

AX8850N is a professional smart IP camera SoC with strong AI capabilities. It integrates eight ARM Cortex-A55 processors, a high efficiency NPU that offers 72.0TOPS@INT4 or 18.0TOPS@INT8, an AI enabled ISP pipeline that delivers up to 8K@30fps, and a VPU with H.264/H.265 encoding capabilities. All these functionalities are provided in a low power chip design. With a high-performance AI-ISP and a power-efficient NPU, AX8850N enables a plurality of AI innovations and brings an extraordinary AI enabled video and image processing experience to worldwide customers.



# AX8850N

## Features

### CPU :

- Octo Cortex A55@1.7GHz
- 32KB I-Cache
- 32KB D-Cache
- Neon acceleration
- Integrated FPU

### NPU :

- Up to 72.0 TOPs @ INT4 or 18.0 TOPs @ INT8
- Support MAU
- Support IVE

### DSP :

- Dual Core VDSP
- 32KB I-Cache
- 16KB D-Cache

### ISP :

- Up to 8K@30fps 2DOL
- 3A (AF, AWB, AE)
- AI-HDR
- AI-3DNR, 2DNR
- FPN removal and DPC
- BPC
- Lens Shading
- Color Enhancement
- Dehaze
- Fisheye
- DIS, EIS

### Video Encoder :

- H.264 HP/MP/BP Level v5.1
- H.265 MP Level v5.0
- I-/P-frames
- Up to 8K@30fps encoding
- Real-time multi-stream
- H.264/H.265 encoding : 7680\*4320@30fps+1080p@30fps
- CBR/VBR/AVBR/CVBR/FI XQP/QPMAP control mode
- Up to 8-ROI encoding
- JPEG encoding : 3840\*2160@200fps
- Up to 200Mbps output bit rate

### Video Decoder :

- H.264 HP/MP/BP Level 5.2
- H.265 HP/MP/BP Level 5.1
- Up to 8K@60fps decoding
- Up to 32x1080p@30fps decoding
- JPEG decoding : 3840\*2160@120fps
- Up to 300Mbps output bit rate

### Video and Graphics Processing :

- Video and graphics scaling
- Up to 12-region OSD overlay before encoding
- 90°, 180°, 270° image rotation

## Peripherals

### Video Interfaces :

- VI
- 4-channel VI
- 2x4 / 4x2 Lane MIPI CSI
- Up to 3.5Gbps

### VO

- Two HDMI 2.0, support output up to 3840x2160@60fps
- BT.1120 / BT.656

### Memory Interfaces :

- SDRAM Interface
- 64bit LPDDR4(x), supporting a maximum capacity of 32GB
- Up to 4266 Mbps rate

### SPI Flash Interface

- Support SPI Nor Flash
- Support SPI Nand Flash

### eMMC Interface

- eMMC v5.1
- Maximum capacity of 2TB

### Ethernet

- Two Gigabit Ethernet ports
- RGMII, and RMII modes
- TSO network acceleration

### USB

- One USB 3.0, two USB 2.0
- Support Host or Device

### PCIe and SATA

- 2x2 Lane PCIe 2.0 RC/EP mode
- Four SATA 3.0, PM/eSATA

### Other Interfaces

- I2S, I2C, SPIs, UART



WeChat  
Subscription  
Number



AXERA  
Official  
Website

## Security

- Secure boot
- Hardware-based encryption and decryption algorithms (including AES/DES/3DES)
- Hardware-based HASH algorithms (SHA-1/SHA-224/SHA-256)

## Startup

- Boot from eMMC, SPI Nor Flash, SPI Nand Flash

## Physical Spec.

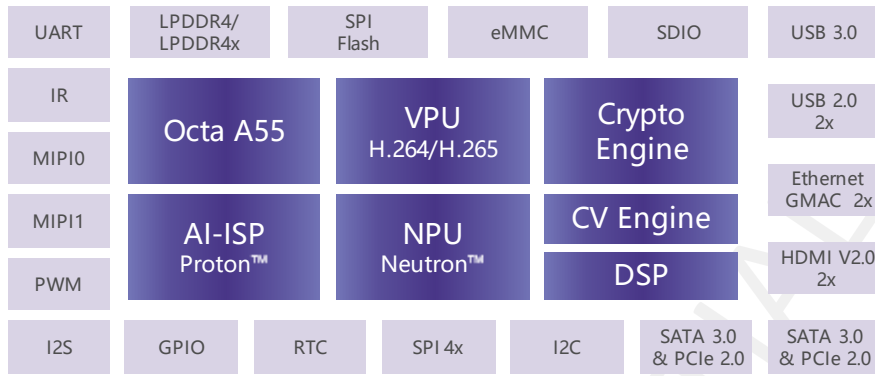
### Operating Voltage :

