Marvell® PXA27x Processor Family

PRODUCT OVERVIEW

Mobile and wireless devices simplify our lives, keep us entertained, increase productivity, and maximize our responsiveness. Enterprise customers and consumers alike realize this potential and are integrating these products at a rapid rate into their everyday lives. The need to communicate and compute wirelessly—to have access to all types of rich information anytime, anywhere—is the expectation of today's mobile lifestyle.

Marvell® solutions are designed to provide the key technologies to help drive wireless handheld device functionality to new heights. Advanced features help deliver high-performance, flexibility, and robust functionality—all in the small-size, low-power framework of handheld, battery-powered devices.

BUILDING TOMORROW'S HANDHELD TODAY

Designed from the ground up for wireless clients and incorporating the latest advances in mobile technology, the Marvell PXA27x processor family redefines what a wireless handheld can do by incorporating innovative new features while borrowing and enhancing others from the world of the PC. The PXA27x processors feature Intel® XScale technology and Intel Wireless MMX™ technology to enable high-performance multimedia acceleration with an industry-proven instruction set. Intel Quick Capture technology provides one of the industry's most flexible and powerful camera interfaces for capturing digital images and video. And while performance abounds in the PXA27x, power consumption is also a critical component. Wireless Intel SpeedStep® technology provides a quantum leap forward in low-power operation. Finally, the PXA27x processors stack Flash memory and low-power SDRAM with the processor for more functionality in a smaller footprint.

ADVANCED MULTIMEDIA CAPABILITY

Through an advanced set of multimedia instructions, and without the use of additional processors or accelerators that can reduce battery life, the Marvell PXA27x processor brings desktop-like multimedia performance to handheld clients while minimizing the power needed to run media-rich applications. Intel Wireless MMX technology builds on previous technology, enabling the large number of software developers already familiar with these instructions to quickly make their applications —such as 2D and 3D gaming, streaming MPEG-4 video, wireless encryption/decryption, Digital TV reception, and voice recognition—available for Marvell-based cell phones and PDAs.

HIGH-QUALITY PICTURES AND VIDEO ON A CELL PHONE OR PDA

The ability to send and receive digital pictures or video clips has been one of the fastest-growing developments in the cell phone and PDA segments worldwide. Through Intel Quick Capture technology, the Marvell PXA27x processors allow imaging capabilities to be incorporated into phones and PDAs, improving image quality and reducing the overall cost of adding digital image capabilities to mobile devices.

Quick Capture is designed to provide the ability to capture live video and high-quality still images from a wide range of camera sensors in current and future camera-enabled mobile handsets and PDAs. Performing the image processing on the PXA27x reduces the need for an external preprocessor, helping save both on cost and power. Quick Capture consists of three primary modes of operation: Quick View mode (providing low-power, real-time previews), Quick Shot mode (providing high-resolution image capture up to 4+ megapixels) and Quick Video mode (providing full-motion, high-quality video capture).

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STEPS TO LOWERING POWER

First available in the Marvell PXA27x processor family, Wireless Intel SpeedStep technology provides the ability to dynamically adjust the power and performance of the processor based on CPU demand. This can result in a significant decrease in power consumption for wireless handheld devices to increase standby and talk-time.

SpeedStep advances the capabilities of functions already built into the Intel XScale microarchitecture by incorporating three new low-power states and by using software to intelligently manage the power and performance needs for the end user. SpeedStep is able to change both voltage and frequency on-the-fly, saving additional power while providing the necessary performance to run media-rich applications.

USING WIRELESS DATA FASTER

Connecting applications processors to communications products is a non-standard, high-power, slow-performing prospect. Part of the Marvell PXA27x processor family feature-set, Intel Mobile Scalable Link (MSL) is a next-generation, scalable, and low-power communications link between applications processors and communication processors. This dedicated link was created to help meet industry requirements for a high-speed interface to supply next-generation clients with data from next-generation networks. Intel MSL supports multiplexed interfaces for data and voice, while supporting up to 14 simultaneous transfers at speeds of up to 416 Mbps. The result is quicker development times for faster time-to-market, longer battery life, and improved real-time video telephony and multimedia streaming for clients.

