

Marvell® PXA300 Processor Series

Scalable Performance up to 624 MHz for Cost-Effective and Power-Efficient Smartphones, Embedded Solutions, and Handheld Devices



▶ PRODUCT OVERVIEW

The PXA300 processor, with scalable performance to 624 MHz and video performance capabilities, enables the development of cost-efficient smartphones, industrial embedded solutions, and handheld devices such as GPS. Built on a low-power 90 nm process technology, and with the ability to dynamically scale voltage and frequency on demand, the PXA300 supports today's stringent requirements for longer battery life.

▶ KEY FEATURES AND PLATFORM BENEFITS

The PXA300 processor and its derivatives, with options for stacked NAND flash and mobile DDR memory, integrate the following features:

- Scalable, general-purpose processing up to 624 MHz with a 16-bit DDR memory interface for a richer end-user experience, such as browsing Web content or streaming video.
- Wireless Intel® SpeedStep® technology with Instruction Power Manager software for MIPS/mW power efficiency, delivering long battery life and enabling consumers to spend more time enjoying the rich features their devices and service providers offer.
- Intel Wireless MMX™ 2 accelerating technology, a 2D graphics accelerator and a 256 KB frame buffer designed to support video codecs, enhances the user's experience of popular usage models like video playback, video conferencing, video telephony, and digital TV.
- An enhanced set of peripherals eases connectivity to technologies like Wi-Fi, WiBro, WiMAX, and Bluetooth v2.0, and Intel's Enhanced Quick Capture technology supports camera sensors up to 2 megapixels (MP) for a richer camera application.

▶ OEM AND CARRIER BENEFITS

Manufacturers benefit from devices featuring the PXA300 processor by being able to showcase cost-efficient smartphones and PDAs, personal multimedia players, embedded industrial handhelds, and other portable devices with cutting-edge features. A comprehensive support package enables OEMs to take advantage of available leading operating system images, optimized multimedia codecs and middleware, tools, and applications supported by a rich hardware and software ecosystem, accelerating time to market (TTM) and return on investment (ROI).

Network operators benefit from the new capabilities in the PXA300 processor. With up to 624 MHz of processing power, the user will be able to enjoy the benefits of complex and concurrent usage models that increase average revenue per user (ARPU). For example:

- With long battery life and powerful video processing, consumers can enjoy advanced features of 3G and HSDPA networks—such as streaming H.264 QVGA video—for extended periods.
- The available performance in the PXA300 allows a customer to simultaneously listen to an MP3 file, play a video game, and have a voice conversation.

▶ CODE COMPATIBILITY AND ECOSYSTEM SUPPORT

The PXA3xx processor family is the third generation of applications processors based on Intel's XScale® technology. To preserve existing investments in applications software, the PXA300 processor maintains backwards code compatibility with previous Intel XScale processors, as well as processors within the PXA3xx family. To further reduce TTM, Marvell provides tuned and validated Windows Mobile, Windows CE, and Linux board-support packages, codecs and multimedia frameworks, and OpenGL-ES 1.1 libraries, as well as optimized compilers, debuggers, and profilers.

The vast ecosystem of software and hardware vendors for Intel XScale processors extends with the Marvell PXA3xx processor family to provide rich and differentiated platforms. Over 150 applications and codecs are optimized for the Intel XScale technology family of products, and more than 30 leading hardware vendors support Intel XScale technology based processors with development environments and devices. Combine these offerings with high-quality documentation and support, and OEMs/ODMs have a path to cost-effective handsets and handheld devices to increase ROI.

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▶ KEY APPLICATIONS

Targeted devices include:

- Low-cost smartphones with video and audio playback and image capture.
- Industrial embedded solutions and GPS.

