MR813

ALLWINER®

SLAM/VSLAM intelligent robot solution
The high-performance dual-camera robot chip

Overview

The MR813 integrates a quad-core ARM Cortex™-A53 CPU that operates at speed up to 1.5 GHz, with dual MIPI CSI and 13M ISP. It is the cost-effective solution for robot sweeper applications.

Highlights

High Performance

MR813 adopts quad-core 64-bit Cortex™-A53 CPU up to 1.5 GHz, which has powerful performance to ensure the smoothly running of various recognition algorithms like VSLAM, in-depth information extraction, and object recognition.

Dual Camera

MR813 integrates dual MIPI CSI, one ISP and H.264 encoder. With these features, MR813 supports up to two cameras (2M@60fps+2M@60fps) to meet the requirements of multiple applications such as dual TOF, one camera and one TOF, or dual camera.
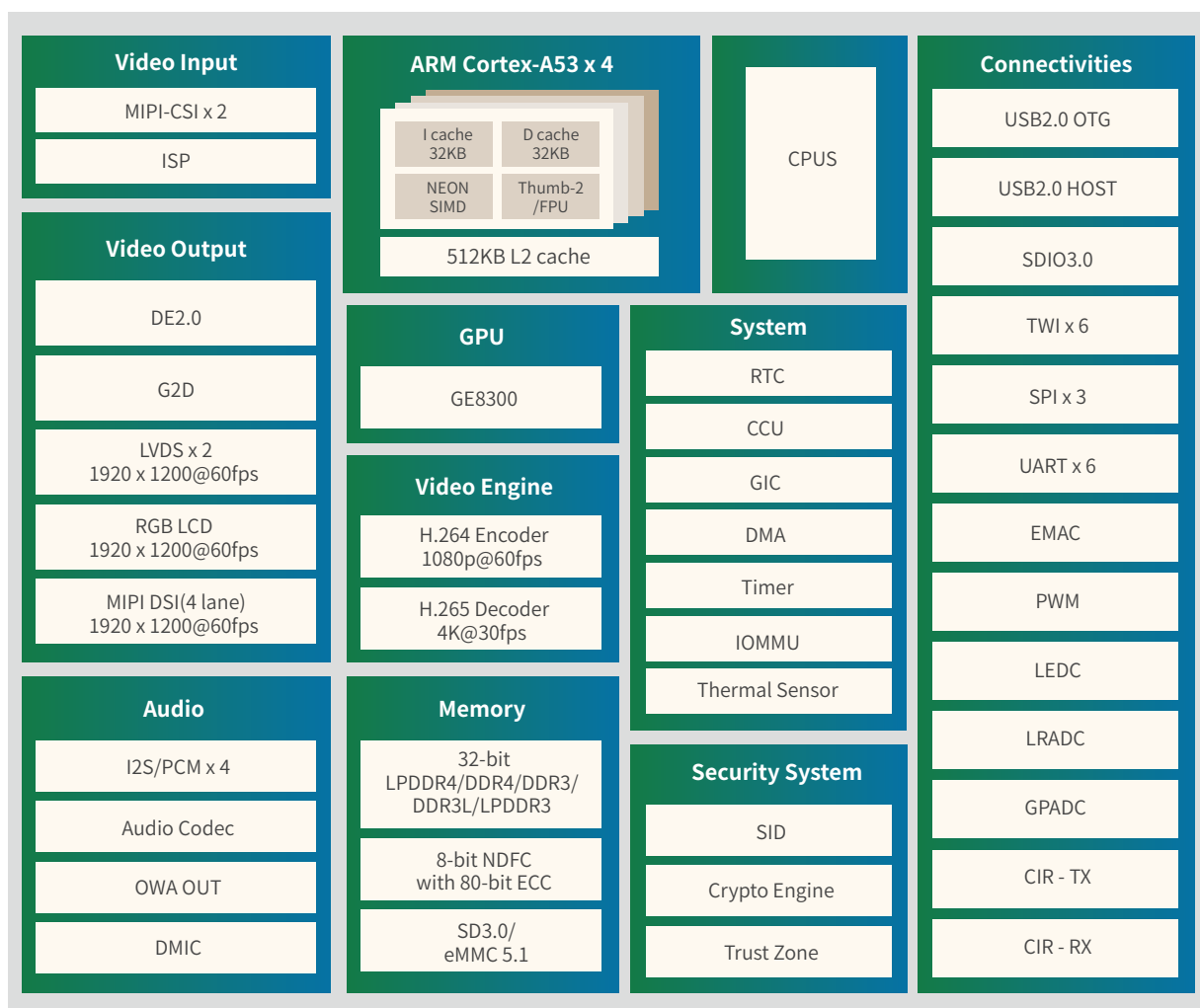
Rich Peripheral

