CONEXANT

Sideport Video Decoder

CX25836/7

High Performance in a Small Package

Conexant's broadband communications portfolio includes a comprehensive suite of semiconductor solutions that enable the digital home and information network. The CX25836/7 is Conexant's fourth-generation video decoding solution. It provides a highly integrated single-chip analog video capture solution ideal for a wide range of digital video systems applications.

The CX25836/7 features, although applicable to a wide range of analog video applications, are focused on both the security and consumer electronics markets. Most notably, CX25836's fast camera locking capabilities and flexible programmable inputs make it most suitable for the security camera market. The CX25837, with its ability to decode Composite Video Baseband Signal (CVBS), S-Video, and YPbPr, is best suited to address the wide array of consumer electronics requirements. Both devices are distinguished by high quality, flexibility, integration, and ease of use. Both fit into a wide array of applications: set-top-boxes, flat panel displays (such as LCD and Plasma TVs), HDTVs, and PVRs/DVRs.

High Quality

The CX25836/7 integrates two high-performance 10-bit ADCs and provides a full 10-bit data path through the video decoder to maintain optimum end-to-end video quality. Eight video inputs provide flexible analog muxing that can be configured for any of the following:

- Eight CVBS inputs
- Four Y/C inputs
- Three composite with one Y/C and one YPbPr
- One composite with two Y/C and one YPbPr
- Two composite with two YPbPr (CX25837 only)

The CX25837 uses its high quality Analog-to-Digital Converter (ADC) to sample the YPbPr video format, which is most often found on prosumer (intermediate to advanced end user) type equipment. Simultaneous digitization of Pb and Pr, through the 10-bit chrominance A/D, is used to offer this feature cost effectively yet yield the highest quality.



Distinguishing Features

- Integrated NTSC/PAL/SECAM video decoding
- Auto detection and configuration for video
- Two 10 bit A/D
- YPbPr component video input
- Ease of Use
- 12mm X 12mm 80-pin TQFP
- 7mm X 7mm 64-pin TQFP
- CCIR 656/601/VIP
- Integrated anti-alias filter
- On-chip voltage regulator

Part Number CX25836/7
Description Sideport Video Decoder

Integrated Filters

All video inputs have integrated anti-alias filters, eliminating the need for external filter components. These filters help improve the video decoding process by removing aliasing artifacts prior to the digitization process.

Conexant also employs a proprietary method of luma/chroma separation of the composite video sources. Conceptually similar to a 4H adaptive chrominance comb filter used for NTSC and PAL, Conexant performs a slight twist to provide unparalleled performance. Through the use of adaptive correlation logic, the resulting combed image provides improved performance over a standard 4H comb solution. In the case where no correlation exists between lines, the decoder automatically falls back to the chrominance band-pass and luma notch filter.

In the case of SECAM, a bell filter is implemented. The net effect of the various filtering stages results in a high-quality image with reduced cross-chrominance and cross-luminance artifacts (such as dot crawl, hanging dots, rainbow effects) and thus restores full bandwidth to luminance data from composite sources.

