

Acoustic Tomographs Powered by Agilent Acqiris High-Speed PCI Digitizers with On-Board Signal Processing

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Introduction

Japan's number one designer and manufacturer of ultrasonic inspection systems (such as portable ultrasonic flaw detector, ultrasonic microscopes and scanning acoustic tomographs) has incorporated Agilent Acqiris technology in its powerful series of scanning acoustic tomographs. The products are designed for the inspection of semiconductor packages and lead the world in scanning speed and measurement capabilities visible observations only hinted at, or missed entirely.

At the heart of the series is a totally new digital acquisition system that uses Agilent Acqiris U1082A digitizers with on-board signal processing. The cards play a key role in enabling the manufacturer's products to extend scanning acoustic tomograph technology. 3F stands for "fine" (high resolution), "fast" (high speed scanning, mass inspection) and "flexible" (enhanced measurement and analysis software). And 3F technology is crucial in allowing the products to measure much thinner and smaller objects, with faster inline inspection times, and with improved operability and analysis efficiency.

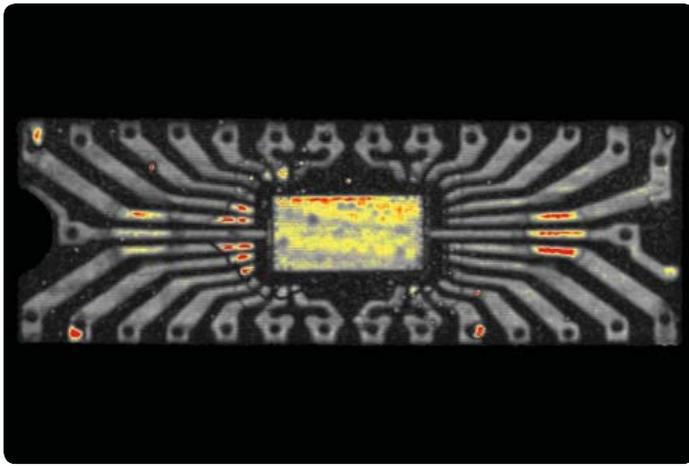
The newly developed products offer a system bandwidth of up to 500 MHz (up from 240 MHz). This additional bandwidth, together with an enhanced probe line up capability, results in a system that can measure with a resolution down to 0.5 μm (8 times better than with previous systems). Furthermore, scanning speed and resolution are also improved. The FineSAT products can scan at 1000 mm/s (up from 600 mm/s) and they can collect much more data (8,192 x 8,192 pixels compared to 600 x 600). Much of the improvement comes from the unique capabilities of the Agilent Acqiris U1082A cards. These cards provide more efficient data collection and transfer together with realtime peak detection and analysis capabilities. For example, the products use the analyzers cards to digitize and transfer only the data of interest. For example, the FineSAT products use the AP cards to



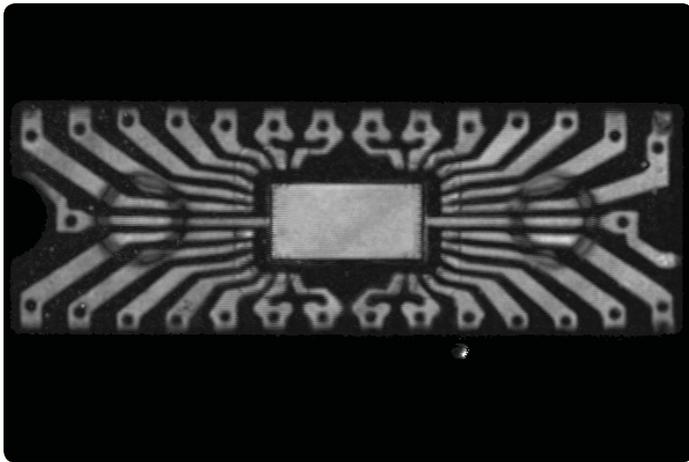
Figure 1. Agilent Acqiris U1082A high-speed PCI digitizers with on-board signal processing

digitize and transfer only the data of interest. Unnecessary and superfluous data is ignored or "skipped". These cards provide more efficient data collection and transfer together with realtime peak detection and analysis capabilities.

Because the data acquisition system in these products is digitizer-based, much more signal analysis and display flexibility is possible. New features in these products include a focus profile function. As these functions work on the digitized data, under software control, it is much easier to optimize the overall system performance. The focus of the ultrasonic beam can be positioned at exactly the desired depth of a sample. Analysis efficiency is also improved thanks to newly developed real-time 3D imaging and waveform analysis functions.



(a)



(b)

Figures 2a and 2b. Scanning acoustic tomograph produces high resolution images that can reveal the internal structure of semiconductor packages. Differences between a good package (Figure 2a) and one with flaws (Figure 2b) can be quickly identified and characterized.

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For more information on Acqiris product line, sales or services, see our website at:

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