


## The Semico Spin

Weekly commentary and analysis direct from Semico's expert analyst team. Understand the impact of new product releases, technical developments and other weekly events on the semiconductor business. The Spin is delivered electronically each week to your inbox! To register to start receiving your copy, please email Michell Prunty at [michellp@semico.com](mailto:michellp@semico.com).

To find out more about Semico, a marketing and consulting research company located in Phoenix, Arizona, please visit [www.semico.com](http://www.semico.com). Semico was founded in 1994 by a group of semiconductor industry experts. We have improved the validity of semiconductor product forecasts via technology roadmaps in end-use markets. Semico offers custom consulting, portfolio packages, individual market research studies and premier industry conferences.

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<p>◆ Data ◆ Analysis ◆ Knowledge</p>	
<p><i>*Market Analysis &amp; Planning</i> <b>Your Strategic Online Semiconductor Database</b> <b>30+ End-Use Markets!</b> Q: How can I capture market share w/o losing my shirt? <b>A: Semico MAP* Model</b></p>  	
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### ***Common Platform: Doors Open for Foundry Users***

Last week, Chartered Semiconductor held its Technology Forum in San Jose, CA. Highlights included a process technology status update and the roll out of its new design for manufacturing (DFM) initiatives. Chartered began delivering 90nm product in June of this year and expects to ship an impressive 123,000 300mm, 90nm wafers by yearend. The company also remains on track to deliver a low power 65nm process by Q1 2006, quickly followed by the generic 65nm process.

The Common Platform provided by Chartered, IBM and Samsung now makes available a comprehensive design-for-manufacturability (DFM) offering. Increased manufacturing awareness and the need for predictability in the manufacturing process are 'must-haves' when dealing with 90nm and smaller technologies. Chartered, IBM and Samsung brought together their customers as well as industry leaders in EDA and DFM to develop a set of rules, models and actual data from silicon production. This information allows their customer to design for optimal use of the advanced manufacturing capability.

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The need for an integrated and 'fab-transferable' foundry service is quite evident as the Chartered/IBM Common Platform concept really begins to gain momentum. More than just a joint technology development effort, the goal of the Common Platform is to expand foundry customers' flexibility to source designs among the manufacturing facilities of Samsung, IBM and Chartered.

The concept is getting huge endorsements from partners and major players from all segments of the semiconductor supply chain. All the major partners were there, i.e. AMD, IBM, Infineon, Samsung, Cadence, Mentor Graphics, Toppan Photomasks, TCE, Amkor, Stat/Chippac, and others.

Semico believes the open access and transferability of the process and the additional tools makes this foundry package very attractive to the all the partners. As Semico pointed out at the Semico Outlook conference two weeks ago, these partnerships and new services are facilitating the continuance and expansion of the foundry model. Fabless, as well as IDM companies, see the value in foundry services that provide options and flexibility.

[Joanne Itow](#), *Managing Director*

### ***A Revolutionary Materials Printing System***

Dimatix, Inc., Santa Clara, CA, has introduced a materials printing system, the DMP-2800 Series, so simple that it is elegant. Basically, it is an ink jet printer; but this isn't your PC's ink jet printer. The Dimatix unit will print very fine lines on a wide variety of materials using complex organic, inorganic or metallic fluids. It is capable of depositing micro-droplets as small as 10 picoliters to achieve line-widths as fine as 50 microns. This is going to generate countless new applications.

Thick film circuits, printed circuit boards and other electronics products have long been

manufactured using high technology versions of either the printing press or the same silk screening process used to make T-shirts. Finally, a more advanced technology has arrived, allowing materials printing to advance beyond the limitations of those old printing methods. The Dimatix ink-jet printer can print using fluids, silver conductive fluids as an example, which either could not be used with older processes or could be used only with great difficulty.

The Dimatix printer's print head contains a module manufactured using MEMS components taken from three wafers, manufactured separately and then bonded together. The bottom MEMS component has the ink jet nozzles. The middle MEMS component has the passages that convey the printing fluid from a reservoir to the nozzles. The top component has a membrane, which is activated by Piezo effect to generate an acoustic wave that forces the printing fluid through the nozzles.

The Dimatix 2800 Series has other advantages. It uses an additive process, not a subtractive process, resulting in significant cost savings because less material is used. The Dimatix system is far less messy than older systems. Clean-up is simple and easy. The system is completely computer controlled. There are no switches or knobs on the printer. The printing pattern is determined by software, so the system can be switched from one job to another simply by changing the program on a pull down menu. Clean up between jobs is minimal or non-existent.

