

# The RISC-V

## Multi-Media Decoding Platform SoC

### Overview

D1 is an advanced application processor designed for RISC-V Multi-Media decoding platform. It integrates a 64-bit XuanTie C906 RISC-V CPU and a HiFi4 DSP to provide the high-efficient computing power. D1 supports full format decoding such as H.265, H.264, MPEG-1/2/4, JPEG, VC1, and so on. The independent encoder can encode in JPEG or MJPEG. Integrated multi ADCs/DACs and I2S/PCM/DMIC/OWA audio interfaces can work seamlessly with the CPU to accelerate multimedia algorithms and improve the user experience. D1 supports RGB/LVDS/MIPI DSI/HDMI/CVBS OUT display output interfaces to meet the requirements of the different screen display. D1 comes with extensive connectivity and interfaces, such as USB, SDIO, EMAC, TWI, UART, SPI, PWM, GPADC, LRADC, TPADC, IR TX&RX, and so on. Besides, D1 can connect with other different peripherals like WiFi and BT via SDIO and UART.

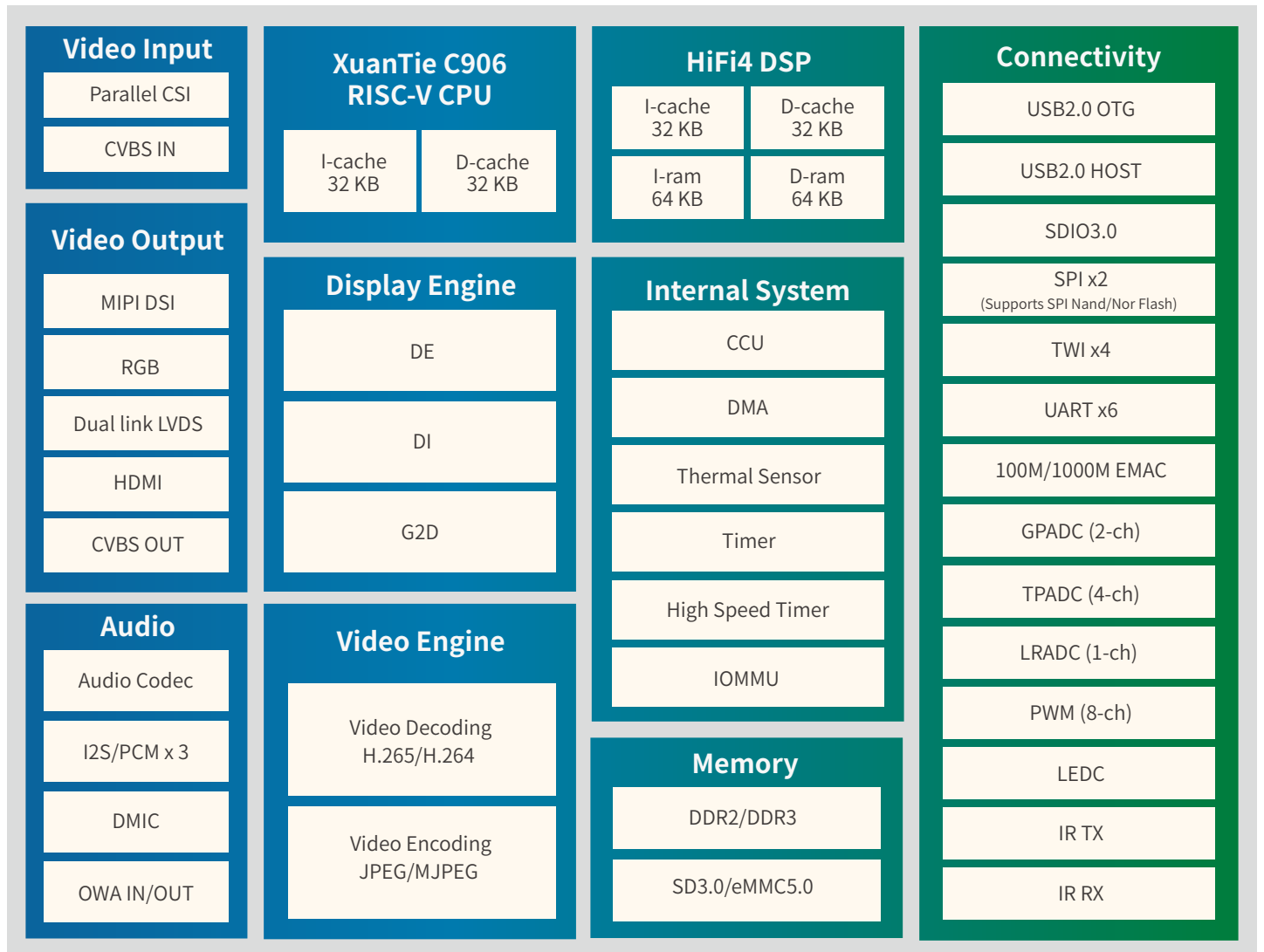
### Highlights

- D1 integrates 64-bit XuanTie C906 RISC-V CPU to provide energy-efficient and stable computing power.
- D1 integrates H.265/H.264 4K decoding and SmartColor2.0 post processing to deliver the perfect video entertainment experience.
- D1 supports high performance 3 ADCs, 2 DACs, 3 I2S/PCM, 8 digital microphones to provide the perfect voice interaction solutions.
- Rich peripheral interfaces, such as RGB, LVDS, MIPI DSI, USB, SDIO, EMAC, TWI, UART, SPI, PWM, GPADC, LRADC, TPADC, IR TX&RX, and so on, greatly facilitate product expansion.
- The advanced process design with lower voltage and lower leakage, the power optimization design for typical scenes, and the enhanced heat dissipation package improve the heating experience of the product.
- Industrial level working temperature, 10-years chip life.

