

Unlock 4K Brilliance: Amlogic S922X Octa-Core Android TV Box

| Specifications | |
|-------------------------|---|
| Model No. | Amlogic S922X Android TV Box |
| CPU | Amlogic S922X Quad Core ARM Cortex A73 and Dual Core ARM Cortex A53 1.98Ghz |
| GPU | ARM Mali-G52 MP4 (6EE) OpenGL ES 3.2, Vulkan 1.1 and OpenCL 2.0 |
| RAM | DDR4 2GB/4GB |
| ROM | 16GB eMMC (Expandable up to 128GB) |
| OS | Android 9.0 |
| Video&Audio CODEC | |
| Decoding resolution | Support 4K H265 10Bit, H.264, AVS, MPEG-2 and many other formats |
| Multimedia Support | Support MPEG1, MPEG2, MPEG4, H.264, WMV, MKV, TS, flv and other video formats; Support MP3 and other audio formats; support JPG, JPEG, BMP, PNG, GIF and other photo formats |
| Port | |
| Video output | 1 channel LVDS 40-pin 2.0mm double-pin, can support 8bit, 10bit screen; 1 channel HDMI output; 1 channel AV output |
| Video input | x1, MIPI CSI |
| Audio ouput | 4-pin 2.5mm socket 25W@2 amplifier and 3W@2 speaker |
| Network interface | x1, 10M/100M Ethernet WIFI+BT, 2.4G single band or 2.4G/5G dual band for options PCIE slot (4G) x1 or M.2 slot (4G) x1 for options |
| USB2.0 interface | USB OTG x1 (available for HOST) USB HOST x7 |
| Backlight interface | x2, 6-pin 2.0mm socket |
| Infrared interface | x1, 7-pin 2.0mm socket, supports both red and green LED indicators |
| Function expansion port | Serial ports x4 |
| TF card slot | x1 |
| SIM card slot | x1 |
| RTC | Supports time synchronization |
| Power | |
| Power Supply | 12V, 2.5DC Connector |

This product is the network Android system motherboard, which is suitable for intelligent display terminal equipment, industrial automation terminal, computer vision/algorithm, 3D experience, game/entertainment equipment, high-performance Face Recognition calculation/storage, AI intelligence with high performance requirements. It can be widely used as the high-end demand intelligent mainboard of finance, advertising, security, transportation, public transportation and other industries.

This product adopts the latest generation of 12 nm ultra-low power AI chip s922x of Amlogic. It is an advanced application processor, integrating a powerful CPU, GPU subsystem, secure 4K video codec engine and first-class HDR image processing. The CPU of S922x main system adopts large and small architecture, which integrates four core arm cortex-a73 CPU cluster and dual core cortex-a53 cluster with unified secondary cache to improve system performance. Each CPU core includes a separate neon SIMD coprocessor to improve the software media processing capacity. Ave-10 can decode 4kx2k resolution video at a speed of 75 frames/second, and has a complete trusted video path (TVP) for security applications, supporting complete formats, including: MVC, MPEG-1/2/4, vc-1/WMV, AVS, AVS +, avs2 realvideo, MJPEG stream, H.264, h265-10, VP9 and JPEG pictures without size restrictions. The independent encoder can encode JPEG or h.265/h.264 format, up to 1080p, 75 frames per second. It supports 4kx2k @ 60fp (3840 * 2160) output of hdmi2.2 interface and 4K point screen of V by one interface. It supports HDCP 2.2, stereo audio DAC, CVBS output, 4-channel Mipi DSI interface, multi TDM, PCM, I2S and SPDIF digital audio I/O interface, 8-Channel

far-field PDM digital microphone (dmic) input and DVP camera interface. The product comes with 2x2 WiFi (supporting 2.4G and 5.8G dual frequency) + 4.1 wireless network module, supporting Gigabit Ethernet interface and infrared remote control, keyboard and mouse operation.

Highlights

- o Amlogic 64-bit quad core ARM® Cortex™ A73 CPU and dual core ARM® Cortex™ A53 CPU
- o ARM Mali-G52 MP4 GPU processor
- o HW UHD 4K@60fps 10-bit video decoder & low latency 1080p H.265/H.264 60fps encoder
- o Dolby Vision and HDR10, HDR10+, HLG and PRIME HDR video processing
- o Built-in Cortex-M4 core for always-on processing
- o TrustZone based security for DRM video streaming
- o WIFI, BT, USB, SD, Ethernet, Analog Audio
- o Power management auxiliary processor

Amlogic S922X is an advanced application processor designed for Android hybrid OTT/IPTV Set Top Box (STB) and high-end media box applications. It integrates a powerful CPU, GPU subsystem, a secured 4K video CODEC engine and a best-in-class HDR image processing pipeline with all major peripherals to form the ultimate high-performance multimedia AP.

