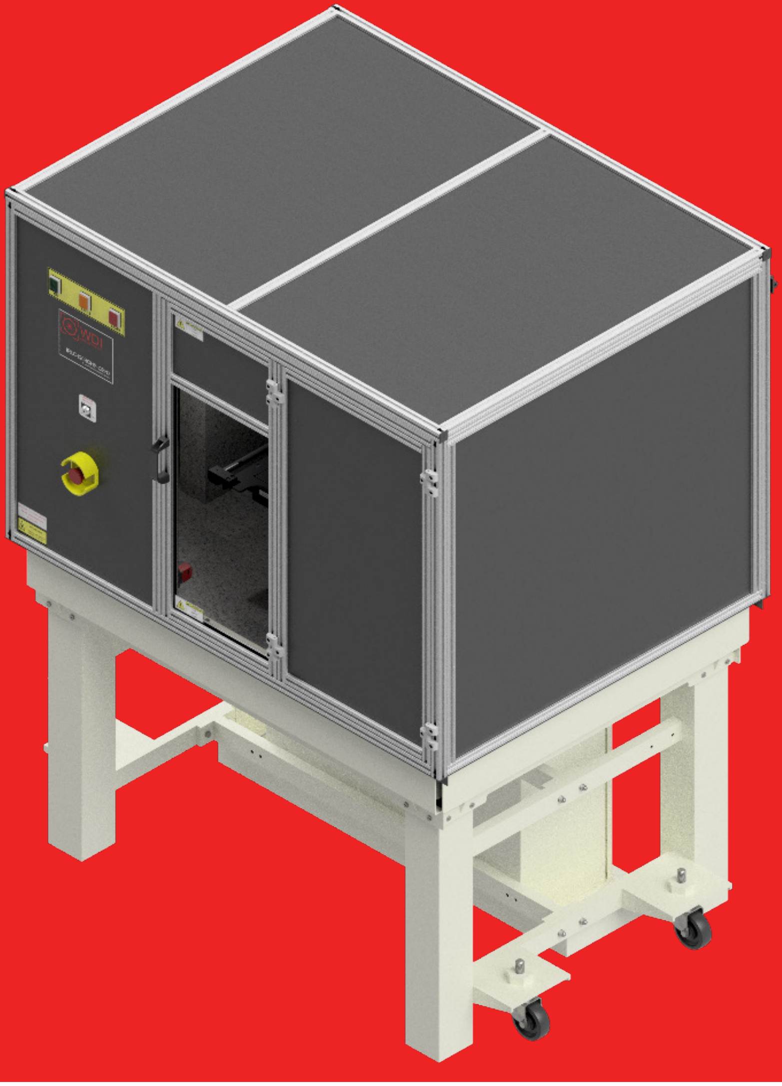
20 year ANNIVERSARY

IRLC

Infrared Laser Confocal Microscopy System

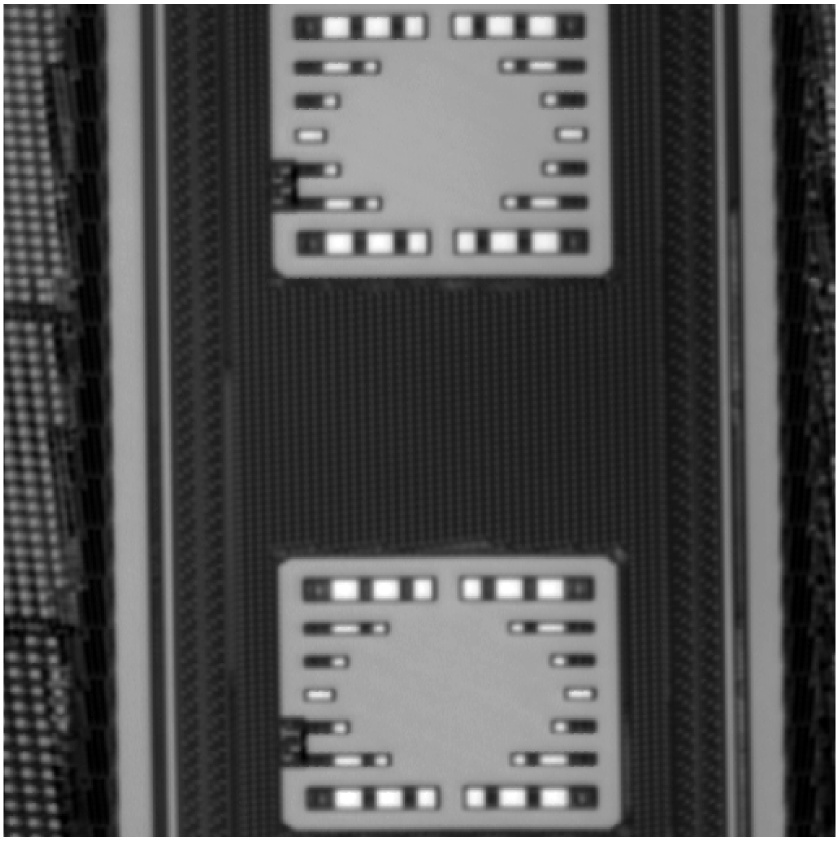


WDI WISE DEVICE INC is a world leader in the design, manufacture and integration of OEM and complete microscopy automation solutions for the biomedical, metrology, electronics, semiconductor, and flat panel display markets.

IR CONFOCAL MICROSCOPY

WDI's Infrared Laser Confocal Microscope Systems (IRLC) employ a near-infrared (NIR) laser, specialized infrared optics, and confocal imaging technology to create the perfect nondestructive, easy to use semiconductor subsurface imaging tool. The technique has several advantages over conventional widefield infrared microscopy systems including:

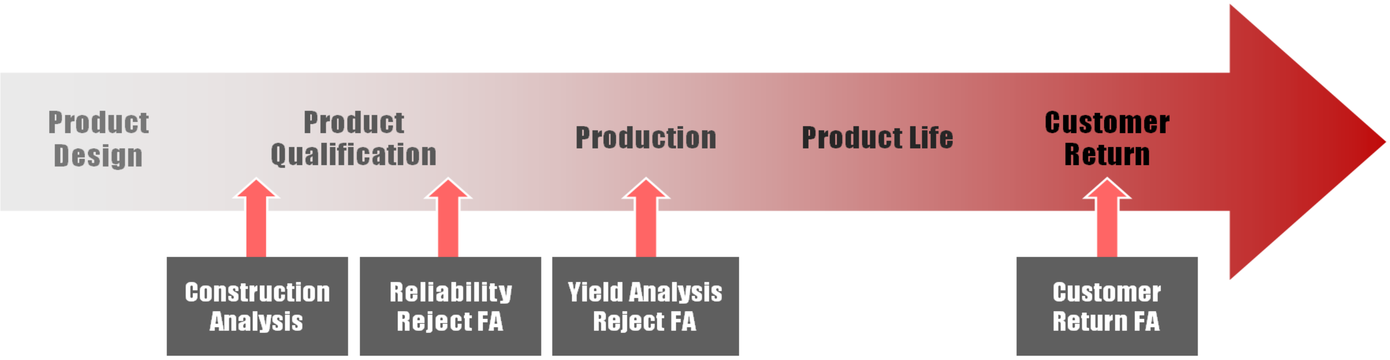
- The ability to acquire clear, high-resolution images from deep within Si and similar materials
