Nanotherm Series Thermal Analyzer Product Portfolio

Microsanj offers a portfolio of system configurations to meet varied customer requirements and applications.

Product Number and Description

Product #	Nanotherm Series	Description/Application
NT100A	General Purpose Thermal Analyzers	*Hot Spot Detection with Thermoreflectance for Design, Quality Control, & Reliability Analysis*
NT200A	High Performance Thermal Analyzer	*Visible Thermoreflectance Thermal Image Analyzer for Submicron Microelectronic Design and Reliability Analysis*
NT210A	High Performance Transient Thermal Analyzer	*Visible Thermoreflectance Thermal Image Analyzer with Transient Capability for Submicron Microelectronic Design and Device Characterization*
NT220A	High Resolution Transient Thermal Analyzer	
NT300A	High Performance Through-the-Substrate Thermal Image Analyzers	*Through-the-Substrate Thermal Imaging for Flip-Chip Thermal Analysis and Device Emission Analysis*
NT310A	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*
NT410A	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*

Feature and Application Summary	NT100A	NT200A	NT210A	NT220A	NT300A	NT310A	NT410A
Key System Features							
Visible Topside Imaging	•	•	•	•			•
Thru-the-Substrate Imaging					•	•	•
Transient Imaging			•	•		•	•
Relative Temperature	•	•	•	•	•	•	•
Absolute Temperature		•	•	•	•	•	•
Sub-Micron Resolution		•	•	•			•
Picosecond Transient							•
Typical Applications							
Hot-Spot Detection	•	•	•	•	•	•	•
High Power Devices	•	•	•	•	•	•	•
Latch-Up Analysis	•	•	•	•	•	•	•
Flip-Chip Imaging					•	•	•
Emission Analysis					•	•	•
Nanosecond Transient Analysis			•	•		•	•
Picosecond Transient Analysis							•

Consulting and Thermal 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 thermal analyzer systems, Microsanj offers consulting and testing services to help you identify and diagnose, submicron thermal problems. We can integrate custom design measurement systems to meet your specific requirements and bring measurement systems to your lab or you can send us devices or components for analysis in our lab.

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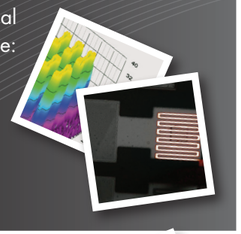
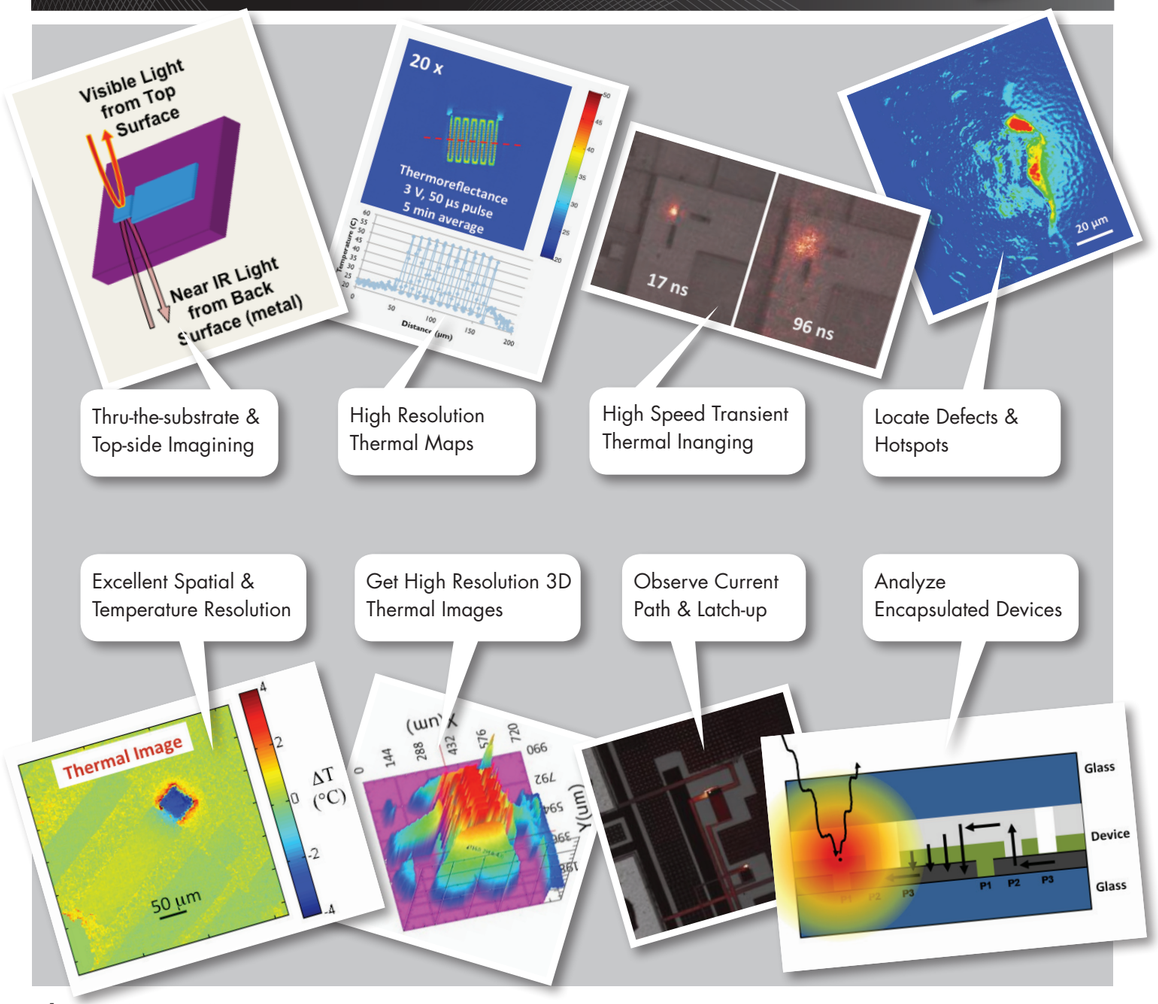
Microsanj ADVANCED THERMAL IMAGING ANALYSIS

