



NXP Nexperia HD IP STB development kit STB225

Create affordable IP and hybrid DTV set-top boxes with highest HD picture quality

Supporting the latest high definition (HD) TV standards, the STB225 development kit gives you a simple route to creating unique IP, and hybrid DTV, set-top boxes (STBs) at a sensible price-point. A simple route to provide a sensory IP delivered HD experience to your customers.

Key features

- ▶ Nexperia multi-format HD source decoder PNX8935
 - powerful 320 MHz MIPS CPU for operating systems and applications
 - video decoding: MPEG4 AVC/H.264 high profile level 4, VC1 advanced profile level 3, MPEG-1 and -2 main/high profile, MPEG4-ASP level 5, DivX 3.11/4/5/6, DV and JPEG
 - video display: 1080i/720p capabilities
 - audio: DSP based, supports MPEG-1 layer 1&2, MPEG-4 AAC and AAC-HE, Dolby Digital AC-3, MP3 and WMA
 - 2D graphics acceleration
- ▶ Linux 2.6 OS with CELF Linux API support (DirectFB, ALSA, LinuxDVB)
- ▶ WinCE 6.0 with DirectShow, DirectDraw, DirectSound + DVB API
- ▶ Secure Boot, unique identifier, secure key storage
- ▶ Support for range of CA systems
- ▶ Hardware reference design
- ▶ Connectivity: USB2.0 OTG, SATA, Ethernet MAC

Key benefits

- ▶ Economical STB system delivering advanced IP and hybrid IP capability
- ▶ Efficient dual 16-bit memory architecture provides the bandwidth needed for HD, at a sensible system cost
- ▶ High integration delivers cost-effective yet feature-rich STB systems
- ▶ Supports latest HD TV formats including MPEG-4 AVC/H264 and VC-1
- ▶ Complete, easy-to-use hardware development platform with reference examples
- ▶ Familiar Linux or Windows CE 6.0 operating system with standard APIs lets you focus on high level applications
- ▶ Backed by NXP worldwide support teams for local and on-site support and training

A flexible, advanced platform targeting IP set-top boxes and hybrid DTV STBs, the Nexperia STB225 HD IP STB development kit introduces support for the latest high definition video standards, including MPEG-4AVC (H264) and VC-1. Its dual channel support allows you to easily create hybrid IP STB solutions, combining the IP channel with terrestrial, satellite or cable DVB reception.

With media access anywhere, any time in mind, the STB225 can fulfill several different vibrant media technology roles in the Connected Living environment. Connected to a hard disk, it becomes a PVR (Personal Video Recorder). It can form the basis for a home media centre, exchanging content with other devices in the home network such as client STBs, audio systems, PCs and even portable devices. Alternatively, the STB225 can be configured as a low cost client, connected to your remote media server.

The development kit comes complete with the latest NXP DVB-T silicon tuner technology for hybrid IP+DVB solutions, with options for DVB-C/S. The platform is also capable of supporting ATSC/ISDB broadcast standards, and you can easily tailor the hardware to your specific requirements.

Migrating existing applications or developing new programs is simple as the software architecture is based on mainstream operating systems and APIs. Manufacturers can choose from Linux or WinCE for fast system development. These are complemented by NXP's 3rd Party Software vendor network which can supply key software components. As well as maximizing compatibility, this also means you don't have to struggle with developing your own low-level drivers.

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The STB225 leverages the excellence of the latest NXP Nexperia PNX8935 multi format source decoder, which combines advanced video decoding with traditional STB features and integrates key connectivity protocols such as USB2.0, SATA and Ethernet. Enabling rapid product development, it comes complete with a hardware development platform, software infrastructure and reference examples. All details of the hardware platform including gerbers and schematics are provided, allowing re-use and easy customization for a particular product.

