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IBM and Chartered Join Forces With Fabs

By Tom R. Halfhill {12/16/02-02}

Fabrication technology and fabs are getting so expensive that even the biggest companies are forming alliances to share the burden. The latest linkup is between IBM, a leading innovator in chip technology, and Chartered Semiconductor Manufacturing, the world's third-largest independent chip foundry. Their open-ended multiyear agreement includes joint technology development and shared fab capacity.

Although IBM originally said the agreement involves "leading-edge technology," the company later clarified that it won't share its most advanced (and expensive) fabrication techniques, which use silicon-on-insulator (SOI) transistors, strained silicon, and silicon germanium. Instead, the technology IBM shares under the agreement will be limited to bulk silicon. It's still a good deal for Chartered, because IBM's bulk-silicon technology is among the world's best, and it's what most foundry customers want. IBM expects bulk silicon to dominate the mainstream foundry market for the next few process generations before giving way to the more-exotic technologies appearing first in CPUs for servers, workstations, and PCs.

Initially, IBM and Chartered will develop mutually compatible bulk-silicon processes for 90-nanometer (nm) and 65nm production on 300mm wafers. Those processes will be based on IBM's 9SF (90nm standard-foundry) and 10SF (65nm standard-foundry) processes, with variations for high performance, low power, and high density. Later, IBM and Chartered may exercise an option to extend the agreement to 45nm production.

By aligning their fabrication technology, IBM and Chartered will make it easier for ASIC and system-on-chip (SoC) customers to bring their chip designs to fabs operated by either company. The two companies are working with providers of electronic design automation (EDA) tools to ensure portability between the fabs and processes.

As insurance against capacity shortfalls and production glitches, IBM and Chartered also have a reciprocal manufacturing agreement. IBM could shift some chip manufacturing for its customers to Chartered's new 300mm fab in Singapore, and Chartered could transfer some manufacturing for its customers to IBM's new 300mm fab in East Fishkill, New York. Although fab capacity isn't a burning issue during the current economic slump, the companies are planning for the market's eventual recovery. Additionally, their reciprocal agreement shows why it's vital to make their processes mutually compatible. Otherwise, if IBM or Chartered moved production to a different fab, customers would have to port their chip designs to different processes and ASIC libraries.

Although neither company revealed how much money Chartered is paying IBM for the technology-sharing part of the agreement, the deal will have some immediate benefits for Chartered, in addition to the obvious economies of shared development costs and fab capacity. The Singapore-based company is pushing back pilot production of 300mm wafers at its new Fab 7 in Singapore, from 3Q03 until late 3Q04. The one-year respite allows Chartered to save money during the current market slump and spend more time

refining its 300mm and 90nm technologies. IBM plans to begin producing 90nm-scale chips on 300mm wafers at East Fishkill in 3Q03, so, under the reciprocal manufacturing agreement, Chartered can still offer those services to its customers in a timely fashion.

To smooth the transition to 65nm, IBM and Chartered will codevelop that technology at East Fishkill and implement it at their respective fabs in 2005. The companies plan to announce more details about their 65nm project in 4Q03.