Quality is more than a word

ESPEC

Semiconductor packaging and material reliability evaluation series

Low-Current Conductor Reliability Evaluation System AMR-SPM

Detecting Small Resistance Changes in Fine Interconnects at Low Current

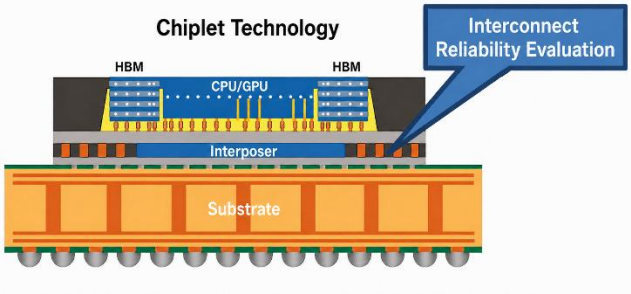
Market background

New Interconnect Reliability Challenges in Advanced Packaging

- Increasing demand for higher-speed, higher-density, and lower-power semiconductor packages
- Growing adoption of chiplet and 2.5D/3D packaging architectures
- Miniaturization and increasing complexity of interconnects and wiring structures
- Greater challenges in ensuring and evaluating interconnect reliability
- Need for precise reliability assessment of fine-pitch interconnects, microvias, and interposers
- Requirement for highly sensitive measurement techniques capable of detecting minute resistance changes without damaging test samples



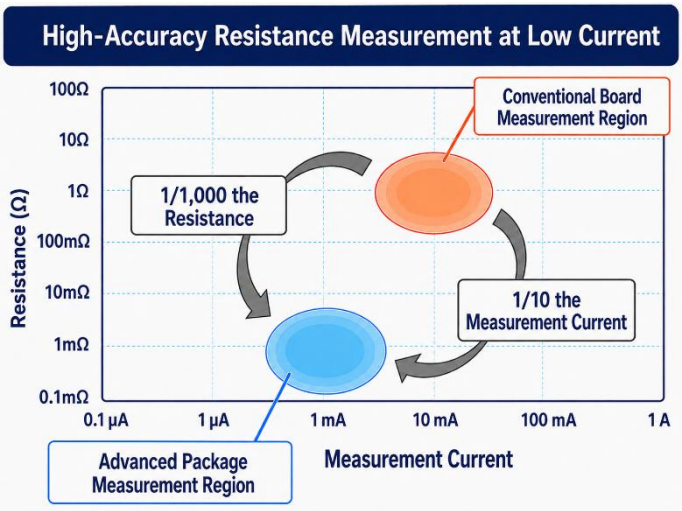
* The equipment shown in the image is for illustrative purposes only.
Actual specifications may differ.



Features

Interconnect Resistance Evaluation with Low-Current Testing and High-Precision Measurement

- Low-current measurement minimizes stress on fine interconnects
- High-precision detection of small resistance changes in micro-bump interconnects
- Combines low-current excitation with high-accuracy resistance measurement
- Optimized for low-current measurements of 1 mA or less
- Achieves low-resistance measurements at the 1 mΩ level with a 1 mA test current
- Enables highly sensitive reliability evaluation of advanced semiconductor package interconnects.



3 Key Features Supporting Reliable Evaluation

Selectable Measurement Modes for Different Evaluation Purposes

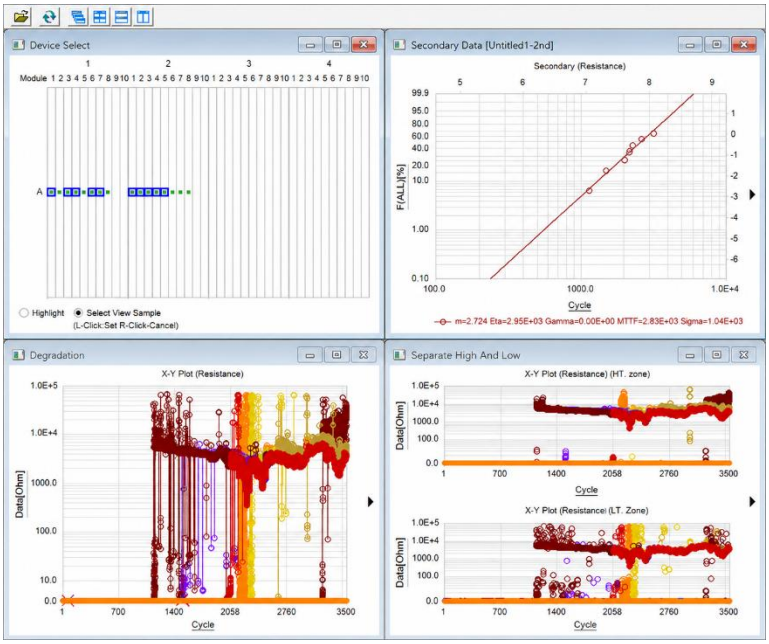
- Equipped with high-precision and high-speed measurement modes
- High-precision detection of small resistance changes
- Efficient evaluation of early failure behavior and progression
- Selectable measurement modes to match specific evaluation objectives
- Supports optimization of reliability test conditions

Compact Benchtop Design

- Approximately 60% smaller footprint and 80% lower weight compared with the standard model
- Easy installation in development environments
- Flexible channel scalability from 40 to 280 channels

Real-Time Weibull Analysis During Testing

- Built-in statistical analysis software
- Real-time visualization and analysis of test data
- Supports Weibull analysis during testing
- Enables timely evaluation through trend monitoring
- Reduces post-test analysis effort
- Facilitates early insight into test results
- Helps accelerate development cycles



Real-time data updates during testing

Specifications

AMR-SPM ／ Specifications	
Measurement current type	DC
Channel configuration	40 to 280 ch (40-ch increments)
Channel control	10-channel increments
Resistance measurement range	1 mΩ to 10 Ω
Resistance measurement accuracy	High-accuracy mode: ±0.7% at 1 mΩ, ±0.1% at 10 mΩ, ±0.05% at 100 mΩ High-speed mode: ±2.5% at 1 mΩ, ±0.5% at 10 mΩ, ±0.1% at 100 mΩ
Measurement time	High-accuracy mode: 40 ch: ≤ 310 s, 80 to 280 ch: ≤ 620 s High-speed mode: 40 ch: ≤ 24 s, 80 to 280 ch: ≤ 48 s
Measurement current	1 mA
Measurement method	Four-wire measurement

** Preliminary specifications. Specifications are subject to change without notice.*

ESPEC CORP. https://www.espec.co.jp/english/
3-5-6, Tenjinbashi, Kita-ku, Osaka 530-8550, Japan
Tel:+81-6-6358-4785

LEAF No.20260912