

Quad-Core Smart Hardware Processor

The most cost-effective speaker with screen

Overview

R311 is a powerful processor features with quad-core Cortex™-A7 CPU operating with up to 1.8GHz high frequency. It also integrates dual-core Mali-400 GPU, H.265 1080p@60fps video decoder, H.264 1080p@60fps encoder, 13MP camera ISP, trustzone, etc. To deliver better architecture scalability, R311 comes with extensive connectivity and interfaces, such as MIPI DSI, RGB/LVDS LCD, USB OTG/Host, SPI, UART, TWI, PWM, LRADC, etc. These features enable R311 to reduce the cost of the overall plan and support the development requirements of a variety of differential products.

Highlights



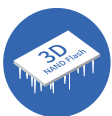
High power efficient

Strong computing power while low power consumption is always the core consideration of mobile device, and R311 makes a perfect balance between them. The 1.8GHz quad-core A7 CPU and 600MHz dual-core Mali-400 GPU make it enough to handle challenging system tasks. Manufactured by 28nm state-of-the-art process, minimum power consumption is also assured.



Advanced memory controller

R311 supports mainstream memory technology including DDR3, DDR3L, LPDDR3, DDR4, LPDDR4, etc, which brings more flexibility to customers and they can choose the most competitive memory components from their supply chain.



Support 3D TLC Nand Flash

Integrated with state-of-the-art LDPC technology, the performance of R311's Nand flash controller is three times better than traditional Nand flash controller with BCH technology. Thus customer is able to adopt 3D TLC nand flash in their system to get additional value.



Strong multimedia support

Entertainment is always the key scenario for most of tablet users. R311 supports popular video format like H.265 1080p 60fps, H.264 1080p 60fps, VP9 decoder 720p@30fps, etc, H.264 1080p 60fps encoding is also supported.



13MP embed ISP

Thanks to its embed mipi-csi camera ISP, R311 offers the possibility for consumer to capture a picture reach up to 13M pixel, when the device is configured with corresponding resolution camera module.



Quick charge

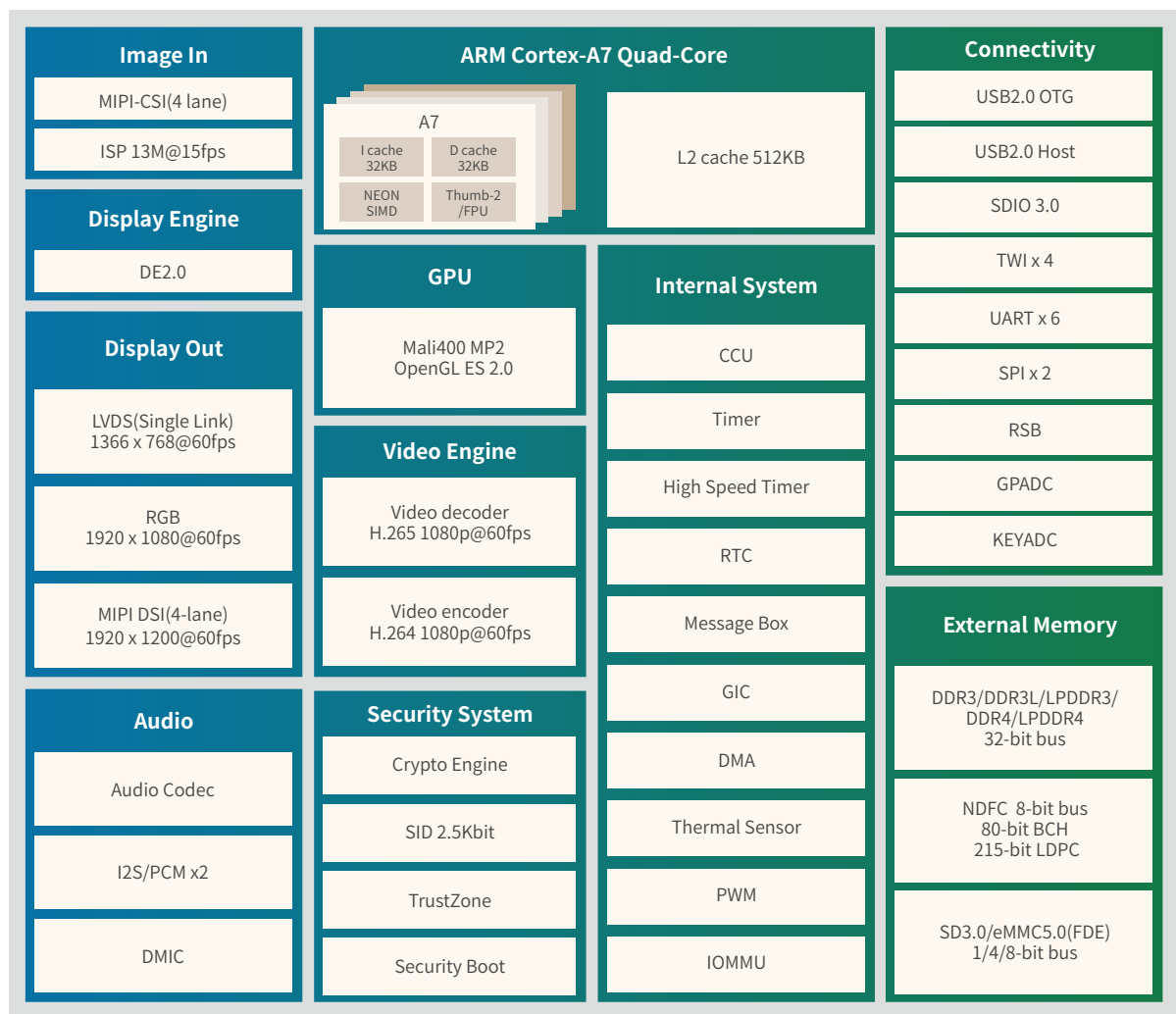
Accompanied by its dedicated PMIC, R311 solution is able to support quick charge feature, which will help user to save time.

