

Research-Grade High-Sensitivity Spectrometer

ATP6500

Features

- Standard Cooled CCD, Cooling Temperature -15°C
- Deep Cooled CCD, Cooling Temperature -70°C
- Detector: Back-thinned CCD (can be cooled to a minimum of -70°C)
- Detector Pixels: 1024×64
- Ultra-low-noise CCD signal processing circuit
- Quantum Efficiency: $>90\%$
- Ultra-high Signal-to-Noise Ratio & Dynamic Range
- Spectral Range: 190-1100nm (widest 700nm)
- Spectral Resolution: 0.05-3 nm (depends on spectral range, slit width)
- Optical Structure: Crossed Czerny-Turner (C-T)
- Integration Time: 1ms-65s
- Power Supply: DC $5\text{V} \pm 10\%$ @ $<2.3\text{A}$
- 18 bit, 570KHz A/D Converter
- Light Input Interface: SMA905 or Free Space
- Data Output Interface: USB2.0 (High Speed) or UART
- 20-pin Dual Row Programmable Expansion Interface

Application

- Biological Fluorescence Detection
- Raman Spectrometer
- Micro-volume, Rapid Spectrophotometer
- Transmittance Detection

Description

The ATP6500 is an ultra-high-performance, cooled, miniature fiber optic spectrometer developed by Optosky, reigning supreme in performance. It utilizes a 1024×64 pixel cooled back-thinned linear CCD. This CCD offers the largest dynamic range and employs semiconductor cooling technology to reduce the dark current during operation. The CCD can operate in a set constant temperature environment (as low as -15°C), significantly reducing sensor noise and achieving an excellent signal-to-noise ratio (approximately twice that of comparable competitors). This also enhances the measurement reliability of the ATP6500, ensuring measurement results remain unaffected by ambient temperature changes.

Simultaneously, Optosky has specially customized an ultra-low-noise CCD signal processing circuit for the ATP6500, with quantization noise less than 5 counts, representing the best level in the industry. The ATP6500 can accept light input via SMA905 fiber optic cable or free-space light and outputs the measured spectral data via USB 2.0 or UART port. The ATP6500 only requires a 5V DC power supply, making it very easy to integrate and use.

Model	Features
ATP6500	Standard Cooled CCD, Cooling Temperature -15°C
ATP6500DC	Deep Cooled CCD, Cooling Temperature -70°C



Figure 1 ATP6500 & ATP6500DC High-Sensitivity, High-Resolution Scientific-Grade Miniature Fiber Optic Spectrometer

1. Selection Guide

Model	Features
ATP6500	Research-grade cooled back-thinned CCD detector, 1044×64
ATP6500DC	External research-grade deep-cooled (-70 °C) CCD camera, 2048 × 264 (Note: Check original spec inconsistency 1044x64 vs 2048x264)

2. Parameter

	Parameter	ATP6500	ATP6500DC
Detector	Type	Area Array Back-thinned CCD (Cooled to -15°C)	Research-grade External CCD Camera (Deep Cooled -70°C)
	Detection Spectral Range	190-1100 nm	190-1100nm
	Pixels	1024×64	2048×264
	Pixel Size	24μm×24μm	15μm×15μm
	Full Scale Range	~600 ke-	>90 ke-
	Full Scale Range	8 e-	<0.1 e-/(s·p)
Optical Parameters	Wavelength Range	190-1100 nm (Max. 700nm)	
	Best Optical Resolution	0.1-3 nm (Depends on slit, spectral range)	0.05-3nm(Depends on slit, spectral range)
	SNR	>1000: 1	
	Dynamic Range	20000: 1	
Optical Path Parameters	Optical Design	F/4 Crossed Asymmetric Czerny-Turner (C-T)	
	Entrance Slit Width	5/10/25/50/100/150/200 μm optional, other sizes customizable	
	Entrance Slit Width	SMA905 Fiber Interface, Free Space	
Electrical Parameters	Integration Time	6 ms - 65 s	1 ms - 65 s
	Data Output Interface	USB 2.0	
	ADC Resolution	18 bit(Output 16bit)	
	Power Supply	DC 5V±10%	DC12V±10%
	Operating Current	<2.3A	
	Operating Temperature	-20°C to +50°C	
	Operating Humidity	< 90%RH	
Physical Parameters	Dimensions	217×110×52 mm3	222×110×96 mm3
	Weight	0.8kg	2.65kg

