ΦM
PHYSIMETRON

Model A6504-B
Data Sheet

Low-Noise Charge Amplifier
Fixed-Gain Cased Module

Features
- Compact: 84 x 55 x 24 mm
- Frequency Response independent of Detector Capacitance (up to 100 pF)
- Very Low Noise

Applications
- AFM Microscopy
- Pyro- and Piezoelectric Detectors
- Capacitive Pickups
- Charged Particle Beam Monitoring

The A6504-B is a state-of-the-art low-noise charge preamplifier module for charge sources like piezoelectric transducers or capacitive pickups. It offers high gain and very low noise in a compact housing. The A6504-B is designed for sinusoidal signals from ac coupled charge sources like tuning fork sensors. Pulsed signals without average DC content can be amplified too. The amplifier is not suited for sources producing an average DC current of more than about 100 pA as this would saturate the device.

This cased amplifier module is well suited for everyday laboratory use. Standard BNC input and output connectors provide convenient connections. A linear regulated power supply is available as an accessory.

The coaxial cable to the detector should be as short as possible, as its capacitance (about 100 pF per meter) induces additional noise and may limit bandwidth.

Characteristics	
Gain ±1%	10^{13} V/C
Bandwidth ±10%	300 Hz – 5 MHz Detector Capacitance < 100 pF 300 Hz – 2.5 MHz Detector Capacitance = 1 nF
Input Charge Noise Density (typ. with open input)	30 x 10^{-21} C/√Hz @ 1 MHz 100 x 10^{-21} C/√Hz @ 30 kHz
Effective Input Impedance (typ.)	500 MΩ // 5 nF
Input Voltage Noise (typ.)	1 nV/√Hz @ 100kHz
Max. Input Charge (for linear amplification)	2 pC peak-peak
Max. recommended Source Capacitance	1 nF (for linear amplification)
Non-Linearity	< 0.1%
Output Voltage Range (for linear amplification)	20 V peak-peak (>1 kΩ Load) 2 V peak-peak (50 Ω Load)
Output Impedance	50 Ω
Max. Output Current	± 20 mA peak
Power Supply Voltage	± 15 V
Power Supply Current	± 30 mA typ. (no signal)

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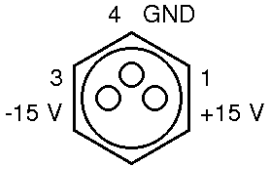
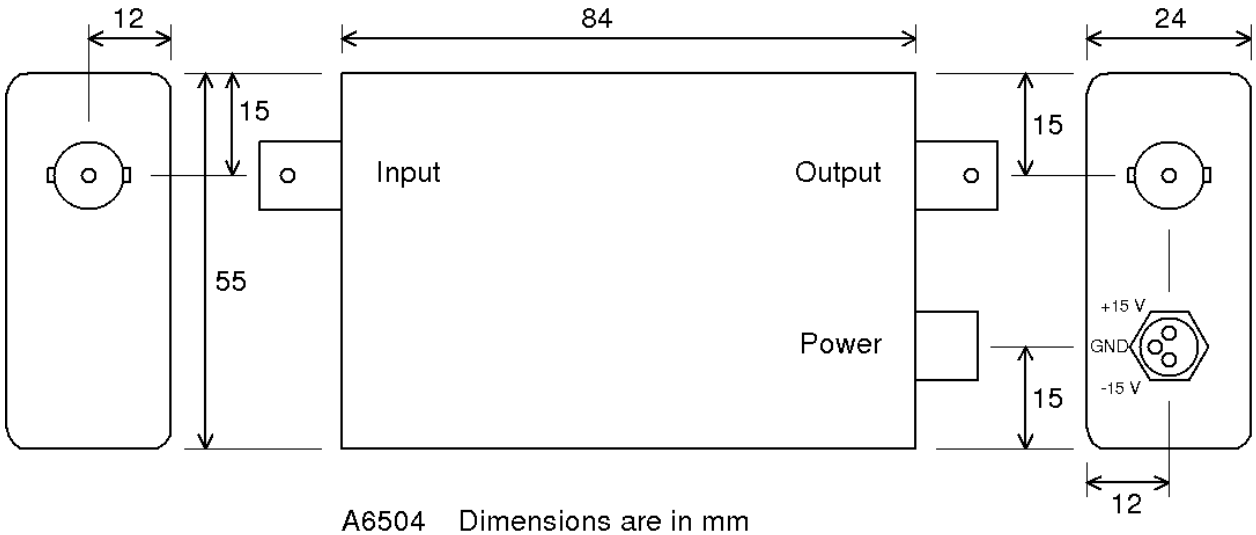
Characteristics	
Case	Anodized Aluminum
Weight	130 g
Storage Temperature	-20 .. +70 °C
Operating Temperature	0 .. 40 °C

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

Absolute Maximum Ratings	
Input Voltage	20 V peak-peak
Power Supply Voltage	± 20 V

Connections	
Input	BNC Connector
Output	BNC Connector
Power Supply 	M8 Connector: Pin 1 = +15V Positive Supply Pin 3 = -15V Negative Supply Pin 4 = Ground

Dimensions



A6504 Dimensions are in mm

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

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