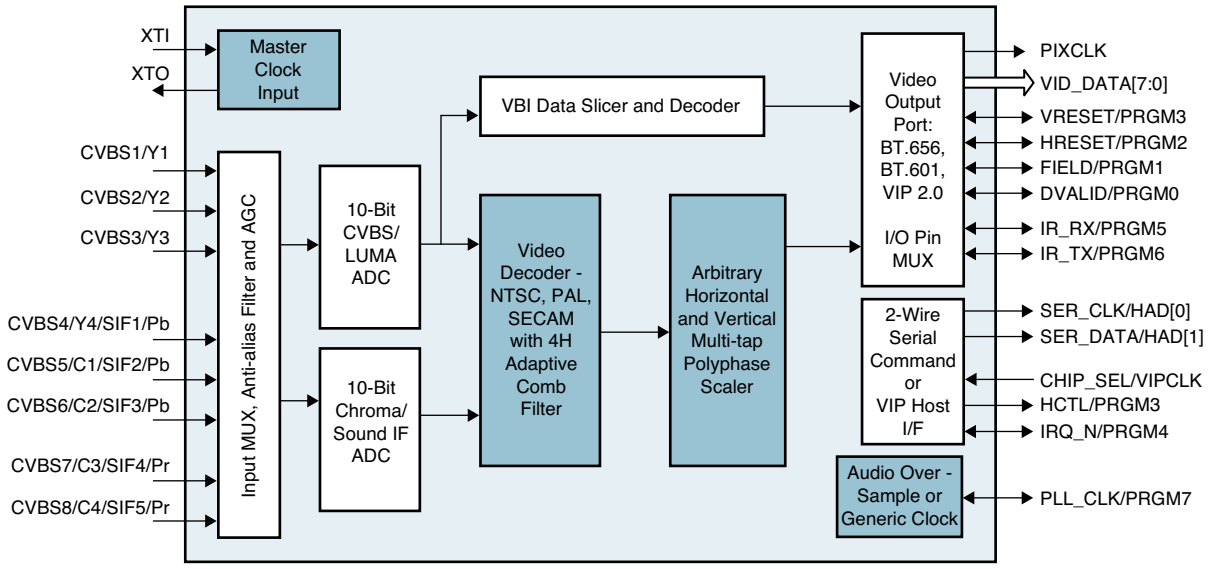
Flexible Architecture

With eight programmable input ports and a configurable output port for 4:2:2 digital, the CX25836/7 can be used to capture video from TV tuners, DVD players, video cameras, VCRs, game consoles, or any other sources of composite Y/C or component (480i) video. The CX25836/7 video inputs can be programmed for up to eight video sources; a maximum of eight CVBS input channels. Each of these inputs can be used to support CVBS, S-Video, or component video inputs. The total number and configuration of video inputs is user-defined.

Ease of Use

The CX25836/7 requires minimal programming for startup. These devices are preconfigured in a default mode for development, verification, and fast prototyping. Additionally, the CX25836/7 can auto detect all worldwide broadcast video standards.

Internally, the CX25836/7 uses on-chip logic to determine which video standard is present and reconfigures automatically so no user intervention is necessary. This is especially useful in geographic regions where different video standards may be received on a channel-by-channel basis. However, like the operation of traditional video decoders where the user chooses a specific video standard, the automatic detection feature may be turned off.



CX25836/7 System Block Diagram

Superior Performance

The CX25836/7 high quality video decoder offers superior performance through advances in technology, integration, and patented intellectual property.

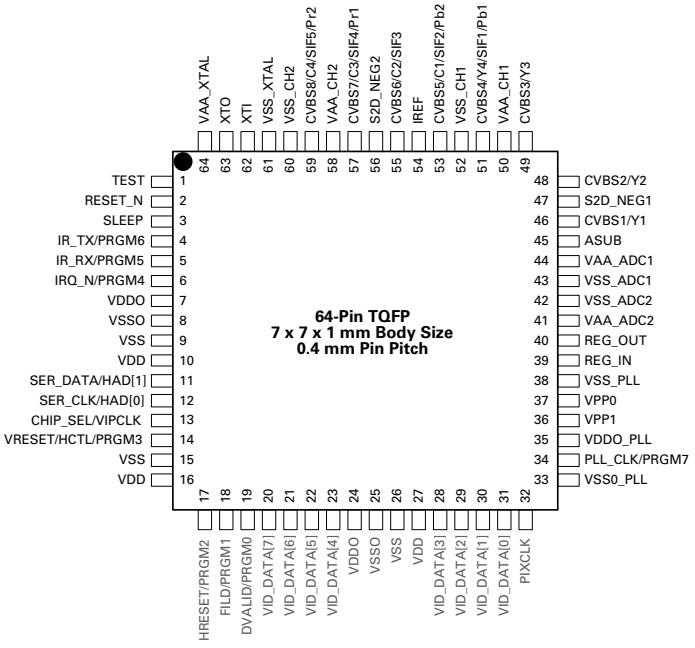
For example, a new and improved arbitrary horizontal and vertical scaler, from full resolution down to an 8:1 ratio (icon size), has been implemented using a polyphase interpolation filter. This maintains a high-quality scaled image that preserves the detail and aspect ratio of the source material. Scaling can be accomplished in both ITU-R BT.656 and square formats.

Additionally, new advances in clamping, Automatic Gain Control (AGC), and DC restore circuitry allow for faster lock times upon channel change and improved signal reconstruction abilities to improve the video decode process. The CX25836/7 is offered in a compact 64-pin 7x7 mm TQFP and operates off of a single 3.3 V regulator.

