# PNX8490/PNX8491 Multi-Format HD SoC for Satellite STBs

## Complete STB System for Pay-TV Satellite Digital Broadcast Networks

**In February 2010, Trident Microsystems acquired the set-top box and television product lines from NXP Semiconductor's home business unit. This product is now a part of Trident's product offering for the set-top box market.**

This highly integrated SoC brings power efficiency, media-rich navigation, and online networked video content to low-cost satellite operator HD STBs

### Key Features

- Complete HD STB operation in a single SoC
- Advanced power management
- Powerful superscalar applications processor
- POWERVR 3D GPU from Imagination Technologies (PNX8491 only)
- Flexible decoding of content format
- High-performance algorithms for picture enhancement

The Trident PNX8490/PNX8491 combines a unique array of world-class, high-performance technologies for mainstream high-definition (HD) set-top box (STB) applications in worldwide satellite broadcast networks.

It offers a complete broadcast receiver decoder chain, featuring a DVB-S2 demodulator, a QPSK demodulator, a multi-stream transport processor, and multi-format, multi-channel A/V decoder engines.

An innovative power management system is supervised by an integrated microcontroller. It enables complete power control for all parts of the system and provides the flexibility to implement use case-based power optimizations as well as ultra low-power standby operation. The system ensures compliance with worldwide regulations for energy efficiency and enhances system reliability.

An ARM Cortex-A9 superscalar 1250 DMIPS CPU delivers advanced performance with low power to execute heavyweight applications and middleware stacks on home-networked STBs.

In the PNX8491, an SGX531 core from Imagination Technologies implements a complete, fully programmable, OpenGL ES2.0-compliant 3D GPU to render next-generation UIs, games, and a wide range of other 3D content.

The DSP core implements a wide variety of Internet content codecs used for online video sources. The codecs complement a robust 1080i 50/60 or 1080p 24/25/30 multi-format decoder hardware engine designed for operator video services.

A rich set of image enhancement tools, along with an advanced 1080p60 video post-processing display pipeline, enables high-quality, artifact-free picture output.

For a complete system hardware design, the only additional components required are Trident's tuner, modem DAA line-side device and card reader interface ICs, along with DRAM and flash memory ICs. This high level of integration enables a very low system bill of materials.

A fully engineered STB reference hardware system and software development kit is provided for product evaluation and system integration. The STB development platform hardware is designed with a flexible architecture to support a variety of regional STB configurations.

Trident's software development environment provides a complete set of STB low-level drivers, a Linux 2.6.28 kernel, a configurable board-support package, and a build environment. The STB low-level drivers are mature and hardened by leveraging core driver libraries developed over multiple generations of production STB SoCs. The software development kit includes tools for flash image management and low-cost debug. Several third-party middleware products are supported.

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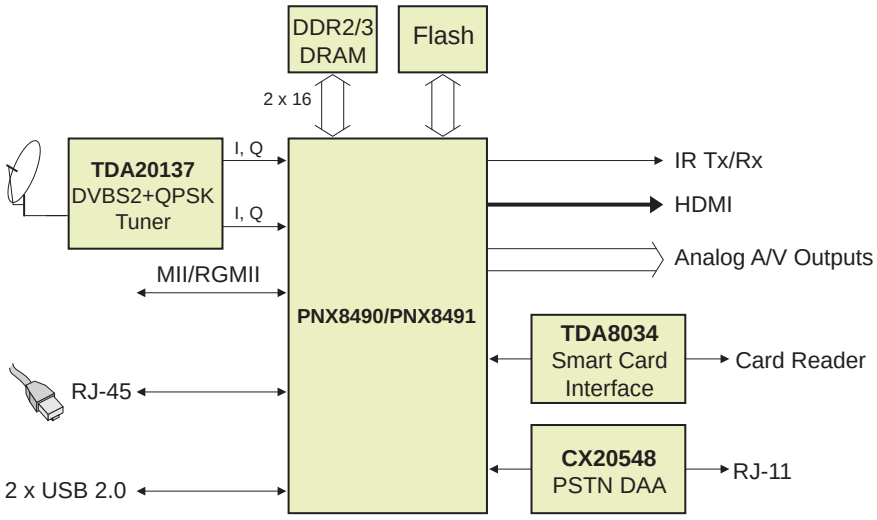
## PNX8490/PNX8491 STB System Diagram




## Technical Specifications

- Multi-format 1080i 50/60 or 1080p 24/25/30 HD video decoder supporting H.264, MPEG-2, VC-1, MPEG-4 ASP and AVS
- Simultaneous 1080i 50/60 and 480/576i program decoding
- Flexible VLIW DSP-based video decoder for Internet TV content formats, e.g. On2, RealVideo, and Sorenson
- Multi-format, multi-channel audio decoder supporting MPEG-1 Layers I/II, MP3, Dolby Digital, Dolby Digital Plus, AAC/aacPlus, WMA/WMA Pro, transcoding, and multi-channel volume control
- A multi-format DVB/DIRECTV®/ATSC-compliant transport processing unit connects to five external baseband transport I/O ports
- Integrated single DVB-S2/Turbo 8PSK and single DVB-S demodulators
- A 1250 DMIPS ARM Cortex-A9 superscalar CPU configured with 32 KB I/D L1 caches, 128 KB L2 cache and FPU
- OpenGL ES 2.0-compliant SGX531 POWERVR 3D GPU (PNX8491 only) and high-performance 2D graphics engine
- Advanced power management system with embedded Cortex-M3 microcontroller
- Advanced 1080p60 10-bit video processing pipeline and display engine with advanced picture-enhancement controls
- Advanced security architecture based on a dedicated secure processor manages secure boot software authentication and secure key management/distribution
- Dual DDR2/3 high-performance memory controllers
- HDMI v1.3 transmitter with HDCP 1.3 content protection
- Analog HD YPbPr and NTSC CVBS/S-video or RGB outputs with Macrovision 7.1 or Dwight Cavendish 6.1 analog copy protection
- Channel 3/4 RF modulated AV output with BTSC encoded stereo
- Integrated audio stereo DACs

Note regarding Macrovision: The Macrovision-enabled version of this device may only be sold or distributed to authorized Macrovision buyers. If you have a Macrovision-enabled device, it is protected by U.S. patent numbers 5,583,936; 6,516,132; 6,836,549; and 7,050,698 (for Encoder Devices) and 6,600,873 (for Detection Devices) and other intellectual property rights. The use of Macrovision's copy protection technology in the device must be authorized by Macrovision and is intended for home and other limited pay-per-view uses only, unless otherwise authorized in writing by Macrovision. Reverse engineering or disassembly is prohibited.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