MicroJava 701 Makes October Debut

After years of waiting, and at least one false start, Sun Microelectronics received first silicon for its Java microprocessor earlier this month. The MicroJava 701, as it is called, is the first announced chip based on Sun's Java-processor design.

Sun first announced the PicoJava-1 design at the Microprocessor Forum exactly two years ago (see MPR 10/28/96, p. 28). The company then licensed PicoJava to a handful of major chip manufacturers, including Fujitsu, NEC, IBM, and LG Semicon. The plan was for each company, plus Sun, to develop different application-specific derivatives of PicoJava for different markets. Shortly thereafter, Sun abandoned its own PicoJava-1 design and developed PicoJava-2, which was unveiled at the Microprocessor Forum last year (see MPR 11/17/97, p. 9). The new MicroJava 701 chip is based on this newer PicoJava-2 core design.

Sun estimates the 701 will run at about 100 MHz, with a 100-MHz bus to memory and a 33-MHz PCI interface for system I/O. The chip executes Java bytecode as its native instruction set, although Sun will offer a C compiler for the 701. Sun is waiting until the chip has been characterized before offering any performance estimates for Java code or for conventional C code.

The 701 is about one year late. Sun originally expected PicoJava-based chips to be shipping before the end of 1997. That estimate was revised to 2Q98, with volume shipments of the 701 already underway by now. Given Sun's new strategy (see next item), the 701 will probably never enter production, but our usual rule of 12–18 months from first silicon to production chips would put the 701 into late 1999.

The 701 is being fabricated by LSI Logic in that company's 0.25-micron CMOS process. Even in that advanced technology, the 701 measures a hefty 67 mm^2 in silicon area. Sun says the chip has 4,160,000 transistors and will consume about 3 W from a 2.5-V power supply (with 3.3-V I/O). The 701 will come in a 316-contact plastic ball-grid array (BGA).

Although no performance estimates are available, it appears that the 701 is an extremely complex chip. Its target frequency of 100 MHz is slow for a chip built in 0.25-micron technology, and 3 W of power consumption is 2 to 10 times what contemporary chips dissipate, even those with about four million transistors. Clearly, the 701 is intended more for line-powered than battery-powered applications. As Sun has always maintained, its Java chips are intended for systems with a deep need to run Java bytecode without a translator. It remains to be seen what systems those could be. —*J.T.*

Sun Cancels Standalone Java Chip Plans

The impending commercial debut of Sun's MicroJava 701 chip (see previous item) is bittersweet news for Sun Microelectronics. The company has quietly altered its strategy and folded its roadmap leading to future Java chips. After the 701, the company will not develop future standalone Java chips, leaving that market to its Java-chip licensees.

Sun's original strategy called for the company to simultaneously cooperate and compete with its half-dozen chip licensees. Sun would develop the core technology, which all parties would incorporate into application-specific chips for the consumer, office, communications, and industrial markets. The MicroJava 701 was to be just the first of a planned series of Java-based chips bearing the Sun brand name.

In the intervening years, Sun Microelectronics has changed management and, not coincidentally, changed its business strategy. The company now believes that its licensees, not Sun itself, should pursue whatever business opportunities exist for hardware-only Java implementations. Sun will continue to develop core CPU technology, but it will probably not develop, build, or sell finished chips.

Overall, the market for Java chips seems to have cooled almost as rapidly as it heated up. Like its software alter ego, Java chips have garnered a lot of attention, but (with no silicon) little in the way of actual usage. Sun's Java-chip licensees have been hesitant to reveal their plans after more than a year, and none of them has demonstrated a Java-based chip. At this rate, Sun's MicroJava 701 may well be the first and last of its kind. —*J.T.*

StrongArm-1100 Takes Companion to Jupiter

The already highly integrated StrongArm-1100 (see MPR 9/15/97, p. 1) now has a companion chip, the SA-1101. The new device adds to—and sometimes duplicates—peripheral functions on the SA-1100, to make it suitable for Windows CE Professional (aka Jupiter-class) subnotebook computers. The pair is already being used in HP's upcoming Jupiter-class product, to be announced soon.

The SA-1101 adds a video-output port that complements the SA-1100's built-in color LCD controller and allows Jupiter machines to drive two different displays simultaneously. The new companion part also adds PS/2 keyboard and mouse ports, a parallel port, and a USB host controller (the SA-1100 has a USB slave port). Finally, the SA-1101 replaces the SA-1100's PCMCIA port with a slightly more complete implementation that requires less support logic.

The new SA-1101 is built on the same Hudson fab line as the other StrongArm chips Intel acquired from Digital Semiconductor. The SA-1101 was partially complete at the time of the acquisition; Intel personnel simply completed the work. The chip is available immediately and sells for $21 in 10,000-unit quantities. —*J.T.*

Jupiter II: NEC VR4121 Rockets to 166 MHz

Not to be outdone, NEC has also announced a new processor and its companion chip, also for Jupiter-class devices. The new VR4121 is a 168-MHz MIPS chip similar to NEC's

existing VR4111 Windows CE processor. The VR4121 has the same caches, at 16K and 8K, but more I/O, with an SDRAM controller and a full keyboard interface. Like the VR4111, the VR4121 includes A/D and D/A circuitry but not an LCD controller.

