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THORLABS

PDA25K2 - APR 27, 2022

Item # PDA25K2 was discontinued on APR 27, 2022. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

GAP TRANSIMPEDANCE AMPLIFIED PHOTODETECTOR

- ▶ **GaP Detector Type**
- ▶ **Switchable Amplified Detector with Output up to 10 V**
- ▶ **Wavelength Range from 150 - 550 nm**

PDA25K2
Power Supply Included with Detector

Detector with Ø1" Lens Tube Attached to a 30 mm Cage System

Hide Overview

OVERVIEW

Features

- Wavelength Range from 150 to 550 nm
- Low-Noise, Wide Band Amplifier
- Bandwidth from DC to 9.5 MHz
- 0 to 10 V Output
- Compatible with SM1 (1.035"-40) Series and Some SM05 (0.535"-40) Series Products
- Linear Power Supply Included

Click to Enlarge
Each detector has internal SM05 and external SM1 threads and includes an SM1T1 Internal SM1 Adapter and SM1RR Retaining Ring.

Click to Enlarge
PDA25K2 Shown with Included Power Supply

The GaP-Based Transimpedance Amplified Photodetector is sensitive to light in the UV to Visible region from 150 nm to 550 nm. This switchable-gain detector is housed in a compact, low-profile package that is ideal for use in light paths with space constraints. All connections and controls are located perpendicular to the light path to provide easy accessibility when integrating the detector into a setup. Amplification is provided by a low-noise transimpedance amplifier that is capable of driving 50 Ω loads. Signal output is via a BNC connector. This photodetector can be used with Thorlabs' passive low-pass filters, which have a 50 Ω input and a high-impedance output that allows them to be directly attached to high-impedance measurement devices such as an oscilloscope. Thorlabs offers a wide variety of BNC, BNC-to-SMA, and SMC cables, as well as a variety of BNC, SMA, and SMC adapters.

This housing of the PDA25K2 features external SM1 (1.035"-40) threading, internal SM05 (0.535"-40) threading, and two universal mounting holes that accept both 8-32 and M4 threads, allowing for either vertical or horizontal post mounting. Addtionally, an SM1T1 internally threaded SM1 coupler and SM1RR retaining ring are included, allowing convenient mounting of SM1-compatible accessories, optics, and cage assembly accessories. The SM1 (1.035"-40) threading on the housing is ideally suited for mounting a Ø1" focusing lens or pinhole in front of the detector element. The internal SM05 threading is only suitable for mating to an externally threaded SM05 lens tube (components such as fiber adapters cannot be threaded onto the SM05 threading). Most SM1-

threaded fiber adapters are compatible with this detector. However, the S120-FC internally SM1-threaded fiber adapter is not compatible because it collides with the photodiode. Externally SM1-threaded adapters should be mated to the included internally SM1-threaded adapter, while internally SM1-threaded adapters can be mated directly to the housing.

The active area of the detector is flush with the front of the housing, simplifying alignments within optomechanical systems. Inhomogeneities at the edges of the active area of the detector can generate unwanted capacitance and resistance effects that distort the time-domain response of the photodetector output. Thorlabs therefore recommends that the incident light on the photodetector be well-centered on the active area.

Power Supply
A ±12 V linear power supply is included with the amplified photodetector and also available separately below. The power supply features a three-way switch and can be plugged into any 50 to 60 Hz, 100 V / 120 V / 230 V power outlet. Before connecting the power supply to an outlet or to the detector, make sure that the power switches on both the power supply and the detector are in the off position. Hot-plugging is not recommended.

Hide Specs

SPECS

Performance Specifications

Item #	Detector Element	Active Area	Wavelength	Peak Response (Typical)	Bandwidth	Noise Equivalent Power (NEP)[a]	Rise Time[b]
PDA25K2	GaP	4.8 mm^2 (2.2 x 2.2 mm)	150 - 550 nm	0.12 A/W @ 440 nm	DC - 9.5 MHz	1.68×10^{-11} - 8.58×10^{-10} $W/Hz^{1/2}$	N/A

a. An NEP range is given for this switchable gain detector. NEP values for specific gain settings are provided below.
b. Rise times depend on the chosen gain level and wavelength. As one increases the gain of a given optical amplifier, the bandwidth is reduced, and hence, the rise time increases. Please refer to the photodiode tutorial for information on calculating the rise time. Bandwidth specifications for the photodetector may be found in the table below.

Gain Specifications

Item #	Gain Step (dB)	Gain w/ Hi-Z Load	Gain w/ 50 Ω Load	Bandwidth[b]	Noise (RMS)	NEP at Peak Wavelength	Offset	Output Voltage w/ Hi-Z Load	Output Voltage w/ 50 Ω Load
PDA25K2[a]	0	1.51 kV/A	0.75 kV/A	9.5 MHz	351 µV	8.58×10^{-10} $W/Hz^{1/2}$	±8 mV (Typ.) ±12 mV (Max)	0 - 10 V	0 - 5 V
	10	4.75 kV/A	2.38 kV/A	1.3 MHz	230 µV	8.76×10^{-11} $W/Hz^{1/2}$			
	20	15 kV/A	7.5 kV/A	1.0 MHz	295 µV	4.9×10^{-11} $W/Hz^{1/2}$			
	30	47.5 kV/A	23.8 kV/A	260 kHz	289 µV	2.07×10^{-11} $W/Hz^{1/2}$			
	40	151 kV/A	75 kV/A	80 kHz	295 µV	1.68×10^{-11} $W/Hz^{1/2}$			
	50	475 kV/A	238 kV/A	28 kHz	298 µV	1.93×10^{-11} $W/Hz^{1/2}$			
	60	1.5 MV/A	750 kV/A	8.5 kHz	389 µV	2.05×10^{-11} $W/Hz^{1/2}$			
	70	4.75 MV/A	2.38 MV/A	2.6 kHz	570 µV	2.03×10^{-11} $W/Hz^{1/2}$			

a. This detector has a 50 Ω terminator resistor that is in series with the amplifier output. This forms a voltage divider with any load impedance (e.g. 50 Ω load divides signal in half).
b. Tested at 405 nm.

