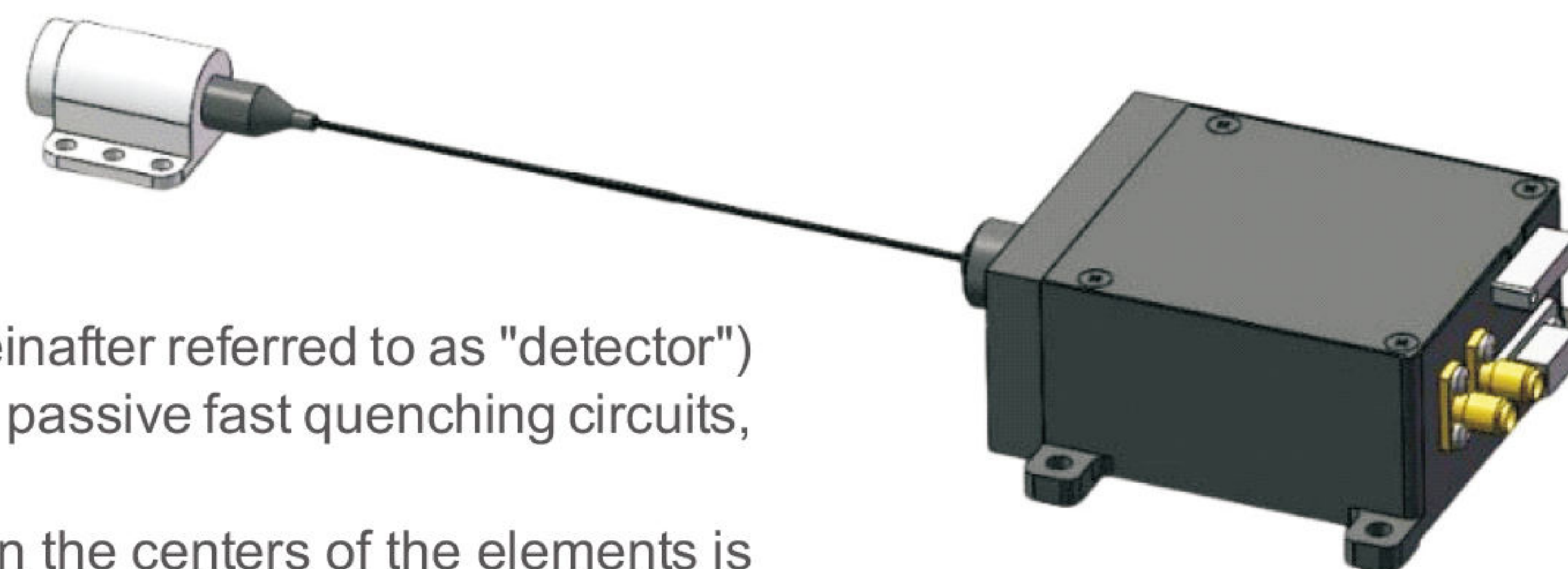


OP500C InGaAs 4x4 Array SPAD Component



Product Features

OP500C InGaAs 4x4 single photon array detector component (hereinafter referred to as "detector") consists of InGaAs avalanche photodiode 4x4 array chip, active and passive fast quenching circuits, refrigeration circuits, signal control circuits and other components.

The size of the detector array is 4x4 elements, the distance between the centers of the elements is 100 μm, and the operating wavelength is 1.0-1.65 μm near infrared wavelength. The detector has high detection sensitivity and is capable of detecting weak optical signals (single-photon signals); each image of the detector operates freely within an adjustable pulse width, and each image independently outputs detection signals and processes the output electrical signals, with minimal influence by noise. The detector assembly is characterized by high sensitivity, simple system structure, etc. It can be applied to long-distance laser distance measurement, long-distance laser distance measurement, long-distance laser distance measurement, long-distance laser distance measurement, and so on.

Space optical communication, optoelectronic radar and other fields.