The main system CPU is based on Big. Little architecture which integrates a quad-core ARM Cortex-A73 CPU cluster and a dual-core Cortex-A53 cluster with unified L2 cache to improve system performance. Each CPU core includes the separate NEON SIMD co-processor to improve software media processing capability.

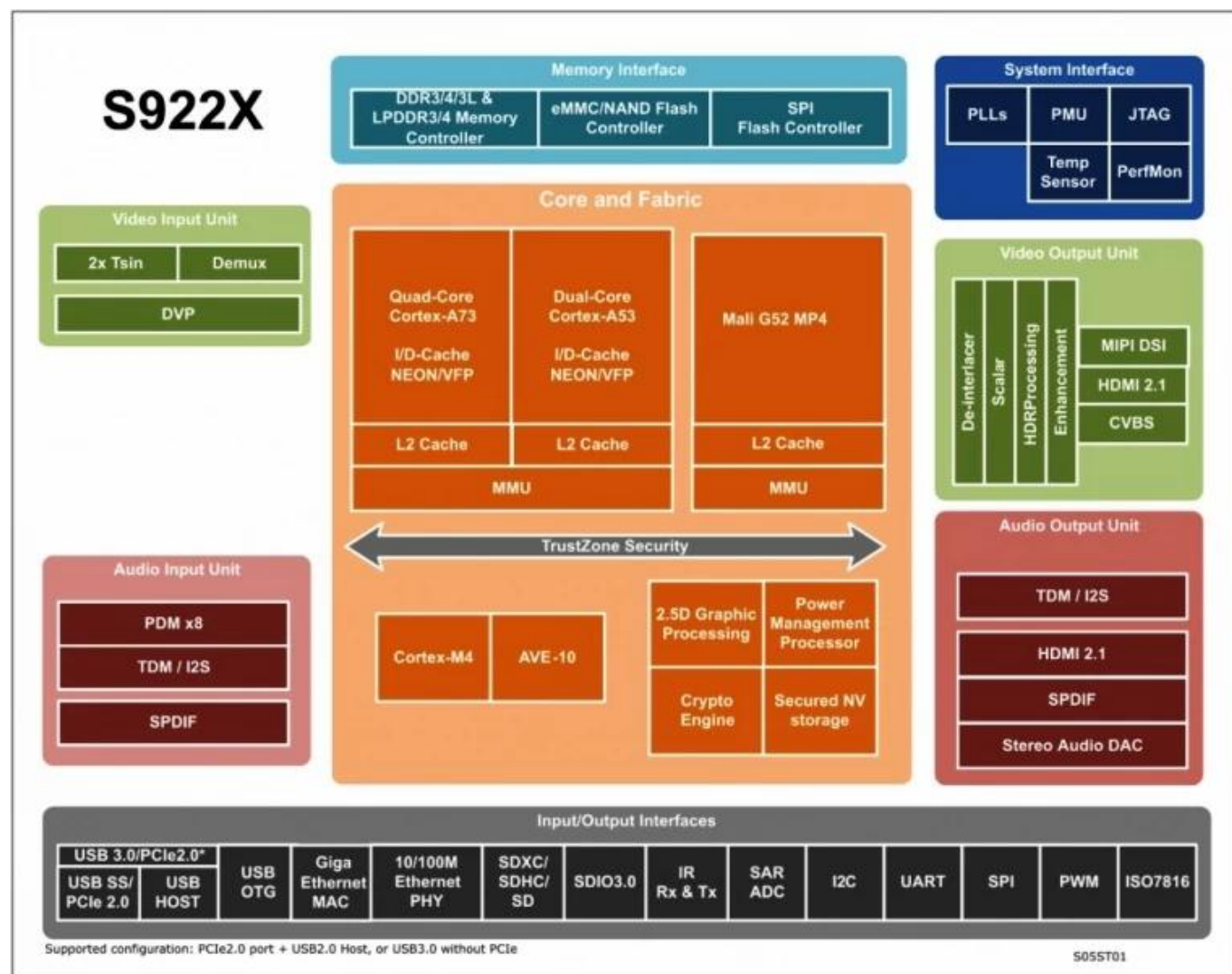
The graphic subsystem consists of two graphic engines and a flexible video/graphic output pipeline. The ARM Mali-G52 MP4 GPU handles all OpenGL ES 3.2 Vulkan 1.0 and OpenCL 2.0 graphic programs, while the 2.5D graphics processor handles additional scaling, alpha, rotation and color space conversion operations. Together, the CPU and GPU handle all operating system, networking, user-interface and gaming related tasks. The video output pipeline includes Dolby Vision optional HDR10, HDR10+, HLG and PRIME HDR processing, REC709/BT2020 processing, motion adaptive edge enhancing de-interlacing, flexible programmable scalar, and many picture enhancement filters before passing the enhanced image to the video output ports.

