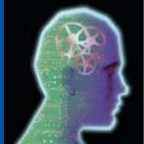




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On the  
Forefront

E. Jan Vardaman

# China: Still the Hot Spot for High Technology

**China's electronics and semiconductor industries continue to grow, as do trade frictions.**

According to Semiconductor Equipment and Materials International (SEMI), the 14<sup>th</sup> annual SEMICON China, held in Shanghai in March, drew a large crowd of more than 15,000 attendees. The increased number of exhibitors—10% more than 2003—illustrates the importance of China in the semiconductor industry, especially the country's sales of semiconductor production equipment and consumption of material.

## China's Electronics Industry Drives Growth

China is the fourth largest manufacturing country in the world. Gross domestic product (GDP) growth has been reported as high as 9% in 2003, and expansion continues. China's Ministry of Information Industry (MII) reported that electronics sales were \$226.5 billion in 2003, an increase of 34% from the previous year. Exports accounted for one-third of the total.

China is the world's fourth-largest automotive producer. Its growing automotive market reached \$6.65 billion in 2003. Delphi Corp. is expanding its presence in Suzhou, China, by investing \$40.5 million in two new manufacturing centers. In December 2003, Delphi announced it was investing \$50 million in a new research and development center in Shanghai.<sup>1</sup>

China's MII projects that personal computer (PC) production will exceed 30 million units in 2004. China has already passed Japan as the world's second largest PC market. China's information technology (IT) industry is projected to spend \$2 billion on equipment purchases. Domestic sales of more than 70 million mobile phones are projected for 2004, and the share of domestic mobile phone makers continues to grow. The latest Chinese phone

models include advanced semiconductor packaging technology such as stacked die chip-scale packages (CSPs) and camera modules.

## Growth of China's Semiconductor Industry

China's semiconductor market reached \$25 billion in 2003. Production of integrated circuits (ICs) was estimated at 12.41 billion units. With domestic production meeting only 20% of the total demand for semiconductors, the Chinese government continues to encourage investment in the semiconductor sector. The Ministry of Information Industry reports that China will invest \$10 billion in the semiconductor industry by 2005.

Data released by SEMI and the Semiconductor Equipment Association of Japan (SEAJ) shows that the market for new semiconductor equipment in China reached \$1.16 billion in 2003. The market is expected to experience continued growth, according to Stan Myers, president and chief executive officer (CEO) of SEMI.

Not only is consumption of materials growing, but an increasing number of suppliers for leadframes, bonding wire, mold compounds, underfill materials, liquid encapsulants and die attach materials have man-

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ufacturing facilities in China, according to the Global Semiconductor Packaging Materials Outlook, available from SEMI. Expansion of IC packaging and assembly facilities in China continues for both captive semiconductor makers and contract service providers.

According to the China Academy of Electronics Sciences, 651 enterprises and 120,000 people comprise China's semiconductor industry, and expansion continues.<sup>2</sup> Thirteen companies already have 200 mm (8-in.) fabs in China.

Semiconductor Manufacturing International Corporation (SMIC) just issued its IPO in March and, despite litigation from TSMC concerning trade secrets, is poised to grow rapidly. SMIC's foundry service features 200 mm wafer production lines and the addition of a 300 mm (12-in.) fab. The foundry prides itself on protection of customers' intellectual property (IP), an important concern to companies worried about IP protection in China.

### Will Trade Friction Dampen China's Prospects?

The U.S. has filed a complaint to the World Trade Organization (WTO), of which China became a member in December 2001. In an effort to protect its growing domestic industry, China imposes a 17% tax on

semiconductors sold in China, but devices made in China receive a 14% rebate. The rebate is scheduled to last until 2010. While it is not clear that China will make changes in its policy, tension is mounting.

### China's Growing Role

China's role in the Asian economy is central to the region's economic health. In 2003, exports to China from Korea, Singapore and Malaysia grew 50%. Exports from Japan increased 40%. Concern about China's financial situation exists, covering aspects ranging from banking loans to currency revaluation.<sup>3</sup> China's role in the world economy has become so interlinked that, should China catch cold, the rest of the world may catch pneumonia. ■

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