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Tracking Fabless, IP & Design-House Startups

Alchip Technologies

The core team from SOC design-services provider Altius Solutions formed a new company in 2002 called Alchip Technologies, which serves as a one-stop-shop for ASIC backend manufacturing. Adopting the increasingly popular fabless ASIC model, Alchip focuses on turnkey ASIC production for SOC designs from RTL/netlists to final chip delivery.

Altius co-founder Kinying Kwan founded Alchip in Aug. 2002 with Global Future Group (GFG), which provided $1 million in seed funding. Alchip raised an additional $3.5 mllion in May 2003 from GFG, Investar and Acer VC, and is in the process of raising a third round of approximately $8 million, which will likely close this spring.

Kwan serves as president and CEO of Alchip Technologies. Prior to Alchip and Altius, Kwan worked as director of engineering at Cirrus Logic's Mass Storage Division. Prior to that, he managed all CMOS technology activities for Tandem Computers.

Hiroyuki Nagashima is Alchip's GM of Japan Business and Operation. Prior to joining the company, Nagashima led various engineering and business development efforts at Cadence Design Systems, Simplex Solutions, Altius Solutions, Excellent Design (EXD), and NEC.

Johnny Shen, GM of the Shanghai SOC Design Center and VP of engineering, has held various engineering positions at Cadence Design Systems, Simplex Solutions, Altius Solutions, Sun Microsystems and Tandem Computers.

The 15 people that comprise Alchip's core team all have roots at Altius, which merged with Simplex Solutions in 2001 and launched an IPO under the Simplex name (Cadence Design Systems acquired Simplex in April 2002). Altius/Simplex had an impressive track record that bodes well for the new Alchip venture. Among its success stories was the graphics chip for Sony's PS2, which has been incorporated into about 70-million consoles. The company was able to deliver the chip on schedule with first silicon success, while also decreasing the chip size and power consumption and increasing the yield.

In total, Altius/Simplex completed more than 20 complex SOC designs with 100% first-silicon success. In addition to the Sony graphics chip, these included the world's first single-chip 40-Gbps framer-mapper for Catamaran/Infineon, and the world's first single-chip disk drive for Cirrus Logic.

Alchip, which is registered in the Cayman Islands, is headquartered in Taipei, Taiwan, with offices in Japan, China, and the U.S. The company's key design center is in Shanghai, where 37 of its 53 employees are located. The company set up shop in China for three basic reasons: China has a much lower cost structure; Shanghai offers a large pool of willing talent, while high-end chip-designers in Silicon Valley are not as eager to work for a startup; and Alchip wanted to be closer to leading-edge suppliers to provide seamless coordination between silicon design and backend engineering teams.

Alchip has four people in the U.S., seven in Taiwan, and five in Japan. The Japan group is comprised of an EDA solutions development team that came from EXD/Japan. One of Alchip's key capabilities is in timing and electrical closure, which the company developed internally through this group.

Based on the notion that designs below 0.18-micron constitute the high end and those above 0.18-micron the low end, Alchip is targeting higher-end designs. This market consists of companies in the high-volume consumer, storage, and networking spaces, among others. The company is focused on designs of two million gates and more that have many IP elements on chip, including CPU, DSP, embedded memory, etc. Most of Alchip's designs are 0.13-micron and 90-nm technology, and the company says it can go from final netlist to tapeout in just four to six weeks.

Alchip chose to be an open-IP company so it could take advantage of leading-edge IP from the industry's myriad providers. IP partners currently include Artisan Components, Virage Logic, TriCN, Ceva, MoSys (now part of Synopsys) and SuperH. Alchip's key foundry partner is TSMC and its primary packaging/assembly partner is ASE, although the company also works with Amkor, Chartered, SMIC and others, and can design to captive fabs such as those of major Japanese companies.

In 2003, Alchip focused primarily on the Japanese market, and expects to grow into the U.S. in 2004. According to Dataquest, Japan represented 29% of ASIC design starts in 2003, and North America 33%. Alchip may target Europe (17%) sometime in the future. Asia/Pacific represented 21% of ASIC design starts, but companies in that region mostly engage in low-end designs, for which Alchip cannot provide much value.

Alchip has already completed two tape-outs. The first is a mobile chip with about 2 million gates and 5 Mb of SRAM, built in TSMC's 0.13-micron process. The second is a camcorder chip with about 3.5 million gates and 12 Mb of SRAM, also built in

TSMC's 0.13-micron process. Both are currently in fab. The company is also working on a 90-nm 6-million gate design, and a .13-micron 15-million-gate networking chip.

The fabless ASIC business model is becoming increasingly popular as the opportunities become clearer. According to Dataquest, the total ASIC/ASSP market in 2002 was about $53 billion, of which $16 billion was ASICs. However, total foundry revenue from ASIC customers was less than $1 billion. The ultimate goal of Alchip and its competitors is to shepherd more of that $16-billion opportunity into the foundries, and it appears to be a successful endeavor.

Alchip's competitors include eSilicon, which is currently focused on the U.S. and has built up strong credibility. Another fabless ASIC company, Open-Silicon, is the ideological successor to Intel Microelectronics, Intel's short-lived ASIC business. Open-Silicon combines India-based design centers, a highly regimented methodology, and strict selectivity about the designs it undertakes to achieve low cost and high predictability and reliability. Like Alchip, competitor VeriSilicon also based its technical team in Shanghai, but differentiates itself by offering front-end as well as backend design services.

(See our profile of eSilicon in the Oct. 2003 issue of *InsideChips.Ventures,* and Open-Silicon in the Feb. 2004 issue.)