That's where the VRC4171A companion chip comes in. This second part handles color LCD and PCMCIA duties. Both parts run on 3.3 V and consume 250–300 mW, according to NEC. The two will sell for $25 and $9, respectively, in 10,000-unit quantities when they start production in 1Q99.

The new VR4121 becomes NEC's new pocket rocket, increasing speed to match that of Toshiba's R3922 (see MPR 4/20/98, p. 12), which has held the portable speed lead for some months. The additional speed is helpful for improving Windows CE performance, of course, but also mandatory for adding new features like "soft" 56K modems and speech recognition. —*J.T.*

STMicroelectronics Extends STPC Line

STMicroelectronics (STM; formerly SGS-Thomson) has extended its line of all-in-one PC-on-a-chip processors with the STPC Industrial. Although there's little industrial about the chip except its temperature range (–40°C to +85°C), the new device does add "Super I/O" functions lacking in its predecessor, the STPC Consumer (see MPR 8/4/97, p. 1). The STPC Industrial has keyboard and mouse interfaces as well as PCI, ISA, and 486-local buses. The chip's 486 processor runs at 66, 75, or 80 MHz and has an 8K unified write-back cache. Pricing is expected to be below $40 in 10,000-unit quantities.

The STPC Industrial follows the Consumer and Client variations, all of which are based on Cyrix's 486 CPU core. STM says future variations on the PC-on-a-chip theme will use other STM "internally developed" cores, but it would not elaborate on whether the Metaflow design team (see MPR 6/23/97, p. 4) is included in that qualification. STM has no intention of marketing its embedded PCs to PC makers; even in the sub-$1,000 market, buyers want more than 486DX-66 performance. Instead, the company believes the STPC's future lies in point-of-sale terminals, kiosks, and other embedded systems, where software development tools and time-to-market are most the important things. —*J.T.*

MIPS Says Lexra "R" Not Us

The lawsuit between MIPS Technologies and Lexra Computing Engines (see MPR 4/20/98, p. 8) has been amicably settled, according to both sides. The two have signed a memorandum of understanding that outlines the conditions of the settlement, namely that Lexra must attribute ownership of the MIPS trademark, cease using the phrase "MIPS-compatible," and explicitly state that its core does not support unaligned loads and stores. In a bizarre twist, MIPS demanded that the letter "R" be stricken from Lexra's part numbers. Henceforth, the LXR-4080 will be the LX-4080. Lexra can now expect a suit from Lexus. —*J.T.*

HP Grabs ARM License

Answering the question, "Who is left to license ARM?" Hewlett-Packard has stepped up to the plate to have a swing at everybody's favorite microprocessor core. HP uses the StrongArm-1100 chip in its new Jupiter-class subnotebook computer, but that is not the reason for the license. HP licensed the ARM7TDMI and ARM740T cores, for use in an unnamed variety of application-specific parts for HP's own portable, networking, and peripherals products. —*J.T.*

AMD Fills Out 186-Based Comm Controllers

AMD has given its newest communications controller a pair of siblings to play with. The 186CC (see MPR 6/1/98, p. 14) is joined by the 186CH and 'CU, two subset devices with fewer serial channels and lower prices.

Both the 'CH and the 'CU are subsets of the 186CC, which has begun sampling. The 'CH deletes the USB slave port and GCI physical interface, and cuts the number of HDLC channels (and DMA channels to serve them) in half. That leaves the 'CH with a 186 processor core, two HDLC channels, and four DMA channels. The feature set suits the 'CH for relatively unchallenging telecommunications applications in line cards and digital phones, according to AMD.

The 'CU includes a smaller, but different, subset of features. It dumps all of its HDLC channels and their associated interfaces while retaining the USB interface. This leaves the 186CU with a USB port to go with its DMA controller, UARTs, timers, and general-purpose I/O pins. AMD sees the 'CU as a useful part for intelligent USB peripherals that need a 16-bit processor with some serial and parallel I/O.

All three devices are pin-compatible despite the great number of unconnected pins the two new chips must have. They also share the same 80186 CPU running at 33, 40, or 50 MHz. An on-chip DRAM controller alleviates some of the need for an on-chip cache. At 25 MHz, the 186CC, 'CH, and 'CU are priced at $13.50, $10.11, and $9.65, respectively. The large price difference between the 'CC and its subsets indicates the value AMD places on the combination of USB and HDLC, an enabling feature for ISDN terminal adapters. Absent either one of these, the price drops by at least 25%.

The new devices compete with Motorola's 86302 family of communications controllers, specifically the 68LC302. The 'LC302 has a pair of HDLC channels but no memory controller, giving the 'CH an advantage in ease of use. AMD's 'CU is similar to a handful of 8-bit USB controllers offered by a number of microcontroller companies, but with more performance and lots of extra I/O. As such, it might be useful for low-end printers or high-end game controllers. —*J.T.*

Osicom Speeds Net+ARM Silicon

Osicom's Net+ARM Ethernet CPU (see MPR 5/11/98, p. 11) will be available in 15- and 40-MHz speed grades in 1Q99. The faster speeds don't affect Ethernet performance, but do increase CPU headroom enough that the chip could be used in single-chip networked systems. —*J.T* M