Note: Gain figures can also be expressed in units of Ω.

Hide Housing Features

HOUSING FEATURES

Housing Features of the Amplified GaP Photodetectors

Thorlabs' PDA25K2 is a compact GaP amplified photodetector with a switchable gain. This detector's housing features internal SM05 (0.535"-40) threading and external SM1 (1.035"-40) threading. It includes an SM1T1 internally SM1-threaded adapter and an SM1RR retaining ring, as shown to the right. The SM1T1 can hold up to 0.1" (2.8 mm) thick optics. This detector can be mounted using a 1/2" Post, as shown in the images below. The PDA25K2 housing features the active area flush with the front of the housing, simplifying alignments within optomechanical systems. This design also has two universal mounting holes that accept both 8-32 and M4 threads. An eight-position rotary gain switch is mounted on an outside edge perpendicular to the power supply and BNC output connections. The location of the gain switch allows for easy adjustments while the detector is mounted. As a convenience, the back panel is engraved with the responsivity curve of the photodiode.

Click to Enlarge
The detector has internal SM05 and external SM1 threads and includes an SM1T1 Internal SM1 Adapter and SM1RR Retaining Ring.

Click to Enlarge
The power input and BNC connectors are located at the top of the housing.

Lens Tube Compatibility

This detector can be integrated into various optomechanical systems using the internal SM05 and external SM1 threads. A lens tube can be directly attached to the SM1 threads, making the detector compatible with lens tube systems. The SM1T1 adapter can be used to mount Ø1" (Ø25.4 mm) optical components, such as optical filters and lenses.

Cage System Compatibility

The detector is also cage system compatible, as shown in the two images below right. A CP33(/M) cage plate can be attached directly to the SM1 threads. This attachment method does not require an adapter piece and allows the diode to be as close as possible to the cage plate, which can be important in setups where the light is divergent. Another method for integrating a detector into a cage system is using the included SM1T1 with an SM1T2 adapter. This allows more freedom in choosing the orientation of the detector. Additionally, this detector can be used with SM1-threaded fiber adapters (sold below).

Post Mounting

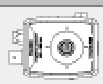
Threaded holes on the housings of the detector allow the units to be mounted in a horizontal or vertical orientation using a 1/2" Post. This gives the user the option to route the power and BNC cables from above or alongside the beam path, as shown below left.

Click to Enlarge
PDA Photodetector Mounted Horizontally

Click to Enlarge
[APPLIST]
[APPLIST]
PDA Photodetector Connected to an SM1 Lens Tube in a 30 mm Cage System

Click to Enlarge
[APPLIST]
[APPLIST]
PDA Photodetector Integrated into a 30 mm Cage System Using the External SM1 Threads

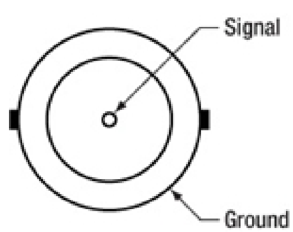
Click to Enlarge
[APPLIST]
[APPLIST]
PDA Photodetector Integrated into a 30 mm Cage System Using the SM1T1 (included) and SM1T2 Adapter

Detectors	Housing Drawing (Click Icon for Details)	Mounting Taps	SM Thread Compatibility	Dimensions	Output Connector
PDA25K2		Two Universal Taps for 8-32 and M4	Internal SM05 (0.535"-40) External SM1 (1.035"-40)	1.96" x 0.89" x 2.79" (49.8 mm x 22.5 mm x 70.9 mm)	BNC

Hide Pin Diagram

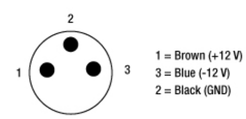
PIN DIAGRAM

BNC Female Output (Photodetector)

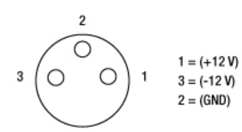


0 - 10 V Output

PDA Male (Power Cables)



PDA Female (Photodetector)



Hide Photodiode Tutorial

PHOTODIODE TUTORIAL

Photodiode Tutorial

Theory of Operation

A junction photodiode is an intrinsic device that behaves similarly to an ordinary signal diode, but it generates a photocurrent when light is absorbed in the depleted region of the junction semiconductor. A photodiode is a fast, highly linear device that exhibits high quantum efficiency based upon the application and may be used in a variety of different applications.

