Philips Updates MIPS Line With 31700

Newest Product Is Fastest Windows CE Chip Set, First With Color

by Jim Turley

Philips has again advanced its line of portable processors with the 31700, a MIPS chip for Windows CE units with support for a color screen. The new "TwoChipPIC Plus," as the company calls it, noses Philips ahead of rivals NEC and Hitachi in providing higher performance and integration for the next generation of WinCE devices.

At the heart of the new part is a 75-MHz MIPS core, a clock-doubled version of the one in the company's existing 30100, 31100, and 31500 devices (see MPR 10/7/96, p. 4). This core, derived from Toshiba's R3900, includes a hardware multiply-accumulate (MAC) unit that permits software-only modem functions. Apart from a new color LCD controller, the 31700 is functionally identical to the 31500.

Two-Chip Set Synthesizes 28.8-kbps Modem

The 31700's caches are not any bigger than they were on the 40-MHz 31500, so performance will not scale directly with clock frequency. For small loops, such as for pseudo-DSP modem synthesis, however, the chip should perform well. In fact, Philips has upgraded the 31700's modem capability to 28.8-kbps, V.34 levels.

Like its siblings, the 31700 is bundled with a mixed-signal peripheral chip, which handles the analog telephone-line interface, and with Philips's own modem-emulation software. The UCB1200 companion part is an upgrade from the previous UCB1100. The newer chip is pin-compatible with its predecessor and includes minor changes to enable the faster modem speed.

Part Competes With NEC, Hitachi Offerings

The 31700 comes on the heels of NEC's announcement of its upgraded WinCE processor, the R4102 (see MPR 4/21/97, p. 4). Like the Philips part, the R4102 offers a speed upgrade (to 66 MHz), and it expands its instruction cache to 4K. The R4102 adds on-chip analog I/O, while the Philips chip comes with the much more valuable color LCD controller. Both vendors now deliver a combination of A/D circuitry for the touchscreen, D/A for the speaker, a real-time clock, and a MAC unit with drivers for a software-only modem.

Whereas NEC integrated the basic analog circuitry and left the LCD controller off, Philips brought the LCD on board and delegated the analog interfaces to the UCB1200 companion chip. NEC's approach allows designers to choose their own color or monochrome LCD controllers—or to omit the display interface entirely—at the cost of an additional chip. Factoring in the cost of an LCD controller, both companies offer comparable value for the price.

At $39 in large quantities, the 75-MHz 31700 is considerably more expensive than NEC's 66-MHz R4102, which lists for about $25. The two chips execute the same instruction set and have comparable caches. They are even expected to start production at about the same time.

The 31700 also competes with Hitachi's SH7708 chip, which is used in the Hitachi, LG, and Casio/Compaq HPCs. The Japanese vendor's SH7707, used in Hewlett-Packard's HPC, is similar to the SH7708 (see MPR 3/6/95, p. 12) but with a monochrome LCD controller and some simple A/D circuitry included. Hitachi does not currently offer the 7707 commercially, but the part might officially debut later this year. The 60-MHz 7708 is priced at about $20 in quantity; allowing a small premium for the additional peripherals, the price of a commercial 7707 would probably be competitive with that of the Philips and NEC offerings.

Hitachi's SuperH architecture offers better code density than either of the MIPS chips, a critical factor for handheld units that execute directly from ROM. All three competitors have similar clock speeds, ranging from 60 to 75 MHz. Running Windows CE, the 31500 outpaces NEC's R4101 on account of its larger cache and wider bus; the 31700 and R4102 are more evenly matched, although the onboard LCD controller should give the 31700 an edge in overall system performance.

The 31700 is pin-compatible with the 31500, allowing easy upgrades from its monochrome predecessor. Better still, the newer chip lowers typical power consumption by 20%, to about 290 mW, even as it increases clock speed by 85%. Although Philips wouldn't provide details, we believe the 31700 is built with a newer 0.35-micron process, possibly by Toshiba, which makes Philips's other MIPS processors.

Clearly, a number of major competitors are placing big bets on the growth of the HPC market. With NEC, Hitachi, and Philips all putting their considerable muscle behind the platform, consumers should be able to look forward to rapid feature and price competition by early next year. ◾

Price & Availability

The 31700 and UCB1200 will begin sampling at 75 MHz in May; production is scheduled to begin in October. In 100,000-unit quantities, the two-chip set (plus modem software) is priced at $39.

For more information, contact Philips (Sunnyvale, Calif.) at 800.447.1500, extension 1372, or set your browser to *www.semiconductors.philips.com.*