

# I-ELITE System

## Full-wafer thermal fault isolation for process control and design debug of advanced devices under production test conditions

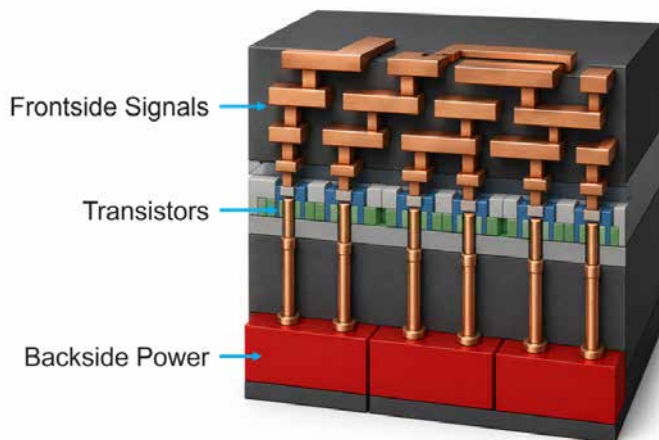
### Wafer-level thermal fault localization

The Thermo Scientific™ I-ELITE System enables early and precise localization of thermal faults in advanced semiconductor devices before wafer dicing and packaging. By combining lock-in thermography (LIT) with production test conditions, the I-ELITE System helps engineering teams identify yield-limiting defects at the wafer level.

Built on the proven Thermo Scientific WaferScan DP platform, the I-ELITE System supports dynamic tester stimulation through probe cards and load boards. This approach allows you to analyze devices under realistic operating conditions, helping accelerate root-cause analysis for both design debug and process development.

### Applications

- Wafer-level yield analysis to identify systematic process or integration issues
- Thermal fault isolation requiring dynamic tester stimulation
- Design debug for advanced semiconductor devices
- Analysis of backside power rail architectures where emission or laser techniques are limited
- Failure analysis of wafer fragments and packaged devices



### Key benefits

**Earlier fault localization.** Identify thermal defects at the wafer level using production testers, helping reduce delays associated with post-packaging analysis.

**High-sensitivity thermal detection.** A proprietary InSb camera with advanced noise reduction supports detection of subtle thermal signatures across a wide range of applications.

**Realistic test conditions.** Perform dynamic LIT with automated test equipment (ATE), enabling analysis under true operating conditions.

**Flexible system integration.** Interface with common tester platforms using probe cards and user-provided custom flex connections tailored to specific workflows. Experienced FA specialists are available to provide guidance on custom flex interconnect solutions.

**Enhanced resolution options.** Use a solid immersion lens (SIL) to support higher-resolution thermal imaging for detailed defect localization.



### System features

- Dynamic test stimulation via probe card and ATE integration
- Software-based die-to-die navigation using wafer maps
- PTPA alignment supporting more than 10,000 vertical pins
- Compatibility with 200 mm and 300 mm full-thickness wafers
- Support for wafer fragments and packaged parts
- Semi-automated thermal imaging workflows with Sierra software

### ATE tester docking

The I-ELITE System's docking architecture and customized interface isolate vibrational noise to enable high-speed dynamic testing using production tester setups.

### Specifications

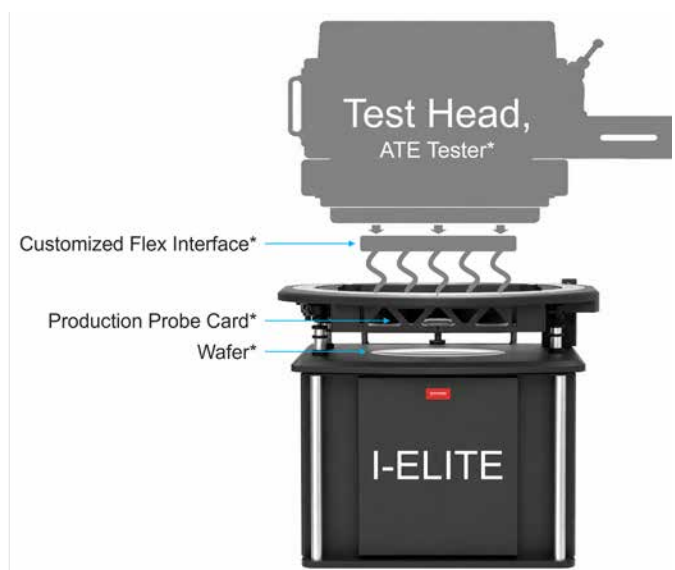
Item	Specification
System architecture	Inverted (up-looking); WS-DP base platform
Sample type	Full-thickness 300 mm/200 mm wafers, wafer fragments, packaged parts
Camera	ELITE InSb 640 camera, high-speed (HS) model
IR wavelength range	3–5 $\mu\text{m}$
Tester docking	WS-DP style docking
Device simulation	Dynamic test program stimulation with probe card. Thermal camera in Secondary mode.
Lens	MWIR lenses 10 $\times$ , 1 $\times$ , 0.25 $\times$ and SIL
Field of view	960x768 $\mu\text{m}$ (10 $\times$ ) with semi-automated mosaic image stitching for full-die coverage
System software	Sierra

A 1:1 signal connection from test head to probe maximizes test flexibility. The systems support round and DP (Direct Probe) probe card setups with vertical or cantilevered probes. Manual probing setups with micro-manipulators and an overhead microscope are also supported as an option.

- Compatible with most commercially available ATE testers, as well as customizable solutions
- 9.5", 12", and 18" round probe cards
- Direct probe load boards
- 440 mm and 300 mm probe cards
- Successfully demonstrated probe card landing with >10,000 pins
- Die-to-die stepping for good die/bad die analysis

### Supported tester platforms

- Advantest (Verigy)
- Teradyne



*\*Third party equipment provided by customer.*

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