

FULL HD 1080P MULTIFORMAT DECODER CONNECTED DIGITAL TV SYSTEM-ON-A-CHIP

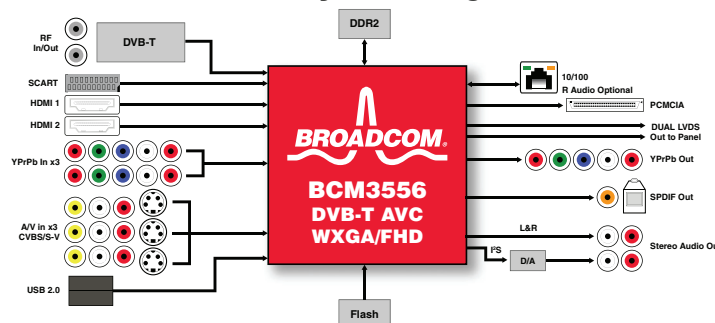
FEATURES

- **Advanced multiformat decoder supporting the following:**
 - H.264/AVC Main and High Profile to Level 4.1 (HD), Level 3.1 (SD)
 - HD/SD AVS Jizhun Profile Levels 2.0, 4.0, and 6.0
 - VC-1 Advanced Profile @ Level 3, simple and main profiles
 - HD/SD MPEG-2 Main Profile at Main and High levels
 - MPEG still image decode
 - HD DivX® 3.11/4.11/5.x/6x/Home Theater
- **3D/2D OpenGL® ES 1.0- compliant graphics core**
- **Integrated Video Processing:**
 - 3D Color management
 - Digital, Analog, and Mosquito Noise Reduction
 - 1080i motion adaptive deinterlacing with 3:2:2:2 pull-down
 - True 10-bit video carried through system
- **Dual HDMI 1.3a receivers**
- **Extensive audio support:**
 - AAC+ Level 2, AAC-HE
 - Dolby® Digital, Dolby Digital Plus, Trusurround XT®
 - MPEG I layers 1, 2, and 3 (MP3)
 - Windows Media® and Windows Media Pro audio
 - Audio DACs, input switch, and equalizer
- **Ethernet MAC and PHY**
- **Integrated DVB-T COFDM terrestrial demodulator:**
 - Standards compliance: ETSI EN 300 744, Nordig Unified v1.0.3, DTG D-Book 5 compliant
 - Excellent Doppler performance
 - Active impulse noise suppression
- **Integrated PAL/SECAM Demodulator**
- **PAL decoder with a 3D/2D comb**
- **Direct PC input support up to 1600 x 1200 UXGA**
- **Integrated dual-link LVDS transmitters**
- **Dual USB 2.0**
- **A 400-MHz 32-bit MIPS dual CPU with two 32-KB instruction caches and a combined 64-KB data cache with 128-KB L2 cache**