Based on optical thermoreflectance in the visible band, dedicated electronics, digital signal processing, and advanced software algorithms; the Nanotherm Series Thermal Analyzers enable:

- Sub-micron spatial resolution
- Excellent temperature resolution
- Transient thermal analysis in the picosecond range
- Thru-the-substrate imaging for flip-chip thermal analysis using near IR illumination





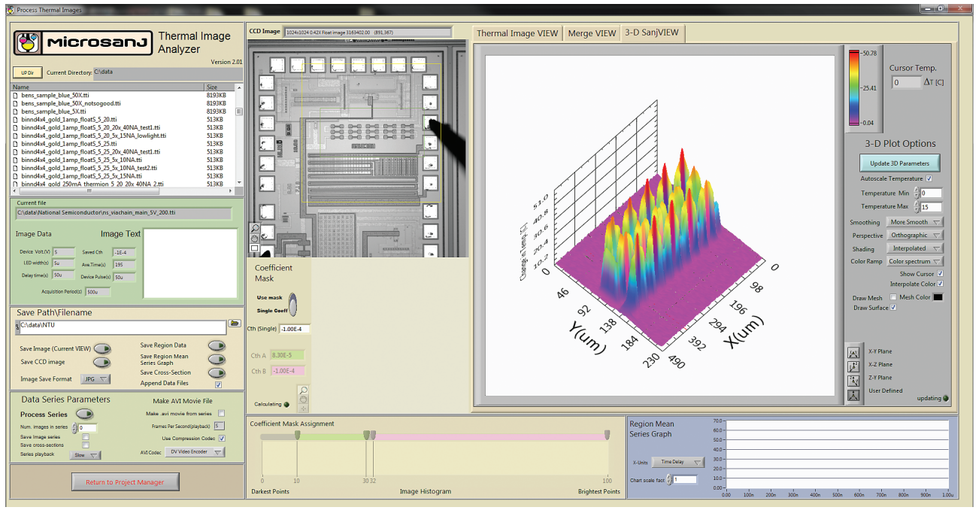
About Microsanj

Microsanj is a leading provider of high-resolution transient thermal imaging systems and services for both commercial and research applications. The system is based on optical thermoreflectance, dedicated electronics, digital signal processing, and advanced software algorithms to support electronic and optoelectronic components measurement, thermal design validation of ICs, defect detection and failure analysis.

SanjVIEW™ 2.0 Software Package

The Microsanj SanjVIEW 2.0 software package with the SanjANALYZER module supports a wide range of Thermoreflectance Image Analyzer (TIA) applications for device thermal characterization, hotspot detection, and reliability analysis. The user-friendly SanjVIEW™ 2.0 software package provides everything you need for DATA ACQUISITION, DATA ANALYSIS, and DEVICE INSPECTION.

ACQUIRE: Based on advanced, band-limited AC imaging algorithms, this SW module ensures reliable thermal imaging over a wide range of conditions. It can provide a running average as thermal images are obtained to increase the temperature sensitivity.



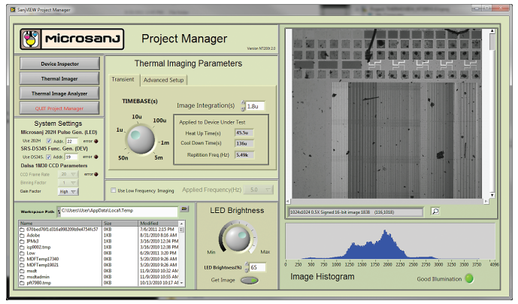
ThermoAnalyzer processes thermal images for region statistics, thermal cross-sections and image merge.