It is necessary to be able to correctly determine the level of the output current to expect and the responsivity based upon the incident light. Depicted in Figure 1 is a junction photodiode model with basic discrete components to help visualize the main characteristics and gain a better understanding of the operation of Thorlabs' photodiodes.

$$I_{OUT} = I_{DARK} + I_{PD}$$

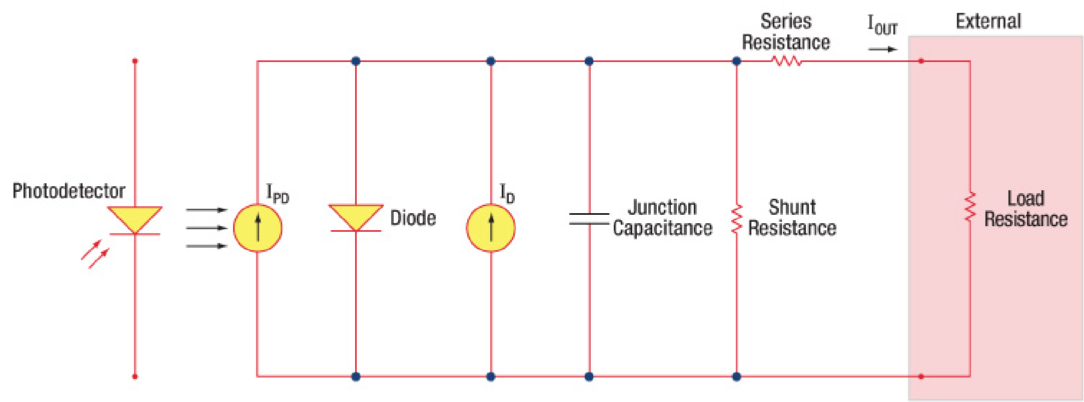


Figure 1: Photodiode Model

Photodiode Terminology

Responsivity

The responsivity of a photodiode can be defined as a ratio of generated photocurrent (I_{PD}) to the incident light power (P) at a given wavelength:

$$R(\lambda) = \frac{I_{PD}}{P}$$

Modes of Operation (Photoconductive vs. Photovoltaic)

A photodiode can be operated in one of two modes: photoconductive (reverse bias) or photovoltaic (zero-bias). Mode selection depends upon the application's speed requirements and the amount of tolerable dark current (leakage current).

Photoconductive

In photoconductive mode, an external reverse bias is applied, which is the basis for our DET series detectors. The current measured through the circuit indicates illumination of the device; the measured output current is linearly proportional to the input optical power. Applying a reverse bias increases the width of the depletion junction producing an increased responsivity with a decrease in junction capacitance and produces a very linear response. Operating under these conditions does tend to produce a larger dark current, but this can be limited based upon the photodiode material. (Note: Our DET detectors are reverse biased and cannot be operated under a forward bias.)

Photovoltaic

In photovoltaic mode the photodiode is zero biased. The flow of current out of the device is restricted and a voltage builds up. This mode of operation exploits the photovoltaic effect, which is the basis for solar cells. The amount of dark current is kept at a minimum when operating in photovoltaic mode.

Dark Current

Dark current is leakage current that flows when a bias voltage is applied to a photodiode. When operating in a photoconductive mode, there tends to be a higher dark current that varies directly with temperature. Dark current approximately doubles for every 10 °C increase in temperature, and shunt resistance tends to double for every 6 °C rise. Of course, applying a higher bias will decrease the junction capacitance but will increase the amount of dark current present.

The dark current present is also affected by the photodiode material and the size of the active area. Silicon devices generally produce low dark current compared to germanium devices which have high dark currents. The table below lists several photodiode materials and their relative dark currents, speeds, sensitivity, and costs.

Material	Dark Current	Speed	Spectral Range	Cost
Silicon (Si)	Low	High Speed	Visible to NIR	Low
Germanium (Ge)	High	Low Speed	NIR	Low
Gallium Phosphide (GaP)	Low	High Speed	UV to Visible	Moderate
Indium Gallium Arsenide (InGaAs)	Low	High Speed	NIR	Moderate

Indium Arsenide Antimonide (InAsSb)	High	Low Speed	NIR to MIR	High
Extended Range Indium Gallium Arsenide (InGaAs)	High	High Speed	NIR	High
Mercury Cadmium Telluride (MCT, HgCdTe)	High	Low Speed	NIR to MIR	High

Junction Capacitance

Junction capacitance (C_j) is an important property of a photodiode as this can have a profound impact on the photodiode's bandwidth and response. It should be noted that larger diode areas encompass a greater junction volume with increased charge capacity. In a reverse bias application, the depletion width of the junction is increased, thus effectively reducing the junction capacitance and increasing the response speed.

Bandwidth and Response

A load resistor will react with the photodetector junction capacitance to limit the bandwidth. For best frequency response, a 50 Ω terminator should be used in conjunction with a 50 Ω coaxial cable. The bandwidth (f_{BW}) and the rise time response (t_r) can be approximated using the junction capacitance (C_j) and the load resistance (R_{LOAD}):

$$f_{BW} = 1 / (2 * \pi * R_{LOAD} * C_j)$$
$$t_r = 0.35 / f_{BW}$$

Noise Equivalent Power

The noise equivalent power (NEP) is the generated RMS signal voltage generated when the signal to noise ratio is equal to one. This is useful, as the NEP determines the ability of the detector to detect low level light. In general, the NEP increases with the active area of the detector and is given by the following equation:

$$NEP = \frac{Incident\ Energy * Area}{\frac{S}{N} * \sqrt{\Delta f}}$$

Here, S/N is the Signal to Noise Ratio, Δf is the Noise Bandwidth, and Incident Energy has units of W/cm^2. For more information on NEP, please see Thorlabs' Noise Equivalent Power White Paper.

