

AVC/MPEG HIGH-DEFINITION DECODER

FEATURES

- **Multi-standard video decoding support for:**
 - MPEG-2 MP@ML
 - MPEG-2 MP@HL
 - AVC HP@L3.0 for 480i
 - AVC HP@L3.2 720p
 - AVC HP@L4 1080i
 - AVC HP@L4.1 1080i for Blu-Ray and HD DVD
- **Multi-standard audio decoding**
 - MPEG2 AAC-LC- Stereo and 5.1
 - MPEG4 AAC HE (High Quality)-Stereo (level 2) and 5.1 (level 4)
 - MP3 (MPEG1 layer 3)
 - Dolby® Digital Plus
 - Dolby Digital Plus to Dolby Digital transcode
- **Dual-stream decoding with independent program clock reference (PCR) clock recovery**
- **Two video output interfaces**
 - BT.656
 - HD_DVI Interface for connection to BCM7038
 - HD or SD, with interlaced or progressive scanning
- **Video post-processing with scaling, 3:2 pull-down, clipping, and padding**

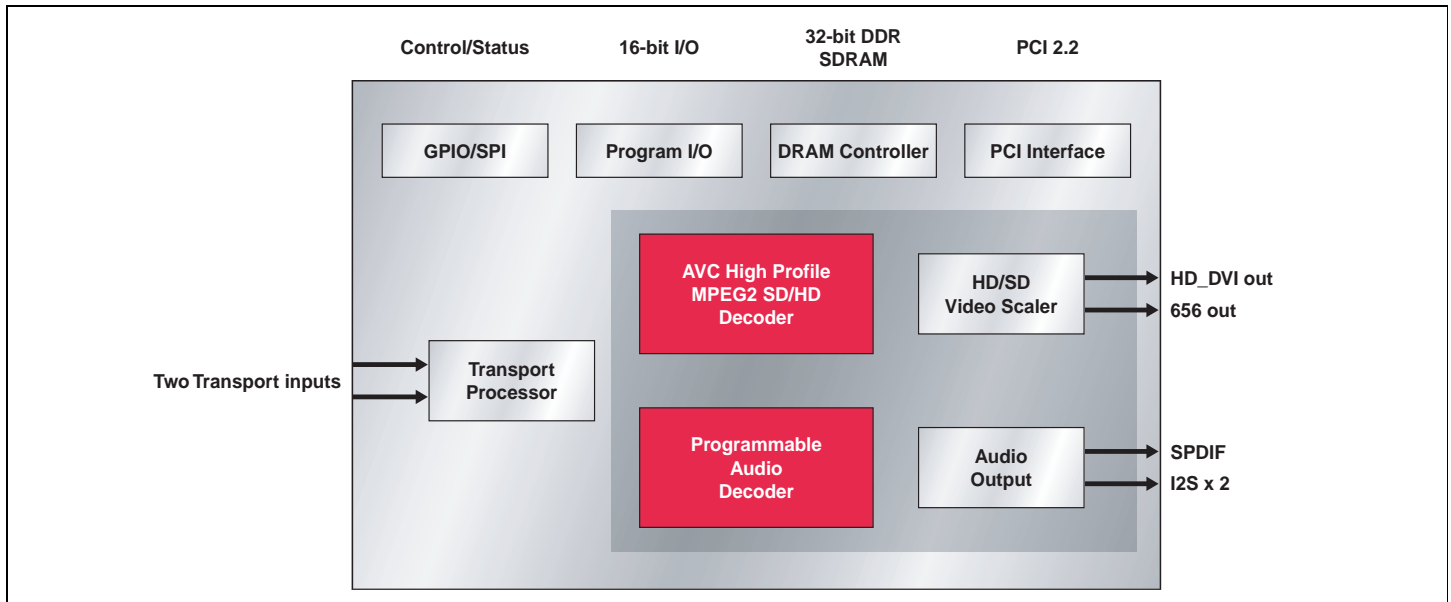
FUNCTIONAL COMPONENTS

- H.264/MPEG-4 part 10 decoder
- MPEG-2 decoder
- Programmable audio decoder
- Transport demultiplexer
- HD-compatible digital video output ports
- Multi-host control/status interface
- DDR SDRAM controller

