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Global Business Ideas and Information for Managers and Test Engineers

An Agilent Quarterly Newsletter

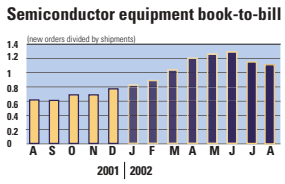
Winter 2003

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Inside:

New Outsource Management Training
SOC: Consider the Total Investment Picture
SOC: What Convergence Means for Mixed Signal
Parametric: New Test System Meets Challenges
Memory: Higher Throughput Rate for Flash Memory
Customer Support: Questions Customers Ask
Customer Service: New Fabless Support Program
International:A Boom in the LCD Market
Photos from SEMICON/Japan
Global Calendar

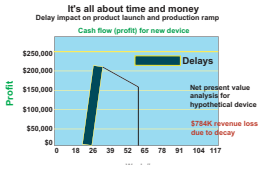
News and Views — Semiconductor market to grow 12% in 2003



Predictions are that the worldwide semiconductor market will post double-digit growth in 2003 — a 12 percent increase from 2002. In other news, semiconductor capital spending is expected to increase, the PC market is expected to grow, and Taiwan's trade surplus is expanding.

View entire article

Products: SOC —Consider the total investment picture in a product launch



To really ensure that the product gets to the market on time, it may be better to think about the overall product launch investment — rather than individual components. It's all about time and money — your company's time and money and your product launch success.

View entire article

Products: SOC — What convergence means for mixed-signal test



Convergence is finally happening in the consumer electronics space and is one of the biggest trends in the high-tech world today. These converged, broadband devices are being shaped by cost pressures. It is imperative to keep the cost of test under control, with sacrificing quality.

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Products: Parametric — New test systems address advanced device challenges



All over the world, leading-edge technology companies are struggling with the challenges of moving advanced process technologies from R&D into production to meet market needs for both higher speed devices and lower power devices. But there are some challenges.

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Products: Memory —Higher throughput rate for flash memory devices



A new tester interface by Agilent optimizes a system to more cost-effectively test flash memory devices and enables the highest throughput rate for the final test of high-volume memory devices. Production volume for NAND flash memory should rise dramatically.

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Customer Service —Questions Agilent's customers are asking



How is Agilent addressing the crucial handoff of the design to manufacturing when fabless? Can Agilent support fabless/SCM manufacturers better than its competitors? Can Agilent handle production support needs in Asia? These are some of the questions customers are asking. View entire article

Customer Support — Agilent has new fabless/SCM integrated support program



Agilent has introduced the new Fabless/SCM Services Program. It is a targeted, flexible solution that paves the way for a smooth transition from design and fabrication through ramp-up and mass production of devices — a comprehensive contractual support services package.

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International: Japan— A boom in the compact LCD market



Production volume in Japan has been soaring for high-performance color liquid crystal displays (LCDs) for cell phones. Some Japanese manufacturers have been overwhelmed with orders for the latest vivid-color models. ALSO: photos of SEMICON/Japan.

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Global calendar — Worldwide events



A partial listing of semiconductor events worldwide, as well as contact information for go/semiconductor global offices.

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Stories begin on next page



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News and Views

Forecast: Semiconductor market to grow 12 percent in 2003

The worldwide semiconductor market is forecast to post double-digit growth in 2003 with revenue totaling $171.8 billion, a 12.1 percent increase from 2002 estimates, according to Dataquest Inc., a San Jose-based unit of the research firm Gartner Inc.

In 2001, worldwide semiconductor revenue totaled $152.5 billion, a 32 percent decline from 2000. This year, the market is beginning to see signs of recovery, as revenue is projected to reach $153.3 billion, a 0.5 percent increase from 2001, Dataquest said.

"The semiconductor market recovery in 2002 has progressed as expected, with strong growth in the first half of 2002 as inventories were replenished, and weaker growth in the second half of the year," said Richard Gordon, principal analyst for Dataquest's semiconductor research group.

"Although semiconductor sales in the third quarter of 2002 held up reasonably well, benefiting from a degree of seasonal strength, that strength has not carried forward into the fourth quarter and highlights the poor state of electronic equipment production," Gordon said.

The worldwide digital cellular handset market is one of the few bright spots in the semiconductor industry and is driven primarily by a replacement cycle as the industry shifts from second generation (also called 2G) to 2.5 generation (2.5G) cellular, which is good news for semiconductor vendors as the shift increases demand for silicon on rich handsets, according to Dataquest.

While PC unit production growth has stalled in 2002, a corporate PC replacement cycle is becoming overdue and can't be put off much longer, the analysts say.

"A broader-based recovery in electronic equipment production, especially in the wired communications segment, is unlikely to begin until 2004, suggesting a limited impact on semiconductor sales in 2003," Gordon said. "2003 is forecast to be a transition year, as a phased recovery in end markets gradually works its way back to fuel incremental semiconductor sales growth."

Source: 2002 American City Business Journals Inc.

Taiwan: trade surplus grows

Taiwan's exports exceeded its imports by $18.05 billion in 2002, the island's largest surplus since 1987, as exports to China surged. Most of the exports went by way of Hong Kong, because China and Taiwan still do not permit direct air and shipping links. In a sign of Taiwan's dependence on high-tech manufacturing, its exports of computer and communications equipment and other electronic gear to all countries amounted to $70.66 billion of the $130.64 billion in total exports last year.

Source: New York Times

DID YOU ? KNOW



Top 10 U.S. cosmetic surgeries for men

These days even the self-made man is revamping his image. A third of all nose jobs and one in five liposuctions and breast reductions are performed on men. Add nonsurgical procedures like Botox injections to the mix, and nearly a million men had work done in 2001 – more than 17 times the number that did a decade ago. The top ten are:

Nose job
Liposuction
Eyelid surgery
Hair transplant
Breast reduction
Ear pinning or bobbing
Face-lift
Chin augmentation
Forehead lift
Cheek implants

Sources: American Academy of Facial Plastic Surgery

more news on next page

Semiconductor capital spending seen increasing in 2003

After two years of negative growth, worldwide semiconductor capital spending and wafer fab equipment spending will return to double-digit growth in 2003, predicts Dataquest Inc., a San Jose-based unit of the research firm Gartner Inc.

Worldwide semiconductor capital spending is projected to grow 15 percent in 2003 to $32 billion, up from $27.8 billion in 2002, Dataquest says. Worldwide wafer fab equipment spending is expected to total $18.5 billion, a 16 percent increase from 2002 revenue of $15.9 billion, it says.

