EMBEDDED TIDBITS

By Mark Long {8/7/00-05}

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◈ MIPS LICENSES CORES TO PHILIPS, CONEXANT

MIPS Technologies has licensed versions of its 64-bit processor core to Philips Semiconductors and Conexant. Philips intends to roll out the MIPS64 20Kc core in a new series of Nexperia digital platforms that the company is developing for the consumer market. Philips will use this 64-bit processor core to run software programs that will enable key features like interactivity, 3D graphics, and intuitive user interfaces. In a separate agreement, Conexant has licensed the MIPS64 K5 processor core, which will be integrated into that company's future product solutions for advanced communications and consumer applications. For more information: *www.mips.com*.

◈ QED AND ATI ANNOUNCE JOINT-DEVELOPMENT AGREEMENT

Quantum Effect Devices, a provider of 32- and 64-bit embedded microprocessor solutions, recently announced a joint-development agreement with Accelerated Technology, Inc., of Mobile, Alabama. QED and ATI will jointly provide customers in the communications, networking, printer, and digital imaging markets with a high-performance development environment for embedded applications that fully integrates the QED family of RISC processors with no-royalty, open-source-code software developed by ATI.

ATI's Nucleus RTOS (real-time operating system) features a scalable real-time kernel with a small footprint, complemented by a TCP/IP-compliant protocol-networking stack called Nucleus NET. The Nucleus RTOS includes prototyping tools, a portable graphics package, developmental and system analysis tools, and source code within all its embedded software products. For more information: *www.atinucleus.com* and *www.qedinc.com*.

◈ PHILIPS ROLLS SINGLE-CHIP USB CONTROLLER

Philips Semiconductors has announced a single-chip Universal Serial Bus (USB) host and interface device controller that will provide peer-to-peer connectivity. The ISP1161/2 USB chip has been designed expressly for systems such as personal digital assistants, set-top boxes, digital still cameras, photo printers, mobile phones, and embedded systems that require the USB host function for controlling USB peripherals on their own.

The ISP1161/2 allows the host and interface device function to coexist and operate simultaneously. This feature will allow system designers to implement peer-to-peer connectivity between PC and Internet appliances, between PC and embedded systems, or even between Internet appliances and embedded systems. Samples of the ISP1161 in LQFP-64 packaging will be available in August 2000, priced at $4.90 in 10,000-unit quantities. Evaluation kits will also be available at that time. The ISP1162 in an LQFP-80 package will be sampling in mid 4Q00, priced at $5.30 in quantities of 10,000. For more information: *www.philips.semi conductors.com*.

◈ MOTOROLA INTRODUCES MCORE MICROCONTROLLER LINE

Motorola, Inc., has unveiled a new MCore flash microcontroller line and its first member, the MMC2107. According to Motorola, the new 32-bit chips have been optimized for embedded-control applications to meet the needs of designers of space-constrained process control and industrial automation devices, such as point-of-sale automation and inventory management equipment, including bar code scanners, magnetic stripe readers, and fixed-function thermal printers.

The MMC2107 uses a 32-bit MCore microRISC CPU that Motorola says provides fast interrupt handling, low power consumption, and very high code density. The chip's embedded flash memory is in-circuit and in-application programmable, allowing OEMs to program late in the manufacturing cycle as well as make upgrades remotely in the field.

The MMC2107 integrates both digital and analog peripherals, including a 16-bit timer, communication interfaces, and a queued analog-to-digital converter (QADC), as well as 8KB of SRAM.

Available at a suggested list price of $15 for quantities under 25,000 units, the MMC2107 may be ordered in either of two package configurations. A 144-pin LQFP is available for use in single-chip and expanded modes. Also available is a 100-pin LQFP that can operate in single-chip mode and is intended for minimized PC-board area applications.

Motorola offers three levels of evaluation kits for the new MCore line, all of which include a GNU compiler and debugger. The MMCEVB2107 evaluation board is available for $495, while the midrange MMCCMB2107 is available for $995. The high-performance KITEVS2107 development tool is expected to be available in September 2000 for a suggested list of $2,500. For more information: *www.motorola.com/semiconductors.*

◈ GREEN HILLS OFFERS DEBUG SUPPORT FOR ARM9E PROCESSORS RUNNING THREADX

Green Hills Software is now offering advanced run-mode debugging support for applications using the ThreadX real-time operating system and ARM9E processor. The new debug mode is an enhancement to the Green Hills MULTI 2000 integrated development environment (IDE), which simplifies the design of multithreaded applications by enabling designers to debug those applications on a thread-by-thread basis while the application continues to run.

ThreadX support is integrated directly into MULTI, enabling it to provide comprehensive thread- and kernel-aware debugging. The MULTI source-level debugger can start and stop tasks and monitor OS resources like buffers, queues, and streams. It can also display multiple tasks or "threads" graphically, including the thread roster, system objects, stack usage, semaphore usage and status, and a variety of other thread- and system-specific data.

Each time a thread hits a breakpoint, MULTI halts the thread and opens a source code debug window specific to that thread. Programmers may either single-step or browse their way through the halted thread and read memory and registers, all without disrupting program execution. For more information: *www.ghs.com.*

◈ TI INTRODUCES NEW MSP430 MICROCONTROLLER FAMILY

Texas Instruments has rolled out a new family of MSP430 ultralow-power, mixed-signal microcontroller products that incorporate a high-performance 12-bit analog-to-digital converter (ADC), an analog comparator, a hardware multiplier, two serial ports, two 16-bit pulse-width modulation (PWM) timers, and up to 60KB of ultralow-power flash memory.

All MSP430 derivatives incorporate the same 16-bit RISC CPU for efficient processing when active. The CPU overhead is greatly reduced by not having to fetch each individual conversion result.