Main photoelectric indicators

Parameterization	Notation	Test Condition	Minimum Value	Typical Value	Maximum Values	Unit
Detector Specifications and Configuration Parameters						
Array size	M	—	4×4			—
Size of target surface	T_s	—	0.4x0.4			mm
pixel center distance	D	—	—	100	—	μm
pixel spacing	D_G	—	—	—	20	μm
operating wavelength	λ	—	1000	—	1650	μm
Output signal amplitude	V_{out}	—	—	—	5.0	V
serial port	$Baud$	—	—	115200	—	Baud/s
baud rate						
power wastage	PDC	$V_{IN} = 12.0V, T_{th} = -30^{\circ}C \pm 5^{\circ}C$	—	—	24.0	W
Input Voltage	V_{IN}		—	12.0	—	V
Input Current	I_{IN}	$V_{IN} = 12.0V, T_{th} = -30^{\circ}C \pm 5^{\circ}C$	—	—	2.0	A
Operating Temperature	T_A	—	-40	—	55	°C
weights	W_t	—	—	—	300	g
Detector Size	S_c	—				mm

Parameterization	Notation	Test Condition	Minimum Value	Typical Value	Maximum Values	Unit
Optical performance parameters						
photon efficiency	PDE	$T_A = 25 \pm 5^{\circ}C, T_{th} = -30^{\circ}C \pm 5^{\circ}C, \lambda = 1550 \pm 50 nm, \tau = 0.8 \mu s \pm 0.1 \mu s$	10	15	—	%
dark count rate	$DCR (PDE=10\%)$		—	—	10	kHz
backpulse probability	$APP (PDE=10\%)$		—	—	12	%

1. the working wavelength: can be in the working wavelength range of optional standard narrow band filter.
2. T_{th} : InGaAs avalanche photodiode 4x4 array chip operating temperature.
3. T : dead time.
4. Ambient temperature for testing the above parameters: $T_A = 25 \pm 5^{\circ}C$.

Parameter setting range and recommended operating conditions

serial number	parameters	Rated Value	
Parameter setting range	1	Detector operating temperature	-30°C~30°C, Minimum step value:0.1°C.
	2	Dead Time Adjustment	0.1μs to 3.2μs, step value: 0.025μs.
	3	Avalanche voltage threshold adjustment	50.0V to 85.0V, step value: 0.1V.
	4	Geiger avalanche comparison voltage setting	0.35V to 1.10V, step value: 0.01V.
	5	Detector door width and duty cycle adjustment	Working gate width: ≥0.1us, working period: >0.1us; step value: 0.01us.

serial number		parameters	Rated Value
Recom mendation Referral conditions	1	Detector operating temperature	-30°C ~ 0°C
	2	dead time value	0.80μs
	3	Avalanche voltage threshold adjustment	See test report for details
	4	Geiger avalanche comparison voltage setting	0.45V to 0.90V