Terminating Resistance

A load resistance is used to convert the generated photocurrent into a voltage (V_{OUT}) for viewing on an oscilloscope:

$$V_{OUT} = I_{OUT} * R_{LOAD}$$

Depending on the type of the photodiode, load resistance can affect the response speed. For maximum bandwidth, we recommend using a 50 Ω coaxial cable with a 50 Ω terminating resistor at the opposite end of the cable. This will minimize ringing by matching the cable with its characteristic impedance. If bandwidth is not important, you may increase the amount of voltage for a given light level by increasing R_{LOAD}. In an unmatched termination, the length of the coaxial cable can have a profound impact on the response, so it is recommended to keep the cable as short as possible.

Shunt Resistance

Shunt resistance represents the resistance of the zero-biased photodiode junction. An ideal photodiode will have an infinite shunt resistance, but actual values may range from the order of ten Ω to thousands of MΩ and is dependent on the photodiode material. For example, and InGaAs detector has a shunt resistance on the order of 10 MΩ while a Ge detector is in the kΩ range. This can significantly impact the noise current on the photodiode. For most applications, however, the high resistance produces little effect and can be ignored.

Series Resistance

Series resistance is the resistance of the semiconductor material, and this low resistance can generally be ignored. The series resistance arises from the contacts and the wire bonds of the photodiode and is used to mainly determine the linearity of the photodiode under zero bias conditions.

Common Operating Circuits

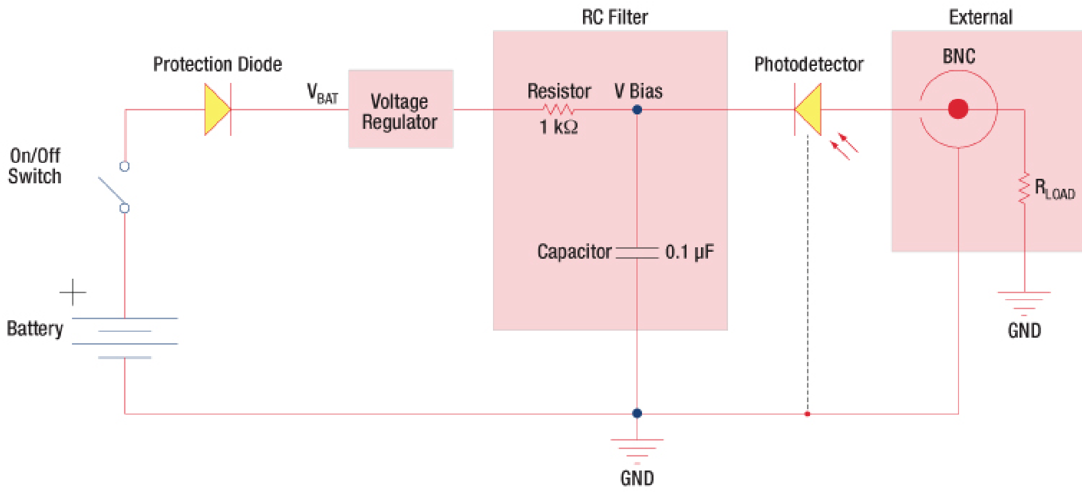


Figure 2: Reverse-Biased Circuit (DET Series Detectors)

The DET series detectors are modeled with the circuit depicted above. The detector is reverse biased to produce a linear response to the applied input light. The amount of photocurrent generated is based upon the incident light and wavelength and can be viewed on an oscilloscope by attaching a load resistance on the output. The function of the RC filter is to filter any high-frequency noise from the input supply that may contribute to a noisy output.

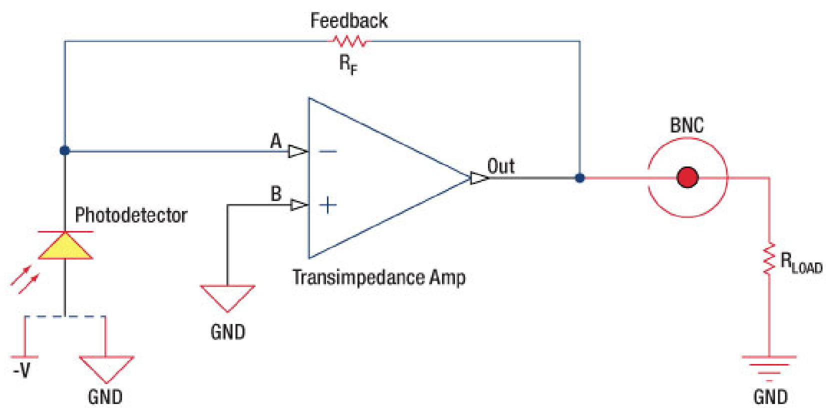


Figure 3: Amplified Detector Circuit

One can also use a photodetector with an amplifier for the purpose of achieving high gain. The user can choose whether to operate in Photovoltaic of Photoconductive modes. There are a few benefits of choosing this active circuit:

- Photovoltaic mode: The circuit is held at zero volts across the photodiode, since point A is held at the same potential as point B by the operational amplifier. This eliminates the possibility of dark current.
- Photoconductive mode: The photodiode is reversed biased, thus improving the bandwidth while lowering the junction capacitance. The gain of the detector is dependent on the feedback element (R_f). The bandwidth of the detector can be calculated using the following:

$$f(-3dB) = \sqrt{\frac{GBP}{4\pi * R_f * C_D}}$$

where GBP is the amplifier gain bandwidth product and C_D is the sum of the junction capacitance and amplifier capacitance.

