



# Cost-effective Industrial SoC

## Overview

T113-i is an advanced application processor designed for the Multi-Media decoding platform. T113-i integrates a 64-bit XuanTie C906 RISC-V CPU, a dual-core Cortex™-A7 CPU, and a HiFi4 DSP to provide the high-efficient computing power. It supports the full format decoding such as H.265, H.264, MPEG-1/2/4, JPEG, etc. 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. T113-i supports RGB/LVDS/MIPI DSI/CVBS OUT display output interfaces to meet the requirements of the different screen display. T113-i comes with extensive connectivity and interfaces, such as USB, SDIO, EMAC, TWI, UART, SPI, PWM, GPADC, LRADC, TPADC, IR TX&RX, etc. Besides, T113-i can connect with other different peripherals like Wi-Fi and BT via SDIO and UART.

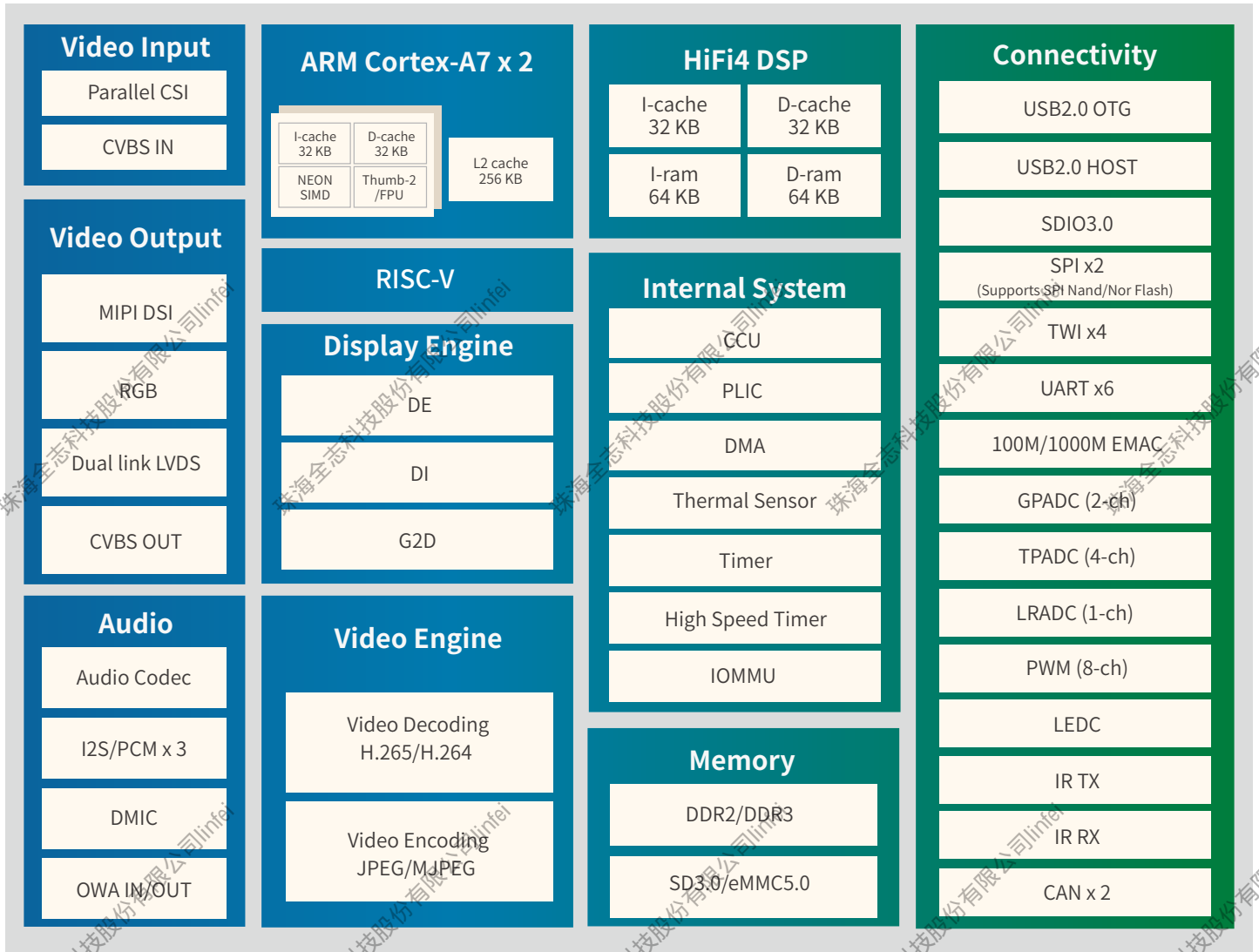
## Highlights

- T113-i integrates a dual-core Cortex™-A7 CPU to provide energy-efficient and stable computing power.
- T113-i integrates H.265/H.264 4K decoding and SmartColor2.0 post processing to deliver the perfect video entertainment experience.
- T113-i 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, CAN, 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.