Typical Characteristic Curve

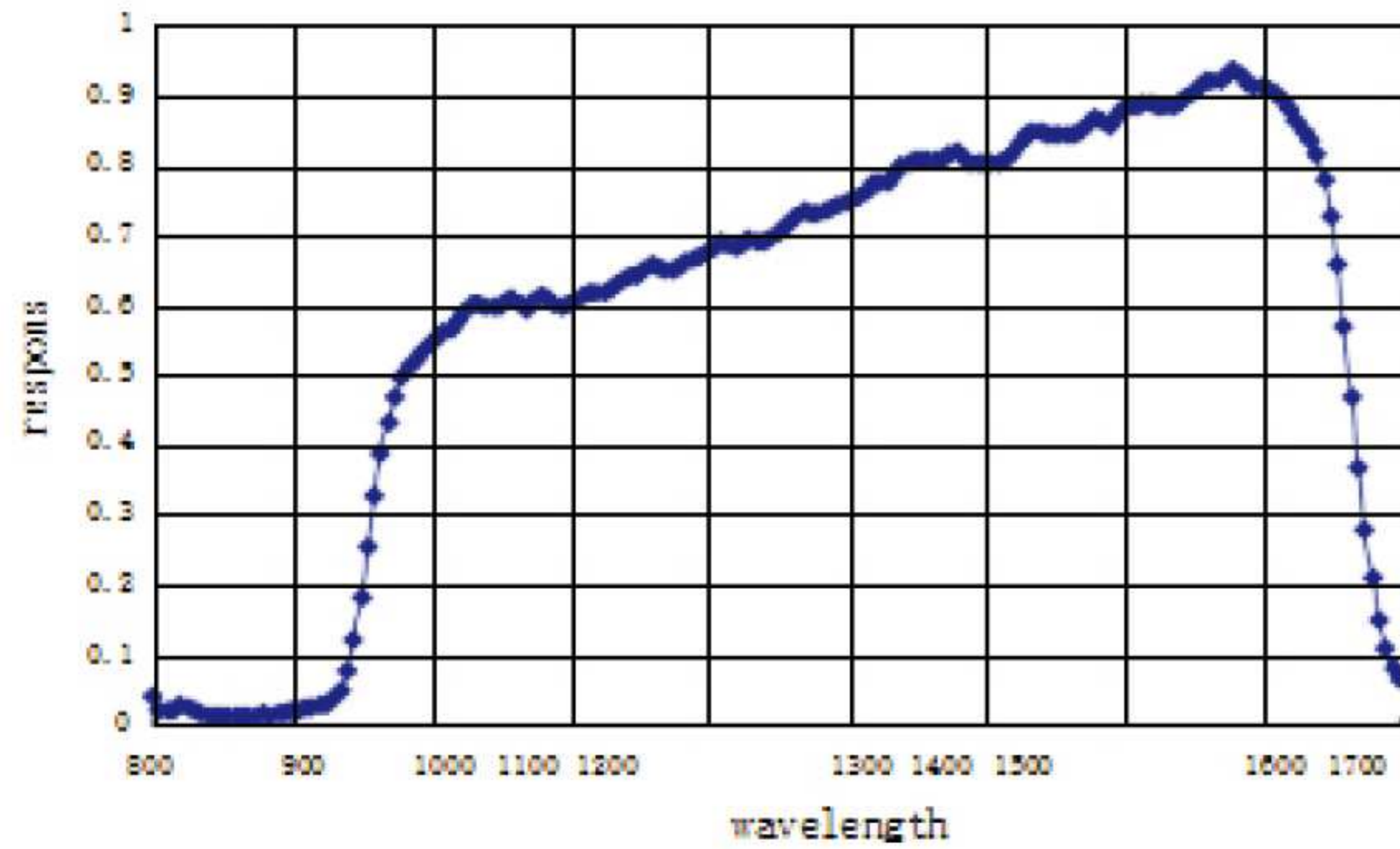


Fig. 1 InGaAs spectral response