The MSP430 product family reportedly achieves low power and system efficiencies that are attractive for battery-powered applications, such as energy meters, personal medical devices, and remote security systems. According to TI, the MSP430F14x/13x with ultralow-power flash consumes less power in stand-by mode than typical batteries dissipate on the shelf. With the ability to burst from stand-by to full-active mode in less than 6µS, battery life is extended even further. When operational, the MSP430F14x/13x consumes 250 µA per mips at 2.2V and operates at up to 8 mips.

TI expects to make its MSP-FET430P140 flash emulation tool available in August, so that all MSP430 derivatives can be fully emulated on chip using IEEE-1149l. The FET emulation tool includes two MSP430F149 evaluation chips, target board, simulator, assembler, and limited C-compiler. For more information: *www.ti.com/sc/msds4298u.*

◈ NATIONAL SEMICONDUCTOR AUTHORIZES DISTRIBUTOR OF BARE DIE PRODUCTS

National Semiconductor has announced certification of Semi Dice Bare Die Distribution, headquartered in Los Alamitos, California, as an authorized North American distributor for small-form-factor bare die products. This relationship became effective on June 15, 2000. National products now available from Semi Dice include selected bare die parts from National's analog, interface, and digital product lines. Digital bare die products from National include microcontroller, microprocessor (Geode GXm, Companion I/O), system test access (SCAN), telecommunications, WAN/LAN network, wireless PLL (phased-lock loops), and military/space logic products.

◈ IBM AND XILINX TEAM UP TO EMBED PROCESSOR CORE IN FPGA

IBM and Xilinx are teaming up to embed IBM PowerPC processor cores into Xilinx's Virtex-II field programmable gate arrays (FPGAs). The two companies will be following a trail blazed by Motorola back in 1998 (see *MPR 2/16/98-en*, "Motorola Core+ Chip Merges CPU with FPGA"). The resulting products from the IBM/Xilinx team effort will be used for communications, storage, and consumer applications.

Under the team's multiyear agreement, Xilinx will license IBM's high-performance PowerPC processor cores and an on-chip bus architecture for SoCs, called CoreConnect, that IBM began offering free to all comers last year (see *MPR 7/12/99-03*, "PowerPC405GP Has CoreConnect Bus"). Xilinx will integrate these products into its FPGAs, and IBM will license IP from Xilinx. IBM and Xilinx will also map the resulting designs to IBM's advanced chip manufacturing processes. Xilinx will announce availability dates for the new chips later this year. For more information on IBM PowerPC processor cores: *www.chips.ibm.com/products/powerpc/cores.*

◇ ARM Introduces ARM922T

ARM recently introduced the ARM922T—a new member of the ARM9 Thumb family of microprocessor cores (see *MPR 12/8/97-02*, "ARM9 Doubles ARM Performance in '98"). The ARM922T core will offer designers a high-performance architecture for portable applications running MP3 audio, Java, voice recognition, and MPEG-4 video. Taiwan Semiconductor Manufacturing Company (TSMC) of Hsin-Chu, Taiwan, will be the first foundry to license the new ARM922T core from ARM.

The ARM922T is a 32-bit microprocessor macrocell that combines the ARM9TDMI CPU core with 8K instruction and 8K data caches, instruction and data memory management units (MMUs), a write buffer, an AMBA bus interface, and an embedded trace macrocell (ETM) interface. The core targets applications running operating systems such as EPOC, Linux, and WindowsCE.

The ARM922T will be backward compatible with the ARM7 Thumb and StrongARM families (see *MPR 11/13/95-04*, "StrongARM punches up ARM Performance," and *MPR 3/27/95-01*, "Thumb Squeezes ARM Code Size"), as well as upward compatible with the ARM9E Thumb and ARM10 Thumb family. The core is supported by ARM's Multi-ICE debug interface and development tools. For more information: *www.arm.com*.

◇ ARM Optimizes PacketVideo Wireless Software for ARM-Powered Cores

PacketVideo Corporation, a developer of wireless software and services for mobile multimedia applications, and ARM have announced that ARM will optimize PacketVideo's wireless video decode software for the ARM architecture, to run on all ARM microprocessor cores. PacketVideo has developed standards-compliant MPEG-4 software that enables the encoding, decoding, and transmission of full-motion video over wireless networks to mobile devices with bit rates as low as 9.6Kbps, 14.4Kbps. The technology works across any type of wireless network, including CDMA, GSM, TDMA, GPRS, and UMTS. For more information: *www.packetvideo.com*.

◇ MIPS and GemPlus Form Strategic Relationship

MIPS Technologies and smart-card solutions provider Gemplus have announced a strategic relationship to develop an ultralow-power, high-performance embedded 32-bit processor core based on a new architecture standard for the next generation of smart-card chips. The new smartMIPS architecture is being specially tailored for open operating-system platforms such as the Sun Microsystems Java Card and the Microsoft Smart Card for Windows. The agreement covers joint development of specifications for the MIPS architecture that specifically targets smart-card requirements, including advanced complex cryptography and Java execution. For more information: *www.gemplus.com*.

◇ STMicroelectronics Acquires Waferscale

STMicroelectronics has acquired former design and manufacturing partner Waferscale Integration, Inc., of Fremont, California. The acquisition is intended to reinforce STM's strategic development of memory systems by adding WSI's complementary portfolio of innovative Flash-based Programmable System Devices, intellectual property, know-how, and technologies. Prior to the acquisition, STM held a 14.5% minority interest in the company. STM is investing a further $68 million to acquire full ownership. Upon completion of the acquisition, WSI's headquarters in the Silicon Valley area will function as an operational business unit within the STM Memory Products Group. ◇