Effects of Chopping Frequency

The photoconductor signal will remain constant up to the time constant response limit. Many detectors, including PbS, PbSe, HgCdTe (MCT), and InAsSb, have a typical 1/f noise spectrum (i.e., the noise decreases as chopping frequency increases), which has a profound impact on the time constant at lower frequencies.

The detector will exhibit lower responsivity at lower chopping frequencies. Frequency response and detectivity are maximized for

$$f_c = \frac{1}{2\pi\tau_r}$$

Hide Previous Generation

PREVIOUS GENERATION

The following table lists Thorlab's selection of previous and current generation PDA, PDF, and DET detectors.

Previous Generation Cross Reference of PDA and DET Detectors

Wavelength	Material	Biased Detector		Amplified Detector	
		Current Generation	Previous Generation	Current Generation	Previous Generation
150 - 550 nm	GaP	DET25K2	DET25K(/M)	PDA25K2	PDA25K(-EC)
200 - 1100 nm	Si	DET10A2	DET10A(/M)	PDA10A2	PDA10A(-EC)
320 - 1000 nm	Si	-	-	PDA8A2	PDA8A
320 - 1100 nm	Si	DET100A2	DET100A(/M)[a]	PDA100A2	PDA100A(-EC)[b]
	Si	-	-	PDF10A2	PDF10A(/M)
350 - 1100 nm	Si	DET36A2	DET36A(/M)	PDA36A2	PDA36A(-EC)
500 - 1700 nm	InGaAs	DET10N2	DET10N(/M)	-	-
800 - 1700 nm	InGaAs	DET20C2	DET20C(/M)	PDA20CS2	PDA20CS(-EC)
		-	-	PDA05CF2	PDA10CF(-EC)
		-	-	PDF10C2	PDF10C(/M)
		-	-	PDA20C2	PDA20C(/M)
800 - 1800 nm	Ge	DET30B2	DET30B(/M)	PDA30B2	PDA30B(-EC)
		DET50B2	DET50B(/M)	PDA50B2	PDA50B(-EC)
900 - 1700 nm	InGaAs	DET10C2	DET10C(/M)	PDA10CS2	PDA10CS(-EC)
900 - 2600 nm	InGaAs	DET05D2	DET05D(/M)[c]	PDA10D2	PDA10D(-EC)[c]
		DET10D2	DET10D(/M)[c]	-	-

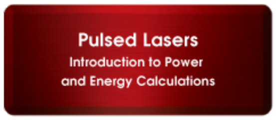
a. The DET100A(/M) wavelength range is 350 - 1100 nm.
b. The PDA100A(-EC) wavelength range is 340 - 1100 nm.
c. The DET05D(/M), PDA10D(-EC), and DET10D(/M) wavelength range is 800 - 2600 nm.

Hide Pulse Calculations

PULSE CALCULATIONS

Pulsed Laser Emission: Power and Energy Calculations

Determining whether emission from a pulsed laser is compatible with a device or application can require referencing parameters that are not supplied by the laser's manufacturer. When this is the case, the necessary parameters can typically be calculated from the available information. Calculating peak pulse power, average power, pulse energy, and related parameters can be necessary to achieve desired outcomes including:



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Protecting biological samples from harm.

- Measuring the pulsed laser emission without damaging photodetectors and other sensors.
- Exciting fluorescence and non-linear effects in materials.

Pulsed laser radiation parameters are illustrated in Figure 1 and described in the table. For quick reference, a list of equations are provided below. The document available for download provides this information, as well as an introduction to pulsed laser emission, an overview of relationships among the different parameters, and guidance for applying the calculations.

Equations:

***Period* and *repetition rate* are reciprocal:** $\Delta t = \frac{1}{f_{rep}}$ and $f_{rep} = \frac{1}{\Delta t}$

***Pulse energy* calculated from *average power*:** $E = \frac{P_{avg}}{f_{rep}} = P_{avg} \cdot \Delta t$

***Average power* calculated from *pulse energy*:** $P_{avg} = \frac{E}{\Delta t} = E \cdot f_{rep}$

***Peak pulse power* estimated from *pulse energy*:** $P_{peak} \approx \frac{E}{\tau}$

***Peak power* and *average power* calculated from each other:**

$$P_{peak} = \frac{P_{avg}}{f_{rep} \cdot \tau} = \frac{P_{avg} \cdot \Delta t}{\tau}$$ and $$P_{avg} = P_{peak} \cdot f_{rep} \cdot \tau = \frac{P_{peak} \cdot \tau}{\Delta t}$$

Peak power* calculated from *average power* and *duty cycle*:**

$$P_{peak} = \frac{P_{avg}}{\tau/\Delta t} = \frac{P_{avg}}{duty\ cycle}$$

*Duty cycle ($\tau/\ \Delta t$) is the fraction of time during which there is laser pulse emission.

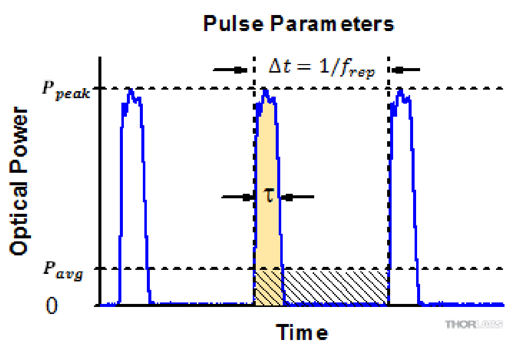

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Figure 1: Parameters used to describe pulsed laser emission are indicated in the plot (above) and described in the table (below). **Pulse energy** (**E**) is the shaded area under the pulse curve. Pulse energy is, equivalently, the area of the diagonally hashed region.

