BROADCOM®

Connecting everything®
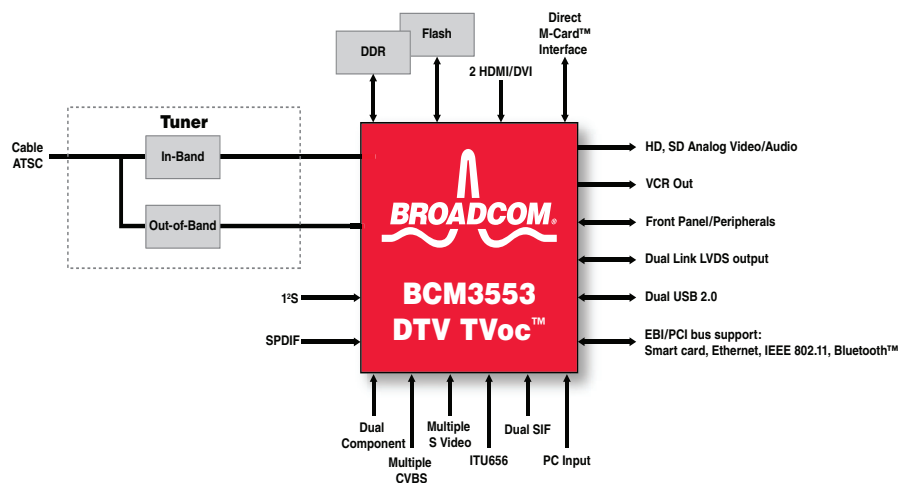
BCM3553 PRODUCT Brief
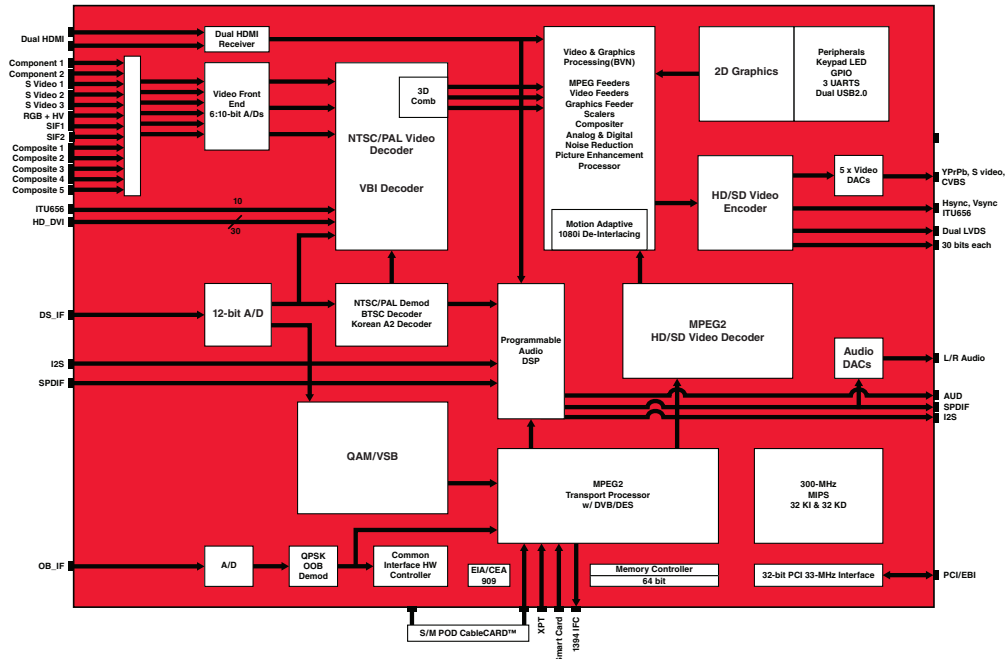
FULL HIGH-DEFINITION 1080P DIGITAL TV SYSTEM-ON-A-CHIP

FEATURES

- Full HD 1080p support
- 1080i motion-adaptive deinterlacing
- NTSC/PAL decoder with a 3D comb
- Direct PC input support up to 1600×1200 UXGA
- Dual HDMI/DVI 1080p 60-fps input
- Six 10-bit ADCs each with a 8:1 input switch
- Integrated dual-link LVDS transmitters
- Integrated video processing
  - Full 10-bit analog video processing
  - Picture Enhancement Processor (PEP™)
  - 3:2 pulldown
  - Multiframe per pixel motion adaptive deinterlacing
- Extensive audio support
  - Auto flesh, green boost, black stretch, histogram equalization, blue shift and sharpness capability
  - Five-band audio equalizer
  - Independent audio output controls for analog and digital outputs
  - Integrated BTSC and A2 audio decoder
  - Integrated audio DACs
  - Dolby® Digital, TruSurround XT®, MPEG audio decoder
- Integrated NTSC demodulator
- Integrated ATSC/QAM receivers
- Dual USB 2.0
- On-chip 330-MHz 32-bit CPU

