Datasheet

Ultra-low Noise Micro Spectrometer | ATP2000D

Features

- Ultra-low noise, down to 5counts p-p
- Built-in ultra-low noise linear detector
- Super small, super thin, super light
- Fiber input, signal output, on the same side, very easy to integrate
- Ultra-low noise CCD signal processing circuit
- Max spectral range: 180-1180nm
- Spectral resolution: 0.3-3nm
- Optical configuration: crossed Czerny-Turner
- Integration time:0.1ms-130s
- Power supply: DC 5V±10% or USB
- Built-in 18-bit ultra-low noise ADC
- Optical input interface: SMA905 or Free space
- Data output interface: USB2.0 (High speed) or UART
- 20-pin connector for interfacing to external products

Application

- Transmittance, reflectance detection
- Fast, ultra microvolume spectrophotometer
- Environmental protection equipment (smoke, water quality)
- Spectral analysis/ Radiation spectrophotometric analysis/ spectrophotometric analysis
- Laser wavelength measurement

Description

With 20 years of experience in the development of optical fiber spectrometers, Optosky has launched a new generation of high-performance ultra-thin optical fiber spectrometers: ATP2000D. It adopts ultra-low noise CCD, and has specially designed ultra-low noise correlated double sampling circuit, 18-bit ultra-low The ADC quantizes noise, which greatly reduces the noise of the sensor and obtains an excellent signal-to-noise ratio (about 8 times higher than similar products). The ATP2000D can monitor the temperature of the optical platform in real time, thus providing a basis for the implementation of temperature compensation, which greatly improves the measurement reliability of the ATP2000D. The measurement results do not change with the ambient temperature, which is the best level in the industry.

ATP2000D can receive SMA905 fiber input light or free space light, through the USB2.0 or UART port, output the measured spectral data. It only needs a 5V DC power supply or USB power supply, which is very easy to integrate.

Model	Pixel	Cooling
ATP2000D	512pixels	No
ATP2000D-2	1024pixels	No

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1. Performance

Detector	
Type	Ultra-low noise linear CCD
Spectral Range	180-1100nm
Effective Pixels	1024×1
SNR	>3000:1
Dynamic Range	12000:1（single sample）
Optical Parameter	
Wavelength Range	180-1100nm
Optical Resolution	0.3-3.0nm （Depends on slit, spectral range）
Optical Path Parameter	
Optical Design	F/4 cross asymmetric C-T optical path
Incident Slit Width	5, 10, 25, 50, 100, 150, 200μm optional
Incident Optical Interface	SMA905 optical fiber interface and free space
Electric Parameter	
Integration Time	0.1 ms - 256 second
Data Output Interface	USB 2.0
ADC Bit Depth	18 bit
Power Supply	5VDC±10%
Operating Current	250mA@Typ.
Storing Temperature	-30°C ~ 70°C
Operating Temperature	-25°C ~ 50°C
Operating Humidity	< 90%RH （Non-condensate）
Physical Parameter	
Dimension	102×72×34 mm^3
Weight	190 g

