Allwinner

H8vr Octa-core
VR Video Standalone Solution

Overview

Allwinner H8vr is an octa-core ARM Cortex™-A7 processor targeted at the virtual reality(VR) market.It is highly competitive in term of system cost thanks to its high system integration and is capable of delivering excellent user experience while maintaining low power consumption.Allwinner is committed to providing a platform to utilize the benefits of this technology by promoting the healthy development of VR within its ecosystem of partners and beyond.Our solutions are deeply optimized to provide users with the best possible experience. In order to achieve this we have targeted and improved features such as increasing the refresh rate, reducing lag, increasing resolution and improving tracking. Our goal is to create solutions that can bridge the gap from concept to reality and in turn proliferate the adoption of VR by mainstream users.

Highlights

Low heat

Supports hardware acceleration of 4K virtual reality videos, which could reduce CPU/GPU load; Supports multi-power domain management and improve the power conversion rate directly. The power consumption of complete machine is less than 480mA(except screen), which really done well in the market.
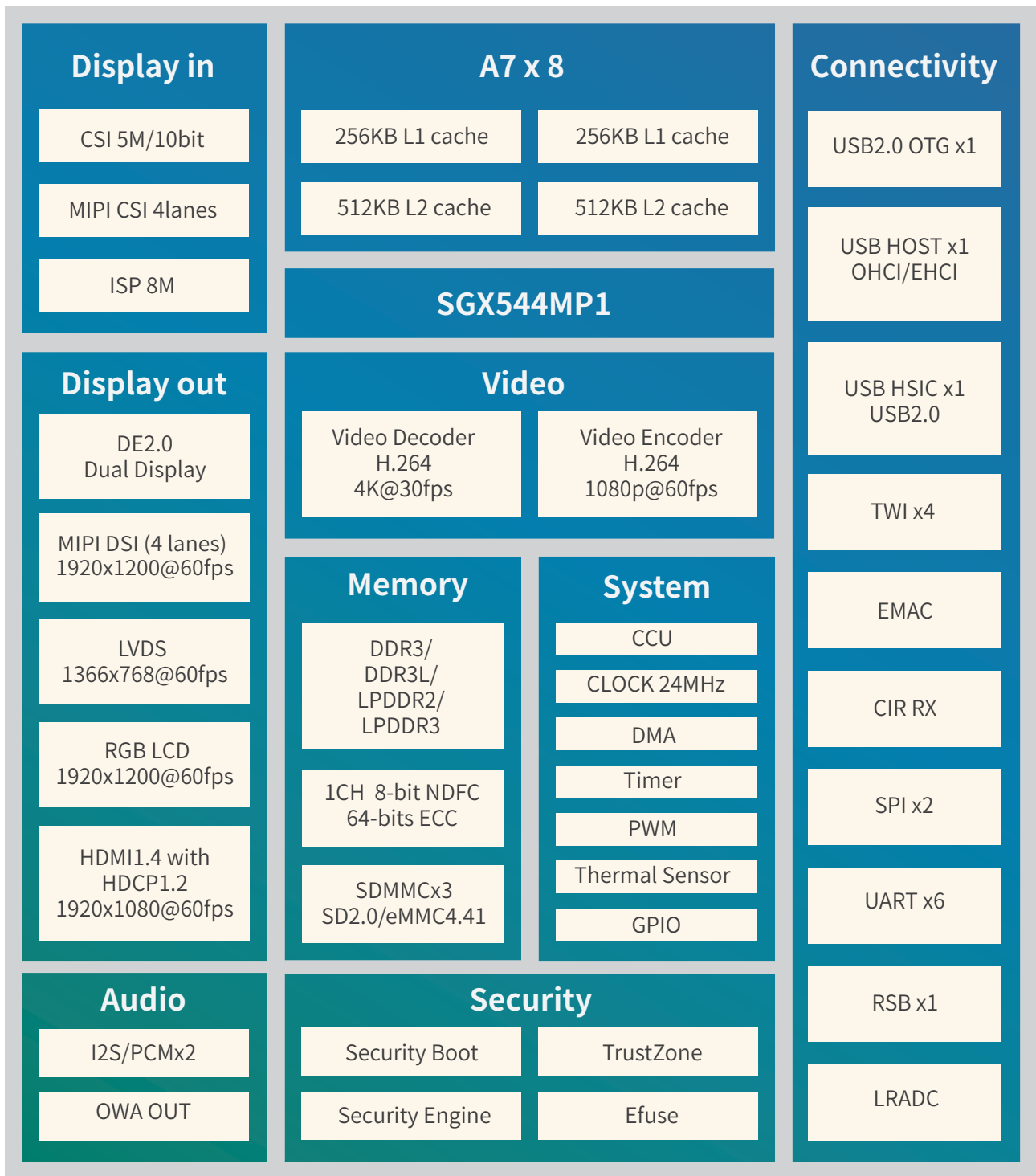
Less nauseous

