# ARM, Chartered, IBM, Samsung, and Synopsys Collaborate to Deliver Vertically Optimized Solution for 32/28nm Mobile SoC Designs

Companies combine low-power processor architecture, integrated design flow, and system-level IP on Common Platform foundry process

SAN FRANCISCO, July 27 /PRNewswire-FirstCall/ -- In a move that addresses fundamental challenges in creating advanced systems-on-chips (SoCs), ARM [(LSE: ARM); (Nasdaq: ARMH)], Chartered Semiconductor Manufacturing Ltd. (Nasdaq: CHRT, SGX: CHARTEREDSC), IBM (NYSE: IBM), Samsung Electronics, Co., Ltd., and Synopsys, Inc. (Nasdaq: SNPS) today announced at the Design Automation Conference (DAC) an agreement to develop a comprehensive technology enablement solution for the design and manufacture of mobile Internet-optimized devices. The objective of this collaboration is to leverage innovations in material science, mobile multimedia implementation and SoC design to lower risk and improve time-to-market for advanced mobile products.

This complete design chain collaboration of technology leaders intends to integrate the following components:

- ARM® high-performance, low-power processor architecture for mobile applications, and optimized suite of physical intellectual property (physical IP)
- 32/28-nanometer (nm) low-power/low-leakage, high-k metal-gate (HKMG) synchronized foundry services through the Common Platform manufacturing alliance of IBM, Chartered and Samsung
- Synopsys Lynx Design System, including Galaxy™ Implementation Platform for SoC implementation, as well as DesignWare® connectivity IP

As semiconductor technology approaches fundamental physical limits and design complexity reaches unprecedented levels, a deeper type of technical alignment is essential. Going beyond an existing track record of successful cooperation at previous nodes, this agreement among ARM, the Common Platform companies, and Synopsys represents a new level of collaboration necessary to address the cost and technical challenges associated with advanced SoC design and manufacturing. This initiative aligns strategy, technology roadmaps and customer deliveries.

“The Common Platform alliance’s expanded engagement approach with ARM, and now Synopsys, means working more closely together with earlier access to each other’s technology innovations, integrating and optimizing our capabilities for clients,” said Michael J. Cadigan, general manager, IBM Microelectronics Division, on behalf of the Common Platform alliance companies. “The benefits are clear and differentiated: lower risk, lower cost and faster time-to-market.”

**Combination of Strengths**

Each company brings unique technology and expertise that, when combined through joint collaboration, creates an optimized solution not available from other sources.

ARM brings a robust portfolio of logic, memory and interface IP, as well as its widely adopted Cortex™ processor family that is used in a broad array of mobile applications. ARM Physical IP optimized for the Common Platform 32/28nm process delivers valuable low-power and system cost benefits. The intention of this agreement is to ensure the IP is fully optimized with the Synopsys design flow.

“The complexity of advanced manufacturing process technology requires a tight connection between the physical IP, processor cores and EDA methodology,” said Warren East, CEO, ARM. “Early collaboration between these leading companies will significantly improve the performance, power and area achievable by our partners and deliver increased value to the end products.”

Synopsys brings a suite of tool components from its Galaxy Implementation Platform, Lynx Design System and DesignWare connectivity IP providing the foundation of the solutions design flow. By tuning the automated front-to-back flow to run on Common Platform technology with ARM processor and physical IP, the flow is aimed at delivering a streamlined implementation path that can reduce the total cost of developing an optimized SoC, while helping speed time-to-market and reduce risk.

“This unique ARM-Synopsys-Common Platform collaboration can alleviate costs and risks by harnessing the leading players in silicon technology, IP, tools and flow enablement to integrate and optimize the path from software to silicon,” said Aart de Geus, chairman and CEO of Synopsys. “Through this alignment, we plan to deliver early 32/28 nanometer tool and IP enablement, plus a complete, vertically optimized design solution based on the Synopsys Lynx Design System to provide

customers the lowest cost of design and fastest time-to-market for next-generation mobile SoC designs."

