OPTOSKY Spectroscopy Solutions

Datasheet

Miniature Spectrometer | ATP5001

Features

- Detector: Back-illuminated ccd (cooled to -15℃)
- Detector pixels: 2048×64
- Ultra-low noise ccd signal processing circuit
- Spectral range: 190-1100 nm
- Spectral resolution:0.1-4nm (depending on spectral range, slit width)
- Optical path structure: Cross c-t
- Integration time: 2ms-130s
- Power supply: Dc 5v±10% @ <2.3A
- 18 bit, 570khz A/D converter
- Input interface: Sma905 or free space
- Output interface: USB 2.0 (high speed) or UART

Application

- LED sorting machine;
- Environmental Science: Multi-parameter online water quality analyzer;
- Micro-volume, fast spectrophotometer;
- Spectral analysis, radiometric analysis, spectrophotometric analysis
- Fluorescence spectrophotometer;
- Life Science Research: Biomedical analyzer;
- Transmittance and absorbance detection;
- Reflectivity detection;
- LIBS;

Description

ATP5001 is a Low Cost Spectrometer that uses a 2048×64 pixel refrigerated linear CCD. The CCD uses semiconductor refrigeration technology. The CCD can work in a set constant temperature environment (as low as -15ºC), thus greatly reducing the sensor noise and achieving extremely high performance. It has the best signal-to-noise ratio (approximately 2 times higher than similar competitors), and improves the measurement reliability of ATP5001, and the measurement results do not change with the ambient temperature.

At the same time, Optosky has specially customized an ultra-low noise CCD signal processing circuit for the ATP5001 measurement tool. Its quantization noise is less than 3 counts, which is the best level in the industry.

ATP5001 Spectrometer can receive SMA905 optical fiber input light or free space light, and output the measured spectral data through USB2.0 or UART port. ATP5001 provides the most advanced spectral analysis and only requires a 5V DC power supply, making it very easy to integrate and use. Suitable for biochemical analyzer, fluorescence spectrometer and LIBS, etc.

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1. Parameter

Detector	
Type	Linear array back-illuminated CCD (cooled to -15ºC)
Spectral range	190-1100 nm
Effective pixels	2048×64
Pixel size	14μm×14μm
Full scale range	~200 ke-
Sensitivity	6.5 uV/e-
Dark noise	6 e-
Optical parameters	
Wavelength range	190-1100 nm
Resolution	0.1-4 nm (depending on slit, spectral range)
SNR	>1300:1
Dynamic range	5000:1
Working temperature	-10-40oC
Working humidity	< 85%RH
Optical path parameters	
Optical design	f/4 crossed asymmetric C-T optical path
Focal Length	40 mm for incidence / 60 mm for output
Incident slit width	5, 10, 25, 50, 100, 150, 200 μm optional, other sizes can be customized
Incident light interface	interface SMA905 fiber optic interface, free space
Electrical parameters	
Integration time	1 ms - 130 seconds
Interface	USB 2.0
ADC bit depth	18 bit
Power supply	DC 5V±10%
Working current	<2.3A
Storage temperature	-20°C to +70°C
Working temperature	-10°C to +40°C
Physical parameters	
Dimensions	120×80×46 mm3
Weight	0.5kg
Sealing	Anti-sweat

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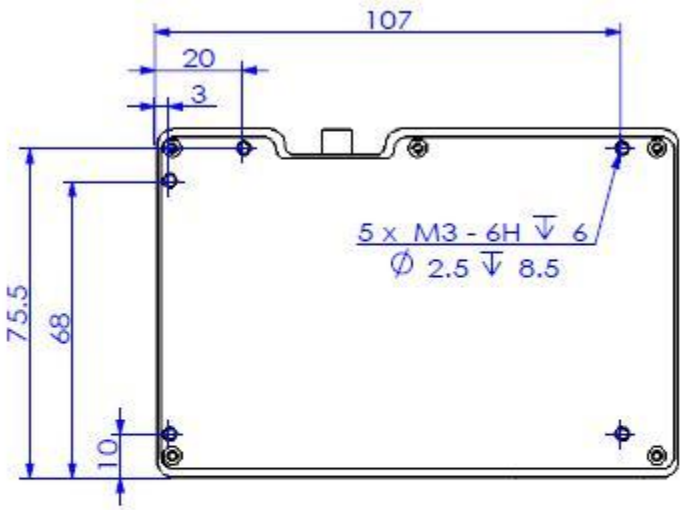
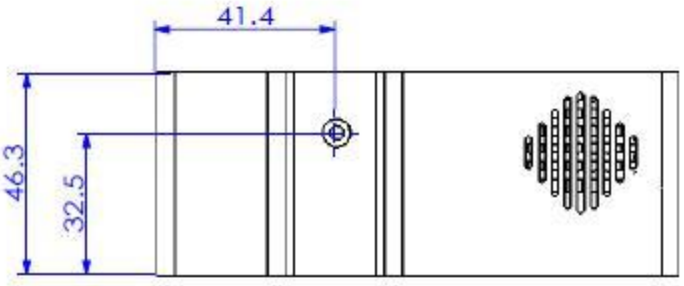
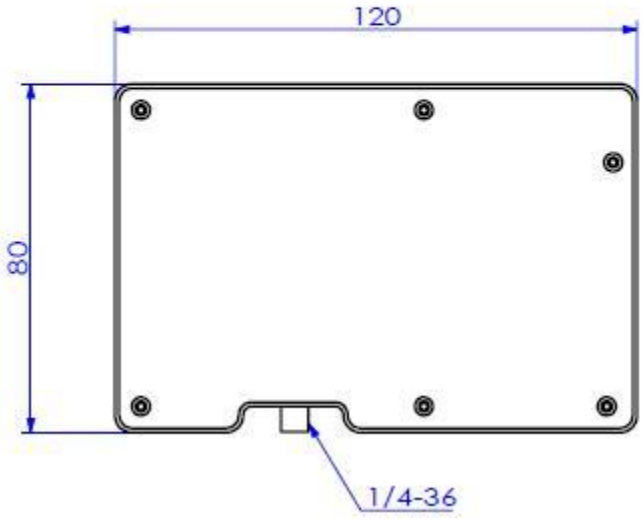
2. Mechanical Diagrams