The nauseous mainly related to image definitionand dispaly latency. H8vr supports OLED low persistence and 4K decoding, up to 16 pixel each degree in sight; The render thread could follow the head tracking algorithm to forecast the orientation and draw the image to be displayed, which could lower the latency directly.

High level ofintegration

Low power consumption makes the battery smaller and lighter, the average weight of complete machine is less than 400g; High level of integration enables the PCB board to be quiet small, the quantity of peripheral devices is less than 400, which greatly improved the wearing comfort level for users.

Features

CPU	• Octa-Core ARM Cortex™-A7 • Low-power CoolFlex™ power management architecture
GPU	• PowerVR SGX544 • Supports OpenGL ES 2.0/1.1, OpenCL 1.1, DX 9_3
Memory	• Supports 32-bit DDR3/DDR3L/LPDDR3/LPDDR2 • Supports 8-bit SLC/MLC/EF NAND with 64-bit ECC • Supports eMMC
Video	• Supports H.264 4K@30fps panoramic video playback • Supports multi-format 1080p@60fps video playback, including H.264 BP/MP/HP, VP8, MPEG1/2, MPEG4 SP/ASP GMC, H.263 including Sorenson Spark, WMV9/VC-1, JPEG/MJPEG, etc • Supports H.265/VP9 1080p@30fps video playback • Supports H.264 1080p@60fps or 720p@120fps video capture
Audio	• Supports spatial audio
Graphic	• Supports 16K panorama JPEG decoding
Display	• Supports MIPI 1080p@60fps • Supports hardware backed side-by-side display
Connectivity	• USB Host, USB Dual-Role (host/device) • 2x SPI, 4x TWI, 6x UART, RSB • 3x SD/MMC • 2x I2S/PCM • CIR, LRADC
Sensor	• Supports 9-axis sensor, including accelerometer, gyroscope, magnetometer • Supports ambient light and proximity sensor
Wifi	• Supports ac/b/N/g/a
OS	• Android 4.4 and above
PMIC	• Customized AXP818 PMIC
Package	• FCBGA 345 • 14mm x 14mm size
Process	• TMSC's 28nm HPC

Block Diagram

Display in
- CSI 5M/10bit
- MIPI CSI 4lanes
- ISP 8M

A7 x 8
- 256KB L1 cache
- 256KB L1 cache
- 512KB L2 cache
- 512KB L2 cache

SGX544MP1

Connectivity
- USB2.0 OTG x1
- USB HOST x1 OHCI/EHCI
- USB HSIC x1 USB2.0
- TWI x4
- EMAC
- CIR RX
- SPI x2
- UART x6
- RSB x1
- LRADC

Display out
- DE2.0 Dual Display
- MIPI DSI (4 lanes) 1920x1200@60fps
- LVDS 1366x768@60fps
- RGB LCD 1920x1200@60fps
- HDMI1.4 with HDCP1.2 1920x1080@60fps

Video
- Video Decoder H.264 4K@30fps
- Video Encoder H.264 1080p@60fps

Memory
- DDR3/ DDR3L/ LPDDR2/ LPDDR3
- 1CH 8-bit NDFC 64-bits ECC
- SDMMCx3 SD2.0/eMMC4.41

System
- CCU
- CLOCK 24MHz
- DMA
- Timer
- PWM
- Thermal Sensor
- GPIO

Audio
- I2S/PCMx2
- OWA OUT

Security
- Security Boot
- TrustZone
- Security Engine
- Efuse