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TDR System

Sales of this product have ended.

TS9001

TDR Analysis System with High Signal Quality and Resolution

Non-destructive and High-precision Analysis of Wiring Failures in Cutting-edge Semiconductor Packages

In fault analysis of the semiconductor packages for increasingly smaller and more highly integrated electronic equipment, there is a demand for a system that can easily create the optimal analysis environment according to diverse analysis conditions.
The TS9001 TDR system conducts rapid, high-precision, and non-destructive analysis of faulty areas of the wires in cutting-edge semiconductor packages by performing high-resolution TDR measurement (time domain reflectometry) utilizing our proprietary short-pulse signal processing technology.
In addition, it can be connected to a radio-frequency probing system that you own or have selected, providing flexible solutions that match your device shape and fault analysis environment.

Features

High-speed and high-resolution measurement

- Support for fault analysis of flip-chip BGAs, wafer level packages, and 2.5D/3D ICs, etc.
- Resolution for faulty area detection: 5 µm or less
- Measurement time: 30 sec. (accumulated 1,024 times, 1/10 when compared with our conventional product)

Automated TDR measurement

By using the auto touch-down function of the auto prober, the system conducts precise and reproducible measurements, contributing to a reduction of human errors.

Temperature control function

When connected to the radio-frequency probing system with a thermal system function, the system can perform fault analysis while keeping evaluation samples at a low or high temperature.

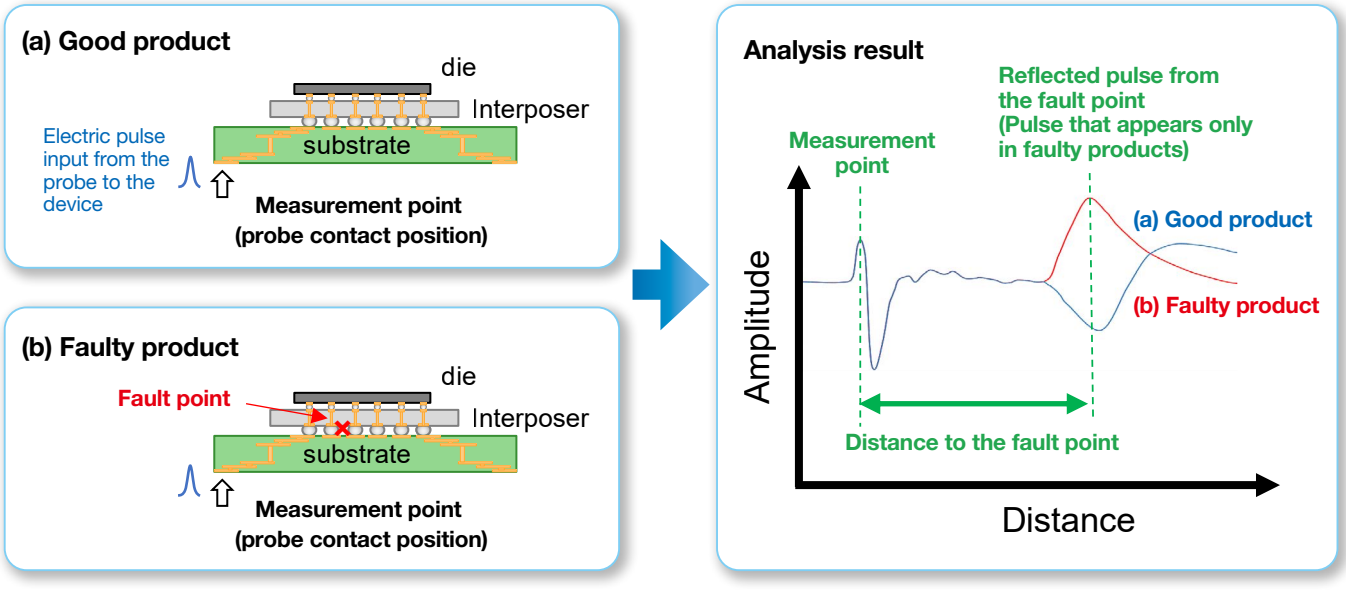
Rich analysis software

Equipped with CAD Data Link, which displays fault points on the CAD (optional)

What is TDR (Time Domain Reflectometry)?