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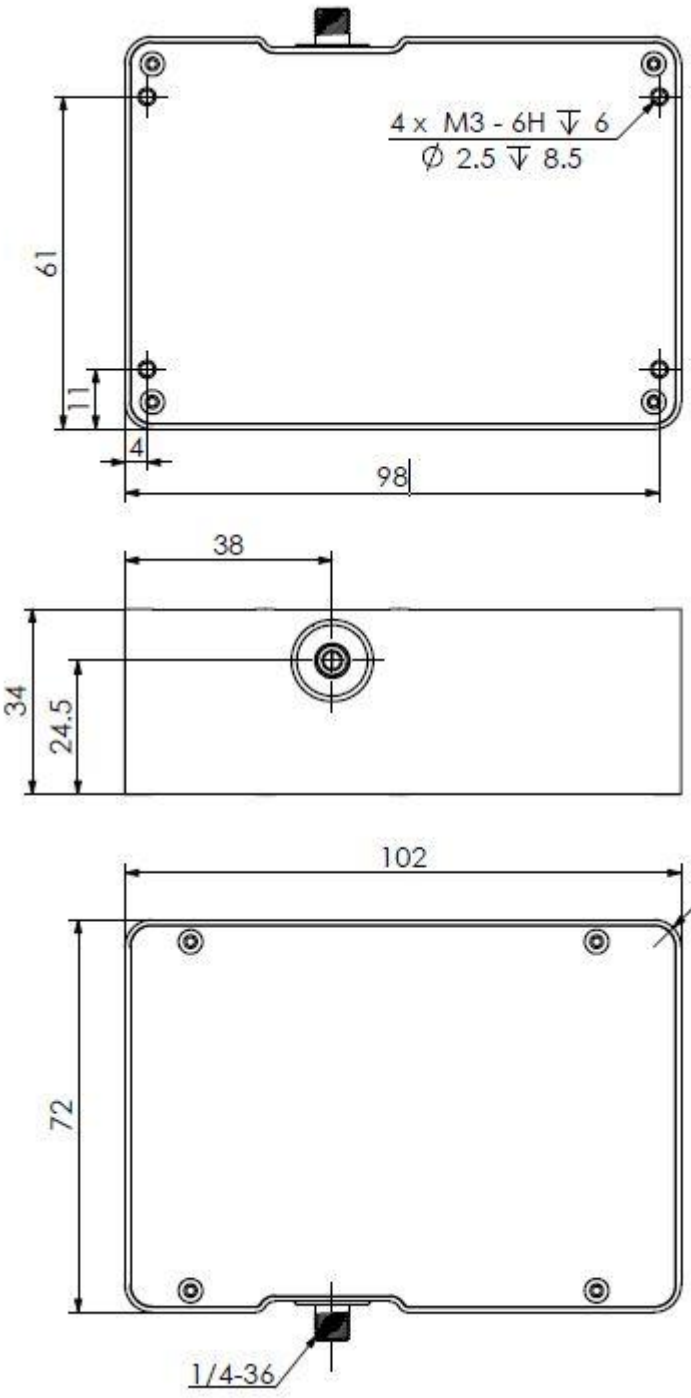
2. Mechanical Diagrams



Mounting Holes (M3 X 4)
Fixed space: 4 M3 screw holes

SMA905 Female Fiber interface

The size of ATP2000 micro spectrometer

Fig 1 ATP2000D outline dimensional drawing

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3. Performance

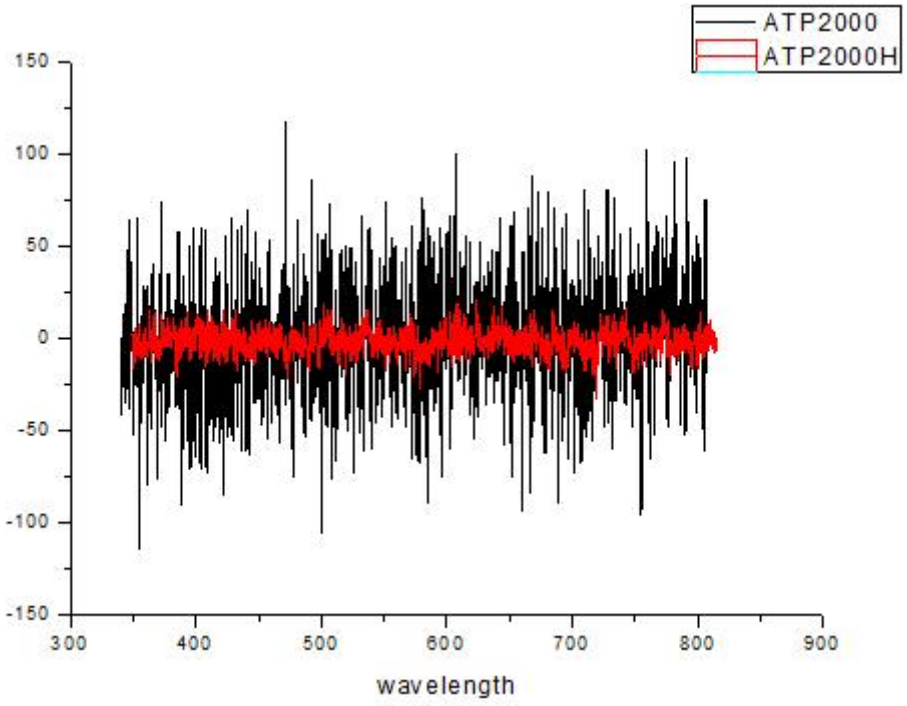

Fig 2 The noise of ATP2000P/ATP2000H (Red) vs ATP2000 (Black)

