

Special Feature Advantest in the Spotlight

First Green Product Certified in Fiscal 2008: The Environmentally Friendly T5503 Memory Test System

The widespread adoption of broadband, enabling significantly higher-volume data transmissions, is driving the imminent shift in DRAM (the memory devices used in computers and servers) from DDR2-SDRAM to the faster DDR3-SDRAM. Device manufacturers consequently require high-speed memory testers with optimal functionality.



The T5503 is Advantest's first Green Product

The T5503 is a memory test system used primarily to test DDR3-SDRAM. Our goal in system development and board design is to both meet our customers' needs for fast, highly accurate measurement and reduced testing costs, and to achieve our concept of environmentally friendly green products. As a result, the T5503 was certified as our first Green Product, passing a stringent environmental assessment to meet our Voluntary Standards for the Green Products.

Excerpt from "Voluntary Standards for the Green Products (Standard for Eco Label Type II)"

- Energy efficiency More than 20% reduction in power consumption
- Improved resource efficiency More than 10% reduction in total area of PC substrate
- Miniaturization More than 10% reduction in size
- Green procurement At least 95%



Our concept for the T5503: A smaller, more power-efficient tester

Since DDR3-SDRAM can deliver higher performance than DDR2-SDRAM on lower voltage, demand has been growing, and manufacturers are seen as likely to face intensifying price pressures. Therefore, though it is possible to test DDR3-SDRAM using existing testers, our customers require a more cost-efficient test method.

The key to developing testers that help lower costs is increasing the number of semiconductors that can be tested at the same time ("parallelism"). Focusing exclusively on increasing the parallel test capability, however, will result in a larger test system, which has the negative impact of increasing the installation footprint and the amount of power that the system uses. Our concept for the T5503 aims to address these issues and meet our customers' need for lower test costs by offering a smaller, more power-efficient tester.

Latest CMOS technology and architecture enable parallel test of up to 128 devices

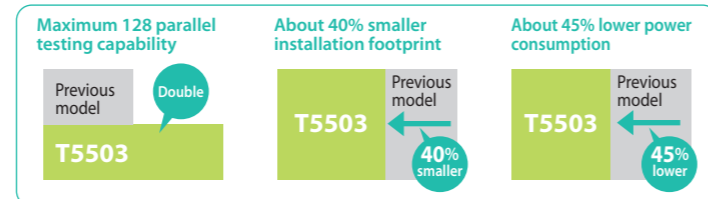
Conventional testers use bipolar technology to build high-frequency, high-precision circuits. While bipolar circuits feature high speed and high driving force, they tend to consume a large amount of power, which would make a tester with the capacity of the T5503 commercially unviable. But complementary metal oxide semiconductor (CMOS) technology consumes much less power than bipolar technology. Applying our independently developed cutting-edge technology, we built a new tester architecture that is both energy efficient and supports high-speed memory devices, with a parallel test capacity of 128 devices.

The maximum speed of the T5503 for volume production test is 3.2 Gbps – the fastest in the industry. This also makes the T5503 test system ideal for GDDR3 and GDDR4 next-generation memory.

Footprint reduced by about 40% through circuit integration*

*Compared to the previous model

At Advantest, innovation goes hand in hand with painstaking attention to detail. We utilized the latest semiconductor processes and optimized our circuit architecture to make the T5503 not only faster, but more compact than that of previous models by developing new parts that allowed us to reduce the number of chip types by 80% from previous models. We were also able to greatly reduce the number of boards by integrating chips. This became possible by mounting about four times as many circuits as previous models, thanks to the savings in power consumption provided by CMOS technology. These initiatives enabled us to reduce the installation footprint by about 40%, and reduce power consumption by about 45% compared to previous models.



Masatoshi Ohashi

Engineering Section 1, Memory Engineering Department,
Memory Tester Business Division, Test System Business Group,
Advantest Corporation

In system development, reducing power consumption is a major focus in lowering our environmental impact. We conducted an in-depth review of new technologies that would enable us to achieve this goal, and ultimately developed our own new CMOS technology. I believe the high marks we receive for energy conservation helped the T5503 to achieve Green Product (Eco Label) certification. In the future, our customers will continue to require higher power efficiency, and we are considering switching to CMOS technology in other tester models as well. Now that we've developed the fundamental circuit technology, I want to raise the bar and develop industry-leading environmentally friendly products.



Developers' Comments

Masaki Idei

PE R&D Section 2, 4th R&D Department,
1st Technology Division, Technology Development Group,
Advantest Corporation

As a board developer, I'm proud that I helped to lower our environmental impact by reducing the number of board components by about 50% compared to previous models. Reducing the number of components also lowers environmental impact by improving productivity. When we developed this board, we worked with the component procurement, mounting, and other divisions, and revised our design over and over to ensure that the components were easy to mount, and used no hazardous substances. There are many aspects to environmental awareness, such as standardization of parts and reduction of heat emissions. I'm excited about the future of this multifaceted approach to reducing environmental impact.



