# Rockchip Commercial and Industrial Grade SoC

<table>
<thead>
<tr>
<th>Chips</th>
<th>Consumer Grade 0~80°C</th>
<th>Commercial Grade -20~85°C</th>
<th>Auto Grade -40~85°C</th>
<th>Industrial Grade -40~85°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>RK3399 Series</td>
<td>RK3399</td>
<td>RK3399K</td>
<td></td>
<td></td>
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<tr>
<td>RK3288 Series</td>
<td>RK3288/RK3288W</td>
<td>RK3288K</td>
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<tr>
<td>RK3368 Series</td>
<td>RK3368</td>
<td>PX5</td>
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<tr>
<td>PX30 Series</td>
<td>PX30</td>
<td>PX30K</td>
<td>RK3358M</td>
<td>RK3358J</td>
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<tr>
<td>RK3308 Series</td>
<td>RK3308/RK3308G/RK3308B/RK3308H</td>
<td>RK3308GK/RK3308K</td>
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<tr>
<td>RV1108 Series</td>
<td>RV1108A / RV1108G</td>
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<td>RV1108K1</td>
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<tr>
<td>RK1808 Series</td>
<td>RK1808</td>
<td>RK1808K</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Commercial, Auto and Industrial Grade chipset support 10years long term supply
2. RK3358M support AEC-Q100
<table>
<thead>
<tr>
<th>PMIC</th>
<th>DCDC</th>
<th>LDO &amp; Switch</th>
<th>Charger</th>
<th>Gas Gauge</th>
<th>Codec</th>
<th>Package</th>
<th>Part Number</th>
<th>For Soc</th>
</tr>
</thead>
<tbody>
<tr>
<td>RK817</td>
<td>2.5A<em>2 1.5A</em>2</td>
<td>400mA<em>8 100mA</em>1 OTG</td>
<td>3A</td>
<td>√</td>
<td>HP out Mic in<em>2 1.3W Class D</em>1</td>
<td>QFN68 (7*7mm)</td>
<td>RK817-1</td>
<td>RK3326 PX30</td>
</tr>
<tr>
<td>RK818</td>
<td>4A<em>2 2.5A</em>2 Boost*1</td>
<td>150mA<em>4 100mA</em>1 300mA<em>3 400mA</em>1 HDIM5V Switch *1/OTG</td>
<td>3A</td>
<td>√</td>
<td>–</td>
<td>QFN68 (7*7mm)</td>
<td>RK818-2</td>
<td>RK3288/RK3368</td>
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<tr>
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<td>RK818-3</td>
<td>RK3399</td>
</tr>
<tr>
<td>RK816B</td>
<td>2A<em>2 1A</em>2</td>
<td>300mA<em>5 100mA</em>1 OTG</td>
<td>2A</td>
<td>√</td>
<td>–</td>
<td>QFN (5*5mm)</td>
<td>RK816-1</td>
<td>RK3128/RK3126C</td>
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<tr>
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<td></td>
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<td></td>
<td>RK816-2</td>
<td>RV1108</td>
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<td></td>
<td>RK816-3</td>
<td>RK3308/PX3-SE</td>
</tr>
<tr>
<td>RK812</td>
<td>1.5A*1</td>
<td>600mA<em>1 400mA</em>1 100mA*2</td>
<td>1A Linear</td>
<td>–</td>
<td>Line out Mic in<em>3 1.7W Class D</em>1</td>
<td>QFN (4*4mm)</td>
<td>RK812-1</td>
<td>RK2206</td>
</tr>
<tr>
<td>RK809</td>
<td>2.5A<em>3 1.5A</em>2</td>
<td>400mA<em>8 100mA</em>1 Switch *2</td>
<td>–</td>
<td>√</td>
<td>HP out Mic in<em>2 1.3W Class D</em>1</td>
<td>QFN68 (7*7mm)</td>
<td>RK809-1</td>
<td>PX30</td>
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<td>RK809-2</td>
<td>RK1808</td>
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<td></td>
<td></td>
<td>RK809-3</td>
<td>RK3399PRO</td>
</tr>
<tr>
<td>RK808</td>
<td>5A<em>2 3A</em>1 2.5A*1</td>
<td>150mA<em>3 100mA</em>1 300mA*3 Switch *2</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>QFN68 (7*7mm)</td>
<td>RK808-B</td>
<td>RK3288/RK3368</td>
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<tr>
<td></td>
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<td></td>
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<td>RK808-C</td>
<td>RK3288 Chrome Book</td>
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<td></td>
<td></td>
<td>RK808-D</td>
<td>RK3399</td>
</tr>
<tr>
<td>RK805</td>
<td>2.5A<em>2 1.5A</em>2</td>
<td>100mA<em>1 300mA</em>3</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>QFN32 (4*4mm)</td>
<td>RK805-1</td>
<td>RK3328/RK3228</td>
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<td></td>
<td>RK805-2</td>
<td>RV1108</td>
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<td></td>
<td></td>
<td></td>
<td>RK805-3</td>
<td>RK3128/RK3036</td>
</tr>
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## RMSL201 3D structured light module

