



NXP Nexperia SD H264/ VC-1 STB development kit STB222

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

Supporting the latest advanced video standards, the STB222 development kit gives you a simple route to create unique IP, DTV, and hybrid set-top boxes (STBs) at a sensible price-point

Key features

- ▶ Nexperia multi-format Dual SD source decoder PNX8932
 - powerful 320 MHz MIPS CPU for operating systems and applications
 - video decoding: MPEG4 AVC / H.264 high profile level 3, VC1 main profile at medium level, advanced profile level 1, MPEG-1 and -2 main / high profile, MPEG4-ASP level 5, DivX 3.11/4/5/6, DV and JPEG
 - video display: 576i/480i & 576/480p 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
 - Pin-to-pin compatible with NXP PNX8935 HD multi-format source decoder
- ▶ Linux OS 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 video format support for IP, DTV and hybrid STBs
- ▶ Supports latest TV formats including MPEG-4 AVC / H264 and VC-1
- ▶ High integration delivers cost-effective yet feature-rich STB systems
- ▶ Efficient Unified memory architecture reduces chip count and simplifies PCB layout
- ▶ Single stream SD H264 implementation possible in 64MB RAM (application dependant)
- ▶ 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
- ▶ Easy upgrade path to HD enabled STB & economy of scale in hardware design and manufacture (PNX8932 SD source decode is pin to pin compatible with the PNX8935 HD source decoder)

A flexible, advanced platform targeting IP, DTV and hybrid set-top boxes, the Nexperia STB222 Dual SD STB Development Kit introduces support for the latest advanced 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. The efficient dual 16-bit memory architecture enables required performance to be balanced with the overall system cost, enabling price sensitive markets to be addressed.

With media access anywhere, any time in mind, the STB222 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 STB222 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, with options for DVB-C/S. This enables the complete spectrum of IP, DTV and hybrid STB to be supported.

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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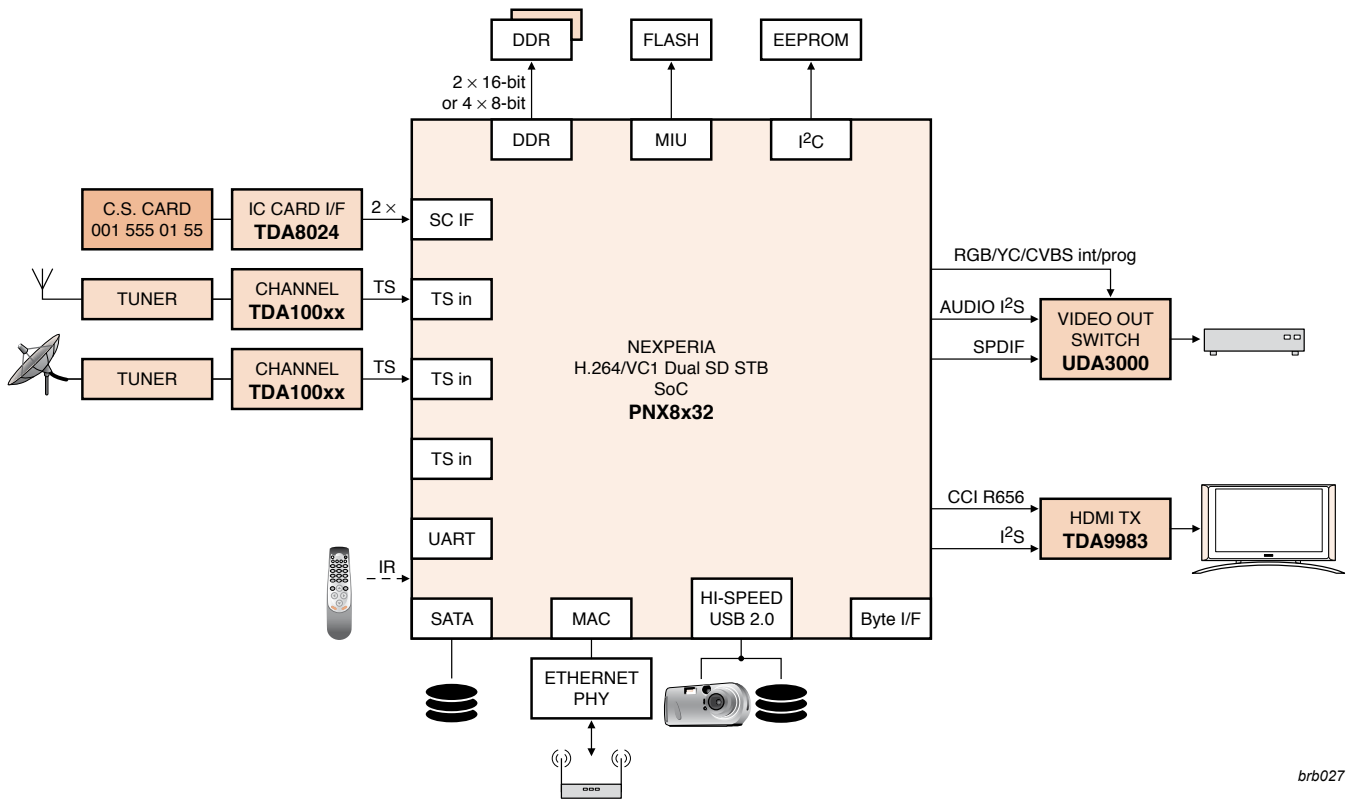
The STB222 leverages the excellence of the latest NXP Nexperia PNx8932 Multi Format Source decoder, which combines advanced video decoding with traditional STB features and integrates key connectivity protocols such as USB2.0, SATA and Ethernet. Enabling rapid product development, it comes complete with 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. As the PNx8932 is pin to pin compatible with the PNx8935 HD source decoder the gerbers and schematics can also be used as a reference for an HD STB design, providing economy of scale in hardware design and manufacture.

