

High Picture Quality 4K STB solution

Overview

H616 is a new-generation high picture quality 64-bit 4K@60fps decoding SoC provided by Allwinner for the OTT and IPTV markets. It integrates the quad core 64-bit Cortex™-A53 processor, and the new G31 GPU engine of ARM that supports OpenGL ES 3.2/Vulkan 1.1. Besides, H616 supports full-format 4K@60fps 10-bit ultra-HD video decoding, Allwinner self-developed SmartColor3.3™ picture enhancement engine, Dolby, and DTS audio processing. H616 adopts the new generation of power consumption technology, and reduces power consumption of 20% than the last generation.

Highlights

- **Quad core ARM Cortex™-A53, 64-bit architecture**
- **High performance multi-core G31 GPU, supporting OpenGL ES 3.2/Vulkan 1.1**
- **Full formats H.265/VP9/AVS2 4K@60fps decoding**
- **Maximum 6K@30fps H.265 decoding performance**
- **Low latency H.264 4K@25fps video encoding**
- **Supports HDR10, HLG**
- **SmartColor™ 3.3 picture enhancement engine**

Features

CPU

- Quad-core ARM Cortex™-A53

GPU

- G31 MP2
- Supports OpenGL ES 3.2/2.0/1.0, Vulkan 1.1, OpenCL 2.0

Memory

- 32-bit DDR4/DDR3/DDR3L/LPDDR3/LPDDR4 interface, supporting maximum capacity of 4GB
- SD3.0/eMMC5.0 interface
- 8-bit Nand flash interface with maximum 80-bit/1KB ECC

Video Engine

Video decoder:

- H.265 Main10@L5.1 decoder up to 4K@60fps or 6K@30fps
- VP9 Profile 2 decoder up to 4K@60fps
- AVS2 JiZhun 10bit decoder up to 4K@60fps
- H.264 BP/MP/HP@L4.2 decoder up to 4K@30fps
- Multi-format 1080p@60fps video playback formats, including H.264 BP/MP/HP, H.263 BP, VP8, MPEG-1 MP/HL, MPEG-2 MP/HL, MPEG-4 SP/ASP@L5, AVS+/AVS JiZhun, WMV9/VC1, etc

Video encoder:

- H.264 BP/MP/HP encoder up to 4K@25fps or 1080p@60fps
- JPEG snapshot performance of 1080p@60fps

Display and Graphic

- Output size up to 4096 x 2048
- Six alpha blending channels for main display
- Four overlay layers in each channel, and has an independent scaler
- Potter-duff compatible blending operation
- Supports AFBC buffer
- Supports keystone correction
- Frame Packing/Top-and-Bottom/Side-by-Side Full/Side-by-Side Half 3D format data
- Supports 10-bit processing path for HDR video
- Supports SDR/HDR10/HLG EOTF and color space conversion
- Supports SmartColor™ 3.3 for excellent display experience
- Supports one hardware accelerator for 2D graphic
- Supports one de-interlacing module

Display Output

- HDMI 2.0a up to 4K@60fps
- TV CVBS output, supporting PAL/NTSC

Package

- TFBGA 284balls
- 14 mm x 12 mm body size, 0.65 mm ball pitch, 0.35 mm ball size

Audio

- Two DAC channels
- Supports 1 audio output interface (differential LINEOUTP/N or single-end LINEOUTL/LINEOUTR)
- One Audio HUB, supporting internal mixing function
- Embedded 3 I2S/PCM (I2S0 for extended audio codec, I2S2 for BT, I2S3 for digital power amplifier)
- Supports Left-justified, Right-justified, Standard I2S mode, PCM mode, and TDM mode
- I2S mode supports 8 channels, and 32-bit/192kbit sample rate
- I2S and TDM modes support maximum 16 channels, and 32-bit/96kbit sample rate
- One OWA OUT interface, supporting 16-/20-/24-bit inputs and outputs
- Integrated digital microphone(DMIC), supporting maximum 8 digital PDM microphones