Parameter	Symbol	Units	Description
Pulse Energy	E	Joules [J]	A measure of one pulse's total emission, which is the only light emitted by the laser over the entire period. The pulse energy equals the shaded area, which is equivalent to the

			area covered by diagonal hash marks.
Period	**Δt**	Seconds [s]	The amount of time between the start of one pulse and the start of the next.
Average Power	P_{avg}	Watts [W]	The height on the optical power axis, if the energy emitted by the pulse were uniformly spread over the entire period.
Instantaneous Power	**P**	Watts [W]	The optical power at a single, specific point in time.
Peak Power	P_{peak}	Watts [W]	The maximum instantaneous optical power output by the laser.
Pulse Width	τ	Seconds [s]	A measure of the time between the beginning and end of the pulse, typically based on the full width half maximum (FWHM) of the pulse shape. Also called **pulse duration**.
Repetition Rate	f_{rep}	Hertz [Hz]	The frequency with which pulses are emitted. Equal to the reciprocal of the period.

Example Calculation:

Is it safe to use a detector with a specified maximum peak optical input power of **75 mW** to measure the following pulsed laser emission?

- Average Power: 1 mW
- Repetition Rate: 85 MHz
- Pulse Width: 10 fs

The energy per pulse:

$$E = \frac{P_{avg}}{f_{rep}} = \frac{1\ mW}{85\ MHz} = \frac{1\ x\ 10^{-3} W}{85\ x\ 10^{6} Hz} = 1.18\ x\ 10^{-11} J = 11.8\ pJ$$

seems low, but the peak pulse power is:

$$P_{peak} = \frac{P_{avg}}{f_{rep} \cdot \tau} = \frac{1\ mW}{85\ MHz\ \cdot 10\ fs} = 1.18\ x\ 10^{3}\ W = \mathbf{1.18\ kW}$$

It is ***not safe*** to use the detector to measure this pulsed laser emission, since the peak power of the pulses is >5 orders of magnitude higher than the detector's maximum peak optical input power.

Hide Cross Reference

CROSS REFERENCE

The following table lists Thorlabs' selection of photodiodes and photoconductive detectors. Item numbers in the same row contain the same detector element.

Photodetector Cross Reference						
Wavelength	**Material**	**Unmounted Photodiode**	**Mounted Photodiode**	**Biased Detector**	**Amplified Detector**	**Amplified Detector, OEM Package**
150 - 550 nm	GaP	-	SM05PD7A	DET25K2	PDA25K2	-
200 - 1100 nm	Si	FDS010	SM05PD2A SM05PD2B	DET10A2	PDA10A2	-
	Si	-	SM1PD2A	-	-	-
320 - 1000 nm	Si	-	-	-	PDA8A2	-
320 - 1100 nm	Si	FD11A	SM05PD3A		PDF10A2	-
	Si	- [a]	-	DET100A2 [a]	PDA100A2 [a]	PDAPC2 [a]

340 - 1100 nm	Si	FDS10X10	-	-	-	-
350 - 1100 nm	Si	FDS100 FDS100-CAL [b]	SM05PD1A SM05PD1B	DET36A2	PDA36A2	PDAPC1
	Si	FDS1010 FDS1010-CAL [b]	SM1PD1A SM1PD1B	-	-	-
400 - 1000 nm	Si	-	-	-	PDA015A(/M) FPD310-FS-VIS FPD310-FC-VIS FPD510-FC-VIS FPD510-FS-VIS FPD610-FC-VIS FPD610-FS-VIS	-
400 - 1100 nm	Si	FDS015 [c]	-	-	-	-
	Si	FDS025 [c] FDS02 [d]	-	DET02AFC(/M) DET025AFC(/M) DET025A(/M) DET025AL(/M)	-	-
400 - 1700 nm	Si & InGaAs	DSD2	-	-	-	-
500 - 1700 nm	InGaAs	-	-	DET10N2	-	-
750 - 1650 nm	InGaAs	-	-	-	PDA8GS	-
800 - 1700 nm	InGaAs	FGA015	-	-	PDA015C(/M)	-
	InGaAs	FGA21 FGA21-CAL [b]	SM05PD5A	DET20C2	PDA20C2 PDA20CS2	-
	InGaAs	FGA01 [c] FGA01FC [d]	-	DET01CFC(/M)	-	-
	InGaAs	FDGA05 [c]	-	-	PDA05CF2	-
	InGaAs	-	-	DET08CFC(/M) DET08C(/M) DET08CL(/M)	-	-
	InGaAs	-	-	-	PDF10C2	-
800 - 1800 nm	Ge	FDG03 FDG03-CAL [b]	SM05PD6A	DET30B2	PDA30B2	-
	Ge	FDG50	-	DET50B2	PDA50B2	-
	Ge	FDG05	-	-	-	-
900 - 1700 nm	InGaAs	FGA10	SM05PD4A	DET10C2	PDA10CS2	-
900 - 2600 nm	InGaAs	FD05D	-	DET05D2	-	-
		FD10D	-	DET10D2	PDA10D2	-
950 - 1650 nm	InGaAs	-	-	-	FPD310-FC-NIR FPD310-FS-NIR FPD510-FC-NIR FPD510-FS-NIR FPD610-FC-NIR FPD610-FS-NIR	-
1.0 - 5.8 µm	InAsSb	-	-	-	PDA10PT(-EC)	-
2.0 - 8.0 µm	HgCdTe (MCT)	VML8T0 VML8T4 [e]	-	-	PDAVJ8	-
2.0 - 10.6 µm	HgCdTe (MCT)	VML10T0 VML10T4 [e]	-	-	PDAVJ10	-
2.7 - 5.0 µm	HgCdTe (MCT)	VL5T0	-	-	PDAVJ5	-
2.7 - 5.3 µm	InAsSb	-	-	-	PDA07P2	-