Nexperia PNx8932 – at the center of life like video and audio

Delivering advanced AV processing, the highly integrated PNx8932 SoC combines MIPS32 application processor with dedicated audio processor and powerful multi-standard video decoder (MSVD). It can handle the latest advanced video formats with ease, while maintaining a degree of flexibility for the future.

The IC can decode two simultaneous standard definition streams, with video output of PAL/NTSC or progressive PAL/NTSC. Dual SD video outputs are supported via dedicated integrated RGB/YUV and YC/CVBS DACs. A digital interface is also available for optional HDMI.

As SD MPEG-2 content will still be prevalent for some time, the PNx8932 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.



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Secure content

The latest security and conditional access features are integrated into the PNX8932 to protect valuable 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 STB222 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 an option 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, coupled with a dedicated smartcard interface with dual ports for various conditional access schemes.

Set-top box solutions

STB222 system solution

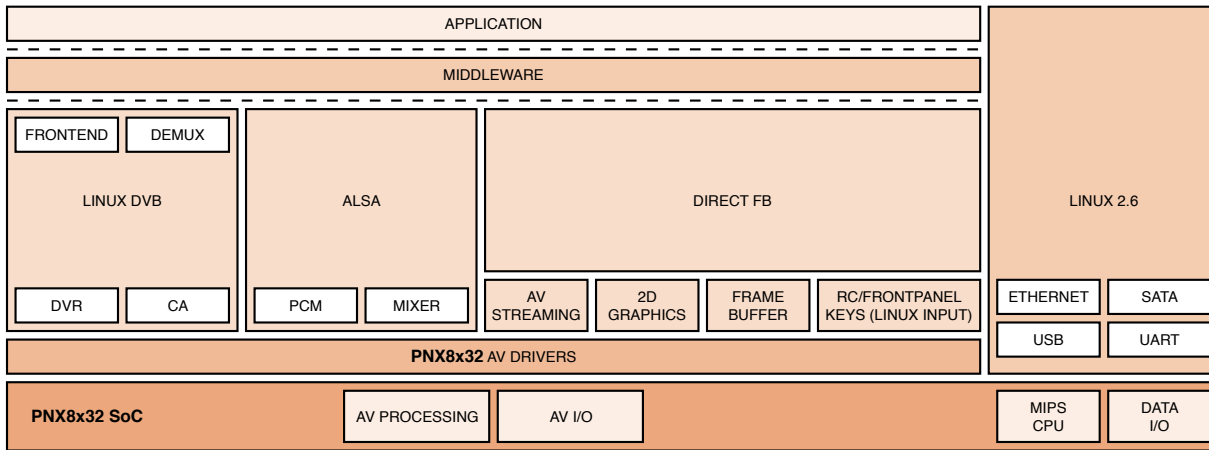
Software development

The STB222 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.

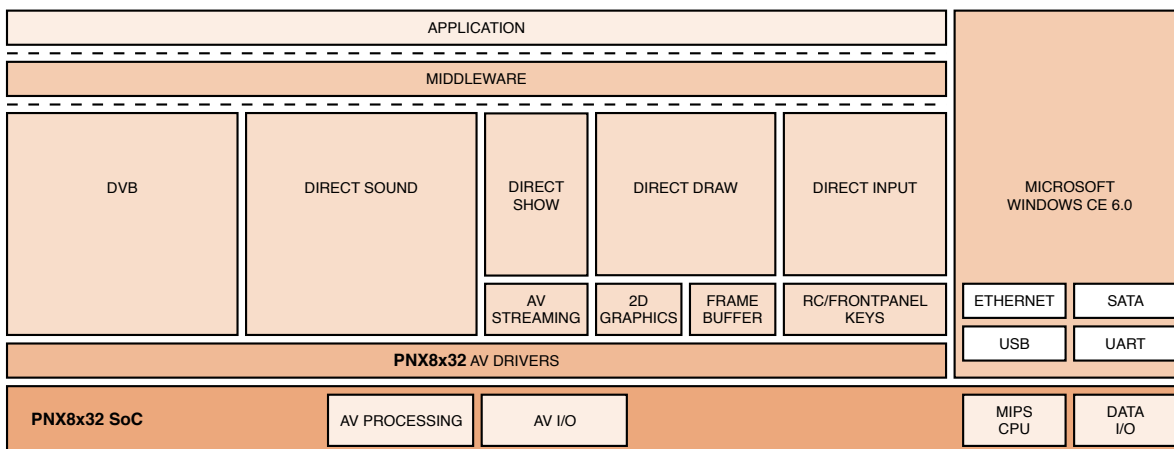
The software environments (Linux/WinCE) offered on the STB222 dual SD platform are consistent with those supported with the STB225 HD platform, allowing for easy migration of applications and economy of scale when developing for both platforms.



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Software architecture: Linux

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™.



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Software architecture: WinCE 6.0

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

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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