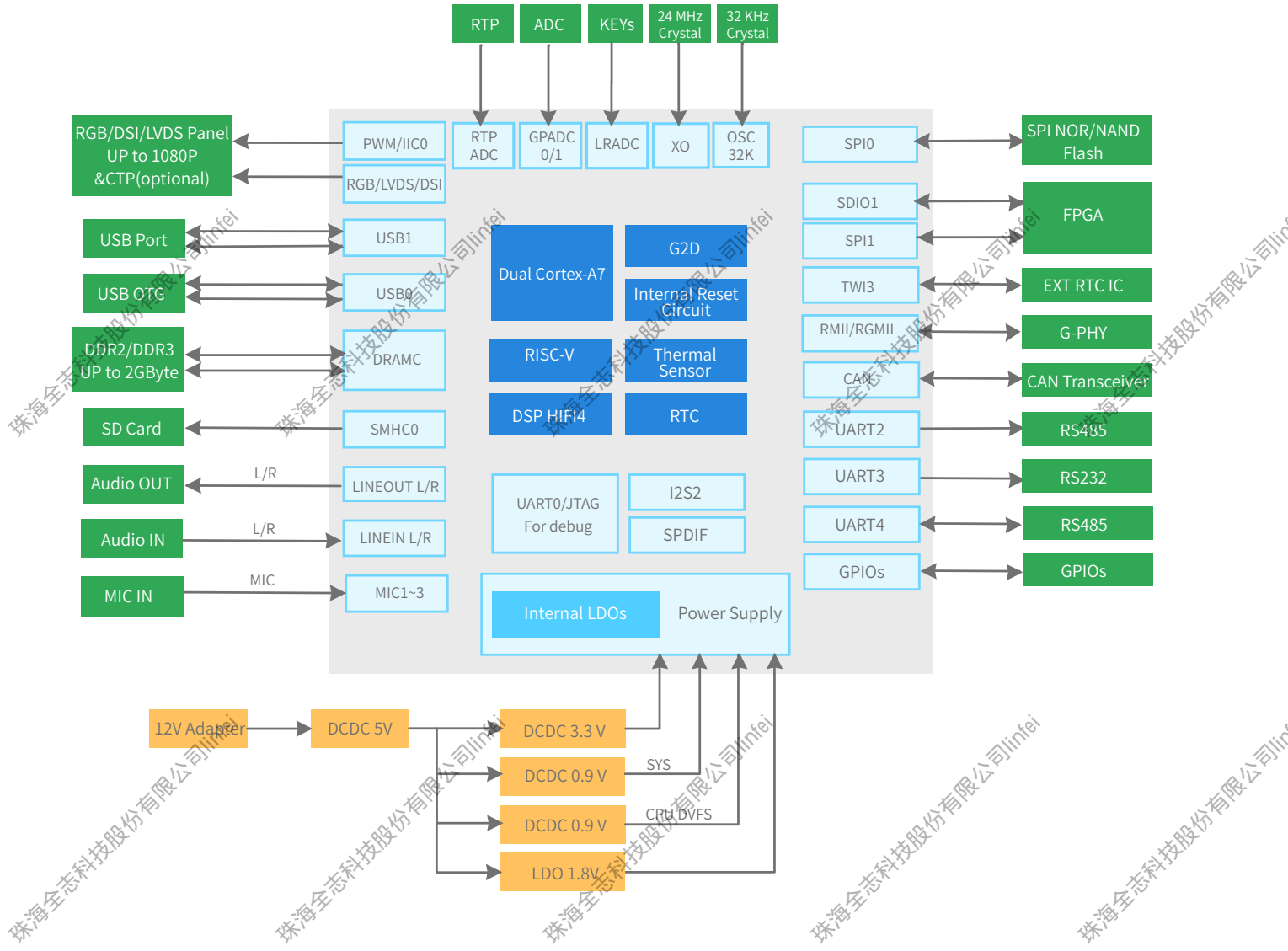
# Features

CPU	<ul style="list-style-type: none"> <li>• 64-bit Xuantie C906 RISC-V</li> <li>• Dual-core ARM Cortex™-A7             <ul style="list-style-type: none"> <li>- 32 KB L1 I-cache + 32 KB L1 D-cache per core, and 256 KB L2 cache</li> </ul> </li> </ul>
DSP	<ul style="list-style-type: none"> <li>• HiFi4</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 4K@30fps</li> <li>- H.264 up to 4K@24fps</li> <li>- H.263, MPEG-1/2/4, JPEG, Xvid, Sorenson Spark, 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 1200@60fps</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>• CAN x 2</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.

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