Marvell PXA1088 Quad-Core WCDMA/TD-SCDMA Communication Processor

Quad-Cortex A7, High-Performance, Low-Power, Low-Cost

PRODUCT OVERVIEW

The Marvell® PXA1088 is a highly integrated quad-core application and communications mobile System-on-Chip (SoC) that provides high-performance, low-power mobile computing; support for all global broadband 3G standards, enabling seamless global roaming; and the latest wireless connectivity technology. Marvell's PXA1088 is the industry's most advanced single-chip solution to feature a quad-core processor with support for field-proven 3G cellular modems, including High Speed Packet Access Plus (HSPA+), Time Division High Speed Packet Access Plus (TD-HSPA+) and Enhanced Data for GSM Environment (EDGE).

The Marvell PXA1088 solution incorporates the performance of a quad-core ARM Cortex-A7 with Marvell's mature and proven WCDMA and TD-SCDMA modem technology to provide a low-cost 3G platform for both smartphones and tablets. The advanced application processor technology of the PXA1088 enables a breakthrough end user experience for multimedia and gaming applications with universal connectivity. Marvell's complete mobile platform solution includes the Avastar® 88W8777 WLAN + Bluetooth 4.0 + FM single-chip SoC and the 88L2000 GNSS Hybrid Location Processor, and an integrated power management and audio codec IC.

Marvell's PXA1088 is backward pin-to-pin compatible with its dual-core single-chip unified 3G platform, the PXA988/PXA986, enabling device partners to upgrade their next-generation mobile devices to quad-core without additional design cost.
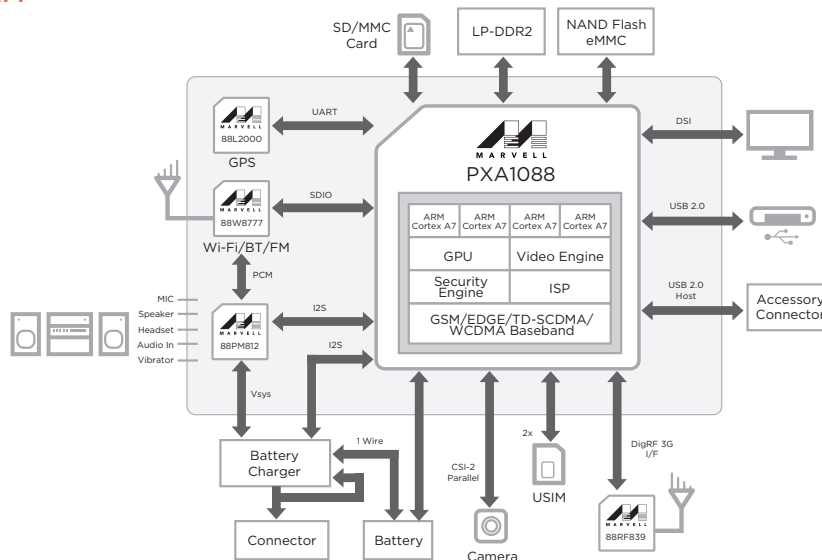
BLOCK DIAGRAM

Fig 1. Marvell PXA1088 Quad-Core WCDMA/TD-SCDMA Smartphone Platform

FEATURES AND BENEFITS

SPECIAL FEATURES	BENEFITS
• WCDMA/TD-SCDMA 3G Cellular Modem Solution	• Evolution of proven Marvell WCDMA and TD-SCDMA solutions, integrated on leading carrier products, shipping in high volume • Marvell PXA1088 high-performance WCDMA/TD-SCDMA platform features: – WCDMA HSPA+ (21Mbps), Release 7 – TD-SCDMA HSPA+ (4.2Mbps), Release 8 – TD-HSDPA, Release 7 – Class 12 EDGE support • Fully integrated cellular platform solution with extensive IOT, GCF and carrier field trial testing

FEATURES AND BENEFITS continued

SPECIAL FEATURES	BENEFITS

• Dedicated Modem and Application Processor Subsystems
  – Shared memory hardware architecture
  – Shared external memory interface
	• Enables reuse of a common application processor software stack across multiple air interfaces and cellular networks
	• Prevents unwanted performance interactions/dependencies between AP and modem subsystems
	• Protects cellular network from application processor security threats
	• High-performance internal memory architecture enables sharing of external memory without the cost and space burden for independent Flash and DDR
	• High-performance, efficient inter-processor communication interface between AP and modem, using shared external DDR

• Efficient, Proven Modem Processors
  – Modem RISC core
  – Modem DSP core
	• Marvell-designed ARM9 with packet processing accelerators and L1/L2 caches
	• Micro Signal Architecture VLIW DSP core with L1/L2 caches

• Quad ARM Cortex A7MP Application Processor Subsystem	• A high-performance quad-core ARM Cortex A7 for low-power applications, with high-performance for browsing and Java applets • NEON™ engine for broad support of media codecs • High-performance memory support for LPDDR2-SDRAM, NAND and eMMC; secure boot from NAND and eMMC • Support mobile security features, including secure boot, root key protection and Widevine Level 1 support

• Full HW-Supported Multimedia Suite
  – Video decode and encode
  – 3D graphics
  – Audio
  – Imaging
  – Display
	• Video decode: 1080p 30 fps/720p 60 fps, with support for H.263, H.264 HP,
	• MPEG-4, MPEG 2, DivX/XviD, AVS and RV
	• Video capture: 1080p 30 fps/720p 30 fps, with support for H.263, H.264 and MPEG-4
	• MJPEG encode and decode, maximum resolution 8192x8192
	• 3D graphics capability up to 96 Mtriangles/s peak rate and 1.56 Gpixels/s peak fill rate; integrated 2D accelerator; supports industry standard APIs, OpenGL ES 2.0/1.1 and Open VG 1.1
	• Low-power audio playback with direct streaming from external source to internal SRAM
	• Imaging sensor support for primary and secondary sensors with one CSI-4 port, up to 4 data lanes (1Gb/s per lane)
	• Integrated ISP supports up to 12 Mpixel sensor
	• LCD controller supports 1 MIPI DSI port (4 lanes) with up to 720p resolution
	• Up to 4 simultaneous overlays

APPLICATIONS

This highly integrated handset platform features the PXA1088 single-chip applications and baseband processor, with a Marvell integrated power management and audio companion IC, and Marvell 802.11n WLAN/BT/FM.

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 a leader in storage, communications, and consumer silicon solutions. Marvell's diverse product portfolio includes switching, transceiver, communications controller, processor, wireless, power management, and storage solutions that power the entire communications infrastructure, including enterprise, metro, home, storage, and digital entertainment solutions. For more information, visit our Web site at www.marvell.com.

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