<table>
<thead>
<tr>
<th>Device</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module</td>
<td>Baseline</td>
<td>40mm</td>
</tr>
<tr>
<td></td>
<td>Precision(Depth)</td>
<td>±1mm@60mm</td>
</tr>
<tr>
<td></td>
<td>Size(L<em>W</em>H, unit: mm)</td>
<td>88.6x19.2x17.9</td>
</tr>
<tr>
<td></td>
<td>Interface</td>
<td>USB2.0</td>
</tr>
<tr>
<td></td>
<td>Power Consumption(typical)</td>
<td>2.45W</td>
</tr>
<tr>
<td></td>
<td>Effective Distance(Unit: m)</td>
<td>0.3~1.2</td>
</tr>
<tr>
<td>IR Camera</td>
<td>Resolution</td>
<td>800<em>1280/720</em>1280/400<em>640/360</em>640</td>
</tr>
<tr>
<td></td>
<td>FPS</td>
<td>30fps(IR@15fps+DEPTH@15fps)</td>
</tr>
<tr>
<td></td>
<td>FOV</td>
<td>79.10°±3°(OPT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80.50°±3°(ME)</td>
</tr>
<tr>
<td>RGB Camera</td>
<td>Resolution</td>
<td>1080<em>1920/1440</em>1920/480*640</td>
</tr>
<tr>
<td></td>
<td>FPS</td>
<td>30fps</td>
</tr>
<tr>
<td></td>
<td>FOV</td>
<td>DIAGONAL=84.0°</td>
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<tr>
<td></td>
<td></td>
<td>HORIZONTAL=71.5°</td>
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<tr>
<td></td>
<td>Encoding</td>
<td>MJPEG</td>
</tr>
</tbody>
</table>

### Laser Specification
- **Laser type**: VCSEL
- **Wavelength**: 940 nm(Typ.)
- **FOV**: D92.1°±3°

### Interface Specifications
- **Interface**: USB2.0

### Power Consumption
- **Power Consumption**: 2.45W

### Effective Distance
- **Effective Distance**: 0.3~1.2 m

### Function and Application

<table>
<thead>
<tr>
<th>Function</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face Recognition</td>
<td>Payment、Gate、Certification-machine</td>
</tr>
<tr>
<td>Robot</td>
<td>Obstacles avoidance</td>
</tr>
<tr>
<td>Motion Sensing</td>
<td>Game、Gesture、VR</td>
</tr>
</tbody>
</table>
RM310 4G module

Key Benefits
- Worldwide LTE, UMTS/HSPA+ and GSM/GPRS/EDGE coverage
- Compact SMT form factor ideal for small end products with tight space
- A rich set of Internet protocols, industry-standard interfaces and abundant functionalities
- A wide range of M2M applications

Key Features

<table>
<thead>
<tr>
<th>Frequency Bands</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LTE-FDD: B1/B3/B5/B8</td>
<td></td>
</tr>
<tr>
<td>LTE-TDD: B38/B39/B40/B41</td>
<td></td>
</tr>
<tr>
<td>WCDMA: B1/B5/B8</td>
<td></td>
</tr>
<tr>
<td>GSM: 900/1800</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LTE-FDD: Max 100Mbps (DL)/Max 50Mbps (UL)</td>
<td></td>
</tr>
<tr>
<td>LTE-TDD: Max 100Mbps (DL)/Max 50Mbps (UL)</td>
<td></td>
</tr>
<tr>
<td>WCDMA: Max 21Mbps (DL)/Max 5.76Mbps (UL)</td>
<td></td>
</tr>
<tr>
<td>GPRS: Max 85.6Kbps (DL)/Max 85.6Kbps (UL)</td>
<td></td>
</tr>
</tbody>
</table>

| Bandwidth             | 1.4/3/5/10/15/20MHz |
|                       |                      |

| MIMO                  | DL MIMO, receive diversity |
|                       |                      |

| Power Supply          | Supply voltage: 3.3V~4.3V, Typical supply voltage: 3.8V |
|                       |                      |

| Temperature Range     | -40°C ~ +85°C |
|                       |                      |

| Dimensions            | 32.0mm x 29.0mm x 2.6mm |
|                       |                      |

| Package               | 144pin LCC |
|                       |                      |

