

CCTV CMOS cameras: Makers expanding overseas business

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The local IC industry enabled low-cost handsets, video in MP3 players, and TV mobile phones.

China's IC design and manufacturing industry has grown steadily in the past two decades. During the early 90s when Motorola entered China as a pager maker, the only component sourced locally for the device was the iron chain. Foreign enterprises establishing facilities there had to rely on international providers for chip requirements. Now the country boasts more than 50 IC production lines and over 400 design houses. Several 12in lines were set up in recent years.

The TLG1121 model is Telegent's third-generation analog mobile TV solution and the industry's first single-chip analog mobile TV receiver based on the 65nm CMOS process technology.

In 2007, China produced 41.17 billion ICs, equivalent to \$18.4 billion in revenue. Both output and sales jumped 20 times from 1998, representing an average annual growth rate of 40 percent.

Manufacturers have gained a foothold in chip design for ID and SIM cards, mobile phone baseband, portable media players and A/V processing. Some, including Hisilicon, ZTE Micro and Nationz, have begun mass production of 65nm versions. Suppliers are forecast to explore 3G handsets, netbooks, LED lighting, medical and automotive electronics, and industrial computers in coming years.

Moreover, not only do local IC makers serve domestic demand but they have also penetrated overseas destinations. A few major players in China have established names in the export industry. Shanghai-based SMIC, for instance, is now the thirdlargest IC OEM enterprise in the world.

Beijing's Vimicro is a recognized provider of digital A/V processing chips, occupying 60 percent of the global PC camera processor market. It is also the first fabless company in China to be listed on NASDAQ, and serves other big-name brands, including Samsung, NXP and Sony. Vimicro entered the security products sector in 3Q09 by purchasing Alcatel-Lucent Shanghai Bell's Video Surveillance System business.

Other major players include CIDC, Datang, Huahong and Tongfang, which offer ID and SIM card ICs.

Unlike design houses in Taiwan, which focus on PC-related components such as memory and display, mainland China makers cater to a range of industries.

After penetrating the fields of consumer and industrial electronics, many companies are targeting automotive applications. Although these have a high technological threshold, the market potential is big.

Car manufacturer BYD has purchased Zhongwei in October 2008. The former, which provides car electronics, lithium batteries and EMS, aims to develop electric vehicle driving motors that comprise a driver IC and power management device. With this core technology, BYD will possess the full supply chain of batteries, electric automotives, ICs and auto-

vehicles. Investment in the IC business is estimated at a minimum of \$300 million.

Close to 10 mainland component manufacturers are also currently in talks with Taiwan's TSMC for IC OEM tie-ups. For now, outlay for security ICs remains minimal. In other segments, however, enterprises are pursuing a vertically integrated strategy via chip development. For example, Haier and Hisense, both home electronics enterprises, are making ICs for in-house use.

Inspur, a major player in PC servers, bought Qimonda's China R&D center. The latter, once the second-largest DRAM producer worldwide, went bankrupt in early 2009. The China government supported Inspur's takeover of the facility.

Price reductions from turnkey solutions

Video functions in MP3 players

Digital & mobile TV sectors growing

Growing the export industry

Ramos' T12 PMP model based on Rockchip's RK2806 solution supports 720p HD video.

Price reductions from turnkey solutions

Several mainland suppliers have made important innovations that changed the way they traditionally manufacture products.

Among these are Spreadtrum, RDA Microelectronics, SG-micro and GalaxyCore, which offer chipsets for mobile phones. They engage in baseband and RF IC manufacture for GSM and 3G products, operational amplifiers, LED drivers, power management systems and CMOS image sensors.

Together with Taiwan's MediaTek and other design houses, they pioneered turnkey solutions in the mainland's handset line. Such systems reduced the technical threshold and costs of making mobile phones, bringing to the fore white-box types. Because of the low price of these devices, international brands have likewise cut quotes for basic handsets.

Entry-level mobile phones currently list at \$30, significantly less than pre-China white-box days at \$100. Mainstream units provide the most-popular applications, including multimedia playback, camera, e-book reader, WAP and handwriting recognition.

The turnkey solution eventually changed the landscape of electronics manufacturing. The advantages of this platform and business model extended to other industries such as TVs, PMPs, GPS, netbooks and e-book readers. Its implementation increased capacity and pushed prices down.

In addition, Spreadtrum enabled the dual-mode dual-standby function on a single baseband chip. This later became a standard in China-made GSM phones with such capability.

Video functions in MP3 players

In the PMP IC line, Actions, Chinachip, Ingenic, Rockchip and Sochip are the major suppliers. Growth began during the transition from audio-only MP3 player to models with video function. International players Sigmatel and NXP dominated output of pure-music solutions.

Actions released its MP3 IC ATJ2075 in late 2004 and an enhanced version, the ATJ2085, in 2005. The latter enabled MP3 players to enable simple video functions on top of music playback. The industry embraced the component, with 48 million units sold within a year.

The player also used turnkey systems to support MP3 makers. Although not the best solutions at the time, they offered multiple functions, including image viewing, e-book reading and video capability. The products were priced one-half or a third that of international brands.

Local PMP IC design companies have since been a major provider to terminal device manufacturers. Their presence was reinforced when flash MP4 players took the market position previously occupied by MP3 counterparts. R&D milestones included AVI, RMVB, 720 to 1080p HD and multiformat support, and TV output.

Digital & mobile TV sectors growing

The digital TV and set-top box IC sector, though not as robust as the mobile phone segment, is another rapidly growing industry.

Progress in the satellite STB chip domain is largely aided by China's TV broadcasting project in rural and remote areas. One of the major providers, Nationalchip, took more than 50 percent of the DVB-C market from international companies in 2008. The supplier's shipment that year reached 7 million ICs.

Nationalchip joins Availink and Haier-IC in the top ranks of the manufacturing base for digital TVs and STBs.

Telegent, an analog TV IC maker, was not popular before 2007, but has since evolved to become one of the fastest-growing design houses in China. As of end-2008, it had sold 20 million chips and by 3Q09, sales volume reached 50 million units.

Through the efforts of companies such as Telegent, analog TV has become a mainstream function in white-box mobile phones. Aside from driving demand in the former segment, it also helped the handset industry find a breakthrough in value-added functions.

As for mice and keyboards, prices went down significantly, thanks to Sigmachip and its Taiwan-based counterparts. Huawei and ZTE have also contributed to robust sales through IC subsidiaries Hisilicon and ZTE Micro, respectively. Hisilicon registered record revenue in 2009 amounting to \$500 million.

Growing the export industry

Chip manufacturers and finished product suppliers are working together to bolster the mainland's IC export business. While device makers open up domestic and overseas markets for ICs, chip companies are setting the trend for the former's product development strategies.

Unlike international providers, local enterprises are closer to clients and can therefore react immediately to trends. They can also cooperate with device suppliers on R&D projects and aftersales services. The mainland's low labor costs also help chip makers become competitive abroad in terms of price-to-performance ratio.

Note: All price quotes in this report are in US dollars unless otherwise specified. FOB prices were provided by the companies interviewed only as reference prices at the time of interview and may have changed.

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