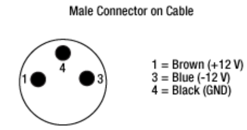
a. If you are interested in purchasing the bare photodiode incorporated in these detectors without the printed circuit board, please contact Tech Support.
b. Calibrated Unmounted Photodiode
c. Unmounted TO-46 Can Photodiode

d. Unmounted TO-46 Can Photodiode with FC/PC Bulkhead
e. Photovoltaic Detector with Thermoelectric Cooler

Hide PDA Power Supply Cable

PDA Power Supply Cable

The PDA-C-72 power cord is offered for the PDA line of amplified photodetectors when using with a power supply other than the one included with the detector. The cord has tinned leads on one end and a PDA-compatible 3-pin connector on the other end. It can be used to power the PDA series of amplified photodetectors with any power supply that provides a DC voltage. The pin descriptions are shown to the right.

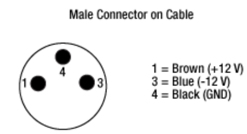


Part Number	Description	Price	Availability
PDA-C-72	**72" PDA Power Supply Cable, 3-Pin Connector**	**$21.63**	**Today**

Hide ±12 VDC Regulated Linear Power Supply

±12 VDC Regulated Linear Power Supply

- Replacement Power Supply for the PDA and PDF Amplified Photodetectors Sold Above
- ±12 VDC Power Output
- Current Limit Enabling Short Circuit and Overload Protection
- On/Off Switch with LED Indicator
- Switchable AC Input Voltage (100, 120, or 230 VAC)
- 2 m (6.6 ft) Cable with LUMBERG RSMV3 Male Connector
- UL and CE Compliant



The LDS12B ±12 VDC Regulated Linear Power Supply is intended as a replacement for the supply that comes with our PDA and PDF line of amplified photodetectors sold on this page. The cord has three pins: one for ground, one for +12 V, and one for -12 V (see diagram above). A region-specific power cord is shipped with the LDS12B power supply based on your location. This power supply can also be used with the PDB series of balanced photodetectors, PMM series of photomultiplier modules,APD series of avalanche photodetectors, and the FSAC autocorrelator for femtosecond lasers.

Part Number	Description	Price	Availability
LDS12B	**±12 VDC Regulated Linear Power Supply, 6 W, 100/120/230 VAC**	**$87.35**	**Today**

Hide Internally SM1-Threaded Fiber Adapters

Internally SM1-Threaded Fiber Adapters

- FC/PC (Narrow or Wide Key), FC/APC (Narrow Key or Wide Key), SMA, ST/PC, SC/PC, or LC/PC Receptacles
- Light-Tight Construction When Used with SM1 Lens Tubes
- Compatible with Many of Our Photodiode Power Sensors

Note: The APC adapters have two dimples in the front surface that allow them to be tightened with the SPW909 or SPW801 spanner wrench. The dimples do not go all the way through the disk so that the adapter can be used in light-tight applications when paired with SM1 lens tubes.

FC/PC and FC/APC adapters are available with either narrow (2.0 mm) or wide (2.2 mm) key connectors; for more details on narrow versus wide key connectors, please see our Intro to Fiber tutorial.

Item #	S120-FC2	S120-FC	S120-APC2[a]	S120-APC[a]	S120-SMA	S120-ST	S120-SC	S120-LC
Adapter Image (Click the Image to Enlarge)								
Connector Type	FC/PC, 2.0 mm Narrow Key	FC/PC, 2.2 mm Wide Key	FC/APC, 2.0 mm Narrow Key	FC/APC, 2.2 mm Wide Key	SMA	ST/PC	SC/PC[b]	LC/PC

Threading	Internal SM1 (1.035"-40)

a. The S120-APC and S120-APC2 are designed with a 4° mechanical angle to compensate for the refraction angle of the output beam.
b. In certain angle-independent applications, this adapter may also be used with SC/APC connectors.

Part Number	Description	Price	Availability
S120-FC2	**FC/PC Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads, Narrow Key (2.0 mm)**	**$43.26**	**Today**
S120-FC	**FC/PC Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads, Wide Key (2.2 mm)**	**$43.26**	**Today**
S120-APC2	**FC/APC Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads, Narrow Key (2.0 mm)**	**$33.78**	**Today**
S120-APC	**Customer Inspired! FC/APC Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads, Wide Key (2.2 mm)**	**$33.78**	**Today**
S120-SMA	**SMA Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads**	**$43.26**	**Today**
S120-ST	**ST/PC Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads**	**$43.26**	**Today**
S120-SC	**SC/PC Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads**	**$54.35**	**Today**
S120-LC	**LC/PC Fiber Adapter Cap with Internal SM1 (1.035"-40) Threads**	**$54.35**	**Today**

Hide Externally SM1-Threaded Fiber Adapters

Externally SM1-Threaded Fiber Adapters

- FC/PC (Narrow or Wide Key), FC/APC (Narrow or Wide Key), SMA, ST/PC, SC/PC, or LC/PC Receptacles
- Light-Tight When Used with SM1 Lens Tubes
- Compatible with Many of Our 30 mm Cage Plates and Photodetectors

Note: Each disk has four dimples, two in the front surface and two in the back surface, that allow it to be tightened from either side with the SPW909 or SPW801 spanner wrench. The dimples do not go all the way through the disk so that the adapters can be used in light-tight applications when paired with SM1 lens tubes. Once the adapter is at the desired position, use an SM1RR retaining ring to secure it in place.