The Dimatix ink-jet printer is finding immediate applications in display manufacturing, electronic circuits and backplanes and ink-jet printed DNA micro arrays. Other applications will follow.

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Some of the most interesting technology advances are the ones that are the result of someone taking a well known process and expanding it in an unexpected direction. The Dimatix material printing system is an example. The ink jet printing process is well known, but who thought of using it to print conductive patterns or organic testing patterns? When someone did, the result is a technology with significant potential for use in a wide variety of completely new applications.

Dimatix has gone to a great deal of trouble to make sure that the 2800 Series materials printing system can be set up and used with a minimum of training and fuss. It is an autonomous printing unit that could easily be used as a part of a piece of production gear or integrated into a production line. It will be interesting to see what applications will emerge.

[Morry Marshall](#), VP of Strategic Technologies

### ***Nokia Milestones Prove Cell Phones' Strength***

In a recent press release Nokia announced the following intriguing facts:

- Nokia shipped its billionth cell handset early this summer.
- There are now two billion cell service customers worldwide.

- Nokia has introduced around 400 cell phone models since its initial Mobira Senator car phone introduction in 1982.
- The Nokia 3310 / 3330 which the company boasts is: "the world's best-selling phone" sold 126 million units from its launch in 2000 until its "retirement" earlier this year. By comparison, the combined total of all Nokia phones sold between 1991 and 1998 is 100 million. If they were all laid end-to-end, the line would stretch from Helsinki, Finland to Santiago, Chile - over 13,500 kilometers.
- In 1991 Nokia sold 800,000 phones. In 2004, it manufactured 207.7 million phones, which equals 6.5 phones per second.
- Nokia consumes 100 billion components on annual level. On average, one phone includes up to 400 components.

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Semico realizes that many of our clients who are suppliers provide Nokia with many of those 400 components per cell phone, and we realize that this is a very critical business for them. We are pleased to note that the current strength in the cell handset market encouraged us to update our unit shipment forecast recently, a fact that our MAP model clients may have already noticed.

[Jim Handy](#), Director Nonvolatile Memory Services

### ***New STAKTEK Technology Improves DRAM Module Density and Cooling***

[Staktek Holdings Inc.](#) announced on Thursday September 22, 2005 a new high-density module technology, ArctiCore. This technology mounts DRAM on a flex-circuit that is then wrapped around one edge of an aluminum core and adhered onto two opposite sides of the core. The result is a DRAM DIMM thinner than a conventional DIMM but with nearly double the amount of potential mounting area, enabling higher-capacity modules with greatly increased cooling capability.

The increased cooling capability is a major advantage of the ArctiCore technology. The aluminum core is a heat sink. In addition, because they are thinner than conventional modules, there is more room for cooling air flow between ArctiCore modules mounted on standard centers. (Alternatively, ArctiCore modules can be mounted closer together, increasing memory capacity in a given area.) The aluminum core also adds mechanical strength, reducing the possibility of failures caused by handling during module insertion.

There are several variations of ArctiCore modules to accommodate different size DRAM chips or to provide different memory capacities. With one minor exception, all of the modules meet JEDEC standards for DRAM modules and fit in standard DRAM module sockets. The exception is a thermally enhanced version that is slightly taller than the JEDEC standard. The extra height is used to add a finned extension of the aluminum core heat sink, further increasing cooling ability in applications where height is not a limiting factor. Exactly the same flex circuit assembly is used on both the standard height module and the taller thermally enhanced version; the aluminum core is the only difference.

Staktek will either license the ArctiCore technology to other companies or manufacture ArctiCore DIMMs as a part of their services business in support of their customers' needs.

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The amount of memory in servers and workstations keeps increasing while the size of the boxes decreases. More heat is being shoved into a smaller box. Something has to give. The ArctiCore technology is an ingenious solution, which has the potential to make a significant dent in this problem. It is important to understand that this is a system solution. Although there will be a slight price premium for ArctiCore DRAM modules; there will be a sizeable system cost reduction, with the added benefit of increased reliability. Smart DRAM module manufacturers or OEMs using DRAM modules will quickly recognize the system level advantages and act accordingly.

[Morry Marshall](#), VP Strategic Technologies

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