

EIC7702X Product Brief

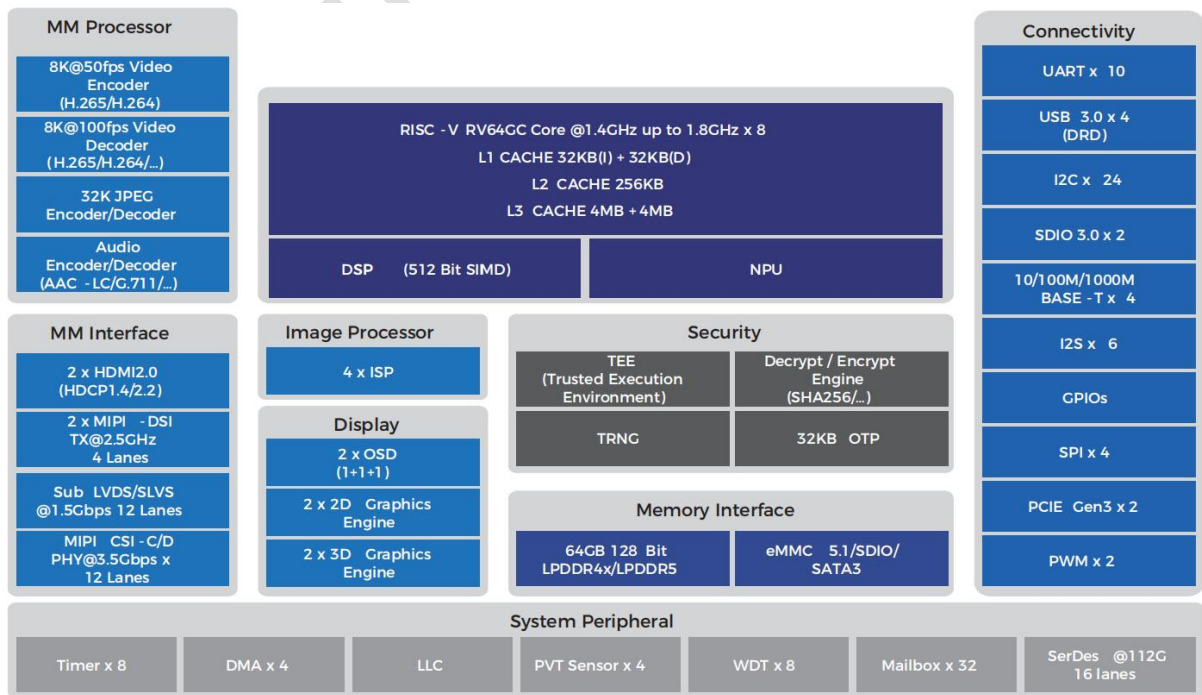
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EIC7702X the world's first AI PC IC, which has 64-bit RISC-V high-performance CPU (processors) and self-developed efficient NPU. It also supports full-stack floating-point computing and comprehensively accelerates generative LLM. The product has rich peripheral expansion interfaces, strong capabilities of audio and video processing, and high adaptability in the field of intelligent devices and cloud computing acceleration.

Highlights

- **The Most Powerful CPU Among the Mass-Produced RISC-V Processors:** x8 64-bit Out-of-Order RISC-V high-performance processors, support Die-to-Die cache coherency interconnect
- **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
- **Graphics Processing:** x2 GPU, High performance 3D graphics processing capability
- **High AI Computations:** AI computations up to 39.9TOPS
- **Rich Peripherals:** USB 3.0/2.0, ETHERNET RGMII, PCIE 3.0, I²C, HDMI, etc.
- **Strong Capabilities of Audio and Video Processing:** Support video decoding up to 8K@100fps and video encoding up to 8K@50fps, 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



Chip Packaging

- FC-BGA 35 x 35 mm²

Application Scenarios

- Speech Synthesis
- LLM
- Image/Video Generation
- Text Generation

Parameters

CPU	<ul style="list-style-type: none">• RISC-V RV64GC 8 cores@1.4GHz up to 1.8GHz• L1 Cache 32KB(I) + 32KB(D) private• L2 Cache 256KB private• L3 Cache 4MB + 4MB shared• Cache supports ECC (support SECDED)
DNN Accelerator	<ul style="list-style-type: none">• 39.9TOPS INT8
Vision DSP	<ul style="list-style-type: none">• Multiple DSPs, support 512 INT8 MAC
Memory	<ul style="list-style-type: none">• Up to 64GB 128-bit LPDDR 4/4x/5
Video Decoder/ Encoder	<ul style="list-style-type: none">• Support HEVC (H.265) and AVC (H.264) encoding and decoding• H.265 up to 8K@100fps or 64 channels of 1080P@30fps video decoding• H.265 up to 8K@50fps or 26 channels of 1080P@30fps video encoding
JPEG Codec	<ul style="list-style-type: none">• JPEG ISO/IEC 10918-1, ITU-T T.81, up to 32K x 32K
Vision Engine	<ul style="list-style-type: none">• 2 x HAE (2D Blit, Crop, Resize, Normalization)• 2 x 3D GPU (supports OpenGL-ES 3.2, EGL1.4, OpenCL 1.2/2.1 EP2, Vulkan 1.2, Android NN HAL)• 2 x OSD (3 layers)
Audio Codec	<ul style="list-style-type: none">• AAC-LC encoding• G.711/G.722.1/G.726/MP2L2/PCM/MP3/AAC-LC decoding
Video Interface	<ul style="list-style-type: none">• Video in: MIPI DPHY v2.1 and CPHY v1.2 Sub LVDS/SLVS or 8 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: 2 x HDMI 2.0 supports HDCP1.4/2.2, 2 x MIPI-DSI TX 2.5GHz 4 x Lanes
External Memory	<ul style="list-style-type: none">• 2 x eMMC 5.1, 2 x SDIO 3.0, 2 x SATA3 (6Gb/s), 2 x SPI NOR flash

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Peripheral Devices and Interfaces	<ul style="list-style-type: none">4 x USB 3.0/2.0 (DRD), 2 x PCIE 3.0 (RC+EP) 4 x Lanes, 4 x GMAC supports RGMII24 x I²C @ 1Mbps, 10 x UARTs, 4 x SPI, 6 x I2S (slave + master)
Security	<ul style="list-style-type: none">TEE, TRNG, ECDSA, RSA4096, AES, SM4, DES, HMAC, CRC32, Dual core hardware acceleration 32KB OTP
Power	<ul style="list-style-type: none">Typical 15W, 2 x RV32I single core L1 CACHE 64KB(I) + 64KB(D)
Temperature	<ul style="list-style-type: none">-20°C ~ 105°C

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