

AI Edge Computing Box – YS-A8

YS-A8 AI Edge Computing Box



Chapter 1 Product Introduction

1.1 Product Overview

YS-A8 is an AI edge computing box designed based on Rockchip RK3588 high-performance ARM processor, featuring 4-core Cortex-A76 + 4-core Cortex-A55 architecture. The processor integrates 6TOPS computing power NPU, ARM Mali-G610 MC4 GPU, 48M ISP, supports 8K@30fps H.264/H.265 video encoding, and supports 8K@60fps H.265/H.264/AV1/VP9/AVS2 video decoding.

The YS-A8 main board is equipped with 2 Gigabit Ethernet ports, 3 USB 3.2 communication interfaces, and also provides HDMI OUT, DP (DisplayPort), 1x MIPI DSI, 1x LVDS, MIC IN, HP OUT and other audio/video multimedia interfaces. It features onboard WiFi/BT, PLP power loss protection circuit, supports optional 4G/5G modules, NGFF SSD, and supports DIN rail, wall-mount, and desktop installation.

The YS-A8 main board has 2 EXPORT expansion interfaces, which can be used with YS-A8 expansion boards to meet different application scenario requirements.

1.2 YS-A8 Application Fields

- ◆ Edge Computing Gateway
- ◆ Industrial & Commercial Energy Storage EMS
- ◆ Communication Management Device
- ◆ Power Monitoring Device

- ◆ AI Computing Box
- ◆ Industrial Vision Equipment
- ◆ Motion Controller
- ◆ High-end Industrial PLC