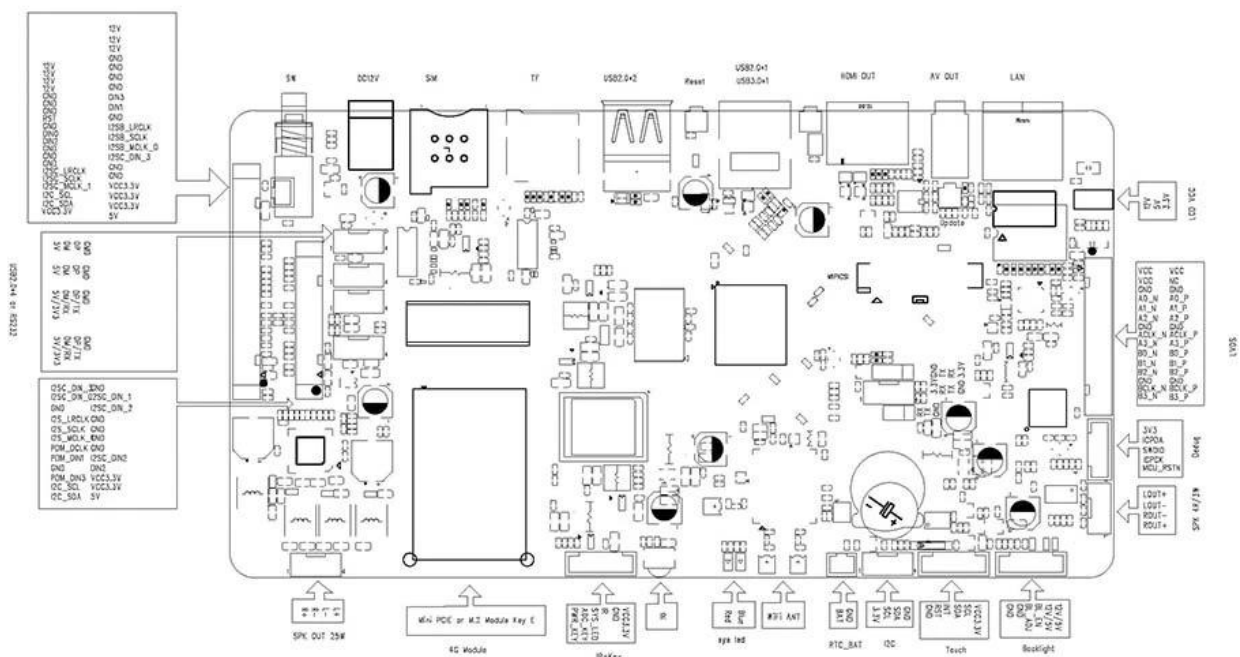
Amlogic Video Engine (AVE-10) offloads the Cortex-A53 CPUs from all video CODEC processing. It includes dedicated hardware video decoder and encoder. AVE-10 is capable of decoding 4Kx2K resolution video at 75fps with complete Trusted Video Path (TVP) for secure applications and supports full formats including MVC, MPEG-1/2/4, VC-1/WMV, AVS, AVS+, AVS2 RealVideo, MJPEG streams, H.264, H.265-10, VP9 and also JPEG pictures with no size limitation. The independent encoder is able to encode in JPEG or H.265/H.264 up to 1080p at 60fps.

