

Global and China IC Manufacturing Industry Report, 2011-2012

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Abstracts

The IC manufacturing industry mainly involves memory vendors, IDMs and foundries. By technology, IC can be divided into analog, digital and mixed signal. Most digital IC businesses are IC design houses and, analog signal businesses commonly refer to IDMs. But it is not the case for Japanese manufacturers, which have long been applying vertical supply chain system and bringing the whole link of the supply chain under control. Thus, nearly all the semiconductor manufacturers in Japan are IDMs.

The foundries fall into two types, one produces high-volume digital IC and the other produces low-volume analog IC, high-voltage IC and mixed signal IC. For high-volume digital IC foundries, they are required to ceaselessly improve the IC process technology by CAPEX at least USD1 billion annually, more than 50% of which are earmarked for equipment depreciation and R&D; for the later, they are much smaller by operation scale, with each annual revenue no more than 700 million USD.

For digital IC foundries, efficiency is the top priority, since only those that can develop the most advanced process technology in the shortest duration can come out top in the cut-throat competition. For instance, the R&D cost is likely to recover within one year provided a company makes the initiative to develop the world's first 90-nm process technology within six months at a cost of USD1 billion. However, if a company develops the same technology by investing the same amount two years later than the pioneer, it means that there is little chance for it to recover its R&D cost, for the less advanced technology is no longer a magnet for customers. Therefore, there is, in general, only one lucrative in digital IC foundries, and one with meager profit, while the rest are either loss-making or with a narrow margin of profit.

TSMC is the biggest player among wafer foundries worldwide, with the market

occupancy approximating 48% and its profit making up roughly 85% in the whole industry. The market capitalization of TSMC is as high as USD68 billion, as opposed to the NO.4 SMIC whose market cap is less than USD1.5 billion.

TSMC, UMC and SMIC are among digital IC foundries, while VIS, TowerJazz, Dongbu HiTek and ASMC are among analog IC, high-voltage IC and mixed-signal foundries. For UMC, its considerable profit is yielded from the investment in a series of well performing IC design houses, such as Mediatek, Novatek and Sunplus, all of which are loyal customers of UMC. Analog foundries have suffered hefty loss for many years, which largely attributed that all its customers are small analog IC designers that are very sensitive to economic climate.

Among foundries in Chinese Mainland, SMIC enjoys absolute dominance. It is the only that has 12-inch wafer fab, comparing to HHNEC and Grace Semiconductor, which were merged by SMIC in late 2011, that only have three 8-inch wafer fabs. Both state-run enterprises, HHNEC and Grace Semiconductor monopolize government-related IC business, which makes them possible to reap lucrative profit. However, both feature laggard of technologies and are hard to face real tough competition. Another case is Shanghai Huali Microelectronics, the investment of which amounts to RMB14.5 billion, by and large backed by the government. In terms of competitiveness, all these businesses far lag behind SMIC

Although Samsung embarked on wafer foundry business as early in 2007, no remarkable achievements have been made over the past five years. In 2007, Samsung's revenue from foundry business reported USD370 million, and the figure in 2011 rose to USD470 million excluding that brought by Apple, the sole big customer of Samsung. Being involved in intellectual property issue, Apple is forced to commission Samsung as its OEM. For Samsung, it sets foot in wafer foundry business with the aim of transferring the excessive capacity. Unlike Samsung, Intel has no intention at all to develop wafer foundry business.

It is worth mentioning that, Taiwan-based DRAMs have been struggling to make the tough choice of transformation or closedown after suffering heavy losses for many years. For instance, Powerchip has shifted its business to foundry. In Q4 2011, 60% revenue of Powerchip was from foundry business. In 2011, Powerchip's revenue from foundry business hit USD431 million, against USD149 million in 2010, marking the fastest developed foundry.

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