"Spending will be driven by a continued need for advanced technology to keep innovation going and manufacturing costs down, and a renewed need for more capacity," says Klaus Rinnen, chief analyst and director of Gartner Dataquest's semiconductor manufacturing group. "Fab utilization worldwide has been improving since the end of 2001. Leading-edge capacity exceeded 90 percent periodically during 2002 and future improvements in end-user demand will map quickly into further capacity needs."

The leading-edge utilization rate is the primary trigger for capacity spending. There is much less capacity available at the leading-edge process technologies, so small increases in demand will have a large effect on utilization, Dataquest explains.

Gartner Dataquest analysts say that in 2003 the industry needs continued strength in consumer and governmental spending as a foundation for growth, but a corporate spending return is a must to drive demand improvements.

"While there is an absence of a driving killer application and a catalyst to incite an end-user spending spree, the temporal expanse of depressed spending is creating pent-up demand," Mr. Rinnen says. "Spending will be more at corporations' discretion, but there are competitive elements that could exert pressure on corporations once the wave starts."

Source: 2002 American Business Journal

PC market uptick predicted

Strong public sector spending and continued improvement in the consumer market are the reasons that Framingham, Mass.-based research company IDC is forecasting more than 8 percent growth in 2003.

In 2003 and beyond, IDC says it continues to expect improvement in the business and consumer sectors, while government spending will slow to reflect reduced budgets. Risks from economic and political factors may also constrain future growth, although IDC projects shipment growth of 8.3 percent in 2003 and 11 percent in 2004 before shipments slow again.

"We continue to expect slow worldwide PC shipment growth for the next several quarters, before the market accelerates in the latter half of 2003," says Loren Loverde of IDC. "While business spending has been slow to recover, we believe it will pick up in the first half of 2003, and market drivers like portable adoption, wireless networking, broadband adoption, new designs, and media convergence… will support moderate growth."

Source: Business Journal

China: Auto Venture

General Motors and its main Chinese joint venture partner signed a $108 million agreement to take control of an auto production factory in Yantai, in northeastern China. The plant will become G.M.'s fourth production plant in China. G.M. has had rapid sales growth at its main China plant in Shanghai, where it makes an executive sedan and a minivan, and has added capacity to produce family cars and other vehicles at separate facilities around the country.

Source: New York Times

DID YOU ? KNOW



Russians urge consideration as software region

Silicon Valley companies should consider Russia as a place to outsource software development, according to speakers at a forum in Silicon Valley in November.

The forum was co-sponsored by the Technology U.S.-Russia Roundtable, chip maker Intel Corp. of Santa Clara, and Rus-Soft, a Russian software company.

Russia has as many engineers per 1 million population as the U.S., but the labor costs to hire them are just 20 percent to 25 percent of what they are in the U.S., speakers said.

However, Russia should not be viewed by U.S. firms just as a source of cheap labor but as a market to sell into, says Richard Lane, a researcher at Aberdeen Group, who spoke at the conference.

The technology roundtable was an outgrowth of a summit meeting last May between President George W. Bush and Russian President Vladimir Putin.

Source: American Business Journal



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Products: System--on-a-Chip

Considering the total investment picture in a product launch

Sometimes it's simply better business economics to make a long-range rather than a short-term decision. Take testing of high-speed devices and ATE DUT Boards (loadboards), for example.

ATE DUT Boards used to be relatively easy to construct with resulting low cost, but today they are becoming more complicated as pin counts and clocking speeds increase. For high-speed devices, testing requires more sophisticated design, more expensive materials and processing, and more complex engineering than was needed four or five years ago.

To best ensure that the product gets to market on time, it may be better to think about the overall product launch investment rather than individual component economies.

A 10 GBps SerDes device, for example, may require less than 40 ps rise times. This is at the limits of most benchtop BERT and DCA systems, let alone ATE systems.

To meet the new high-speed requirements, a DUT Board, such as illustrated in figure 1, may be required. This deceptively simple DUT Board required extensive engineering and very high performance (but expensive) components to achieve the required 35 ps rise time for testing a 10GBps SerDes device on the 93000 SOC platform. Such kinds of boards can exceed $15K in material costs and upward of $15K in engineering charges in order to meet today's test requirements. This will come as quite a shock to anyone accustomed to only spending $5K for a board and less than $3K for a PCB layout service.

Along with these increased testing demands, product life cycles have become even shorter, thus creating even greater pressures to get a new product to market as fast as possible.

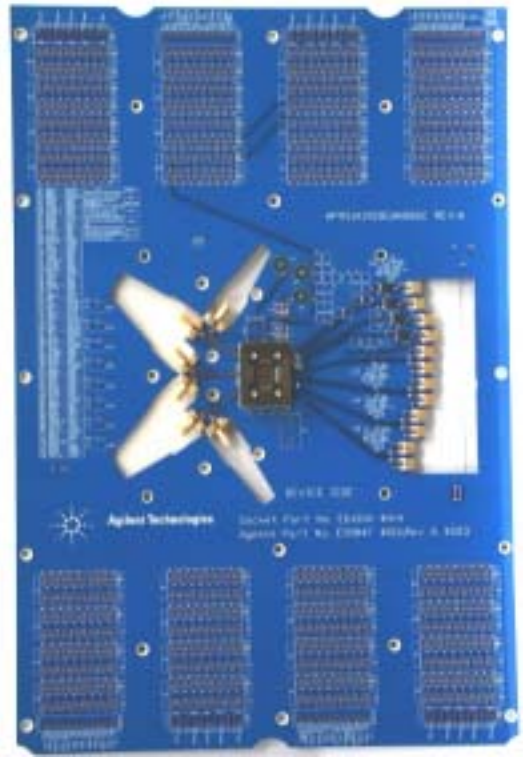


Figure 1

DID YOU ? KNOW



Ski jumps

How's this for the latest in ski jumps? A new Bergisel jump in Innsbruck, Austria meets World Cup specs, and also stands as a breathtaking landmark. Clad in concrete, glass and stainless steel, the new space-age tower is a $4.3 million structure. It doubles as a viewing platform, where spectators can sip lattes, enjoy the view, and watch flying creatures of all species.

Source: Wired magazine

To best ensure that the product gets to market on time, it may be better to think about the overall product launch investment rather than individual manufacturing component economies.

Low cost is not always the best

It would be easy to decide to buy a $5K DUT board, rationalizing that it only will be needed for a product for just a few months. But when it comes to testing that product, and one discovers limitations in testing capabilities, time-to-market is delayed. If there are breakdowns and delays in product introductions, that short-term $5K decision may not be the wisest one to make.

