

**Low-Noise Charge Amplifier
Fixed-Gain Mini-Module**

Features

- Compact: 40 x 42 x 13 mm (for SMB)
40 x 42 x 16 mm (for SMA)
- Frequency Response independent of Detector Capacitance (up to 100 pF)
- Low Noise

Applications

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

The A1504 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 an ultra-compact housing. The A1504 is designed for sinusoidal signals from ac coupled charge sources. Pulsed signals without average DC content can be amplified too.

Due to their small footprint these modules can be mounted very close to the detector. This reduces noise pickup and input capacitance to a minimum. The amplifier is not suited for sources producing an average DC current of more than about 100 pA as this would saturate the device.

Characteristics	
Gain ±5%	10 ¹³ V/C
Bandwidth ±10%	500 Hz – 15 MHz (Detector Capacitance ≤ 100 pF)
Input Charge Noise Density (with open input)	40 x 10 ⁻²¹ C/√Hz @ 1 MHz 150 x 10 ⁻²¹ C/√Hz @ 30 kHz
Effective Input Impedance	500 MΩ // 7 nF
Input Voltage Noise (typ.)	1 nV/√Hz @ 100kHz
Max. Input Charge (for linear amplification)	1 pC peak-peak
Max. recommended Source Capacitance	1 nF (for linear amplification)
Non-Linearity	< 0.1%
Output Voltage Range	10 V peak-peak (>1 kΩ Load)
Output Impedance	50 Ω

Characteristics	
Max. Output Current	± 20 mA
Power Supply Voltage	± 15 V
Power Supply Current	± 30 mA typ. (no signal)
Shield	Tin-Plated Steel
Weight	20 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

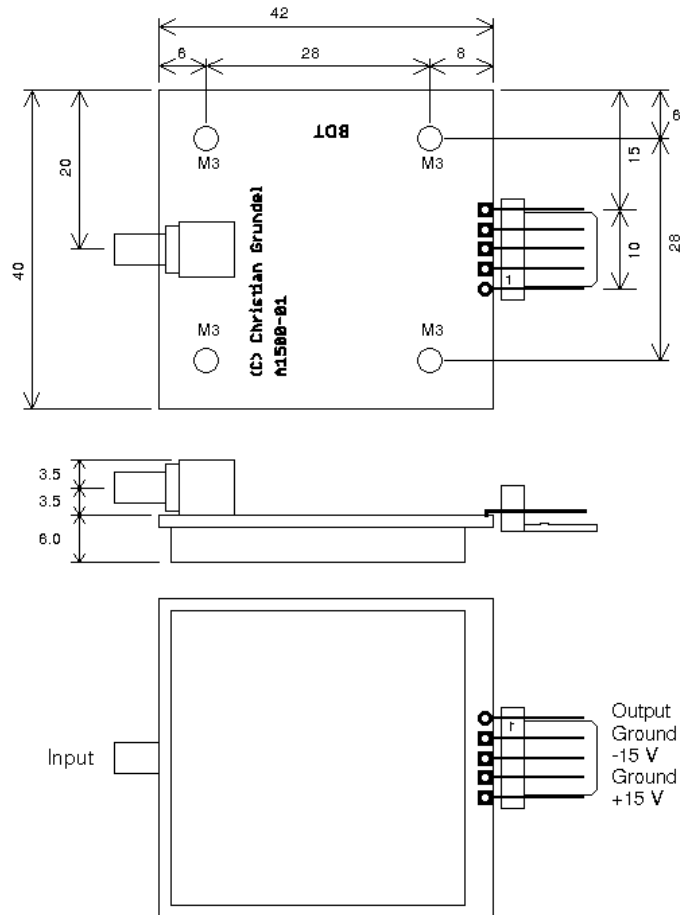
Ordering Information		
Ordering Code: A1504-YZ		
	Y = Input Configuration:	Z = Output and Supply Configuration:
	A = SMA Connector	S = 5 Pin Header
	B = SMB Connector	N = Without Connector, open solder pads

Ordering Code Example:

A1504-BS = Input with SMB Connector, Output and Supply with 5 Pin Header

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

Dimensions



A1503 and A1504 Dimensions are in mm

Dimensions are for SMB-Version. The SMA Input Connector is 3 mm higher above the PCB.

The module can be fastened by means of four M3 threads. Do not drive the screws in more than 4 mm, otherwise mechanical damage may occur.

The 5 pin output header (2.54 mm pitch) with friction lock is Molex KK compatible.

The shielding cap and the four M3 fastening threads are connected to Ground.