



C O N E X A N T



Product of the Year Award Winner
Best Silicon Innovation

Dual Decode HDTV MPEG-2/H.264/VC-1 Video Decoder

CX2427x

Conexant's portfolio includes a comprehensive suite of semiconductor solutions for broadband communications and the digital home.

Conexant's CX2427x is a highly integrated, triple-display dual decode MPEG-2/H.264/VC-1, DIRECTV/DVB compliant, back-end decoder IC solution for high-definition digital TV systems with support for personal video recorder (PVR) applications, which can be deployed in digital satellite, cable, Telco or terrestrial TV networks.

The CX2427x family features a flexible, multi-program HDTV multi format video decoder capable of decoding two HDTV programs simultaneously in any dual stream combination of MPEG-2, H.264 and VC-1 formats. Three TV outputs are supported, a primary HDTV display with simultaneous down-converted SD output, plus an independent down-converted NTSC/LPAL SDTV output. The dual multi-format audio decoder supports multiple audio format decoding, including MPEG-1, MPEG-2, Dolby® Digital, Dolby Digital+. MPEG-4 aac and aacPlus™, WMA and WMA Pro. An integrated ARM1176 CPU with 128KByte L2 cache supplying over 800 Dhrystone 1.2 MIPS at 666MHz, and a high performance, unified memory, dual 667MHz 32-bit DDR-2 SDRAM memory controllers give ample processing power for advanced applications and future expansion capability.

PVR functionality is supported by two multi-stream transport processors, each of which is based on a dedicated RISC engine, with each supporting six simultaneous transport streams (3 from baseband inputs and 3 from DMA interfaces). Each transport processor unit also supports DVB, DES, AES or Multi-II descrambling and contains hardware support for the NDS conditional access system. The CX2427x integrates dual serial ATA2 controllers with support for internal and external HDD attachments with 3DES/AES ciphering engines for encryption of data to the HDD.

The CX2427x also features an impressive array of I/O features, including HDMI with HDCP, an integrated RF modulator, dual BTSC stereo encoders, dual USB 2.0 host controller with integrated Phys, an additional USB1.1 solution, dual integrated 10/100 Ethernet MAC with MII, PCI bus, HomePlug® connectivity via a high-speed UART and an integrated V.92 hardware modem. The CX2427x fully supports cable applications when used in conjunction with the CX24450-CX24453 DOCSIS 2.0+ STB Front End IC, supporting an OpenCable™ Cable CARDTM M-Card™ interface.



Distinguishing Features

- DVB/DIRECTV® compliant back-end HDTV decoder for worldwide markets
- Three TV outputs, primary HDTV display with simultaneous down-converted SD output, with independent down-converted NTSC/LPAL SDTV output
- High-performance ARM1176 CPU with 128K L2 cache providing 800+ DMIPS
- Dual PVR support with dual SATA-2/eSATA-2 interface
- Multiple OS support including Nucleus+, VxWorks, Linux® and Windows® CE
- Dual video decoder with MPEG-2, H.264 and VC-1 support
- Dual advanced audio decoders with multiple audio format support
- Advanced security features including secure boot software authentication, IC personalization via OTP memory, SVP support and 3DES/AES ciphering engines
- HDMI transmitter with HDCP content protection
- High performance de-interlacer with 480i or 1080i to 480p/720p conversion
- Integrated V.92 hardware modem
- OpenCable M-Card support

Conexant Product Portfolio

The company's broad portfolio of semiconductor products also includes client-side DSL and cable modem solutions, home network processors, broadcast video encoders and decoders, digital set-top box components and systems solutions, and dial-up modems. In addition to its IEEE 802.11a/b/g-compliant WLAN chipsets, software, and reference designs, Conexant offers a suite of networking components that includes solutions for applications based on HomePlug® and HomePNA™. Additional products include a complete line of asymmetric and symmetric DSL central office solutions, which are used by service providers worldwide to deliver broadband data, voice, and video over copper telephone lines.

