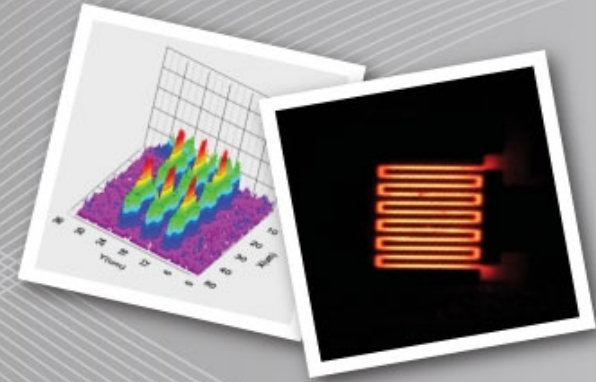


## **Microsanj** ADVANCED THERMAL IMAGE ANALYSIS

Microsanj is a leading provider of high-resolution transient thermal imaging services and solutions for both commercial and research applications. The system is based on optical thermoreflectance characterization; digital signal processing and advanced patented software algorithms that supports electronic and optoelectronic components measurement, thermal design validation of ICs, defects and failure analysis.



# **Microsanj™ Product Catalog**

**NanoTherm Series Thermoreflectance Thermal Image Analyzers for Top-Side and Thru-the-Substrate Device Thermal Imaging and Analysis**

## Microsanj Nanotherm Series System Description

| <b>Product #</b> | <b>Nanotherm Series</b>   | <b>Description/Application</b>   |
|------------------|---|--|
| <b>NT100A</b>    | General Purpose Thermal Analyzer  | Hot Spot Detection with Thermoreflectance for Design, Quality Control, & Reliability Analysis  |
| <b>NT110A</b>    | General Purpose Transient Thermal Analyzer  | Transient Capability for Time-Sensitive Hot Spot Detection and Analysis  |
| <b>NT200B</b>    | High Performance Thermal Analyzer   | Visible Thermoreflectance Thermal Image Analyzer for Submicron Microelectronic Design and Reliability Analysis   |
| <b>NT210B</b>    | High Performance Transient Thermal Analyzer   | Visible Thermoreflectance Thermal Image Analyzer with Transient Capability for Submicron Microelectronic Design and Device Characterization  |
| <b>NT220B</b>    | High Resolution Transient Thermal Analyzer  |  |
| <b>NT300A</b>    | High Performance Through-the-Substrate Thermal Image Analyzers                                  | Through-the-Substrate Thermal Imaging for Flip-Chip Thermal Analysis and Device Emission Analysis  |
| <b>NT310A</b>    | High Performance Through-the-Substrate Transient Thermal Image Analyzer                         | Through-the-Substrate Thermal Imaging with Transient Capability for Flip Chip Thermal Characterization and Device Emission Analysis  |
| <b>NT410A</b>    | High Performance Thru-the-Substrate & Top Side Thermal Analyzer with Pico-sec Transient Imaging | Top-Side and Thru-the-Substrate Thermal Imaging with Transient Capability for High Resolution, Pico-sec Transient Imaging for Microelectronic Device Characterization and Device Emission Analysis |

## Nanotherm Series: Key Specifications<sup>1</sup>

|                          | General Purpose |        | High Performance Visible Thermal Imaging |        |             | Thru-the-Substrate Imaging |        | Picosecond Transient Imaging                    |
|--------------------------|-----------------|--------|--|--------|-------------|----------------------------|--------|---|
|                          | NT100A          | NT110A | NT200B                                   | NT210B | NT220B      | NT300A                     | NT310A | NT410A  |
| Spatial Resolution       | 2.1 μm/pixel    |        | 600 nm                                   |        | 300 nm      | 2 μm                       |        | Thru-the-Subs: 2 μm<br>Top-Side: 300 nm         |
| Temperature              | 1 °C Relative   |        | 0.5 °C Absolute                          |        |             | 2 °C Absolute              |        | Thru-the-Subs: 2 °C Abs<br>Top-Side: 0.2 °C Abs |
| Transient                | n/a             | 10 μs  | n/a                                      | 100 ns |             | n/a                        | 100 ns | 800 ps  |
| Effective Pixels (h x v) | 1280 x 960      |        | 1600 x 1200                              |        | 2040 x 2040 | 640 x 512                  |        | 1024 x 1024                                     |

## Nanotherm Series: System Options

| NT200 Series                      |                           |                                    |
|-----------------------------------|---------------------------|------------------------------------|
| For NT200A and NT210A             |                           |                                    |
| Option                            | Name                      | Description                        |
| NT200B Op-050 or<br>NT210B Op-050 | Upgrade to 50x Objective  | Provides 350 nm Spatial Resolution |
| NT200B Op-100 or<br>NT210B Op-100 | Upgrade to 100x Objective | Provides 300 nm Spatial Resolution |