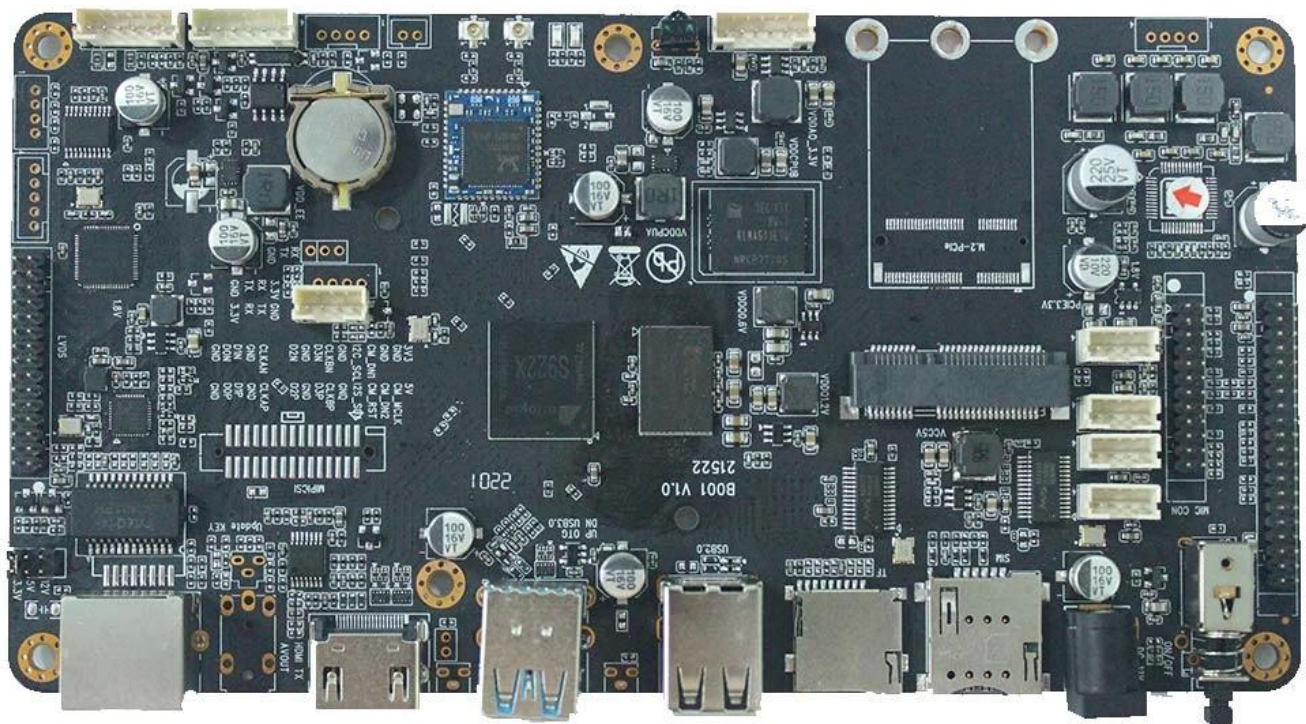
Amlogic S922X integrates all standard audio/video input/output interfaces including a HDMI 2.1 transmitter with 3D, Dynamic HDR, CEC and HDCP 2.2 support, stereo audio DAC, a CVBS output, 4-lane MIPI DSI interface, multiple TDM, PCM, I2S and SPDIF digital audio input/output interfaces, 8 channel far-field PDM digital microphone (DMIC) inputs and a DVP camera interface.