Features

CPU	<ul style="list-style-type: none">• Quad-core ARM Cortex™-A7@1.8GHz• 32KB L1 I-cache + 32KB L1 D-cache per core• 512KB L2 cache• Low-power CoolFlex™ power management architecture
GPU	<ul style="list-style-type: none">• Mali400 MP2• Supports OpenGL ES 2.0/1.1, Direct3D 11.1, OpenVG 1.1
Memory	<ul style="list-style-type: none">• Supports 32-bit DDR4/DDR3/DDR3L/LPDDR3/LPDDR4• Supports eMMC 5.0, support Full Disk Encryption(FDE)• Supports 8-bit TLC/MLC/SLC/EF NAND flash, supports FDE• Supports LDPC, BCH(80bits/1024bytes)
Video Engine	<ul style="list-style-type: none">• Supports HEVC decoder 1080p@60fps• Supports VP9 decoder 720p@30fps• Supports H.265 decoder 1080p@60fps• Supports multi-format 1080p@60fps video playback, including VP8,MPEG1/2, MPEG4-XVID SP/ASP, H.263,WMV7/8• Supports H264 HP encoder 1080P@60fps• Supports three bit rate control: CBR, VBR, FIXQP• Supports JPEG encoder 4096 x 4096
Video Input	<ul style="list-style-type: none">• Compliant with MIPI-CSI2 V1.00 and MIPI DPHY V1.00.00• 1/2/3/4 Data Lanes Configuration and up to 1Gbps per Lane in HS Transmission• Maximum to 13M@15fps, 8M@30fps with 4 data lane• Supports format: YUV422-8bit/10bit, YUV420-8bit, RAW-8, RAW-10, RAW-12, RGB888, RGB565
ISP	<ul style="list-style-type: none">• Maximum picture resolution of 4224x3168• Adjustable 3A functions, including automatic exposure(AE), automatic white balance(AWB) and automatic focus (AF)• Supports spatial(2D) de-noise filter• Supports contrast enhance and sharpening• Supports chrominance noise reduction• Supports defect pixel correction
Audio	<ul style="list-style-type: none">• Supports two audio DAC and one audio ADC• Supports Three analog audio inputs and one analog audio outputs• Capless stereo headphone driver• Up to two I2S/PCM controllers for connecting Bluetooth and external audio codec.• Integrated digital microphone, supports maximum 8 digital microphones
Display Engine	<ul style="list-style-type: none">• Supports output size up to 1920 x 1200• Four alpha blending channels for main display• Four overlay layers in each channel, and has a independent scaler• Supports SmartColor2.0 post processing for an excellent display experience• Supports Frame Packing/Top-and-Bottom/Side-by-Side Full/Side-by-Side Half 3D format data
Display Output	<ul style="list-style-type: none">• Supports one channel MIPI DSI output, MIPI DSI is 4-lane• Supports LVDS interface with single link, up to 1366 x 768@60fps• Supports RGB interface with DE/SYNC mode, up to 1920 x 1080@60fps
Security Engine	<ul style="list-style-type: none">• Supports Symmetrical algorithm: AES,DES,3DES,XTS• Supports Hash algorithm: MD5,SHA,HMAC• Supports Pubic Key algorithm: RSA, ECC• Supports 160-bit hardware PRNG with 175-bit seed• Supports 256-bit hardware TRNG• Supports 2.5K-bit EFUSE for chip ID and security application

Connectivity	<ul style="list-style-type: none"> • USB Host, USB 2.0 OTG • SDIO 3.0, RSB • 4 x TWI, 2 x SPI • 6 x UART, 3 x PWM • GPADC, LRADC
WIFI	<ul style="list-style-type: none"> • XR829 or others
OS	<ul style="list-style-type: none"> • Android 8.1 or above
PMIC	<ul style="list-style-type: none"> • PMU AXP2585 • BMU AXP15060
Package	<ul style="list-style-type: none"> • FBGA 413balls • 12.3mm x 12.8mm size, 0.5 ball pitch, 0.3 ball size
Process	<ul style="list-style-type: none"> • 28nm HPC

Block 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, or scan the QR code to follow us on Wechat.

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