Why buy a more expensive test interface? Because testing the product right, even if it has a short life cycle, requires ensuring that these complex devices are tested as efficiently and correctly as possible — the first time around. While the cost of DUT interface hardware could run from $20K to $35K, in the long-term your company may save a million dollars because you got your product to market on time.

A delay in the product launch and therefore the product ramp-up time can result in considerable revenue losses.

Consider this example on a product launch and the resulting product ramp. And, keep in mind that a DUT Board project is not an isolated activity.

As illustrated in the figure 2, let us consider a net present value analysis of a hypothetical device, assuming:

- Shipping at 500,000 devices a month
- Nine months of production life
- $20 device average selling price at 10 percent profit
- 30 percent/year price erosion
- 16 percent discount rate.

Two scenarios were considered: one with an on-time launch, and the second with a four-week delay. The financial result of a four-week delay is a $784,000 revenue loss.

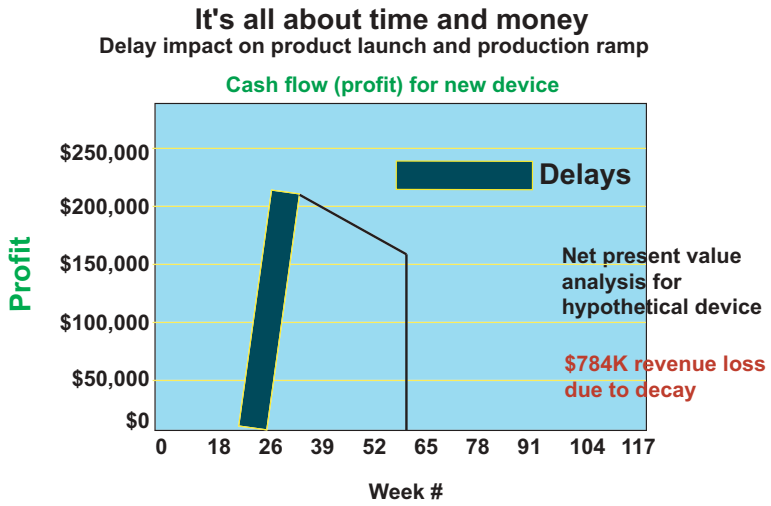


Figure 2

A similar delay for your product could result in a multi-million dollar risk – or even a business failure. The DUT Board is just part of the cost of getting a product to market, but a critical component. If delays occur during the testing period, product sales could disappear.

So keep in mind the following principles:

- Establish the importance of treating a DUT Board with the same seriousness as any other test and manufacturing component in your business.
- Keep in mind that selecting a solid ATE platform is just one component that helps get your product to market on time – long-range economic decisions also come into play with the interface components. You don't want to jeopardize millions of dollars by a late introduction to market.

Agilent's role

Agilent's experience is that there is no room for schedule slop or mistakes.

Agilent provides DUT Board support for the 93000 SOC system, and qualifies other third party vendors to support the 93000 system. This may prove useful to your next high-speed DUT Board activity. It's all about time and money — your company's time and money and your product launch success.

For more information about the Agilent 93000 SOC Series, visit our website at:
www.agilent.com/see/93000wlan



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Products: System--on-a-Chip

Wireless and consumer convergent SOCs: What it means for mixed-signal test

By Tom Vana and Don Blair
Agilent Technologies

Editor's Note: *This is a condensed version of an article appearing in the January issue of Evaluation Engineering.*

After being talked about for years, convergence is finally happening in the consumer electronics space and is one the biggest trends in the high tech world today. Voice, audio, video, and data services are being converged in a wide range of consumer applications, such as 2.5G/3G handsets and next-generation residential gateway and digital set-top boxes.

It is imperative to keep the cost of test under control without sacrificing the quality of test.

In the mobile space, 3G cellular with its high data rates will be able to support data (e-mail and Web surfing), location, video, and audio services on top of current voice services. Similarly, within the home/SOHO it is not unusual to find cable, satellite and/or terrestrial video, audio and data coming into the residence along with CD, DVD, and MPEG content from a variety of sources, including digital still and digital video cameras (figure 1). With all this converged information cascading into and through the home, the set-top box seems the most likely candidate for becoming the central device to manage the content and distribute it throughout the home.

One of the key enablers of these convergent devices in the home/SOHO and mobile appliances is the emergence of mixed-signal SOCs. However, this does create some interesting challenges for test—specifically for IC test. These converged, broadband devices are being shaped by higher integration levels, increased performance driven by higher data rates and new multimedia applications, and most importantly, cost pressures. That is why it is imperative to keep the cost of test under control without, of course, sacrificing the quality of test.

Complex Mixed Signal ICs

As these converged consumer systems come to the fore, the underlying circuitry is beginning to incorporate sophisticated mixed-signal capabilities to support all the broadband content. But prices must be kept as low as possible to appeal to a mass consumer audience. This is leading to an

Figure 1: Here are some of the many different convergent input sources to the home/SOHO today.



DID YOU ? KNOW



HEADLINES IN 2035....

Ozone created by electric cars now killing millions in the seventh largest country in the world, California.

Baby conceived naturally.... Scientists stumped.

Authentic year 2000 "chad" sells at Sotheby's for $4.6 million.

Castro finally dies at age 112; Cuban cigars can now be imported legally, but President Chelsea Clinton has banned all smoking.

George Z. Bush says he will run for President in 2036.

35 year study: diet and exercise is the key to weight loss.

Texas executes last remaining citizen.

Upcoming NFL draft likely to focus on use of mutants.

Average height of NBA players now nine feet, seven inches.

Microsoft announces it has perfected its newest version of Windows so it crashes BEFORE installation is completed.

aggressive push for integration, where stand-alone chipsets are being merged into a few or even a single SOC.

To save on development costs and to hedge their bets as the market unfolds, several SOC vendors today are creating converged ICs that include a wide range of computational, communication, and entertainment functionality. The devices require all these capabilities because their job is to obtain content from a variety of communication methods and protocols, decode that content and then display, distribute or store the content.

Although these SOCs will be used in a variety of applications—digital set-top boxes, cellular handsets, and advanced PDAs—it should come as no surprise that they share remarkably similar architectures. The common denominator is that they all include the ability to encode/decode, and then display, distribute, and store convergent voice, video, audio, and data. To that end, these SOCs contain an assortment of IP blocks including logic cores, memories, embedded processors, and a range of mixed-signal and RF cores to support voice, video, audio and data communications.