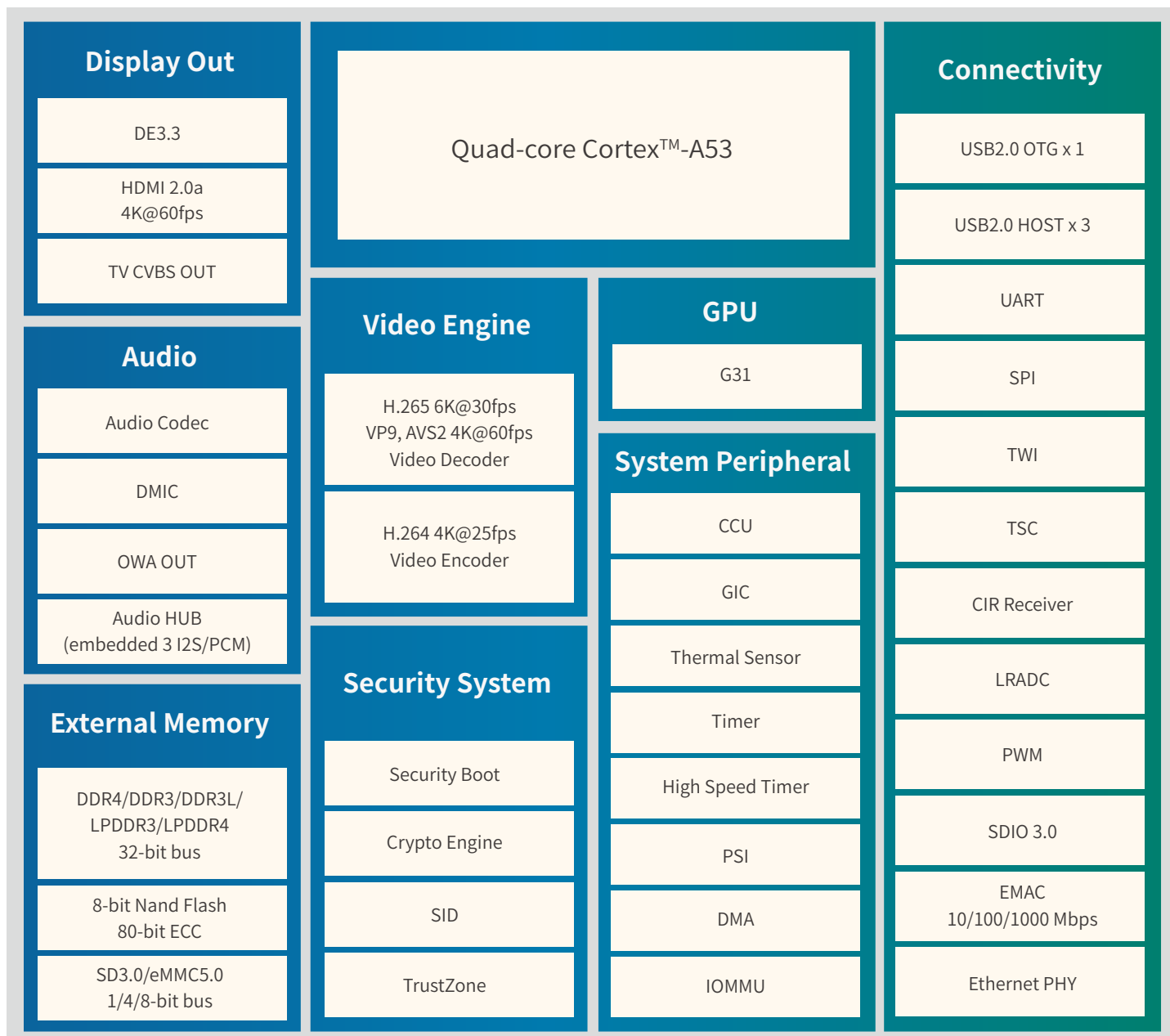
Security Engine

- Supports Full Disk Encryption
- AES, DES, 3DES, and XTS encryption and decryption algorithms
- MD5, SHA, and HMAC tamper proofing
- RSA, ECC signature and verification algorithms
- Supports 160-bit hardware pseudo random number generator(PRNG)
- Supports 256-bit hardware true random number generator(TRNG)
- Integrated one EFUSE for chip ID and security application

