

**Low-Noise Current Amplifier  
Fixed-Gain Cased Module**

**Features**

- Compact: 84 x 55 x 24 mm
- Two Outputs, one DC and one AC coupled
- Transient protected Input

The A629-002 is a state-of-the-art low-noise transimpedance preamplifier for current sources like photovoltaic infrared detectors. It offers stable gain and low noise in a compact housing. Both AC and DC coupled Outputs are provided.

**Applications**

- Preamplifier for photovoltaic infrared detector

The amplifier is optimized for the P5968-100 InSb photovoltaic detector at a gain of 1 MV/A. Standard BNC Input and BNC / SMA Output Connectors provide convenient laboratory use. A matching power supply is available as an accessory.

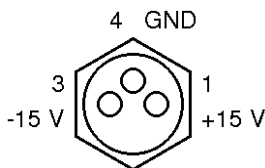
<b>Characteristics</b>	
Gain DC Channel	10 <sup>6</sup> V/A ± 0.5% @ 1 kHz
Gain AC Channel	10 <sup>6</sup> V/A ± 0.5% @ 1 kHz
Bandwidth DC Channel	DC - 50 kHz ± 10%
Bandwidth AC Channel	10 Hz - 25 kHz ± 5%
Input Transient Voltage Limit	< ± 0.4V
Input Current Noise (typ.)	170 fA/√Hz @ 1 kHz (Input Open)
Input Bias Current (typ.)	2 pA
Input Bias Current Drift	x1.8 / 10 °C
Input Voltage Noise	5 nV @ 1 kHz
Input Offset Voltage	< 0.1 mV
Input Impedance (DC)	100 Ω
Max. Source Capacitance	500 pF

All characteristics are for ±15 V power supply and 25 °C ambient temperature.

Characteristics (continued)	
Nonlinearity	< 0.1%
Output Voltage Range (both AC and DC)	$\pm 11$ V (>1 k $\Omega$ Load)
Output Offset Voltage (both AC and DC)	< 0.1 mV (no signal)
Output Impedance (both AC and DC)	50 $\Omega$
Max. Output Current (both AC and DC)	$\pm 10$ mA (for linear operation)
Power Supply Voltage	$\pm 15$ V
Power Supply Current	$\pm 7$ mA typ.
Case	Anodized Aluminum
Weight	130 gr.
Storage Temperature	-20 .. +70 °C
Operating Temperature	10 .. 40 °C

Absolute Maximum Ratings	
Input Voltage	$\pm 6$ V
Input Current	$\pm 50$ mA
Power Supply Voltage	$\pm 20$ V

Connections	
Input	BNC Connector
Main Output (AC Coupled)	BNC Connector
Auxiliary Output (DC Coupled)	SMA Connector
Power Supply	M8 Connector Pin 1 = +15V Positive Supply Pin 3 = -15V Negative Supply Pin 4 = Ground