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www.conexant.com
General Information:
U.S. and Canada: (888) 855-4562
International: (732) 345-7500
Headquarters
4000 MacArthur Blvd.
Newport Beach, CA 92660
Order# PRB-200960A



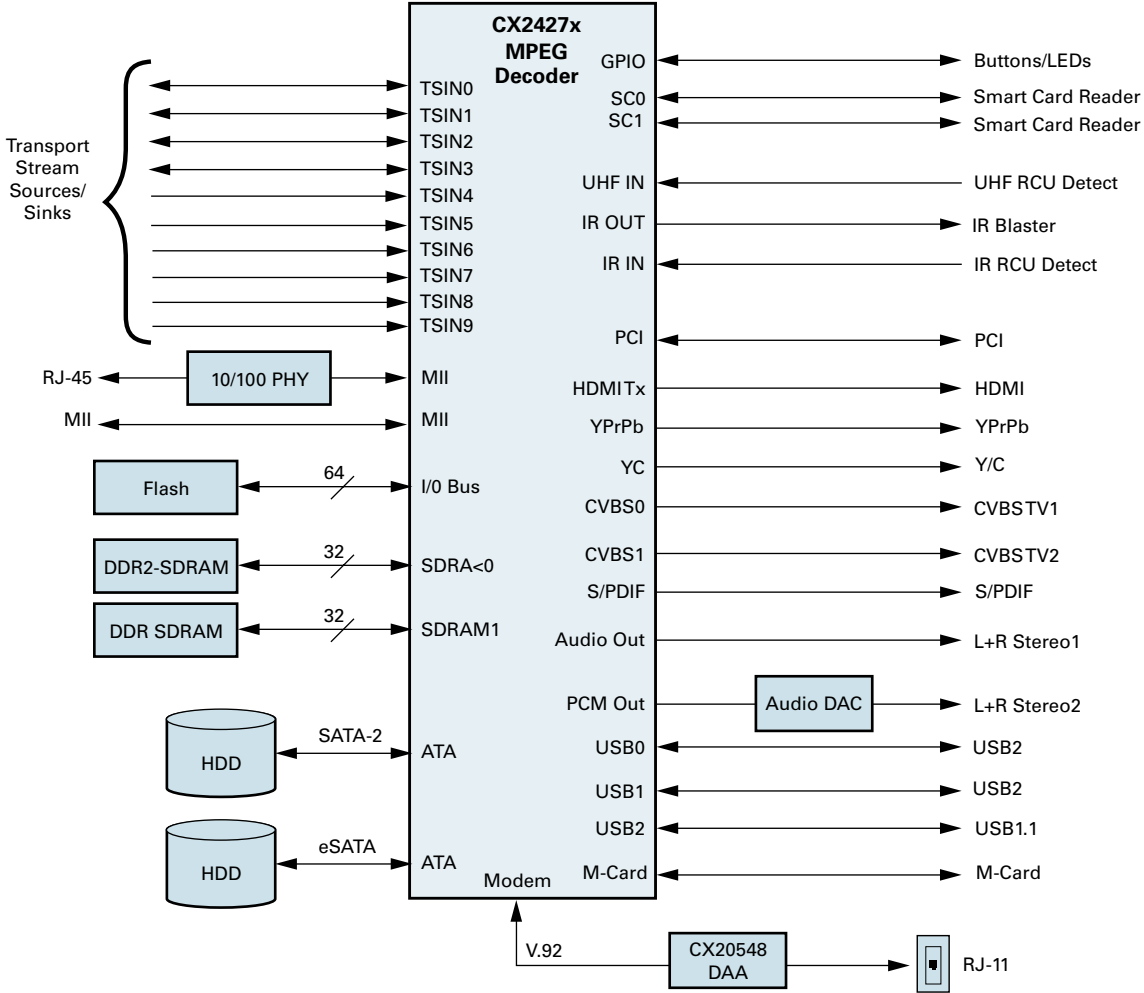
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For a complete HDTV hardware design, the only additional components required are a tuner, demodulator, modem DAA, double data rate (DDR-2) synchronous dynamic random access memory (SDRAM), and flash memory ICs. This level of integration enables a low-cost system bill of materials and allows the flexibility of supporting different modulation and compression technologies with a low cost, highly featured MPEG solution for dual TV set-top box (STB) applications.

