

PD12 Amplified Photodetector

1. Overview

The PD12 is a photodetector with amplification circuitry for use with FC-connected fiber optic cables in optical systems. The device consists of a photodiode, transimpedance amplifier, and RF connector packaged in an aluminum housing. The FC flange facilitates coupling to a fiber optic light source, and an SMA connector is used at the output to reduce size and maximize frequency response up to a maximum bandwidth of 1 GHz. The detector is available in two spectral ranges, 400-1000 nm and 1000-1700 nm.

2. Features

- Covers wavelength range of 400-1700nm
- Bandwidth from kHz to GHz
- Connects to singlemode (SM) or multimode (MM) fibers
- FC fiber input header
- Supports 4/8/16 channel customization



3. Applications

- Detection of weak light signals
- Detection of fast laser pulses
- Detection of aberrant laser beat signals

4. Specifications

Items	PD12A-50k	PD12A-300k	PD12A-700k
Materials	Si		
Wavelength	400-1000nm		
Photosensitive diameter	200um		
Responsivity	0.5A/W @850nm		
Bandwidth	DC-50kHz	DC-300kHz	DC-700kHz
Rise time	7us	1us	0.5us
Gain ^a	0.5x10 ⁶ V/W	1.0x10 ⁵ V/W	2.6x10 ⁴ V/W
Saturated Optical power	-20.4dBm (9.1uw)	-13.4dBm (45.5uw)	-7.5dBm (0.18mw)
Output bias voltage ^a	10mV	10mV	10mV
Noise voltage ^a	4mV	3mV	2mV
NEP	2.46pW/√ Hz	4.98pW/√ Hz	11.1pW/√ Hz
Maximum output amplitude ^a	5V	5V	5V

Items	PD12A-10M	PD12A-50M	PD12A-200M	PD12A-400M
Materials	Si			
Wavelength	400-1000nm			
Photosensitive diameter	200um			
Responsivity	0.5A/W @850nm			
Bandwidth ^b	DC-10MHz	DC-50MHz	DC-200MHz	DC-400MHz
Rise time ^b	40ns	8ns	2ns	1ns
Gain ^a	$1.35 \times 10^5 \text{V/W}$	$2.7 \times 10^4 \text{V/W}$	$1.2 \times 10^4 \text{V/W}$	$5.4 \times 10^3 \text{V/W}$
Saturated Optical power	23.7uW	118uW	268uW	592uW
Noise voltage ^b	18mV	18mV	18mV	18mV
NEP	5.2pW/√Hz	11.4pW/√Hz	28pW/√Hz	80pW/√Hz
Maximum output amplitude ^a	3.2V	3.2V	3.2V	3.2V

Items	PD12A-500M	PD12A-1G
Materials	Si	
Wavelength	400-1000nm	
Photosensitive diameter	200um	
Responsivity	0.5A/W @850nm	
Bandwidth	DC-500MHz	DC-1GHz
Rise time	800ps	400ps
Gain ^a	600V/W	340V/W
Saturated Optical power	6.1dBm (4.1mw)	7dBm (5mw)
Noise voltage ^a	5mV	5mV
NEP	100.3pW/√Hz	156.6pW/√Hz
Maximum output amplitude ^a	2.5V	1.7V

Items	PD12C-50k	PD12C-300k	PD12C-700k
Materials	InGaAs		
Wavelength	1000-1700nm		
Photosensitive diameter	70um		
Responsivity	0.9A/W @1550nm		
Bandwidth	DC-50kHz	DC-300kHz	DC-700kHz
Rise time	7us	1us	0.5us

Gain ^a	0.9x10 ⁶ V/W	1.8x10 ⁵ V/W	4.6x10 ⁴ V/W
Saturated Optical power	-23.8dBm (4.2uw)	-15.6dBm (27.8uw)	-6dBm (0.25mw)
Output bias voltage ^a	10mV	10mV	10mV
Noise voltage ^a	4mV	3mV	2mV
NEP	1.25pW/√Hz	2.46pW/√Hz	6.24pW/√Hz
Maximum output amplitude ^a	5V	5V	5V

Items	PD12C-10M	PD12C-50M	PD12C-200M	PD12C-400M
Materials	InGaAs			
Wavelength	1000-1700nm			
Photosensitive diameter	70um			
Responsivity	0.9A/W @1550nm			
Bandwidth ^b	DC-10MHz	DC-50MHz	DC-200MHz	DC-400MHz
Rise time ^b	40ns	8ns	2ns	1ns
Gain ^a	2.5x10 ⁵ V/W	4.9x10 ⁴ V/W	2.0x10 ⁴ V/W	8.7x10 ³ V/W
Saturated Optical power	12.8uW	65uW	160uW	368uW
Noise voltage ^b	18mV	18mV	18mV	18mV
NEP	2.2pW/√Hz	5.6pW/√Hz	18.4pW/√Hz	39.9pW/√Hz
Maximum output amplitude ^a	3.2V	3.2V	3.2V	3.2V

