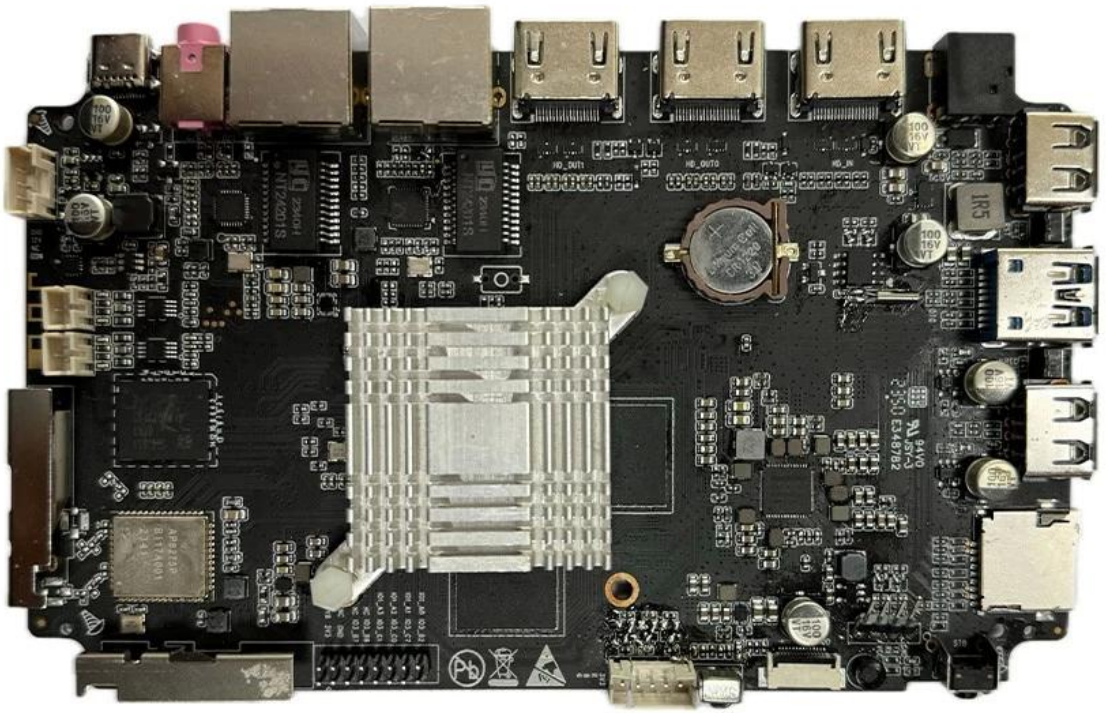
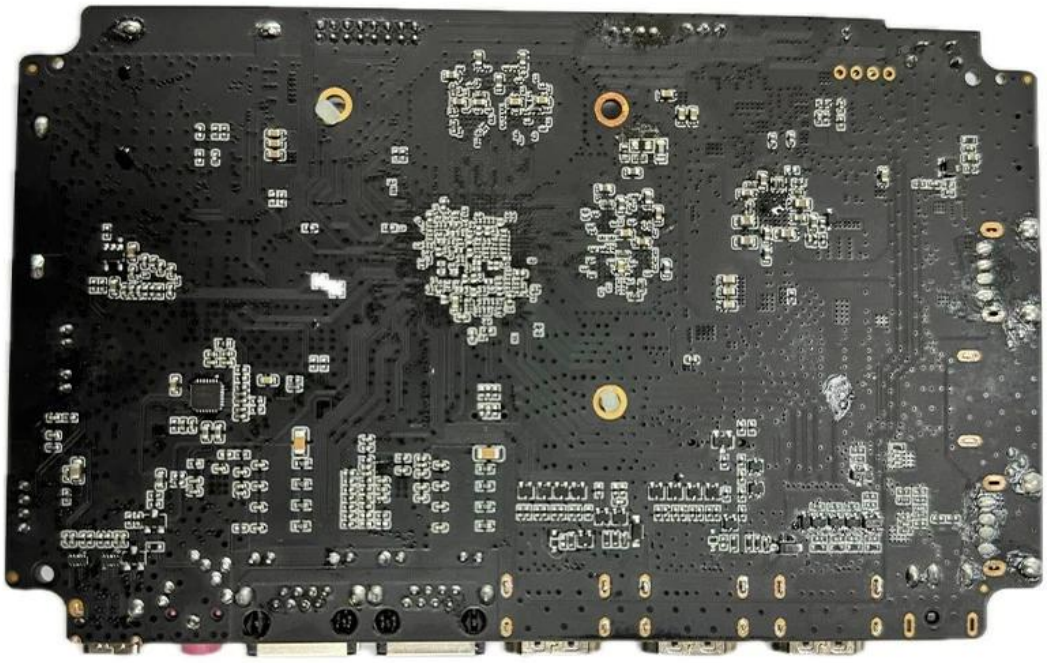