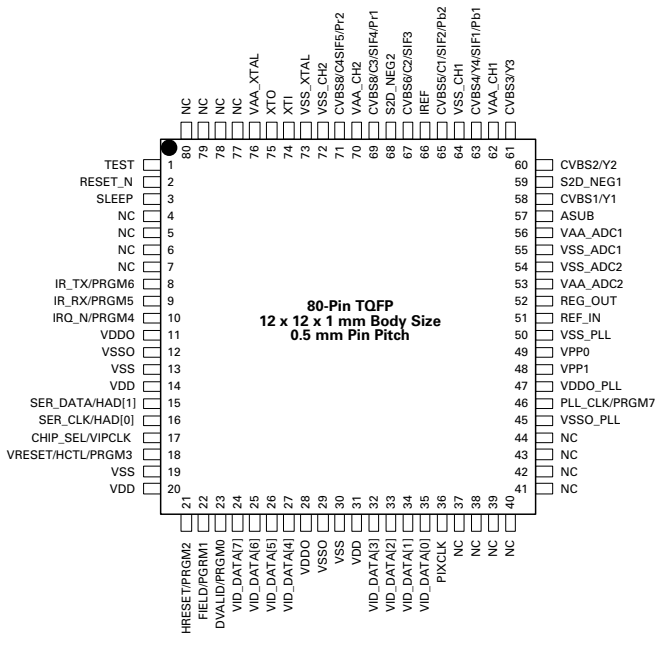
Moreover, the surrounding Bill of Materials (BOM) has been integrated and optimized for performance and overall cost effectiveness. Together, small package and integration yield high performance in a small package. To maximize the customer's flexibility and minimize the board space by eliminating multiple foot print options, the CX25837 is also offered in an 80-pin 12x12 mm device, which is pin-for-pin compatible with the CX25840/1/2/3 broadcast A/V decoder. Broadcast audio can be added by a mere device change. Finally, the CX25836/7 has multiple power-down modes to address low-power applications and power budget-sensitive designs. The video decoder is designed on the latest sub-micron process, which reduces the overall power consumption through the advantages of reduced geometries.

Part Ordering Numbers

Part Number	6 Video Input Mux	8 Video Input Mux	Component Video Input	VIP Host Port
CX25836		X		
CX25837	X		X	X



CX25837 and CX25836 Pinout (64-Pin)



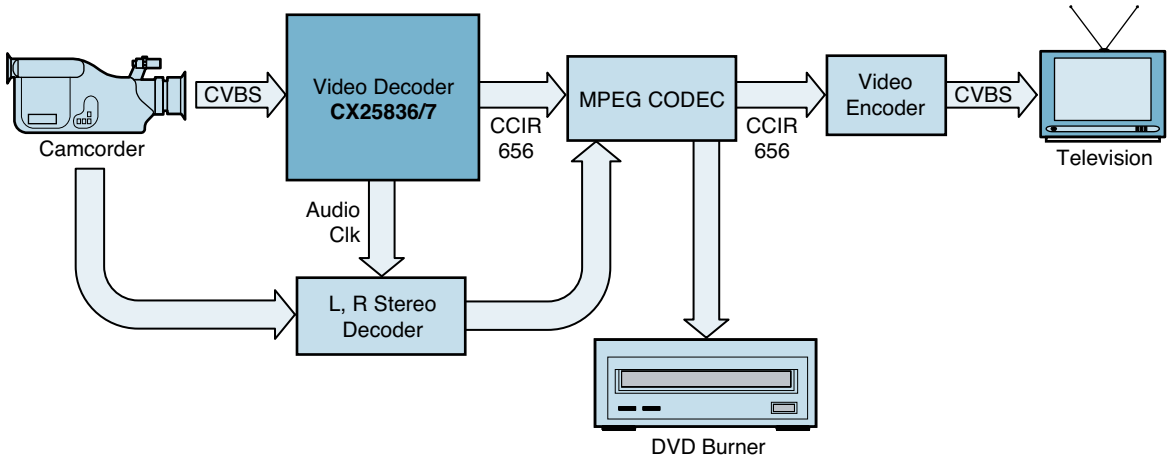
CX25837 Pinout (80-Pin)

CX25836/7 Features

- Auto detection and configuration of NTSC/PAL/SECAM video
- Worldwide video standards – NTSC (M, J, 4.43), PAL (B, D, G, H, I, M, N, Nc), SECAM (K, L)
- Full 10-Bit ADCs and data path
- Flexible video input mux with integrated anti-alias filtering
- Four line adaptive comb filter for NTSC and PAL
- Flexible video output port - 27 MHz ITU-R BT.656, VIP 2, or ITU-R BT.601 video with separate syncs
- Macrovision detection
- Programmable VBI data slicer for data services such as closed caption, Teletext, and program guides
- Power-up configurable two wire serial command interface or two wire VIP 1.1/2 host port interface
- Hardware interrupt to eliminate polling
- Auto detection and configuration for video
- Fast locking mode for security camera applications (CX25836)
- Auxiliary clock output – For providing an oversampled audio clock locked to the video or for use as a general purpose PLL output
- Infrared transmit and receive logic
- Internal voltage regulation for single supply operation
- Lower power consumption
- Small form factor
- Pin for pin compatible devices

Video Decoder Applications

- Set-top-boxes
- Flat panel displays – LCD and Plasma TVs
- HDTVs
- PVRs/DVRs/VCRs
- TV tuners
- DVD players
- Video cameras



CX25836/7 Diagram

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