iCatch & Wasintek

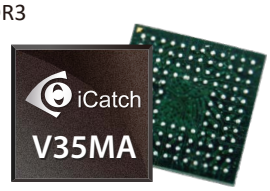
Catching Intelligence

Product Brief

V35MA

Hybrid Camera Controller

The iCatch V35MA is a powerful SoC for hybrid camera products, such as automotive dashboard cameras, sports/action cameras, wearable cameras, smart home camera, doorbell cameras, and more. It integrates an embedded DDR3 SDRAM to reduce the system BOM cost and minimize the area of PCB dimension. V35MA provides not only the excellent still image quality but also H.264 video recording with outstanding performance. The V35MA supports CMOS image sensor of resolution up to 24M pixels and high speed capture features, such as fast continuous shots, multi-frame de-noise, and multi-frame high dynamic range. The iCatch image processing pipeline and acceleration engines of V35MA enable camera products to support highly efficient features, such as face beautification, face detection, multi-layer OSD drawings, and object tracking.



Ultra high speed 12-lane MIPI/SubLVDS serial interface enables the V35MA to capture raw image data at 576M pixels per second. In the process of capture flow, image processing and compression are executed in parallel, and the maximum encode speed reaches up to 180M pixels per second. The H.264 video codec of the V35MA supports 1080p60, 1080i60, and 1080p30. It also enhances the video quality in the low bit rate for the internet application.

FEATURES

Image Sensor Interface

- 12-lane SubLVDS, HiSPI and MIPI-CSI2 serial interfaces
- Dual sensor inputs
- CMOS sensors up to 24M pixels resolution

Advanced Still Image Processing

- Advance high-ISO de-noise
- Raw data capture speed up to 576M pixels/sec
- JPEG codec speed up to 180M pixels/sec
- Face beautification
- Face detection, red-eye removal, blink detection, smile detection
- Object tracking
- Lens distortion correction
- Wide dynamic range/High dynamic range
- Chromatic aberration correction
- Electronic image stabilization
- Rolling shutter compensation
- Super resolution of single-frame/multi-frames
- Motion compensation temporal filter

Video

- H.264 video codec BP/MP/HP Level 4.2
- H.264 1080p60/1080i60/1080p30/720p120 video recording and playb
- H.264 dual video stream output with resolution up to 180p30
- MJPEG 1080p30/720p120 video recording and playback
- Advanced bit rate control

Memory

- 16-bits DRAM controller with programmable SDRAM frequencies up to 500Mhz
- System in package DDR3 SDRAM

Processor Cores

- 32-bit RISC CPU, operating frequency up to 450MHz
- iCatch image processing pipeline and acceleration engines

Audio

- MPEG-1 layer 1/2, MP3, AAC, G.726
- Wind sound reduction filter and notch filter
- Dynamic range control
- I2S interface to external audio codec
- 16-bit stereo audio ADC with microphone input
- 24-bits mono audio DAC with 1 lineout to TV and 1 speaker output

Display Capability

- BT.601/656/1120 digital interface
- i80/M68 interface
- On-chip PAL/NTSC encoder and TV DAC
- On-chip HDMI controller and PHY
- Alpha blending OSD and 3D-like user interface
- MIPI-DSI support
- Dual display capacity (LCD and TV)

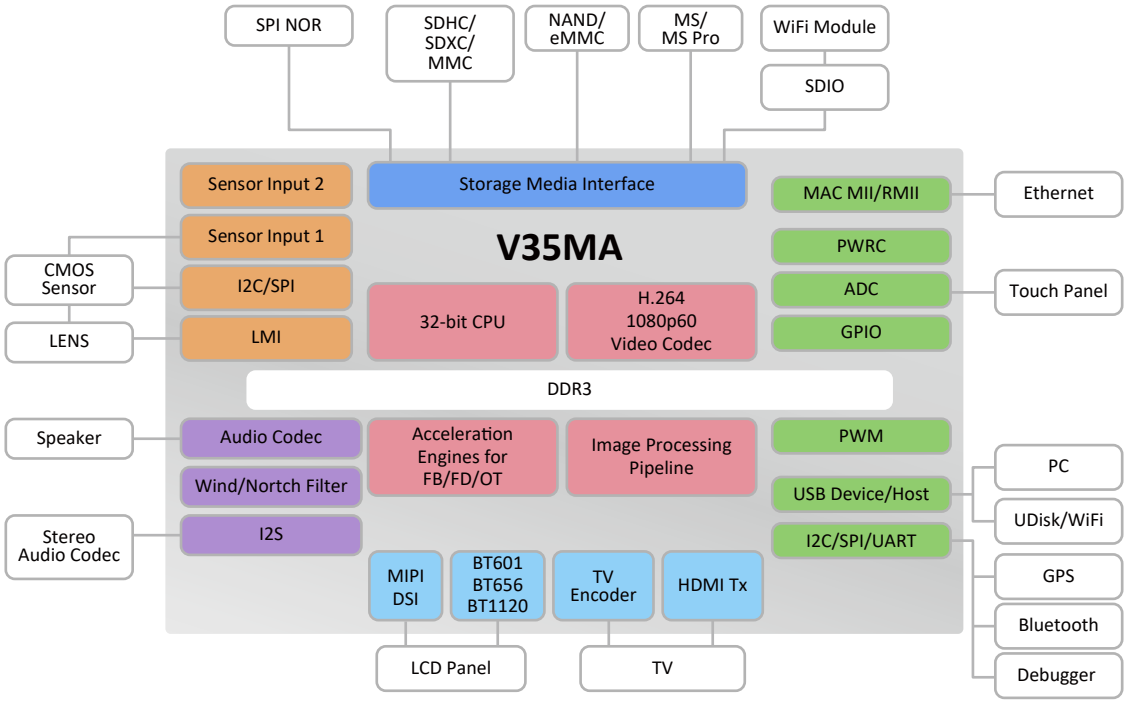
Peripherals

- NAND and SPI flash memory
- SD/SDHC/SDXC, MMC3.0/4.0, MS and MS-pro card support and eMMC
- USB 2.0 device and host controller with PHY
- Ethernet MAC with MII and RMII interface
- Many GPIO, PWM, UART, SPI, and I2C ports
- Real-time clock and watchdog timer
- Multiple channels of 12-bits SAR ADC
- Touch panel interface
- Stand-alone SDIO controller for wireless device

Package

- 312-ball HSBGA package with 13x13mm
- Operation temperature: -10°C to +70°C

BLOCK DIAGRAM



DEVELOPMENT PLATFORM

The V35MA Hybrid Camera Development Platform provides evaluation boards, software development kits and documentation to develop a highly advanced camera with network connectivity.

Hardware

- V35MA evaluation board
- Sensor board with OmniVision, Sony or Aptina CMOS sensors
- LCD display board

Software Development Kit

- IQ tuning tool
- Libraries for ISP, 3A, NDK, and RTOS
- Full source code of reference design
- PC tool chain of programmer, and font and string generator

Documentation

- User's manual for EV board, application notes, and API documents
- SoC data sheet, schematics and layout files

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