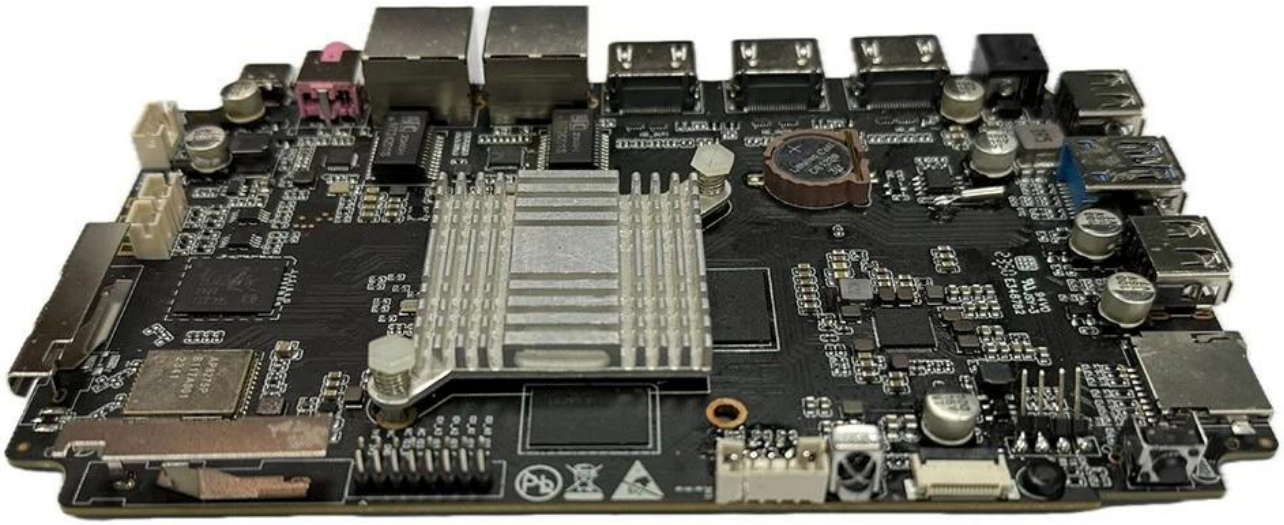
Rockchip RK3588 Octa-Core 8K for AIoT applications

