PNX5220

Nexperia™ cellular multimedia baseband for GSM/GPRS/EDGE/UMTS handsets

Highly-efficient ARM9 architecture brings multimedia to the mainstream by delivering superior voice, audio, video, connectivity and security options while minimizing power consumption.

Key features

- Highly efficient architecture for unprecedented multimedia performance
  - ARM9 processor running at 208 MHz
  - Dual 16-bit DSP controllers for maximum audio/modem flexibility
  - EGPRS Class 12 modem with DTM class 5/9/11, SAIC
- Unique algorithms for voice and audio
  - Exceptional voice clarity with handset, headset, and handsfree
  - Latest music support: MP3, AAC+, MIDI 64 voices, 3D effects
- Low-power video, graphics, and camera features
  - Longer video playtimes, higher-quality recording, UMTS videotelephony
  - Color display support optimized for QVGA with 262k colors
  - Interface for multi-megapixel camera with smooth zoom, low-power preview
- Comprehensive connectivity interfaces
  - USB OTG, Fast IrDA, SDIO, Bluetooth, WLAN, memory cards
- Built-in security functions for DRM (OMA) and GSMA
- Space-saving 336-pin LFBGA package (12 x 12 mm)
- Flexible development tools for rapid design-in

The Nexperia PNX5220 cellular multimedia baseband delivers highly efficient performance in feature-rich mobile handsets and smartphones. Built around an advanced ARM9 processor and two 16-bit DSP controllers, it provides superior voice quality and industry-leading standby times while enabling the latest features in music, video, connectivity and security. It supports quad-band (850, 900, 1800, 1900 MHz) operation for GSM/GPRS/EDGE and dual-band operation for UMTS, and is the basis of next-generation Philips Nexperia Cellular System Solutions.

Highly efficient architecture

The ARM926-EJ processor, manufactured in a power-efficient 90-nm CMOS process technology, runs at 208 MHz and is supported by 32 kB of instruction cache and 32 kB of data cache. For maximum flexibility, the ARM9 processor is complemented by two 16-bit DSP cores that can be programmed to keep pace with evolving algorithms and new codecs. The on-chip modem delivers EGPRS Class 12 performance, with DTM class 5/9/11 and SAIC.

The baseband's memory architecture uses multiple parallel buses to support the latest technologies, including NAND Flash, SDRAM, cellular RAM, and burst-mode/page-mode memory. To optimize the interaction with on- and off-chip memories, the ARM9 processor uses a multi-layer AHB bus structure to separate slow external peripherals from fast external memories. Independent processing units serve as bus masters to let functional units form a balanced network. Built-in Java acceleration improves performance in multimedia environments.

Unique algorithms for voice/audio

The PNX5220 has integrated analog stereo codecs for high-quality voice and audio and takes advantage of the unique Philips portfolio of sound enrichment algorithms to provide superior sound quality. Voice calls are exceptionally clear in all environments, whether using the handset, a headset, or handsfree options. Comprehensive speech functionality includes W-AMR, AMR, EFR, FR, HR, handsfree, noise reduction, and wide-band synthesis.

PHILIPS

For audio applications, auxiliary stereo audio input and output channels support optional music sources and sinks. The audio algorithms go beyond the standard play and record functions to offer high-quality music performance.
In fact, the PNX5220 has everything necessary to convert the phone to an MP3 player, enabling music downloads from the cellular network. In addition to MP3, the PNX5220 also supports AAC+, MIDI 64 voices, and 3D effects.

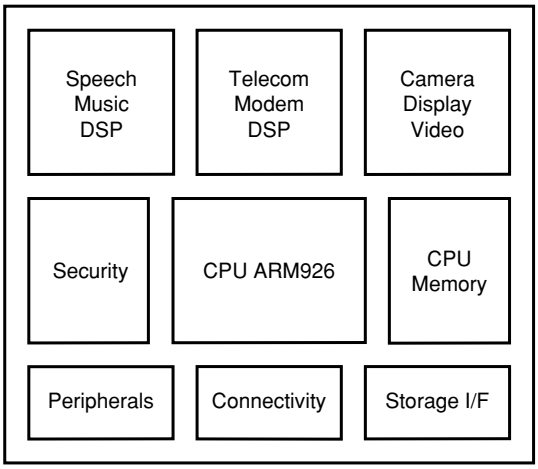
Low-power video, graphics, and camera features

The PNX5220 leverages Philips' extensive experience in video processing to incorporate a low-power video engine that plays videos longer than current solutions and can record video clips at a new level of quality. In UMTS applications, the PNX5220 can even enable video downloads from the cellular network. Low-power H.263 encoding and decoding performs at up to CIF 30 fps and there is support for H.264 decoding in DVB-H applications. The display interface is optimized for QVGA with 262k colors and supports text, image, and video with graphics overlay.

For still pictures, the PNX5220 integrates a multi-megapixel camera interface with "smooth zooming" support and low-power preview. Multimedia functions are easy to access with a keyboard controller that supports up to 36 keys and offers a jog-dial function.

Comprehensive connectivity

Several connectivity interfaces make it easy for the PNX5220 to share information with peripherals and other handhelds. For fast and simple cable connections, there is a USB OTG interface. For wireless applications, there are interfaces for Fast IrDA, Bluetooth, WLAN, and NFC. For removable storage applications, memory-card support includes 4-bit SD, MemoryStick, and MultiMedia Card. General-purpose interfaces include I^2C, I^2S, SPI, and more.



PNX5220 block diagram

Built-in security features

To protect valuable content and ensure safe transactions, the PNX5220 offers a comprehensive set of built-in security features, including secure storage and high-speed crypto to implement DRM- and GSMA-compliant security.

Nexperia Mobile Developer's Kit

For the fastest possible system and application development, the PNX5220 is supported by a suite of flexible development tools that cover host integration, target integration, debug, field test tracing, and production/customization.

Philips Semiconductors
Philips Semiconductors is one of the world's top semiconductor suppliers, with 20 manufacturing and assembly sites and a sales organization that delivers in 60 countries.
For a complete up-to-date list of our sales offices please visit our website http://www.semiconductors.philips.com/sales

date of release: september 2005
document order number: 9397 750 14576
Printed in the Netherlands