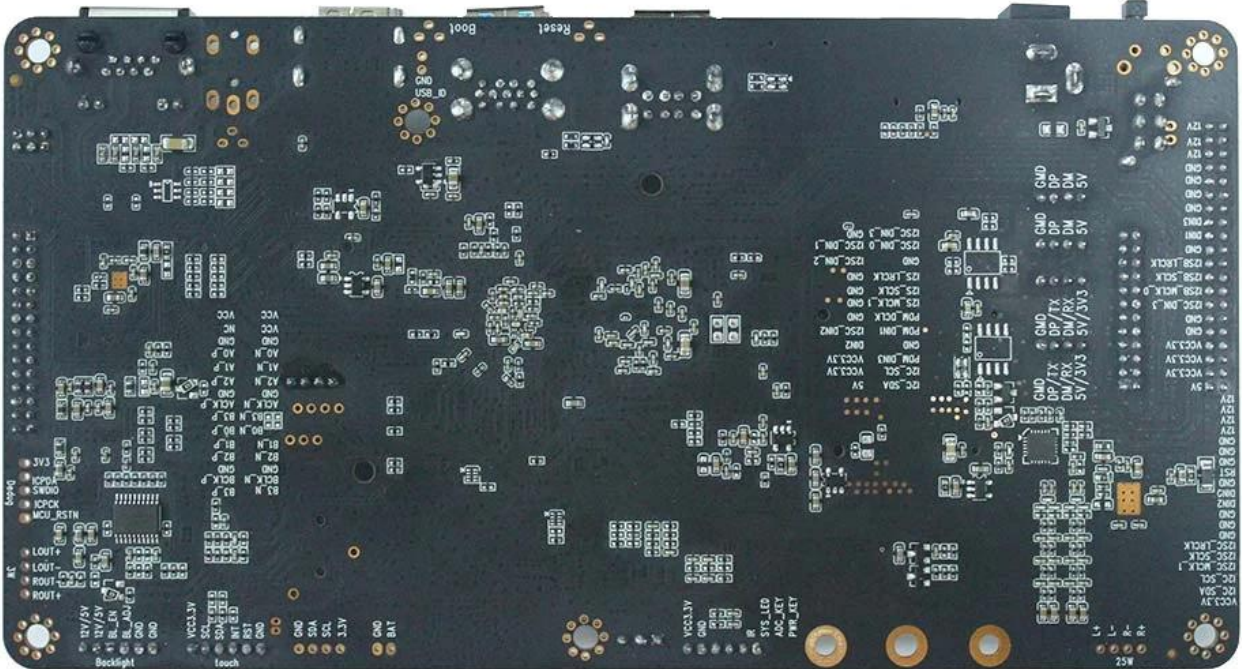
Amlogic S922X also integrates a set of functional blocks for digital TV broadcasting streams. The built-in two demux can process the TV streams from the serial and parallel transport stream input interface, which can connect to external tuner/demodulator.

The processor has rich advanced network and peripheral interfaces, including a 10/100/1000M Ethernet MAC with RGMII, 10/100M Ethernet PHY, one USB XHCI OTG 2.0 port, one USB3.0 and PCIe









Board Introduction

Amlogic S922X Android Development Board multimedia network player-LCD driver integrated board adopts Amlogic S922X 12nm high-end chip, which supports UHD 4K@60fps hardware video decoding. It also supports supports H.265 10-bit, H.264 and AVS+ and many other formats. Support HDR10 and HLG high dynamic range processing, with multi-channel UART and USB interfaces. Support Bluetooth, WIFI, 4G and Ethernet functions. Support AV serial use, SD card expansion. Perfectly supports all kinds of touch screens, suitable for high-performance intelligent display terminal equipment, industrial automation terminal, computer vision/algorithm, 3D experience, game/amusement equipment, high-performance face recognition computing/storage, AI intelligence, etc. It can be widely used as a high-end intelligent motherboard for various industries such as finance, advertising, security, transportation, and public transportation.

(1) With various interfaces

- 1 channel LVDS video output (40pins)
- 1 channel HDMI video output
- 5 channels USB2.0
- 4 channels RS232 (can be modified to USB2.0 by patch)
- 1 channel MIPI CSI
- 1 channel AV output

- 1 channel I2C
- I2SC/IS2B
- 1 channel 25W super power amplifier and 3W speaker interface
- (2) Hybrid networking to break through network constraints
- Support wired, WiFi and 4G access, can realize multi-network hybrid networking
- (3) Easy to operate & fast maintenance
- Support breakpoint playback
- Super multi-period timing switch function
- Support U disk loading or direct playback
- Support automatic repair, remote upgrade, intelligent domain name resolution

Chip Performance

CPU Sub-system

- (1) Quad Core ARM Cortex-A73 and Dual Core ARM Cortex-A53 CPU
- (2) ARMv8-A architecture with Neon and Crypto extensions
- (3) Unified system L2 cache
- (4) Build-in Cortex-M4 core for always on processing
- (5) Advanced TrustZone security system
- (6) Application based traffic optimization using internal QoS-based switching fabrics

3D Graphics Processing Unit

- (1) ARM Mali-G52 MP4 (4ppc) GPU
- (2) 8-wide warps, 2x dual texture pipe, 6x8-wide execution engines (EE)
- (3) Concurrent multi-core processing
- (4) OpenGL ES3.2, Vulkan 1.0 and OpenCL 2.0 support

