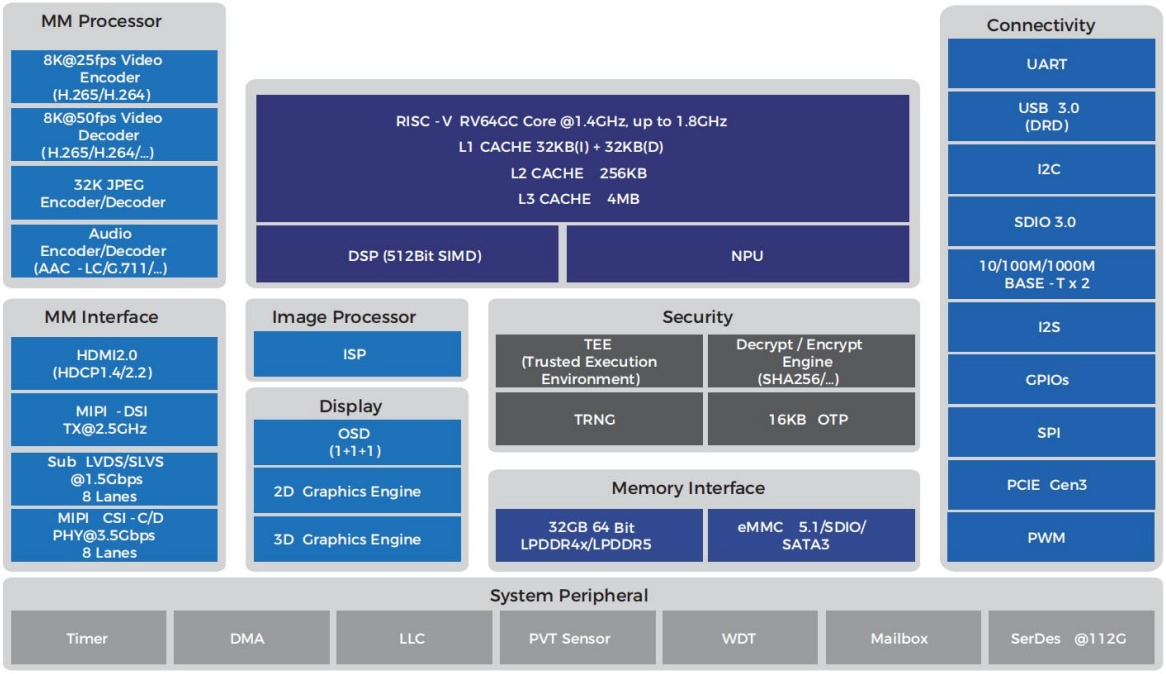
EIC7700X Product Brief

EIC7700X is an edge computing SoC with excellent performance. With a 64-bit RISC-V processor and self-developed neural network computing unit, it supports full stack floating point computing, and generative LLM. The product has rich interfaces, strong audio/video processing capabilities, highly adaptable in computer vision (CV) applications.

Highlights

- **The Most Powerful CPU Among the Mass-Produced RISC-V Processors:** The world's first AI SoC equipped with 64-bit RISC-V out-of-order CPU (processors) and self-developed high-performance NPU
- **Multiple Computing Acceleration Units:** Multiple CV and AI computing acceleration units including NPU, GPU and DSP, which can be widely applied to various scenarios in computing
- **Low Power Consumption:** Typical power consumption is 8W (with CNN)
- **High AI Computations:** AI computations up to 19.95TOPS
- **Rich Peripherals:** USB 3.0/2.0, ETHER NET RGMII, PCIE 3.0, I²C, HDMI, etc.
- **Strong Capabilities of Audio and Video Processing:** Support video decoding up to 8K@50fps and video encoding up to 8K@25fps, and multiple audio codecs such as ACC-LC, G.711, G.722.1, etc.
- **Safety and Reliability:** Hardware encryption engine supports the algorithms of TEE, TRNG, RSA4096, ECDSA, AES, DES, HMAC, SM4, CRC32, etc.
- **High-Precision LLM Model:** Support software development frameworks such as Pytorch, Tensorflow, PaddlePaddle, ONNX, etc., and high-precision LLM

Functional Diagram



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ESWIN

Chip Packaging

- FC-CSP 17 x 17 mm^2
- FC-BGA 23 x 23 mm^2

Application Scenarios

- Industrial Quality Inspection
- LLM
- Behavior Recognition
- Intelligent Sorting
- Secure Identification
- Face Identification

Parameters

CPU	• RISC-V RV64GC 4 cores@1.4GHz up to 1.8GHz • L1 Cache 32KB(I) + 32KB(D) private L2 Cache 256KB private L3 Cache 4MB shared • Cache supports ECC (support SECDED)
DNN Accelerator	• 19.95TOPS INT8
Vision DSP	• DSPs single cluster; support 512 INT8 SIMD
Memory	• Up to 32GB 64-bit LPDDR 4/4x/5
Video Decoder/ Encoder	• Support HEVC (H.265) and AVC (H.264) encoding and decoding • H.265 up to 8K@50fps or 32 channels of 1080P@30fps video decoding • H.265 up to 8K@25fps or 13 channels of 1080P@30fps video encoding
JPEG Codec	• JPEG ISO/IEC 10918-1, ITU-T T.81, up to 32K x 32K
Vision Engine	• HAE (2D Blit, Crop, Resize, Normalization) • 3D GPU (support OpenGL-ES 3.2, EGL 1.4, OpenCL 1.2/2.1 EP2, Vulkan 1.2, Android NN HAL) • OSD (3 layers)
Audio Codec	• AAC-LC encoding • G.711/G.722.1/G.726/MP2L2/PCM/MP3/AAC-LC decoding
Video Interface	• Video in: MIPI DPHY v2.1 and CPHY v1.2 Sub LVDS/SLVS or 6 cameras input • Single channel supports 4-Lane MIPI D-PHY/2-Trio C-PHY interface, up to 2.5Gbps/Lane

	• Single channel supports 4-Lane LVDS/Sub-LVDS/HiSPi interface, up to 1.0Gbps/Lane • Video out: HDMI 2.0 supports HDCP1.4/2.2, MIPI-DSI TX 2.5GHz 4 x Lanes
External Memory	• eMMC 5.1, 2 x SDIO 3.0, SATA3 (6Gb/s), SPI NOR flash
Peripheral Devices and Interfaces	• 2 x USB 3.0/2.0 (DRD), PCIE 3.0 (RC+EP) 4 x Lanes, 2 x GMAC supports RGMII • 12 x I^2C @ 1Mbps, 5 x UARTs, 2 x SPI, 3 x I2S (slave + master)
Security	• TEE, TRNG, ECDSA, RSA4096, AES, SM4, DES, HMAC, CRC32, Dual core hardware acceleration 16KB OTP
Power	• Typical 8W, RV32I single core L1 CACHE 64KB(I) + 64KB(D)
Temperature	• -20°C ~ 105°C