

Model 5183

Nanovolt Preamplifier

SIGNAL RECOVERY



FEATURES

- ◆ High input impedance
- ◆ Very low noise
- ◆ Pseudo-differential input
- ◆ Fixed $\times 1000$ gain
- ◆ 0.5 Hz to 1 MHz frequency response
- ◆ Battery or external DC power

APPLICATIONS

- ◆ Capacitor transducer amplification
- ◆ IR detector amplification
- ◆ Increasing oscilloscope sensitivity

DESCRIPTION

The model 5183 is a high input impedance, AC coupled voltage preamplifier which features a very low noise input stage. It has a frequency response from 0.5 Hz to 1 MHz and a fixed gain of $\times 1000$ (60 dB) and incorporates a special pseudo-differential input stage that can be floated to give the ground loop immunity normally associated with true differential inputs but without the associated noise penalty. It can be powered from its own internally housed (alkaline) batteries, an external low voltage supply (± 15 V or ± 18 V) or from the model PS0108 remote line power supply (optional extra). This preamplifier can also be powered from most of our range of lock-in amplifiers and from the model 7310 noise rejecting voltmeter.

The model 5183 is ideally suited for amplifying signals from high impedance cryogenic sources, capacitance transducers and IR detectors such as Ge, Si, PbS, PbSe and InGaAs.

Specifications

General

AC coupled voltage amplifier with fixed $\times 1000$ (60dB) voltage gain and a maximum frequency response extending from 0.5 Hz to 1 MHz. Pseudo-differential input and single-ended output via BNC connectors.

Battery powered from internal alkaline batteries or external DC power supplies.

Gain Accuracy $\pm 1\%$
Gain Stability ± 500 ppm/ $^{\circ}$ C

Output

Impedance 450 Ω
Max voltage swing > 10 V pk-pk
Slew rate > 22 V/ μ s
Polarity Non-inverting
Distortion $< 0.1\%$ T.H.D.

Inputs

Modes Asymmetrical differential. Front panel ground terminal provided.

Coupling AC
Impedance 100 M Ω // 20 pF
Frequency Response 0.5 Hz - 1 MHz
C.M.R.R. > 80 dB (100 Hz to 1 kHz)

Max differential input voltage 10 mV pk-pk

Max common-mode input voltage 300 mV pk-pk

Max signal low potential w.r.t. ground terminal ± 600 mV

Max input without damage ± 15 V DC or 10 V rms. AC @ 50 Hz

Noise See Figure 1 ;
typ 2 nV/ $\sqrt{\text{Hz}}$ @ 1 kHz

Gain $\times 1000$ (60 dB) fixed

Power

Internal Four 9 V alkaline batteries provide approximately 10 hours of use

External

a) ± 15 V or ± 18 V DC @ 30 mA

b) 110 V AC or 240 V AC via optional external model PS0108 power supply

Dimensions

(excluding connectors) 8.25" wide x 11" deep x 3.5" high
(210 mm wide x 279 mm deep x 89 mm high)

Weight 5.3 lbs. (2.4 kg) excluding power supply

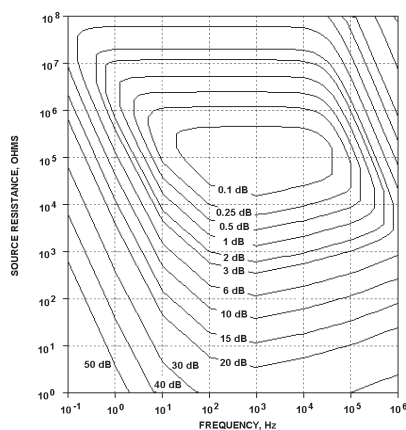


Figure 1, Model 5183 Noise Figure Contours (Typical)