CX92745 Interactive Display, Media, and Image Processor

VideoSmart Product Brief

CONEXANT®
EXPERIENCE SMART™

HD Video Decode Processor

Product Overview

Conexant's CX92745 SoC is an integrated display, media, 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 1080p video processing hardware. To support a robust system design and lower BOM costs, the CX92745 also integrates a stereo class-D amplifier, microphone input, touchscreen controller, and power supply controller.

The hardware video subsystem supports 1080p decode and video post processing for popular video CODECs (including H.264), and offloads the CPU from video decode tasks. Along with video decode, the CX92745 supports a BT.656 compatible video-in port for video capture and docking applications.

For advanced GUI operations, the CX92745 supports a hardware graphics accelerator that includes a display list processor along with alpha blend and clipping units to support complex, independent UI operations. The CX92745 features a flexible, programmable LCD interface, hardware JPEG CODEC, and Conexant's advanced image processing pipeline. The CX92745 display subsystem further integrates an LVDS transmitter and high-speed triple video DACs to support a wide range of display applications.

Conexant 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.

A high-performance ARM RISC processor supports a robust embedded operating system and application design. The high-speed USB 2.0 host and device ports support PC and peripheral connections. Enhanced multimedia and graphics processing is further supported with the CX92745's ARM VFP unit, and high-speed DDR2 memory.

The CX92745 contains several features that lower cost and operating power while providing unsurpassed image processing and flexibility. Conexant's industry-standard development environment enables manufacturers to quickly design cost-effective interactive display products.

The SoC is packaged in an environmentally-friendly, RoHS/green-compliant, 400-pin fpBGA.

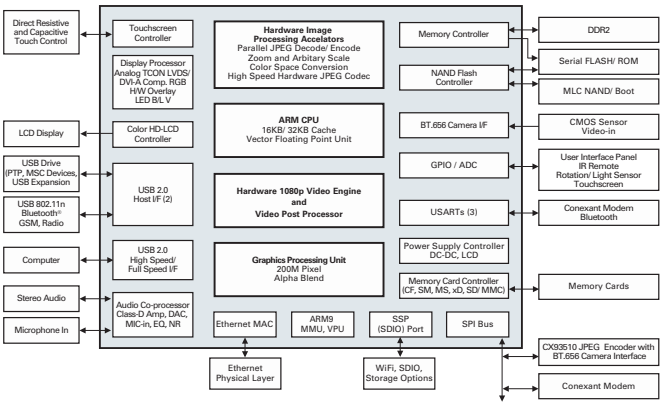
Applications

- Digital IP intercom
- Smart home displays/automation
- Media displays and playback devices

Benefits

- Easily handles complex computational, geometry, and system tasks
- Hardware acceleration speeds up decoding/ displaying common video formats and profiles
- Supports advanced independent user interface operations and display effects
- Quickly provides superior photo rendering and multimedia processing
- Low-cost touchscreen implementation with proven drivers
- Provides extended internal memory storage system BOM savings
- Directly interfaces to analog and digital LCDs, LVDS LCDs, analog monitors, and HDMI controllers

System Block Diagram



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Key Features

- ARM microprocessor with a VFP unit and MMU
- Hardware 1080p H.264 baseline/main/high profile/MPEG4/MPEG2/H.263/BT.656 video-in port
- Hardware graphics processor with display list processor and alpha blend unit
- Flexible high-performance image processing pipeline and JPEG CODEC
- Hardware touchscreen controller for advanced capacitive touchscreens
- Advanced MLC NAND flash controller with robust ECC and NAND boot capability
- Integrated class-D stereo DAC, stereo microphone, and on-chip power supply controller
- Flexible LCD controller with integrated video DACs and an LVDS transmitter

Additional Features

Processor

- ARM RISC microprocessor and MMU
- ARM VFP unit and Java byte-code acceleration
- 600MHz DDR2 memory subsystem

Timers

- Real-time clock with battery backup

A/D and PWM Control

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

External Memory Support

- DDR2 memory subsystem
- Serial flash
- MLC NAND flash controller/NAND boot/extended ECC
- SD card/SDIO expansion port
- Embedded memory card controller (CF, xD, MS, MS-Pro, SD/SDHC, MMC)

Connectivity/Interfaces

- Integrated Ethernet MAC
- USB 2.0 high-speed device and USB hosts (2)
- Additional high-speed and expansion ports for peripheral integration
- SPI, I^2C, and SSP that supports an SDcard and SDIO
- SPI/UART modem interface to Conexant modem solutions

Video and Image Processor

- Hardware 1080p MPEG2/H.263/MPEG4/H.264 decoder, including up to advanced profile MPEG4 and high profile H.264
- Hardware video post processor with scaling, rotation, and 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

Package

- 400-pin fpBGA package—RoHS/green compliant

Graphics Accelerator

- Programmable display list processor
- Linear to X,Y memory addressing
- Multi-operand BLT, 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 24 bits/pixels
- Hardware overlay support
- High-speed triple 8-bit video DACs and analog TCON
- Integrated LVDS transmitter
- Integrated capacitive touchscreen controller
- GPIO support for buttons, LEDs, sensors, etc.

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/VGl generation
- I^2S interface for audio CODEC expansion

Development Environment

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

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