Nexperia PNX8935 – at the center of life like video and audio

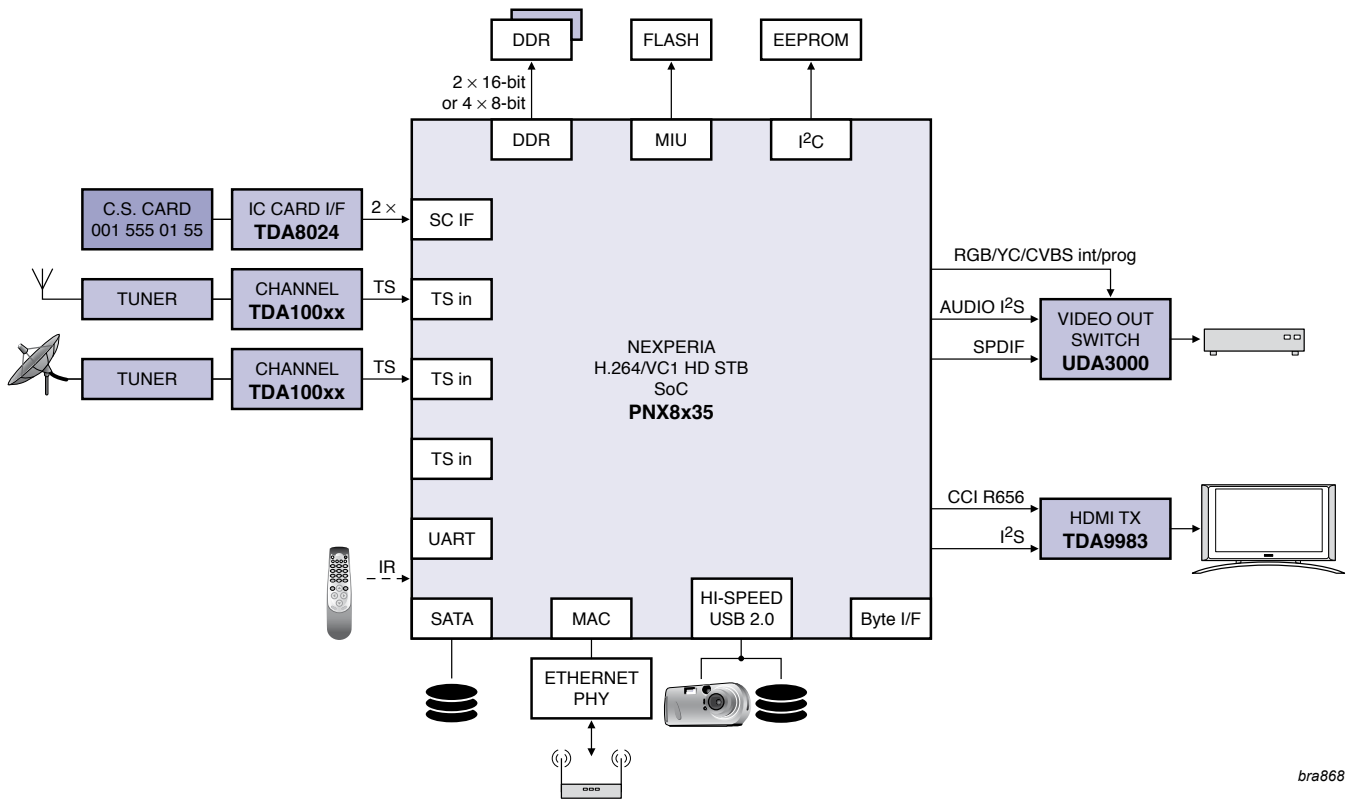
Delivering advanced HD AV processing, the highly integrated PNX8935 SoC combines MIPS32 application processor with dedicated audio processor and powerful multi-standard video decoder (MSVD). It can handle the latest HD video formats with ease, while maintaining a degree of flexibility for the future.

The efficient memory architecture provides the performance needed for HD, but at a sensible system cost.

The IC can decode a single HD stream at 1080i @ 60 Hz or two standard definition streams. Video output resolutions are 1080i/720p for HD and PAL/NTSC or progressive PAL/NTSC for SD. Simultaneous HD and SD video outputs are supported via dedicated integrated RGB/YUV and YC/CVBS DACs.

As SD MPEG-2 content will still be prevalent for some time, the PNX8935 incorporates dedicated picture improvement features, common to advanced standards such as H264, for the reduction of visible MPEG artifacts, such as blocking and ringing. This ensures the best picture performance when displaying SD content on an HD screen.

When not being used for its primary function of video decoding the MSVD can also be re-tasked for other applications, including Video Telephony.



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Secure content

The latest security and conditional access features are integrated into the PNX8935 to protect HD content. Secure boot, unique ID and secure key handling are implemented, along with decryption standards such as AES, DES, 3DES, DVB-CSA and Multi2. AES encryption is provided to help secure PVR applications, and other operator specific CA schemes are also available.

Connectivity and expansion

To make the experience even better the STB225 includes a wide range of connectivity options including Ethernet for IP based video services, PC connectivity or in-home networking. USB2.0 and SATA enable support for an external or internal HDD for PVR applications. The USB interface also enables portable media devices and other peripherals such as a VoIP phones and WiFi adapters to be easily connected.

HDMI is provided for connection to an HD display, while component video (RGB/YUV), S-video, and composite video outputs ensure compatibility with legacy displays. There are also two generic UART interfaces, an MIU bus to support NAND, NOR and SPI Flash devices, and a remote control interface for common protocols.

Up to three digital tuners can be connected – with any two active at the same time – for DVB/ATSC/ISDB reception, coupled with a dedicated smartcard interface with dual ports for various conditional access schemes.