Mounting holes (M3 X 5)
Fixing space:5M3 screw holes



SMA905 Female Fiber interface



The size of ATP5001 micro spectrometer

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3. Electrical Pin-out

Table 1 Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Power Supply				
Operating voltage range	4.5	5	5.5	V
Operating current	170	500	2000	mA
Logic Inputs(3.3V LVTTL, Five-volt tolerant)				
High level input voltage	1.7		3.6	V
Low level input voltage	-0.3		1.0	V
Logic Output(3.3V LVTTL)				
High level output voltage	2.4			V
Low level output voltage			0.4	V

The module is equipped with a 20-pin male angled box header (2x10,2.00 mm pitch) and USB2.0 B type interface. The 20-pinconnector is a Samtec part # STMM-110-02-L-D-RA connector. The mate to this is a Samtec part # TCSD-10-D-XX.XX-01-N.

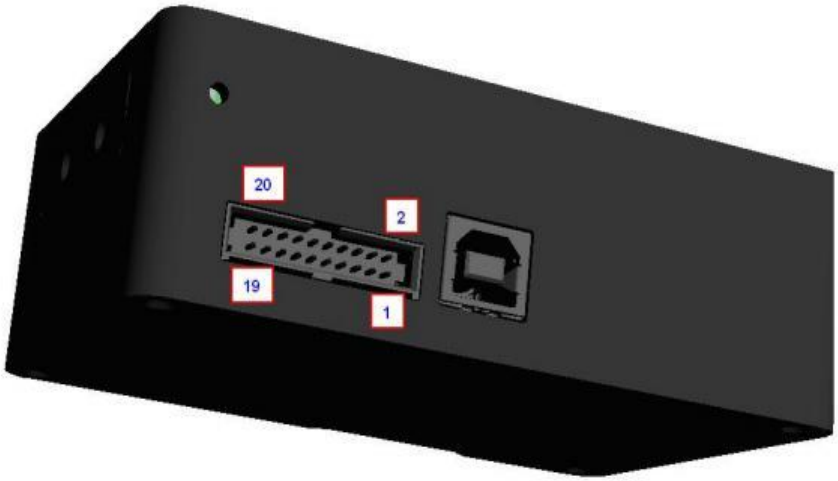

Table 2 Electrical Pin-Out

Pin#	Description	I/O	Function Description
1	VCC	/	Power Supply, 5V±0.5,
2	GND	/	Ground
3	UART_TX	Output	UART Transmit signal

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4	UART_RX	Input	UART Receive signal
5	Lamp_En	Output	LVTTL output the lamp enable signal.
6	Continuous_ strobe	Output	LVTTL output the continues strobe signal.
7	Ext_trigger_i n	Input	LVTTL input the trigger signal.
8	Single_strob e	Output	LVTTL output the single strobe signal.
9	SPI_SCK	Output	The SPI Clock signal for communications to other SPI peripherals
10	SPI_MOSI	Output	The SPI Master Out Slave In (MOSI) signal for communications to other SPI peripherals
11	SPI_MISO	Input	The SPI Master In Slave Out (MISO) signal for communications to other SPI peripherals
12	SPI_CS	Output	The SPI Chip/Device Select signal for communications to other SPI peripherals
13	GPIO0	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
14	GPIO1	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
15	GPIO2	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
16	GPIO3	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
17	GPIO4	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
18	GPIO5	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
19	GPIO6	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.
20	GPIO7	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTL Logic.

4. Order Guide

Order number Rules:

Model	Spectral region		Slit width	
ATP5001	Short wavelength	Long wavelength	Slit width	

For example:

What to buy ATP5001, spectral region: 200-850nm, slit width is 50 um, then the order no is:

ATP5001-200-850-050

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Order No	Spectral region	Slit	
ATP5001-200-400-###	200~400	10 μm	
ATP5001-200-850-###	200~850	25 μm	
ATP5001-200-1100-###	200~ 1000	50 μm	
ATP5001-340-850-###	340~850	100 μm	
ATP5001-600-1100-###	600~ 1100	200 μm	
ATP5001-###-###-###	Other	Other:_____ μm	

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