

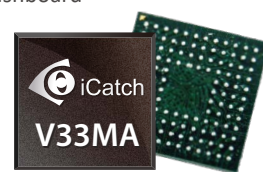
# V33MA

## Hybrid Camera Controller

The V33MA Hybrid Camera Controller is a highly-integrated SoC solution for DSC and DV applications, such as dashboard cameras, sports/action cameras, and wearable cameras. It supports high ISO-6400 at full picture resolution, image stabilization for both video and still images, and still image capture at 16M pixel resolution in less than one second between consecutive shots, using iCatch's advanced still and video processing technologies.

Outstanding still image quality is achieved even in very low-light conditions through iCatch's superior noise reduction technology that avoids the blur caused by long exposure times associated with camera vibrations due to handshake. The high performance H.264 codec enables the camera to shoot full HD videos and compress the data into small files.

The V33MA also integrates an embedded DDR3 SDRAM and a variety of peripheral controllers for those peripheral devices required in DSC/DV system, such as: LCD display, storage media, RTC, PWM, PLL, HDMI output and multi-channel general purpose ADC, to reduce the system BOM cost.



### FEATURES

#### Image Sensor Interface

- 4-lane LVDS, HiSPI and MIPI CSI2 serial interfaces
- Parallel interface with 150MHz pixel clock
- CCD or CMOS sensors up to 22M pixels

#### Advanced Still Image Processing

- High ISO : 3200, 6400
- Shot to shot at 0.6sec @ 16MP with AHD
- 10MP@10fps without LDC, 10MP@7fps with LDC
- High performance FD (Face Detection) and OT (Object Tracking) engines
- Lens distortion correction
- Smear cancellation
- Wide dynamic range / High dynamic range
- Chromatic aberration correction
- Digital image stabilization
- Rolling shutter compensation

#### CPU

- Programmable CPU frequencies up to 480MHz
- On-chip 64KB mask ROM for boot code

#### Advanced Video Processing

- 1080p video recording and playback
- H.264 video codec, main profile and high profile up to level 4.1
- Support CABAC and CAVLC entropy coding
- Support I/P/B slices
- Advance bit rate control mechanism
- 1080p@30fps or 720p@60fps

#### Display Capability

- LCD panel interface – UPS051/UPS052/CCIR656/C-CIR601/Parallel RGB
- LCM panel interface – i80/M68
- On-chip PAL/NTSC encoder and TV DAC
- On-chip HDMI controller and PHY
- Alpha blending OSD

#### Memory

- 16-bits SDRAM controller with programmable SDRAM frequencies up to 360Mhz
- System in package DDR3 SDRAM