- Deeper and clearer imaging through both n-doped and p-doped substrates
- Improved XY spatial resolution and near diffraction limited performance
- Faster image acquisition



Doped silicon device image at 50X magnification 400 µm depth

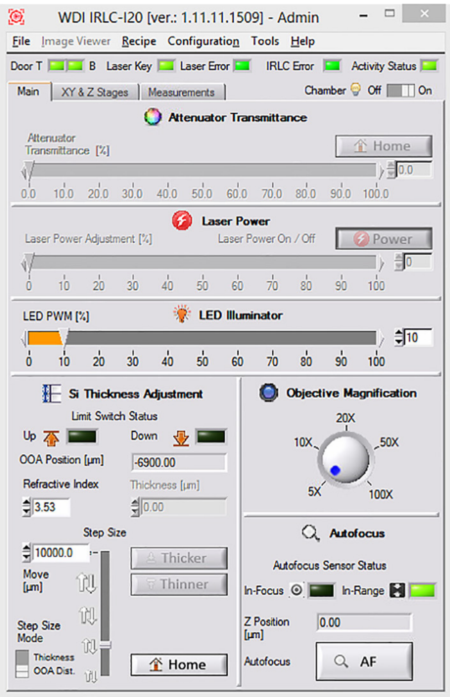
NIR INSPECTION FOR FAILURE ANALYSIS

NIR confocal microscopy is ideally suited for use at various points within the failure analysis (FA) workflow because it is non-destructive and allows inspection of both Silicon bulk integrity and active level/layer areas. The imaging technique has been applied to Flip Chip, Wafer Level Chip Scale Packaging, and doped devices and wafers. Other applications include integrity inspection after bonding, sacrificial oxide layer inspection after etching, inspection for chipping and cracks after grinding or dicing, and inspecting System in Package, 3D mounting, or Chip Scale Packages.