characteristic curve

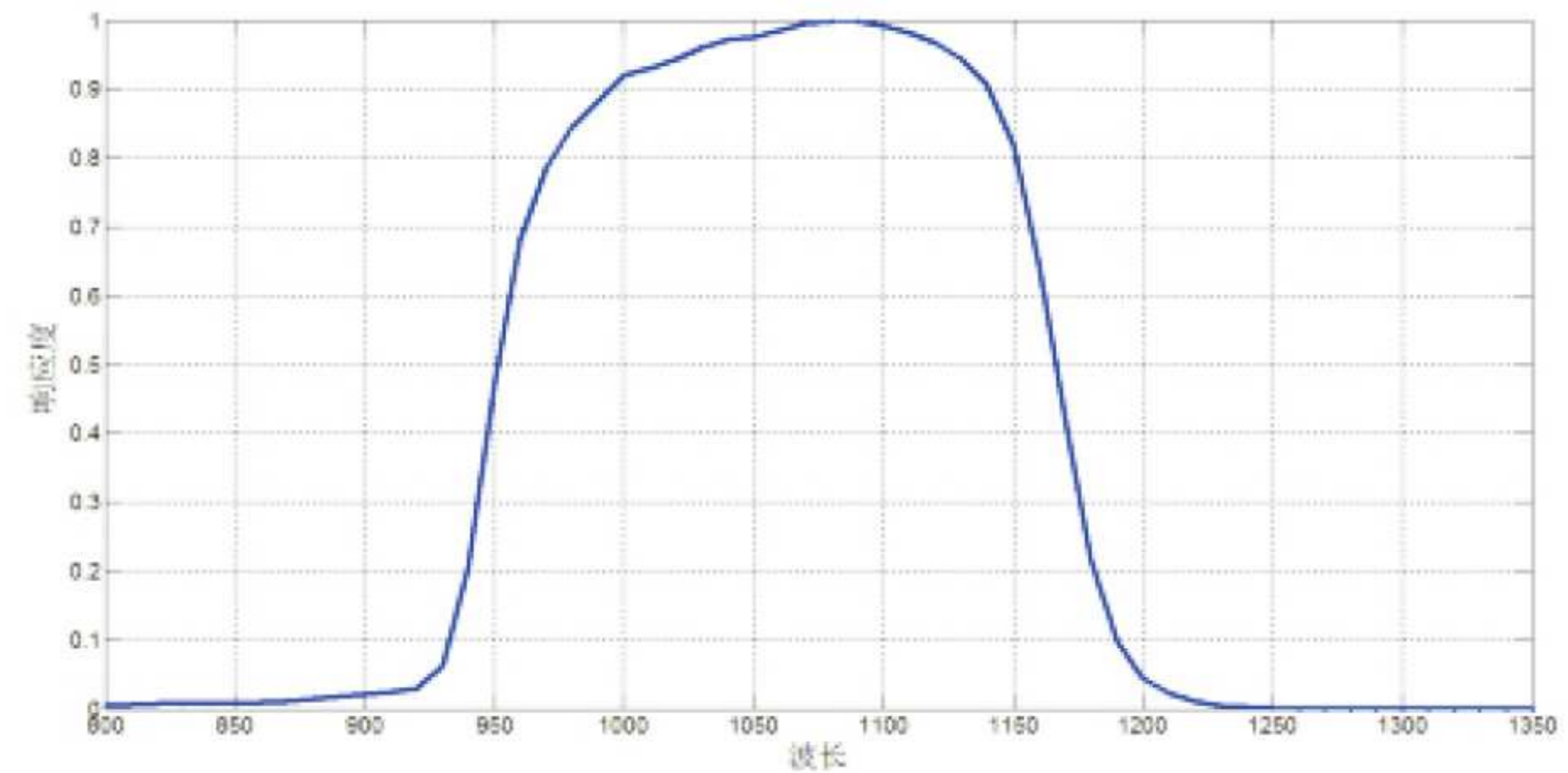
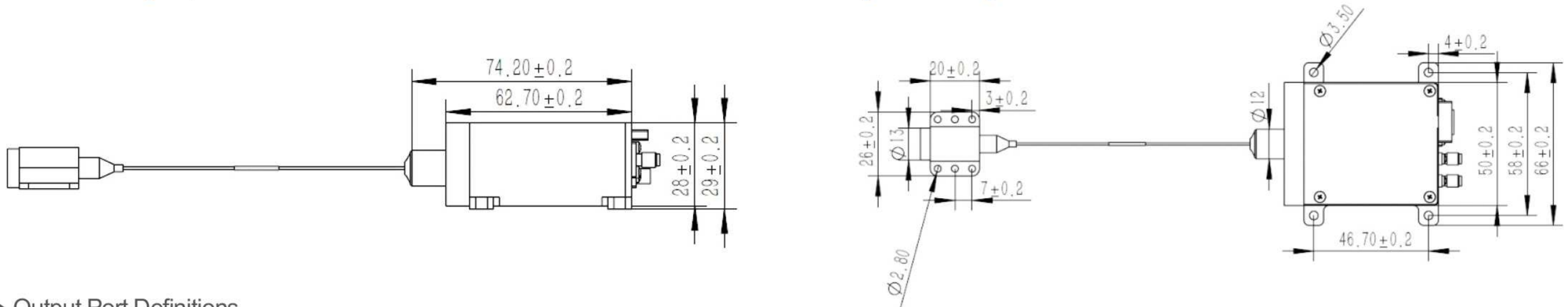