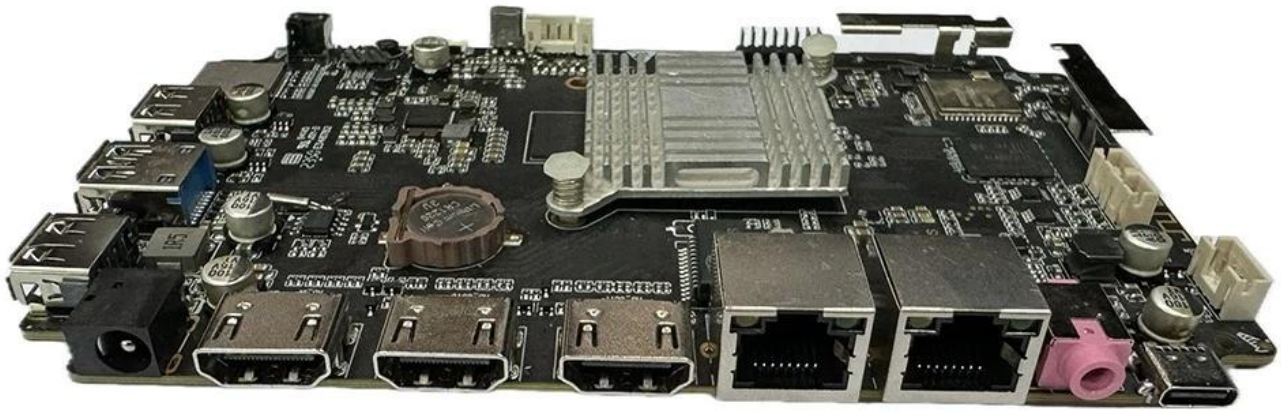
Specifications	
Model No.	Rockchip RK3588
CPU	Rockchip RK3588 8nm process, quad-core Cortex-A76 + quad-core Cortex-A55
GPU	ARM Mali-G610 MC4 OpenGL ES 1.1/2.0/3.1/3.2 Vulkan 1.1, 1.2 OpenCL 1.1,1.2,2.0 Embedded high performance 2D image acceleration module
NPU	6 TOPS (Supports int4/int8/int16/FP16/BF16/TF32)
RAM	4GB/8GB (64bit LPDDR4/LPDDR4x)
ROM	32G/64G/128G/256G (eMMC5.0/ 5.1)
WiFi	Type IEEE 802.11a/b/g/n/ac/ax Frequency Wi-Fi6 2.4GHz/5.8GHz (PCIe v3.0) Antenna Type 2T2R
OS	Android 12 and Multi-Language
Bluetooth	Bluetooth 5.0
Video&Audio CODEC	
Video Codec	∗ Real-time video decoder of MPEG-1,MPEG-2,MPEG-4,H.263,H.264,H.265,VC-1,VP9,VP8 MVC,AV1 ∗ MMU Embedded ∗ Multi-channel decoder in parallel for less resolution ∗ H.264 AVC/MVC Main10 L6.0 : 8K@30fps (7680x4320) ∗ VP9 Profile0/2 L6.1 : 8K@60fps (7680x4320) ∗ H.265 HEVC/MVC Main10 L6.1 : 8K@60fps (7680x4320) ∗ AVS2 Profile0/2 L10.2.6 : 8K@60fps (7680x4320) ∗ AV1 Main Profile 8/10bit L5.3 : 4K@60fps (3840x2160) ∗ MPEG-2 up to MP : 1080p@60fps (1920x1088) ∗ MPEG-1 up to MP : 1080p@60fps (1920x1088) ∗ VC-1 up to AP level 3 : 1080p@60fps (1920x1088) ∗ VP8 version2 : 1080p@60fps (1920x1088) Video Encoder ∗ Real-time H.265/H.264 video encoding ∗ Support up to 8K@30fps ∗ Multi-channel encoder in parallel for less resolution ∗ Dual 16M Pixel ISP with HDR&3DNR
Audio Codec	I2S0 with 8 channels ∗ Up to 8 channels TX and 8 channels RX path ∗ Audio resolution from 16bits to 32bits ∗ Sample rate up to 192KHz ∗ Provides master and slave work mode, software configurable ∗ Support 3 I2S formats (normal, left-justified, right-justified) ∗ Support 4 PCM formats (early, late1, late2, late3) ∗ Support TDM normal, 1/2 cycle left shift, 1 cycle left shift, 2 cycle left shift, right shift mode serial audio data transfer ∗ I2S, PCM and TDM mode cannot be used at the same time
I/O Port	
Power Supply	DC 12V/2A Power ON: Blue

