

# 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)

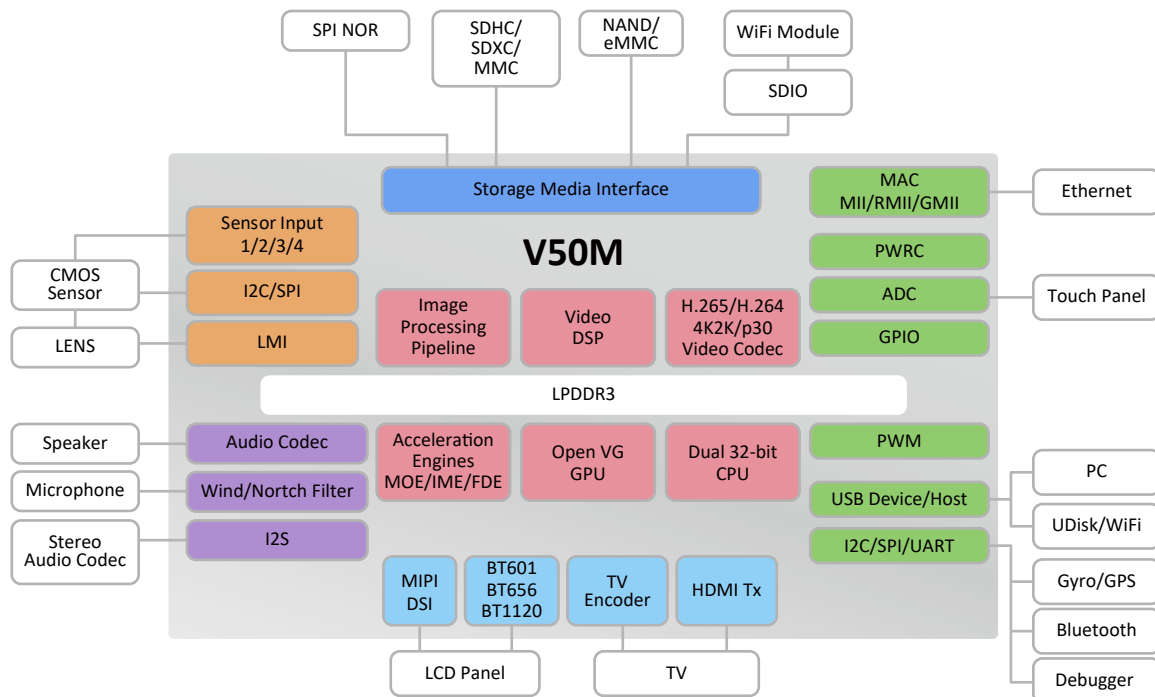
#### Peripherals

- 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



For more information, please contact our sales representative at T: +886-3-564-1600 or E-mail to [sales@icatchtek.com](mailto:sales@icatchtek.com)

**iCatch Technology, Inc.** [www.icatchtek.com](http://www.icatchtek.com)

4F, No.19-1, Innovation 1st Rd. Hsinchu Science Park, Hsinchu, Taiwan, 300  
T: +886-3-564-1600 F: +886-3-567-0528

Copyright © 2019 iCatch Technology, Inc. All rights reserved. iCatch makes no guarantee or warranty concerning the accuracy and availability of said informations and shall not be responsible for any loss or damage resulting from the use of said informations. Information in this document is subject to change without prior notice.

V50M-Product Brief-20190308