A method that analyzes a position of damage or short-circuit by inputting signals to a device and measuring a time-response waveform of the signal that reflects to the input side.

Waveforms of good products and faulty products are compared to calculate fault points based on the peak position and measurement point that appear only in the faulty products.

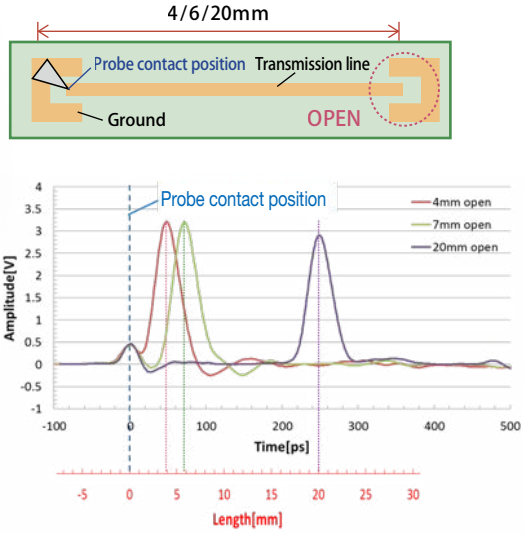


Example of the TDR Measurement

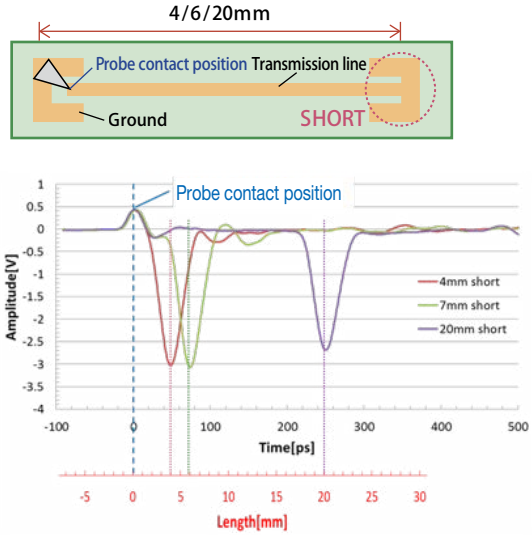
Example of TDR measurement of a transmission line with an OPEN/SHORT structure (length: 4/6/20 mm)

- When the failure mode is OPEN, it is observed as a positive reflected pulse; when SHORT, a negative reflected pulse.
- Since this system uses impulse probe signals, fault points are identified easily at pulse peaks.

Reflected pulse from the OPEN end



Reflected pulse from the SHORT end



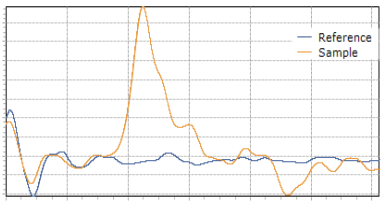
Analysis and Display Function

The TS9001 TDR system comes equipped with a TDR Analyzer as standard.
The analyzer displays the differences between Reference (good product) and Sample (faulty product) waveforms and predicts the distance from the pad to a fault point by detecting a changing point of the waveform.

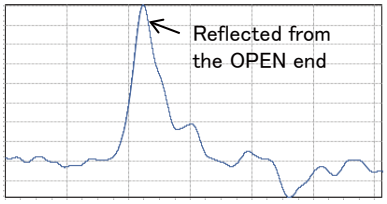
CAD Data Link (optional), which maps predicted fault points on CAD wiring data, assists identifying fault points.

By aligning the waveform levels and phase fluctuations of the measurement data of the Reference (good product) and Sample (faulty product), it is possible to extract only the characteristics of the Sample waveform.

Measured waveforms

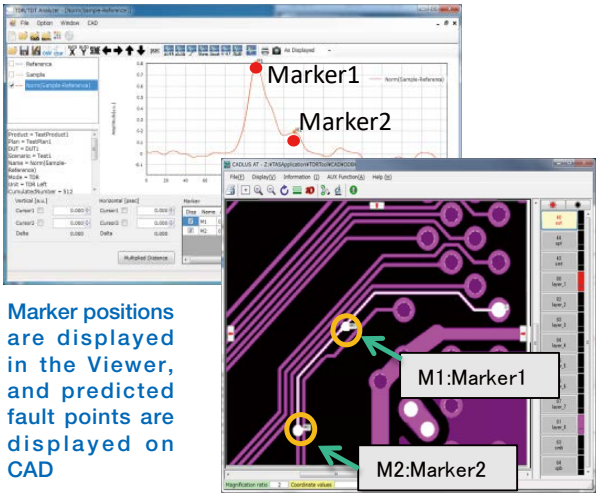


Differential waveform



TDR Analyzer

By using the waveform calculation and marker functions of TDR Analyzer, the Peak, which indicates the characteristics of a fault point, is detected.