Any or all of these IP blocks could be integrated on the SOC. For example, the typical digital set-top box architecture can be divided into three functions: channel decode (tuner/demodulation/FEC), source decode (demux and decode the content MPEG, audio, VoIP, JPEG, data), and distribution (to the display, speakers, PDA, PC, or storage medium) (Figure 2).

Figure 2 This block diagram illustrates the many different functions being incorporated into next-generation, broadband set top box architectures.

To drive down the manufacturing cost of these set-top boxes, the trend is toward capturing their functionality on fewer chips. One possible architecture is a front-end chip that integrates the tuner and ADC/demodulator, and a back-end IC that supports MPEG, graphics, the core processors, peripherals, and busses. Other possible IP blocks could include:

- NTSC/PAL encoder
- Bluetooth
- WLAN 802.11
- Dolby AC-3
- DVI
- IEEE1394 (FireWire)
- I2C
- RS-232
- PCMCIA interface
- USB port
- PCI
- ATA (IDE)

From an SOC perspective, a 3G Baseband IC architecture mirrors that of a digital set-top box IC (Figure 3). The 3G chipset can contain integrated GPS and Bluetooth transceivers, as well as various cellular modes and bands. But it is the critical baseband processor SOC that can incorporate everything from the analog I/Q interface to the DSP and MCU.

Until recently, many baseband processor designs comprised two separate blocks: an analog baseband section, and a DSP/MCU section. Lately, the trend is to integrate the two sections into a single-chip baseband processor with both analog data converters

Figure 3. This block diagram is representative of a high-integration 3G baseband SOC. Although there are currently many variations, this is a typical example of the levels of integration achieved in these SOCs.

To drive down the manufacturing cost of set-top boxes, the trend is toward capturing their functionality on fewer chips.

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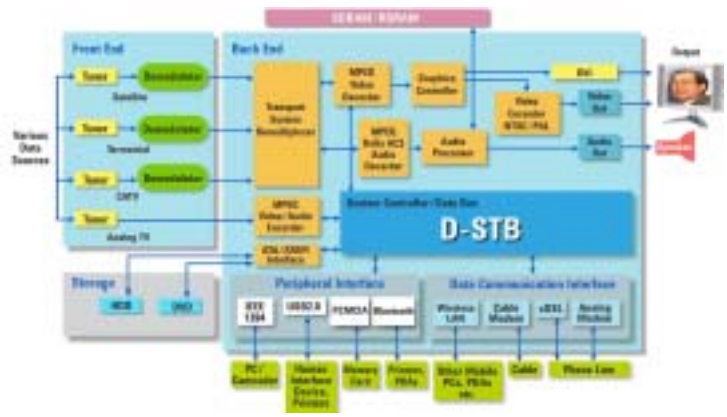


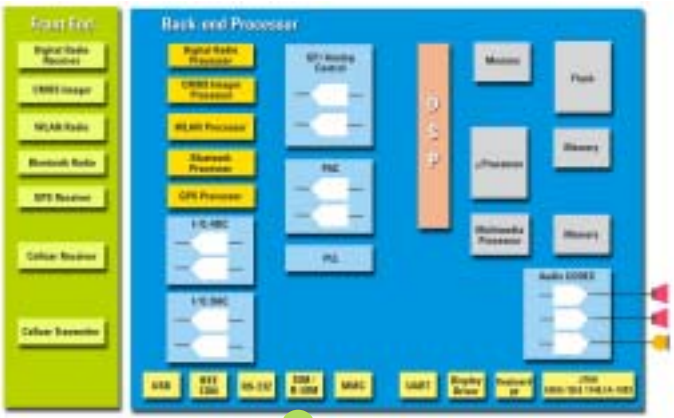
How well grandfather ate linked to diseases

The grandchildren of men who grew up when food was abundant may be at an increased risk of developing diseases linked to overeating such as heart disease and diabetes, researchers have found.

A group of scientists at the Umea University in Sweden looked at offspring of people born in 1890 and 1920 and found those whose grandfathers had been exposed to plenty of food were more likely to develop diabetes and heart disease.

The researchers speculated that the abundance or shortage of food early in life may affect genes involved in metabolism.





and DSP/MCU processors. There is also potential for more embedded memory and RF circuitry to be integrated in the future.

Challenging IC testing requirements

Given that these converged SOCs are highly elastic in the capabilities they will provide, the exact test requirements are a function of the IP blocks integrated, the test strategies defined by the engineering staff, and cost of test pressures. But there is no doubt that these converged SOCs will require the full gamut of testing capabilities—from RF and mixed signal to high-speed digital, memory, and scan test.

To test the various IP blocks using traditional ATE equipment requires multiple insertions utilizing multiple point solution testers. This is obviously not a cost-effective approach for consumer-oriented devices. To keep test cost under control, the optimal solution is to use one test platform that provides the full range of test resources. Creating and maintaining one test program for a single platform is much less expensive than having to deal with multiple test programs and platforms. Moreover, the use of one tester offers the opportunity to test IP blocks in parallel, opening the way for higher levels of concurrent test, and test-time efficiencies. In fact, IP test blocks will probably become part of the "package" when the IP blocks are bought and sold.

A true SOC tester requires high flexibility: It must meet mixed-signal requirements, SCAN vector depths and speeds, as well as channel speeds to test the range of digital I/O clock and data rates now being integrated on-chip. Advanced analog and RF performance along with embedded memory test capabilities are required. The challenge for test vendors is to offer an architecture that is advanced yet flexible and also to keep ahead of the performance and cost of test demands these new consumer devices will need.

Testing a set-top box SOC

With all that in mind, let's take a closer look at the detailed IC test requirements for these converged consumer ICs. Since the architectures for these devices are very similar, the following discussion will focus on a representative chip set for a converged digital set-top box that is intended to function as a residential server (Figure 2).

Flexibility for today and tomorrow

Besides supplying a comprehensive range of test resources for converged SOCs, an SOC tester needs to provide true port scalability. Port scalability enables the test engineer to scale test resources to test needs: placing fast digital pins where they are needed and deep memory where required, while populating the remaining pins with lower speed/memory resources, helping to achieve more cost-effective test.

Looking into the future as the converged consumer market evolves and matures, the test platform will also need the flexibility to keep pace—it must have leading-edge capabilities for a wide range of SOC testing requirements. Essentially, a convergence of test platforms needs to occur, with a single SOC platform offering the combined test capabilities for the convergent SOC market. Such a test platform would offer the flexibility and capabilities needed to successfully address converged SOC device testing both from a technical standpoint and from a cost of test perspective.

