



WM9955: Advanced Smart IPC SoC with Powerful AI

WM9955 is a state-of-the-art smart IPC SoC designed for cutting-edge AI-driven video and image applications. Powered by **eight ARM Cortex-A55 processors** and a high-efficiency NPU delivering up to **72.0 TOPS@INT4** or **18.0 TOPS@INT8**, it offers exceptional AI performance for next-level capabilities.

Equipped with an AI-enabled ISP pipeline, WM9955 supports **8K@30fps** ultra-high-definition imaging, while its integrated VPU provides seamless H.264/H.265 encoding, ensuring superior video quality and efficient processing. This powerful SoC is built with a low-power design, offering peak performance without compromising energy efficiency.

With its advanced AI-ISP and power-efficient NPU, WM9955 empowers a wide range of AI innovations, delivering an unparalleled **AI-powered video and image processing experience** to clients worldwide.

Features	
CPU	● Octo Cortex A55@1.7 GHz ● 32KB I-Cache ● 32KB D-Cache ● Neon acceleration ● Integrated FPU
NPU	● Up to 72.0 TOPs @INT4 or 18.0 TOPs @INT8 ● Supports MAU ● Supports 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

Features

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/FIXQP/QPMAP control mode
	● Up to 8-ROI encoding
	● JPEG encoding: 3840×2160@200fps
Video Decoder	● Up to 200Mbps output
	● H.264 HP/MP/BP Level 5.2
	● H.265 HP/MP/BP Level 5.1
	● Up to 8K@60fps decoding
	● Up to 32 × 1080p@30fps decoding
Video and Graphic Processing	● JPEG decoding: 3840 × 2160@120 fps
	● Up to 300Mbps output
	● Video and graphics scaling
	● Up to 12-region OSD overlay before encoding
	● 90°, 180°, and 270° image rotation

Peripherals

Video Interfaces	VI	● 4-channel VI
		● 2×4 / 4×2 Lane MIPI CSI
	VO	● Up to 3.5 Gbps
Memory Interfaces	SDRAM Interface	● Two HDMI 2.0. Both support output up to 3840×2160@60fps
		● BT.1120/BT.656
	SPI Flash Interface	● 64bit LPDDR4(x), supporting a max. capacity of 32 GB
		● Up to 4266 Mbps
	eMMC Interface	● Supports SPI Nor Flash
Ethernet		● Supports SPI Nand Flash
		● eMMC V5.1
		● Max. capacity of 2 TB
USB		● Two Gigabit Ethernet ports
		● RGMII, and RMII modes
PCIe and SATA		● TSO network acceleration
		● One USB 3.0, two USB 2.0
Other Interfaces		● Supports Host or Device
		● 2×2 Lane PCIe 2.0 RC/EP mode
		● Four SATA 3.0, PM/eSATA
		● I2S, I2C, SPIs, and UART

Security

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

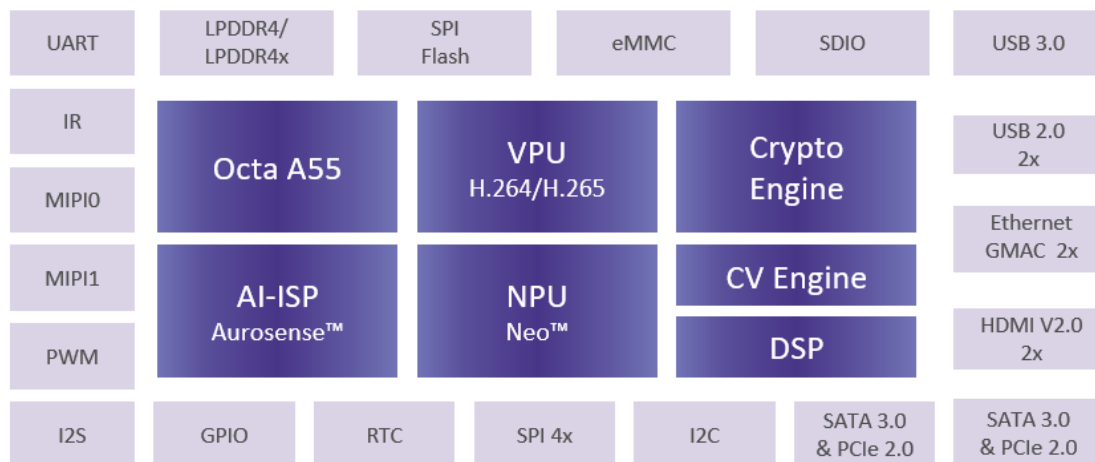
Startup

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

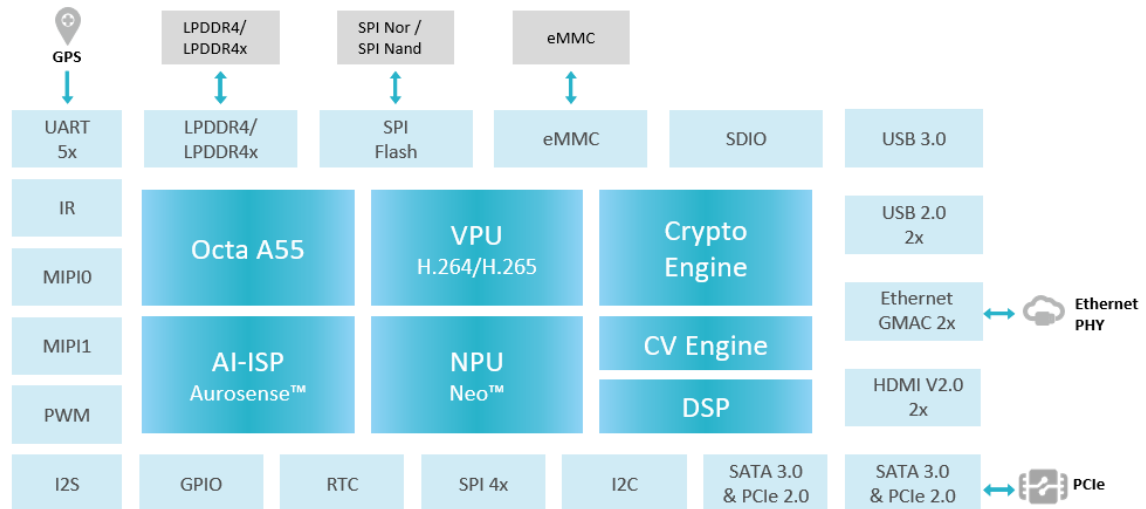
Physical Specs

Operating Voltage	● 0.8V core voltage
	● 1.1V/0.6V LPDDR4(x) interface voltage
	● 1.8V/3.3V I/O voltage
Package	● 16 mm × 16 mm FC-CSP

WM9955 Block Diagram



AI Accelerator Card Solution



AI Box/XVR Solution