Interfaces

| USB                  | USB 2.0 with High Speed up to 480Mbps |
|                      |                      |
| PCM                  | options              |
| USIM                 | 1.8V/3.3V            |
| UART                 | x2                    |
| NETLIGHT             | NET_STATUS and NET_MODE |
| RESET                | Active Low           |
| PWRKEY               | Active Low           |
| Antennas Interface   | Primary Antenna, Rx-diversity Antenna |
| ADC                  | x2                    |
| GPIO                 | GPIO                  |

Rockchip Confidential Proprietary
RK912 80.11 b/g/n Wi-Fi chip

Main Features
• 40-pin QFN
• IEEE 802.11b/g/n 2.4G
• Compliant with SDIO Specification Version 3.00
• Highly integrated PA, TR switch, Balun, LNA for low BOM cost
• Power Saving Mechanism

Applications
• This product is applicable for Tablet, OTT box, IP Camera, etc. Wi-Fi application
Core
- Big.Little architecture: Dual-core Cortex-A72+Quad-core Cortex-A53, 64-bit CPU
- ARM Mali-T860MP4 GPU, OpenGL ES1.1/2.0/3.0/3.1/3.2, Vulkan 1.0, OpenCL 1.2, DX11
- NPU: 1920 INT8 MACs/192 INT16 MACs/64 FP16 MACs, MAX to 800MHz

Memory
- Dual channel DDR3-1866/DDR3L-1866/LPDDR3-1866/LPDDR4-1866
- Support eMMC 5.1 with HS400, SDIO 3.0 with HS200

Multimedia
- 4K VP9 and 4K 10-bit H.265/H.264 video decoder, up to 60fps
- 1080P other video decoders (VC-1, MPEG-1/2/4, VP8)
- 1080P video encoders for H.264 and VP8
- Security Video Path, OP-TEE, support Widevine Level1, PlayReady
- Video post processor: de-interlace, de-noise, enhancement for edge/detail/color

Display
- Dual display engine up to 4096x2160 and 2560x1600
- Dual channel MIPI-DSI TX, 4 lanes per channel
- eDP 1.3 with PSR, 4 lanes up to 10.8Gbps
- HDMI 2.0a with HDCP 1.4/2.2, up to 4K 60Hz
- DisplayPort 1.2 with 4 lanes, up to 4K 60Hz
- HDR10/HLG display with conversion between Rec.2020 and Rec.709

Camera
- Dual 13MPixel ISP and dual MIPI CSI-2

Other
- Built-in dual Type-C with USB 3.0 and DisplayPort Alternate mode
- PCIe v2.1 (4 full-duplex lanes), up to 2.5Gbps/lane
- Embedded RGMII interface three channels I2S, SPDIF output

PMU
- RK808-D / RK818-3

Availability
- MP Now
RK1808 AIOT Processor

Core
• Dual core ARM Cortex-A35, 1.6GHz

NPU
• 1920 INT8 MACs/192 INT16 MACs/64 FP16 MACs
• MAX to 800MHz

Memory
• 32bit DDR3-1600/DDR3L-1600/ LPDDR2-1066 / LPDDR3-1600
• Support eMMC 4.51, Serial Nor Flash booting

Multi-Media
• 1080P H.264 video encoder/decoder
• 2M ISP with MIPI-CSI/ 5M DVP input
• BT.1120 and UVC interface

Display
• MIPI-DSI/RGB interface

External interface
• RGMII interface
• PCI-e 2.1, dual link; mux with USB 3.0
• USB 2.0 OTG and USB 2.0 host
• Dual SDIO 3.0 interface for Wi-Fi and SD card
• 8ch I2S with TDM/PCM, 2ch I2S, VAD function
• I2C/UART/SPI interface