As this market becomes more established, new requirements will undoubtedly emerge and the SOC capabilities will be enlarged to accommodate those needs. So too, the converged test platform will need to evolve. If the SOC test platform can easily extend to support these new requirements—more analog and RF, higher speed analog and digital, as well as increased pin counts—it will prove much more cost effective than having to migrate to a completely new platform or multiple platforms to keep up with the evolution of these convergence devices.

DID YOU ? KNOW



Half the world has never made a phone call.

That may have been true a few years ago, but figures are rapidly changing.

The International Telecommunication Union estimates that there were 689 million landlines in 1995 and a few more than 1 billion by 2001. This amounts to an average growth rate of slightly more than 7 percent. Put another way, half as many landlines were laid in the last six years of the 20th century as in the whole previous history of the world.

The growth rate is even higher if you focus on the developing world. China alone went from 41 million landlines to 179 million during those six years. Nine others tripled their hardwired telephone infrastructure. And 35 others — including India, Indonesia and Brazil — doubled the number of landlines.

The global population was also rising, but not as fast. Between 1995 and 2001, the world population rose by about 8 percent, while in developing countries the number of landlines rose by 130 percent, and cellular subscribers by more than 2,300 percent.

If we assume the original guess of half of the world never made a call was right in 1994, the revised estimate of the percentage of people in the world who have placed a phone call would be around two-thirds – and rapidly rising.

Source: Wired magazine



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Products: Parametric

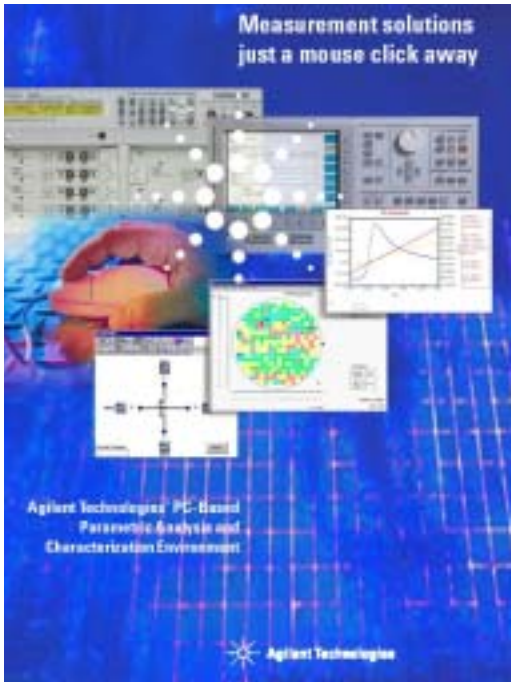
New Parametric Test Systems address advanced device challenges

Nearly 40 years have passed since Moore's Law was first enunciated. This observation has held true to the present, even as feature sizes have moved from the micrometer range to the nanometer range. Pessimists predicted that process and device issues would have brought Moore's Law to a halt by now; however, diligent R&D efforts over the last few years have conquered most of these challenges. Now it appears that we have a fairly clear view of advanced process roadmaps through at least the year 2010 according to the latest news releases. Nevertheless, the companies involved in this development work need to overcome some hurdles in order to turn these advanced laboratory devices into manufacturable products.

Leading-edge technology companies are struggling with the challenges of moving advanced process technologies from R&D into production to meet market needs.

Technology challenges

Researchers are currently examining with keen interest copper metalization schemes, low-K materials such as SiOF, SiOC, or next-generation devices with dielectric constants under 3.0. All over the world, leading-edge technology companies are struggling with the challenges of moving these advanced process technologies from R&D into production in order to meet market needs for both higher speed devices and lower power devices. However, these new materials typically require longer parametric test times than traditional materials, and multi-level interconnect schemes need more inter-layer capacitance measurements as well. These factors work against the goals of increased throughput and faster time to market.



Besides the low-K material, one of the main technical arenas for SOC test is the evaluation of gate dielectric materials with recent finer process technologies or High-K materials. Basically there are two types of gate dielectrics with different uses. One is used

DID YOU ? KNOW

Honesty, integrity are top leadership traits

What employees want most from their business leaders are basic principles in practice such as honesty, integrity, ethics and caring, according to the results of a survey conducted by Right Management Consultants.

"Employees today are looking for strength of character in their leaders," says Chris Pierce-Cooke, director of Right's organizational consulting practice.

Pierce-Cooke noted an irony in the results of the study. "Employees are confronted with continued layoffs, a spotty recovery and three years of stock market declines. But they are not looking for leaders with a magic wand or a quick fix. Instead, they seem to be yearning for fundamental leadership principles, lessons on honesty and goodness that they were more likely to have been learned in elementary school than in business or law school."

Right based its results on a survey of 570 full-time, white-collar employees in the United States.

Source: Silicon Valley Business Journal

to create thinner gates to achieve higher speed, and the other is used to make the gate thicker to avoid leakage current and achieve lower power consumption. Moreover, it is also suggested that some logic devices require both gate types and multiple Vth to achieve lower leakage current when the devices are active. Of course, process monitoring and its tuning are more important than usual in these cases in order to make these multiple gate dielectrics in one process.

Production challenges

For these new advanced process technologies, it is extremely important to feed parametric test data taken under production test conditions back to the wafer fab in a timely manner. This enables process engineers to modify the process recipe quickly, resulting in both improved yields and faster time to market. Agilent Technologies' parametric test solutions continue to meet these challenges and to provide users with consistently accurate and highly automated test solutions for better process monitoring.

New Agilent 4072B and 4073B advanced parametric testers

The new 4072B and 4073B testers, recently shown at Semicon Japan 2002, dramatically improve capacitance measurement capability. The 4072B and 4073B have a high-speed capacitance meter embedded in the test head, which provides three times faster capacitance measurement speeds than can be obtained using the previous-generation 4072A and 4073A. Agilent has primarily focused on improving capacitance measurement speed because newer advanced processes typically require a larger percentage of capacitance measurements in production test relative to the past. In addition, enhancements to the 4072B and 4073B firmware and hardware improve current measurement throughput for the 1 mA and above ranges by 20 percent. Overall, most customers will likely see about 40 percent higher throughput using the 4072B and 4073B versus the 4072A and 4073A due to the improved capacitance and current measurement capabilities. This throughput improvement enables you to either to reduce your test times, or to keep your test times the same but increase the amount of detailed device evaluation that you perform.



Agilent's 4070 Series: The latest 4072B and 4073B provide capability for ultra low current and voltage measurement and capacitance measurement with fast throughput.

The 4072B and 4073B are also fully software compatible with the previous-generation 4072A and 4073A. Test engineers can use the same test programs and measurement algorithms that they used in previous-generation 4070 Series testers running under Agilent SPECS or SPECS-FA on the 4072B and 4073B without modification. This reduces the switching costs associated with upgrading to a new hardware platform.

