

Operating SanjVIEW 7 with the Visible Camera (TR)

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(Source Section 8)

Opening the software and setting up a session:

1. Open SanjVIEW v7.0 from the computer desktop; center the sample in Project Manager and focus on the target device.
2. **System Status** — ensure all indicator lights are green for the connected system.
3. **Select Camera to Use** — available cameras: Infrared (IR), Visible - Thermoreflectance (TR), Near Infrared (NIR). Press **F1** to switch cameras.
4. Click the Auto Focus tab.
5. Set "Mag" to the objective in use (example: 5X).
6. Click "Enable Motion" ON and "Center Stage" ON. (The microscope may need refocusing after centering the stage.)
7. Click the file icon; name the file path and click "current folder."
8. Select the desired imaging operation.

“ Note: Transient Thermoreflectance is only available when a Visible camera is selected (not with an Infrared camera).

Steady State

8.1.1 Hardware

1. Enter the desired Base Temp (°C) and click "SET" next to Set Base Temp.

2. Set Stage State ON.
3. Set "Vo ON Voltage" to 7V.

8.1.2 Timing / Illumination

1. Set Device On Time to 10.
2. Set Image Averages (cycle) to 10.

8.1.3 3D Alignment — Focus ROI

1. Select a region on the CCD image using the rectangle tool — choose a unique feature (e.g., edges, scratch marks).
2. Press Focus ROI to set the selected region as the ROI.
3. Wait a few seconds until the Focus ROI light turns green.
 - *Note: To zoom, use the magnifying glass; hold SHIFT to zoom out, SHIFT+click to zoom in.*
4. Ensure "Enable 3D NanoAlign" is checked.

8.1.4 3D Alignment — Capture Reference

1. After the ROI is focused, press Capture Reference to set it as the Reference region.
2. Wait for the Capture Ref light to turn green ("Enable Digital Anti-vibration" turns on automatically).
3. Set initial Focus Tolerance, Alignment %, and Vibration Filter parameters — lights turn green when the image is in range.
 - *Note: Increasing Alignment % and decreasing Vibration Filter improves alignment accuracy. Alternatively, load a prior reference for easier alignment.*

8.1.5 Start Measurement

1. Click "START Measurement" to begin.
2. Progress displays in the System Status bar; "Turn OFF" appears after each cycle; "Loop Iterations" tracks cycle count (9–11 iterations is sufficient for TR).
3. Under Save Path, confirm the directory/name are correct — save in `C:\Data\Qualification\`, appending the filename to the path.
4. Click "Save Every Cycle." Click "Save Data" when ready. (*Save the image before stopping the measurement.*)
5. To stop: click "STOP MEASUREMENT," then "Return to Project Manager," or File → Quit.

Calibration

8.2.1 Hardware

1. Set "Magnification" to match the objective (example: 5x).

2. Set "High Temp" to 120°C and "Base Temp" to 20°C.
3. Turn "Stage State" ON.
4. Click "Set Low Temp" to initialize the chuck to the base temperature.
5. Click "Use Chuck Sensor" to use the embedded chuck thermal sensor, or leave off to use an external thermal probe.

8.2.2 Timing/Illumination

1. Set Stage Heating Time to 40.
2. Set Image Averages to 50.

8.2.3 3D Alignment — Focus ROI: same procedure as 8.1.3.

8.2.4 3D Alignment — Capture Reference: same procedure as 8.1.4. Alternative: click "Load Reference," select a previously saved file, and wait for the "Load Reference" light to turn green.

8.2.5 Start Measurement

1. Click "START Measurement."
2. The calibration cycles through temperatures; progress shown in System Status, "Calibration Done" after each cycle, "Loop Iterations" tracks count.
3. Select a region on Thermal Image View to read the sample's Calibration Factor live, shown in "Mean CTR."
4. Under Save Path, confirm directory/name — example: `C:\Data\Qualification\Training`.
5. Under Save Image, click "Save Every Cycle," then "Save Data" when ready. (*Save before stopping.*)
6. To stop: "STOP MEASUREMENT," then "Return to Project Manager," or File → Quit.

Failure Analysis (FA) Mode

8.3.1 Parameter Setup

1. In Project Manager, set "Cam Selection (F1)" to VISIBLE.
2. Uncheck "INT Vo 20mA Range" (green = checked, grey = unchecked).
3. File → Options.
4. Software tab → set "FA Mode Pulse Width" to Long (15 Frames).
5. Return to Project Manager and click "FA Mode."