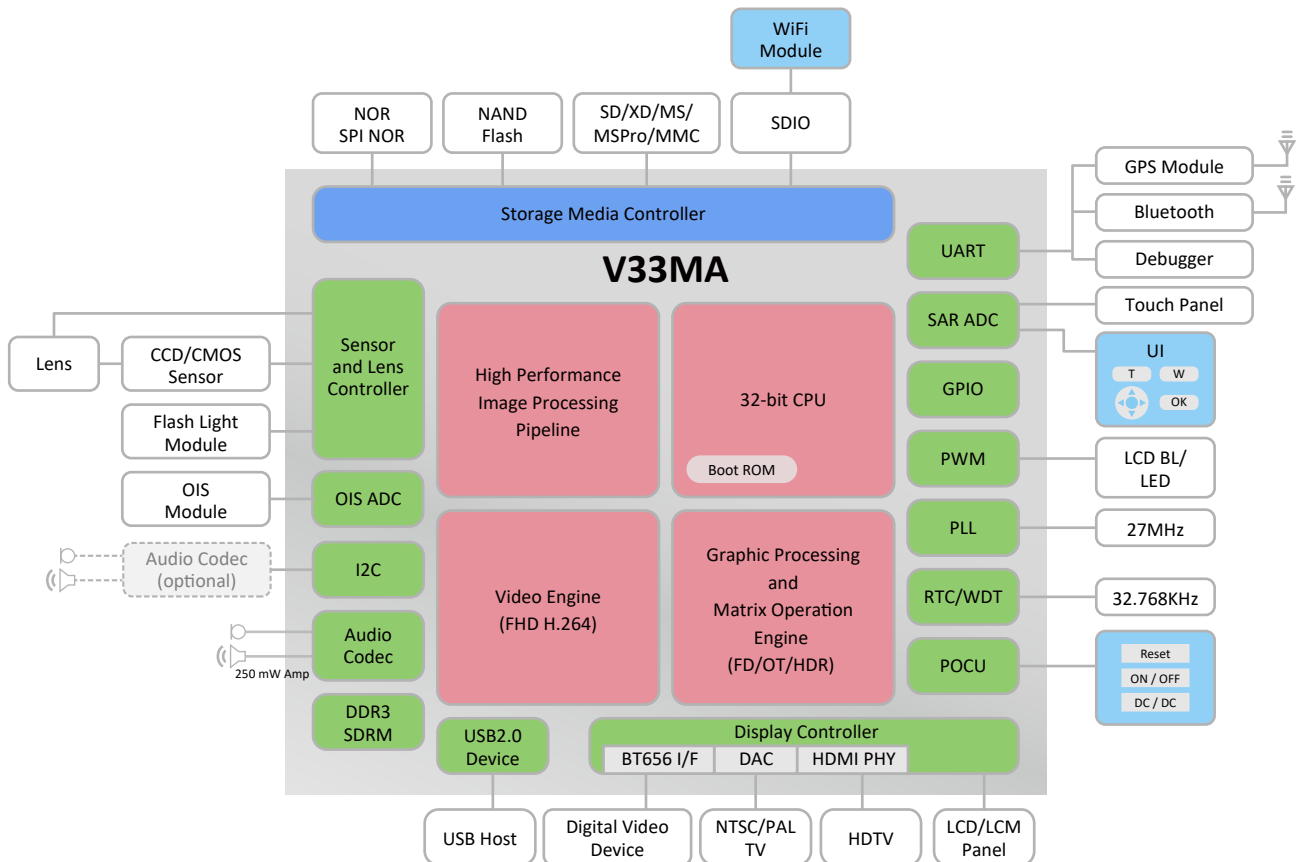
#### Peripherals

- Storage Media controller for NAND flash, SDIO, SD SPI, SPI, MMC4.0, MS and MS-pro
- USB 2.0 device with UVC and UAC supports
- 20 GPIOs with multi-functions, 2 UARTs, 2 PWMs
- Real-time clock (RTC), 6 Timers and watchdog timer (WDT)
- 6 channels of 10-bits SAR ADC
- 4 channels of 12-bits high speed OIS ADC
- 16-bits mono audio ADC with microphone input
- 24-bits mono audio DAC with 1 lineout to TV and 1 speaker output
- I2S for audio in/out
- SDIO interface for wireless device

#### Package

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

## BLOCK DIAGRAM



## DEVELOPMENT PLATFORM

The V33MA Hybrid Camera Development Platform provides evaluation boards, software development kits and documentation to develop a highly advanced camera with network connectivity.

### Hardware

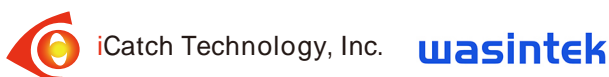
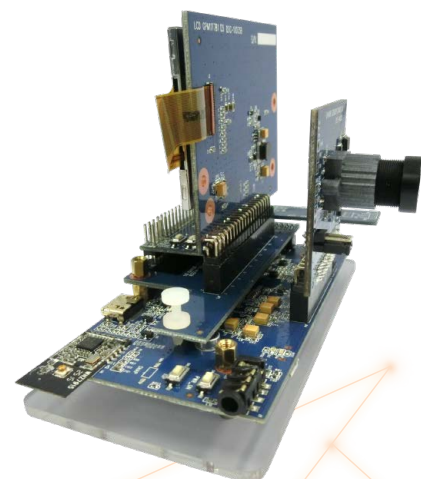
- V33MA evaluation board
- Sensor board with OmniVision, Sony or Aptina CMOS sensors
- LCD display board

### 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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