FC/PC and FC/APC adapters are available with either narrow (2.0 mm) or wide (2.2 mm) key connectors; for more details on narrow versus wide key connectors, please see our Intro to Fiber tutorial.

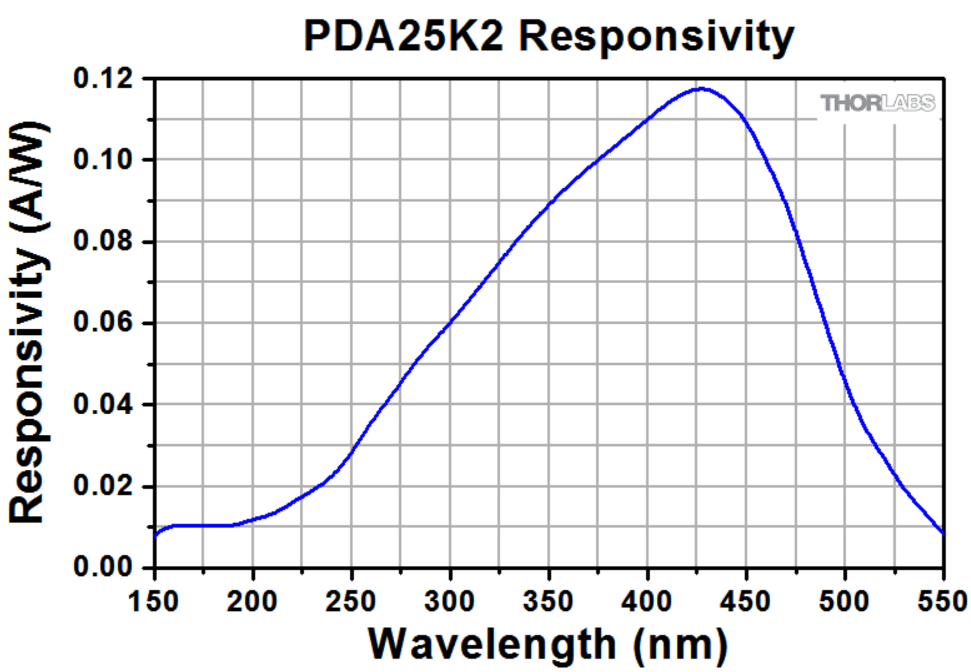
Item #	SM1FC2	SM1FC	SM1FCA2[a]	SM1FCA[a]	SM1SMA	SM1ST	SM1SC1[b]	SM1LC[b]
Adapter Image (Click the Image to Enlarge)								
Connector Type	FC/PC, 2.0 mm Narrow Key	FC/PC, 2.2 mm Wide Key	FC/APC, 2.0 mm Narrow Key	FC/APC, 2.2 mm Wide Key	SMA	ST/PC	SC/PC[c]	LC/PC
Threading	External SM1 (1.035"-40)							

a. The SM1FCA2 and SM1FCA are designed with a 4° mechanical angle to compensate for the refraction angle of the output beam.
b. These adapters can only be threaded in place with the connector facing away from the internal threading.
c. In certain angle-independent applications, this adapter may also be used with SC/APC connectors.

Part Number	Description	Price	Availability
SM1FC2	**FC/PC Fiber Adapter Plate with External SM1 (1.035"-40) Threads, Narrow Key (2.0 mm)**	**$32.16**	**Today**
SM1FC	**FC/PC Fiber Adapter Plate with External SM1 (1.035"-40) Threads, Wide Key (2.2 mm)**	**$32.16**	**Today**
SM1FCA2	**Customer Inspired! FC/APC Fiber Adapter Plate with External SM1 (1.035"-40) Threads, Narrow Key (2.0 mm)**	**$34.11**	**Today**
SM1FCA	**FC/APC Fiber Adapter Plate with External SM1 (1.035"-40) Threads, Wide Key (2.2 mm)**	**$34.11**	**Today**
SM1SMA	**SMA Fiber Adapter Plate with External SM1 (1.035"-40) Threads**	**$31.38**	**Today**
SM1ST	**ST/PC Fiber Adapter Plate with External SM1 (1.035"-40) Threads**	**$29.91**	**Today**
SM1SC1	**SC/PC Fiber Adapter Plate with External SM1 (1.035"-40) Threads**	**$61.23**	**Today**
SM1LC	**LC/PC Fiber Adapter Plate with External SM1 (1.035"-40) Threads**	**$61.23**	**7-10 Days**

Visit the *GaP Transimpedance Amplified Photodetector* page for pricing and availability information:


OUTPUT
0 - 10 V
PDA25K2
Amplified Detector
150 - 550 nm


PDA25K2 Responsivity
Responsivity (A/W)
0.12
0.10
0.08
0.06
0.04
0.02
0.00
150
200
250
300
350
400
450
500
550
Wavelength (nm)
THORLABS