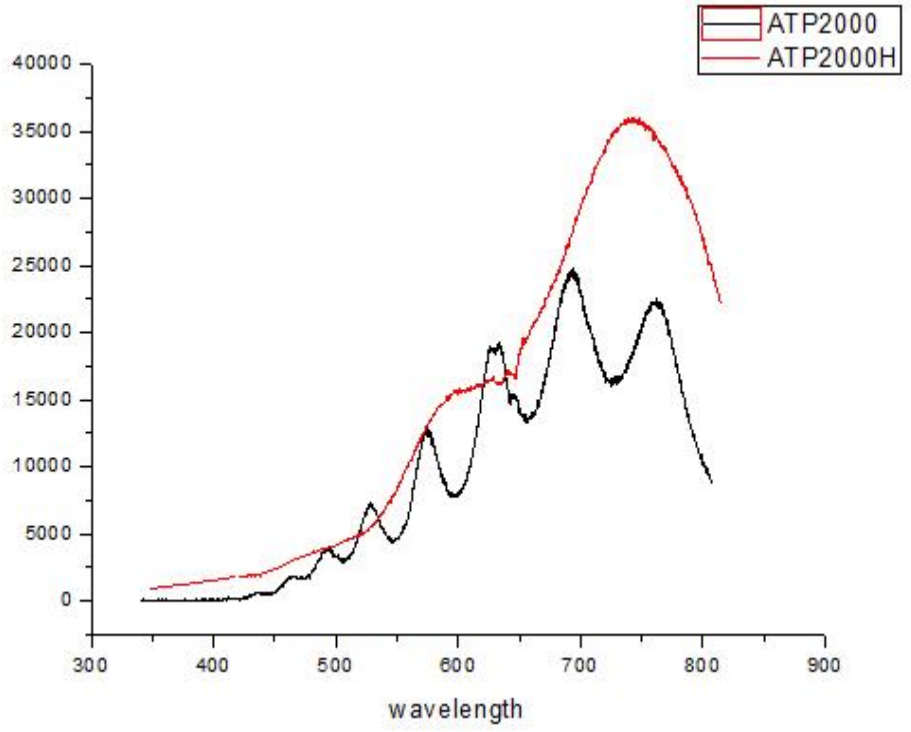

Fig 3 The sensitive of ATP2000P/ATP2000H (Red) vs ATP2000 (Black)

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4. Electrical interface

Table 1 Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Power Supply				
Operating voltage range	4.5	5	5.5	V
Operating current		170		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-pin connector 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.

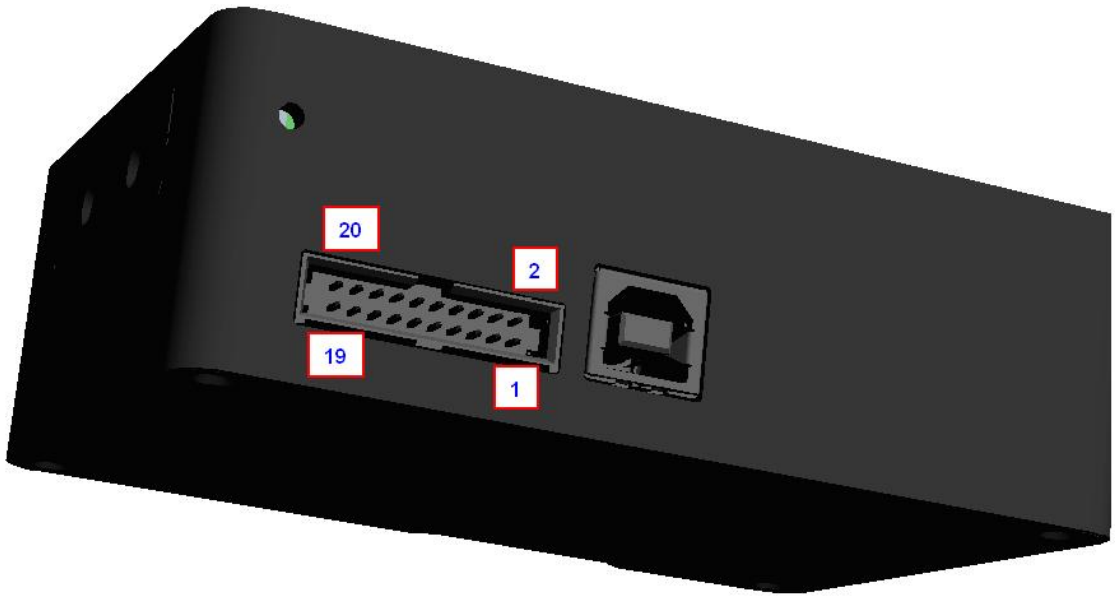

Table 2 Electrical Pin-Out

Pin#	Description	I/O	Function Description
1	VCC	/	Power Supply, 5V±0.5,
2	GND	/	Ground
3	RS232_TX	Output	RS232 Transmit signal
4	RS232_RX	Input	RS232 Receive signal
5	Lamp_En	Output	LVTTL output the lamp enable signal.
6	Continuous_strob	Output	LVTTL output the continues strobe signal.

