



Features

CPU

- Quad-core ARM Cortex-A76 processor and quad-core ARM Cortex-A55 processor
- Integrated 64KB L1 instruction cache, 64KB L1 data cache and 512KB L2 cache for each Cortex-A76
- Integrated 32KB L1 instruction cache, 32KB L1 data cache and 128KB L2 cache for each Cortex-A55
- Big cluster and little cluster share 3MB L3 cache
- MCU for low power control

GPU

- ARM Mali-G610 MC4
- High performance OpenGL ES 1.1, 2.0 and 3.2, OpenCL 2.2, Vulkan1.2 etc.
- Embedded 4 shader cores with shared hierarchical tiler

NPU

- 6TOPs@int8
- Support int4/int8/int16/FP16/BF16/TF32
- Support deep learning frameworks: TensorFlow, Caffe, Tflite, Pytorch, Onnx NN, Android NN, etc

Memory

- 64bit LPDDR4/LPDDR4x/LPDDR5
- Support eMMC 5.1 with HS400, SDIO 3.0 with HS200,
- NVMe, SFC

Multi-Media

- H.265/H.264/VP9/AV1/AVS2 video decoder, up to 8K@60fps
- 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)
- 1080P other video decoders (VC-1, MPEG-1/2/4, VP8, AVS1)
- MPEG-1 up to MP: 1080p@60fps (1920x1088)
- MPEG-2 up to MP: 1080p@60fps (1920x1088)
- VC-1 up to AP level 3: 1080p@60fps (1920x1088)
- VP8 version2: 1080p@60fps (1920x1088)
- 8K@30fps video encoders for H.264/H.265

Video Input

- 48M Pixel ISP with HDR&3DNR
- Multiple (4*4lanes or 4*2lanes+2*4Lanes) MIPI CSI-2 and DVP interface
- HDMI 2.0 input to 4K@60fps

Display

- Multiple display engine max to 8K
- Dual HDMI2.1/eDP V1.4 Combo interface
- Dual MIPI-DSI TX, 4 lanes
- Dual DP v1.3 embed in USB 3.1, Audio, HDCP2.x

Audio Interface

- I2S0/I2S1 with 8 channels
- I2S2/I2S3 with 2 channels
- SPDIF0/SPDIF1
- PDM0/PDM1 with 8 channels
- Digital Audio Codec with 2 channels
- VAD (Voice Activity Detection)

High Speed Interface

- Dual port USB 3.1 with type-C & DP
- Dual port USB 2.0 OTG & dual port USB 2.0 host
- PCIe 3.0, 4 lanes or 2x2 lanes or 4x 1lane
- Three port PCIe 2.0/SATA 3.0
- Dual RGMII interface

Security

- ARM Trustzone security extension
- Secure boot
- Secure JTAG to debug
- Key ladder
- Crypto (RSA 2K, HAS 256...)
- HDCP 2.x for HDMI and DP/eDP

SDK

- Linux5.10
- Android12

Device Information

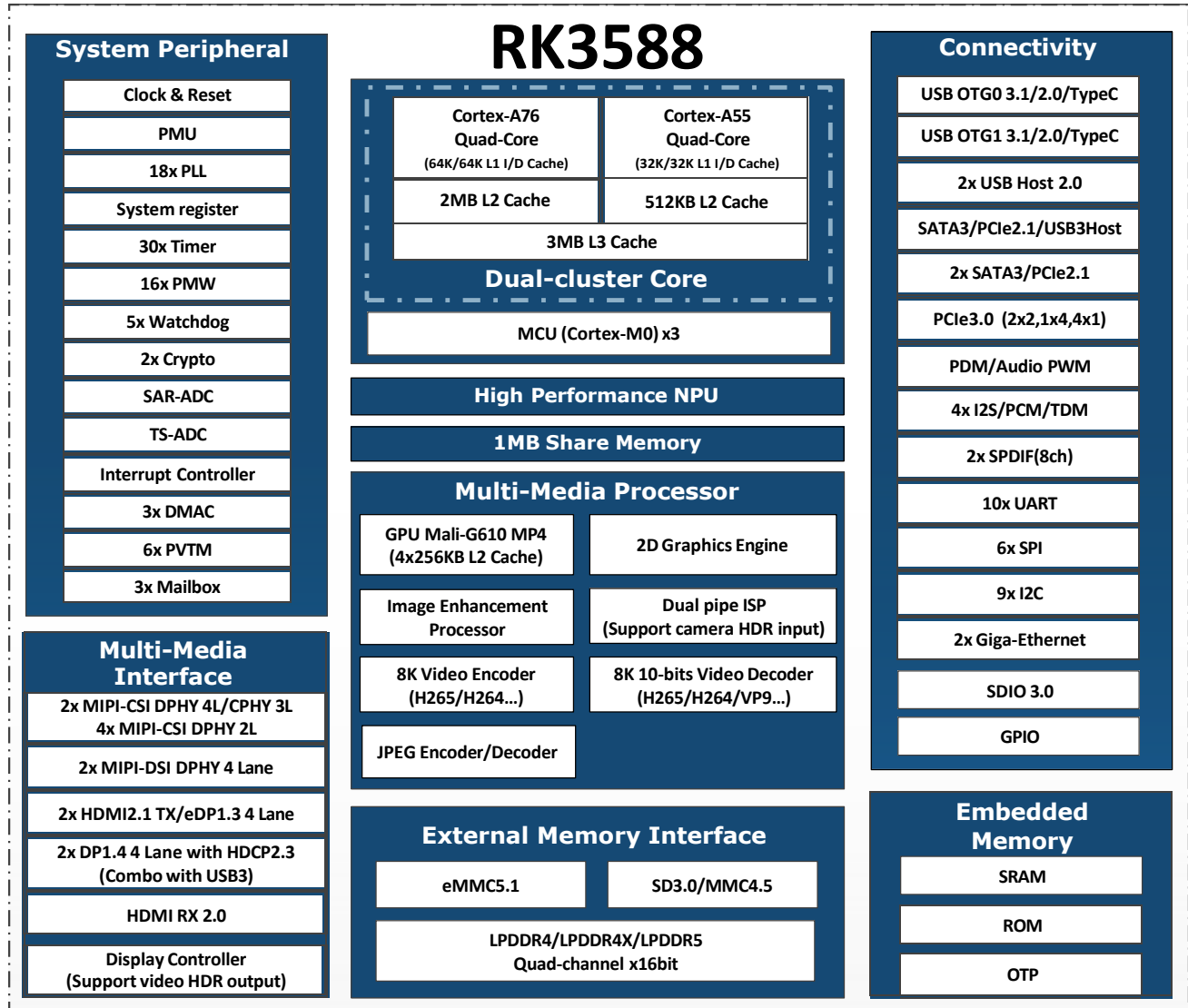
- | | |
|----------|-----------------------|
| Package: | • Package: FCBGA1088L |
| | Body: 23mm x 23mm |
| | Ball pitch: 0.65mm |



RK3588 Target Applications

- Cockpit
- Smart display
- AI Camera
- Edge Computing
- ARM PC
- Tablet
- NVR
- AR/VR

Block Diagram





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Typical Application Diagram – AIoT