Offering Highly Reliable Products The Advantest Reliability Assurance Program

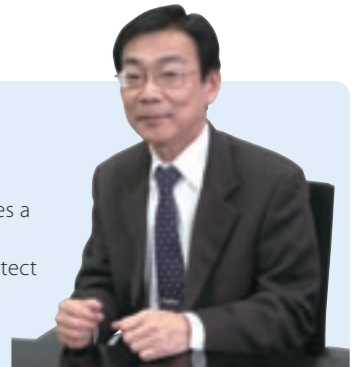
About the Reliability Assurance Program

Eliminating all foreseeable performance issues at the design stage improves product quality and reliability, with great cost benefits for both Advantest and our customers. We introduced the Reliability Assurance Program in order to achieve these goals. Under this program, we check product quality and reliability at every stage in collaboration with the relevant stakeholders, and resolve issues as they are found. This helps us to provide new products with the reliability that our customers expect, starting from the first delivery, and contribute to improving our customers' operating ratios.

VOICE Quality is our lifeblood

No company can survive if it does not satisfy its customers. Likewise, it cannot survive unless it maintains good relationships with its suppliers. We believe that building strong partnerships with such stakeholders is what truly enables a company to grow. The loss of confidence and trust in quality is the start of any company's downfall, as its partnerships crumble and its customers desert it. Quality is truly the lifeline between a company and its customers. Our role is to protect this lifeblood, and build and strengthen our partnerships.

Yasuhiro Kawata Executive Officer, Senior Vice President, Quality Assurance Group, Advantest Corporation



VOICE Process reviews enable early detection of potential issues and prevent problems from being overlooked

T2000 Test System
Continual process reviews created the ultimate high-quality tester

We work continually to improve quality and timeliness. But the increased scope of our development activities, combined with shorter lead times, adds up to a lot of pressure. I remember one occasion when a performance issue got through all our processes and made it to the market undetected.

We responded by revising our entire development process to solve the issue. We broke up the process into six development phases, and created a structure to enhance information flow between divisions. Now, our system maintains the design quality we and our customers expect through information-sharing and design reviews at the end of every development phase.

These initiatives have made design quality visible at the upstream development processes. We have confirmed that our new system detects issues early, and prevents problems from being overlooked. Moving forward, we will deploy this new development process laterally to the development of next-generation products, and continue to deliver high-quality products with short lead times.

Shigeki Takizawa
GPDM Project Leader, 2nd R&D Department, SoC Tester Business Division, Test System Business Group, Advantest Corporation