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	e		
7	Ext_trigger_in	Input	LVTTL input the trigger signal.
8	Single_strobe	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.

5. Order Guide

Order number Rules:

Model	Spectral region		Slit width	
ATP2000D	Short wavelength	Long wavelength	Slit width	

For example:

What to buy ATP2000D, spectral region: 200-850nm, slit width is 50 um, then the order no is:

ATP2000D-200-850-050

Order No	Spectral region	Slit	
ATP2000D-200-400-###	200~400	10 μm	
ATP2000D-200-850-###	200~850	25 μm	
ATP2000D-200-1100-###	200~1000	50 μm	
ATP2000D-340-850-###	340~850	100 μm	
ATP2000D-600-1100-###	600~1100	200 μm	

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ATP2000D-###-###-###	Other	Other:_____μm	

6. ATP2000D spectrum measurement example

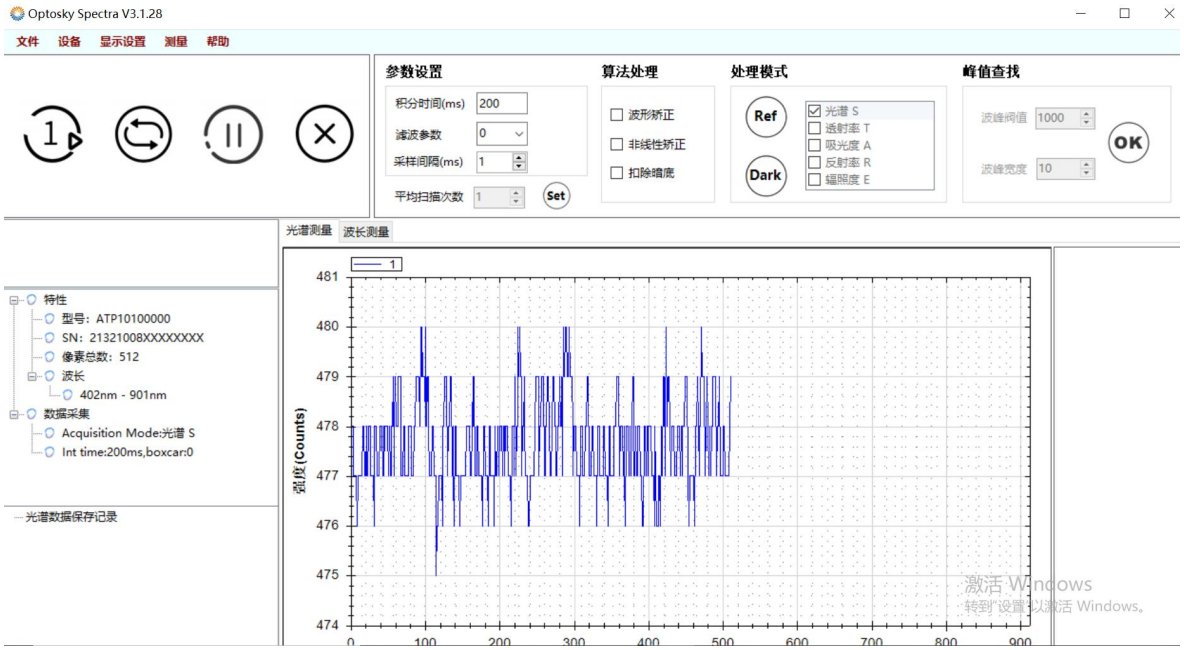

Fig 4 ATP2000D Dark current and noise，integration time is 200ms，dark current is 478counts，noise（P-P）is 5counts