▶ INTEL PXA300 PROCESSOR KEY FEATURES

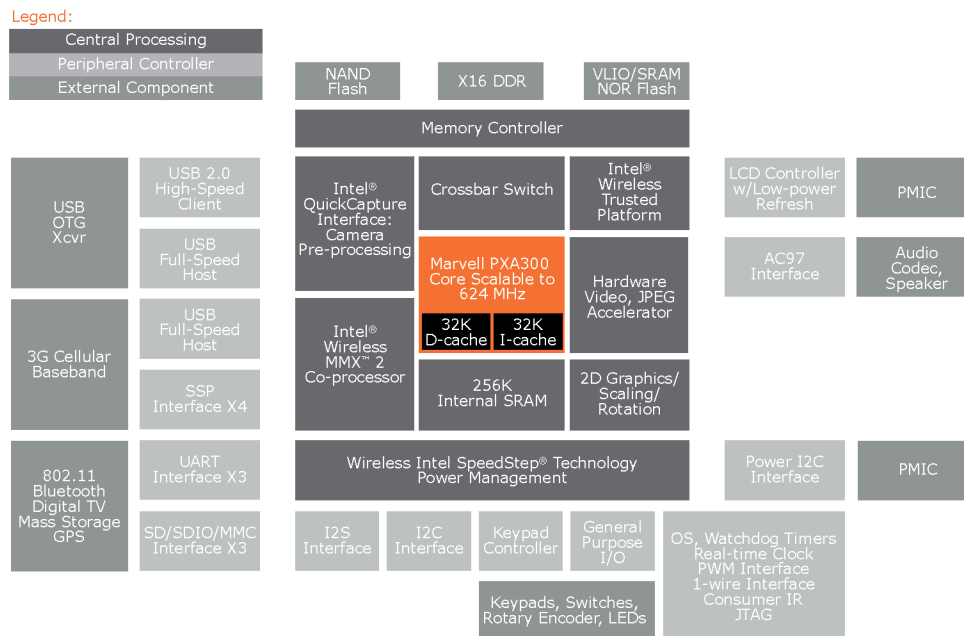
FEATURES	BENEFITS
<ul style="list-style-type: none">• Scalable core up to 624 MHz, 16-bit DDR interface• Wireless Intel SpeedStep Technology with Power Manager Software	<ul style="list-style-type: none">• Up to 624 MHz core clock provides burst-processing when needed, such as for processing of video streams and Web browsing.• Helps extend battery life in usage scenarios, such as phone standby, video and music playback, and general-purpose applications processing. Includes hardware and software processing to dynamically change the voltage and frequency of the processor depending on the workload.
<ul style="list-style-type: none">• 90 nm low-power process• 256 KB frame buffer	<ul style="list-style-type: none">• Low-power customized process allows for lower voltages and enables low-cost solutions for the mobile market.• Supports QVGA-quality graphics for applications such as streaming H.264 compressed video, video playback from network services, video conferencing, and in-home entertainment systems.
<ul style="list-style-type: none">• Multimedia acceleration with Intel Wireless MMX 2 technology• Code compatibility	<ul style="list-style-type: none">• Support for audio, video, and other multimedia processing via a co-processor based on Intel Wireless MMX 2 technology.• Improves TTM by allowing manufacturers to reuse applications written for Intel XScale technology or ARM-compliant processors, and lowers development costs by reducing the number of resources required for a derivative product. Allows high degree of hardware and software reuse, migrating from the PXA270 processor and other processors in the PXA3xx processor family.
<ul style="list-style-type: none">• Versatile interfaces• Stacked memory	<ul style="list-style-type: none">• Integrated interfaces, including NAND memory controller, USB2.0 high-speed client, and Enhanced Quick Capture technology, enable the implementation of complex usage scenarios at a competitive cost. Enables easy connectivity to 3G wireless baseband modules, DVB-H, Wi-Fi, WiMAX, Bluetooth v2.0, and other peripherals. Supports a wide variety of camera sensors up to 2 MP resolution.• Stacked NAND and DDR memory reduces board real-estate sizes for sleek, thin form-factor designs.

