

# New Generation Flagship – AIoT Solution

**Rackchip**

**8 nm**  
FinFET Process

**8-Core**  
Cortex A76 up to 2.4GHz

**8K**  
Video Codec Display Output

**6TOPS**  
AI Accelerator - NPU

**32 GB**  
Super large DRAM support

**RK3588 CPU 8-Core A76+A55**  
CPU Score on Geekbench  
RK3399 **4 Times improved**

**RK3588 GPU 4-Core Mali-G610**  
GPU Score on Geekbench  
RK3399 **8 Times improved**

## RK3588 Microprocessor Highlights



<p><b>64bit Octa CPUs</b> Quad A76 + Quad A55 8nm FinFET process 2.4GHz</p>	<p><b>High-performance GPU, NPU</b> ARM Quad Mali G610 6TOPS NPU</p>	<p><b>ISP, Video Codec</b> 48M ISP, HDR/3DNR Full-duplex 8K video codec</p>
<p><b>32 GB DRAM</b> Support 64bit LPDDR4/ LPDDR4x/LPDDR5</p>	<p><b>Video In-/output</b> HDMI RX/Dual MIPI-CSI/... HDMI TX/Dual MIPI-DSI/... Support displays up to 8Kp60</p>	<p><b>SATA / PCIe</b> 4 lane PCIe3.0 3 lane SATA3.0</p>
<p><b>Rich User Interfaces</b> QSPI, I2C, UART, I2S, CAN, USB3.1, RGMII</p>	<p><b>Operation System</b> Linux Andriod</p>	<p><b>Applications</b> ARM PC / Smart Screen Edge Computing / AR/VR</p>

## RK3588 Key Specifications



Key Specifications	RK3588	RK3588S
<b>Processing</b>		
<b>CPU</b>	4x Cortex-A76	
	4x Cortex-A55	
<b>GPU</b>	Mali G610 MC4	
	OpenGL ES1.1/2.0/3.0/3.1/3.2, OpenCL 2.0, Vulkan	
<b>NPU</b>	6 Tops NN Accelerator	
<b>Memory I/F</b>		
<b>DDR I/F</b>	Max. 32GB, 64-bit LPDDR4/LPDDR4x/LPDDR5	
<b>Video</b>		
<b>Camera Input I/F</b>	4x4lanes / 4x2-lanes+2x4-lanes MIPI CSI	
<b>ISP</b>	48 MP resolution, HDR	
<b>HDR</b>	HDR10, HLG	
<b>Display Output I/F</b>	2x MIPI DSI, 2x HDMI2.1, 2x eDP	2x MIPI DSI, HDMI2.1, eDP
<b>LCD Display</b>	1x 8K / 3x 4K / 6x 1080P	
<b>Video Encode</b>	H.264 / H.265 up to 8Kp30	
<b>Video Decode</b>	VP9 / H.265 / H.264 / AV1 up to 8Kp60	
<b>Connectivity</b>		
<b>Network</b>	2x GbitE MAC	1x GbitE MAC
	1x RGMII	1x RGMII
	3x CAN	3x CAN
<b>Expansion I/F</b>	USB2.0, USB3.1	USB2.0, USB3.1
	3x PCIe2.1	2x PCIe2.0
	4x1/1x4/2x2 PCIe3.0	
	3x SATA3.0	2x SATA3.0
<b>Others</b>		
<b>Security</b>	ARM Trustzone	
	SHA-512 / AES-256 / DES / RSA / ECC cryptography	
<b>Package</b>	23x23mm, 0.65mm pitch	17x17mm, 0.41mm pitch

## Rockchip Application Microprocessor Highlights

Rockchip	Entry Level			Mid Range		High End	
	RV1126	RK3308	PX30/RK3358	RK3328	RK3568	RK3399	RK3588
<b>CPU</b>	Quad-core Cortex-A7	Quad-core Cortex-A35	Quad-core Cortex-A35	Quad-core Cortex-A53	Quad-core Cortex-A55	Dual Cortex-A72 Quad Cortex-A53	Quad Cortex-A76 Quad Cortex-A55
<b>DSP/GPU</b>	n/a	n/a	ARM G31 MP2	ARM Mali450 MP2	ARM Mali G52	ARM Mali-T860	ARM Mali G610
<b>NPU</b>	2.0Tops	n/a	n/a	n/a	1.0 TOPs	3.0TOPs (RK3399Pro)	6.0 TOPs
<b>DDR</b>	32bits DDR3/DDR3L/ DDR4/LPDDR3/ LPDDR4	16bits DDR2/DDR3/ LPDDR2	32bits DDR4/ DDR3/ DDR3L/ LPDDR3/LPDDR2	32bits DDR3/DDR3L/ LPDDR3/DDR4	32bits DDR3/DDR3L/ DDR4/LPDDR4/ LPDDR4x	64bits DDR3/DDR3L/ LPDDR3/LPDDR4	64bit LPDDR4/ LPDDR4x/LPDDR5
<b>Display Interface</b>	RGB/MIPI DSI	RGB	RGB/LVDS/ MIPI DSI	HDMI2.0a	MIPI DSI/LVDS/ HDMI2.0b/ eDp/eInk	HDMI2.0b/ Dual MIPI DSI/ eDP	MIPI DSI/LVDS/ HDMI2.1/eDp
<b>Max. LCD Res.</b>	1080P	720P	1080P	n/a	4K	4K	8K
<b>Video Encoder</b>	4KP30 H.264/H.265	n/a	1080P30 H.264	1080P30 H.264/H.265	1080P60 H.265/ H.264	1080P30 H.264/ VP8	8KP30 H.264/ H.265
<b>Video Decoder</b>	4KP30 H.264/H.265	n/a	1080P60 H.265/H.264	4KP30 H.265/ H.264	4KP60 H.265/ H.264	4K60 H.265/ 4K30 H.264	8KP60 H.265/ H.264
<b>ISP/ Camera IF</b>	14M ISP/MIPI-CSI	n/a	8M ISP/MIPI-CSI	n/a	8M ISP/MIPI-CSI	13M ISP/MIPI-CSI	48M ISP/MIPI-CSI
<b>Industrial Automotive Qualification</b>	Industrial	Automotive	Automotive	-	Automotive	Industrial	Automotive