

CX92755 HD Video Processor

VideoSmart Product Brief



HD Video Encode/Decode Single Chip Processor

Product Overview

Conexant's CX92755 SoC is an integrated display, media, video, and image processor that delivers a new level of performance and system integration. The SoC builds on Conexant's strengths in image and mixed-signal processing, and integrates high performance video CODEC and graphics processing hardware. To support robust system design and lower BOM costs, the CX92755 also integrates a stereo class-D amplifier, microphone input, touchscreen controller, and power supply controller.



A high-performance ARM Cortex-A8 processor with NEON SIMD engine supports robust embedded operating system operation and advanced algorithm development. High-performance DDR3 memory supports high-bandwidth operations. High-speed USB 2.0 host and device ports support PC and peripheral connections. A PCIe root and endpoint controller supports advanced peripheral expansion and flexibility, as well as multi-chip communication and control.

The hardware video subsystem supports 1080p decode and video post processing for popular video CODECs, (including H.264) and off-loads the CPU from video decode tasks. To support full-duplex video CODEC operation, a 720p HD video encoder is also supported. Along with video encode and decode, the CX92755 supports a BT.656 compatible video-in port for video capture applications.

For advanced GUI operations, the CX92755 supports a hardware GPU. This GPU includes a display list processor along with alpha blend and clipping units to support complex, independent user interface operations.

The CX92755 features a flexible, programmable LCD interface, hardware JPEG CODEC, and Conexant's advanced image processing pipeline. The CX92755 display subsystem further integrates an LVDS transmitter and high-speed triple video DACs to support a wide range of display applications, up to 1080p.

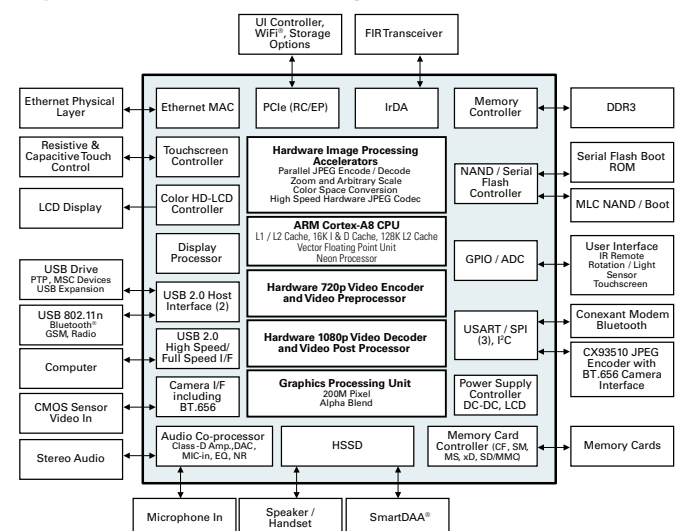
The CX92755 supports network connectivity, including Bluetooth®, 3G, WiFi®, and integrated Ethernet. The integrated camera card controller supports all popular memory cards, and an advanced NAND flash controller supports NAND boot and extended MLC-NAND ECC control.

The CX92755 contains several features for lower cost and operating power while providing unsurpassed image processing and flexibility. Conexant's Linux development environment enables manufacturers to quickly design cost-effective interactive display products. The SoC is packaged in an environmentally-friendly, RoHS/green-compliant 441-pin fpBGA.

Applications

- Digital IP intercom
- IP camera
- Home automation/Smart home panel
- Digital signage

System Block Diagram



Key Features

- ARM Cortex-A8 CPU with L1/L2 cache and NEON SIMD engine
- Hardware 1080p MPEG2/MPEG4/H.263/H.264 video decoder, 720p encoder, and BT.656 video-in port
- Hardware graphics processor with display list processor and alpha blend unit
- DDR3 memory interface
- PCIe root and endpoint interface
- Advanced power management
- Advanced MLC NAND flash/ECC controller
- Integrated class-D stereo DAC, stereo microphone, and on-chip power supply controller
- Programmable LCD controller with integrated video DACs, LVDS transmitter, up to 1080p output support

Additional Features

Processor

- ARM Cortex-A8 processor
- NEON SIMD engine
- L1/L2 cache

External Memory Support

- DDR3 memory subsystem—Up to 1GB support
- Serial flash and MLC NAND flash controller/NAND boot/extended ECC
- Embedded (CF, xD, MS, MS-Pro, SD/SDHC/SDXC, and MMC)

Connectivity/Interfaces

- PCIe 1.1 root and endpoint controller
- Integrated Ethernet MAC
- USB 2.0 high-speed device and USB hosts (2)
- SPI, I²C, integrated FIR IrDA and Conexant DAA modem interfaces

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Video and Image Processor

- Hardware 1080p MPEG2/H.263/MPEG4/H.264 decoder, including up to an advanced profile MPEG4 and a main profile H.264
- 720p video encoder, supporting H.264/MPEG4/MPEG2 and full-duplex encode/decode
- Hardware video post processor with scaling, rotation, color operations
- Hardware JPEG CODEC and unlimited JPEG size support
- Programmable, pipelined image processor
 - Color space/image filter/error diffusion
 - Adjustable color tables, TRC, and filters to enable unique display features

GPU

- Programmable display list processor
- Linear to X,Y memory addressing
- Multi-operand BLT and line engine with transparency and blending
- Alpha blending and region clipping
- Two-operand BitBLT, line, stipple, and fill operations with transparency

Display Support

- TFT LCD (digital RGB) up to 24bits/pixels
- Advanced video overlay engine with an independent overlay buffer
- High-speed triple 8-bit video DACs and analog TCON
- Integrated LVDS transmitter
- Integrated capacitive touchscreen controller
- GPIO support for buttons, LEDs, sensors, etc.

Advanced Power Management

- Programmable power management and voltage scaling

Timers

- Real-time clock with battery backup

Audio and Power Supply Controllers

- 1.2W stereo class-D amplifier with EQ, noise reduction, stereo microphone input, and line-out
- On-chip power supply controller, including buck and boost regulators, and LCD VGh/VGI generation
- I²S interface for audio CODEC expansion

A/D and PWM Control

- Multi-channel 10-bit A/D
- PWMs with firmware control

Package

- 441-pin fpBGA package—RoHS/green compliant

Development Environment

- Linux BSP development environment
- JTAG in-circuit emulator
- Conexant EVK and reference designs

Benefits

- Easily handles complex computational, geometry, and system tasks
- Hardware acceleration that supports full-duplex encode/decode and popular video formats
- Supports advanced user interface operation and display effects
- High-bandwidth memory architecture
- Low-cost touchscreen implementation with proven drivers
- Variable power/temperature controls for power savings
- Flexible memory storage interface
- System BOM savings
- Directly interfaces to analog and digital LCDs, LVDS LCDs, analog monitors, and HDMI controllers