APPLICATIONS

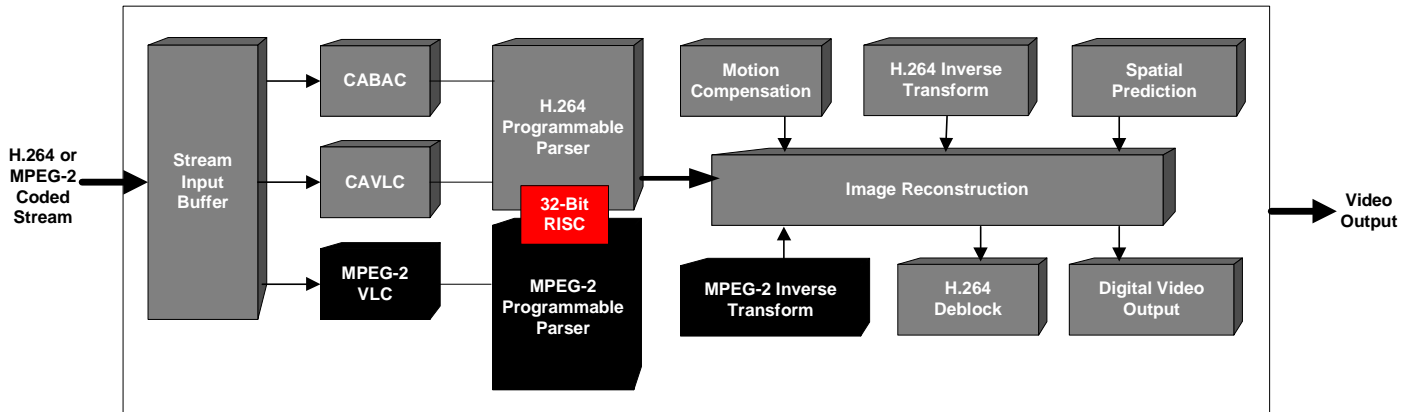
- Digital cable, satellite, terrestrial, IP, and DSL set-tops
- HD DVD players
- DVR (playback)
- Portable multimedia players

Block Diagram



OVERVIEW

Video Decoder Block Diagram



The BCM7411 introduces the advantages of the H.264 video compression algorithm to today's advanced consumer and broadcast applications. The BCM7411 is a dual-channel AVC/MPEG-2 decoder chip capable of full HD real-time decoding.

Broadcom's H.264 Compression Advantage™ architecture provides three times the compression power of MPEG-2. Systems incorporating the BCM7411 have superior image quality, improved system performance, and larger storage capacity with the reduced bit rates of H.264—also known as MPEG-4 Advanced Video Coding (AVC). The BCM7411 fully supports the MPEG-2 standard, so that compatibility with existing media can be maintained.

The BCM7411 supports the following decoding operations:

- 1 HD (MPEG-2 or H.264) in real-time
- 2 SD streams (MPEG-2 or H.264) in real-time

The H.264 Advantage

The H.264 coding standard incorporates innovations and techniques developed over decades of worldwide research into video compression. The algorithm produces results far superior to the preceding MPEG standards. H.264 derives much of its performance gain from complex motion estimation techniques, integration of an in-loop deblocking filter, and brand-new spatial prediction operations.

H.264 Support

- Complies with the ISO/IEC 14496-10 specification
- Decoder support for AVC High Profile streams up to level 4.1 with a 30 Mbps maximum encoded bit rate restriction
- I, B, and P slices
- CABAC and CAVLC entropy decoding
- Field/frame and picture adaptive decoding
- Macroblock adaptive field/frame decoding
- All intrablock and interblock sizes
- Resolutions supported: QCIF up to 1920 × 1088

MPEG-2 Support

The BCM7411 complies with the ISO/IEC 13818-2 specification and supports Main Profile up to high level at 125 Mbps.

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Transport/Program Stream Demultiplexer

The BCM7411 accepts transport or program streams depending on the preferred application, and parses the incoming video, audio, and private data for decoding. The BCM7411 monitors PCR information in the transport stream to adjust the frequency of an external VCXO oscillator.

Digital Video Output Ports

The BCM7411 provides configurable digital video output ports for a glueless interface to the BCM7038 or to a variety of video DACs. The outputs may be configured for BT656 and HD-DVI.

System Control/Status Interface

The BCM7411 is intended for use as a peripheral system and requires a controlling agent to configure and monitor its operation. The following interfaces are supported:

- PCI 32-bit interface
- Generic 16-bit host interface
- SPI serial and GPIO interfaces

BCM7411 Specifications

| Parameter | Value | Unit/Description |
|----------------------------|-------------|------------------|
| Logic supply | 1.2 | V |
| SDRAM I/O supply | 2.0 | V |
| I/O supply | 3.3 | V |
| Maximum power dissipation | 2.0 | W |
| Operating temperature | 0 to 70 | °C |
| Storage temperature | -30 to +125 | °C |
| Package Information | | |
| Package type | 336-pin | Ball grid array |
| Package size | 27 × 27 | mm |



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