8.3.2 Process

FA Mode confirms the device is biased and conducting current before using Movie Mode / Transient Mode.

1. Go to the "Biasing" tab.
2. Change Vo(V) to 7.000.

3. Click "Update Values."
4. Confirm "Peak Voltage (V)" and "Peak Current (I)" read near 7V and 70 mA for device 2 (Center Diode).
 - *Note: If current is much lower than expected, confirm "INT VO 20mA Range" is unchecked in Project Manager.*

8.3.3 Save Data

1. File → Save Data.
2. Click File Browser, choose the save folder, click "Current Folder" (example: `C:\Data\Qualification\Training`).
3. Enter the file name (example: "FA-File").
4. Click "Save."
5. Click "Return" to close the pop-up.
 - *Note: Change the Microsanj Data Save Path before saving a new data set, to avoid overwriting previous data.*

Transient Thermoreflectance

8.4.1 System Status

1. Change Camera to VISIBLE.
2. Click Transient Thermoreflectance.
3. Click "Measurement Settings" tab.

8.4.2 Measurement Setting

Two alignment approaches:

- *Approach 1 (Focus Region + Capture Reference):*
 1. Select a region on the CCD image with the rectangle tool (a unique feature, e.g., edges/scratch marks).
 2. Press Focus ROI; wait for the light to turn green.
 3. Press Capture Reference; wait for the Capture Ref light to turn green.
- *Approach 2 (Load Reference):*
 1. Click "Load Reference."
 2. Enter/browse the calibration file path and click LOAD.
 3. Wait for the "Load Reference" light to turn green.
 4. Click Enable 3D Motion & Enable DAV.
 5. Set "Alignment %" to 99.00.

8.4.3 Transient Thermoreflectance — Single Image

(Thermal Image should appear before proceeding.)

1. In Measurement Settings, set "Voltage to Device (V)" to 7V.
2. Click "Update Values."
3. Leave "DUT Pulse," "LED width," and "Acq Period" at their automatically-inserted initial values (in this example — they can be changed).
4. Click "Start Measurement."
5. Wait ~30 s or until noise averages out, then File → Save Data.
6. Choose a save location via File Browser, enter the file name, click "Save."
7. Click "Measurement Running" to stop.

8.4.4 Transient Thermoreflectance — Series

1. In Measurement Settings, set "Voltage to Device (V)" to 7V.
2. Click "Update Values."
3. Leave "DUT Pulse," "LED width," and "Acq Period" at automatic values (can be changed).
4. Set "Image Delay" to 0s. Click "Update Delay."
5. File → Setup Sweep.
6. Choose the save location via File Browser (click "current folder") and append the desired file name.
7. Enter "Number Delay Images" (example: 10).
8. Enter "Delay Step" (example: 50 μ s) — the DUT Pulse increment per frame.
9. Enter "Ave time per frame" (example: 30 s).
10. Click "START" to begin acquisition.
11. When the designated number of images is collected, the Start button turns green again — click "Close" to exit the dialog, then click "Measurement Running" to stop.

SanjAnalyzer

8.5.1 System Status

1. Confirm Camera is set to VISIBLE.
2. Click SanjAnalyzer to open the "SanjVIEW Image Analyzer" window.

8.5.2 Process Data

1. Select the Calibration tab.
2. Select "Point to Point" under "Method" — a "Load CTR Map" window appears.
3. Click the Browse icon and select the calibration image.
4. Click "LOAD" to overlay the calibration image onto the selected test image.
5. In the file window (top left), click Browse and select the file to analyze (double-click). *(If the file isn't listed, click "UP Dir" to change directory.)*
6. Drag an ROI box across the specimen with the rectangle tool to measure temperature in that range — up to 5 ROI boxes can be drawn (hold Ctrl while selecting additional boxes) to compare locations.
7. Adjust the temperature scale and image-averaging factors as desired (optional).

8. Select "Settings" tab, choose a save path via Browse, and click "Save Image Current View" to save the processed image.
 9. To process a series: enter the file count in "Number of Images in Series" and click "Process Series" — the ROI Mean graph plots mean temperature of the selected ROIs over time.
 - *Note: Right-click the graph → Export → "Export Data to Clipboard" to export data to a table.*
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