



Smart TV & Hybrid STB Solution for Triple-Play Service

Key Specifications

CPU

- High-performance core solo ARM Cortex A9 processor
- Mechanism for processing dual-core services
- Built-in I-cache, D-cache, and L2 cache
- Hardware Java acceleration
- Floating-point coprocessor

Memory Control Interface

- DDR2/DDR3 interface
 - Maximum memory of 1 GB
 - 32-bit memory width
- SPI flash
- NAND flash

Video Decoding

- H264 MP, HP@ level 4.1
- MPEG1
- MPEG2 MP@HL
- MPEG4 SP@ levels 0–3 and ASP@ levels 0–5
- MPEG4 short header format (H.263 baseline)
- AVS baseline@ level 6.0
- H.263
- VC-1 AP
- Decoding capabilities of 1080p (30 fps) and 576i (25 fps) or 480i (30 fps)
- Video post-processing such as denoising and deblocking

Picture Decoding

- Full high-definition JPEG decoding, a maximum of 64 megapixels
- PNG decoding, a maximum of 64 megapixels

Audio/Video Encoding

- H.264/MPEG-4 video encoding, a maximum of 800x600@25 fps
- JPEG encoding
- VBR and CBR for video encoding
- 1-channel audio encoding
- Echo cancellation

Audio Decoding

- MPEG L1/L2 decoding
- Dolby digital decoding, Dolby digital plus decoding, and Dolby digital plus transcoding
- Dolby digital transparent transmission
- DTS/DTSHD core decoding
- DTS transparent transmission
- DRA decoding
- Down mixing
- Resampling
- 2-channel sound mixing

- Intelligent volume control

TS Demultiplexing/PVR

- 3-channel TS inputs including 1-channel IF input
- A maximum of 96 PID filters
- Full-service PVR
- Recording of scrambled and non-scrambled streams
- AES, DES, or 3DES data encryption
- Content protection of USB devices
- Content protection of SATA or eSATA hard disks

Channel Decoding

- One built-in QAM module supporting ITU J83-A /C standards
- 1-channel QAM loopback output

Security Processing

- Advanced security features
- OTP and chip ID

Graphics Processing

- Enhanced full-hardware 2D graphics acceleration engine
- Full-hardware anti-aliasing and anti-flicker
- Full-hardware 3D GPU acceleration engine
- Standard OpenGL ES 2.0/1.1/1.0 OpenVG 1.1 interfaces

Display Processing

- 2-layer OSD
- 16-bit or 32-bit color depth
- Two background layers and two video layers
- 1920-pixel width for each layer
- Image enhancement

Audio/Video Interface

- Output norm of PAL, NTSC, or SECAM and force standard conversion
- Aspect ratio of 4:3 or 16:9, force aspect ratio conversion, and scaling
- 1080p 50 (60)/1080i/720p/576p/576i/480p/480i outputs
- Receiving of standard-definition and high-definition signals
- Simultaneous output of high-definition and standard-definition signals from the same source or different sources
- xvYCC (IEC 61966-2-4) standard for color gamut
- Digital video interface
 - HDMI 1.4 with HDCP 1.2
 - One BT.656/601 or BT.1120 VI interface
 - One 24-bit RGB output interface
- Analog video interface
 - One CVBS interface
 - One YPrPb interface
 - One S-Video interface



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- Six built-in video DACs
- Configurable output interface
- Macrovision and VBI
- Audio interface
 - Left-audio and right-audio channels (RCA output interface with low impedance and imbalance)
 - SPDIF
 - One built-in audio DAC
 - One digital AI/AO interface (PCM with multiple time slots)

Peripheral Interface

- One eSATA/SATA interface (with integrated PHY), supporting 1.5 Gbit/s or 3.0 Gbit/s rate
- One PCIe interface (with integrated PHY)
- Two USB 2.0 host ports (with integrated PHY)
- One 8-bit SDIO interface
- Two 10/100 Mbit/s adaptive Ethernet ports, supporting layer-2 or layer-3 switching or one 10/100 Mbit/s or 10/100/1000 Mbit/s adaptive Ethernet port

- Three UART interfaces
- Two smart card interfaces, supporting T0, T1, and T14 protocols
- One IR receiver processor and two input interfaces
- One LED and keypad control interface
- Three I²C interfaces
- 13 groups of GPIO interfaces

