

RISC-V Multi-Media Decoding Platform SoC

Overview

F133 MX-HXX is an advanced application processor designed for the video decoding platform. It integrates a 64-bit processor with RISC CPU instruction architecture to provide the most efficient computing power. F133 MX-HXX supports full format decoding such as H.265, H.264, MPEG-1/2/4, JPEG, VC1, and so on. And the independent hardware encoder can encode in JPEG or MJPEG. Integrated multi ADCs/DACs and I2S/PCM/DMIC/OWA audio interfaces can provide the perfect voice interaction solution. F133 MX-HXX supports rich display output interfaces including HDMI, RGB, LVDS, MIPI DSI and CVBS OUT to meet the requirements of the screen display in differentiated markets. F133 MX-HXX can be used in network video machines, advertising machines, digital photo frames, car MP5, and so on.

Highlights

- F133 MX-HXX integrates 64-bit XuanTie C906 RISC-V CPU to provide energy-efficient and stable computing power.
- F133 MX-HXX integrates H.265/H.264 4K decoding and SmartColor2.0 post processing to deliver the perfect video entertainment experience.
- F133 MX-HXX 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 HDMI, 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.

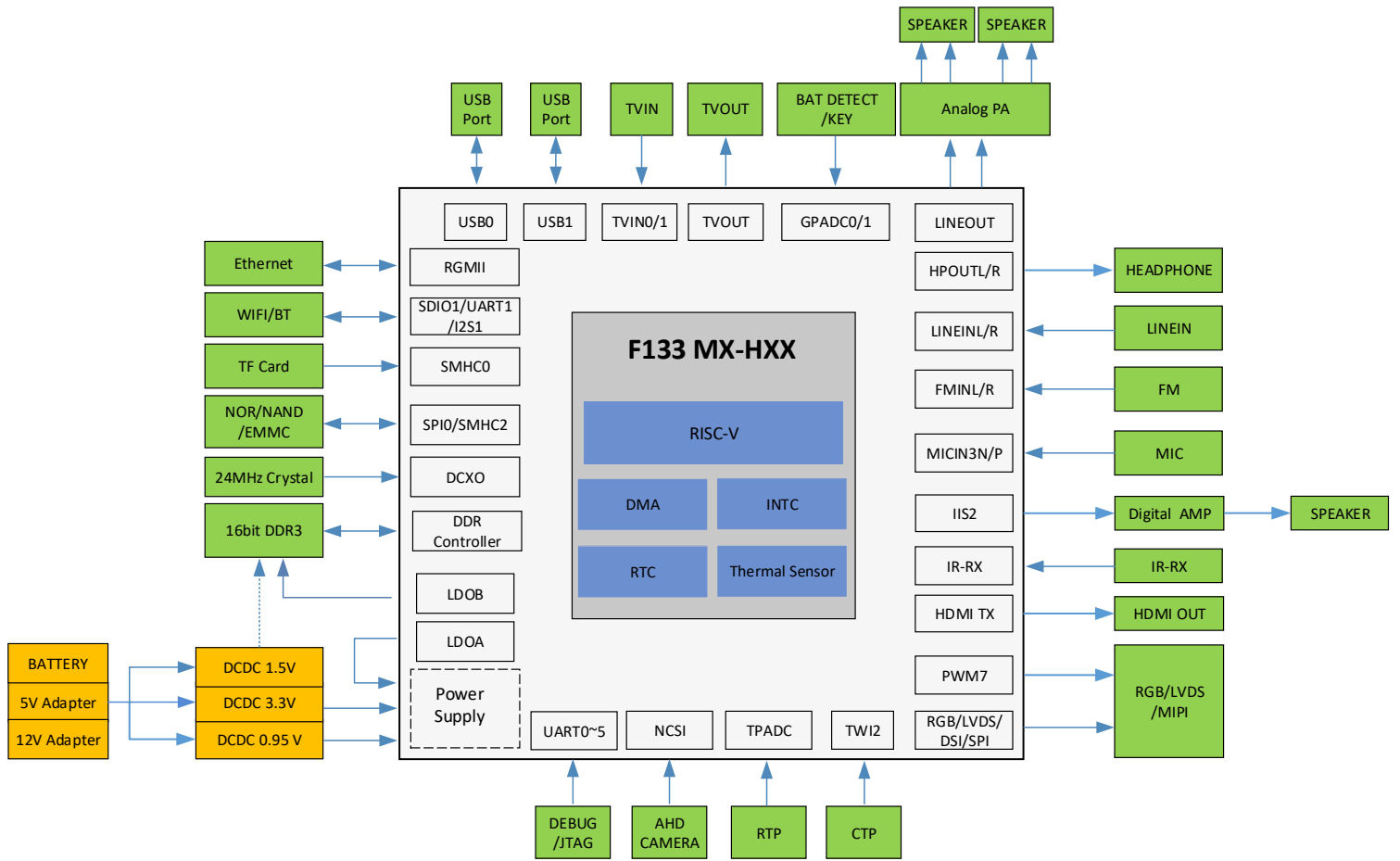
Features

CPU	<ul style="list-style-type: none"> • XuanTie C906 RISC-V CPU • 32 KB I-cache + 32 KB D-cache
Memory	<ul style="list-style-type: none"> • DDR2/DDR3, up to 2 GB • SD3.0/eMMC 5.0, SPI Nor/Nand Flash
Video Engine	<ul style="list-style-type: none"> • Video decoding <ul style="list-style-type: none"> -H.265 up to 4K@30fps -H.264 up to 4K@24fps -H.263, MPEG-1/2/4, JPEG, Xvid, Sorenson Spark, up to 1080p@60fps • Video encoding <ul style="list-style-type: none"> - JPEG/MJPEG up to 1080p@60fps - Supports input picture scaler up/down
Display Engine	<ul style="list-style-type: none"> • Allwinner SmartColor2.0 post processing for an excellent display experience • Supports de-interlace (DI) up to 1080p@60fps • Supports G2D hardware accelerator including rotate, mixer, lbc decompression functions
