG1/2 SP/MP, MPEG4 SP/ASP, ● AVS+/AVS JIZHUN, VC1 SP/MP **Video encoder** ● H.264 encoder up to 4K@25fps ● MJPEG encoder up to 4K@15fps ● JPEG encoder up to 8K x 8K resolution
Video Input	● Supports one 8-/10-/12-/16-bit digital camera(DC) interface ● Maximum pixel clock of 148.5MHz for each DC interface ● BT656, BT1120 video input for multichannel YUV ● Four-lane MIPI CSI, up to lGbps per lane in HS transmission, compliant with MIPI-CSI2 V1.00 and MIPI DPHY V1.00 ● Maximum video capture resolution of 8M@30fps or 4x 1080p@25fps for MIPI CSI ● Supports formats:YUV422,YUV420,RAW-8,RAW-10,RAW-12
Audio	● Two DAC channels ● Supports 1 audio output interface (differential LINEOUTP/N or single-end LINEOUTL/LINEOUTR) ● One Audio HUB, supporting internal mixing function ● Embedded 3 I2S/PCM for connecting the external devices (I2S0 for extended audio codec, I2S2 for BT, I2S3 for digital power amplifier) ● Supports Left-justified, Right-justified, Standard I2S mode, PCM mode, and TDM mode ● I2S mode supports 8 channels, and 32-bit/192kbit sample rate ● I2S and TDM-modes support maximum 16 channels, and 32-bit/96kbit sample rate ● One OWA OUT interface, supporting 16-/20-/24-bit outputs ● Integrated digital microphone, supporting maximum 8 digital PDM microphones
Display Output	● HDMI 2.0a up to 4K@60fps ● TV CVBS output, supporting PAL/NTSC ● LVDS interface with dual link, up to 1080p@60fps ● RGB interface with DE/SYNC mode, up to 1080p@60fps

Security Engine	● Supports Full Disk Encryption ● AES, DES, 3DES, and XTS encryption and decryption algorithms ● MD5, SHA, and HMAC tamper proofing ● RSA, ECC signature and verification algorithms ● Supports 160-bit hardware pseudo random number generator(PRNG) with 175-bit seed ● Supports 256-bit hardware true random number generator(TRNG) ● Integrated 2K-bit EFUSE for chip ID and security application
Interfaces	● 3 x USB2.0 Host, l x USB2.0 OTG ● 2 x Ethernet MAC (one 10/100 Mbps Ethernet port, one 10/100/1000 Mbps Ethernet port) ● SDIO 3.0, TSC, SCR, CIR Receiver ● 6 x TWI, 2 x SPI, 6 x UART ● 6-ch PWM, 4-ch GPADC. 1-ch LRADC
PMIC	● Companion Allwinner Power Management IC
Packaging	● TFBGA 421balls ● 15 mm x 15 mm size,0.65 mm ball pitch,0.35 mm ball size
Process Technology	● 28nm HPC

Features of T507-H Processor



T5 Series Block Diagram

The MYC-YT507H SOM takes full features of T507-H and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 43mm x 45mm
- PCB Layers: 10-layer design
- Power supply: +5V/2A
- Working temperature: 40~85 Celsius (industrial grade)

Processor

- Allwinner T507-H processor
  - Up to 1.5GHz Quad-core ARM Cortex-A53
  - ARM Mali-G31 MP2 GPU with support for OpenGL ES 3.2/2.0/1.0, Vulkan 1.1, OpenCL 2.0

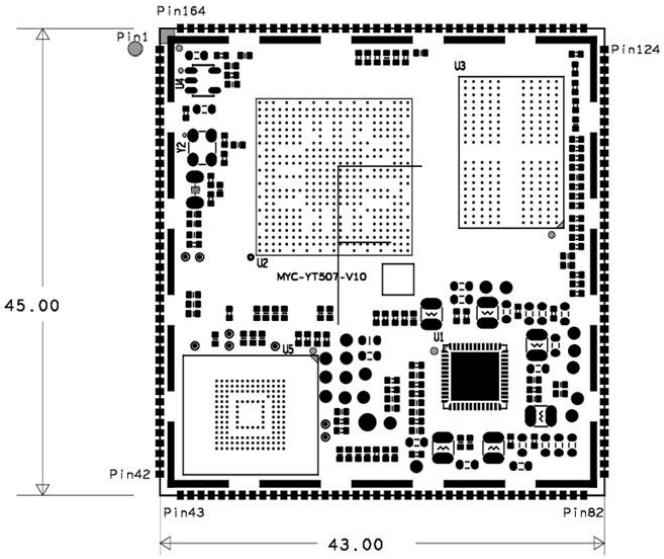
Memory

- 1G/2G LPDDR4 (supports optional 3GB / 4GB LPDDR4)
- 8GB eMMC (supports optional 4GB, 16GB / 64GB eMMC)
- 32Kbit EEPROM