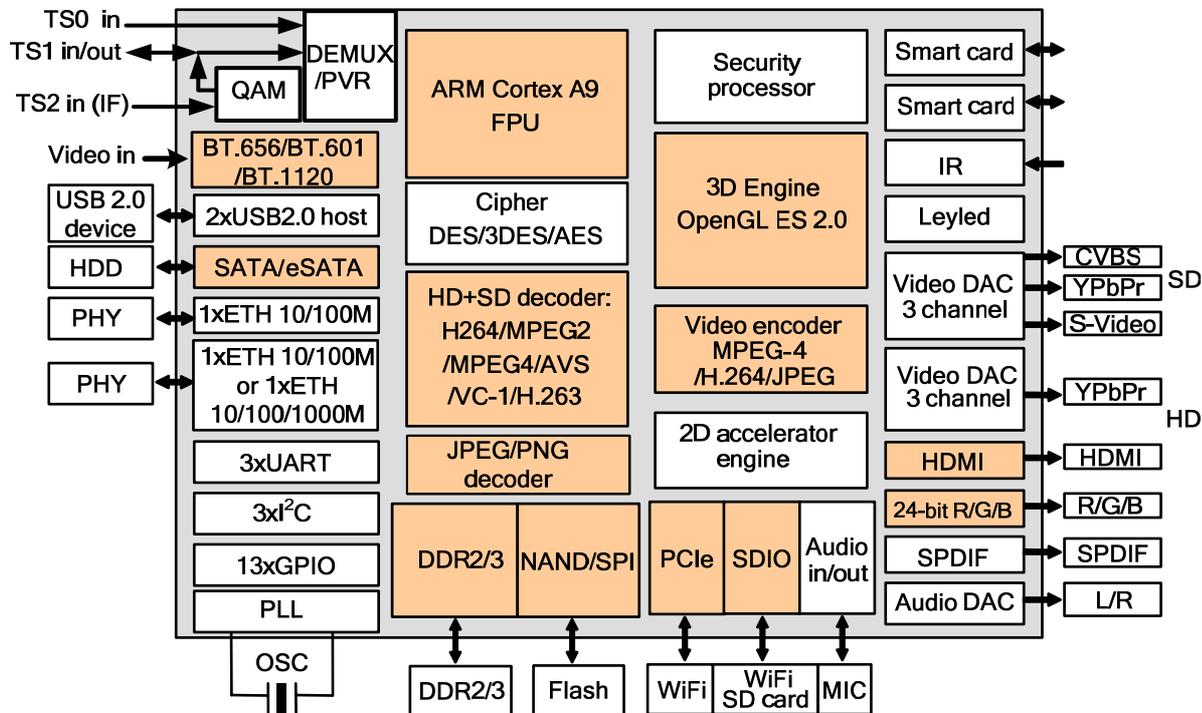
Others

- Fast startup
- Downloading and running of boot programs through the serial port
- Passive standby and low-power consumption
- Entire standby power less than 1 W
- Typical entire power less than 9 W in operating mode
- 756-pin PBGA package with 31 mm x 31 mm body size and 0.8 mm pitch



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Functional Block Diagram



With the advanced ARM Cortex A9 processor, the Hi3716C provides high-speed processing capability, which meets the requirements of future service development. As the Hi3716C has two built-in Ethernet interfaces, two USB ports, and one SATA/eSATA interface, the Hi3716C supports flexible connection schemes. The Hi3716C also supports high-definition video decoding in various formats (including MPEG2, H.264, AVS, VC-1) to meet multi-media playing requirements. In addition, the Hi3716C provides audio and video input interfaces to meet visual communication requirements and provides 3D acceleration engine and standard Open GL ES2.0 interface to bring you wonderful experience in 3D GUIs and 3D games.