The CX2427x IC family is integrated into a fully engineered interactive TV STB reference development system that implements third-party interactive middleware/real-time operating system (RTOS) platforms and provides a complete set of STB low-level drivers. The STB development platform hardware is designed with a flexible architecture that supports multiple front end tuner/demodulator daughter boards. A mature and robust hardware abstraction layer is assured by re-use of core driver libraries developed over multiple generations of production MPEG ICs. Support for Nucleus+ and Linux OS is included, with the software architected to allow easy porting to other real-time OS.

Common Platform for Satellite, Cable, IP and Terrestrial STB manufacturers increasingly look to leverage a common hardware platform that can be reused over various broadband networks, including satellite, cable, terrestrial, DSL, and Telco networks. Conexant's CX2427x ICs can serve as a common back-end platform that easily interfaces to a variety of broadband

front ends, including QPSK, 8-PSK, DVB-S2, QAM, OFDM, 8-VSB, ADSL/VDSL, 802.3, 802.11a/b/g, Homeplug, MoCA® or IEEE 1394 through either transport stream, MII or PCI interfaces. This provides a flexible STB solution that can be targeted to a variety of broadband operators while minimizing hardware/software development costs.



CX2427x System Block Diagram

CX2427x Product Features

- High-performance ARM1176 CPU with 128K L2 cache supplying 800+Dhrystone 1.2 MIPS at 666MHz
- Dual 667MHz 32-bit DDR-2 memory interface (optionally configurable for 400MHz DDR support)
- DIRECTV/DVB transport stream demultiplexing
- Two multi-standard transport processors with 3DES, AES and Multi-II descrambling
- Transport stream processing capability supporting up to 6 records and 2 playback streams simultaneously for dual HD-PVR support
- Supports MPEG-2 MP@HL, MP@ML, MP@LL, SP@ML
- Supports H.264 MP@L4.1 and HP@L4.1
- Supports VC-1 AP@L3 and MP@HL
- Multi-plane video/graphics display controller
- HD displays supports HD 1080i and 720p picture output with six-plane compositing
- Supports constrained HDTV image output on YPrPb
- Supports video plane re-sizing for format conversion, picture-in-picture, or picture-in-graphics
- High-performance de-interlacing supports 480i to 480p/720p and 1080i to 480p/720p conversions
- Multi-format audio decoders supporting dual program decoding of any combination of MPEG-1, MPEG-2, Dolby Digital, Dolby Digital Plus, MPEG-2 AAC, MPEG-4 AAC, aacPlus, WMA and WMA Pro encoded bitstreams
- Advanced 2D graphics rendering engine for alphabl, bitblt, textblt, line draw, and color expansion acceleration

- Nine 10-bit video DACs; supports multiple output scenarios on a primary HD display with the same content downscaled to SD on a second display, with different HD content downscaled to SD on a third display
- Macrovision® 7.x copy protection with 525p/625p optional support
- Advanced security features including secure boot SW authentication, IC personalization via OTP memory, and 3DES/AES ciphering engines
- Secure video processor (SVP) support
- Integrated DIRECTV security
- HDMI transmitter with HDCP
- Integrated RF modulator
- Dual BTSC stereo encoders
- Dual USB2.0 host controllers with integrated Phys
- USB 1.1 controller and Phy
- NDS XTV and RASP PVR support
- Dual Serial ATA-2 interfaces for internal or external HDD attachment
- Dual channel 10/100 Ethernet MAC with overclocked MIIs
- Two Smart Card ports
- 32-bit 33 MHz PCI controller
- CCIR656 YCrCb digital video output port
- Multiple I2S, 12C, SPI, GPIO, UARTs
- Integrated V.92 hardware modem
- OpenCable™ CableCARD™ M-Card interface
- 2 ultra-high frequency (UHF) remote inputs
- Infrared (IR) input/output