

SanjSCOPE™ NanoTherm-Series For Back-Side Thermal Imaging

This **NANOSECOND TRANSIENT THERMAL IMAGER** is optimized for thermal imaging in the NIR range and has a 50 ns transient resolution. Since silicon is virtually transparent to wavelengths greater than approximately 1000 nm, this spectral range is ideally suited for back-side thermorefectance-based thermal imaging of flip-chip mounted devices, CMOS, and other more complex 3-dimensional semiconductor structures.

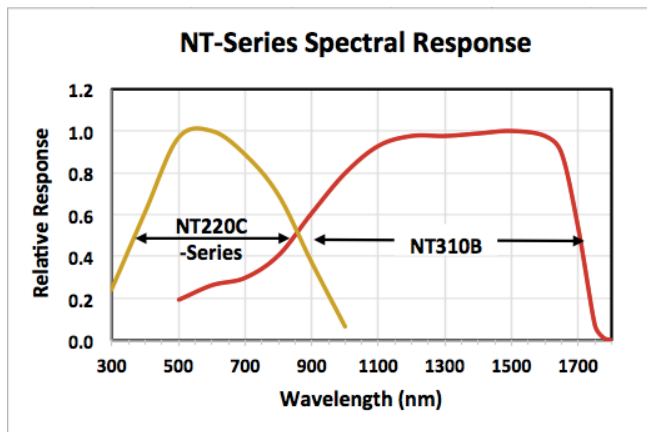


Figure 2: The NT310B spectral response covers 900 nm to 1700 nm. The NT220-series designed to cover the NUV & VIS bands is also shown.



Figure 1: The SanjSCOPE™ Thermal Imaging System for back-side analysis incorporates an InGaAs sensor to cover the NIR band.

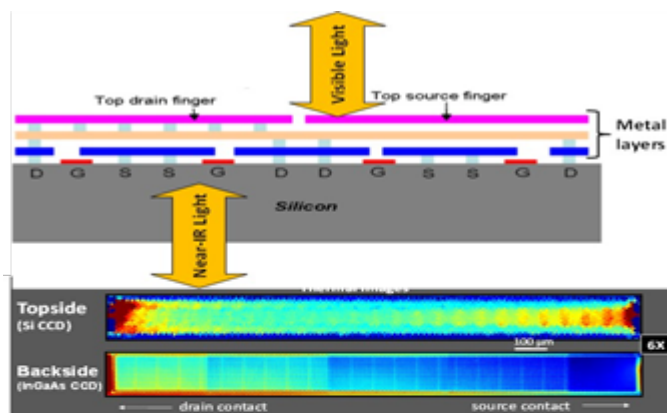


Figure 5: The structure of an array of LDMOS transistors with multiple contact layers & passivation layer on topside. If the goal is to analyze the transistor itself, then the uneven surface with different materials will complicate topside imaging. The backside of the silicon is smooth & uniform, providing a better solution for analyzing the junction thermal behavior with NIR illumination. The topside & backside images are shown in the lower portion of the figure. The topside image shows the temperature distribution for the metal layer, while the backside image shows the thermal image for the transistor array.

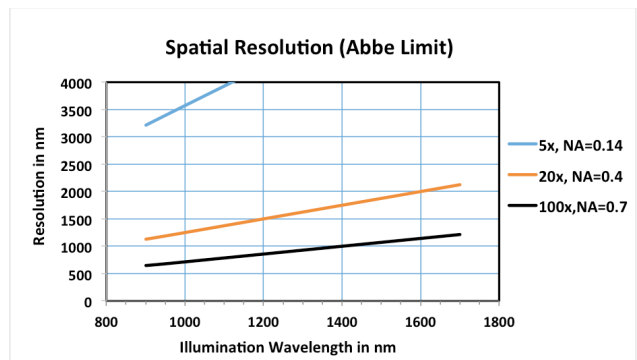


Figure 3: The diffraction limited spatial resolution is shown for the 3 objectives included with the system.

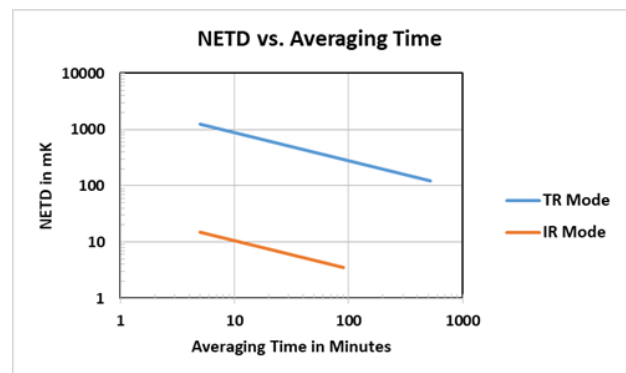


Figure 4: The lock-in technique enables S/N improvement for sensitivity enhancement with increased time averaging in either TR Mode or IR Mode.



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NT310B/NTIR310B Performance Specifications

	SanjSCOPE™ NT310B & SanjSCOPE™ NTIR310B in TR Mode	SanjSCOPE™ NTIR310B in IR Mode
DESCRIPTION		
Camera Sensor	InGaAs	VO Micro-bolometer
Active Thermal Pixels	640 x 512 (0.33 MP)	640 x 512 (0.33 MP)
Detector Pitch	15 µm	12 µm
Spectral Range	(NIR) 900 nm to 1700 nm	(LWIR) 7.5 µm to 13.5 µm
Output Format	14 bit	USB 2.0
LED Illumination Sources	1050 nm and 1300 nm	n/a
Objectives	5x, NA = 0.14, WD = 37.5 mm 20x, NA = 0.40, WD = 20 mm 100x, NA = 0.70, WD = 10 mm	0.5x, WD=32 mm
Field of View (FOV)	1.92 mm x 1.54 mm with 5x objective	15.4 mm x 12.3 mm with 0.5x
Operating System	SanjCONTROLLER™ with embedded SW: SanjVIEW™ v6.0 for system management, image data collection, and data processing and analysis	
PERFORMANCE		
Spatial Resolution	Diffraction limited: 915 nm (@100x, 0.7 NA, 1050 nm LED)	Nyquist limit: 48 µm with 0.5x objective 12 µm with optional 2x objective
Pixel Resolution	150 nm/pixel at 100x	24 µm/pixel at 0.5x objective 6 µm/pixel with optional 2x objective
NETD ¹	1250 mK	15 mK
Transient	Resolution: 12.5 ns delay 50 ns Pulse duration (FWHM)	17 ms Pulse Duration (FWHM)
GENERAL		
Operating Temperature	10 °C to 35 °C (50 °F to 95 °F)	
Power	600 W: 120 V/5 A (240 V/2.5 A)	
Rack Size (L x W x H)	34.5 in x 23.7 in x 28.9 in (900 mm x 603 mm x 734 mm)	
Weight Electronics Rack	125 lbs (56 kg)	

1. Temperature sensitivity typical after 5 min.

OPTIONAL ACCESSORIES FOR THE NT310B	
SA-200: SanjANALYZER-PLUS™	For advanced post-processing of SanjVIEW™ data files
Optional Objectives for TR Mode	Several available from 1x to 100x with varied NA and WD
Optional Objectives for IR Mode	1x, 2x
Optional LEDs	Several available within the specified spectral range
VT-100: Vibration Isolation Table	For sample stability in environments subject to vibration

**For further information about
 the NT310B system or other**

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Or contact your local sales representative:

<https://www.microsanj.com/contact/locations>