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Solution Features

Open Architecture Meeting the Requirements of Future Service Development

- Open Linux OS
- Open Android OS
- Open source communities
- Open OpenGL ES standard and high-performance hardware 3D GPU, improving the user experience and speeding up the game and flash services

Communication

- 1-channel visual phone service
- 1-channel VoIP service

Bandwidth Service

- Integrates with two 10/100 Mbit/s adaptive Ethernet ports and supports layer-2 or layer-3 switching, VLAN, and DHCP, enabling the home STB and PC to be online at the same time
- Integrates with one 10/100/1000 Mbit/s adaptive Ethernet port, providing fast network connection speed
- Provides low-cost wireless connection schemes by connecting to the WiFi device over the PCIe interface

Full-Service PVR

- Connects to peripherals over USB ports for recording
- Connects to peripherals over the SATA/eSATA interface for recording
- Provides the FAT32 or NTFS file system compatible with the PC
- Supports the recording of scrambled and non-scrambled streams
- Supports timing recording and scheduled recording of EPG programs
- Plays and time-shifts the program at a frequency, while recording the program at another frequency

Advertisement

- Displays static pictures rapidly after startup
- Plays local videos and transparent streams obtained from Internet rapidly after startup
- Supports interactive advertisement services such as the

EPG advertisement during program channel switching

Game

- Console game and online game
- Game background music and sound effect
- High-performance floating-point coprocessor and 3D GPU engine to improve the game performance

Home Digital Entertainment

- Local album and Web album
- MP3 playing with lyrics
- Browse of picture in various formats, full-hardware JPEG or PNG decoding
- Special effects such as shutter, gradient, and scroll bar, and page flipping
- Playing of MJPEG clips recorded by the mobile phone, digital camera, or PMP
- Playing of media files in multiple formats

Environmental Protection

- Entire standby power less than 1 W
- Typical entire power less than 9 W in operating mode
- Auto-hibernation or standby when no operations in preset period
- Various wakeup modes

3D Television

- Playing of side-by-side 3D videos

Mosaic Preview

- Previews multiple pictures dynamically each time (local mosaic)
- Enables customers to learn about the programs in a short period to find favorite programs
- Supports advertisements in the mosaic window

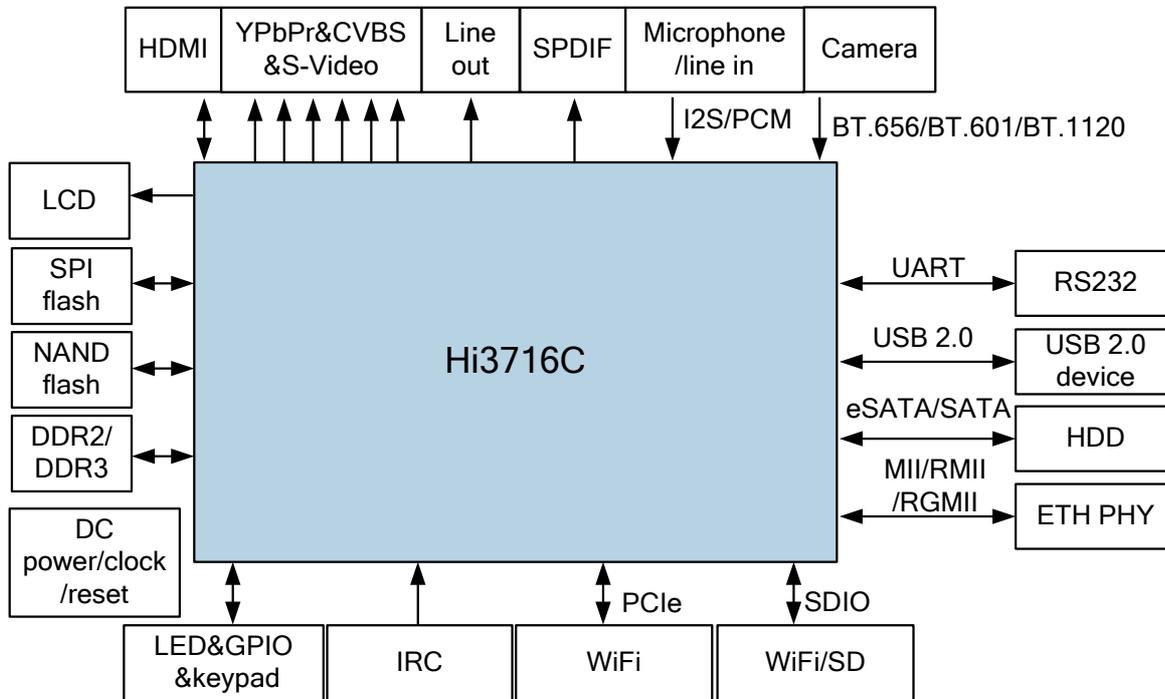
Intelligent volume control

- Automatic volume equalization between different program channels, implementing intelligent and human-centered operations



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Typical Application Block Diagram



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