

V50M

UHD 4K Camera Processor

The iCatch V50M is a system-on-chip solution that enables various high-end camera applications, such as DSC, action camera, automotive camera, surveillance camera and more. Not only does it include a dual-core Rise CPU and an OpenVG GPU, but it also integrates iCatch's 6th generation image signal processor, H.265/H.264 Codec for 4K2K resolution, and a programmable image and computer vision DSP. Furthermore, a rich set of acceleration engines are also incorporated into V50M to support the most advanced image processing technology, such as multi-axis EIS, multi-frame super resolution and HDR.



V50M has 12 data lanes which supports a variety of sensor interfaces and raw image data capture at 1200M pixels/s and the image signal processor works seamlessly with the JPEG engine and storage media controller to enable high-speed burst capture up to 300M pixels/s. Audio codec, MIPI D-PHY and HDMI PHY are also included in V50M to minimize system BOM cost and to maximize design flexibility. For connectivity, V50M comes with USB host and stand-alone SDIO interface for WiFi and 4G/LTE modem as well as Ethernet MAC for Gigabit Ethernet.

FEATURES

Image Sensor Interface

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

Advanced Still Image Processing

- Raw data capture speed up to 1200M pixels/sec
- JPEG codec speed up to 300M pixels/sec
- Motion compensated temporal filtering for video noise reduction
- Real-time multi-frame HDR video
- Real-time super resolution enhancement for image zoom
- 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
- Local tone mapping WDR video
- Edge enhancement over-shoot control
- Motion-based object tracking engine
- Face beautification
- Dual-core face detection and tracking engine
- Red-eye removal, blink detection, and smile detection

Video

- H.264 BP/MP/HP and H.265 MP up to Level 5
- Real-time encode and decode at 4K2Kp30
- H.264 CABAC/CAVLC and H.265 CABAC entropy coding
- Up to 8 simultaneous encoding streams
- Support I/P/B slice
- Advanced bitrate control
- Motion-JPEG up to 4K2K resolution

Memory

- 32-bits DRAM controller up to 800MHz
- System in package 4Gb LPDDR3 SDRAM

Processor Cores

- Dual-Core ARM Cortex-A7 processors up to 800MHz
- iCatch image processing pipeline and acceleration engines
- Video DSP up to 400MHz which automatically offload Computer Vision tasks from CPU

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
- 16-bits mono audio DAC with 1 lineout to TV and 1 speaker output

Display Capability

- OpenVG and EGL graphic accelerator
- Real-time vector graphic with sustainable performance at 1080p
- MIPI-DSI support
- On-chip HDMI controller and PHY
- BT.601/656/1120 digital interface
- On-chip PAL/NTSC encoder and TV DAC
- Dual display capacity (LCD and TV)

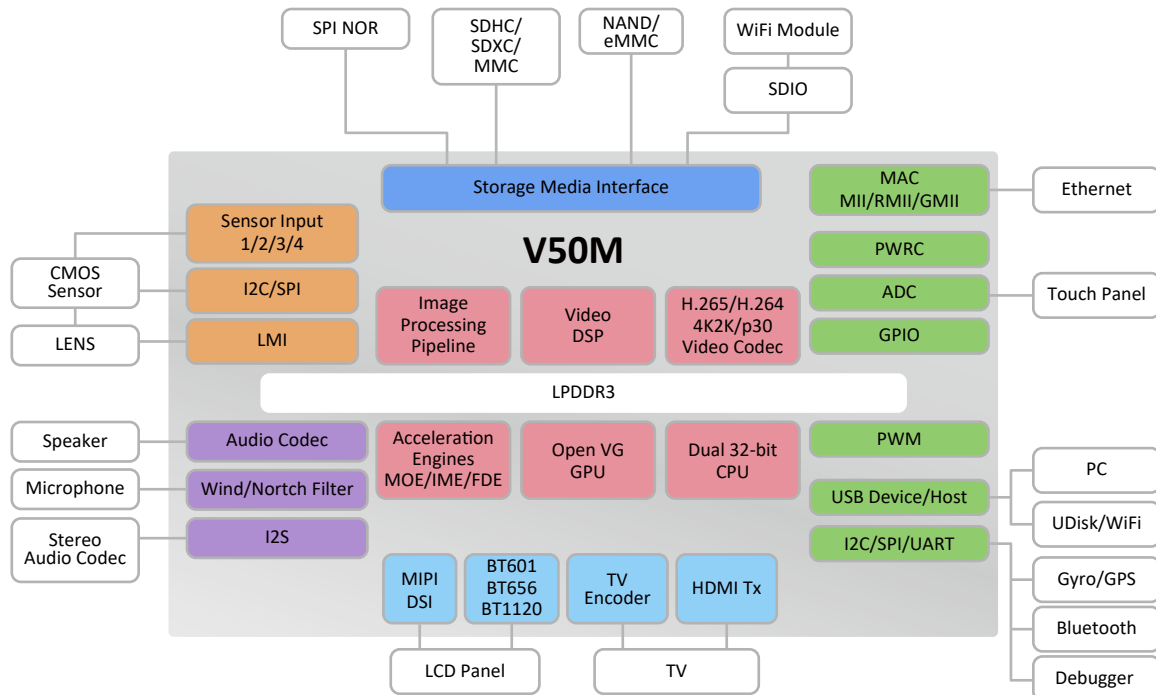
Peripherals

- NAND and SPI flash memory
- SD/SDHC/SDXC, MMC, and eMMC4.5/5.0
- USB 2.0 device and host controller with PHY
- Ethernet MAC with MII/RMII/GMII 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

- 433-ball HSBGA package with 15 mm x 15 mm x 1.6 mm
- Operation temperature: 0°C to +70°C

BLOCK DIAGRAM



DEVELOPMENT PLATFORM

The iCatch V50M 4K Camera Development Platform provides evaluation boards, software development kits and documentation to develop highly advanced camera with network connectivity.

Hardware

- V50M SBC evaluation board
- Sensor board with OmniVision, Sony or Aptina CMOS sensors

Software Development Kit

- IQ tuning tool
- Libraries for ISP, 3A, NDK, RTOS, and Linux
- Full source code of reference design
- PC tool chain of programmer, and font and string generator
- Calibration tool of VR Application
- Android/iOS APP SDK for mobile phone connection

Documentation

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