Package
• FCCSP420LD 14X14, 0.5mm pitch

Availability
• MP Now

RK1808
USB3.0 AI
Neural Computational Stick Accelerator Card

RK1808
PCI-e AI
RK1808/RK3399Pro NPU Operational Performance

3.0 TOPs
(300 GOPs for INT16, 100 GFLOPs for FP16)

- **Easy Programming**
  - One-Button Mapping: Caffe/TensorFlow directly converted to HW binaries
  - OpenCL/OpenVX for creating custom NN layers or pre-processing CV functions

- **Heterogeneous Computing**
  - NN Cores for convolution and FC layers
  - CPU/PPU for precision compute and for future network layers

<table>
<thead>
<tr>
<th>CNN Module</th>
<th>FPS</th>
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<tbody>
<tr>
<td>VGG16</td>
<td>51.23</td>
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<tr>
<td>ResNet50</td>
<td>75.39</td>
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<td>Inception_v4</td>
<td>18.36</td>
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<td>YOLO_v2</td>
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<td>DeepSpeech2</td>
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<tr>
<td>Real-time rate</td>
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<tr>
<td>Accuracy</td>
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<tr>
<td>WER (LibriSpeech)</td>
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</table>
• ARM Cortex-M4F
• Cadence Tensilica HiFi3 Audio DSP
• WLAN 802.11 b/g/n
• Embedded PSRAM
• Embedded SPI Nor FLASH
• SDMMC3.0
• Acodel (RK812)
  • 3x ADC 1xDAC
  • Class D Audio PA
• Digital Audio Interface
  • 4CH I2S/TDM/PCM
• Connectivity
  • USB 2.0 OTG
  • MCU LCD Interface
  • 8bit DVP Camera Interface
  • UART, SPI, I2C, PWM
• Package QFN68 7*7
• Availability: MP Now
RK2108 SoC Spec and Block Diagram

- ARM Cortex-M4F
- Cadence Tensilica HiFi3 Audio DSP
- Embedded 1.5MB SRAM+DTCM
- Embedded LDOs
- SPI Nor FLASH,
- SD/MMC 3.0  SDIO 3.0
- Digital Audio Interface
  - 4CH RX,2CH TX I2S/PDM/PCM
  - 6CH RX,2CH TX I2S
- Acodec
  - 2x ADC for MIC IN and LINE IN
- Connectivity
  - USB 2.0 Device
  - MIPI DSI/MCU LCD interface
  - 12bit DVP camera interface
  - UART , SPI , I2C , PWM
- Total 42 GPIOs
- Package QFN68 7*7
- Availability: MP Now

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System Peripheral
- Clock & Reset
- PLL x3
- System register
- Timer
- Interrupt Controller
- DMAC
- VAD
- PMU
- LDO 0.9V & 1.6V

Embedded Memory
- ROM (8kB)
- ShareMem (1MB)

Audio I/F
- Codec ADC x2
- 4RX+2TX I2S/PDM/PCM
- 6RX+2TX I2S

HiFi 3 DSP
- I-Cache 16kB
- D-Cache 16kB
- I-TCM 64kB
- D-TCM 512kB

Cortex-M4F
- I-cache 16kB
- D-cache 16kB

Connectivity
- UART
- SPI slave & master
- GPIO
- JTAG
- I2C slave & master
- DVP
- USB
- SDIO
- SFC
- MIPI DSI
- PWM
RK3399 Application Processor

Core
- Big.Little architecture: Dual-core Cortex-A72 + Quad-core Cortex-A53, 64-bit CPU
- ARM Mali-T860MP4 GPU, OpenGL ES1.1/2.0/3.0/3.1/3.2, Vulkan 1.0, OpenCL 1.2, DX11

Memory
- Dual channel DDR3-1866/DDR3L-1866/LPDDR3-1866/LPDDR4-1866
- Support eMMC 5.1 with HS400, SDIO 3.0 with HS200

Multimedia
- 4K VP9 and 4K 10-bit H.265/H.264 video decoder, up to 60fps
- 1080P other video decoders (VC-1, MPEG-1/2/4, VP8)
- 1080P video encoders for H.264 and VP8
- Security Video Path, OP-TEE, support Widevine Level1, PlayReady
- Video post processor: de-interlace, de-noise, enhancement for edge/detail/color

Display
- Dual display engine up to 4096x2160 and 2560x1600
- Dual channel MIPI-DSI TX, 4 lanes per channel
- eDP 1.3 with PSR, 4 lanes up to 10.8Gbps
- HDMI 2.0a with HDCP 1.4/2.2, up to 4K 60Hz
- DisplayPort 1.2 with 4 lanes, up to 4K 60Hz
- HDR10/HLG display with conversion between Rec.2020 and Rec.709