- 0.8V core voltage
- 1.1V / 0.6V LPDDR4(x) interface voltage
- 1.8V / 3.3V I/O voltage

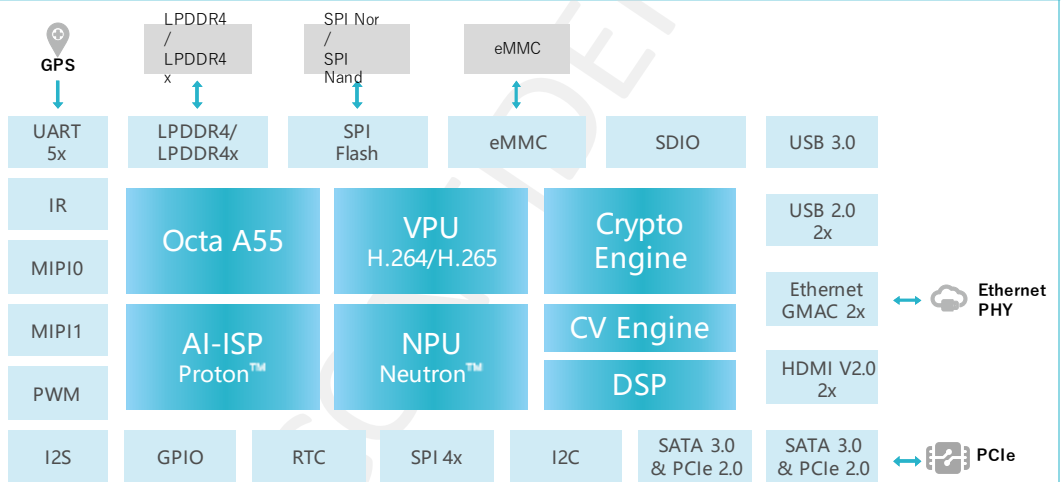
### Package :

- 16mm x 16mm FC-CSP

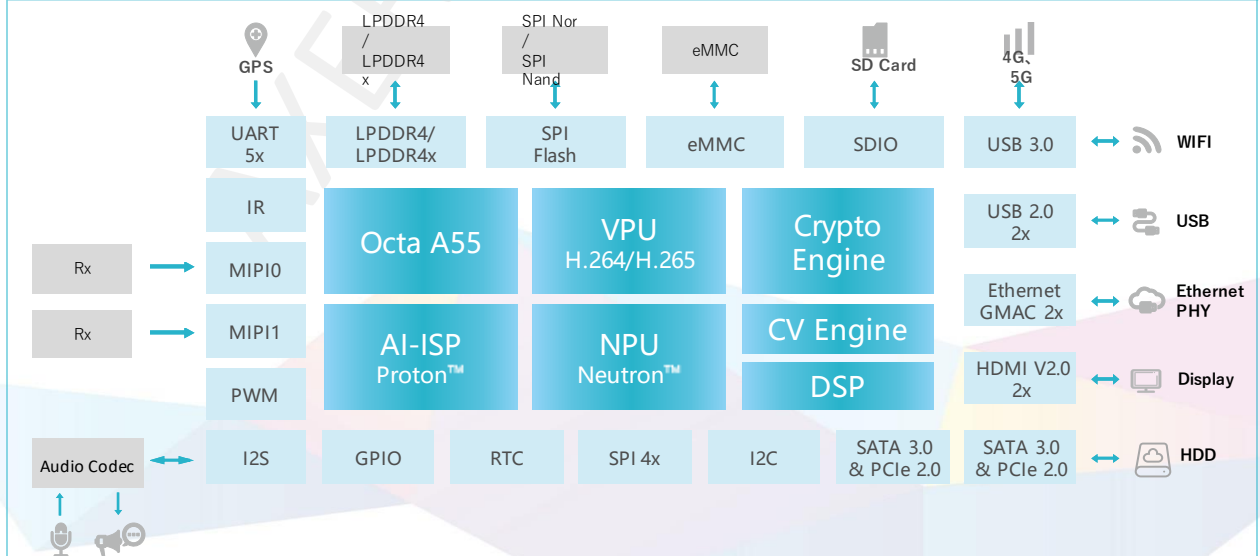
# AX8850N Block Diagram



## AI Accelerator Card Solution



## AI BOX/XVR Solution



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