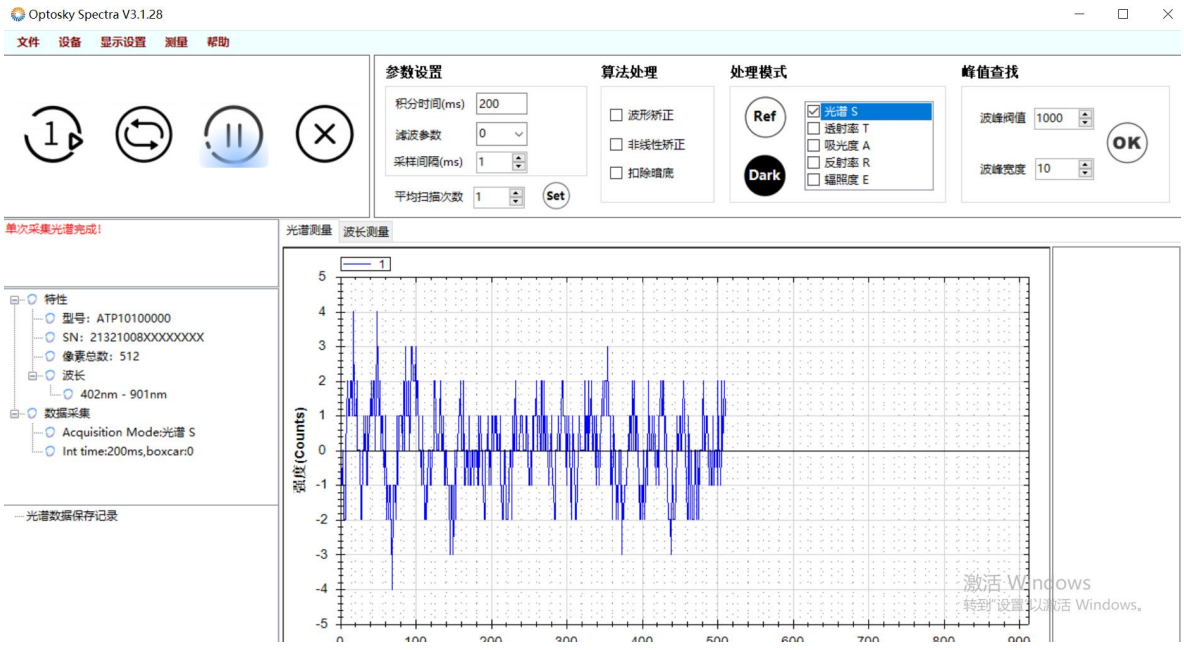

Fig 5 ATP2000DNoise test (minus dark background), value of ±4counts

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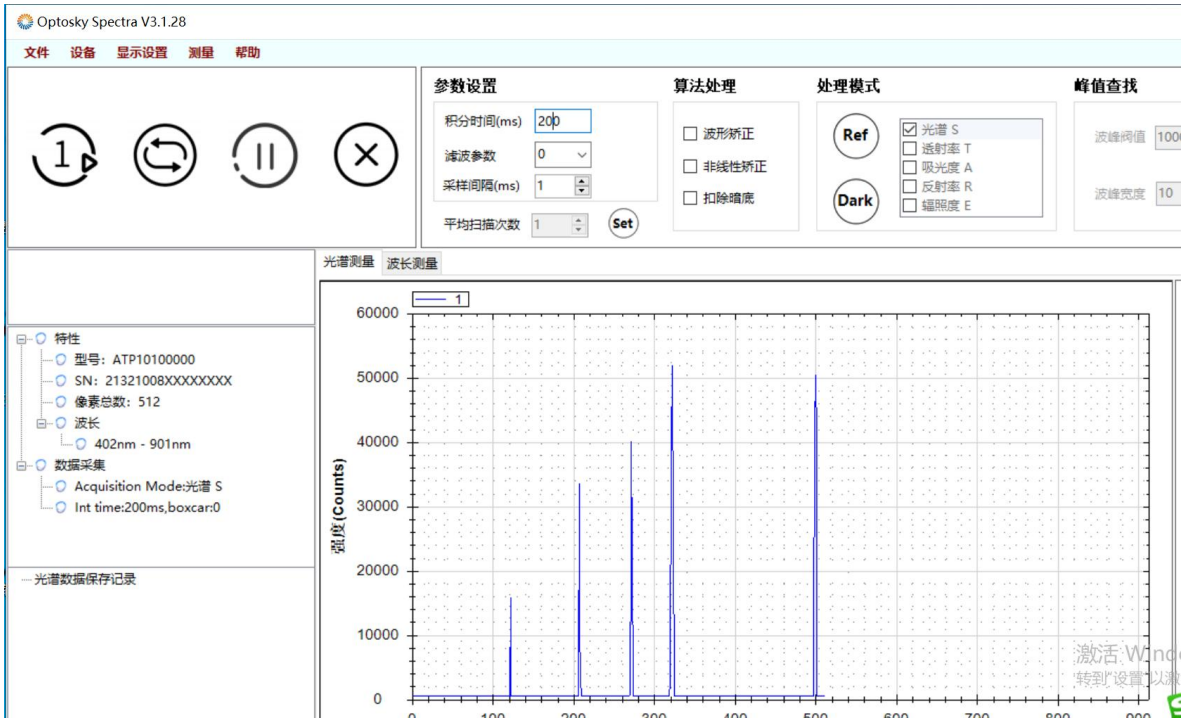

Fig 6 ATP2000D resolution measurement，about 1.3nm

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7. ATP2000D

图 2 ATP2000D

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