3. Key Performance Test Reports

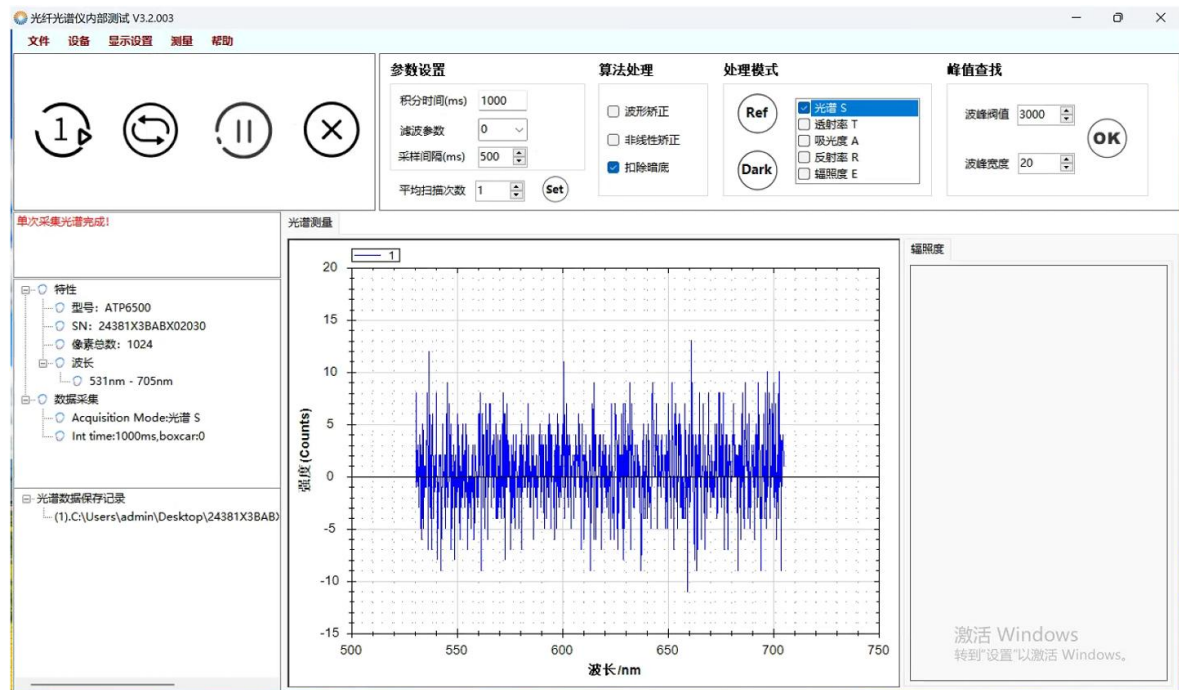


Figure 2 ATP6500 Dark Current Test (1000ms)