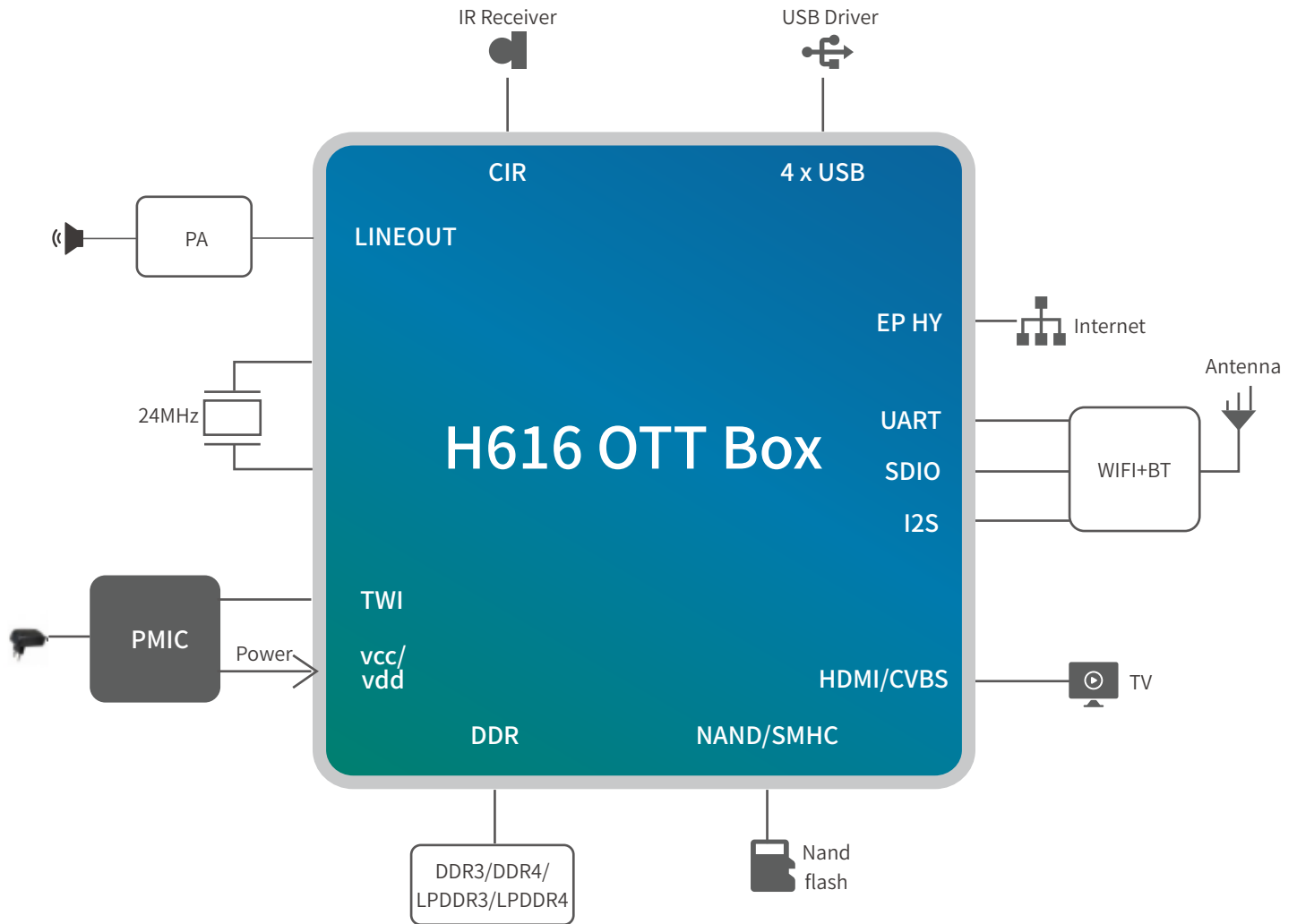
Connectivity

- 3 x USB2.0 Host, 1 x USB2.0 OTG
- One 10/100/1000 Mbps Ethernet port with RGMII and RMII interfaces
- One 100Mbps Ethernet port with PHY
- SDIO 3.0, TSC, CIR Receiver
- TWI, SPI, UART
- PWM, LRADC

Block Diagram



OTT Box Solution



ABOUT ALLWINNER

Allwinner Technology is a leading fabless design company dedicated to smart application processor SoCs and smart analog ICs. Its product line includes multi-core application processors for smart devices and smart power management ICs used by brands worldwide.

With its focus on cutting edge UHD video processing, high performance multi-core CPU/GPU integration, and ultra-low power consumption, Allwinner Technology is a mainstream solution provider for the global tablet, internet TV, smart home device, automotive in-dash device, smart power management, and mobile connected device markets. Allwinner Technology is headquartered in Zhuhai, China.

CONTACT US

For more product info, please contact service@allwinnertech.com, or scan the QR code to follow us on Wechat.

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