VOICE Major yield improvements through new "change point control" method

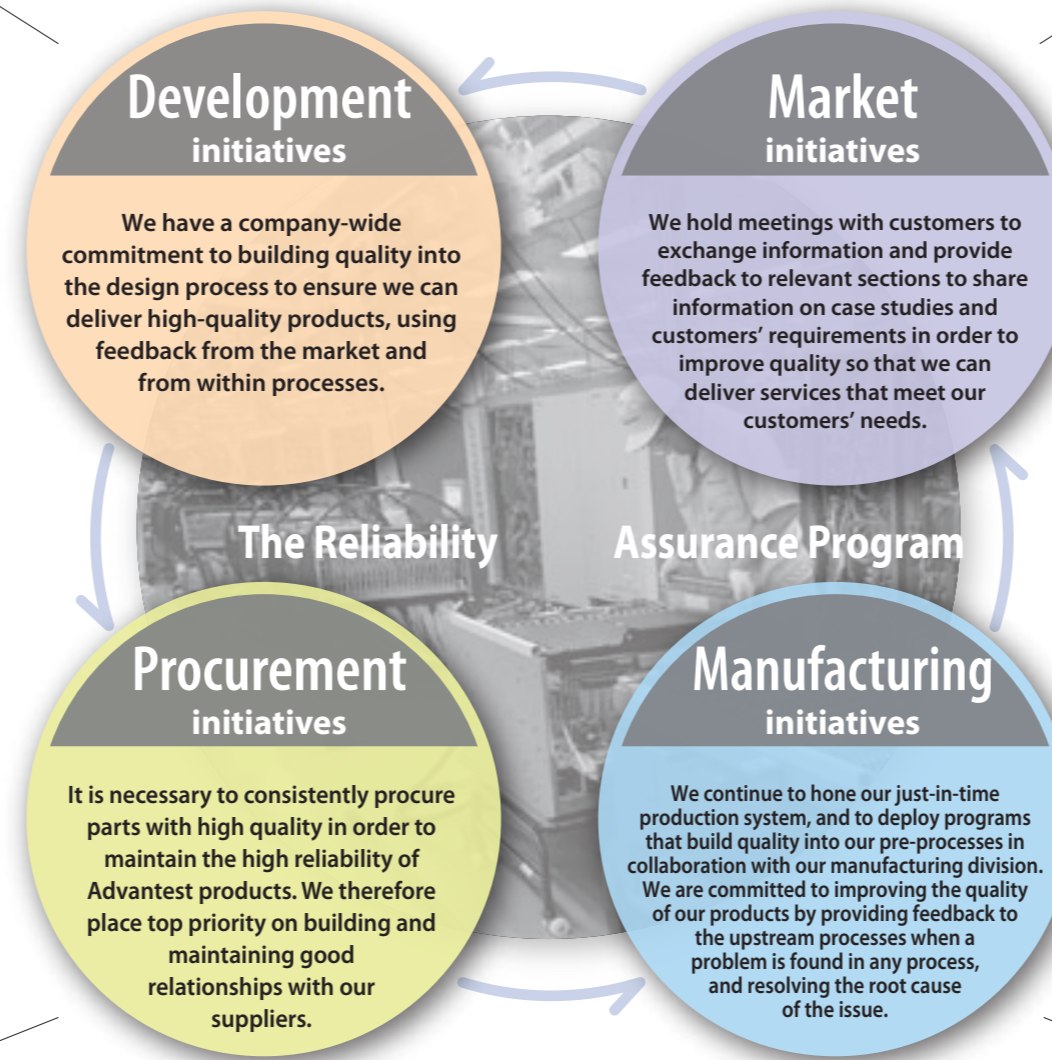
Molex Japan Co., Ltd. manufactures and sells connectors for electronic devices. We place great value on communicating with our customers to ascertain their needs, and manufacturing highly reliable components. Advantest has helped us to boost quality on the factory floor by demonstrating the use of our components in their equipment and advising us on improvements.

In particular, Advantest suggested a new "change point control" method* that includes several new concepts. We were able to greatly improve our yields by deploying this new method aggressively at the relevant work sites. We remain committed to delivering products with high quality and reliability that satisfy our customers through strong communication and close collaboration with Advantest.

* New "change point control" method

Management at every stage		Alertness and perception	
M (Man)	M (Machine)	H: Hajimete (first-time events)	H: Henka (changes)
M (Material)	M (Method)	H: Hisashiburi (unusual events)	

Yoshiharu Hiruma
Vice President, Quality Assurance, Molex Japan Co., Ltd.



VOICE Partners for kaizen improvement

I work at Toshiba's Oita Operations. We are the main plant producing Toshiba SoC products, and we use a large number of Advantest testers.

I first started working with Advantest about 10 years ago, when we introduced the T6575 tester at Oita Operations. In our test process, we are under constant pressure to minimize test time and improve our operating ratio, while maintaining quality. When we introduced the T6575, we were facing several issues: due to a variety of factors, we had been unable to reduce test time; and due to tester downtime, we could not increase our operating ratio. Amidst these circumstances, we began to hold regular meetings with Advantest. Through pinning down the issues and continuing improvements, we streamlined our process and improved our operating ratio out of all recognition.

I hope Advantest will continue to develop new testers with high cost performance coupled with new test methods to maximize our efficiency. In order to accomplish this, we are also committed to collaborating with Advantest as a good partner.

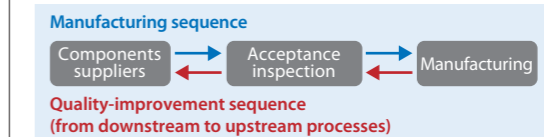
Tatsuya Kusano
System LSI Test Technology Development Group, System LSI Test Engineering Department, Oita Operations, TOSHIBA CORPORATION Semiconductor Company



VOICE Subtle clues point the way to quality improvement

We are constantly on the lookout for signs of minute changes, such as things that are out of place. When we spot these clues, we roll out improvements in order to deliver high-quality products on schedule.

We also build in quality in our upstream processes, and provide feedback to prevent issues from recurring: we send feedback from the manufacturing process to the acceptance-inspection process, and from the acceptance-inspection process to the manufacturers of our raw materials. Through these efforts we improve the quality awareness and alertness of each employee, polish their skills, and improve quality synergistically. As a result, we have achieved a significant reduction in defects per unit. We remain committed to uniting our employees to make products that our customers can use with confidence.



Tomoyuki Okada
Memory Adjustment Section Manager, Adjustment Department, Advantest Manufacturing, Inc.

