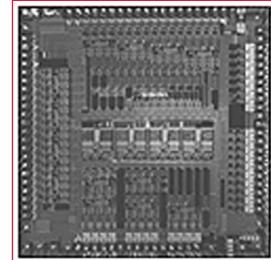# BROADCOM®

## Connecting everything®

## BCM7040
### PRODUCT Brief

# BCM7040 MPEG2 DIGITAL VIDEO/AUDIO ENCODER

## BCM7040 FEATURES

- **Single-chip NTSC/PAL MPEG-2 encoding system**
- **MP@ML MPEG-2 video encoder**
  - Variable resolutions:
    Horizontal: 720,704,640,544,480,360,320,160
    Vertical: 480,240,112 (NTSC); 576,288,144 PAL
  - Variable frame rate, up to 30(NTSC)/25(PAL) fps
  - Supports constant/variable bit rates: 1–24 Mbps
  - Variable GOP length and structure: I, IP, IPB, IPBB
  - +/-100 pixels wide motion estimation search range
  - Automatic 3/2 pulldown detection
  - Video input: selectable 8/10 bits CCIR656
  - 4:2:2 to 4:2:0 conversion
- **High-fidelity 24/56 bits programmable audio DSP**
  - MPEG-1 Layer II stereo encoding
  - Dolby Digital (AC-3) stereo encoding
  - Programmable frequencies and bit rates (64–384 Kbps)
- **Highly programmable system multiplexing processor**
  - CBR/VBR program/transport stream multiplexing
  - User data/VBI insertion
  - Programmable stream parameters
- **Video pre-processing**
  - 7-tap vertical/horizontal luminance/chrominance filter
- **Accurate 27-MHz video/audio/PCR time stamps for exact video/audio synchronization during playback**
- **Dedicated serial/parallel DVB transport stream interface**
- **I²S/AC-97 stereo audio inputs**
- **PCI 32 bit/33 MHz, PCI DMA master or PCI slave and 16-bit Generic Host interface**
- **Integrated I²C controller**
- **Package: 176-pin LQFP**
- **Supply voltage: I/O 3.3V (5V compatible)**
- **Power consumption: less than 1W**
- **System memory: SDRAM, 1 module of 2M x 32**

## SUMMARY OF BENEFITS

- **Fully integrated MPEG-2 Digital Video/Audio Encoder and Video/Audio Multiplexer in a single chip drastically reduces overall system and development costs.**
- **Video/Audio Elementary, Video/Audio Packetized Elementary, Program, and Transport Streams are generated internally to the BCM7040.**
- **Broadcom third generation production of field-proven and in-production technology.**
- **Universal compatibility through standards compliance: Video Encoding (ISO/IEC 13818-2), Audio Encoding (ISO/IEC 11172-3, MPEG-1, Layer II and Dolby Digital AC-3) and System Multiplexing (ISO/IEC 13818-1).**
- **Broadcom-developed reference design kit includes application board, sample application, and drivers based upon industry-standard operating systems, enabling rapid and streamlined software and hardware development, reducing time to market.**
- **Simple system design: BCM7040 + single SDRAM.**

## APPLICATIONS

- **Time shift/personal video recording (PVR):**
  - Set-top boxes
  - Stand-alone PVRs
  - Television sets
- **DVD recorders**
- **Digital VCRs (VCR replacements)**
- **PC TV tuners**
- **Digital camcorders**
- **Video transmission**
- **Video over IP**
- **Video conferencing**
- **Security and surveillance**

**System Block Diagram**

2M x 32 SDRAM

Video A/D

Audio A/D

**BCM7040**
MPEG-2 Encoder

Compressed data (DVB) output

PCI/Generic interface