SUMMARY OF BENEFITS

- Full HD 1080p support on a single chip
- Dual 1080p 60-fps HDMI receivers provide connectivity to highest quality consumer electronic products
- Integrated dual-link LVDS transmitters provide direct connection with full HD 1080p panels
- PEP advanced video signal processing provides an elevated viewing experience through edge and color enhancements
- Motion-adaptive per pixel deinterlacing produces superior display of interlaced video
- Direct PC input support with auto-phase and mode detection reduces system design cost and complexity
- 3D comb filter with per pixel adaptive motion detection delivers excellent Y/C separation
- On-chip high-quality video scaling provides extensive Picture-in-Picture support and non-linear conversion of 4:3 images for display on 16:9 televisions
- Full 10-bit video support preserves signal integrity and image quality
- Superior ATSC signal reception and demodulation under both static and dynamic multipath conditions
- Comprehensive integration of ADCs and DACs supports direct audio/video inputs/outputs simplifying system design and cost
- Full peripheral support eliminates the need for additional components including dual USB 2.0, LED/keypad, and smart card

BROADCOM®

BCM3553 Block Diagram

The BCM3553 combines a cable/terrestrial 4/1024-QAM and 8/16-VSB receiver, an out-of-band QPSK receiver, NTSC demodulator, two DVI/HDMI receivers, a transport processor, a digital audio processor, a high-definition (HD) MPEG video decoder, 2D graphics processing, digital processing of analog video and audio, analog video digitizer and DAC functions, stereo high-fidelity audio DACs, a 330-MHz millions of instructions per second (MIPS) processor, and a peripheral control unit providing a variety of television control functions.

The cable/terrestrial receiver directly samples a tuner output with an analog-to-digital (ADC) converter. It digitally resamples and demodulates the signal with recovered clock and carrier timing, filters and equalizes the data, and passes soft decisions to an ATSC A/53 and ITU-T J.83 Annex A/B/C-compatible decoder. A CEA/EIA-909 smart antenna interface is included on-chip.

The out-of-band receiver digitizes a surface acoustic wave (SAW) centered interface (IF). It demodulates the signal with recovered clock and carrier timing, filters and equalizes the data, and incorporates a DigiCipher® II/ DAVIC-compatible forward error correction (FEC) decoder. The common hardware interface provides a direct interface to a M-Card™/CableCARD™ device.

The BCM3553 has an MPEG-2 Digital Video Broadcasting (DVB)-compliant transport processor with advanced section filtering capability, DVB descrambler, and an MPEG-2 (MP@HL profile) video decoder.

Audio support includes both a BTSC/Korean A2 audio decoder and a Dolby AC3/MPEG-2 Layer 1, 2, audio decoder with TruSurround XT support.

The BCM3553 provides analog and digital audio/video outputs. Dual-link LVDS transmitters provide direct digital connection to panel displays. A NTSC/PAL video encoder analog output with Macrovision® (optional) provides analog video for VCR out support. A SPDIF output and a pair of analog outputs (L-R) are provided via the integrated audio DACs.

The NTSC analog video decoder is supported by its own motion adaptive deinterlacing and 3D comb filtering, including 1080i deinterlacing. Direct PC input up to UXGA 1600×1200 is supported with auto-phase and mode detection. Two independent HDMI receivers each support 1080p 60-fps inputs.

The BCM3553 includes Broadcom's advanced 2D graphics processing. Two transport stream inputs, one ISO7816 smart card interface, and a high-speed interface supporting IEEE 1394 is included. The BCM3553 incorporates a complete MIPS32®-based microprocessor subsystem including caches with bridging to memory and a local bus, where external peripherals can be attached. Integrated peripherals include two USB 2.0, three UARTs, counter/timers, GPIO, keypad, LED, IR Tx/Rx, IR keyboard, Broadcom Serial Control (BSC), and SPI controllers.

Connecting
everything®

BROADCOM®