Fig. 2 InGaAsP spectral response characteristic curve

Shape, Dimensions and Pinout Definitions (in mm)



Output Port Definitions

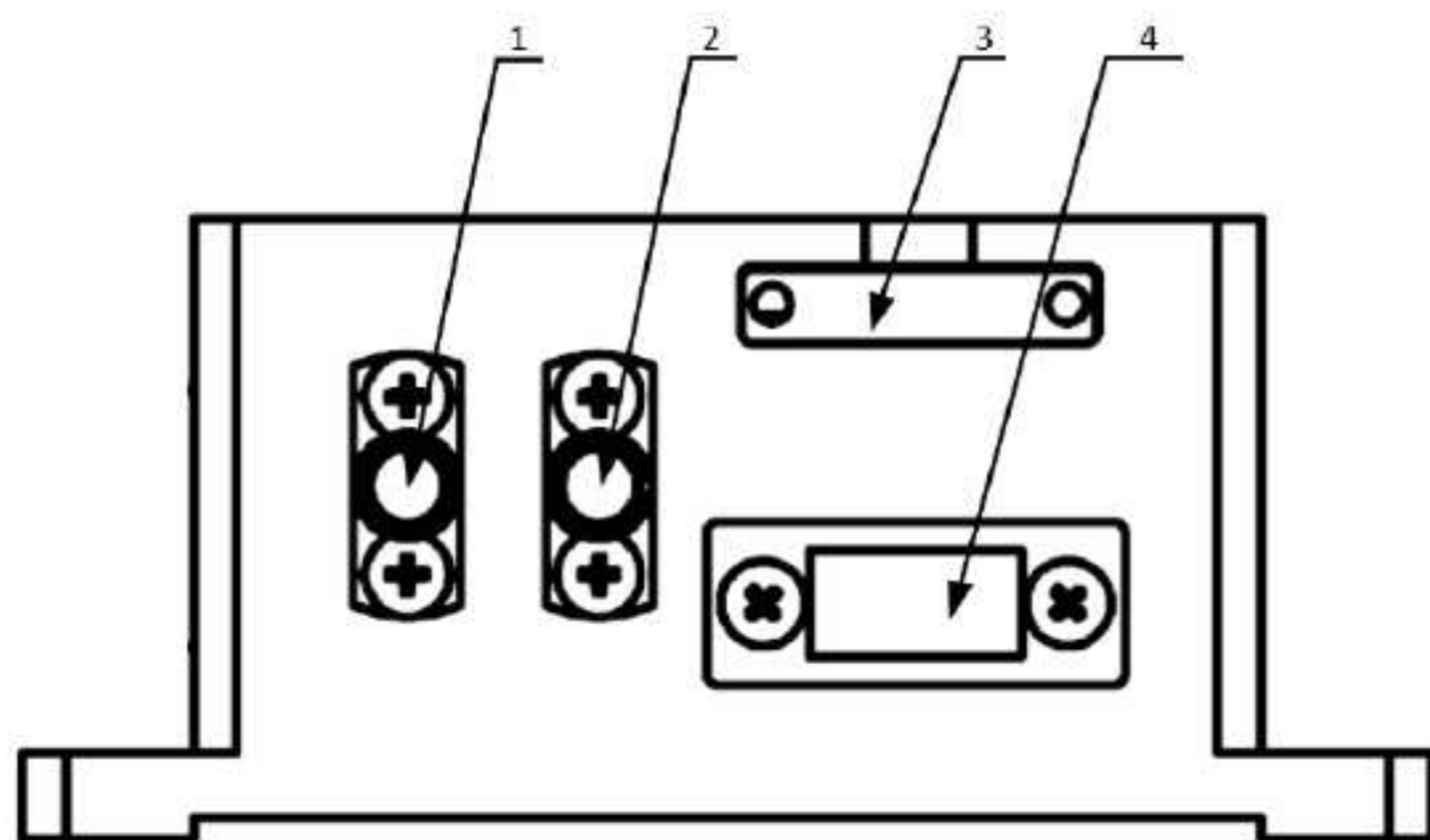


Figure 5 Electrical connector arrangement and numbering

Electrical Connector Number	Electrical Connector Type	Functionality
1	SSMA	Synchronized signal output port
2	SSMA	Synchronized signal input port
