



# SGCCTV<sup>®</sup>



1. Ambarella H22 chipset, 4MP CMOS sensor
2. Battery capacity built-in 3000mah
3. Recording time Max is 10 hours
4. 480P/720P/1080P/4MP video resolution
5. 30MP photo resolution
6. Digital zoom up to 16X
7. IP66 waterproof
8. Encryption passwords protect
9. Charge time approximate 4 hours
10. MP4 H.264 & H.265
11. 140 degrees view angle lens

Model: CCBWCX3H1	Specifications
Chipset	Ambarella H22
Video Format	MP4
Storage Capacity	Built-in 16G/32G/64G/128G
Camera Angle	140°
Digital Zoom	16 times (The maximum resolution cannot be adjusted)
Video Resolution	2688 ×1512 30P/2560×1440 30P/2304×1296 30P/1920×1080 30P/1280×720 30P/848×480 30P
Compatible System	Windows (98/2000/ME/XP/7/8/10)
One touch record	One-touch recording (in the off state, press the "Video" button directly to enter the recording mode)
Display Size	2-inch LCD full HD display
Loop Recording	Support (when the memory is full, the system automatically deletes the first recorded video)
Watermark	Support (User ID, Time and date Stamp ,embedded into Video)
Fast	Support 2-8 times fast forward and rewind
Native Playback	Support (on-site playback of video/photo/audio files)
Pre-recorded / extended	Support (Default resolution pre-recorded for 30 second)
One-click playback	Support (One-click playback of the latest recordings)
Photo Format	JPEG
Video split time	Support (3Min/5Min/10Min/15Min/30Min/45Min)
Photo Pixel	5M/10M/20M/25M/30M
Slide	Electronic Image Stabilization
Anti-Shake	Electronic shutter
Shutter	Automatic
Audio	WAV
One-click	Support separate recording, dual microphone noise reduction
Infrared	10 meters max
USB cable type	USB 2.0
Night Vision	Manual Switching
Password Protection	Support (Software password protection, tamper-proof)
Battery	3000 mah
Log	Support (Documents are attached time, product number, user)
Charging	Approximate 4 hours
Motion Detection	Support (Screen object movement, automatically turn on recording mode)
Recording Time	Max 10 hours
Voice	Support (Can be equipped with a dedicated car suction cup for driving recorder)
Weight	122g±5g + 15g (Host + back clip)
Car Mode	Support
Physical Dimension	76mm x 54 mm x 27mm
Flashlight	Supports (Lights and fill lights at night)
Protection Level	IP66
Anti-drop rating	1.5m
Working temperature	-20°C~60°C
Standard Accessories	USB cable, Chest Clip, Adapter, Shoulder clip, User Manual



# H22 Video SoC for Consumer Applications

## Overview

The Ambarella H22 SoC for consumer applications is a system-on-chip that integrates an advanced image sensor pipeline (ISP), H.265 (HEVC) and H.264 (AVC) encoders, and a powerful Quad core ARM® Cortex™-A53 CPU for advanced analytics, computer vision, flight control, WiFi streaming, and other user applications.

Targeting the next generation of connected drones, sports, and 360° (VR) cameras, the H22 delivers up to 4K-video recording at 60fps or equivalent performance while streaming a second, live, mobile-resolution video over a WiFi network for preview or sharing.

Equipped with dedicated hardware, H22 can support 3D Electronic Image Stabilization (EIS) up to 4Kp30, and multi-exposure High Dynamic Range (HDR) capture up to 4Kp30.

A unique architecture and 14-nm process technology minimizes H22 power consumption while maximizing performance.



The 14 nm Ambarella H22 (H22S75) SoC Device.

## Key Features

### Flexible Low-Power Platform

- Quad core ARM® Cortex™-A53 CPU up to 1 GHz
- Fast Boot ThreadX / Linux Dual OS
- 14-nm low-power CMOS Process

