# Allwinner Technology

**R16** — Quad-Core — ALLWINNER TECH
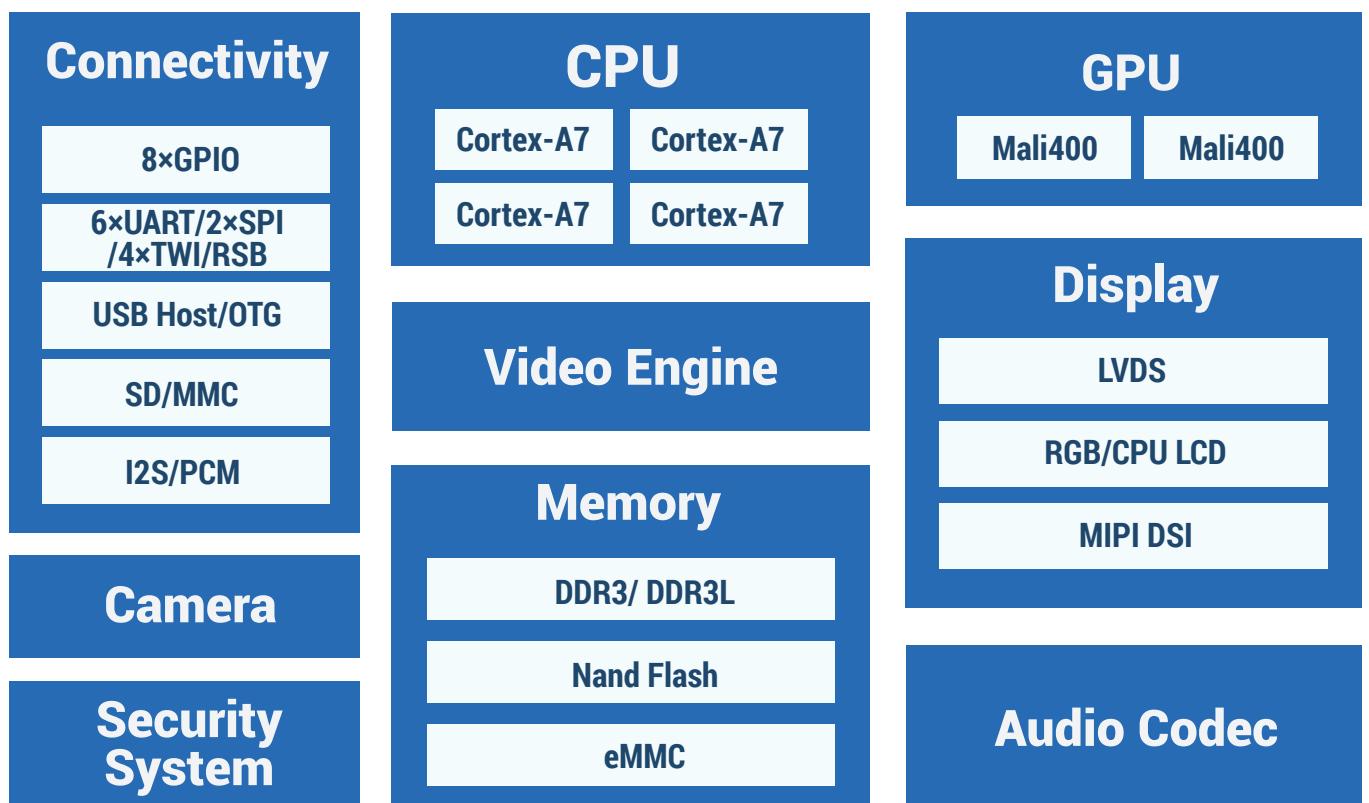
# The Most Efficient Quad-Core IoT Solution

## Overview

The Allwinner R16 is an efficient quad-core solution designed for Internet-of-Things applications, which outperforms competitors in terms of its system performance, scalability, and energy-efficiency.

Allwinner R16 packs four ARM Cortex-A7 CPU cores and Mali400MP2 graphics architecture to enable impressive system performance, and it perfectly supports various applications of mainstream operating systems such as Android, Linux, etc.

To deliver better architecture scalability, Allwinner's R16 comes with an extensive connectivity and interfaces, including eight groups of GPIO, six UARTs, two SPIs, four TWIs, 4-lane MIPI DSI, LVDS, USB OTG/HOST, SD/MMC, I2S/PCM, RSB, and a lot more. Allwinner also designed R16 to be extremely power-efficient to realize massive ubiquitous deployment. It achieves lower power consumption with a balanced combination of several features: the exceedingly power efficient Cortex-A7 CPU cores, the advanced fabrication process, the battery-saving DVFS technology support, and the low power design architectures, etc.

## Block Diagram

**Connectivity**
- 8×GPIO
- 6×UART/2×SPI /4×TWI/RSB
- USB Host/OTG
- SD/MMC
- I2S/PCM

**Camera**

**Security System**

**CPU**
- Cortex-A7
- Cortex-A7
- Cortex-A7
- Cortex-A7

**Video Engine**

**Memory**
- DDR3/ DDR3L
- Nand Flash
- eMMC

**GPU**
- Mali400
- Mali400

**Display**
- LVDS
- RGB/CPU LCD
- MIPI DSI

**Audio Codec**

# Specifications

| | |
|---|---|
| **CPU** | · Quad-core Cortex™-A7<br>· 256KB L1 Cache<br>· 512KB L2 Cache |
| **GPU** | · Mali400<br>· Supports OpenGL ES 2.0 / VG 1.1 standards |
| **Video** | · Supports 1080p@60fps video playback<br>· Supports multi-format FHD video decoding, including Mpeg1/2, Mpeg4 SP/ASP GMC, H.263, H.264, WMV9/VC-1, VP8, etc.<br>· Supports H.264 High Profile 1080p@60fps encoding<br>· Complies with RTSP, HTTP, HLS, RTMP, MMS streaming media protocols<br>· Supports OpenMax protocol |
| **Display** | · Supports 1/2/4-lane MIPI DSI up to 1280x800 resolution<br>· Supports MIPI DSI V1.01 and MIPI D-PHY V1.00<br>· Supports command mode and video mode（non-burst mode with sync pulses, non-burst mode with sync event and burst mode）<br>· Supports RGB/CPU/LVDS LCD up to 1280x800 resolution |
| **Camera** | · Integrated parallel camera sensor interface<br>· Supports 5M CMOS sensor<br>· Supports 8-bit YUV sensor |
| **Memory** | · Supports 16-bit two ranks DDR3/DDR3L SDRAM controller, supports memory capacity up to 2GB<br>· Supports 8-bit NAND Flash controller<br>· Supports MLC/TLC/SLC/EF-NAND, 2 flash chips, ECC 64-bit |
| **Audio** | · Integrated Hi-Fi audio codec<br>· Two integrated differential analog mic amplifiers for headset and phone |