3	J63A-31	UART and 16-channel pixel signal output
4	J30J-2	+12.0 V single power supply

The J31J-2 port numbers are shown in Figure 9.

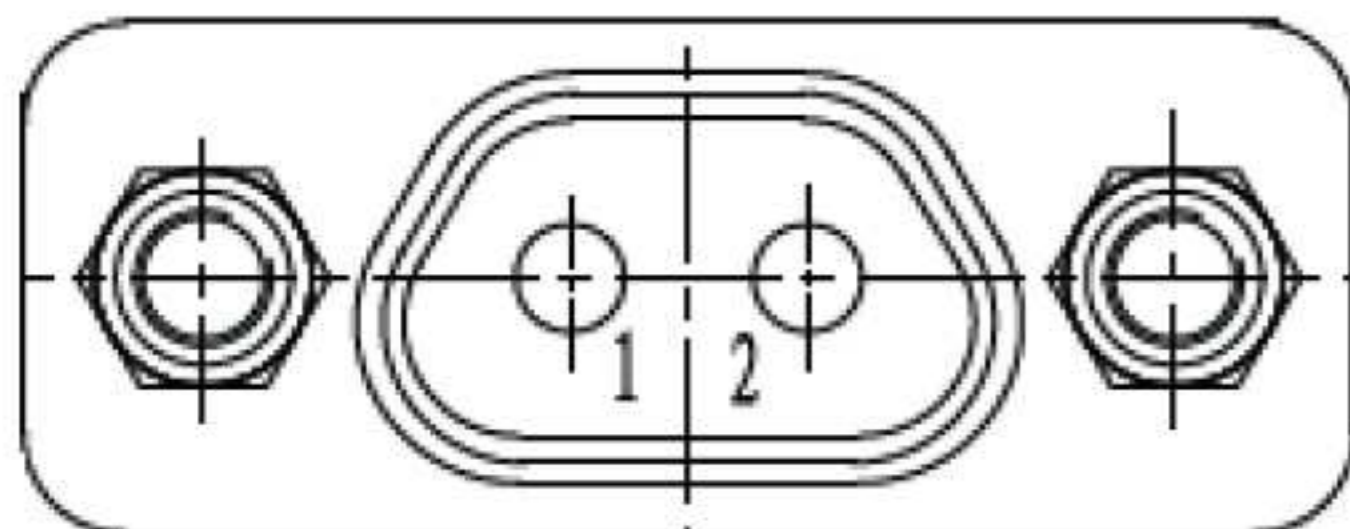


Figure 6 J31J-2 Port Numbering

Pin Number	Name (of A Thing)	Functionality	Pin Number	Name (of A Thing)	Functionality
1	GND	grounding port	2	POWER_+12V	+12V power positive input port