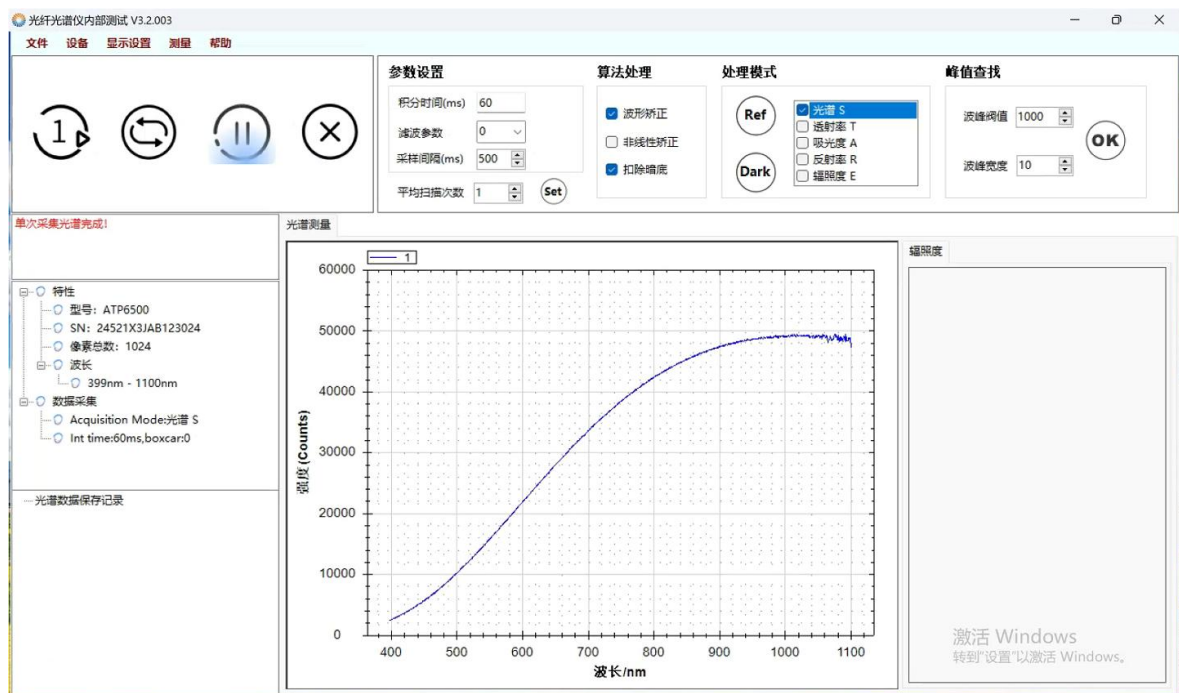


Figure 3 ATP6500 Wavelength Calibration

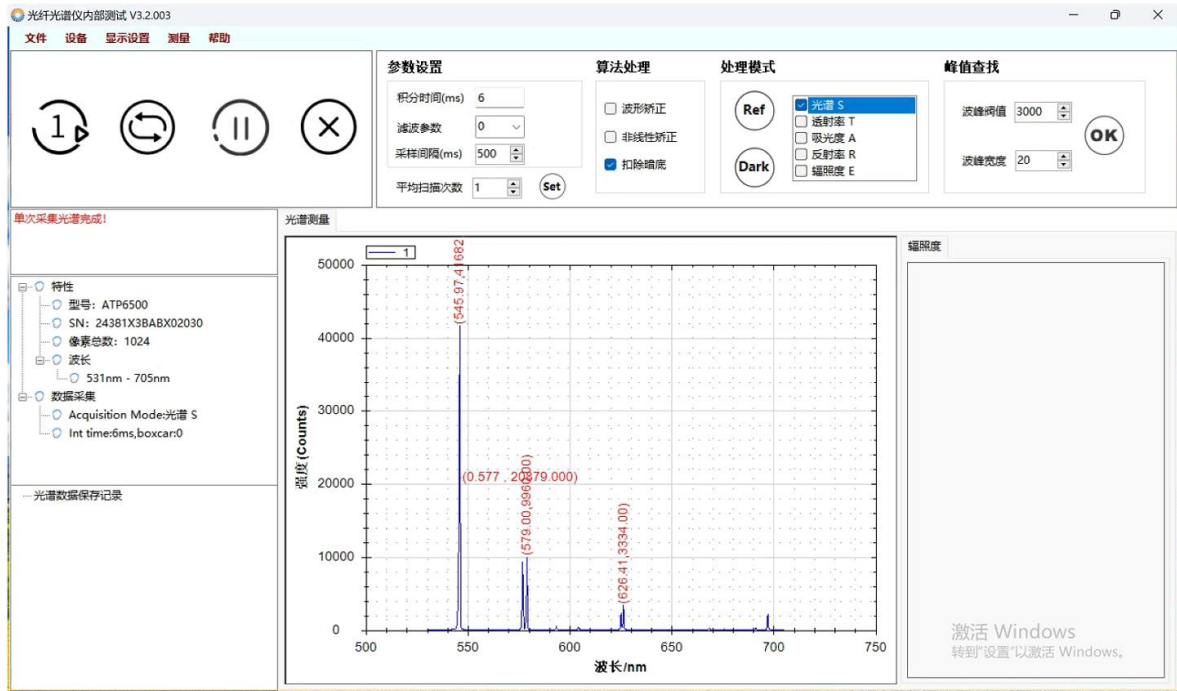


Figure 4 ATP6500 Resolution - 0.577nm @546nm

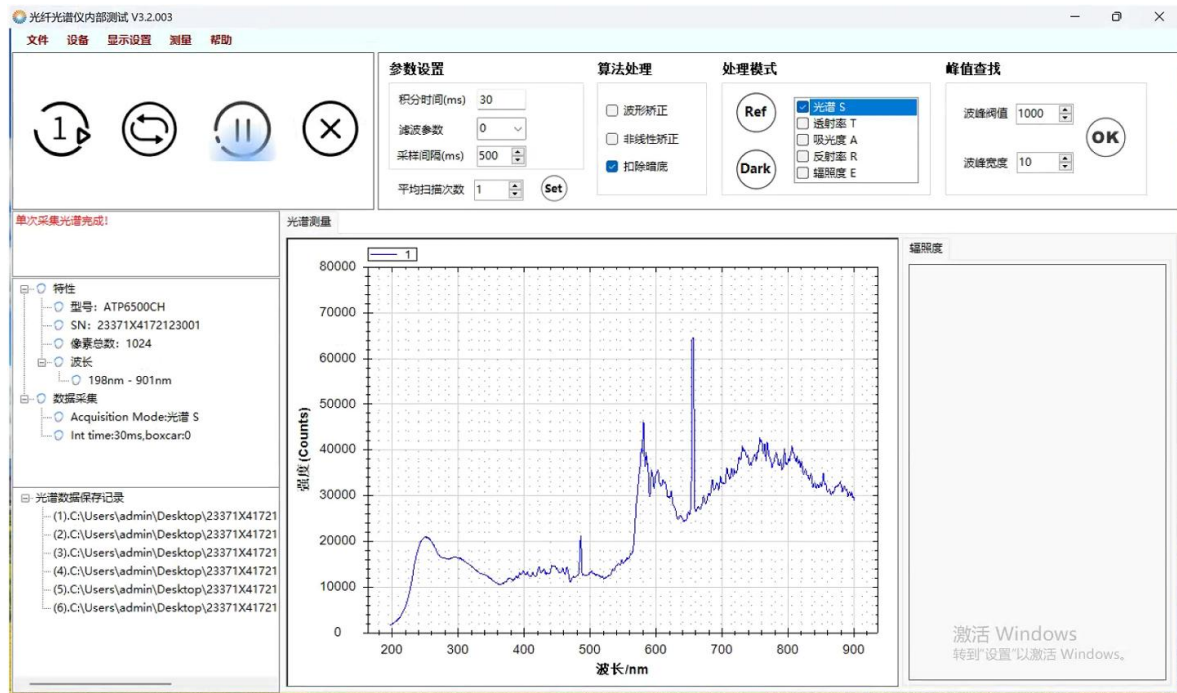


Figure 5 ATP6500 Deuterium Halogen Lamp Test Spectrum

