

**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)
- Low Noise

Applications

- Ultrasound Sensing
- Pyro- and Piezoelectric Detectors
- Capacitive Pickups
- Charged Particle Beam Monitoring

The A6503 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 low noise in a compact housing. The A6503 is designed for sinusoidal signals from ac coupled charge sources. 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 10 nA as this would saturate the device. This cased amplifier module is well suited for everyday laboratory use. Standard BNC input and output provides convenient connections. A linear regulated power supply is available as an accessory.

Characteristics	
Gain ±1%	10^{11} V/C
Bandwidth ±10%	200 Hz – 20 MHz (Detector Capacitance ≤ 100 pF) 200 Hz – 10 MHz (Detector Capacitance = 1 nF) 300 Hz – 1 MHz (Detector Capacitance = 10 nF)
Input Charge Noise Density (with open input)	0.8×10^{-18} C/√Hz @ 1 MHz 0.9×10^{-18} C/√Hz @ 30 kHz
Effective Input Impedance	10 MΩ // 30 nF
Input Voltage Noise (typ.)	1 nV/√Hz @ 100kHz
Max. Input Charge (for linear amplification)	100 pC peak-peak
Max. recommended Source Capacitance	10 nF (for linear amplification)
Non-Linearity	< 0.1%

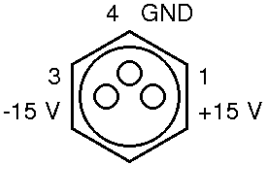
Characteristics	
Output Voltage Range	10 V peak-peak (>1 kΩ Load) 5 V peak-peak (50 Ω Load)
Output Impedance	50 Ω
Max. Output Current	± 50 mA
Power Supply Voltage	± 15 V
Power Supply Current	± 30 mA typ. (no signal)
Case	Anodized Aluminum
Weight	130 g
Storage Temperature	-20 .. +80 °C
Operating Temperature	0 .. 50 °C

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

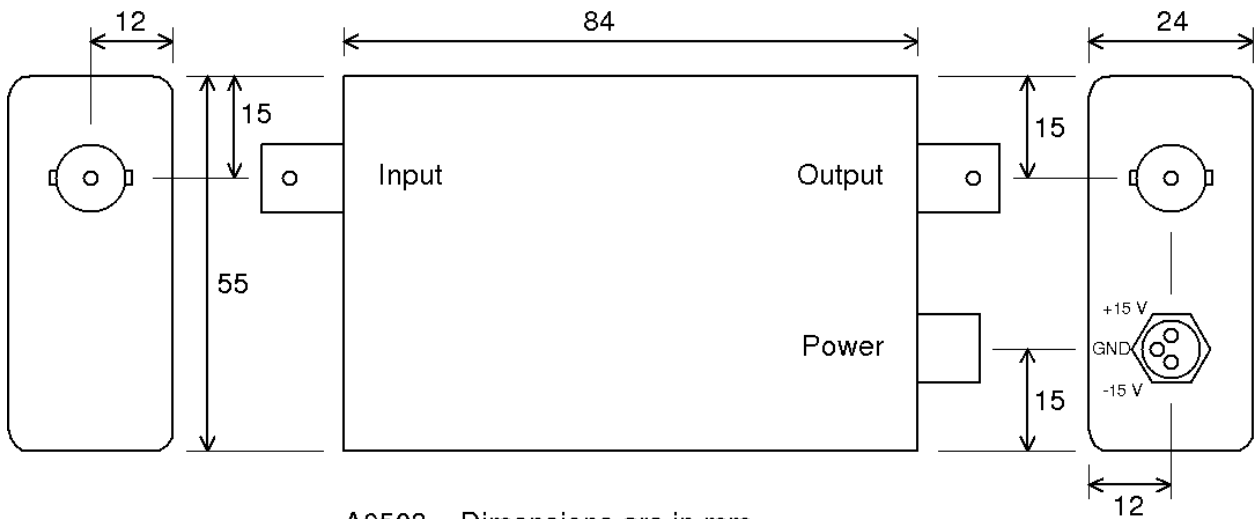
Absolute Maximum Ratings	
Input Voltage	20 V peak-peak
Power Supply Voltage	± 20 V

Ordering Information		
Ordering Code: A6503-Y		
	Y = Input Configuration:	
	S = BNC Connector (Standard)	
	A = SMA Connector	
	B = SMB Connector	

Ordering Code Example:
A6503-S = Input with BNC Connector

Connections	
Input	BNC, SMA or SMB Connector
Output	BNC Connector
Power Supply	 <p>M8 Connector Pin 1 = +15V Positive Supply Pin 3 = -15V Negative Supply Pin 4 = Ground</p>

Dimensions



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