▶ POWER-EFFICIENT SCALABLE PERFORMANCE TO 624 MHz

The PXA300 processor provides millions of instructions per second (MIPS) on demand to 624 MHz, speeding Web-page browsing, video encode and decode applications, file compression, and PIM/office applications, among others. The Intel XScale microarchitecture, combined with support for 16-bit DDR memory up to 260 MHz, provides headroom to support multimedia evolution, application multitasking, and complex use cases. But advanced performance does not come at the cost of battery life. Fine-grained power modes integrated into the processor design, an Instruction Power Manager (IPM) for dynamic voltage and frequency scaling, and an advanced 90 nm process enable power-efficient performance, resulting in long battery life.

▶ FOUNDATION FOR A COST-EFFECTIVE, HIGH-PERFORMANCE PLATFORM

The PXA300 processor integrates technologies into compact, powerful devices for network operators, enterprises, and consumers. A new low-latency, fully connected internal memory switch eliminates memory bottlenecks, while separate interfaces for 16-bit DDR memory and Flash memory (NANDX8, NANDX16, and NOR) provide performance for cost-sensitive phone features and platform flexibility. More and faster peripheral interfaces, including high-speed serial interfaces, enable Wi-Fi, WiBro, and WiMAX connectivity, and address the needs of multiple market segments.



PXA300 Processor Block Diagram

▶ ENHANCED VIDEO AND AUDIO PERFORMANCE

The PXA300 processor enables next-generation cell phones and smartphones, GPS devices, and industrial handhelds, with support for QVGA-quality video, streaming video playback at 30 fps, 2 MP camera capture, and DVB-H. With a new memory architecture and support for faster DDR memory, the PXA300 processor delivers fast video performance at a low cost. And multimedia processing can take advantage of the SIMD instruction set in Intel Wireless MMX 2 technology, which includes new instructions for speech and video algorithms.

▶ ABOUT THE PXA3xx PROCESSOR FAMILY

The PXA3xx applications processor family enables new services and capabilities across multiple device segments of the communications and computing world. PXA3xx processors make possible a new category of converged devices that are small, sleek, highly energy efficient, and that feature standards-based communications capabilities.

PXA3xx processor family performance enables a wide variety of features and usage models. From a low-cost, 200 MHz smartphone to higher end, multimedia-rich feature phones, the versatile PXA3xx processor-based platform complements a broad range of the most popular consumer electronics devices and embedded applications.

The latest advancements in trusted computing set the PXA3xx processors apart from previous-generation technologies. The platform combines both hardware and software elements, provides robust security for consumers, and allows designers to migrate applications to this new-generation processor family with ease. With a wide range of performance, power, and integration levels, the PXA3xx processors meet the needs of current and future wireless devices.

▶ THE MARVELL ADVANTAGE

Marvell products come with complete reference designs which include board layout designs, software, manufacturing diagnostic tools, documentation, and other items to assist customers with product evaluation and production. Marvell's worldwide field application engineers collaborate closely with end customers to develop and deliver new leading-edge products for quick time-to-market. Marvell utilizes world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low-cost total solutions.

▶ ABOUT MARVELL

Marvell is the leader in storage, communications and consumer silicon solutions. Marvell's diverse product portfolio includes switching, transceiver, communications controller, processors, wireless, power management and storage solutions that power the entire communications infrastructure, including enterprise, metro, home, and storage networking. Today's cell phone and handheld users demand the latest and greatest in mobile functionality. From full-color displays and voice recognition to video streaming and Bluetooth capabilities, Marvell cellular and applications processors deliver full-featured, media-rich experiences to the palm of your hand. Based on the Intel® XScale micro-architecture, Marvell's cellular and applications processors feature advanced integration, multimedia acceleration, and superior power savings that propel the evolution of mobile devices. For more information, visit our website at www.marvell.com.



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