Model 5184

Ultra Low Noise Preamplifier

SIGNAL RECOVERY

FEATURES

- **Medium input impedance**
- **Ultra low noise**
- **Pseudo-differential input**
- **Fixed ×1000 gain**
- **0.5 Hz to 1 MHz frequency response**
- **Battery or external DC power**

APPLICATIONS

- **Cryogenic detector amplification**
- **IR detector amplification**
- **Increasing oscilloscope sensitivity**

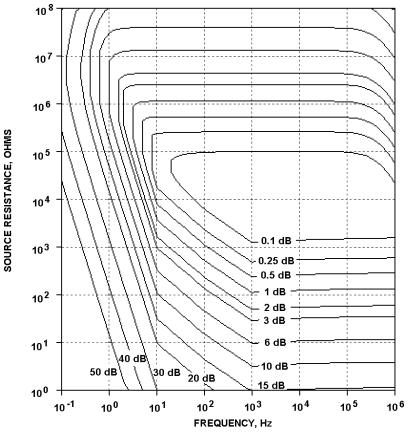

Figure 1, Model 5184 Noise Figure Contours (Typical)

DESCRIPTION

The model 5184 is a medium input impedance, AC-coupled, voltage preamplifier which features an ultra low-noise input stage. It has a frequency response from 0.5 Hz to 1 MHz and a fixed gain of x1000 (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.

The model 5184 is ideal for use with medium impedance cryogenic sources and IR detectors, such as HgCdTe, InSb and InAs.

Specifications

General

AC coupled voltage amplifier with fixed x1000 (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.

Inputs

Modes	Asymmetrical differential. Front panel ground terminal provided.
Coupling	AC
Impedance	5 MΩ //50 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 800 pV/√Hz @ 1 kHz
Gain	x1000 (60 dB) fixed
Gain Accuracy	±1%
Gain Stability	±800 ppm/° C

Output

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

Power

Internal	Four 9 V alkaline batteries provide approximately 8 hours of use
External	
a)	±15 V or ±18 V DC @ 40 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