Chapter 2 Hardware Parameters

2.1 Main Board Hardware Parameters

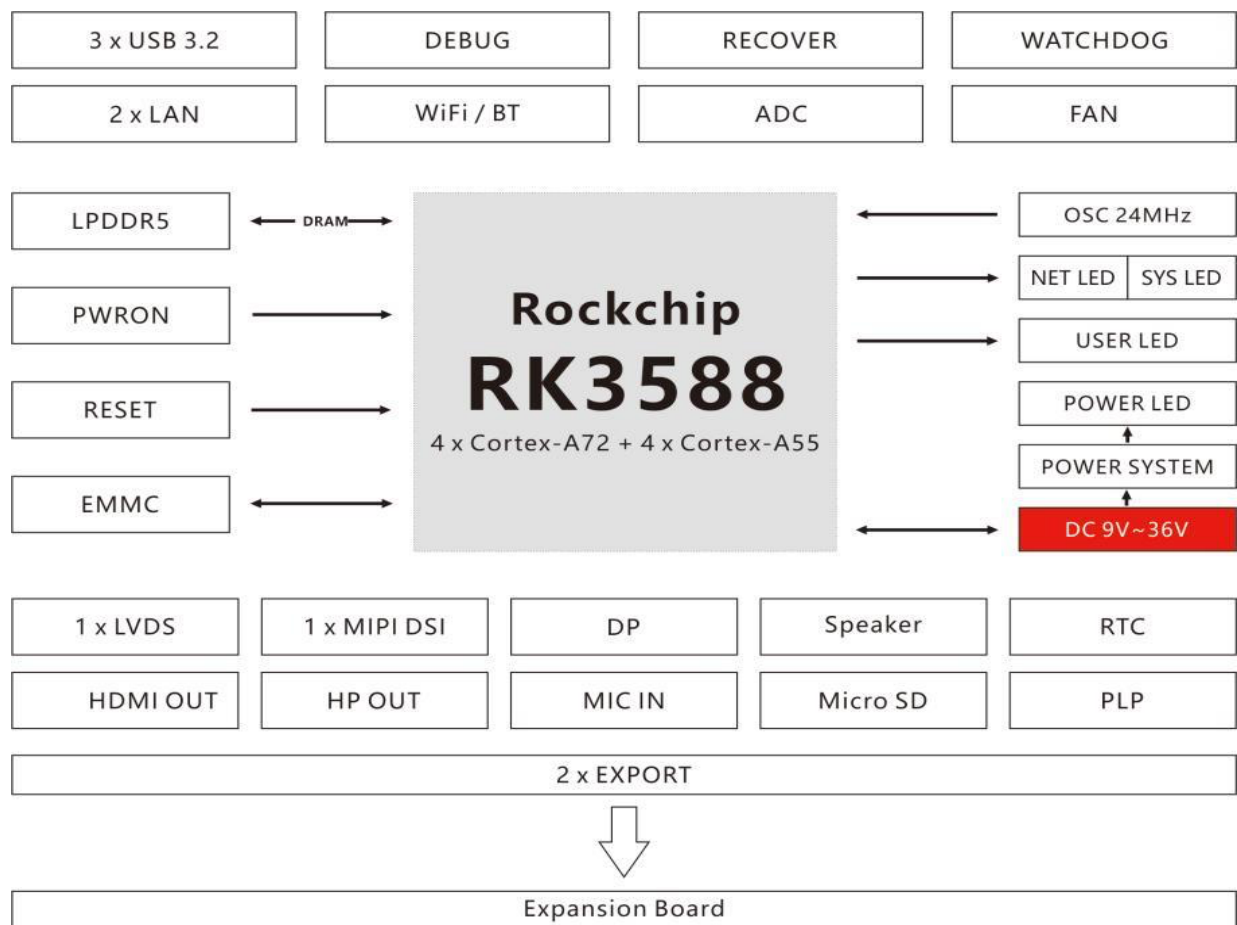
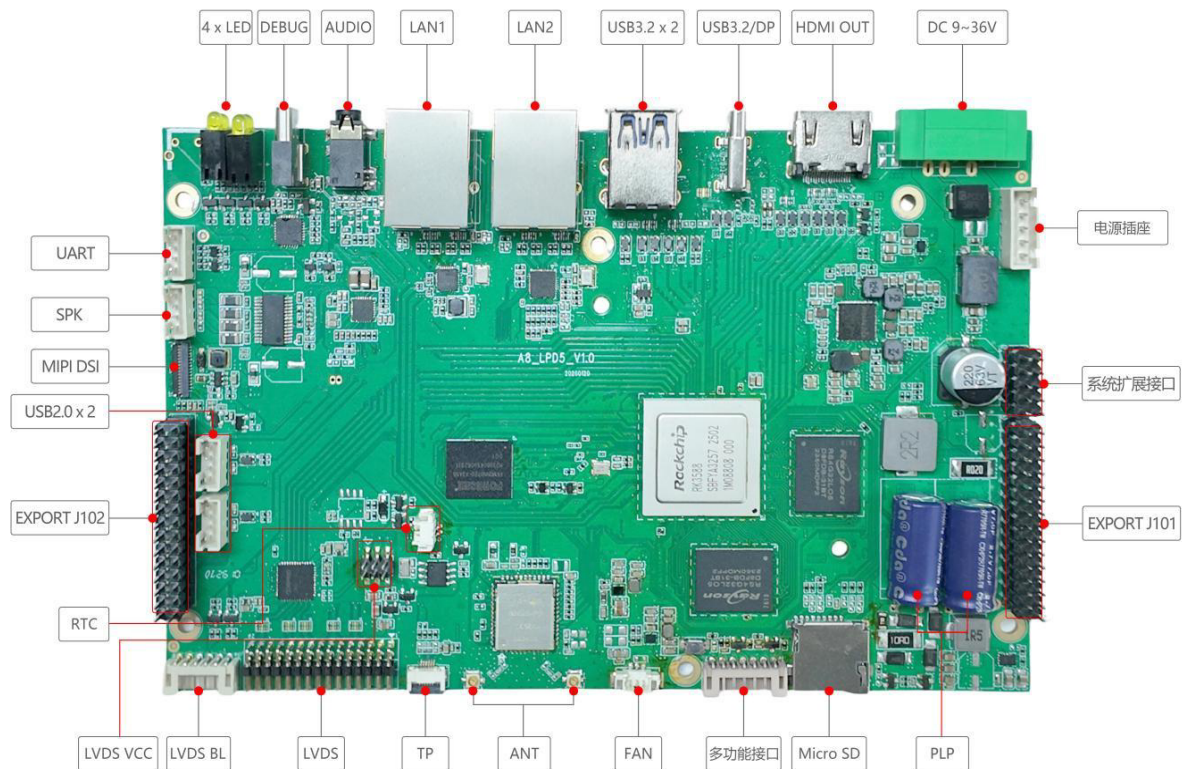


Figure 4: YS-A8 Main Board Hardware Block Diagram

AI Edge Computing Box – YS-A8



Parameter	Specification
CPU	RK3588: 4-core Cortex-A76 + 4-core Cortex-A55
GPU	ARM Mali-G610 MC4, supports OpenGL ES 1.1/2.0/3.2, OpenCL 2.2, Vulkan 1.2
NPU	6TOPS computing power, supports INT4/INT8/INT16/FP16, supports TensorFlow/MXNet/PyTorch/Caffe deep learning frameworks
Decoder	H.265/VP9/AVS2 up to 8K@60fps, H.264 up to 8K@30fps, AV1 up to 4K@60fps
Encoder	H.264/H.265 up to 8K@30fps
ISP	48M
RAM	2GB LPDDR5 (4GB/8GB/16GB optional)
ROM	16GB EMMC (8GB/32GB/64GB/128GB optional)
LED	1 x Power LED, 1 x System LED, 1 x Network LED, 1 x User Programmable LED
KEY	1 x Reset button, 1 x RECOVERY button

