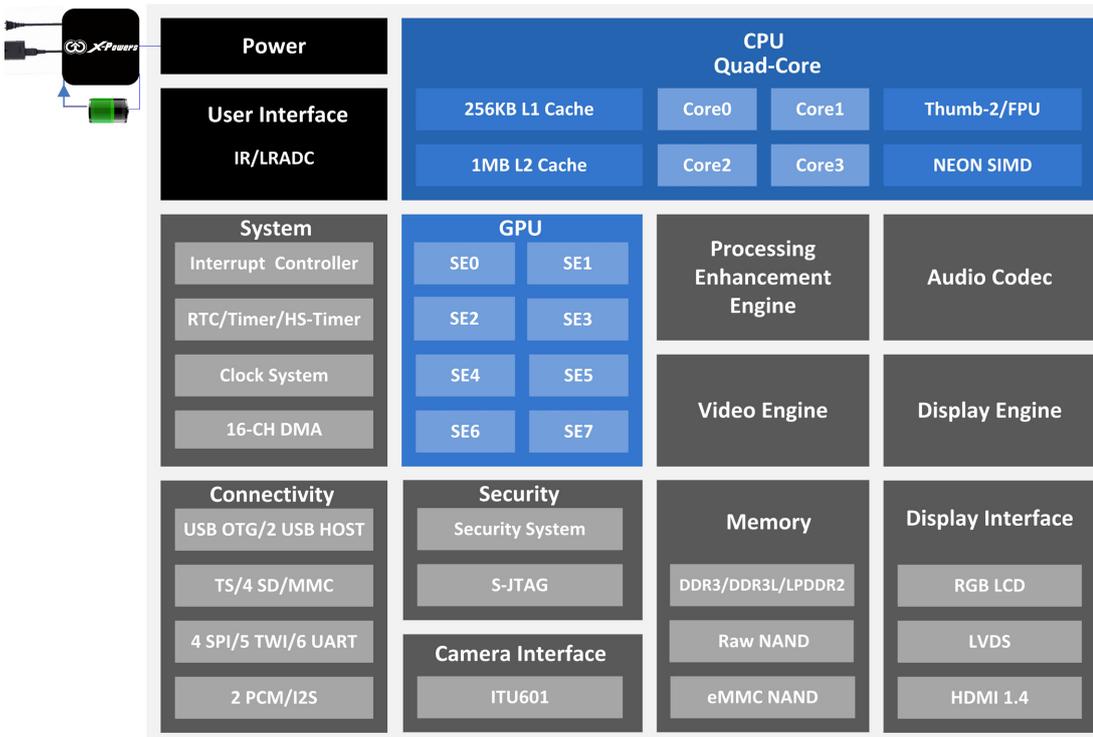# Quad-Core
Phablet Processor

Phablets, hybrids between smartphones and tablets, are disrupting the traditional smartphone market and shaping the way people consume mobile media content. A31s, through its turnkey solutions, enables the next generation of low power, connected, and high definition phablets for its brand and design house partners. It offers optimized connectivity to EDGE, 3G, LTE, WiFi, Bluetooth, FM, GPS, AGPS, and NFC radios.

Large, high resolution displays, great video performance, and fast baseband connectivity are some of the growing critical factors behind successful products in this category. The Allwinner A31s processor features low power, powerful multimedia, superior integration, and enhanced voice communication interfaces to drive the next-generation of phablets for consumers. A31s delivers this experience through these key features: Quad-core Cortex™-A7 CPU with a fifth power-saving standby core that optimizes battery life; 3D gaming behemoth PowerVR™ SGX544MP2 GPU with eight unified shader cores; HawkView™ camera ISP with enhanced image quality and rapid image capture; custom low power companion PMIC AXP221s designed to dynamically manage multi-core CPUs; and an integrated audio codec with multiple mic support.

Application

Power	CPU Quad-Core			
User Interface IR/LRADC	256KB L1 Cache	Core0	Core1	Thumb-2/FPU
	1MB L2 Cache	Core2	Core3	NEON SIMD

System	GPU		Processing Enhancement Engine	Audio Codec
Interrupt Controller	SE0	SE1		
RTC/Timer/HS-Timer	SE2	SE3		
Clock System	SE4	SE5	Video Engine	Display Engine
16-CH DMA	SE6	SE7		

Connectivity	Security	Memory	Display Interface
USB OTG/2 USB HOST	Security System		
TS/4 SD/MMC	S-JTAG	DDR3/DDR3L/LPDDR2	RGB LCD
4 SPI/5 TWI/6 UART	**Camera Interface**	Raw NAND	LVDS
2 PCM/I2S	ITU601	eMMC NAND	HDMI 1.4

Features

CPU	• ARM® Cortex™-A7 Quad-Core • 256KB L1 Cache • 1MB L2 Cache
GPU	• PowerVR™ SGX544MP2 • Complies with OpenGL ES 2.0, OpenCL 1.x, DX 9_3
Audio	• Two sets of I2S/PCM interfaces for Baseband and Bluetooth • Two integrated differential analog MIC amplifiers for headset and phone • Integrated digital MIC interface • Dedicated headphone/speaker/receiver outputs • Two-channel audio ADC with 96dBA SNR • Two-channel audio DAC with 100dBA SNR
Video	• UHD H.264 2160p video decoding • Multi-format FHD video decoding, including Mpeg1/2, Mpeg4 SP/ASP GMC, H.263, H.264,etc. • H.264 High Profile 1080p@30fps or 720p@60fps encoding • 3840x1080@30fps 3D decoding, BD/SBS/TAB/FP supported • 3840x1080@30fps 3D encoding • Complies with RTSP, HTTP, HLS, RTMP, MMS streaming media protocols
Display	• Integrated LVDS/RGB/CPU LCD interface 1280x800 resolution • Integrated HDMI1.4 1920x1080@60fps
Camera	• Supports 0.3M/1.3M/2M/5M CMOS sensor • Supports 8/10/12-bit YUV/Bayer sensor
HawkView™ ISP	• Static and dynamic defect pixel correction, and lens shading correction • Anisotropic non-linear Bayer interpolation with false color suppression • Programmable color correction, dynamic range compression and contrast enhancement • Advanced spatial de-noise filter • AE/AF/AWB • Anti-flick detection
Memory	• 32-bit DDR3/DDR3L/LPDDR2 controller • 8-bit NAND Flash controller with 64-bit ECC
PMIC	• PMIC AXP221s • 21-CH power output and 2.2A Flash charging • Comply with USB 3.0 power supply standard
OS	• Supports Android 4.1/4.2 and above • Compatible with Microsoft Windows 8

Selection Guide
Allwinner Cortex-A Family

	A31	A31s	A20
CPU	Quad-Core Cortex™-A7	Quad-Core Cortex™-A7	Dual-Core Cortex™-A7
GPU	SGX544MP2	SGX544MP2	Mali400MP2
Video Playback	4Kx2K	2160p	2160p
Video Capture	H.264 HP 1080p@60fps	H.264 HP 1080p@30fps 720p@60fps	H.264 HP 1080p@30fps 720p@60fps
LCD	2048x1536	1280x800	1280x800
MIPI	MIPI DSI/MIPI CSI	N/A	N/A
DDR	DDR3/DDR3L/LPDDR2	DDR3/DDR3L/LPDDR2	DDR3/DDR3L/DDR2
Package	BGA609 18mmx18mm 0.65mm Pitch	BGA460 18mmx18mm 0.80mm Pitch	BGA441 19mmx19mm 0.80mm Pitch
Applications	Tablet Smart TV	Phablet	Tablet Smart TV

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.