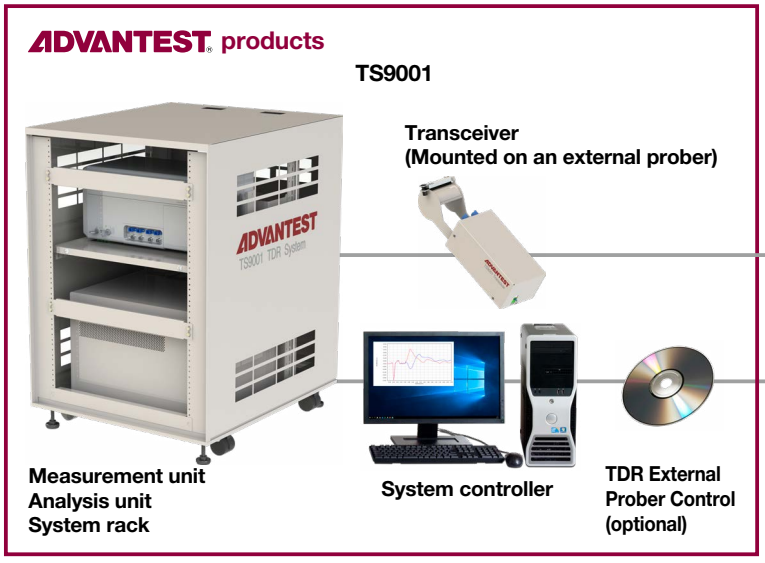
Marker positions are displayed in the Viewer, and predicted fault points are displayed on CAD

CAD Data Link (Optional)

Main Specifications

Item		Specification
System configuration		Measurement unit, analysis unit, transceiver, system controller (for system control and data analysis), and system rack
System performance	Resolution for faulty area detection	< 5 µm @ 0 to 800 ps, < 10 µm @ 800 to 1,500 ps time range
	Rise time	< 12 ps
	Max. measurement distance	100 mm @ effective permittivity = 5
	Measurement time	30 sec. @ 1 point (Not including the touch-down. Average of 1,024 measurements)
	Probing method	Automatic with the External Prober Control option
Software performance	TDR Analyzer	Provided as standard feature
	CAD Data Link	Optional
	External Prober Control	Optional
System controller		Provided as a standard feature
General specifications	Guaranteed performance range	Temperature range: 23°C ±5°C, relative humidity: 80% or less (with no condensation)
	Operating environment	Temperature range: +10°C to +30°C, relative humidity: 80% or less (with no condensation)
	Storage environment	Temperature range: –10°C to +50°C, relative humidity 80% or less (with no condensation)
	Power supply	• Analysis unit: 100 V AC (100–120) / 200 V (220–240) ±10%, 50/60 Hz, 250 VA • System controller: 100 V AC (100–120) / 200 V (220–240) ±10%, 50/60 Hz
	Dimensions/weight	• Measurement unit: 430 (W) × 240 (D) × 220 (H) mm, 14 kg or less • Analysis unit: 430 (W) × 540 (D) × 330 (H) mm, 30 kg or less • Transceiver: 100 (W) × 340 (D) × 80 (H) mm, 1.5 kg or less • System rack: 860 (W) × 600 (D) × 700 (H) mm, 60 kg or less • System controller (main unit): 177 (W) × 519 (D) × 418 (H) mm, 16 kg or less • System controller (monitor): 520 (W) × 166 (D) × 351 (H) mm, 4.8 kg or less (The dimensions and weight of the system controller may be changed depending on the release time.)

Example of the System Configuration



RF Probe System

(Recommended) Manufactured by FormFactor, Inc.

Semi-automated probe system

Manual probe system

●The product specifications and appearances shown in this catalog are subject to change without prior notice.

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