<sup>1</sup> Requires optical table mount

## Accessories, Supporting Products, and System Upgrades

| Number            | Name   | Description   |
|-------------------|--|---|
| <b>TM-200</b>     | High Speed Transient Module (NT200-PG)             | Upgrade for NT200A or NT300A to add: <ul style="list-style-type: none"> <li>• 100 ns Transient capability (includes SW license for SanjVIEW 2.0 Transient Imaging Module)</li> <li>• Support for higher biasing levels for DUT</li> </ul> |
| <b>TC-100</b>     | Thermal Chuck                                      | Thermal chuck controller and module for: <ul style="list-style-type: none"> <li>• +/- 0.5 Temperature Control °C 20 °C to 150 °C (applicable for systems with TIM II)</li> <li>• 50 mm x 50 mm Work surface area</li> </ul>               |
| <b>VT-100</b>     | Vibration Isolation Table                          | Provides: <ul style="list-style-type: none"> <li>• ≥ 80 % Isolation efficiency at 5 Hz</li> <li>• ≥ 90 % Isolation efficiency at 10 Hz</li> </ul>   |
| <b>TCAT-100</b>   | Thermoreflectance Coefficient Analysis Tool (TCAT) | TCAT Reference Unit and SW<br>Coefficient Resolution to $5 \times 10^{-5}$  |
| <b>PA45U</b>      | Power Amplifier                                    | Increased biasing alternatives for device under test  |
| <b>SAT-100</b>    | SanjANALYZER™                                      | Standalone Thermoreflectance Analysis Software Tool   |
| <b>MO-200-xxx</b> | Microscope Objectives for NT200A and NT210A        | <ul style="list-style-type: none"> <li>• MO-200-001: 1.25 x Objective</li> <li>• MO-200-002: 2 x Objective</li> <li>• MO-200-050: 50 x Objective</li> <li>• MO-200-100: 100 x Objective</li> </ul>  |

Product specifications and configurations are subject to change.

Contact Microsanj LLC at [info@microsanj.com](mailto:info@microsanj.com) for PRICING, AVAILABILITY, and latest UPDATES

Or visit [www.microsanj.com](http://www.microsanj.com) for Data Sheets, Application Notes, and Papers

## NanoTherm Series: System Summary

|   | General Purpose |        | Visible Imaging |        |        | Thru-the-Substrate Imaging |        | Picosec Transient Imaging |
|---|-----------------|--------|-----------------|--------|--------|----------------------------|--------|---------------------------|
|   | NT100A          | NT110A | NT200A          | NT210A | NT220A | NT300A                     | NT310A | NT410A                    |
| Visible Topside Imaging                     | ■               |        | ■               | ■      | ■      |                            |        | ■                         |
| Thru-the-Substrate Imaging                  |                 |        |                 |        |        | ■                          | ■      | ■                         |
| Transient Imaging                           |                 | ■      |                 | ■      | ■      |                            | ■      | ■                         |
| Relative Temperature                        | ■               |        | ■               | ■      | ■      | ■                          | ■      | ■                         |
| Absolute Temperature                        |                 |        | ■               | ■      | ■      | ■                          | ■      | ■                         |
| Sub-Micron Resolution                       |                 |        | ■               | ■      | ■      |                            |        | ■                         |
| Picosecond Transient                        |                 |        |                 |        |        |                            |        | ■                         |
| <b>Typical Thermal Imaging Applications</b> |                 |        |                 |        |        |                            |        |                           |
| Hot-Spot Detection                          | ■               |        | ■               | ■      | ■      | ■                          | ■      | ■                         |
| High Power Devices                          | ■               |        | ■               | ■      | ■      | ■                          | ■      | ■                         |
| Latch-Up Analysis                           | ■               |        | ■               | ■      | ■      | ■                          | ■      | ■                         |
| Flip-Chip Imaging                           |                 |        |                 |        |        | ■                          | ■      | ■                         |
| Emission Measurements                       |                 |        |                 |        |        | ■                          | ■      | ■                         |
| Microsecond Transient Analysis              |                 | ■      |                 | ■      | ■      |                            | ■      | ■                         |
| Nanosecond Transient Analysis               |                 |        |                 | ■      | ■      |                            | ■      | ■                         |
| Picosecond Transient Analysis               |                 |        |                 |        |        |                            |        | ■                         |

## Microsanj Consulting and Testing Services

## Consulting and Thermal Imaging and Testing Services

**Microsanj** would like to be your partner in your efforts to meet the thermal challenges associated with today's high performance electronic and optoelectronic devices and components. In addition to providing complete state-of-art thermal analyzer systems, Microsanj offers consulting and testing services to help you identify and diagnose submicron thermal problems. Microsanj is a founding member of the **Microelectronics Design and Measurement Group**, [www.mdamGroup.com](http://www.mdamGroup.com), and has a working relationship with other solution partners such as; **Silicon Frontline**, [www.siliconfrontline.com](http://www.siliconfrontline.com), and **Chip Test Solutions**, [www.chiptestsolutions.com](http://www.chiptestsolutions.com), to provide you with a complete suite of thermal analysis and microelectronic design services. We can integrate custom design measurement systems to meet your specific requirements and bring measurement systems to your facility or you can provide us with devices or components for testing and analysis in our lab.

### Services include:

#### 1. Thermal Imaging

- a. Imaging and quantification of spot temperatures of micron-scale devices for steady state or transient profiles
- b. Providing methods or direct work to find the open/short circuit defects in devices

#### 2. Thermal Characterization

- a. Characterization of effective thermal conductivity of device layers (e.g. thin films)
- b. Characterization of thermal conductivity of suspended or embedded micro features

#### 3. Thermal Design Verification

- a. Thermal characterization of packaged device, e.g. thermal resistance for JEDEC standard and non-JEDEC specific conditions. Small board level also available

#### 4. Thermal Modeling and Validation

- a. Thermal network modeling and analysis for specific devices with a comprehensive validation using thermal imaging tools for future designs

Contact Microsanj LLC at [info@microsanj.com](mailto:info@microsanj.com) or the Microelectronics Design & Measurement Group at [info@mdamgroup.com](mailto:info@mdamgroup.com) for more information on consulting and testing services

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