Video OUT	<ul style="list-style-type: none"> • RGB LCD output interface up to 1920 x 1080@60fps • Dual link LVDS interface up to 1920 x 1080@60fps • 4-lane MIPI DSI interface up to 1920 x 1200@60fps • HDMI V1.4 output interface up to 4K@30fps • CVBS OUT interface, supporting NTSC and PAL format
Video IN	<ul style="list-style-type: none"> • 8-bit parallel CSI interface • CVBS IN interface, supporting NTSC and PAL format
Audio	<ul style="list-style-type: none"> • 2 DACs and 3 ADCs • Analog audio interfaces: MICIN1P/N, MICIN2P/N, MICIN3P/N, FMINL/R, LINEINL/R, LINEOUTLP/N, LINEOUTRP/N, HPOUTL/R • Digital audio interfaces: I2S/PCM, DMIC, OWA
Security	<ul style="list-style-type: none"> • AES, DES, 3DES encryption and decryption algorithms • RSA signature verification algorithm • MD5/SHA and HMAC tamper proofing • Hardware random number generator • Integrated 2 Kbits OTP storage space
Connectivity	<ul style="list-style-type: none"> • USB2.0 OTG, USB2.0 Host • SDIO 3.0, SPI x 2, UART x 6, TWI x 4 • PWM (8-ch), GPADC (2-ch), LRADC (1-ch), TPADC (4-ch), IR TX&RX • 10/100/1000M EMAC with RMII and RGMII interfaces
Package	<ul style="list-style-type: none"> • LFBGA 337 balls, 13 mm x 13 mm

Block Diagram



Application Diagram



ABOUT ALLWINNER

Allwinner Technology, founded in 2007, is a outstanding designer dedicated to intelligent application SoC, high performance analog component and wireless connectivity IC. It is headquartered in Zhuhai China, with other R&D centers and offices in Shenzhen, HongKong, Xi'an, Beijing and Shanghai. Listed on the GEM of the Shenzhen Stock Exchange in 2015, with the stock code 300458.

Motivated by customer-oriented strategy, Allwinner aligns remarkable R&D teams with long-term core-technology investment in UHD video processing, high-performance multi-core CPU/GPU integration with AI and advanced manufacturing process in terms of high integration, ultra-low power consumption and full-stack integration platform, providing competitive turnkey solutions with considerate services. The products powered by Allwinner spread across from smart hardware, smart home, consumer electronics, HD media, smart video, connected car, industry control, wireless communication to analog products.

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