The Common Platform 32/28nm process uses an innovative high-k metal-gate (HKMG) approach to address the limitations of polysilicon technology. It leverages the research and development efforts of the IBM joint technology development alliance to offer a high-performance, low-power manufacturing platform. The process offering is available with synchronized foundry services from all three Common Platform companies, ensuring customer freedom of choice and maximum sourcing flexibility.

The collaborative effort began a year ago. Initial 32nm low-power tool and IP enablement has been released and a steady stream of early customer deliverables is targeted in the coming months. Supporting physical and processor IP, connectivity IP, process design kits and tools will be available from their respective suppliers. Demonstrations of the technology based on initial test chips will be shown at the 2009 DAC in the ARM-Common Platform-Synopsys "Innovation Optimized" exhibit (booth #1114).

To view a video webcast of the Monday morning press conference, please visit the following link: http://hosted.mediasite.com/mediasite/Viewer/?peid=529369c0a8264da898fcb9662f5574f1

**About ARM**

ARM designs the technology that lies at the heart of advanced digital products, from wireless, networking and consumer entertainment solutions to imaging, automotive, security and storage devices. ARM's comprehensive product offering includes 32-bit RISC microprocessors, graphics processors, video engines, enabling software, cell libraries, embedded memories, high-speed connectivity products, peripherals and development tools. Combined with comprehensive design services, training, support and maintenance, and the company's broad Partner community, they provide a total system solution that offers a fast, reliable path to market for leading electronics companies. More information on ARM is available at http://www.arm.com

**About the Common Platform**

IBM, Chartered Semiconductor Manufacturing and Samsung Electronics have forged a unique manufacturing collaboration, featuring 28nm, 32nm, 45nm, 65nm and 90nm process technologies. By combining the expertise and research resources of all three companies and leveraging advances such as high-k metal gate technology, 193nm immersion lithography and ultralow-k dielectrics, the Common Platform™ technology collaboration is able to accelerate the availability of leading-edge technology to foundry customers. The Common Platform model is supported by a comprehensive design-enablement ecosystem, enabling foundry customers to easily source their chip designs to multiple 300mm foundries with minimal design work and with unprecedented flexibility and choice. More information is available at http://commonplatform.com/

**About Chartered**

Chartered Semiconductor Manufacturing Ltd. (Nasdaq: CHRT, SGX-ST: CHARTEREDSC), one of the world's top dedicated semiconductor foundries, offers leading-edge technologies down to 40/45 nanometer (nm), enabling today's system-on-chip designs. The company further serves its customers' needs through a collaborative, joint development approach on a technology roadmap that extends to 22nm. Chartered's strategy is based on open and comprehensive design enablement solutions, manufacturing enhancement strategies, and a commitment to flexible sourcing. In Singapore, the company owns or has an interest in six fabrication facilities, including a 300mm fabrication facility and five 200mm facilities. Information about Chartered can be found at www.charteredsemi.com

**About IBM**

For additional information, visit www.ibm.com.

**About Samsung Electronics**

Samsung Electronics Co., Ltd. is a global leader in semiconductor, telecommunication, digital media and digital convergence technologies with 2008 consolidated sales of US$96 billion. Employing approximately 164,600 people in 179 offices in 61 countries, the company consists of four main business units: Digital Media Business, LCD Business, Semiconductor Business, and Telecommunication Business. Recognized as one of the fastest growing global brands, Samsung Electronics is a leading producer of digital TVs, memory chips, mobile phones and TFT-LCDs. For more information, please visit www.samsung.com.

**About Synopsys**

Synopsys, Inc. (Nasdaq:SNPS) is a world leader in electronic design automation (EDA), supplying the global electronics market with the software, intellectual property (IP) and services used in semiconductor design, verification and manufacturing. Synopsys' comprehensive, integrated portfolio of implementation, verification, IP, manufacturing and field-programmable gate array (FPGA) solutions helps address the key challenges designers and manufacturers face today, such as power and yield management, software-to-silicon verification and time-to-results. These technology-leading solutions help give Synopsys customers a competitive edge in bringing the best products to market quickly while reducing costs and schedule risk. Synopsys is headquartered in Mountain View, California, and has more than 65 offices located throughout North America, Europe, Japan,

Asia and India. Visit Synopsys online at http://www.synopsys.com/.

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