Camera
- Dual 13MPixel ISP and dual MIPI CSI-2

Other
- Built-in dual Type-C with USB 3.0 and DisplayPort Alternate mode
- PCIe v2.1 (4 full-duplex lanes), up to 2.5Gbps/lane
- Embedded RGMII interface three channels I2S, SPDIF output

PMU
- RK808-D / RK818-3

Availability
- MP Now

Rockchip Confidential Proprietary
RK3288 Application Processor

Core
- Quad-Core A17 CPU, up to 1.8GHz
- ARM Mali-T760MP4, support OpenGL ES1.1/2.0/3.0, OpenVG1.1, OpenCL, DirectX11

Memory
- DDR3-1333/LPDDR3-1066/LPDDR2-1066
- Support MLC NAND, eMMC 4.51

Multi-Media
- 4K 10-bits 60fps H.265 video decoder, 4K H.264 video decoder
- 1080P 60fps video decoders (VC-1, MPEG-1/2/4, VP8)
- 1080P video encoder for H.264 and VP8
- Video post processor: de-interlace
- Embedded 13MPixel ISP and MIPI-CSI2 interface
- Security video path, support Widevine Level1, PlayReady

Display
- Display resolution up to 3840X2160
- Support dual display, embedded dual MIPI-DSI, dual LVDS, eDP1.1
- HDMI 2.0 for 4K display, support HDCP 1.4/2.2

External interface
- SDIO 3.0 interface
- I2S supports 8 channels TX
- Embedded RGMII interface
- Triple USB2.0 embedded

Package
- BGA636 19mmX19mm, 0.65mm pitch

PMU
- RK808-B / RK818-1 / RK808-C

Availability
- MP Now
RK3368 Application Processor

Core
- Octal 64bit ARM Cortex-A53 Big/Little core, up to 1.5GHz
- Imagination GC6110 GPU, support OpenGL ES1.1/2.0/3.0, OpenVG1.1, OpenCL

Memory
- 32bit DDR3-1600/DDR3L-1600/LPDDR3-1333
- Support MLC NAND, eMMC 4.51, Serial Nor Flash booting

Multi-Media
- 4K@60fps H.265 decoder, 4K@30fps H.264 Video decoder (RK3368)
- 1080P H.264/H.265 video decoder (RK3368H)
- 1080P other video decoders (VC-1, MPEG-1/2/4, VP8)
- 1080P video encoder for H.264 and VP8
- Security video path, support Widevine Level 1, PlayReady
- DTV functions, include TS IF/Demux/PID filter/Descrambler (RK3368 Only)

Display
- eDP1.1/LVDS/MIPI-DSI/RGB interface, up to 2048x1536 resolution
- HDMI 2.0 for 4K YUV420@60Hz with HDCP 1.4/2.2

Camera
- Embedded 8MPixel ISP
- 4-lane MIPI-CSI2 and DVP interface

External interface
- Dual SDIO 3.0 interface for Wi-Fi and SD card
- I2C/I2S/UART/SPI/SPDIF interface
- Embedded 1000M RGMII interface (RK3368 Only)
- Dual USB2.0 port, OTG and HOST

Package
- BGA453 19mmX19mm, 0.8mm pitch

PMU
- RK808-B / RK818-1

Availability
- MP Now
PX30 Application Processor

Core
- Quad Core ARM Cortex-A35 CPU
- Mali-G31 MP2 GPU, supports OpenGL ES 3.2, Vulkan 1.0, OpenCL 2.0

Memory
- 32bit DDR4-1600/DDR3-1600/DDR3L-1600/LPDDR3-1600/LPDDR2-1066
- Support MLC NAND, eMMC 4.51, Serial Nor Flash booting

Multi-Media
- 1080P H.265/H.264/VC-1/MPEG/VP8 video decoder
- 1080P video encoder for H.264/VP8
- 4-lane MIPI-CSI2 and DVP interface, embedded 8M ISP

Display
- Dual VOP
- LVDS/MIPI-DSI + RGB interface

External Interface
- Dual SDIO 3.0 interface for Wi-Fi and SD card
- Support one 8ch I2S/TDM, one 8ch PDM, two 2ch I2S
- RMII/I2C/UART/SPI/PWM interface

