Transimpedance Amplifier, 10 kV/A



AMP140

Description

The AMP140 Transimpedance Amplifier for photodiodes, photodetectors, or other devices amplifies low output current with a gain of 10 kV/A. This amplifier has an in-line box design with two female BNC connectors that is intended to be used between two BNC cables. An external power supply feeds the amplifier via the Micro-B USB cable, connected at the INPUT end of the amplifier. An LED next to the USB connector indicates active power supply.

At the OUTPUT end of the amplifier, a small switch allows users to choose the polarity: AG (anode grounding) or CG (cathode grounding). The bias voltage can be adjusted from 1.5 V up to 15 V with the BIAS ADJ screw on the OUTPUT end.

Caution: The outer conductor at the INPUT BNC connector carries potential and shall not be grounded. Attach only devices to the INPUT BNC of the AMP140 that are not attached to ground or else it will short circuit the AMP140 and may break the device.

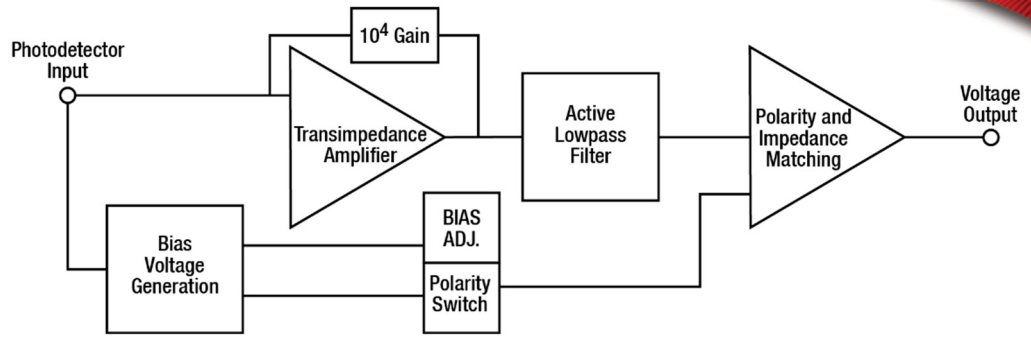
Specifications

AC Performance	
Bandwidth (3 dB, C_{in} ≤ 200 pF)[a]	DC to 10 MHz
Rise/Fall Time (10% to 90%)	<35 ns

Specifications				
	Conditions	**Min**	**Typical**	**Max**
Transimpedance Gain	DC	-	10 kV/A	-
Input Current Limits[b]	-	-350 µA	-	+350 µA
Input Impedance[c]	-	-	0 Ω	-
Input Current Noise (NEP)[a]	DC to 10 MHz	-	5.0 pA/√Hz	-
Quiescent Current	-	-	150 mA	-
Output Voltage Range	50 Ω Load	-1.75 V	-	+1.75 V
	Hi-Z Load	-3.5 V	-	+3.5 V
Output Impedance	-	-	50 Ω	-
Bias Adjustment Range at CG	-	+1.5 V	-	+15 V
Bias Adjustment Range at AG	-	-1.5 V	-	-15 V
Power Supply Voltage	-	-	5 V	-
Power Supply Current	-	-	2 A	-

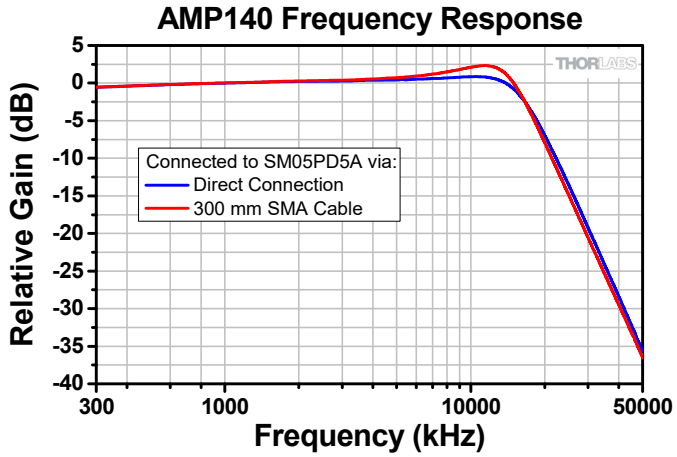
a. Bandwidth and input current noise are typical values that depend on the source capacitance. Keep the source capacitance as low as possible by using short cables at the input to achieve the best possible bandwidth and noise performance.
b. Exceeding these limits saturates the amplifier. There is a chance of damaging the amplifier if operating outside of this specification.
c. Virtually Grounded

Electrical Schematic



Typical Performance Plot

The graph below represents measured data using an input source with capacitance of 200 pF. Please always keep output cables as short as possible for they will induce a high capacitance. The blue curve shows the frequency response when directly connected to an SM05PD5A photodiode and the red curve shows the results when connected via a 300 mm SMA cable.



Certificates and Safety



The safety of any system incorporating the equipment is the responsibility of the assembler of the system. All statements regarding safety of operation and technical data in this instruction manual will only apply when the unit is operated correctly as it was designed for.

This item must not be operated in explosion endangered environments!

Do not remove covers or open the cabinet. There are no parts serviceable by the operator inside. Refer servicing to qualified personnel. This precision device is only serviceable if properly packed into the complete original packaging including the plastic foam sleeves. If necessary, ask for replacement packaging. Only with written consent from Thorlabs may changes to single components be made or components not supplied by Thorlabs be used.

Prior to applying power to this item, make sure that the protective conductor of the 3 conductor mains power cord is correctly connected to the protective earth ground contact of the socket outlet! Improper grounding can cause electric shock resulting in damage to your health or even death!

All modules must only be operated with duly shielded connection cables.

Users that change or modify the product described in this manual in a way not expressly approved by Thorlabs (party responsible for compliance) could void the user's authority to operate the equipment.

Thorlabs GmbH is not responsible for any radio television interference caused by modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Thorlabs. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Mobile telephones, cellular phones or other radio transmitters are not to be used within the range of three meters of this unit since the electromagnetic field intensity may then exceed the maximum allowed disturbance values according to IEC 61326-1.

This product has been tested and found to comply with the limits according to IEC 61326-1 for using connection cables shorter than 3 meters (9.8 feet).

Herewith Thorlabs declares that this product complies with all relevant EU-Directives. The full text of the EU Declaration of Conformity can be found on the following page:

EU Declaration of Conformity

in accordance with EN ISO 17050-1:2010

We: Thorlabs GmbH

Of: Münchner Weg 1, 85232 Bergkirchen, Deutschland

in accordance with the following Directive(s):

2014/35/EU	Low Voltage Directive (LVD)
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Use of Certain Hazardous Substances (RoHS)

hereby declare that:

Model: ***AMP1/2xx***

Equipment: ***Photocurrent-/ Voltage-Amplifier Series***

is/are in conformity with the applicable requirements of the following documents:

EN 61010-1	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.	2010 + A1:2019 + AC:2019.
EN 61326-1	Electrical Equipment for Measurement, Control and Laboratory Use - EMC Requirements	2013

and which, issued under the sole responsibility of Thorlabs, is/are in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8th June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment, for the reason stated below:

does not contain substances in excess of the maximum concentration values tolerated by weight in homogenous materials as listed in Annex II of the Directive

I hereby declare that the equipment named has been designed to comply with the relevant sections of the above referenced specifications, and complies with all applicable Essential Requirements of the Directives.

Signed: *On:* 15 November 2019

Name: Bruno Gross

Position: General Manager

EDC - AMP1/2xx -2019-11-15

CE