

**Low-Noise Current Amplifier
Variable-Gain Mini-Module**

Features

- Compact 60 x 58 x 15 mm
- Frequency Response Independent of Detector-Capacitance (up to 2 nF)
- Switchable Gain of $10^7 / 10^8 / 10^9$ V/A

Applications

- Photodiode- and Photomultiplier-Preamplifier
- Ionisation Detectors
- Impedance Measurement
- STM Microscopy

The A1221 is a state-of-the-art low-noise preamplifier module for current sources like photodiodes, tunnel contacts or ionisation chambers. It offers high gain and low noise in a compact housing. Gain Switching is realized without moving parts, allowing fast and wearless operation.

Due to its small footprint this module can be mounted very close to the detector. This reduces noise pickup and input capacitance to a minimum.

Selected Gain	10^7	10^8	10^9
Gain $\pm 2\%$	10^7 V/A	10^8 V/A	10^9 V/A
Bandwidth $\pm 10\%$	DC – 200 kHz	DC – 20 kHz	DC – 2 kHz
Input Current Noise (typ.)	60 fA/ $\sqrt{\text{Hz}}$ @ 10 kHz	20 fA/ $\sqrt{\text{Hz}}$ @ 1 kHz	6 fA/ $\sqrt{\text{Hz}}$ @ 200 Hz
Max. Source Capacitance	2 nF	10 nF	10 nF

Common Characteristics	
Linearity	$\pm 0.1\%$
Input Bias Current (typ.)	2 pA
Input Bias Current Drift	$\times 2 / 10^\circ\text{C}$
Input Voltage Noise (typ.)	6 nV/ $\sqrt{\text{Hz}}$ @ 1 kHz

Model A1221 Preliminary Datasheet

Common Characteristics	
Input Offset Voltage max.	1 mV
Input Impedance (DC)	50 Ω
Output Voltage Range	± 10 V (>10 k Ω Load)
Output Impedance	50 Ω
Max. Output Current	± 10 mA
Power Supply Voltage	± 15 V
Power Supply Current	± 35 mA typ.
Shield	Tin-Plated Steel
Weight	30 g
Storage Temperature	-20 .. +80 $^{\circ}$ C
Operating Temperature	0 .. 50 $^{\circ}$ C

All characteristics are for ± 15 V power supply and 25 $^{\circ}$ C ambient temperature.

Absolute Maximum Ratings	
Input Voltage	± 5 V
Power Supply Voltage	± 20 V
Control Input Voltage (Pin 7 and 8)	-3 / +8 V

Ordering Information		
Ordering Code: A1221-YZ		
	Y = Input Configuration:	Z = Output and Supply Configuration:
	A = SMA Connector	S = 8 Pin Header
	B = SMB Connector	N = Without Connector, open Solder Pads

Ordering Code Example:

A1221-BS = Input with SMB Connector, Output, Control and Supply with 8 Pin Header

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Connections	
Input	SMA or SMB Connector
Output and Power Supply	8 Pin Header (2.54 mm Pitch): Pin 1 = Output Pin 2 = Ground Pin 3 = -15 V Negative Supply Pin 4 = Ground Pin 5 = +15 V Positive Supply Pin 6 = Ground Pin 7 = Gain Control Input L Pin 8 = Gain Control Input H

Gain Selection		
Control Inputs Pin 7 and 8 are TTL compatible. They are terminated to Ground with 10 kΩ		
Level Pin 8	Level Pin 7	Gain
L	L	10^7
L	H	10^8
H	L	10^9
H	H	not defined

Dimensions

TBD