

News Release

FOR IMMEDIATE RELEASE

Hitachi Power Solutions launches Scanning Acoustic Tomograph that enables higher image quality of defect detection and one-time inspection for 300 mm wafers

Improving quality inspection accuracy of semiconductor devices, electronic components becoming finer and more multilayered, and large wafers



Scanning Acoustic Tomograph "FineSAT7"

Tokyo, August 29, 2022, – Hitachi Power Solutions Co., Ltd. (Hitachi Power Solutions), today announced the launch of Scanning Acoustic Tomograph "FineSAT7" from October 1, as the newest model of FineSAT series of devices that detects and images minute structures and defects*¹ such as delamination and voids inside semiconductors and electronic components nondestructively by utilizing the reflective and transmissive properties of ultrasonic wave. It enables high-quality defect-detection images and one-time inspection of 300 mm (12-inch) wafers by adopting an A/D conversion board*² with the resolution by 16 times and the measuring period by twice compared to the conventional model. FineSAT7 will contribute to improve inspection accuracy and productivity in research, development, and manufacturing fields through these performances and functions.

*¹ Delamination, voids (bubble-like defects such as air in inside of body) and cracks in the material at joints

*² A/D conversion board: a board with a function to convert analog signals to digital signals

■ Background of development

As power semiconductor devices, electronic components, automotive devices and power devices have been made in more miniaturized size in recent years, higher-quality inspections are required in manufacturers more than ever.

In addition, there is an increasing need for one-time inspection using the through transmission method in view of work-efficiency and productivity, because defect inspection for each layer is required for products with multi-layered structure, such as 2.5D and 3D, which are expected to be mass production. For wafer inspection, which is material of semiconductor devices, there is also an increasing need for equipment compatible with inspections of large-size wafers used for mass production.

Hitachi Power Solutions has a wealth of experience in the domestic and overseas market,

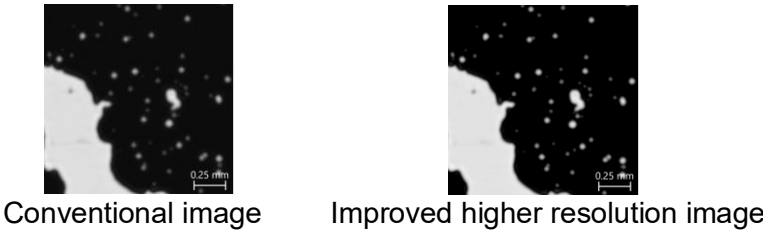
including sales of approximately 2,400 units^{*3} of FineSAT series as a non-destructive device for detecting and imaging microscopic structures and defects inside semiconductor devices and electronic components by utilizing the reflective and transmissive properties of ultrasonic waves.

The techniques used in this equipment received the Prize of METI at the 54th Machinery Promotion Award by the Japan Society for the Promotion of Machine Industry in fiscal year 2019, and Kanto Regional Invention Award of Commissioner of Patents by Japan Institute of Invention and Innovation in fiscal year 2020.

^{*3}As of July 2022

■ Features of FineSAT7

(1) Higher-quality defect-detection images using an in-house developed A/D conversion board
 It has improved the accuracy^{*4} of feature extraction after digital processing through adopting an A/D conversion board with the resolution by 16 times and the measuring period by twice compared to the conventional model. In addition, using a technique^{*5} that adds and averages ultrasonic waveforms from eight locations around a pixel's brightness, we can reduce random noise caused by thermal noise in electronic circuits and other factors, thereby improving the quality of defect-detected images.



(2) Larger water tank realizes one-time inspection of 300 mm (12-inch) wafers using the through transmission method

Conventionally, inspection of 300 mm wafers using the through transmission method had to be performed half-side by side while moving the inspection object. This time, the water tank that measures the object is made larger by reviewing the equipment layout in SAT7, and expanded the motion range of the measurement equipment including the probe^{*6} that transmits and receives ultrasonic waves. As a result, it is possible to inspect the entire 300 mm wafer at once.

Larger water tank also improves workability, such as moving objects to be inspected in a water tank and removing bubbles that cause reflection of ultrasonic waves.

^{*4}Accuracy to extract more useful information from inspection objects for identifying defects.

^{*5}Patent pending in Japan.

^{*6}A probe that transmits and receives ultrasonic waves and has a vibrator such as a piezoelectric element built into a case.

■ Description and Price

Name	Scanning Acoustic Tomograph "Fine SAT 7"
Description	An ultrasonic probe that transmits and receives ultrasonic waves, Ultrasonic flaw detector, scanner mechanism (3 axis), Composed of a control device and an image processing device, etc.
Price (w/o tax)	28.5 million yen ~

FineSAT7 complies with standards for the safety of semiconductor-manufacturing equipment set out by Semiconductor Equipment and Materials International (SEMI)

We will exhibit FineSAT7 at the "NEPCON JAPAN 2022 [September]" an electronics development and implement exhibition at Makuhari Messe from August 31 to September 2.

■ Related information

Website on Scanning Acoustic Tomograph "FineSAT7"

<https://www.hitachi-power-solutions.com/en/product-site/sat/products/finesat-7/index.html>

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About Hitachi Power Solutions Co., Ltd.

Hitachi Power Solutions focuses on the Social Innovation Business, which combines OT (Operational Technology), IT (Information Technology) and products, as a member of Hitachi Group, we contribute to improving customer's three values as social, environmental, and economic value by providing solutions in various fields of social infrastructure, including energy, industry, and information. For more information on Hitachi Power Solutions, please visit the company's website (<https://www.hitachi-power-solutions.com/en/>).

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
