Hurdles loom as foundry early adopters sprint toward 45 nm

• The starting gun sounded on the 45-nanometer foundry race last week as the world’s largest foundry service provider announced an accelerated ramp for its 45-nm process. But there are signs that the 45-nm node could prove a painful and costly transition for foundry customers.

• Taiwan Semiconductor Manufacturing Co. (TSMC) had planned to release its first “commercial” 45-nm wafers in the fourth quarter but now is shooting for September. Its first 45-nm process is a low-power technology. Volume production is slated for the first half of 2008.

• The foundry giant’s main rivals at 45 nm—UMC and IBM Corp.’s technology alliance—are not far behind and plan to ship their respective processes by year’s end. IBM’s foundry alliance partners are Chartered Semiconductor (Singapore) and Samsung (South Korea).

• It’s unclear when—or if—other foundries will enter the 45-nm race, though Fujitsu, Toshiba, China’s Semiconductor Manufacturing International Corp. (SMIC) and a few others are expected to field 45-nm foundry processes.

Hurdles loom as foundry early adopters sprint toward 45 nm

- Another question is how quickly foundry customers will embrace 45 nm. IC design costs alone will range between $20 million and $50 million. As for photomask costs, a "mask set" requires an outlay of $500,000 to $800,000 at the 90-nm node and $1.5 million at the 65-nm mode. At 45 nm, photomask costs will be double the 65-nm tally, said Naveed Sherwani, president and chief executive of Open-Silicon Inc.
- That won't deter all customers, Sherwani said, adding that he expects the 45-nm node to be "driven by high-volume chip makers like Xilinx, Intel and TI."
- But many others won't jump on the bandwagon just yet, said Jack Browne, vice president of marketing at MIPS Technologies Inc. (Mountain View, Calif.). Trailing-edge processes "are cheap," Browne said. "These processes will last a lot longer. There are a lot of small guys out there [for whom] $1 million is too much for a mask."

Source: EE Times, "Top Story", April 9, 2007, "Hurdles loom as foundry early adopters sprint toward 45 nm"