Optical Port Parameters

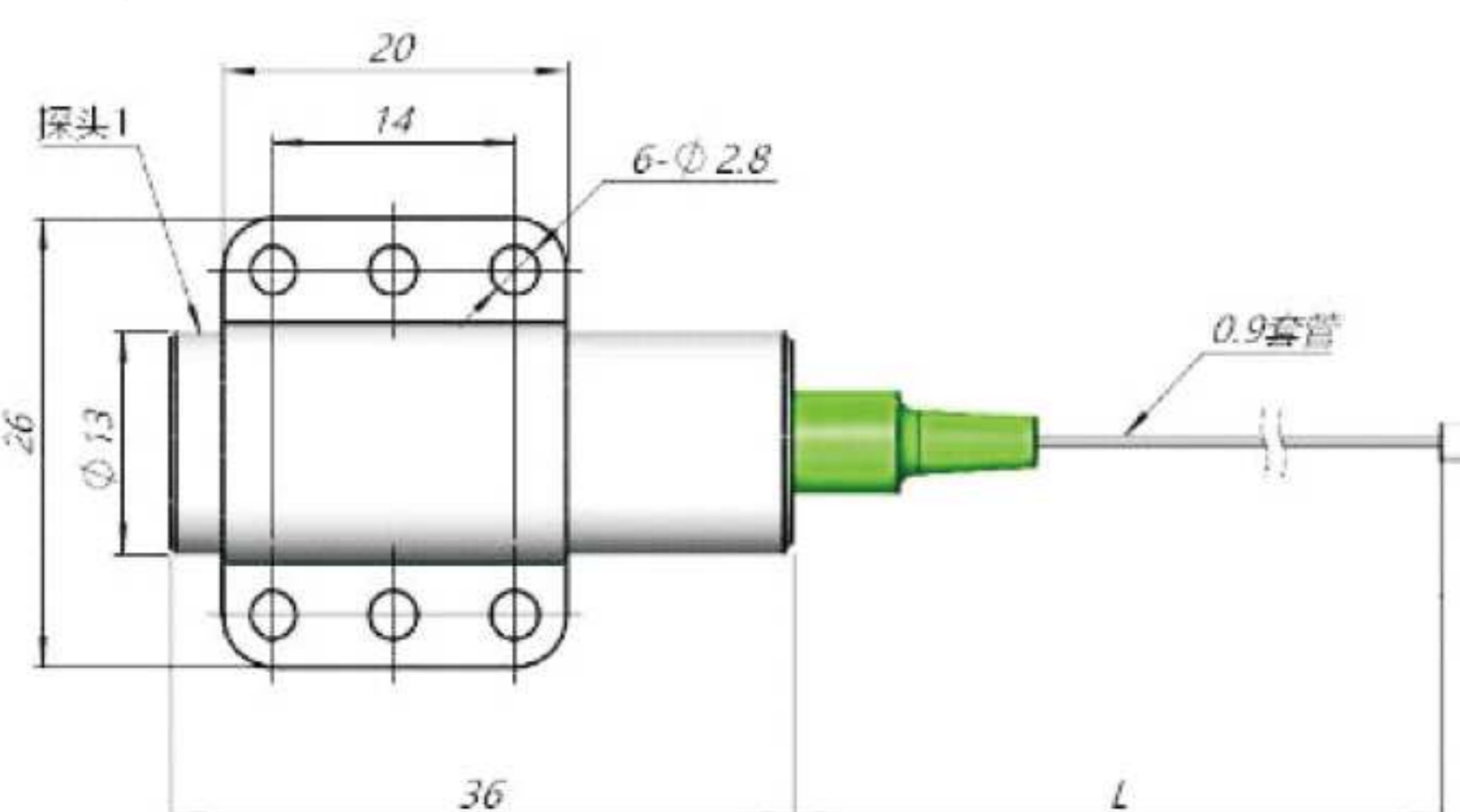


Fig. 7 Optical Port Dimensions

table. 2 Optical Port Parameters

Parameters	Unit	Functionality
center wavelength	nm	1550
geometric spot	mm	>3.0
Working distance	mm	50
Angle of incidence	°	±1
Maximum power	mW	500
Casing O.D.	mm	0.9 (black loose tube)