RV1106

A high-performance AI vision processor SoC

Features

CPU

- ARM Cortex-A7, 1.2GHz
- MCU 300MHz

NPU

- 0.5TOPS, support INT4、INT8、INT16

Memory

- 16-bit DDR2/DDR3/DDR4
- RV1106G2 embedded 1Gb DDR design
- Support eMMC 4.51, dual and quad SPI Flash

Multi-Media

- 5M ISP 3.x with 2F HDR(Line-based/Frame-based/DCG)
- Support 2*MIPI CSI /LVDS/sub LVDS
- DVP interface with BT.656/BT.1120
- H.264/H.265 encoder capability:
    - 3072*1728@25 + 1280*720@25 + 720*576@25 + 5FPS JPEG
    - 2592*1944@25 + 1280*720@25 + 720*576@25 + 5FPS JPEG
    - 2880*1620@25 + 1280*720@25 + 720*576@25 + 5FPS JPEG
    - 2560*1440@30 + 1280*720@30 + 720*576@30 + 5FPS JPEG
- 16M@30FPS JPEG snapshot
- Six bit rate control modes (CBR, VBR, FIXQP, AVBR, QPMAP, and CVBR)
- Intelligent encoding mode
- 8-area OSD
- Ultra-low delay encoding

Rockchip Intelligent Video Engine

- Support 20+ IVE algorithms
- Support rotation, x-mirror, y-mirror
- Support scale down/up

External Interface

- RMII interface with TSO network acceleration and Ethernet PHY
- One USB 2.0 Host/Device
- Dual SDIO 3.0 interface for Wi-Fi and SD card
- 2-channel ADC、12 PWM interfaces
- I2C、SPI、and UART interfaces
- Embedded Audio codec 、RTC、POR

SDK

- Linux-5.10 base SDK

Physical Specifications

- Power Consumption
    - Typical power consumption at 5M30fps: 760mW
- Operating Voltage
    - 0.9V core voltage
    - 3.3V I/O voltage
    - 1.8V DDR2/1.5(1.35)V DDR3(L)/1.2V DDR4 SDRAM interface voltage
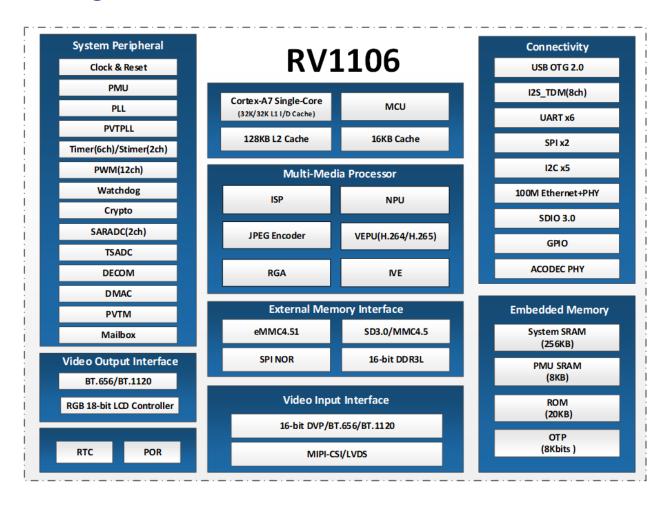
Device Information

Package:
- QFN128
  Body: 12.3mm x 12.3mm
  Ball pitch: 0.35mm

- **AI Application**
- **IPC**

Block Diagram

RV1106

System Peripheral
- Clock & Reset
- PMU
- PLL
- PVTPLL
- Timer(6ch)/Stimer(2ch)
- PWM(12ch)
- Watchdog
- Crypto
- SARADC(2ch)
- TSADC
- DECOM
- DMAC
- PVTM
- Mailbox

Video Output Interface
- BT.656/BT.1120
- RGB 18-bit LCD Controller

- RTC
- POR

Cortex-A7 Single-Core (32K/32K L1 I/D Cache) | **MCU**
128KB L2 Cache | **16KB Cache**

Multi-Media Processor
- ISP | NPU
- JPEG Encoder | VEPU(H.264/H.265)
- RGA | IVE

External Memory Interface
- eMMC4.51 | SD3.0/MMC4.5
- SPI NOR | 16-bit DDR3L

Video Input Interface
- 16-bit DVP/BT.656/BT.1120
- MIPI-CSI/LVDS

Connectivity
- USB OTG 2.0
- I2S_TDM(8ch)
- UART x6
- SPI x2
- I2C x5
- 100M Ethernet+PHY
- SDIO 3.0
- GPIO
- ACODEC PHY

Embedded Memory
- System SRAM (256KB)
- PMU SRAM (8KB)
- ROM (20KB)
- OTP (8Kbits)

- AI Application
- IPC

Application Typical Diagram – IPC

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