"It is our mission to anticipate future technical trends and to develop the products needed to meet these challenges," said Masaki Yamamoto, R&D manager of Agilent's Hachioji Semiconductor Test Division. "The latest Agilent 4072B and 4073B provide the capability for ultra low current and voltage measurement and capacitance measurement with very fast throughput. In addition, the ability to re-use test plans and algorithms developed on previous-generation 4070 Series testers is an important feature."

The new Agilent 4072B/4073B Advanced Parametric Testers enable you to achieve faster production ramps and higher process yields.

For more details about these new parametric testers, please contact your local Agilent Technologies sales professional.

The 4072B and 4073B have a high-speed capacitance meter embedded in the test head, which provides three times faster capacitance measurement speeds.

DID YOU ? KNOW

Silicon Valley Jargon

Crunchy Conservative

Someone right of center on foreign policy and the economy, but more liberal when it comes to issues associated with granola lefties, like the environment, home schooling and alternative medicine.

Newater

Purportedly pure drinking water now being bottled in Singapore. It contains treated effluent from baths, sinks, and yes, even toilets.

Portal Shields

Biological weapons detection systems installed at military bases in the Persian Gulf.

Post-Traumatic Job Switcher

Someone deeply affected by a disaster or life-changing event such as 9/11 who, as a result, decides to pursue a more meaningful career.

Source: Wired magazine



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Global Business Ideas and Information for Managers and Test Engineers

An Agilent Quarterly Newsletter

Winter 2003

Products: Memory

Highest throughput rate for final test of flash memory devices

A new tester interface has been introduced for the Agilent Versatest Model V4100 that optimizes the system to more cost-effectively test flash memory devices during final test. Fully compatible with the industry's most popular memory handlers, the V4100 final test interface also enables the highest throughput rate for final test of high-volume memory devices.

The Model V4100, with final test interface, allows engineers to test up to 32 NAND devices in parallel, allowing for reduced cost of test and faster time-to-market. Production volume for high-density NAND flash memory

Production volume for high-density NAND flash memory should rise dramatically as flash memory cards find applications in popular consumer electronics.

is expected to rise dramatically as flash memory cards find applications in popular consumer electronics, including digital cameras, MP3 players and personal digital assistants. According to Web-Feet Research Inc, NAND megabit volumes will increase nearly 13-fold between 2002 through 2006, from 68,000 to 857,000 MMb(1).

The characteristics of the V4100 include:

- Unique for every device (analogous to probecards)
- Designed to minimize temperature and vibration transfer to testhead

The popularity and demand of flash memory in consumer products places tremendous pressure on contract manufacturers to reduce cost of test (COT) for these devices. To answer this challenge, the V4100 covers a broad range of test applications, from wafer sort and final test of flash devices on a single V4100 system. Additionally, the V4100 is well suited for high-mix production environments. The system can perform wafer sort test on a wide variety of memory and logic applications, including flash memory, SRAM, embedded memory and pure logic. The versatility and flexibility of the V4100 help contract manufacturers maintain low COT as production mixes and test applications change.

The V4100's field-upgradeable performance levels of 40, 70 and 100 MHz are fully compatible with the other members of the Agilent Versatest Series. This compatibility allows test programs developed on the Model V4100 TDS (test development system) to be transferred directly to the Versatest Series' production testers -- the Model V4100 and Model V4400 -- delivering correlation and test repeatability from engineering development to high-volume wafer sort to final test. Additionally, the V4100's small, 0.5-square meter (5.8-square-foot) footprint conserves valuable floor space.

"We're helping our customers control test costs by offering a single platform that

DID YOU ? KNOW



Future space missions

Martian life:
A series of Mars landers and orbiters will be launched every other year starting in 2003 to scout the Red Planet for sites where biological activity might be found. A mission to collect a sample of Martian rocks and soil and return it to Earth is planned for 2011 or 2013.

Extraterrestrial life:
The Terrestrial Planet finder, an even more powerful space telescope that's still being designed, is planned for launch by 2015. its mission is to investigate 50 extrasolar planets where conditions might make it possible. It then will pick 10 of these for closer study, looking for signposts of primitive life.

The moons of Saturn and Jupiter
NASA is designing scientific instruments that would fly on missions to Mars and the moons of Jupiter and Saturn. It is testing robots that can drill through rock, soil and ice in Antarctica and the Chilean desert.

In addition, a space probe will reach Titan, and Earth-sized moon orbiting Saturn, in 2005. Astrobiologists are interested in Titan because it may have lakes of liquid hydrocarbons, such as methane, which might host an alternative form of life.

Source: NASA

tests a wide range of products," said Gayn Erickson, marketing manager of Agilent's Memory Test Division. "These new final test capabilities enable the V4100 to provide the same proven performance and features as the V4400, but at a price and size more in-line with the needs of our small- to mid-sized memory and logic manufacturing customers."

The Agilent V4100 Final Test Solution starts at $450,000 for an eight-site configuration and will be available to ship 12 weeks after initial order.



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Global Business Ideas and Information for Managers and Test Engineers

An Agilent Quarterly Newsletter

Winter 2003

Customer Service and Support

Questions our customers are asking

Q: I'm a Fabless/SCM manufacturer. How is Agilent able to support me better than others?

A: In addition to dedicated resources, Agilent is rolling out a portfolio of services specifically geared to the fabless/SCM community. We understand and appreciate the whirlwind environment in which fabless/SCMs operate: changing system configurations, loading different devices and programs, and managing overall equipment efficiency and productivity. Across the supply chain, from test program development to production support, Agilent's fabless/SCM services enable cost and time savings for both design houses and test houses, by building efficiencies, especially in the ramp-to-production stage. The ramp service is currently being piloted with select customers in a beta site program; services for test program development or optimization are currently available. Additional services for the fabless/SCM community will be introduced in 2003.

Q: How is how is Agilent addressing the crucial handoff of the design to manufacturing when fabless?

A: Agilent has implemented a Ramp-to-Production Service that addresses the critical needs and complexity during this transfer stage. We have dedicated expert resources to provide seamless support through the supply chain, processes that enable efficiencies, especially in the correlation/debug steps, and a support infrastructure equipped with tools to ensure quick knowledge transfer. These service features allow Agilent to provide maximum value to fabless and SCM customers by helping them get over the "ramp-up" hurdle, to Time-to-Market and Time-to-Profit in the shortest possible time.

Q: Can Agilent handle my production support needs in Asia?