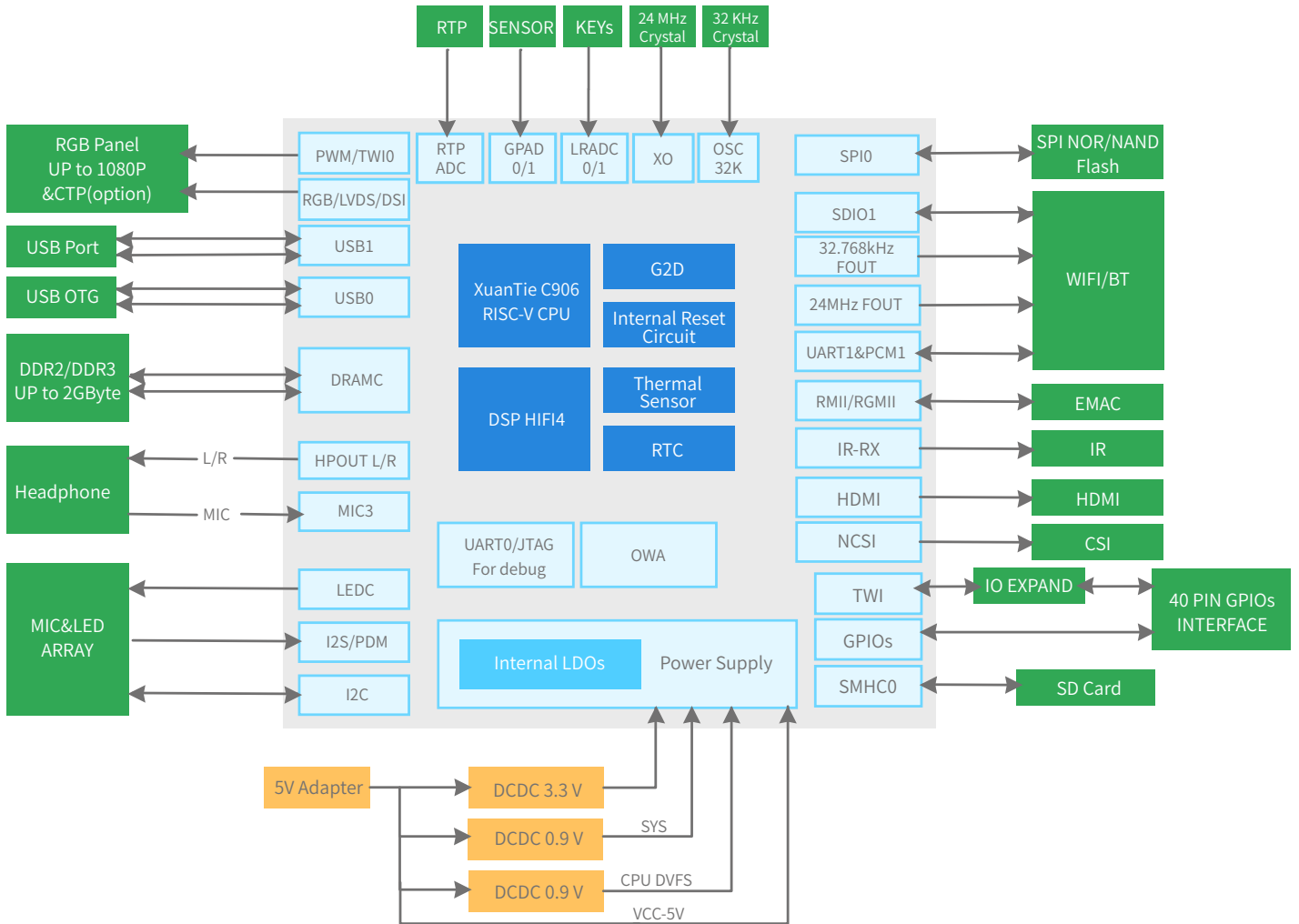
## Features

CPU	<ul style="list-style-type: none"> <li>• XuanTie C906 RISC-V CPU</li> <li>• 32 KB I-cache + 32 KB D-cache</li> </ul>
DSP	<ul style="list-style-type: none"> <li>• HiFi4 DSP</li> <li>• 32 KB I-cache + 32 KB D-cache</li> <li>• 64 KB I-ram + 64 KB D-ram</li> </ul>
Memory	<ul style="list-style-type: none"> <li>• DDR2/DDR3, up to 2 GB</li> <li>• SD3.0/eMMC 5.0, SPI Nor/Nand Flash</li> </ul>
Video Engine	<ul style="list-style-type: none"> <li>• Video decoding <ul style="list-style-type: none"> <li>- H.265 up to 1080p@60fps, or 4K@30fps</li> <li>- H.264 up to 1080p@60fps, or 4K@24fps</li> <li>- MPEG-1/2/4, JPEG, VC1 up to 1080p@60fps</li> </ul> </li> <li>Video encoding <ul style="list-style-type: none"> <li>- JPEG/MJPEG up to 1080p@60fps</li> <li>- Supports input picture scaler up/down</li> </ul> </li> </ul>
Display Engine	<ul style="list-style-type: none"> <li>• Allwinner SmartColor2.0 post processing for an excellent display experience</li> <li>• Supports de-interlace (DI) up to 1080p@60fps</li> <li>• Supports G2D hardware accelerator including rotate, mixer, lbc decompression functions</li> </ul>