4. Product and Dimension Drawings



Figure 6 ATP6500 & ATP6500DC Product Image

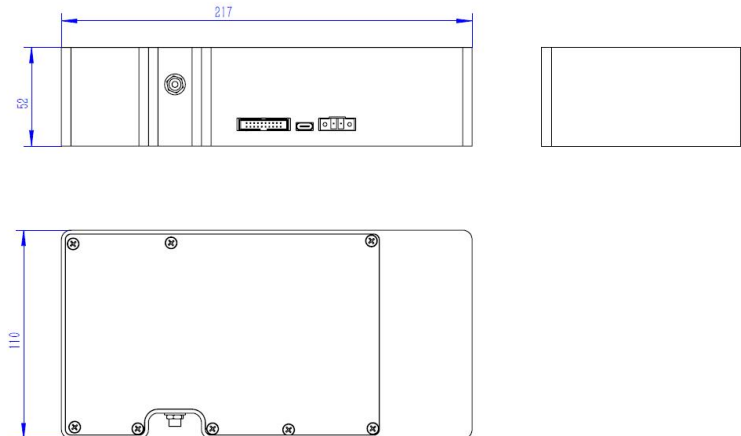


Figure 7 ATP6500 Outline Dimension Drawing

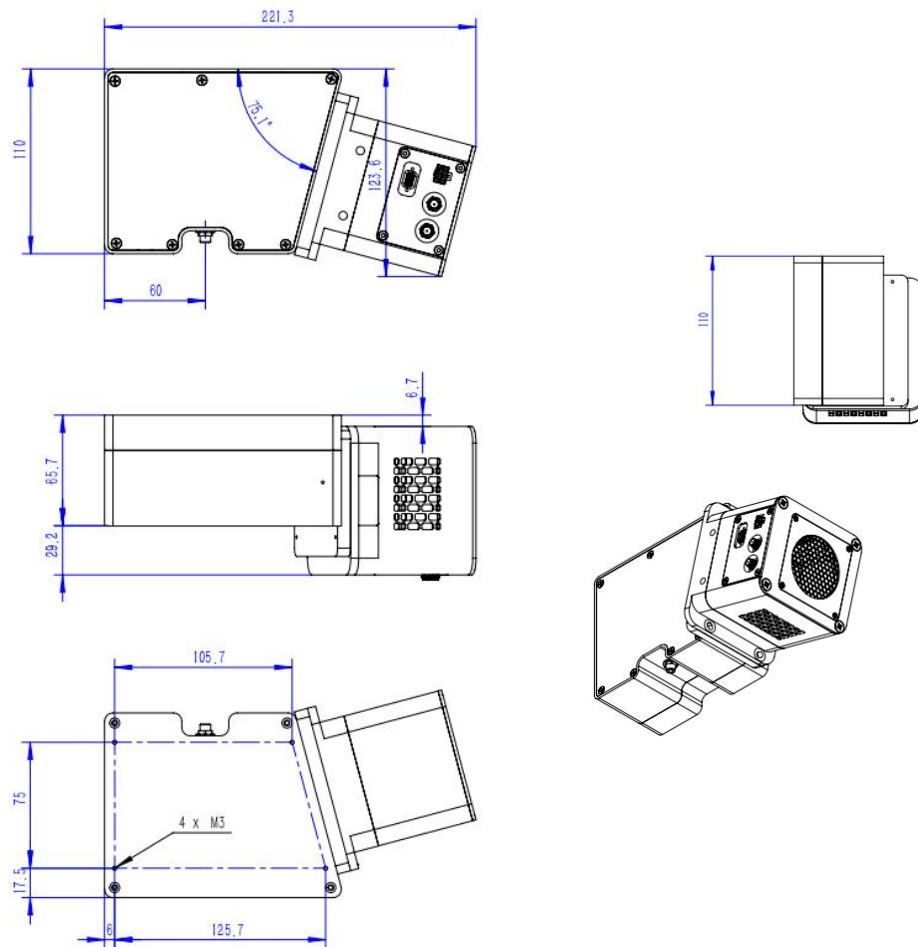


Figure 8 ATP6500DC Outline Dimension Drawing

5. Accessories

Standard Accessories	
1	Type-C to USB Cable
2	5V or 12V Power Adapter
Optional Accessories	
1	UV-VIS Fiber Optic Cable
2	Spectral Analysis Cuvette (Disc Type)
3	Standard Diffuse Reflection Standard White Board
4	Transmittance/Reflectance Measurement Integrating Sphere Holder