GETTING MORE FROM LESS

In the wireless handheld market segment, space is everything. Customers are demanding thinner, lighter, and more flexible handhelds that do not sacrifice features. The challenge is to integrate the features that customers want while simultaneously reducing the size and weight of wireless handheld devices packaging. The Marvell PXA27x processor family paves the way toward thinner, lighter designs by stacking variations of Flash and low-power SDRAM in a space-saving 14×14-mm package. The PXA27x processor family supports the tight space requirements for today's 3G wireless handheld applications while providing scalable solutions for tomorrow's generation of platforms.

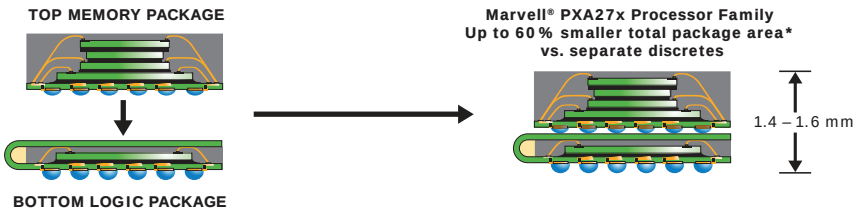
WIRELESS INTEL SPEEDSTEP® LOW POWER MODES

FASTER RESPONSE TIME ↑ / LOWER POWER ↓

IDLE Mode:	Fast response time (Idle CPU between user input)
Deep IDLE Mode:	Human interface devices (LCD, keypad) left on
Standby Mode:	Lowest power setting that retains processor state
Sleep Mode:	Lowest power setting that retains board component state (GPIOs)
Deep Sleep Mode:	Max power savings

MORE FLEXIBILITY, LESS SPACE

- More components per package
- More product combinations with package on package stacking
- Separates logic and memory packages to help meet changing market segment needs



The photos of the tape, die and packages shown are samples only provided solely to illustrate steps in the folded stack packaging process and Intel makes no warranties, either express or implied with regard to such tape, die or packages.

* When comparing 14x14x1.4mm Marvell® PXA27X processor family and separate discretes of 17x17x1.75mm processor, 9x11x1.0mm Intel® Flash, 11x13x0.8mm SDRAM.

