



## AVC/VC-1/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
  - VC-1 AP@L3 1080i
- **Multi-standard audio decoding**
  - MPEG2 AAC-LC- Stereo and 5.1
  - MPEG4 AAC HE (High Quality)-Stereo (level 2) and 5.1 (level 4)
  - MPEG, LI LII, 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**

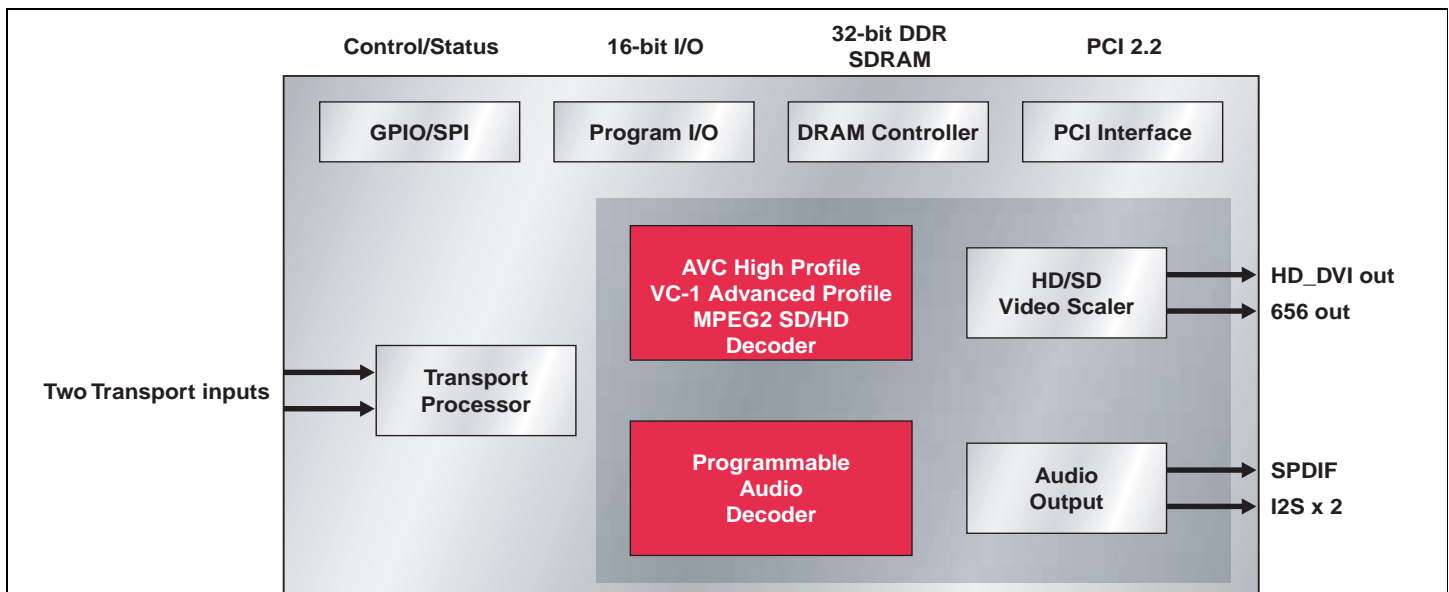
### FUNCTIONAL COMPONENTS

- H.264/MPEG-4 part 10 decoder
- VC-1 advanced profile decoder
- MPEG-2 decoder
- Programmable audio decoder
- Transport demultiplexer
- HD-compatible digital video output ports
- Multihost control/status interface
- DDR SDRAM controller

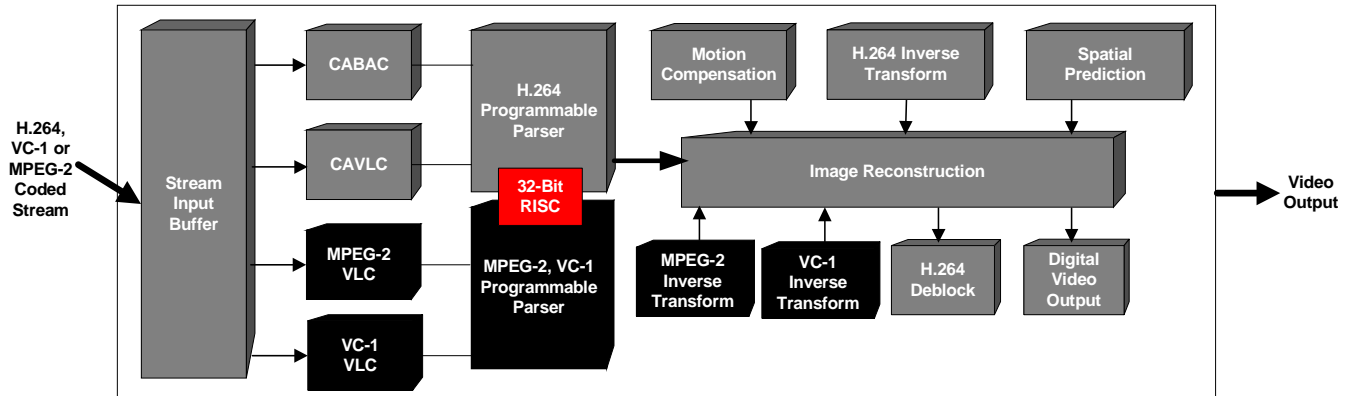
### APPLICATIONS

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

### Block Diagram



# OVERVIEW



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/VC-1/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, H.264 or VC-1) in real-time
- 2 SD streams (MPEG-2, H.264 or VC-1) 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 40 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.

## VC-1 Support

The BCM7411 supports Advanced Profile VC-1 streams up to 40 Mbps, as defined in the proposed SMPTE specification.

## 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 interface

## BCM7411 Specifications

| Parameter                  | Value       | Unit/Description |
|----------------------------|-------------|------------------|
| Logic supply               | 1.2         | V                |
| SDRAM I/O supply           | 2.6         | V                |
| I/O supply                 | 3.3         | V                |
| Maximum power dissipation  | 2.5         | W                |
| Operating temperature      | 0 to 70     | °C               |
| Storage temperature        | -30 to +125 | °C               |
| <b>Package Information</b> |             |                  |
| Package type               | 336-pin     | Ball grid array  |
| Package size               | 27 × 27     | mm               |

Broadcom®, the pulse logo, Connecting everything®, and the Connecting everything logo are among the trademarks of Broadcom Corporation and/or its affiliates in the United States, certain other countries and/or the EU. Any other trademarks or trade names mentioned are the property of their respective owners.

Connecting  
everything®



**BROADCOM CORPORATION**  
16215 Alton Parkway, P.O. Box 57013  
Irvine, California 92619-7013

© 2005 by BROADCOM CORPORATION. All rights reserved.

7411-PB05-R 12/07/05

Phone: 949-450-8700  
Fax: 949-450-8710  
E-mail: info@broadcom.com  
Web: www.broadcom.com