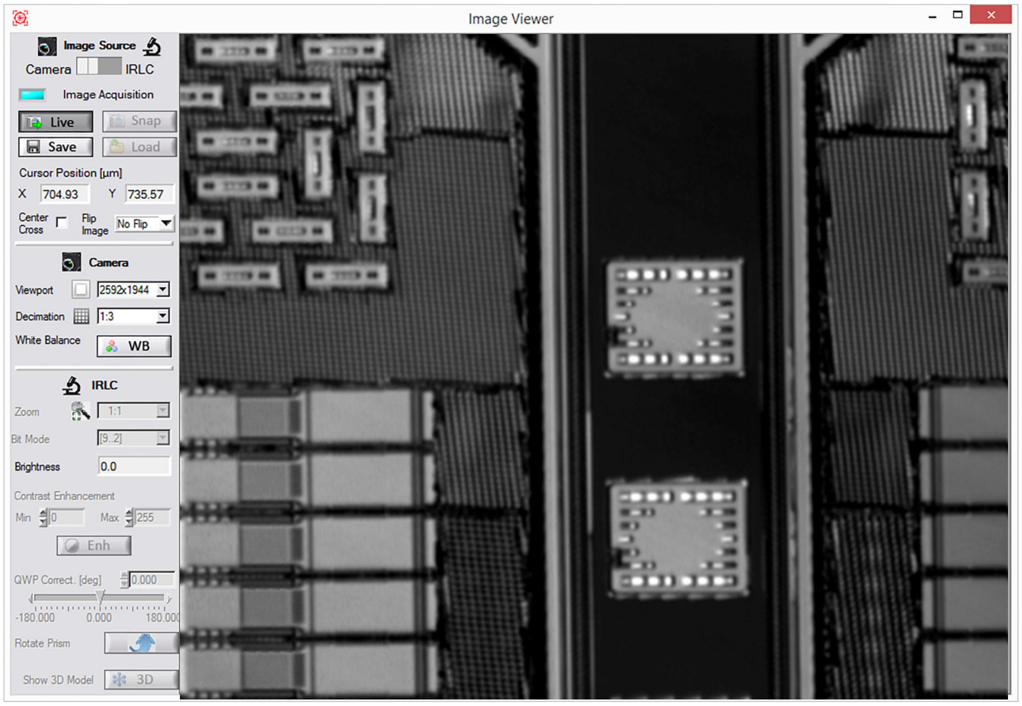


INTUITIVE SOFTWARE

All systems feature powerful yet intuitive software permitting efficient image collection. Operation of the system, including system adjustments for illumination, magnification, XYZ stage position, and focus offset, are intuitive. The software also features advanced image acquisition options, such as maximum Z projection, image stacking and image sequences. Die, Tray, Strip and Wafer recipe software for automated image acquisition is also available. Data can be easily exported to popular imaging processing software such as ImageJ and Matlab.

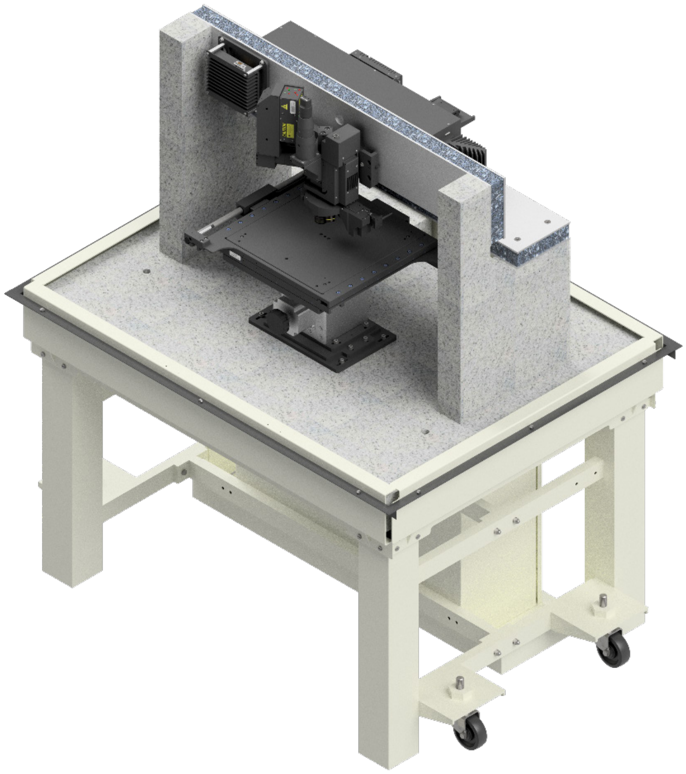


Attenuator Transmittance [%] 0.0
Laser Power Adjustment [%] 0
LED PWM [%] 10
OOA Position [µm] -6900.00
Refractive Index 3.53
Thickness [µm] 0.00
Step Size 10000.0
Z Position [µm] 0.00