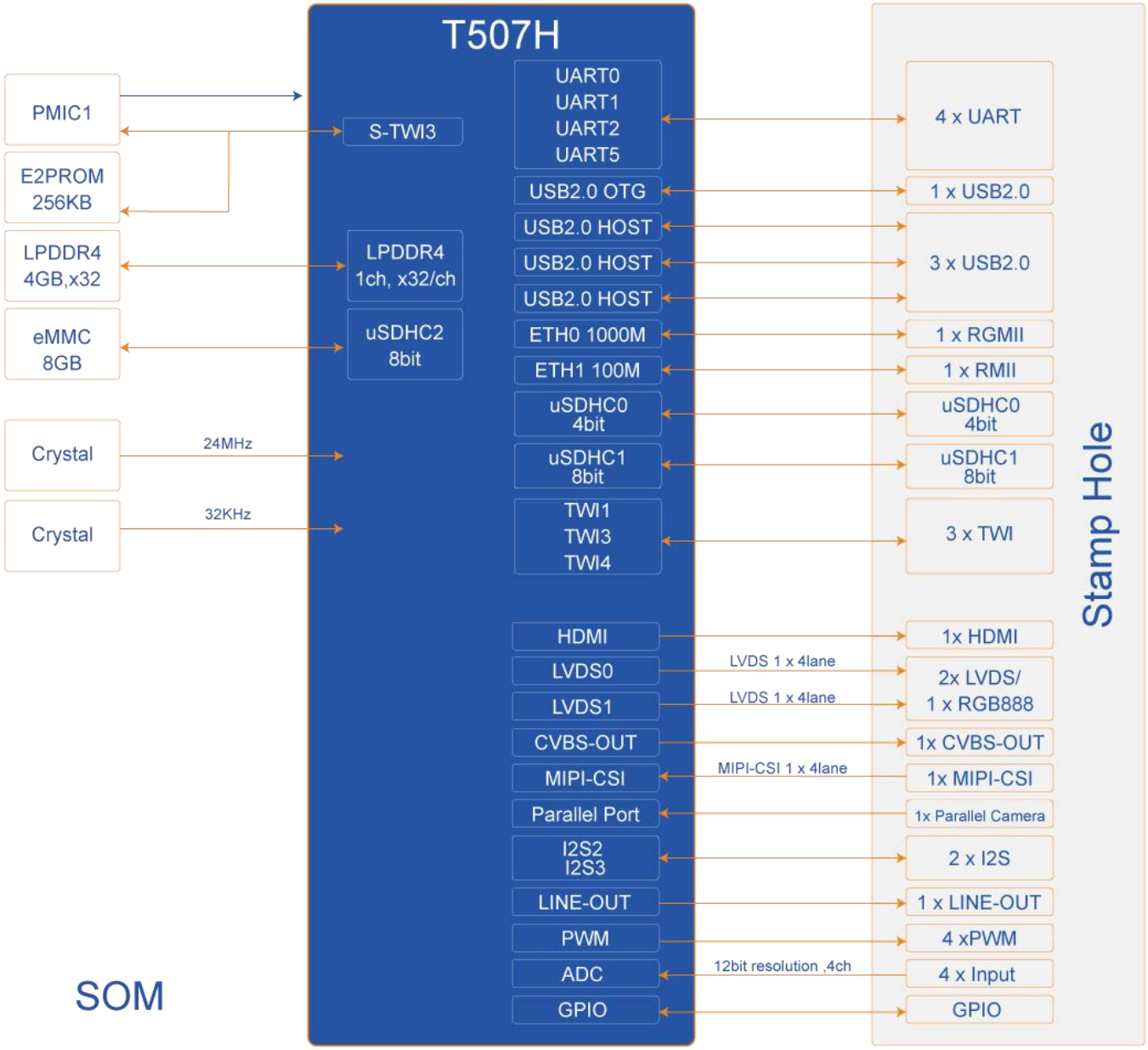
Peripherals and Signals Routed to Pins

- Power Management IC (Allwinner AXP853T)
- 1.0mm pitch 164-pin Castellated-Hole and 50-pin LGA Expansion Interfaces
  - up to 138 x GPIO
  - 1 x RGMII and 1 x RMII
  - 4 x I2C and 2 x SPI
  - 3 x USB 2.0 Host and 1 x USB 2.0 OTG
  - 1 x DVP digital camera and 1 x MIPI CSI camera
  - 2 x SDIO
  - 6 x UART
  - 4 x GPADC and 1x LRADC
  - 1 x HDMI 2.0a (supports 4K@60fps)
  - 2 x Single-channel LVDS or 1 x Dual-channel LVDS or 24-bit RGB (supports up to 1080p@60fps)
  - 1x TV CVBS output (supports PAL/NTSC)
  - 1 x JTAG
  - 3x I2S/PCM and 1x Audio out

  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-YT507H Dimensions Chart (Unit: mm)



MYC-YT507H SOM Block Diagram

Software Features

The MYC-YT507H SOM supports Linux and Android OS, which comes with software packages. The kernel and many peripheral drivers are available in source code to assist clients expedite their ideas. The following are a summary of the software features:

Item	Feature	Description	Source Code
Bootloader	U-boot	Boot boot program uboot_2018	YES
Linux kernel	Linux kernel	Customized base on official kernel_4.9.17 version	YES
Device driver	PMIC	AXP858 driver	YES
	USB Host	USB Host driver	YES
	USB OTG	USB OTG driver	YES
	TWI	TWI bus driver	YES
	SPI	SPI bus driver	YES
	Ethernet	10M/100M/1000M driver	YES
	SDC	eMMC/TF card storage driver	YES
	HDMI	HDMI display driver	YES
	Singer LVDS	7-inch single-channel LVDS driver	YES
	Double LVDS	21.5 inch dual LVDS 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
	GPADC	GPADC driver	YES
	LRADC	LRADC driver	YES
	RTC	real time clock driver	YES
	IO driver	Generic GPIO driver	YES