Package
- BGA418 14X14, 0.65mm pitch

PMU
- RK817 / RK809

Availability
- MP Now

PX30
- 64bit Octa-Core CPU
- OPENGL ES3.2 Vulkan V1.0 OpenCL V2.0 GPU
- 1080P 60fps H.264/H.265 Video Decoder
RK3326 Application Processor

Core
• Quad Core ARM Cortex-A35 CPU, up to 1.5GHz
• Mali-G31 MP2 GPU, support OpenGL ES 3.2, Vulkan 1.0, OpenCL 2.0

Memory
• 32bit DDR4-1600/DDR3-1600/DDR3L-1600/LPDDR3-1600/LPDDR2-1066
• Support MLC NAND, eMMC 4.51, Serial Nor Flash booting

Multi-Media
• 1080P H.265/H.264/VC-1/MPEG/VP8 video decoder
• 1080P video encoder for H.264/VP8
• 4-lane MIPI-CSI2 and DVP interface, embedded 8M ISP

Display
• LVDS/MIPI-DSI/RGB interface

External interface
• Dual SDIO 3.0 interface for Wi-Fi and SD card
• Support one 8ch I2S/TDM, one 8ch PDM, two 2ch I2S
• I2C/UART/SPI interface

Package
• BGA418 14X14, 0.65mm pitch

PMU
• RK817 / RK809

Availability
• MP now
RK3128 Application Processor

Core
- Quad-Core ARM Cortex-A7 CPU, up to 1.2GHz
- ARM Mali-400MP2 GPU

Memory
- 32bits DDR3-1066/DDR3L-1066
- Support MLC NAND, eMMC 4.51, Serial Nor FLASH Booting

Multi-Media
- 1080P 60fps H.265/H.264/VC-1/MPEG/VP8 video decoder,
- 1080P video encoder for H.264
- Video post processor: de-interlace
- DTV functions, include TS IF/Demux/PID filter/Descrambler

Display
- LVDS/MIPI-DSI/RGB interface
- HDMI1.4 transmitter with HDCP 1.2
- CVBS encoder and output

External interface
- I2C/I2S/UART/SPI/SPDIF interface
- Dual SDIO interface for SD card and Wi-Fi
- Embedded audio Codec
- 1000M RGMII interface
- Dual USB2.0 port, OTG and HOST

Package
- BGA316 14mmX14mm, 0.65mm pitch

PMU
- RK816-1 / RK818-1

Availability
- MP Now
RK3126C Application Processor

Core
• Quad Core ARM Cortex-A7 CPU, up to 1.2GHz
• ARM Mali-400MP2 GPU

Memory
• 16bits DDR3-1066/DDR3L-1066
• Support MLC NAND, eMMC 4.51, Serial Nor FLASH Booting

Multi-Media
• 1080P H.264/VC-1/MPEG/VP8 video decoder
• 1080P video encoder for H.264/VP8
• Video post processor: de-interlace

Display
• LVDS/MIPI-DSI/RGB interface

External interface
• I2C/I2S/UART/SPI interface
• SDIO interface for SD card
• Embedded audio Codec
• Dual USB2.0 port, OTG and HOST

Package
• LQFP176 20mm x 20mm

PMU
• RK816-1 / RK818-1

Availability
• MP Now
CPU and GPU
- Quad Cortex-A53, 64bit CPU, up to 1.5GHz
- ARM Mali-450MP4 GPU, OpenGL ES1.1/2.0

Memory
- 32 bits DDR3-1800/DDR3L-1800/LPDDR3-1800/DDR4-2133
- eMMC 4.51, SDIO 3.0, SDcard 3.0

Multi-Media
- 4K 10bits 30fps H.264 video decoder, 4K 10bits 60fps H265 video decoder
- 1080P video decoders (WMV, MPEG-1/2/4, VC-1, AVS, AVS+, …)
- HDR10, HLG HDR
- 1080P@30fps video encoders for H.264/H.265
- Video post processor: de-interlace, de-noise, enhancement for edge/detail/color

Display
- HDMI 2.0a for 4K 60Hz with HDCP 1.4/2.2
- Support BT2020/BT709 display

External interface
- USB 2.0 x2 and USB 3.0 x1
- 100M Ethernet with built-in PHY and 1000M MAC interface
- Built-in CVBS and audio DAC
- 8 channels I2S IO and 8 channel digital PDM input (for MIC array)

Security
- TrustZone based security, Secure content path
- SecureOS, OPTEE, Widevine L1/ PlayReady / ChinaDRM