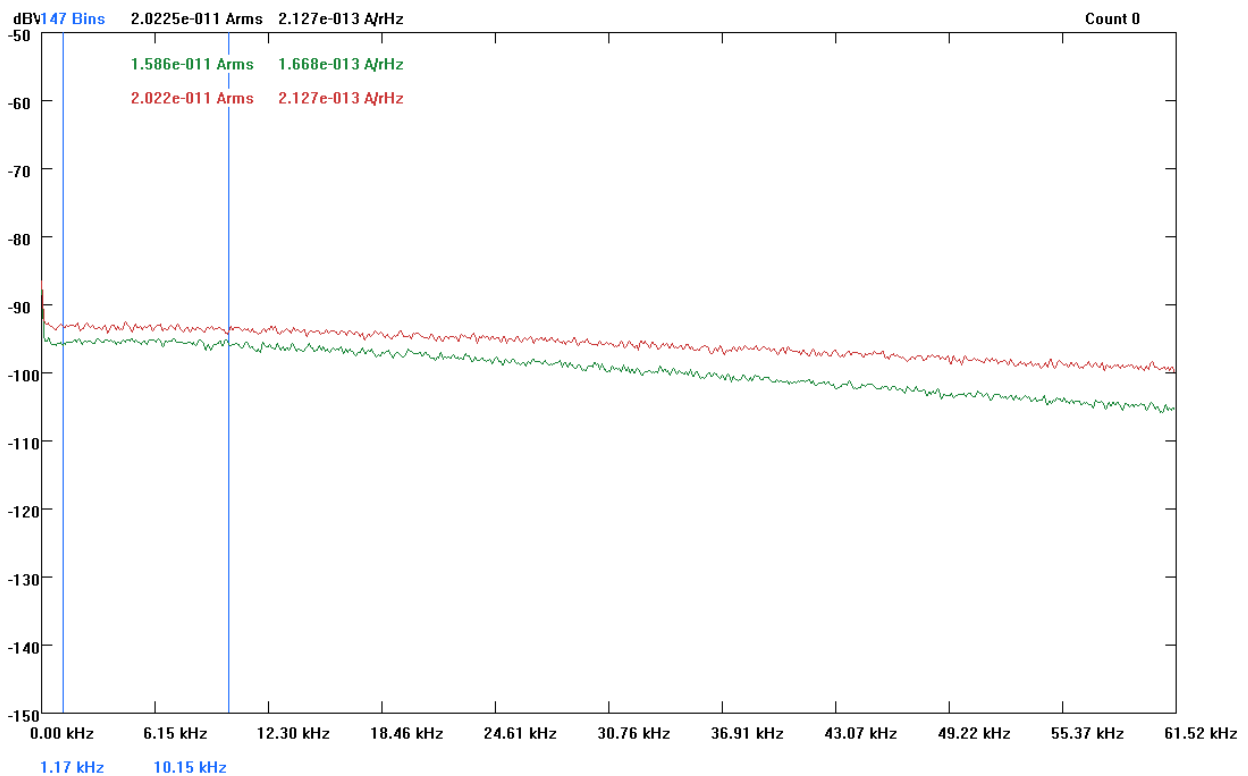


### Functional Description

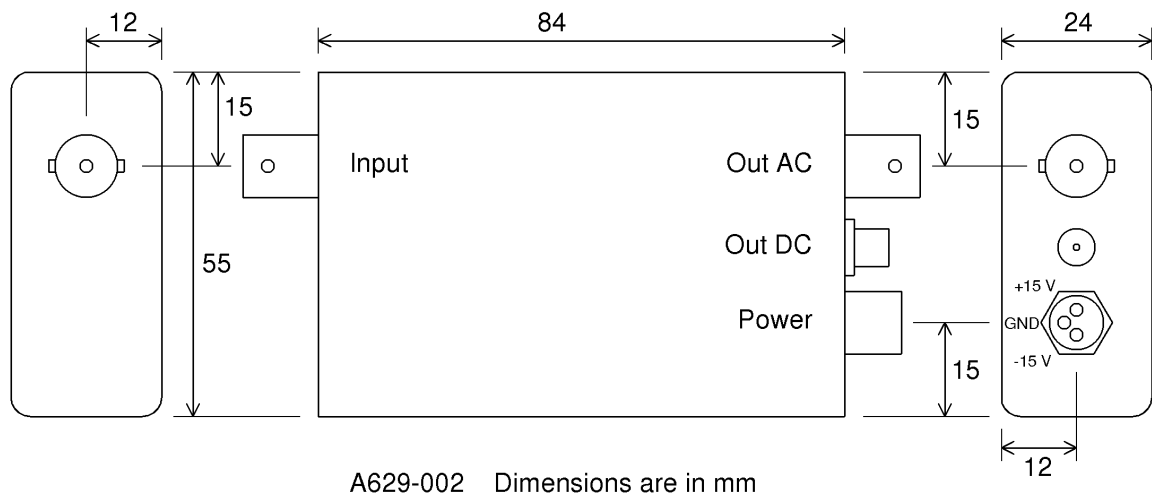
The A629-002 has a first transimpedance stage with a gain of 1MV/A and DC coupling, which is inverting. The second stage is also inverting with a voltage gain of -1 and AC coupling. Whereas the first stage has an upper bandwidth limit of 50 kHz, the second stage reduces this further with high pass filtering to 25 kHz.

Voltage transients at the input, which occur on powering on or off the amplifier, are limited to less than  $\pm 0.4$  V to protect the detector from damage.

Typical noise density spectra are shown in the following diagram. The green line is the equivalent input noise of the amplifier with open input, the red line with a detector dummy of 1M $\Omega$  parallel 100 pF connected to it. As the P5968-100 detector is operated at 77 K, its shunt resistance exhibits only about a quarter of the thermal noise relative to the room temperature of the dummy. So the actual noise performance of the A629-002 preamplifier in combination with the P5968-100 infrared detector will fall between the two lines.



### Dimensions



Power Supply is a female 3-pin industry standard M8-connector.