RTC	Support
IR	Infrared + BT Voice Remote
HDMI	HDMI OUT 1:HDMI 2.1/7680x4320@60Hz HDMI OUT 2:HDMI 2.1/4096x2304@60Hz HDMI IN:HDMI 2.0/HDMI 1.4b 4K x 2K video formats(3840x 2160p@24Hz/25Hz/30Hz and 4096x2160p@24Hz)
Earphone	1*3.5mm Port
Ethernet	Ethernet 1:1*1000M(RGMII) Ethernet 2:1*1000M
TF Card	1*TF Card
USB port	2*USB 2.0 (Host) 1*USB3.0 (Host)
Type-C	1*Type C 3.0 (Download Port) Supported Devices









RK3588

System Peripheral

- Clock & Reset
- PMU
- 18x PLL
- System register
- 30x Timer
- 16x PMW
- 5x Watchdog
- 2x Crypto
- SAR-ADC
- TS-ADC
- Interrupt Controller
- 3x DMAC
- 6x PVTM
- 3x Mailbox

Multi-Media Interface

- 2x MIPI-CSI DPHY 4L/CPHY 3L
  4x MIPI-CSI DPHY 2L
- 2x MIPI-DSI DPHY 4 Lane
- 2x HDMI2.1 TX/eDP1.3 4 Lane
- 2x DP1.4 4 Lane with HDCP2.3
  (Combo with USB3)
- HDMI RX 2.0
- Display Controller
  (Support video HDR output)

Cortex-A76 Quad-Core / Cortex-A55 Quad-Core

Cortex-A76 Quad-Core (64K/64K L1 I/D Cache)
Cortex-A55 Quad-Core (32K/32K L1 I/D Cache)
2MB L2 Cache
512KB L2 Cache
3MB L3 Cache

Dual-cluster Core

MCU (Cortex-M0) x3

High Performance NPU

1MB Share Memory

Multi-Media Processor

- GPU Mali-G610 MP4
  (4x256KB L2 Cache)
- 2D Graphics Engine
- Image Enhancement Processor
- Dual pipe ISP
  (Support camera HDR input)
- 8K Video Encoder
  (H265/H264...)
- 8K 10-bits Video Decoder
  (H265/H264/VP9...)
- JPEG Encoder/Decoder