Package
- BGA395, 14mmx14mm, 0.65 pitch

Availability
- MP Now
RK3228/RK3229 Application Processor

Core
- Quad-Core ARM Cortex-A7 CPU, up to 1.5GHz
- Mali-400 triple core and dual core 2D processor

Memory
- 32bit DDR3-1600/DDR3L-1600/LPDDR3-1333/LPDDR2-1066
- Support MLC NAND, eMMC 4.51, Serial Nor Flash booting

Multi-Media
- 4K 10-bits 60fps H.265/H.264/VP9 video decoder (30fps for RK3228)
- 1080P other video decoders (VC-1, MPEG-1/2/4, VP8)
- 1080P video encoder for H.264 and VP8
- Video post processor: de-interlace
- Security video path, support Widevine Level1, PlayReady (RK3229)

Display
- HDMI 2.0 for 4K YUV420@60Hz with HDCP 1.4/2.2

External interface
- Dual SDIO 3.0 interface for Wi-Fi and SD card
- I2S interface, supports 8 channels RX or 8 channels TX
- I2CUARTSPI/SPDIF interface
- Embedded audio DAC
- Embedded TV encoder and CVBS output
- Embedded 1000M RGMII interface and 100M MAC PHY

Package
- BGA316 14mmX14mm, 0.65mm pitch

Availability
- MP Now
RK3128H Application Processor

Core
- Quad-Core ARM Cortex-A7 CPU, up to 1.2GHz
- Mali-400 triple core and dual core 2D processor

Memory
- 32bit DDR3-1333/DDR3L-1333/LPDDR3-1333/LPDDR2-1066
- Support MLC NAND, eMMC 4.51, Serial Nor Flash booting

Multi-Media
- 1080P60 H.265/H.264 video decoder
- 1080P other video decoders (VC-1, MPEG-1/2/4, VP8)
- 1080P video encoder for H.264 and VP8
- Video post processor; de-interlace
- Support security and non-security mode

Display
- HDMI 1.4 for 1080P @60Hz with HDCP 1.4

External interface
- Dual SDIO 3.0 interface for Wi-Fi and SD card
- I2C/UART/SPI/SPDIF interface
- Embedded audio DAC
- Embedded TV encoder and CVBS output
- Embedded 1000M RGMII interface and 100M MAC PHY

Package
- BGA316 14mmX14mm, 0.65mm pitch

Availability
- MP Now
RK3036 Application Processor

Core
• Dual-Core A7 CPU, up to 1.0GHz
• ARM Mali-400 GPU

Memory
• 16bits DDR3-1066/DDR3L-1066
• Support MLC NAND, eMMC 4.51, Serial Nor FLASH Booting

Multi-Media
• 1080P H.265/H.264/VC-1/MPEG/VP8 video decoder

Display
• HDMI 1.4 transmitter with HDCP 1.2
• CVBS output

External interface
• I2C/I2S/UART/SPI/SPDIF interface
• SDIO interface for SD card
• 100M MAC (RMII) interface
• Dual USB2.0 port, OTG and HOST
• Embedded audio DAC

Package
• BGA236 12mm x 12mm

Availability
• MP Now
RK3308/RK3308B Application Processor

Core
- Quad Core ARM Cortex A35 CPU, up to 1.3GHz

Memory
- 16bits DDR2/DDR3/LPDDR2
- Support SLC NAND, eMMC 4.51, Serial Nor FLASH Booting
- Embedded 64MB DDR2 (RK3308G/RK3308H)

Acodec
- 8x ADC for analog MIC In and Line in
- Stereo HP Out and Line Out

Digital Audio Interface
- 8TX+8RX, 8CH, 2CH I2S/TDM/PCM
- 8CH PDM IN
- SPDIF IN/OUT, HDMI ARC support
- Embedded VAD (Voice Activation Detection)

External interface
- I2C/UART/SPI interface
- SDIO 3.0
- SD/MMC 3.0
- 100M MAC (RMII) interface
- RGB/8080 display interface
- Dual USB2.0 port, OTG and HOST

Package
- TFBGA355 13mm x 13mm

Availability
- MP now
RV1108 Application Processor

Core
- ARM Cortex A7, single core 1GHz
- 600M CEVA XM4 high performance DSP

Memory
- 16-bit DDR3-1866/DDR3L-1600
- Support Serial NOR Flash, SLC, eMMC

Video process
- H264 Video Codec, up to 1440P@30fps, 1080P@60fps
- Low bitrate/high quality encoding, CBR and VBR rate control mode