Video OUT	<ul style="list-style-type: none"> <li>• RGB LCD output interface up to 1920 x 1080@60fps</li> <li>• Dual link LVDS interface up to 1920 x 1080@60fps</li> <li>• 4-lane MIPI DSI interface up to 1920 x 1080@60fps</li> <li>• HDMI V1.4 output interface up to 4K@30fps</li> <li>• CVBS OUT interface, supporting NTSC and PAL format</li> </ul>
Video IN	<ul style="list-style-type: none"> <li>• 8-bit parallel CSI interface</li> <li>• CVBS IN interface, supporting NTSC and PAL format</li> </ul>
Audio	<ul style="list-style-type: none"> <li>• 2 DACs and 3 ADCs</li> <li>• Analog audio interfaces: MICIN1P/N, MICIN2P/N, MICIN3P/N, FMINL/R, LINEINL/R, LINEOUTLP/N, LINEOUTRP/N, HPOUTL/R</li> <li>• Digital audio interfaces: I2S/PCM, DMIC, OWA IN/OUT</li> </ul>
Connectivity	<ul style="list-style-type: none"> <li>• USB2.0 OTG, USB2.0 Host</li> <li>• SDIO 3.0, SPI x 2, UART x 6, TWI x 4</li> <li>• PWM (8-ch), GPADC (2-ch), LRADC (1-ch), TPADC (4-ch), IR TX&amp;RX</li> <li>• 10/100/1000M EMAC with RMII and RGMII interfaces</li> </ul>
Package	<ul style="list-style-type: none"> <li>• LFBGA 337 balls, 13 mm x 13 mm</li> </ul>

# Block Diagram



# Application Diagram



## 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](mailto:service@allwinnertech.com), or scan the QR code to follow us on Wechat.