The MR813 supports rich peripheral interfaces, such as 2 x USB 2.0, 3 x SPI, 6 x TWI, 6 x UART, 5 x PWM, KEYADC, GPADC, SDIO 3.0, and so on.

Features

CPU	• Quad-core ARM Cortex ™-A53@1.5 GHz • 32 KB L1 I-cache + 32 KB L1 D-cache per core • 512 KB L2 cache
GPU	• GE8300 • OpenGL ES1.1/2.0/3.2, Vulkan1.1, OpenCL1.2
Memory	• 32-bit DDR4/DDR3/DDR3L/LPDDR3/LPDDR4, support 4 GB • eMMC 5.1 • 8-bit MLC/SLC/EF NAND flash • SPI NAND flash
Video Engine	• Supports H.264 HP encoder 1080P@60fps • Supports JPEG encoder 4096 x 4096
Video Input	• Dual MIPI CSI up to 4lane and 2lane • Maximum to one camera 8M@30fps or dual camera 5M@25fps + 2M@25fps • Supports format: YUV422-8bit/10bit, YUV420-8bit, RGB888, RGB565

Others	• USB Host, USB 2.0 OTG, SDIO 3.0 • AUDIO 2 x ADC, 2 x DAC, 4 x I2S/TDM • LCD MIPI/LVDS/RGB/MCU • 3 x SPI, 6 x TWI, 6 x UART, 5 x PWM, KEYADC, GPADC
PMIC	• AXP305B
WIFI	• XR829 or others
OS	• Linux4.9/Android 10.0
Package	• LFBGA 346 balls • 12mm x 12mm size, 0.5 mm ball pitch, 0.3 mm ball size

Block Diagram

Video Input
- MIPI-CSI x 2
- ISP

ARM Cortex-A53 x 4
- I cache 32KB
- D cache 32KB
- NEON SIMD
- Thumb-2 /FPU
- 512KB L2 cache

CPUS

Connectivities
- USB2.0 OTG
- USB2.0 HOST
- SDIO3.0
- TWI x 6
- SPI x 3
- UART x 6
- EMAC
- PWM
- LEDC
- LRADC
- GPADC
- CIR - TX
- CIR - RX

Video Output
- DE2.0
- G2D
- LVDS x 2 1920 x 1200@60fps
- RGB LCD 1920 x 1200@60fps
- MIPI DSI(4 lane) 1920 x 1200@60fps

GPU
- GE8300

System
- RTC
- CCU
- GIC
- DMA
- Timer
- IOMMU
- Thermal Sensor

Video Engine
- H.264 Encoder 1080p@60fps
- H.265 Decoder 4K@30fps

Audio
- I2S/PCM x 4
- Audio Codec
- OWA OUT
- DMIC

Memory
- 32-bit LPDDR4/DDR4/DDR3/ DDR3L/LPDDR3
- 8-bit NDFC with 80-bit ECC
- SD3.0/ eMMC 5.1

Security System
- SID
- Crypto Engine
- Trust Zone