ANALYZE: This module processes thermal images supporting: region statistics, thermal cross-sections, and image merge. Images can be saved in a variety of formats including: JPG, PNG, and raw ASCII for MATLAB data sets for further analysis.

INSPECT: The TIA system can be used as a megapixel, low noise, high zoom imaging system for device inspection. Point and click sliders, based on image intensity, enables the creation of image masks to compensate for different thermoreflectance coefficients.

The **SanjVIEW 2.0** Project Manager Module keeps data files organized and lets you switch between the primary tool functions. The **SanjANALYZER** module is a fully integrated analysis package that works with the low frequency, and transient imaging acquisition software. With **SanjANALYZER** you will be able to:

- View previously acquired thermal images
- Correct for different values of thermoreflectance coefficients
- Find region mean temperature values
- Create and save cross-section plots.
- Output the images in various image formats
- Create .avi movies from a series of images

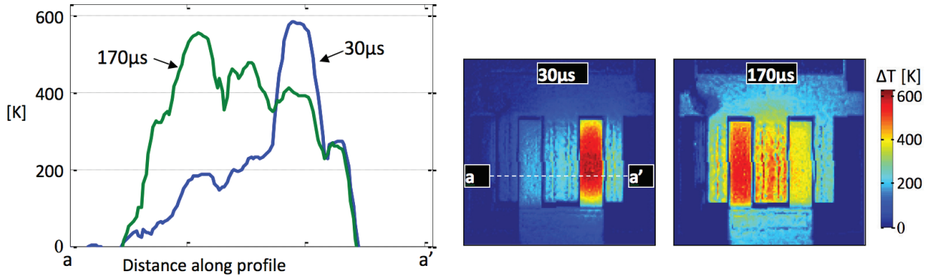


Easy to use SanjVIEW™ 2.0 software provides everything you need for ACQUISITION, ANALYSIS, and INSPECTION.

Applications and Services

SCR Transient Analysis

Transient thermal images of a Silicon Controlled Rectifier (SCR) used for ESD protection in response to a 200 microsecond electrical pulse. The device is 115 microns wide. The current path starts in one finger and, when the device switches, moves to the second finger.



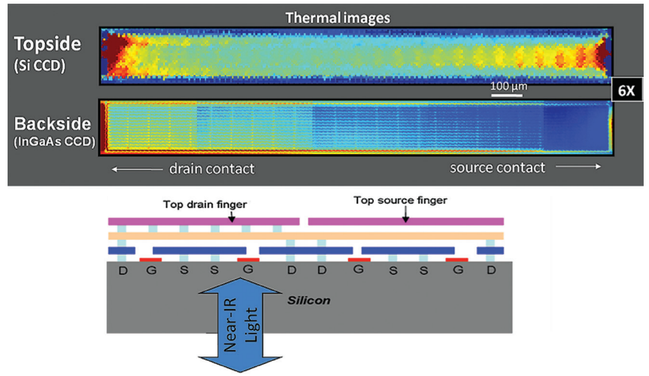
Transient thermoreflectance images for Silicon Controlled Rectifier (SCR) and thermal profiles for 30 µs and 170 µs. Snapback current = 1.22 A for both images.

Through-the-Substrate Imaging for Flip-Chip Thermal Analysis

Using longer wavelength illumination (near-IR) enables thermal imaging through typical substrate materials to enable thermal analysis of flip-chip assemblies.

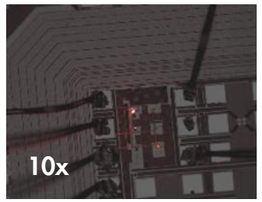
Failure Analysis and Hot Spot Detection

Thermoreflectance imaging with visible light provides device thermal properties on a sub-micron scale enabling detailed failure analysis and device thermal design verification.

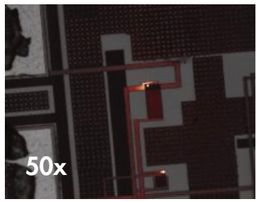


Through-the-Substrate imaging with Near-IR illumination source for thermal analysis of a flip-chip mounted MOSFET on a silicon substrate

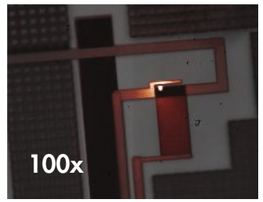
Analysis Example



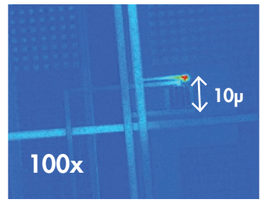
Merged thermal image (optical + thermal image) of faulty transistor sample, at low magnification.



Zoom-in shows failure location of multiple devices in parallel.



Further zoom indicates hot spot seen on gate of upper transistor.



Thermal image of lower transistor using 'rainbow' color palate shows gate short circuit. Fingers in transistor are 180nm wide.