Quality is more than a word

ESPEC

Semiconductor Package and Material Reliability Evaluation Series

# Low-Voltage Insulation Reliability Evaluation System AMI-SPM

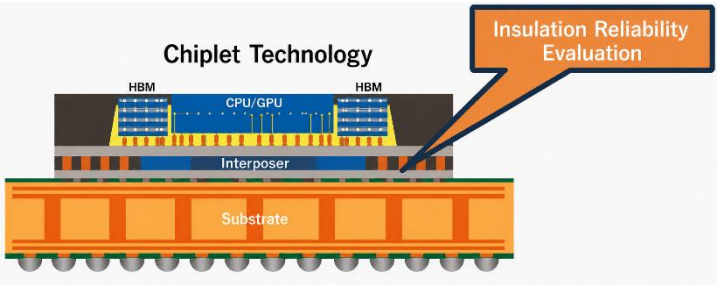
## High-Accuracy Detection of Insulation Degradation at Low Voltage

### Market Background

**Emerging Insulation Reliability Challenges in Advanced Packaging**

- Increasing demand for higher-speed, higher-density, and lower-power semiconductor packages
- Growing adoption of new insulation materials and advanced package architectures
- Miniaturization and increasing complexity of package interconnect structures
- More subtle insulation degradation under low-voltage operating conditions
- Need for highly sensitive insulation resistance and leakage current measurements
- Need for accurate reliability assessment of next-generation package materials and structures

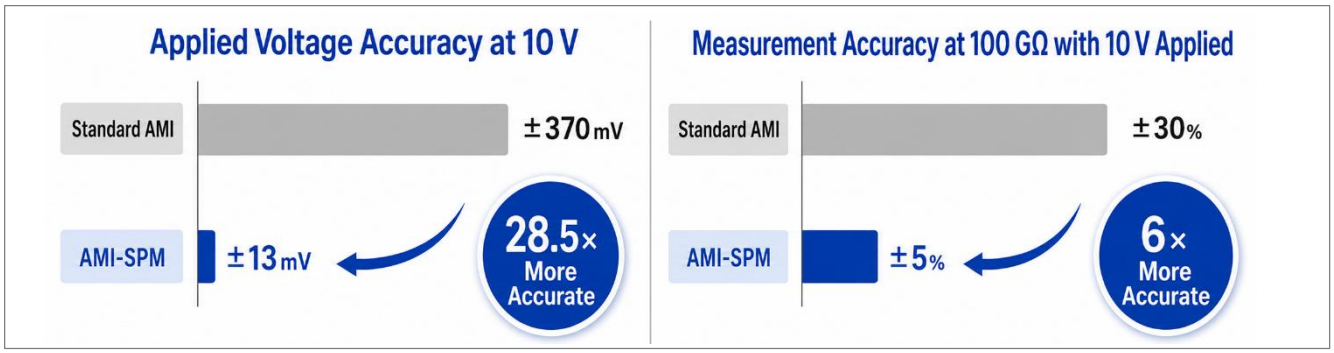





### Features

**Detecting Small Leakage Currents Under Low-Voltage Stress**

- Designed for insulation reliability testing with an applied voltage of up to 10 V
- High-precision measurement of insulation resistance and leakage current
- Detects small leakage currents associated with early insulation degradation
- Supports evaluation of fine-pitch wiring, advanced insulation materials, and new package structures
- Enables reliable assessment of advanced package insulation performance



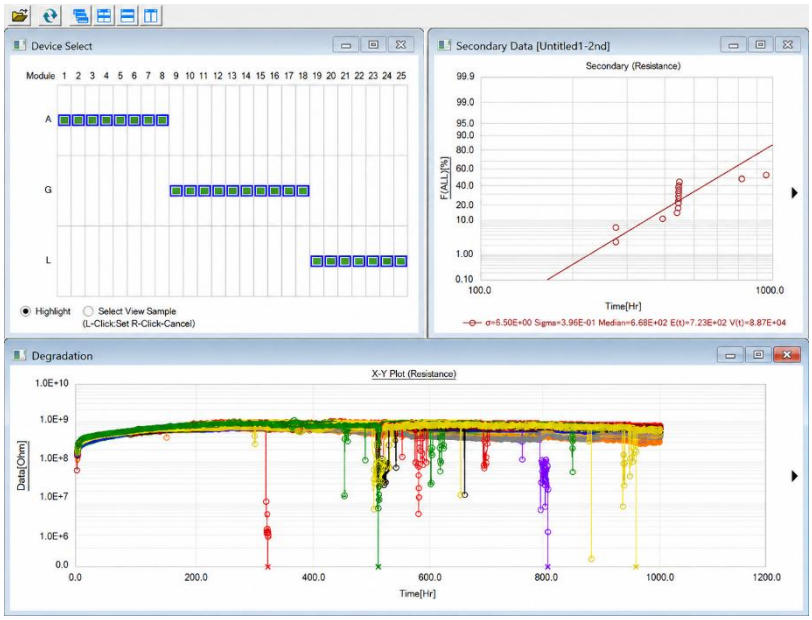
## 2 Key Features Supporting Efficient Reliability Evaluation

### Accelerated Reliability Evaluation through HAST Chamber Integration

- Detects small leakage currents and changes in insulation resistance during accelerated testing
- Captures degradation behavior before catastrophic failure occurs
- Supports b-HAST and other accelerated reliability test methods
- Automated operation from test start to completion through chamber integration
- Improves testing efficiency and reduces operator workload

### Real-Time Weibull Analysis During Testing

- Built-in statistical analysis software
- Real-time visualization and analysis of measurement data
- Supports Weibull and other statistical analyses during testing
- Enables real-time trend monitoring and timely evaluation
- Reduces post-test analysis effort
- Enables earlier assessment of reliability test results
- Helps accelerate development cycles




Real-time data updates during testing

## Specifications

| AMI-SPM / Specifications | |
|---|---|
| Channel configuration | 25 to 300 ch/rack |
| Channel control | 5 ch or 25 ch |
| Stress voltage | 0 V DC or 10 mV to 10 V DC |
| Min. set voltage resolution | 10 mV |
| Applied voltage accuracy | ±(0.1% of set voltage + 3 mV) |
| Resistance measurement range (Ω) | $2.0\times10^{4}$ to $1.0\times10^{12}$ Ω or more (20 kΩ to 1 TΩ or more) at 10 V<br>$2.0\times10^{3}$ to $1.0\times10^{11}$ Ω or more (2 kΩ to 100 GΩ or more) at 1 V |
| Resistance Measurement accuracy (at 10 V) | ±2%: $2.0\times10^{4}$ to $1.0\times10^{10}$ Ω (20 kΩ to 10 GΩ)<br>±5%: $1.0\times10^{10}$ to $1.0\times10^{11}$ Ω (10 GΩ to 100 GΩ)<br>±30%: $1.0\times10^{11}$ to $1.0\times10^{12}$ Ω (100 GΩ to 1 TΩ) |
| Measurement voltage | 10 mV to 10 V DC (10 mV increments) |
| Leak detection speed | Continuous detection in less than 100 μ sec |
| Leak detection setting range | 1 to 500 μA (1 μA increments) |

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

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