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Parameter	Specification
VIDEO OUT	1 x HDMI OUT, HDMI female connector, supports 4K@60fps resolution
	1 x MIPI DSI, supports 2560x1600@60fps resolution, supports capacitive touch screen, 6pin FPC connector
	1 x LVDS, supports 1080P resolution
	1 x DP (DisplayPort), shared with USB3.2 OTG Type-C port (either/or)
AUDIO	1 x HP OUT (HeadPhone OUT), 3.5mm audio jack
	1 x MIC IN, 2PIN connector
	1 x Speaker, 4PIN connector, stereo, 8W*2
ETHERNET	2 x LAN, 10/100/1000M adaptive, RJ45 interface
SD	1 x Micro SD card slot
USB	2 x USB 3.2 HOST, Type-A interface
	1 x USB 3.2 OTG, Type-C interface
UART	1 x Debug, Type-C interface
WiFi / BT	WiFi / BT 2-in-1 module, supports WiFi 5/WiFi 6, Bluetooth 5.2
ADC	1 x ADC, 3 channels, 2 x 5pin header
RTC	1 x External RTC, 2pin header, compatible with CR2032 battery (3V non-rechargeable)
Parameter	Specification
EXPORT	1 x EXPORT J101 expansion interface, 2 x 15pin header, provides 4xUART, 2xCAN, I2C and other signals
	1 x EXPORT J102 expansion interface, 2 x 15pin header, provides 2xUSB 2.0 HOST, PCIe 2.0, SPI and other signals
	Note: (1) Can be used with YS-A8 expansion board to meet different application scenario requirements
	(2) PCIe 2.0 signal is multiplexed with USB 3.0 function, either/or
SYS	1 x SYS expansion interface, 2 x 5pin header, provides ADC, VCC, GND signals
FAN	1 x FAN, 5V power supply, 2pin terminal, provides ADC, VCC, GND
WATCHDOG	1 x External independent watchdog
PLP	1 x Power Loss Protection circuit, continuous operation time approximately 3~8s
POWER	1 x 9~36V DC input, 3pin green phoenix terminal connector
	1 x 5pin power socket

2.2 Expansion Board Hardware Parameters

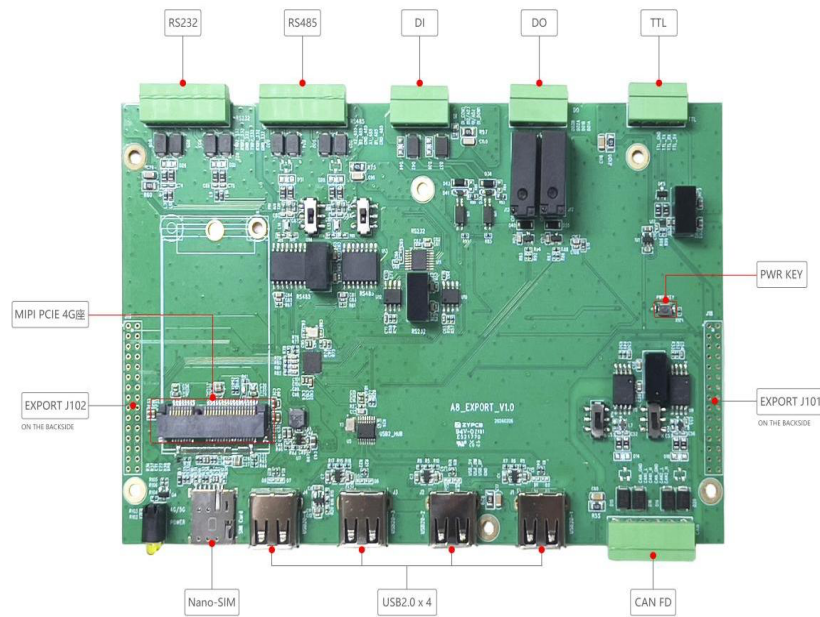


Figure 6: YS-A8 Expansion Board Hardware Diagram

Interface	Specification
RS485	2 channels (with isolation)
RS232	2 channels (with isolation)
DI	2 channels (optocoupler isolation)
DO	2 channels (relay isolation)
TTL	2 channels (with isolation)
CAN FD	2 channels (with isolation)
USB 2.0	4 x USB 2.0 HOST, Type-A interface
4G/5G	1x 4G module (optional), connected via USB 2.0, Mini PCIe female connector
	1x 5G module (optional), connected via PCIe 2.0, M.2 B-Key slot (shared with NGFF SSD, either/or)
	1x Nano-SIM interface Note: 4G/5G modules share the Nano-SIM interface
LED	1 x Power LED, 1 x 4G/5G LED
EXPORT	1 x EXPORT J101 expansion interface, 2 x 15pin header
	1 x EXPORT J102 expansion interface, 2 x 15pin header
SSD	1 x NGFF SSD (optional), connected via PCIe 2.0, M.2 B-Key slot
	Note: Shared with 5G module, either/or