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HITACHI, UMC JUMP ON 12" WAFERS

By Keith Diefendorff {1/24/00-04}

Following Intel's lead (see *MPR 6/21/99-msb*, "Intel Commits to 300-mm Wafers"), Hitachi and United Microelectronics (UMC) have announced they are joining forces to build a 300-mm (12-inch) wafer fab. The joint-venture company, which has not yet been named, will locate its facility in the N3 building of Hitachi's current facilities in Hitachinaka, Japan. Hitachi (*www.hitachi.co.jp*) has taken a 60%-majority equity position in the nearly $600 million venture, with UMC (*www.umc.com.tw*) taking the remaining 40%.

According to the companies, the fab will begin pilot production in January 2001. Volume production will commence in 2Q01, ramping to a capacity of 7,000 wafers per month in 2H01. Each company will take half of the total fab capacity. Although the Hitachi/UMC announcement follows Intel's by more than six months, their aggressive schedule puts them in production roughly a year ahead of the date Intel has said it will roll foot-wide wafers out of its 300-mm facility in Hillsboro, Oregon, which is now under construction.

Hitachi and UMC will each contribute their current leading-edge 0.18-micron processes, as well as other unspecified future processes. Although the companies have not confirmed it, we expect the fab will be outfitted primarily to produce parts using copper interconnects. Most experts agree that copper is a requirement for processes much beyond 0.18 micron, and UMC has already announced its plans to produce copper-interconnect parts for its foundry customers, beginning this quarter.

While Intel claims 300-mm wafers will lower manufacturing costs by up to 30%, some experts are skeptical that this benefit will be realized in early production. Issues such as warping and runout may hurt early yields and require thicker wafers that must later be backlapped. But by getting an early start, Hitachi and UMC will gain valuable experience that may put them ahead of their competitors. If nothing else, the new joint facility will give each company a significant boost in fab capacity. Since 300-mm wafers offer nearly 2.5× the potential number of die per wafer as 200-mm wafers, the new facility amounts to the rough equivalent of a 2,000-wafer/week 200-mm fab for each company.

Independently, UMC is building its own 300-mm fab in Tainan Science Park (Taiwan). Construction on this new facility is scheduled to be complete by the end of the year, with production beginning midyear 2001. The primary process at the fab will be 0.13 micron. At its full capacity of 7,000 wafers per week, this fab will be able to pump out the equivalent of about 17,000 200-mm wafers per week—an output matching three of Intel's current 200-mm megafabs. Obviously bullish on the outlook for semiconductor demand, UMC is planning five 300-mm fabs at its Tainan site.