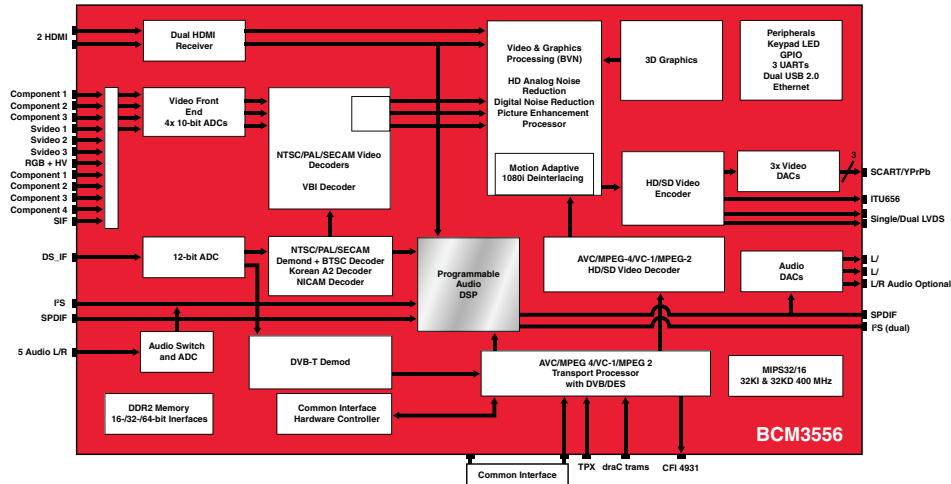
SUMMARY OF BENEFITS

- Expand content access via the integrated Advanced multiformat decoder.
- Ethernet connectivity enables the television to access home or network-based photos, music, and videos.
- 3D graphics provides a rich and product differentiating 10-ft user interface.
- Full HD 1080p support on a single chip.
- Dual 1.3a HDMI receivers provide connectivity to highest quality consumer electronic products including xvYCC and Deep Color support.
- Integrated dual-link LVDS transmitters provide direct connection with Full HD 1080p panels.
- 3D color management system provides an elevated viewing experience through edge and color enhancements.
- Motion adaptive per pixel deinterlacing produces superior 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.
- Full 10-bit video support preserves signal integrity and image quality.
- NorDig-Unified 1.0.3 and DTG D-Book 5 compliant
- Robust performance in time-varying Single Frequency Network environments
- Excellent out-of-span echo performance and active impulse noise suppression
- Comprehensive integration of ADCs and DACs supports direct audio/video inputs/outputs, simplifying system design and cost.

BCM3556 System Diagram



OVERVIEW



BCM3556 Block Diagram

The BCM3556 is the next generation of System-on-a-Chip (SoC) Digital Television (DTV) products from Broadcom® with 1080p60 input and output capability targeted for the EU Market. It combines a high level of integration with best-of-class picture quality, enabling TV manufacturers to reduce overall system cost (BOM) and improve picture quality, all with a single SoC.

The BCM3556 combines DVB-T COFDM terrestrial and PAL/SECAM demodulators, two DVI/HDMI receivers, a transport processor, a digital audio processor, 3D/2D graphics processing, Ethernet MAC and PHY, digital processing of analog video and audio, analog video digitizer and DAC functions, stereo high-fidelity audio DACs, a 400-MHz dual-threaded MIPS processor, and a peripheral control unit providing a variety of television control functions. The BCM3556 also features an advanced video decoder capable of supporting high-definition AVC, VC-1, and DVB-T MPEG-2 streams.

The integration of the DVB-T COFDM terrestrial demodulator reduces the overall cost of the external tuner module, resulting in cost savings for the customer. The BCM3556 also integrates four 10-bit ADCs with integrated front-end analog muxing that accept four CVBS inputs, three S-video inputs, three component inputs, one PC input, one full SCART input with fast blanking, and one Sound IF (SIF) input at the same time without the requirement for any off-chip muxing ICs. The BCM3556 offers two HDMI 1.3a receivers, a motion adaptive deinterlacer, HD Analog Noise Reduction, and an analog video decoder with 3D comb for PAL and Y/C separation for SECAM.

The multiformat video decoder in the BCM3556 is capable of supporting high-definition AVC, VC-1, and DVB-T MPEG-2 streams. AVC support is up to High Profile Level 4.1. New tools in the AVC Fidelity Range extensions are supported, including 8x8 transform and spatial prediction modes and adaptive quantization matrix. The video decoder also supports

high-definition VC-1 (Advanced Profile Level 3, Main, and Simple profiles) and DVB-T-compliant MPEG-2, Main Profile at Main and High Levels. The BCM3556 has an advanced programmable audio processor capable of decoding a broad range of formats including Dolby Digital, Dolby Digital Plus, AAC 5.1, AAC+ Level 2, AAC+ Level 4, WMA, and MPEG-1 Layer 1, 2, and 3 with simultaneous pass-through support.

The BCM3556 also supports 3D SRS Audio and includes an analog audio decoder for BTSC and A2 formats. The BCM3556 also integrates an analog audio switch that accepts six stereo inputs. In addition, the SoC supports SPDIF and I²S inputs. One SPDIF, two I²S, and three analog audio outputs are available.

The SoC family also has an integrated advanced Picture Enhancement Processor (PEP) to improve sharpening and perform picture post-processing functions (e.g., autoflesh, green boost, black and blue stretch). The PEP engine is fully programmable and can be optimized by the TV manufacturer to meet their respective quality requirements. Also integrated is a video encoder for NTSC and an advanced 2D/3D graphics for OSD acceleration.

The BCM3556 supports direct PC inputs up to UXGA 1600x1200 formats with autophase and automode detection and supports dual LVDS outputs to support 1080p60 panels.

The BCM3556 integrates a 400-MHz 32-bit MIPS dual CPU with two 32-KB instruction caches and a combined 64-KB data cache with a 128-KB L2 cache, and a 32-bit 800/1066-MHz DDR2. The BCM3556 also supports an 8-bit external NAND Flash interface and SPI Flash interface for booting. Integrated peripherals include two USB2.0 ports, three UARTs, controllers for SPI, BSC, keypad, LED and IR Tx/Rx, and an Ethernet port with MAC and integrated PHY.

The BCM3556 is available in several package options: WXGA and FHD, PIP and non-PIP, or MPEG-only and combined AVC/MPEG-2.

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