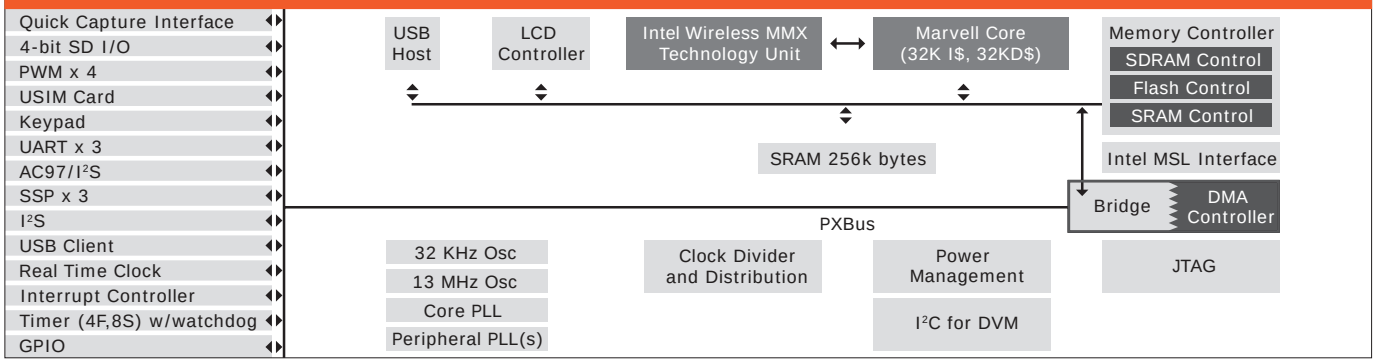
A TRUSTED HARDWARE SOLUTION

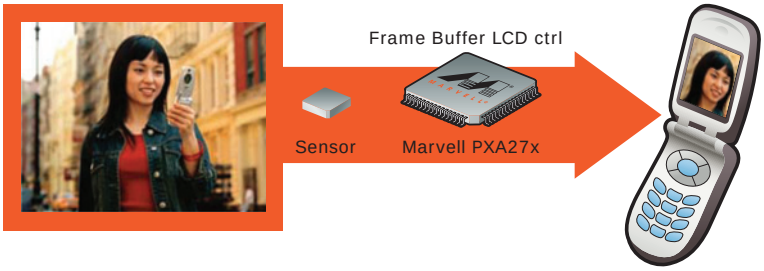
The Marvell PXA27x processor family incorporates the Wireless Trusted Platform that is designed to provide platform trust and robust security services required for today's wireless devices. Built around the concepts developed by the Trusted Computing Group (TCG) industry forum, the Wireless Trusted Platform is comprised of hardware and software components that are designed to provide services such as secure boot, secure storage of private information and keys, cryptographic acceleration, and key management support for common security protocols such as Virtual Private Networks (VPN), Secure Sockets Layer (SSL), and Open Mobile Alliance Digital Rights Management (OMA-DRM). The Wireless Trusted Platform also provides the tools to enable OEMs to prevent the reprogramming of International Mobile Equipment Identifiers (IMEI) thus helping reduce handset theft and fraud.

DEVELOPMENT ECOSYSTEM

Marvell is a leader in creating comprehensive developer ecosystems for processors. The Marvell PXA27x processor family products are code compatible with all ARM and Intel XScale technology-based solutions providing an opportunity for developers and manufacturers to maintain their code investments. In addition, the PXA27x family will be supported by the ecosystem of reference platforms compilers, debuggers, code analyzers, codecs, and integrated primitives for performance, graphics and security. In addition, Marvell will make available OS board support packages that include drivers and power management software for Linux, Palm OS, Symbian, Microsoft (CE.Net, Smartphone, and Pocket PC) as well as Nucleus and SavaJe. A number of third-party applications developers are optimizing for Intel Wireless MMX technology today. All this provides the manufacturer with one of the most exhaustive choices of software and development hardware in the industry.

MARVELL® PXA27X PROCESSOR BLOCK DIAGRAM





MARVELL PXA27X PROCESSOR KEY FEATURES

FEATURES	BENEFITS
• Intel XScale technology	• Highly scalable core up to 624 MHz
• Secure solution	• Wireless Trusted Platform: security trusted services such as trusted boot, secure storage of private information, and support for security protocols such as VPN, SSL, OMA, IMEI, and OMA-DRM
• Incredible multimedia	• Familiar Intel Wireless MMX technology instructions designed for high-performance multimedia, 3D games, and advanced video
• Advanced camera interface	• Intel® Quick Capture technology supports 4+ megapixel cameras for capturing digital images and video, and for low-power, real-time previews
• Enhanced LCD controller	• Dual-panel LCD up to 24-bit color. Hardware color space conversion with 256 KB of on-chip SRAM for faster video. Two overlays to reduce LCD bandwidth. Integrated with Intel Quick Capture technology to enable fast video preview
• Reduced power consumption	• Wireless Intel SpeedStep technology with five low-power modes can change frequency and voltage dynamically. SpeedStep Power Manager software enables built-in, intelligent power management
• Fast access to wireless data	• Intel® Mobile Scalable Link provides up to 416 Mbps link between communications and applications processors
• Large peripheral set	• USB host/client • USB OTG • 4-bit SD I/O • MMC/SD card • Memory stick • USIM card interface • Keypad controller • PCMCIA/CF • ICP
• Memory interface	• 100 MHz memory bus supports a variety of 1.8V, 2.5V, 3.0V and 3.3V memory
• Less space	• For greater memory density and flexibility • Up to 64 MB Intel StrataFlash® memory • 32 MB Intel StrataFlash and 32 MB low-power SDRAM

THE MARVELL ADVANTAGE: Marvell chipsets 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. For more information, visit our website at www.marvell.com.

MARVELL®

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