

# V39A

## Powered Image Processing SoC

The iCatch V39A is a highly integrated system-on-chip solution that can enable various high-end 4K imaging applications with edge computing capability. V39A can capture stunning 4Kp30 video with iCatch's 7th generation image signal processor (ISP) and H.264 high-performance encoder.

V39A supports a variety of sensor interfaces and can connect up to two sensors simultaneously with a maximal raw image data rate at 960M pixels/s. It can support RGB-IR sensors for security applications. Its H.264 video encoder can generate multiple bit streams at the same time for on-device storage and over-the-air transmission. V39A also embeds many interfaces to support digital microphone input, MIPI DSI output, and HDMI output to minimize system BOM cost and to maximize design flexibility. For connectivity, V39A is equipped with GMAC with RGMII for Ethernet, USB host interface for 4G/LTE modem and stand-alone SDIO interface for WiFi.



### FEATURES

#### Image Sensor Interface

- 10-lane SubLVDS, HiSPI and MIPI-CSI2 serial interfaces
- Dual sensor inputs
- CMOS sensors up to 42M pixels resolution

#### Advanced Image Processing

- Raw data capture speed up to 960M pixels/sec
- Pixel processing speed up to 280M pixels/sec
- Motion compensated temporal noise filtering for video
- Real-time multi-frame HDR video
- Real-time multi-axis electronic image stabilization (EIS)
- Real-time multi-segment rolling shutter correction (RSC)
- Advanced raw noise and high-ISO noise reduction technology
- Lens distortion correction (LDC) and dewarping engine
- Edge enhancement over-shoot control
- Motion-based object tracking engine
- Face detection and tracking engine

#### Processor Cores

- Arm Cortex-A7 CPU, frequency up to 720MHz
- iCatch image processing pipeline and acceleration engines
- 3D depth engine up to VGA30fps

#### Audio

- Digital PDM microphone input
- I2S interface to external audio codec
- Digital adaptive equalizers
- Support band-pass filter and notch filter
- Support audio sampling rate up-scaling for playback

#### Video

- H.264 BP/MP/HP up to level 5
- Real-time performance up to 4K2Kp30+720p30
- Up to 3 simultaneous encoding streams
- Advanced bitrate control

#### Display Capability

- Alpha blending OSD for user interface
- Support MIPI-DSI for panel display
- On-chip HDMI controller and PHY
- BT.601/656/1120 digital interface
- Dual display capacity (LCD and HDMI)
- Support MIPI CSI output for camera module application

#### Memory

- 16-bits SDRAM controller with programmable SDRAM frequencies up to 800MHz
- DDR2/DDR3/DDR3U/DDR3L

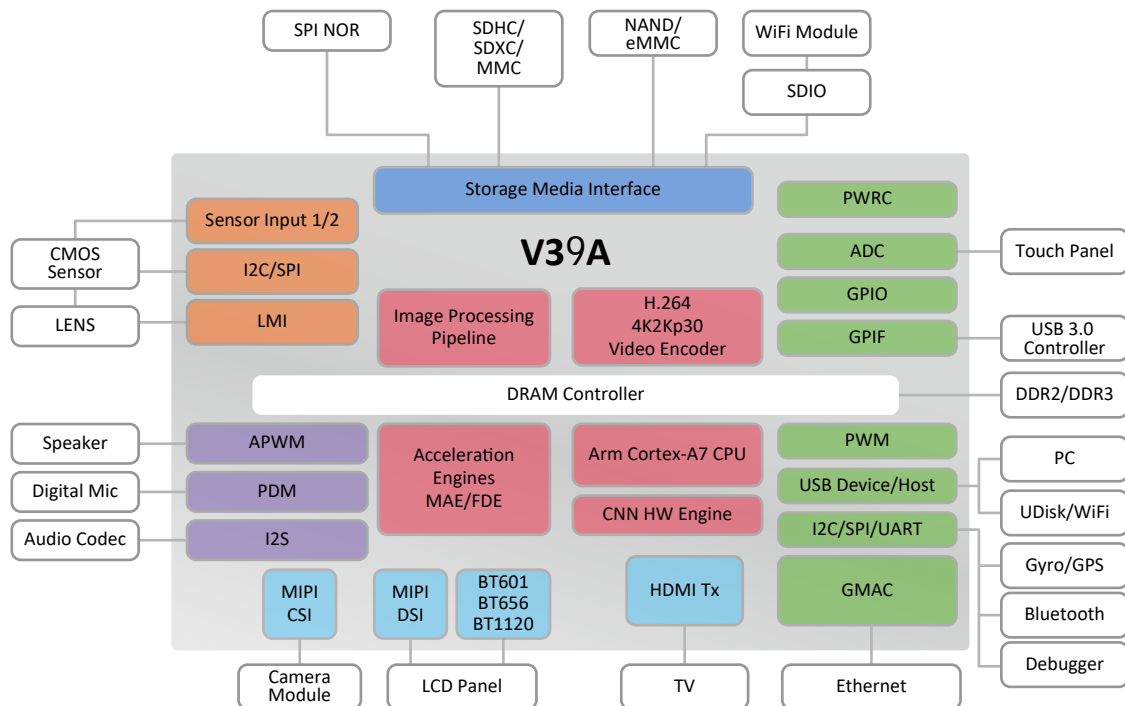
#### Peripherals

- Support NAND and SPI-XIP flash memory
- SD/SDHC/SDXC, MMC, and eMMC4.5/5.0 interfaces
- USB 2.0 device and host interfaces
- Many GPIO, PWM, UART, SPI, and I2C ports
- Real-time clock and watchdog timer
- Multiple channels of 12-bits SAR ADC
- GMAC with RGMII interface
- Stand-alone SDIO controller for WiFi and UART for BT
- Support external USB 3.0 controller through GPIF

#### Package

- LFBGA 353, 14 mm x 14 mm x 1.4 mm

## BLOCK DIAGRAM



## DEVELOPMENT PLATFORM

The V39A 4K Camera Development Platform includes SBC (Single Board Camera) board, software development kits and documentation. The users can develop their advanced imaging and video solutions with various networking capabilities.

### Hardware

- V39A SBC board
- Sensor board with OmniVision, Sony, or On Semi CMOS sensor
- LCD display board

### Software Development Kit

- libraries for ISP, 3A, NDK, RTOS
- WiFi connected camera application source code of reference design
- PC tool chain of programmer, and font and string generator
- Android/iOS APP SDK for mobile phone connection

### Documentation

- User's manual for SBC board, application notes, and API documents
- Data sheet, schematics and layout files