ISP and Video input
- 8MPixel ISP with WDR, AE/AWB/AF
- MIPI CSI and DVP Sensor interface
- CVBS IN function, support multi CVBS-in through external chipset

Display
- HDMI 1.4, 1080P@60fps output; CVBS output
- Parallel RGB888/Serial RGB888/MIPI interface to panel

External interface
- Embedded audio codec and three I2S, support 8ch Tx or Rx audio
- RMII for Ethernet
- Dual SDIO for Card and WIFI
- UART, SPI for BT/GPS

Package
- BGA, 14mmx14mm
- Embedded 128MB DDR3 (RK1108G)

PMU
- RK805-2 / RK816-2

Availability
- MP Now
RKNanoD Audio/IOT Processor

Core
- Dual ARM Cortex-M3 CPU
- 250MHz system core and 500MHz calculate core

Memory
- 320K IRAM and 256K DRAM for system core
- 128K IRAM and 256K DRAM for calculate core
- 16K byte boot ROM and 64K always on SRAM
- SPI NAND, SPI NOR, eMMC/SD Card memory interface

Audio
- H/W accelerator for lossless audio decoding
- H/W accelerator for low power MP3 playback
- 192K/24bit audio codec with earphone driver

Display
- i8080/SPI/E-INK LCD interface
- SDIO, UART, I2S interface
- USB2.0 OTG

Package
- LQFP128 and QFN68

Availability
- MP now
RKNanoC Audio/IOT Processor

**Core**
- ARM Cortex-M3, 100MHz

**Memory**
- 80K Byte IRAM and 64KByte DRAM
- Boot from SPI Nor flash or MLC NAND

**Power**
- High efficiency DCDC and LDO
- Max 200mA charger
- Power path management

**Audio**
- Lower power cap-less Audio-DAC
- Low power class-G HP driver
- Only 20mW @MP3 playback

**Display**
- i8080/SPI LCD interface

**Package**
- LQFP64

**Availability**
- MP Now
RV1109 Application Processor

CPU
• Dual core ARM Cortex-A7, 1.0GHz

NPU
• 1.0Tops, support INT8/ INT16

Memory
• 32bit DDR3/DDR3L/LPDDR2/LPDDR3/DDR 4/LPDDR4
• Support eMMC 4.51, Serial Nor Flash
• Support fast booting

Display
• MIPI-DSI/RGB interface
• 1080P @ 60 FPS

Multi-Media
• 13M ISP 2.0 with 3F HDR(Line-based/Frame-based/DCG)
• Support 2*MIPI CSI /LVDS/sub LVDS
• 4K H.264/H.265 30fps video encoder
  • 3840 x 2160@30 fps+720p@30 fps encoding
• 4K H.264/H.265 30fps video decoder
  • 3840 x 2160@30 encoding + 3840 x 2160@30 decoding
• DVP interface with BT.656/BT.1120

External interface
• RGMII interface with TSO network acceleration
• USB 2.0 OTG and USB 2.0 host
• Dual SDIO 3.0 interface for Wi-Fi and SD card
• 8ch I2S with TDM/PCM, 2ch I2S
• I2C/UART/SPI interface

Availability
• 2019 Q4
• 14nm, FCCSP 0.65
RK3566 Application Processor

**CPU**
- Quad core ARM Cortex-A55, 1.8GHz

**GPU**
- G52 2EE

**NPU**
- 0.5 Tops, support INT8/ INT16

**Memory**
- Support eMMC 4.51, Nand Flash,SFC Nor

**Display**
- Support Dual Display
- MIPI-DSI/RGB interface
- LVDS/eDP/DP
- HDMI 2.0

**Multi-Media**
- 8M ISP 2.0 with 3F HDR(Line-based/Frame-based/DCG)
- Support MIPI-CSI2,4-lane
- 1080P60 H.265, H.264
- 4K H.264/H.265/VP9 60fps video decoder
- DVP interface with BT.656/BT.1120

**External interface**
- 2*RGMII interface with TSO network acceleration
- USB 2.0 OTG and USB 2.0 host
- USB3.0 HOST, SATA3.0, PCIE
- 3*SDIO 3.0 interface for Wi-Fi and SD card
- 2*8ch I2S, 2*2ch I2S, PDM, TDM, SPDIF
- 6*I2C/10*UART/4*SPI/8*PWM/2*CAN interface

**Availability**
- 2020 Q2
Thank You!

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