Items	PD12C-500M	PD12C-1G
Materials	InGaAs	
Wavelength	1000-1700nm	
Photosensitive diameter	70um	
Responsivity	0.9A/W @1550nm	
Bandwidth	DC-500MHz	DC-1GHz
Rise time	800ps	400ps
Gain ^a	1.1x10 ³ V/W	610V/W
Saturated Optical power	3.6dBm (2.3mw)	6.1dBm (4.1mw)
Noise voltage ^b	4mV	4mV
NEP	41.7pW/√Hz	85.6pW/√Hz
Maximum output	2.5V	2.5V

amplitude ^a		
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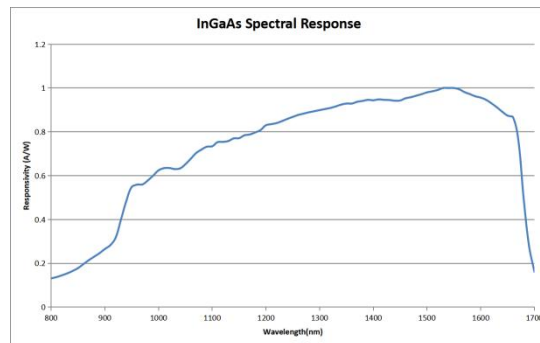
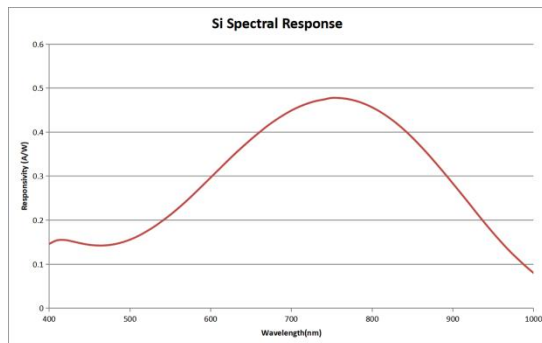
Items	Detector Common Parameters	
Operating voltage	9-12V	
Operating Current	<200mA	
Output Impedance	50Ω	
Output coupling mode	DC	
Output connector	SMA female	
Operating temperature	-20~65°C	
Storage temperature	-40~85°C	

Remarks:

a For high resistance loads

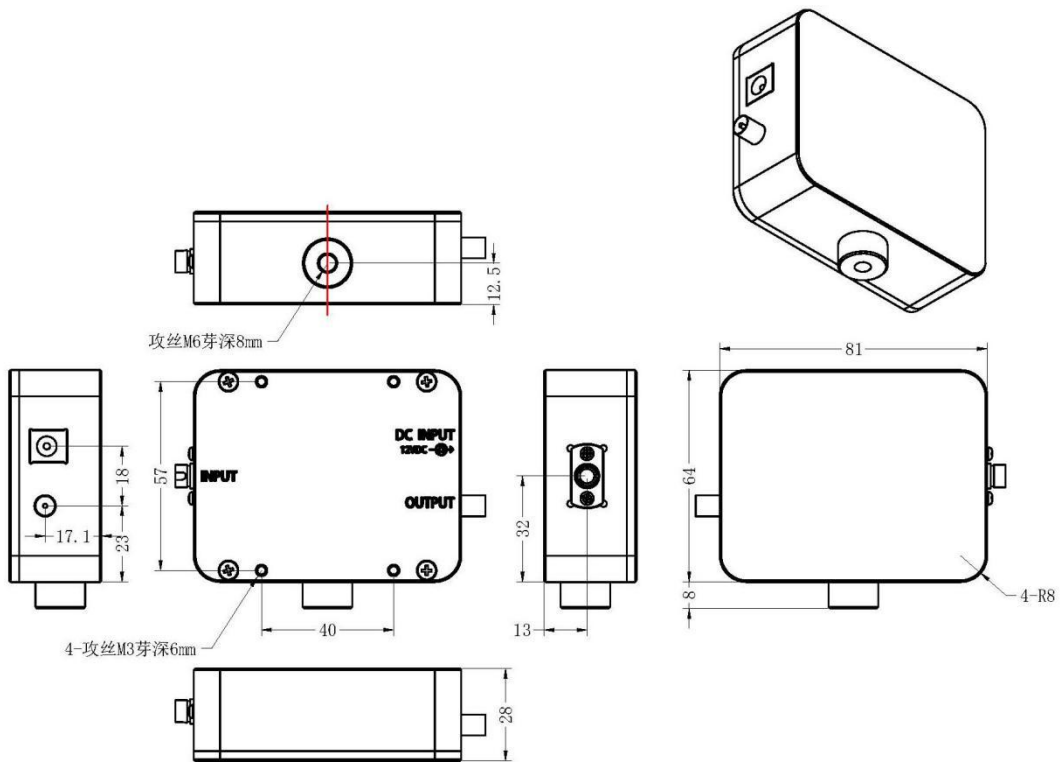
b For 50Ω loads

5. Response curve



Note: Response curves are typical values for reference only.

6. Mechanical dimensions



7. Shipping list

Item	Name of material	num	unit	note
1	photodetector	1	pcs	
2	power adapter	1	pcs	12V
3	SMA to BNC RF Cable	1	pcs	