Cursor Position [µm] X 704.93 Y 735.57
Flip Image No Flip
Viewport 2592x1944
Decimation 1:3
Zoom 1:1
Bit Mode [9..2]
Brightness 0.0
Contrast Enhancement Min 0 Max 255
QWP Correct. [deg] 0.000

IRLC MICROSCOPE SYSTEM



Now in its 3rd generation, WDI's IRLC Infrared Laser Confocal Microscopy System features a powerful combination galvo & resonance scanner and automation of all components:

- Galvo/Resonance Laser Confocal Scanner
- 1155 nm 500 mW Laser
- Motorized Variable Attenuator & Detector
- ¼ Wave Plate Contrast Adjustment
- Motorized Z Jack for course focus
- Motorized Hybrid ZAA fine focus
- ATF6 Autofocus + Optical Offset Adjuster
- Motorized Objective Turret
- 5X, 10X, 20X, 50X, 100X IR Objectives
- Motorized XY 300 mm Linear Stage
- WLED & CMOS Camera for Brightfield
- Laser Safety Acoustic Cancelling Enclosure
- Granite Base and Gantry Risers
- Active Anti Vibration Isolation Table
- Laser Marking (Optional)

SYSTEM SPECIFICATIONS

General System	System Laser Class	Class 1 (Laser Safety)	
	Observation Methods	NIR Laser Scanning Confocal & Conventional Bright Field	
	Electrical	3 Separate AC Outlets, 100-240 V, 50/60 Hz, Single Phase	
	Current	13.0 A Total System	
	Operating Temperature	10°C to 30°C Ambient	
	Operating Humidity	10% to 70% Non-Condensing	
	Weight	900 kg	
Motorized Objective Turret	Objective Capacity	6 RMS Thread	
	Objective Change Time	1 Second Adjacent Objective	
Structure	Base & Risers	4” Granite Base & 2” Granite Risers	
	Anti Vibration Table	Welded Steel	
Motorized Z Jack	Travel	50 mm	
Motorized Z Actuator	Type	Hybrid 1/32 Stepper	Piezo
	Travel	10 mm	100 µm
	Resolution	0.157 µm	10 nm
	Maximum Speed	10 mm/sec	100 mm/sec
Motorized XY Stage	Type	Linear Encoded	
	Travel	300 mm X 300 mm	
	Repeatability	0.1 µm	
	Accuracy	0.5% Full Travel	
	Resolution	0.1 µm	
Imaging	Type	1/2” 2MP CMOS	Confocal Detector
	Illumination	1 Amp White LED	Single Mode 500 mW 1155 nm
	Resolution	2592 X 1944	512 X 512
	Frame Rate	10 FPS	Up to 30 FPS
	Bit Depth	10 Bits	14 Bits
	Pixel Size	4.2 µm X 4.2 µm	7.5 µm X 7.5 µm

OBJECTIVE SPECIFICATIONS

Category	5X	10X	20X	50X	100X
Numerical Aperture	0.1	0.3	0.45	0.65	0.85
Working Distance	23 mm	18 mm	8.3 mm	4.5 mm	1.2 mm
Resolution @ 1155 nm	7.05 µm	2.35 µm	1.57 µm	1.08 µm	0.83 µm
Correction Collar	No	No	Yes	Yes	Yes
Thickness Correction			0 to 1.2 mm	0 to 1.2 mm	0 to 0.7 mm

WDI is a world leader in the design, manufacture, and integration of OEM and complete microscopy automation solutions for the biomedical, metrology, electronics, semiconductor, and flat panel display markets. WDI’s success lies in an innovative culture and ability to optimize and adapt our technology to customers’ specific requirements by listening to their needs and gaining a deep understanding of their processes, applications and goals. WDI employs over 70 optical, electrical, mechanical and software engineers, as well as scientists, who are dedicated to servicing our customers. Contact WDI today to see how we can help solve your microscopy automation needs.

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