A: Yes, Agilent has support resources in all countries, including China and Taiwan. Our support offerings can address the critical needs in the production environment, such as system-to-system correlation or investigating test repeatibility. We are also working with customers to develop new production support products, thereby enriching our support offerings.

DID YOU ? KNOW

Friendly Poison



Some noxious chemicals of yesteryear are becoming today's chemical heroes.

Thalidomide

Introduced in 1957 by the German company Chemie Grunenthal, it was especially popular for relieving morning sickness.

Bad reputation: It causeD miscarriages and horrific birth defects across Europe. The drug was banned worldwide in 1962.

Saving grace: The FDA reapproved thalidomide for treating leprosy in 1998. It also has proven a success in fighting myeloma, a type of bone marrow cancer. New data suggests the drug may be effective in treating lupus and in combating HIV-induced mouth sores.

Napalm

A mix of gasoline, benzene, and polystyrene, napalm was invented by U.S. scientists in the 1940s. It burns at up to 5,000 degrees Fahrenheit.

Bad reputation: After an AP photographer snapped a child running naked and burned from her Vietnamese village in 1972, the U.S. stopped using it as a weapon.

Saving grace: Oil spills and diseased livestock. In August 2001, Nevada officials found that napalm destroyed anthrax-infected carcasses in just 60 minutes. In 1999, the U.S. Coast Guard used napalm to clean up an oil slick along the Oregon coast.

Source: Wired magazine



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Customer Service and Support

Agilent simplifies fabless/SCM supply chain through fully integrated support program

For years, the fabless/subcontract manufacturing (SCM) supply chain has ridden a bumpy road to market, where potholes inherent in the process have been patched reactively on an ad-hoc basis. As emerging semiconductor technologies, tightening costs, and faster turnaround times have become the driving forces for design and test houses, establishing a proactive and integrated response that links the entire supply chain has become critical to the success of all involved parties.

In response to customer needs, Agilent has introduced the Fabless/SCM Services Program (FSSP). By building efficiency into the supply chain, Agilent aims to help design and test houses achieve a faster time-to-market, a faster time-to-profit, and optimal use of their in-house resources. The FSSP is a targeted, flexible solution that paves the way for a smooth transition from design and fabrication through ramp-up and mass production of devices.

“We look at the entire outsourcing process and our customers’ requirements throughout,” explained Agilent’sYih-Neng Lee, vice president, Worldwide Fabless Technologies, Agilent Technologies, Inc. “We’re linking the processes between design and test houses to resolve challenges quickly, rather than jumping in at a particular point to fight fires. This approach creates lasting value for our customers.”

One of the programs resulting from this focus, the FSSP, consists of three elements, managed by a single Agilent customer service and support engineering team that coordinates and communicates upstream and downstream activities. Agilent’s Test Programming Services assist design engineers with test program development, optimization, and conversion. Design-to-Production Ramp Services deliver resources, expertise, process knowledge, and a support infrastructure, to assist test houses with ramp-up and full production, including correlation and debugging on multiple testers, test cell assessment, and troubleshooting. Agilent’s Total

Agilent’s Test Programming Services assist design engineers with test program development, organization, and conversation. Agilent’s Total Support Solutions Portfolio offers a comprehensive packaged and contractual support services, and include individual service offerings.

DID YOU ? KNOW



Trick questions – be careful!

Go on, test your brain! Below are four (4) questions. You have to answer them instantly. You can't take your time; answer all of them immediately. Don’t turn to the answers on the next page until you have completed all answers.

OK? Let's find out just how clever you really are.

First Question:
You are participating in a race. You overtake the second person. What position are you in?

Second Question:
If you overtake the last person, then you're in what place.?

Third Question:
Very tricky math! Note: This must be done in your head only. Do NOT use paper and pencil or a calculator. Try it.

Take 1000 and add 40 to it. Now add another 1000. Now add 30. Add another 1000. Now add 20. Now add another 1000. Now add 10. What is the total?

Fourth question:
Mary's father has five daughters: 1. Nana, 2. Nene, 3. Nini, 4. Nono. What is the name of the fifth daughter?

‘Agilent is organized to address the specific needs of the SCM market. We can improve the entire fabless/SCM process quickly and alleviate our customers’ pain points.’

— Yih-Neng Lee, Vice President, Worldwide Fabless Technologies

Support Solutions Portfolio offers a comprehensive packaged and contractual support services, and individual service offerings.

The FSSP provides expertise and resource leverage, cost and time savings, knowledge transfer, documented processes to overcome repetitive problems, and peace of mind.

“Agilent is organized to address the specific needs of the SCM market,” said Lee. “As a global company, with a worldwide services and support team, we can improve the entire fabless/SCM process quickly and alleviate our customers’ pain points.”

For more information on FSSP, please contact your local field representative.

DID YOU ? KNOW



Answers to four tricky questions

Question 1:
If you answer that you are first, then you are absolutely wrong! If you overtake the second person and you take his place, you are second!

Question 2:
If you answered that you are second to last, then you are wrong again. Tell me, how can you overtake the LAST person?!

Question 3:
Did you get 5000? The correct answer is actually 4100. Don't believe it? Check with your calculator!

Question 4:
Answer: Nunu? NO! Of course not. Her name is Mary. Read the question again.
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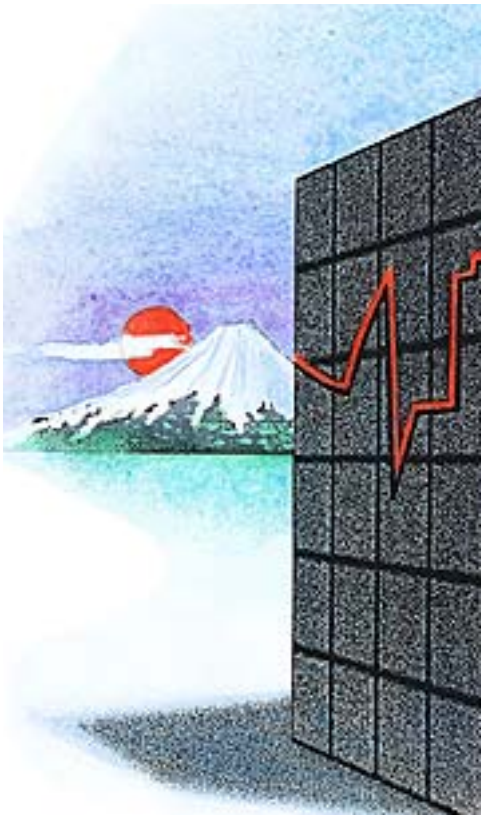
An Agilent Quarterly Newsletter

Winter 2003

International — Japan

A Japanese perspective

Colored cellular phone a blessing for vendors



Boom in compact LCD market: 'Can't keep up with orders'

Offensive and defensive battles among Korean and Japanese competitors

In contrast to the moribund state of the overall electronics market, production volume in Japan has been soaring for high-performance color liquid crystal displays (LCDs) for cell phones. Some Japanese manufacturers have been overwhelmed with orders for the latest vivid-color models. After the bitter experience of losing the sales race to foreign rivals in the field of large LCDs for TVs, Japanese vendors have already started a fierce offensive and defensive battle to fend off foreign brands, especially from Korea, that are entering the market for small LCDs.