	tty	RS232/RS485/TTL driver	YES
	Touch	capacitive touch	YES
	Camera (DVP)	500W camera driver	YES
	Camera (MIPI)	500W camera driver	YES
	WiFi & BT	AP6212 driver	YES
	Watchdog	Watchdog driver	YES
File system	Ubuntu18.04	Base on ubuntu-base-18.04.5-base-arm64	YES
	myir-image-full	Base on buildroot construction zone Qt 5.12.5 file system	YES
	myir-image-android10	Compiled and constructed based on Android10 SDK	YES

Application Program	GPIO LED	Indicator routine	YES
	GPIO KEY	keystroke routine	YES
	NET	TCP/IP Sokect C/S routine	YES
	eeprom	Read/write eeprom routine	YES
	RTC	Real Time Clock routine	YES
	RS232	RS232 routine	YES
	RS485	RS485 routine	YES
	LCD	LCD routine	YES
	Camera	Camera display routine	YES
Compiler Tool Chain	Cross compiler	gcc-linaro-7.4.1-2019.02-x86_64_aarch64-linux-gnu	BINARY

MYC-YT507H Software Features

Order Information

Product Item	Part No.	Packing List
MYC-YT507H System-On-Module	MYC-YT507H-8E1D-150-I	✓ One MYC-YT507H SOM
	MYC-YT507H-8E2D-150-I	
MYD-YT507H Development Board	MYD-YT507H-8E1D-150-I	✓ One MYD-YT507H Development Board (including MYC-YT507H SOM) ✓ One USB TYPE-A to TYPE-C cable ✓ One 12V/2A Power adapter ✓ One DC Power jack adapter ✓ One Quick Start Guide
	MYD-YT507H-8E2D-150-I-G	
MY-CAM002U USB Digital Camera Module	MY-CAM002U	**Add-on Options** ✓ One MY-CAM002U Module ✓ MY-CAM011B Module ✓ MY-CAM003M Module ✓ MY-LVDS070C Module ✓ MY-WIREDCOM Module ✓ MY-WF005S Module
MY-CAM011B BUS Camera Module	MY-CAM011B	
MY-CAM003M MIPI Camera Module	MY-CAM003M	
MY-LVDS070C 7-inch LCD Module	MY-LVDS070C	
MY-WIREDCOM RPI Module (RS485/RS232)	MY-WIREDCOM	
MY-WF005S WiFi/BT Module	MY-WF005S	

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