Nexperia STB810 System Solution

Development platform for IP set-top box products

Combining the advanced PNX8550 home entertainment engine, the Linux OS, and the latest AV codecs (H.264, WM9), the flexible Nexperia™ STB810 System Solution enables rapid system development of broadcast and IP STBs with advanced features such as video telephony, picture enhancement, and more.

Semiconductors

The Nexperia STB810 is the first in a series of flexible, advanced system solutions targeting IP and dual functionality (IP and broadcast) set top boxes (STBs). It leverages the power and flexibility of the PNX8550 home entertainment engine and the latest AV codecs to support advanced features such as video telephony, picture improvements, time-shift recording, DVD playback, storage, personal video recording, network connectivity, even voice over IP. Support for high-quality H.264 and WM9 video formats enables features such as streaming of pay-per-view movies over ADSL. As delivered, the STB810 includes a hardware development platform, software infrastructure, key codecs, and reference examples.

The STB810 hosts the familiar Linux operating system and Linux-based software environment for rapid system development. It also supports digital broadcast TV features including reception of two SD or one HD transport streams (DVB and ATSC), related multimedia, connectivity, and interactivity features, and extensive video enhancements of both analog or digital signals. It handles all digital audio processing on chip and supports next generation displays such as LCD, PDP, and LCoS. From this single platform, manufacturers can differentiate a variety of end products while minimizing development cost and lowering the risk of new-feature adoption.

Key features

- H.264 Main Profile Level 3 SD PAL/NTSC resolution decoding with CABAC (up to 2 Mbps) or CAVLC (up to 2.5 Mbps)
- WM9 SD decode capable
- Dedicated hardware for demux and decode of 2 SD MPEG-2 or 1 HD streams; SD decode up to 6x
- High-quality image scaling and de-interlacing of all image resolutions
- Extensive picture enhancements include integrated video temporal noise reduction, video measurement, histogram correction, and more
- Linux operating system from market leader MontaVista
- Supports popular middleware such as IP, DVB, ATSC
- Supports conditional access: DVB, Multi2, DES/3DES, AES
- Smart card interface

Nexperia PNX8550

The highly integrated PNX8550 media processing engine integrates a MIPS32 application processor with two powerful DSPs for advanced AV processing and dedicated hardware for functions such as MPEG-2 decoding, MPEG-2 transport stream processing, conditional access (DVB, DES, Multi2, AES), video scaling, and graphics. Its sophisticated de-interlacing and picture improvement features can drive high-quality HD displays.
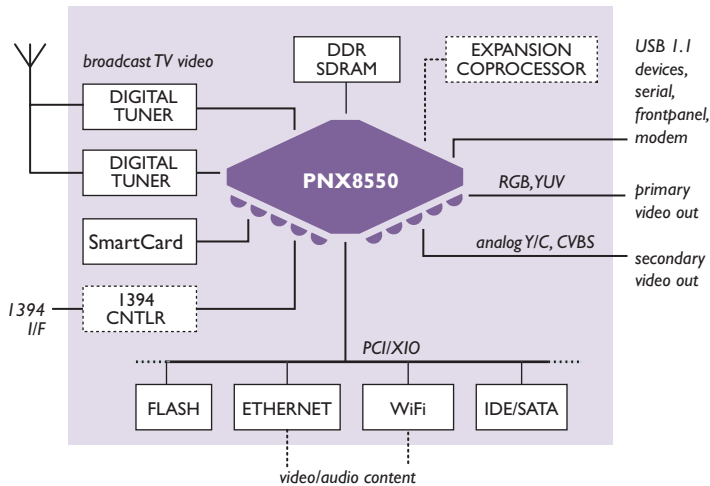
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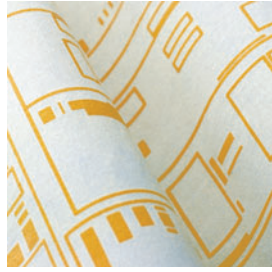
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Audio/Video codecs

The STB810 includes the advanced codecs needed for key video telephony, PVR, and broadcast TV features. Main Profile H.264 decode supports D1 PAL/NTSC resolutions with advanced features such as CABAC at bitrates up to two Mbps. WM9 is available for SD resolutions. Other codecs include MPEG-2 decode, DivX, Dolby AC-3®, MP3, and MPEG layer I/II audio. A wide range of features can be supported through advanced AV codecs available from Philips and third-party companies including MPEG-4 en/decode, DTS, AAC4, CELPH4, H.263 decode or encode, MPEG-2 encode, H.264 encode.

Connectivity and expansion

The STB810 offers a range of connectivity options. Two USB 1.1 ports enable connection to a wide range of peripheral devices. An HDMI interface connects to TVs and TV monitors. General purpose UARTs are available for serial communications together with a dedicated UART for SmartCard interface. A fully compliant PCI bus interfaces to Ethernet, WiFi™ controllers, and other expansion devices such as IDE/SATA controllers, USB 2.0 devices, etc. An XIO bus interfaces with Flash memories and other generic 8-bit devices.

Linux-based software development

The PNX8550 runs the Linux 2.6 kernel on a dedicated MIPS32 core. Development tools and support are available from kernel supplier MontaVista. The STB810 employs an easy to use Linux-based software architecture. Standard Linux APIs simplify porting of existing Linux applications, significantly reducing development time. These APIs abstract on-chip hardware peripherals and 'soft' DSP functionality, making the platform familiar and freeing the Linux application developer to focus on applications instead of complex DSP programming. Binary codec modules (e.g. H.264, WM9, etc.) can be loaded, configured, and connected with a few lines of code to achieve overall system functionality.

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