

NASA STANDARD TEST REPORT

TEST REPORT DOCUMENT: RSP.001

Test Title: Raman Spectrometer Performance Evaluation

Test Identifier: RSP-001

Test Date: [Insert Date]

Test Location: [Insert Location]

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Quality Engineer: Berhane

1. TEST OBJECTIVE

To document the performance evaluation of a Raman spectrometer using a 527 nm excitation laser, including spectral accuracy, resolution, and efficiency based on the test procedure RSP-001.

2. TEST CONDITIONS

- Environmental Conditions: [Temperature, Humidity, Pressure]
- Instrument Calibration: Verified using a silicon wafer as a reference sample.
- Alignment Checks: Ensured proper positioning of collimating and focusing mirrors.

3. DATA COLLECTION

3.1 Measurement Parameters

Parameter	Measured Value	Expected Value	Deviation
Raman Peak (Si)	[XX] nm	520.7 nm	[XX] nm
Spectral Range	[XX] nm	530-630 nm	[XX] nm
Resolution (FWHM)	[XX] nm	≤ 0.5 nm	[XX] nm

MTF @ 10 cycles/mm	[XX]	≥ 0.8	[XX]
Signal-to-Noise Ratio	[XX] dB	\geq [XX] dB	[XX] dB

4. RESULTS & ANALYSIS

4.1 Spectral Accuracy

- The Raman peaks were identified at [XX] nm, within [XX] nm of the expected values.
- Calibration confirmed using a silicon wafer reference spectrum.

4.2 Resolution & Image Quality

- The spot diagram analysis shows well-separated wavelengths at different positions.
- MTF results indicate an optical transfer function above the threshold at 10 cycles/mm.

4.3 Intensity & Irradiance Distribution

- The intensity distribution was analyzed at multiple wavelengths.
 - The CCD detected sufficient illumination across the spectral range with minimal noise.
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5. DEVIATIONS & CORRECTIVE ACTIONS

Observation	Cause	Corrective Action	Status
[Issue]	[Cause]	[Action Taken]	[Resolved/Pending]

6. CONCLUSION

- The Raman spectrometer met/not met the acceptance criteria.
- Improvements in [XX] may enhance future performance.
- Further optimization in slit width, mirror alignment, or grating selection may be necessary.

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