iOne - Smart Camera Solution

Overview

The iOne SoC delivers advanced full HD camera and multimedia capabilities to the Android platform. The iOne enables the development of a new class of smart camera device capable of no-compromise still photography, full HD video recording, internet connectivity and the ability to run powerful applications.

The iOne device supports live video streaming and wireless uploading of video clips to popular websites such as YouTube. Its multi-format, full HD video decoding enables the playback of internet and broadcast based video content including HD 3DTV. The iOne also supports full 1080p HD telepresence applications.

Ambarella-grade camera quality and features coupled with a powerful applications processor enable a new class of Android-based, smart camera products.

Key Features

High Performance Multi-Core Architecture
- Dedicated Ambarella image and video DSPs
- Dual core ARM Cortex A9 for applications
- ARM 11 for real time camera tasks
    - camera boots in under 1 second
- Imagination SGX540 3D graphics core

Ambarella Class Camera Processing
- High quality CMOS sensor video and image processing pipeline
- Full featured digital still camera engine
- Full HD 1080i60 H.264 video encoder
- Multiple simultaneous capture scenarios:
    - Full HD + mobile video
    - Full HD + 5 mega-pixel stills
- Full duplex, full HD codec
    - Simultaneous 1080p30/720p60 HD encode and decode
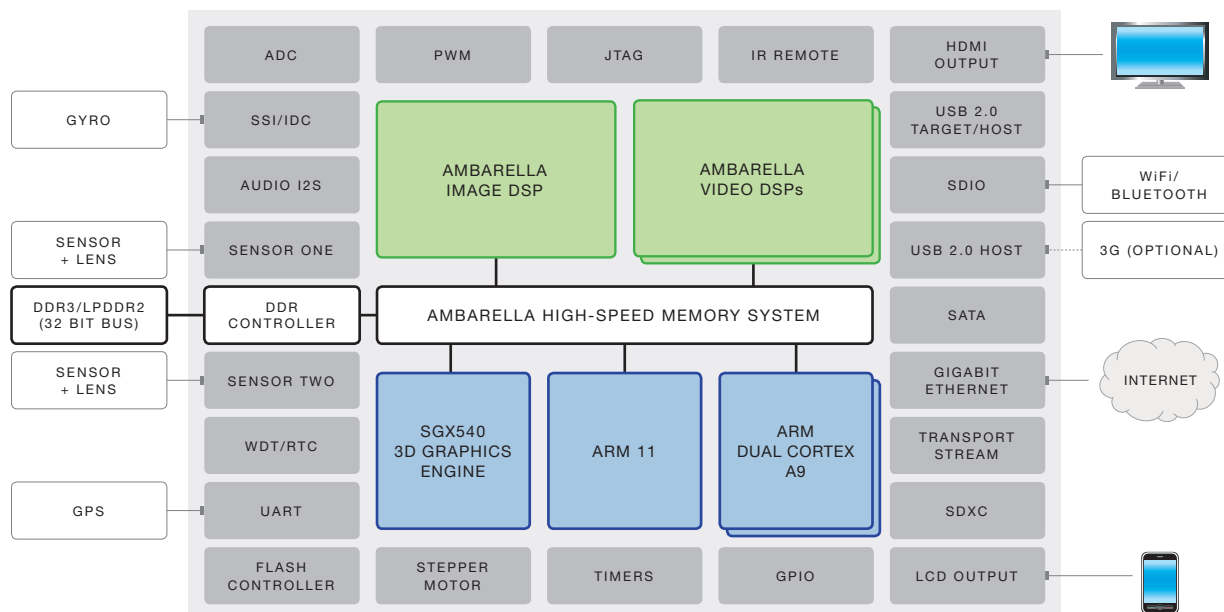- 3D capable with S3D pre-processor

Full HD Multi-Format Media Player
- World's first low power, fully compliant H.264 1080p60 HD decoder with 32 bit memory bus
- Fully compliant decode to 1080i60/1080p30 of many formats
- Ultra low power architecture

Android Support
- Full support for Linux kernel and Android OS

Block Diagram

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General Specifications

Extensive Image Sensor Interface Support
◦ Parallel, MIPI
◦ LVDS, SLVS/MLVS, LVCMOS, HiSPi™

Ambarella Grade Video & Image Processing Pipeline
◦ Seamless CMOS sensor interface
◦ Up to 32 MPixel image capture resolution
◦ High speed burst still capture
◦ Advanced noise reduction including MCTF
◦ 5MP@60fps sensor input support
◦ Digital/Electronic Image Stabilization
   • Advanced rolling shutter compensation
◦ High ISO: 1600, 3200, 6400
◦ Innovative digital wide dynamic range
◦ 3D color processing
◦ Geometric distortion correction
◦ False color chromatic aberration removal
◦ Baseline JPEG compression/decompression
◦ Face/smile detection and tracking

Rich Peripheral Support
◦ AES/DES/SHA1 and MD5 cryptographic acceleration
◦ USB 2.0 host and host/device
◦ HDMI 1.4a output with integrated PHY
◦ SDIO, SSI/SPI, IDC, I2S, PWM, UART, NAND, JTAG
◦ Real-time clock and watchdog timer

Powerful Multi-Format Media Player
◦ Fully compliant H.264 decode to 1080p60
◦ Fully compliant decode up to 1080i60/1080p30 for MPEG-2, VC-1, WMV9, MPEG4 ASP, others
◦ Ultra low power decode and playback architecture

High Performance Multi-Core Architecture
◦ Ambarella Video/Image DSPs
◦ Dual core ARM Cortex A9
   • NEON SIMD instruction set support
   • ARM VFPv3-D16 FPU
   • TrustZone support
◦ ARM 11 (camera boots in less than 1 second)
   • Dedicated to camera operation and housekeeping
   • ARM 11 core frees Cortex A9 for user applications
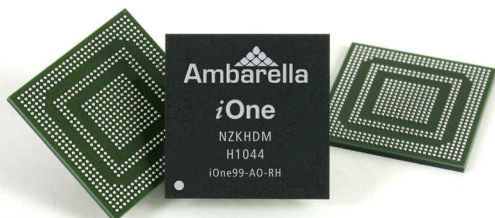◦ SGX540 3D graphics core with Open GL ES 2.0

Flexible Audio Processing
◦ AC3 5.1 channel codec
◦ AAC, AC3 two channel codec
◦ MP3 and WMA decode

Physical
◦ 45nm LP CMOS technology
◦ 16x16 mm 624 FBGA package
◦ POP package option available

iOne Chip

iOne Development Platform

Contact

Ambarella
Website : www.ambarella.com   General Inquiries : inquiries@ambarella.com   Telephone : 408 734 8888