EIC7702 Product Brief

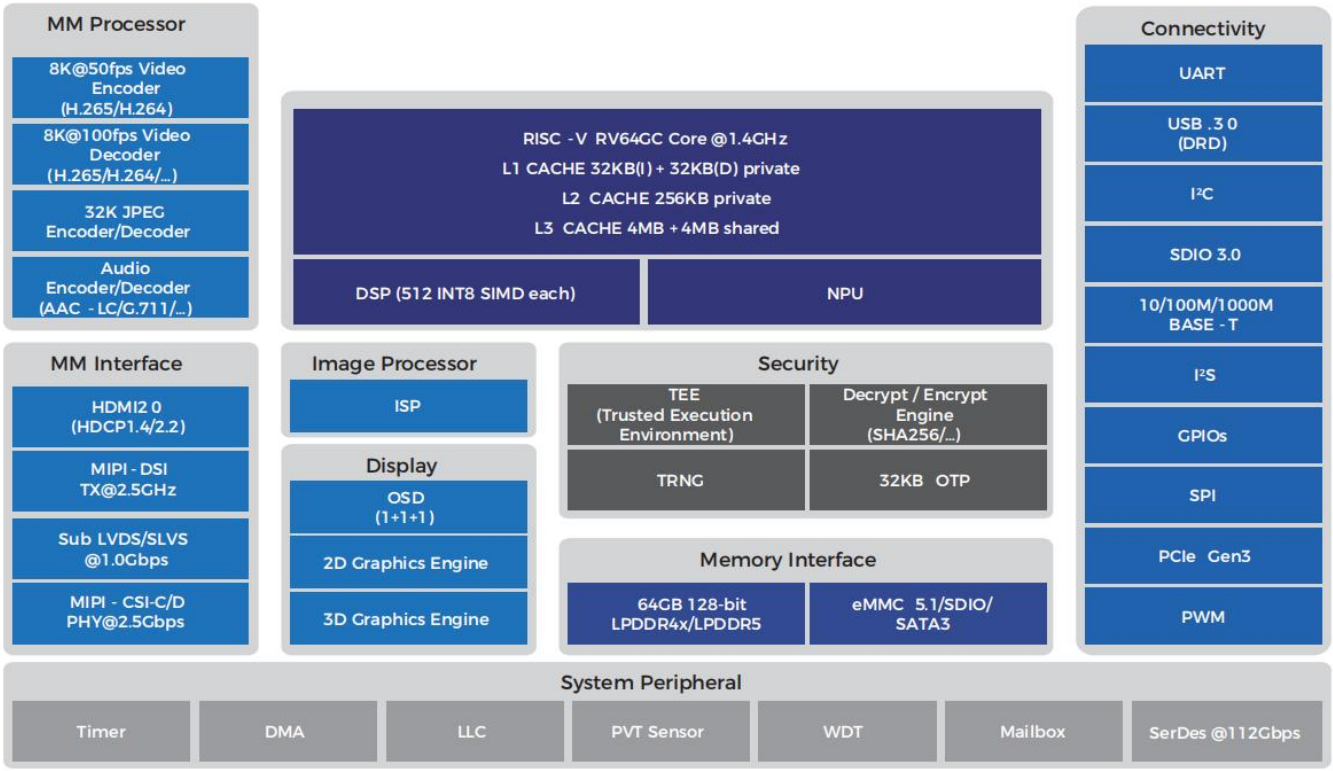
ESWIN

EIC7702 is an IC with high computation. It has 64-bit high-performance RISC-V CPU (processors) and self-developed efficient NPU, also it supports full-stack floating-point computing and comprehensively accelerating generative LLM. The product has rich peripheral expansion interfaces, strong capabilities of audio and video processing, high adaptability in the field of AI PC.

Highlights

- **The Powerful RISC-V CPU:** 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:** High-performance 3D graphics processing capability
- **High Computation:** Up to 26.6 TOPS in INT8, 13.3 TOPS in INT16, and 13.3 FTOPS in FP16
- **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. Support audio codecs such as ACC-LC, G.711, G.722.1, etc.
- **Security and Reliability:** Hardware encryption engine supports the algorithms of TEE, TRNG, RSA, 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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Chip Packaging

- FC-BGA 35 x 35 mm^2

Application Scenarios

- Office
- Gaming
- Video
- Internet

Parameters

CPU	• RISC-V RV64GC 8 cores @1.4GHz • L1 Cache 32KB(I) + 32KB(D) private L2 Cache 256KB private L3 Cache 4MB + 4MB shared • Support ECC (support SECDED)
DNN Acceleration Units	• Up to 26.6 TOPS in INT8, 13.3 TOPS in INT16, and 13.3 FTOPS in FP16
Vision DSP	• Multiple DSP cores, support 512 INT8 SIMD each
Memory	• Up to 64GB 128-bit LPDDR 4/4x/5
Video Decoder/ Encoder	• Support HEVC (H.265) and AVC (H.264) encoding and decoding • H.265 up to 8K@100fps or 64-channel 1080P@30fps video decoding • H.265 up to 8K@50fps or 26-channel 1080P@30fps video encoding
JPEG Codec	• JPEG ISO/IEC 10918-1, ITU-T T.81, up to 32K x 32K
Vision Engine	• HAE x2 (Bitblit, Crop, Resize, Normalization...) • 3D GPU x2 (support OpenGL-ES 3.2, EGL 1.4, OpenCL 1.2/2.1 EP2, Vulkan 1.2, Android NN HAL) • OSD x2 (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 up to 8 cameras input • Single channel supports up to 4-Lane MIPI D-PHY/3-Trio C-PHY interface, up to 2.5Gbps/Lane • Single channel supports up to 4-Lane LVDS/Sub-LVDS/HiSPi interface, up to 1.0Gbps/Lane

	• Video out: HDMI 2.0 x2 (support H DCP 1.4/2.2), 4-lane MIPI-DSI TX 2.5GHz x2
External Memory	• eMMC 5.1 x2, SDIO 3.0 x2, SATA3 (6Gb/s) x2, SPI NOR Flash x2
Peripheral Devices and Interfaces	• USB 3.0/2.0 (DRD) x4, 4-lane PCIe 3.0 (RC+EP) x2, GMAC (RGMII interface) x4 • I^2C @ 1Mbps x24, UARTs x10, SPI x4, I^2S (slave + master) x6
Security	• TEE, TRNG, ECDSA, RSA, AES, SM4, DES, HMAC, CRC32, Dual core hardware acceleration 32KB OTP
Power	• Typical 15W
Temperature	• -20°C ~ 105°C