Set-top box solutions

STB225 system solution

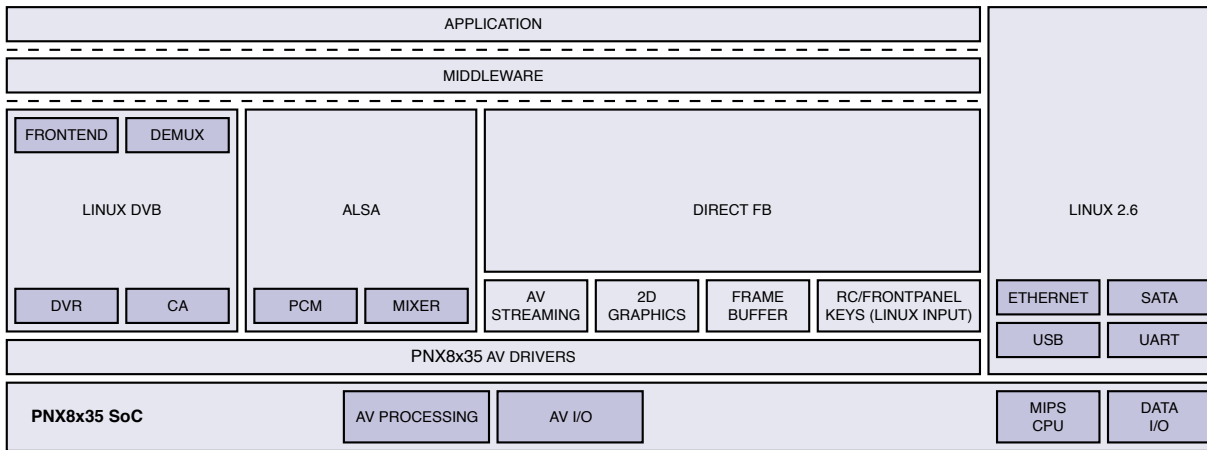
Software development

The STB225 comes complete with either Linux 2.6 kernel or WinCE 6.0 software environments.

For Linux based solutions, NXP uses the latest 2.6 kernel combined with open source development tools. In addition, standard Linux APIs such as LinuxDVB, DirectFB, and ALSA abstract on-chip hardware peripherals, simplifying porting of existing Linux applications and reducing the development time for new applications.

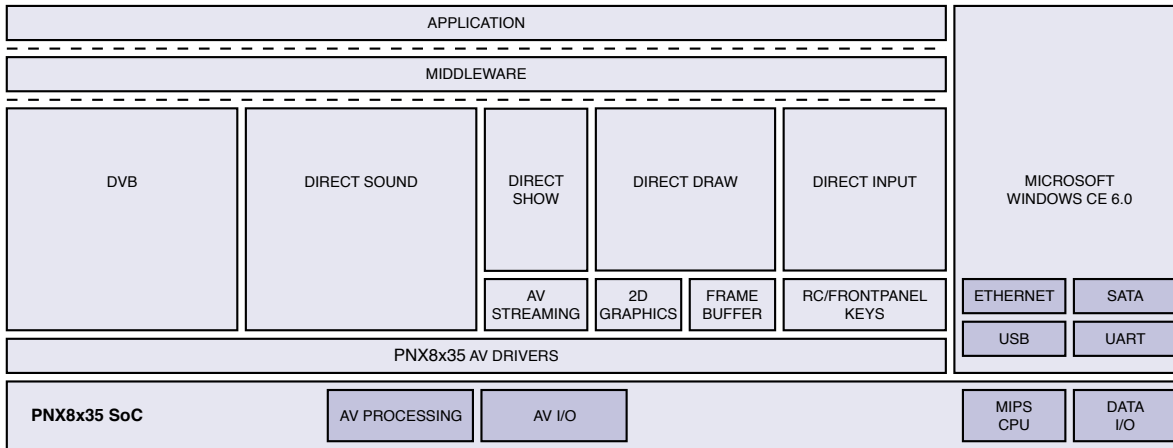
For WinCE based solutions, a complete WinCE 6.0 BSP and the standard WinCE development environment are available, with easy access to multimedia functions through DirectShow™.

In addition to Linux/WinCE environments, our network of third-party vendors offers a wide variety of software components including IP, DVB and ATSC middleware stacks, web browsers, VoIP and much more.



Software architecture: Linux

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Software architecture: WinCE 6.0

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MPEG-2 disclaimer

Use of this product in any manner that complies with the MPEG-2 Standard is expressly prohibited without a license under applicable patents in the MPEG-2 patent portfolio, which license is available from MPEG LA, L.L.C., 250 Steele Street, Suite 300, Denver, Colorado 80206.

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