"We can barely keep up with the flood of orders," says an executive at Toshiba Matsushita Display Technology, a joint venture of Toshiba Corp. and Matsushita Electric Industrial Co., Ltd. In the six months from March to September 2002, its monthly output of colored LCDs for cell phones jumped from one to two million units. In response to this "happy problem," the company has invested over one billion yen in new production lines or in converting lines to produce small instead of large LCDs.

Japan is far ahead of the rest of the world in the popularization of color LCDs. According to Display Search Inc., a U.S. specialist market researcher, color products account for about 15 percent of the 360 million cell phones produced worldwide in 2001. In Japan, almost 50 percent of cell phones were color products as early as 2000. Most cell phones released this year are color ones. This trend will emerge gradually in Korea, China, and Europe, thus prompting the LCD vendors to increase production.

DID YOU ? KNOW



Mighty mouse

Gene therapy may be a distant dream for humans, but for rodents the future is now. By adding and subtracting DNA, researchers have already bred lab animals that can gorge on fatty foods and stay thin. Others build up muscle without lifting a paw. Still others boast unparalleled powers of recovery or regrow lost cartilage.The result is a very might mouse.

Photos from SEMICON/Japan

See page 3

Japanese vendors have already started a fierce offensive and defensive battle to fend off foreign brands that are entering the market for small LCDs.

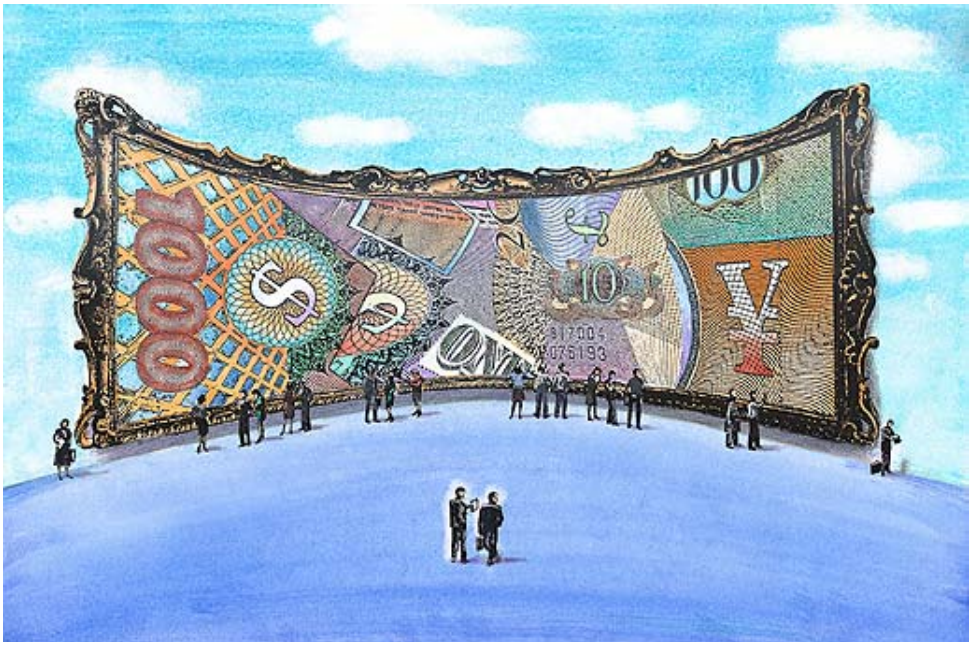
In the market for color LCDs, the display model STN (Super Twisted Nematic Liquid Crystal) dominated the field up to last year. This year, TFT (Thin Film Transistor Liquid Crystal) was adopted for its more vivid color, and sales are on the up and up. In the monochrome LCD market, two Korean and European vendors had a 40 percent share of the world shipments in 2001. However, Japan accounted for 90 percent of the TFT shipments. Toshiba Matsushita, Seiko Epson, NEC and Sharp are battling it out in this arena.

The LCD business for PCs has seen the Korean vendors investing heavily to build new state-of-the-art plants and shipping big volumes of low-price products. As a result, the Japanese vendors relinquished their leading position in the market, and excess supply has led to sharp drops in prices. Already, Hitachi Display (founded in October as a spin-off of Hitachi Limited's LCD Division) is switching production from large to small LCDs.

Japan is also the leader in semiconductor drivers for controlling the color LCDs, and the outlook there is rosy. In late April, Hitachi Limited set the stage for a FY 2002 monthly production of 9 million units, 40 percent more than the previous year. Since there are fewer overseas players in this sphere and the products have a higher added value than the conventional monochromatic displays, they are eagerly boosting production because profitability increases with scale.

The flourishing small LCD business has its own weak point: Manufacturers of cell phones place strong pressure on the LCD vendors to lower prices. Also, despite the increase in color products, the demand for cell phones in Japan is expected to level off. Moreover, the next round of offensive and defensive battles has begun, as evidenced by the entrance of the Korean giant, Samsung Electronics Co.

Source: Asahi



Photos from SEMICON/Japan

See page 3

SEMICON/Japan 2002











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Global Business Ideas and Information for Managers and Test Engineers

An Agilent Quarterly Newsletter

Winter 2003

Global Calendar

For more information, please contact your Agilent sales engineer. Or visit our Website at:

http://www.agilent.com/ste/library/intelligent_test

FEBRUARY

National Engineers Week
February 16 – 22

MARCH

SEMICON/China
March 12 – 14
Shanghai, China

Electronic China
March 12 – 14
Shanghai, China

APEX
March 29 – April 2
Anaheim, CA

APRIL

SEMICON/Europa
April 1 – 3
Munich, Germany

International Jugglers Day
April 18
Everywhere

MAY

SEMICON/Singapore
May 6 – 9
Singapore

For more information on these events, please visit Agilent's web page at:
http://www.ate.agilent.com/ste/events/events_index.shtml

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