6. Application Scenarios and Measured Data

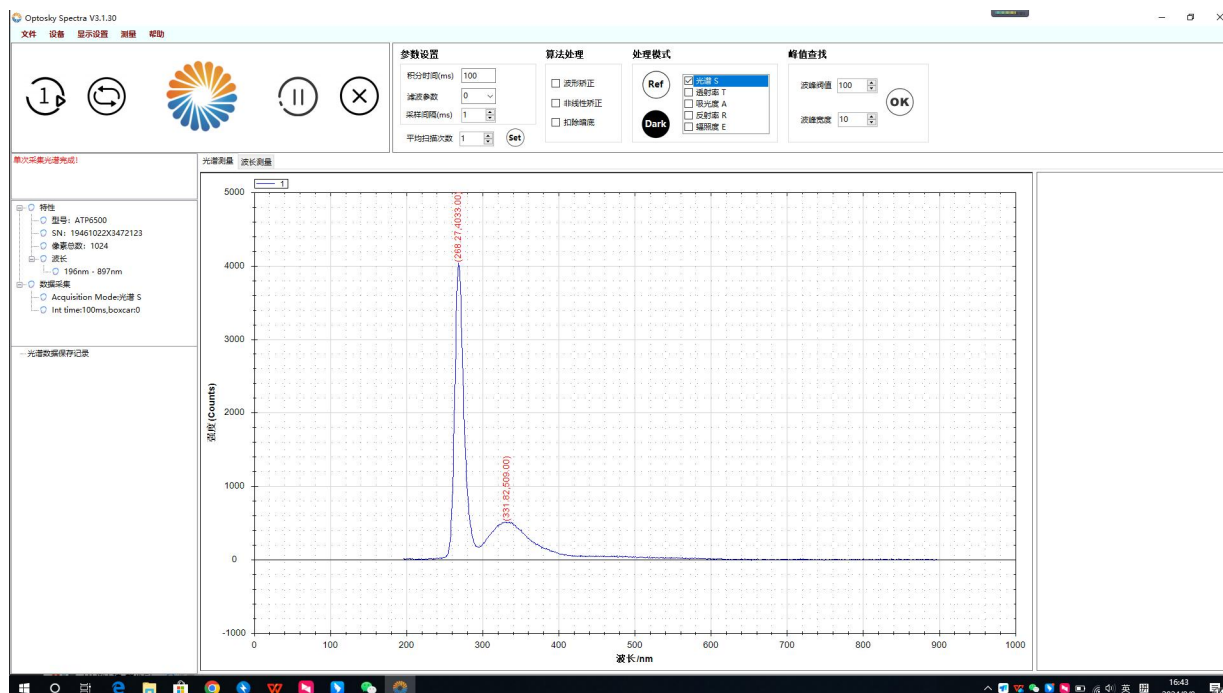


Figure 9 ATP6500 Fluorescence Excitation Spectrum Test Graph of Fluorescent Sample

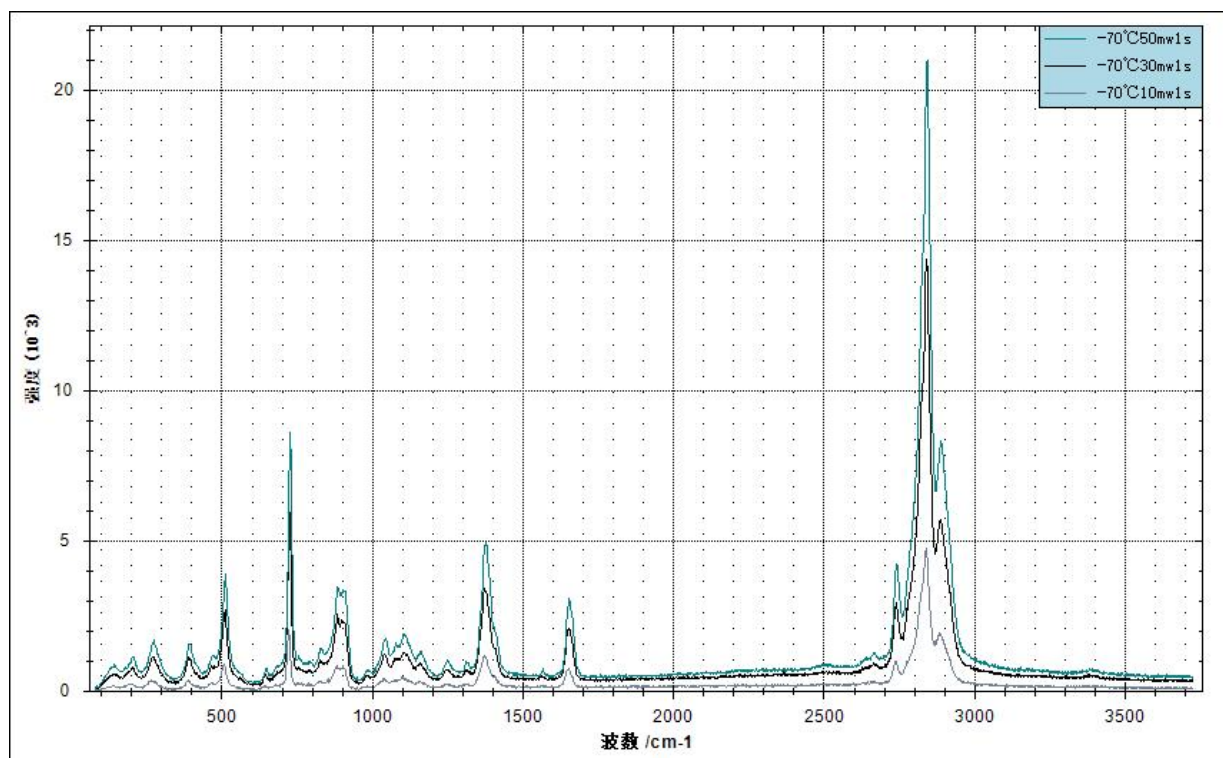


Figure 10 ATP6500 Comparison of Raman Spectra of Plastic Sample Tested under Different Laser Powers