Video/Picture CODEC

- (1) Amlogic Video Engine (AVE) with dedicated hardware decoders and encoders
- (2) Support multi-video decoder up to 4Kx2K@60fps+1x1080P@60fps
- (3) Supports multiple "secured" video decoding sessions and simultaneous decoding and encoding
- (4) Video/Picture Decoding
 - VP9 Profile-2 up to 4Kx2K@60fps
 - H.265 HEVCMP-10@L5.1 up to 4Kx2K@60fps
 - AVS2-P2 Profile up to 4Kx2K@60fps
 - H.264 AVCHP@L5.1 up to 4Kx2K@30fps
 - H.264 MVC up to 1080P@60fps
 - MPEG-4 ASP@L5 up to 1080P@60fps (ISO-14496)
 - WMV/VC-1 SP/MP/AP up to 1080P@60fps
 - AVS-P16(AVS+) /AVS-P2 JiZhun Profile up to 1080P@60fps
 - MPEG-2 MP/HL up to 1080P@60fps (ISO-13818)
 - MPEG-1MP/HL up to 1080P@60fps (ISO-11172)
 - RealVideo 8/9/10 up to 1080P@60fps
- Multiple language and multiple format sub-title video support
- MJPEG and JPEG unlimited pixel resolution decoding (ISO/IEC-10918)
- Supports JPEG thumbnail, scaling, rotation and transition effects
- Supports *.mkv, *.wmv, *.mpg, *.mpeg, *.dat, *.avi, *.mov, *.iso, *.mp4, *.rm and *.jpg file formats
- (5) Video/Picture Encoding
 - Independent JPEG and H.265/H.264 encoder with configurable performance/bit-rate
- JPEG image encoding
- H.265/H.264 video encoding up to 1080P@60fps with low latency

Video Output

- (1) Built-in HDMI 2.1 transmitter including both controller and PHY with CEC, Dynamic HDR and HDCP 2.2, 4Kx2K@60 max resolution output
- (2) CVBS 480i/576i standard definition output

- (3) Supports all standard SD/HD/FHD video output formats: 480i/p, 576i/p, 720p, 1080i/p and 4Kx2K
- (4) 4-lane MIPI DSI interface, resolution up to 1920*1080 with rotation and panel calibration

Chip Performance

CPU Sub-system

- (7) Quad Core ARM Cortex-A73 and Dual Core ARM Cortex-A53 CPU
- (8) ARMv8-A architecture with Neon and Crypto extensions
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- (10) Build-in Cortex-M4 core for always on processing
- (11) Advanced TrustZone security system
- (12) Application based traffic optimization using internal QoS-based switching fabrics

3D Graphics Processing Unit

- (5) ARM Mali-G52 MP4 (4ppc) GPU
- (6) 8-wide warps, 2x dual texture pipe, 6x8-wide execution engines (EE)
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Video/Picture CODEC

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VP9 Profile-2 up to 4Kx2K@60fps

H.265 HEVCMP-10@L5.1 up to 4Kx2K@60fps

AVS2-P2 Profile up to 4Kx2K@60fps

H.264 AVC@L5.1 up to 4Kx2K@30fps

H.264 MVC up to 1080P@60fps

MPEG-4 ASP@L5 up to 1080P@60fps (ISO-14496)

WMV/VC-1 SP/MP/AP up to 1080P@60fps

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MJPEG and JPEG unlimited pixel resolution decoding (ISO/IEC-10918)

Supports JPEG thumbnail, scaling, rotation and transition effects

Supports *.mkv, *.wmv, *.mpg, *.mpeg, *.dat, *.avi, *.mov, *.iso, *.mp4, *.rm and *.jpg file formats

(10) Video/Picture Encoding

Independent JPEG and H.265/H.264 encoder with configurable performance/bit-rate

JPEG image encoding

H.265/H.264 video encoding up to 1080P@60fps with low latency

Video Output

- (5) Built-in HDMI 2.1 transmitter including both controller and PHY with CEC, Dynamic HDR and HDCP 2.2, 4Kx2K@60 max resolution output
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- (8) 4-lane MIPI DSI interface, resolution up to 1920*1080 with rotation and panel calibration

Experience the future of entertainment with our Amlogic S922X Octa-Core Ultra HD 4K [Android TV Box](#). This high-performance TV box is your gateway to a world of stunning visuals and endless streaming possibilities.