### High Resolution and Frame Rate Image Processing

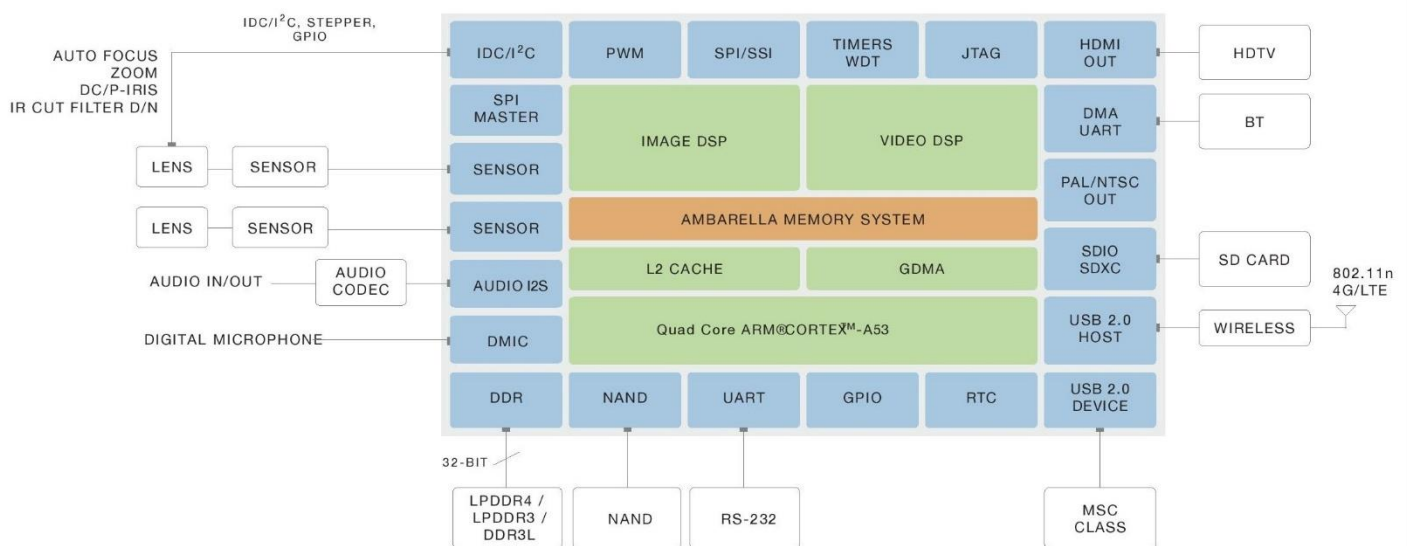
- 4Kp60 video encoding (HEVC / AVC)
- High Dynamic Range multi-exposure capture up to 4Kp30
- Simultaneous second stream
- 3D Electronic Image Stabilization (EIS) with 6-axis correction (translational, pitch, yaw, and roll) and shutter correction
- Dual processing pipe for Drone Optical Flow, 360° cameras, and other multi-sensor applications

### Wireless Connectivity and Video Streaming Options

- USB Host for 4G Module Connectivity
- DMA UART for Bluetooth (BT) Module Connection
- Dual Encode for On-The-Fly Mobile Resolution Streaming

## Block Diagram

The diagram below illustrates a camera design based on the Ambarella H22 device.



## General Specifications

### Processor Cores

- Quad-core ARM® Cortex™-A53 up to 1 GHz
- 32 KB / 32 KB I/D and 256 KB L2 Cache
- AES / 3DES / SHA-1 / MD5 Cryptography Engine
- Ambarella Image and Video DSPs

### Sensor and Video I/O

- 2 MIPI CSI-2 sensor inputs, 4 lanes each
- 8 lane MIPI mode
- 10 lane SLVS / HiSPi™ mode
- 24-bit RGB out, HDMI® 2.0 with PHY out
- PAL / NTSC composite SD video out
- RGB Bayer interface to popular sensors

### CMOS Sensor Processing

- High Dynamic Range multi-exposure capture up to 4Kp30
- Lens shading, fixed pattern noise correction
- Multi-exposure HDR
- Wide Dynamic Range (WDR) local exposure

### Image Processing

- 3D motion-compensated noise reduction (MCTF)
- Adjustable AE / AWB / AF
- Lens Distortion Correction (LDC) for wide-angle-lens
- Defect pixel correction
- Geometric and chroma lens distortion correction
- Backlight compensation
- Electronic Image Stabilization and tilt correction up to 4Kp30
- Crop, mirror, flip, 90° / 270° rotation

### Video Encoding

- H.265 / HEVC MP Level 5.1 encoding up to 4Kp60
- H.264 MP / HP Level 5.1 encoding up to 4Kp60
- Simultaneous streams
- Multiple CBR and VBR rate control modes

### Memory Interfaces

- LPDDR4 (for certain parts) or LPDDR3 / DDR3 / DDR3L (for certain parts)
- 32-bit data bus
- Three SD controllers, including SDXC™ / UHS-1 support
- NAND flash, SLC with ECC
- Boot from SPI-NOR, SPI-EEPROM, NAND flash, USB or eMMC

### Peripheral Interfaces

- Two USB 2.0 ports with Device and Device / Host w / PHY
- Multiple SSI / SPI, IDC / I<sup>2</sup>C, and UART
- Many GPIO ports, multiple PWM, Steppers, IR, ADC
- Watchdog Timer, multiple general purpose timers, JTAG, I2S

### Physical

- 14-nm low-power CMOS
- Operating temperature: -20°C to +85°C
- 11 x 11 mm or 14 x 14 mm packages

## H22 Camera Development Platform

The H22 Camera Development Platform contains the necessary tools, software, hardware and documentation to develop a small form factor camera.

### Evaluation Kit (EVK)

- H22 main board with connectors for sensor/lens board, peripherals
- Sensor board: Omnivision, Sony, and others
- Data sheet, BOM, schematics, and layout
- Reference application with C source code

### Software Development Kit (SDK)

- Dual OS ThreadX/Linux with patches, drivers, tools, and application source code
- Royalty-free libraries for ISP, 3A, dewarp, and codecs
- Image tuning and manufacturing calibration tools
- Detailed documentation with programmer's guide, application notes