External Memory Interface

- eMMC5.1
- SD3.0/MMC4.5
- LPDDR4/LPDDR4X/LPDDR5
  Quad-channel x16bit

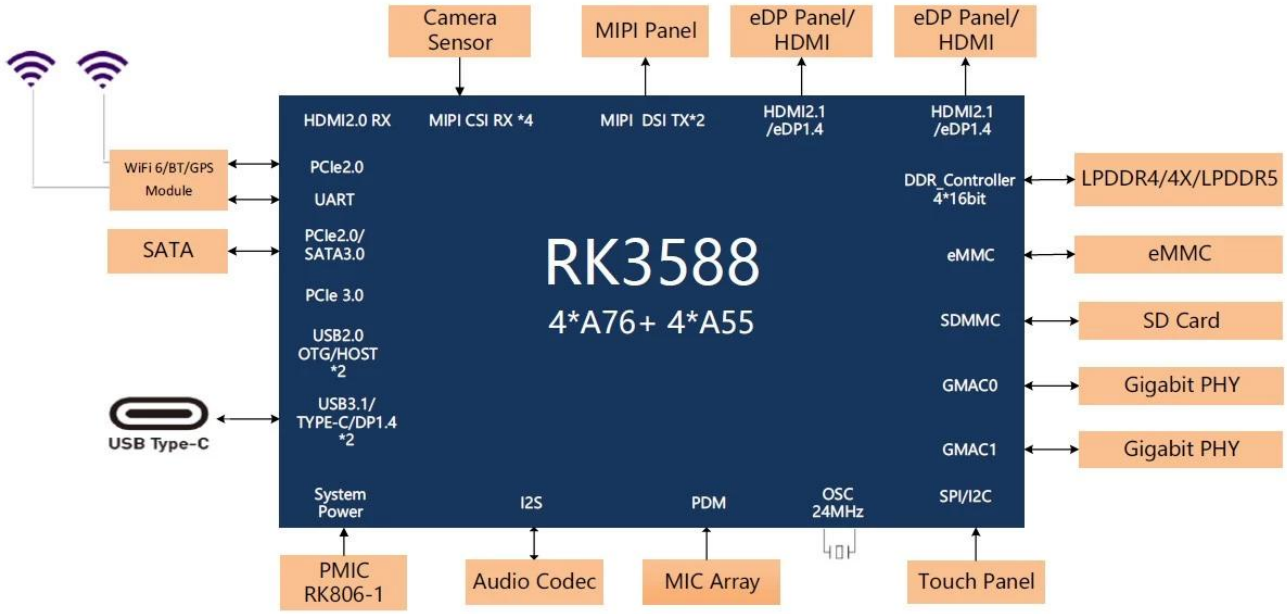
Connectivity

- USB OTG0 3.1/2.0/TypeC
- USB OTG1 3.1/2.0/TypeC
- 2x USB Host 2.0
- SATA3/PCIe2.1/USB3Host
- 2x SATA3/PCIe2.1
- PCIe3.0 (2x2,1x4,4x1)
- PDM/Audio PWM
- 4x I2S/PCM/TDM
- 2x SPDIF(8ch)
- 10x UART
- 6x SPI
- 9x I2C
- 2x Giga-Ethernet
- SDIO 3.0
- GPIO

Embedded Memory

- SRAM
- ROM
- OTP

Typical Application Diagram – AIoT



the Power of AIoT with Rockchip RK3588 Octa-Core 8K

Product Description

Introducing the Rockchip RK3588, an octa-core powerhouse designed for cutting-edge AIoT (Artificial Intelligence of Things) applications. This state-of-the-art chipset redefines performance, making it the ideal choice for the next generation of intelligent devices.

The Rockchip RK3588 combines eight high-performance cores to deliver unparalleled processing speed, ensuring seamless execution of AI algorithms and handling data-intensive tasks with ease. Its native support for 8K resolution brings a visual feast to AIoT applications, enhancing clarity and detail for an immersive user experience.

With advanced AI capabilities, the RK3588 empowers AIoT devices to understand, learn, and adapt to user preferences. This facilitates more intuitive interactions, personalized recommendations, and intelligent automation, creating a smarter and more responsive environment.

Key Features:

- **Octa-Core Performance:** Eight powerful cores for lightning-fast processing.
- **Native 8K Support:** Unmatched visual clarity and detail for an immersive experience.
- **Advanced AI Capabilities:** Enhance user interactions and enable intelligent automation.
- **Versatile Connectivity:** Seamlessly connect with a wide range of IoT devices for a cohesive ecosystem.

Revolutionizing AIoT Applications: The Rockchip RK3588 Advantage

The Rockchip RK3588 opens doors to a new era of AIoT applications. Whether it's smart homes, industrial automation, or intelligent surveillance, this chipset sets the benchmark for performance, efficiency, and adaptability.

Benefits:

1. **Efficiency:** Optimize AIoT workflows with efficient processing and reduced latency.
2. **Scalability:** Adapt to evolving requirements with the RK3588's versatile architecture.
3. **Reliability:** Ensure a reliable and stable performance for mission-critical applications.

Conclusion

Experience the future of AIoT with the Rockchip RK3588. Elevate your projects to new heights of performance, efficiency, and intelligence. It's time to redefine what's possible in the world of AIoT applications.