

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

Features

- Compact 40 x 42 x 13 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 A1503 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 A1503 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 10 nA as this would saturate the device.

Characteristics	
Gain ±5%	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 x 10 ⁻¹⁸ C/√Hz @ 1 MHz 0.9 x 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)
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: A1503-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:

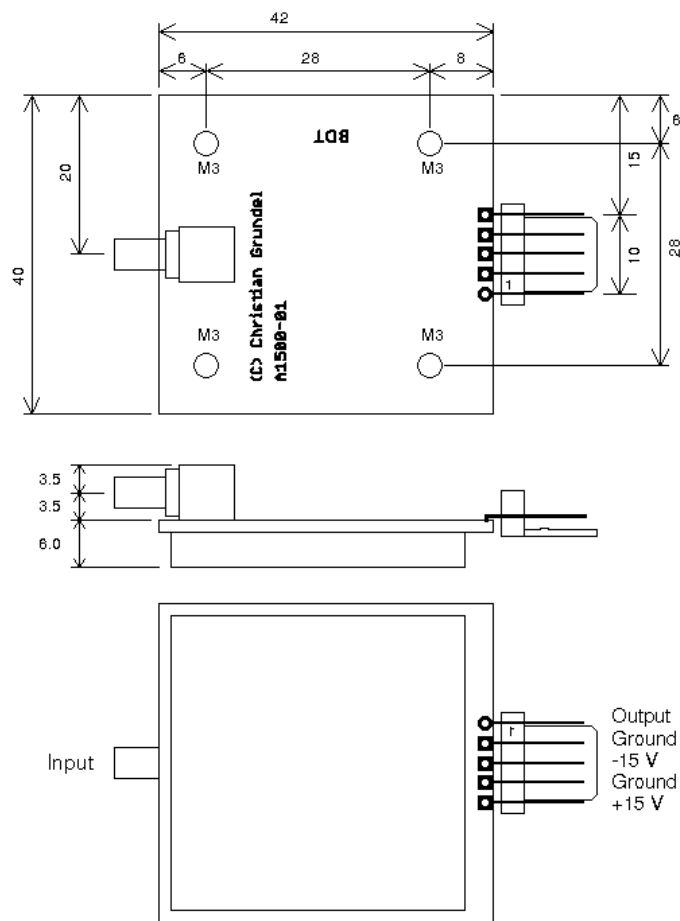
A1503-AN = Input with SMA Connector, Output and Supply with open Solder Pads

Connections	
Input	SMA or SMB Connector

Model A1503 Preliminary Datasheet

Connections	
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

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.

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