



FREQUENCY EXTENDER

1.8 TO 18 GHz

Features

- Low Noise Amplification
- Broad Frequency Range
- Improves Noise Characterization Accuracy



Description

The Maury MT868C is a packaged, broad band, microwave amplifier followed by a double sideband mixer which provides low noise amplification of signals in the 1.8 to 18 GHz frequency range and down-conversion of these signals to a fixed intermediate frequency. This instrument is designed to provide a low noise second stage (with frequency conversion) for the Maury automated tuner system (ATS) [1] when used in a noise characterization application.

The MT868C is packaged in an enclosure which is mechanically compatible with the Maury ATS to simplify connection into the system while maintaining the primary characteristic, i.e.: low

noise performance. A low second stage noise figure is critical to the accuracy of a device noise characterization system [2]. The MT868C permits direct connection to the output bias network of the Maury system with no intervening cables or adapters to degrade the noise performance of the noise measurement sub-system (see Figure 1).

The MT868C requires only 0 dBm external local oscillator power which allows the use of typical laboratory signal sources for this application. It is fully self-contained featuring integral power supplies and fused, filtered input line connectors and, therefore, can be used as a general purpose laboratory instrument.

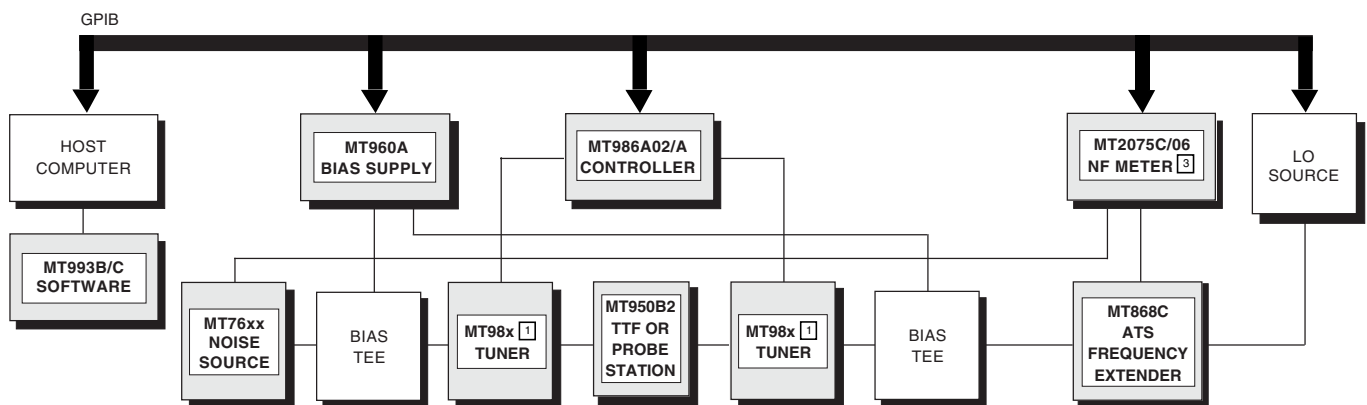


Figure 1. Typical Noise Characterization Block Diagram



Application

The primary application for the MT868C is as the input stage of a noise measurement sub-system used as part of a noise characterization system to determine the noise and gain parameters, and, subsequently, contours of constant noise figure and gain of a semiconductor device.

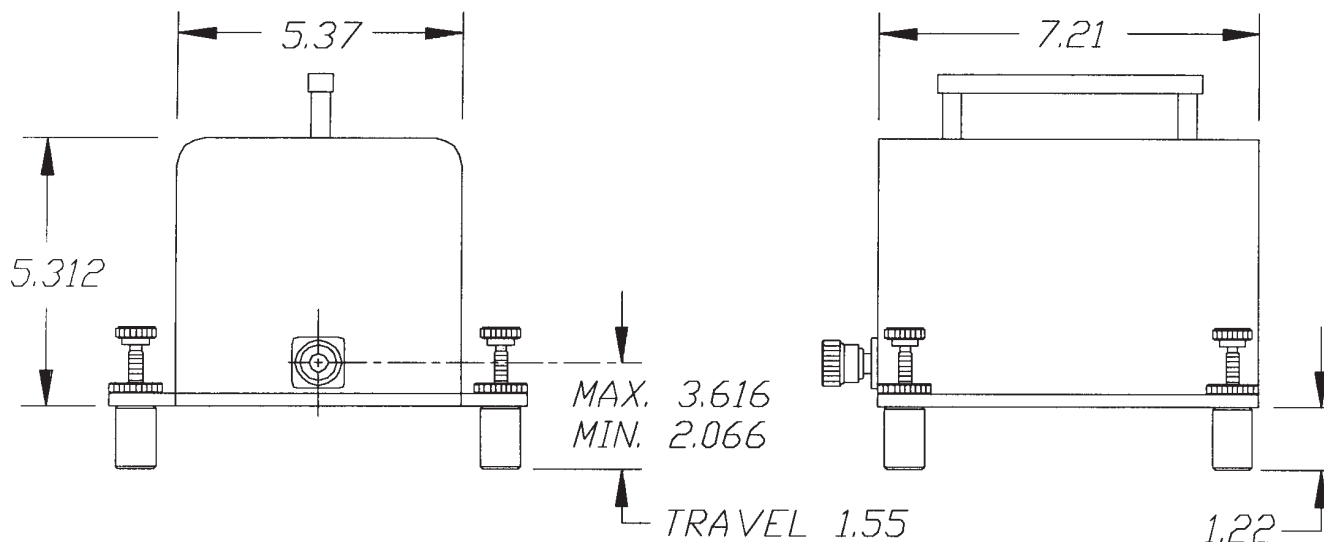
The MT868C provides an accurate low cost alternative to expensive, preselected test sets such as the HP 8971B/C. The major improvement is the elimination of the preselector - LO tracking error inherent in such instruments. This error is random and is generally manifested as a degradation of repeatability. Typically, a tracking preselector test set will degrade noise figure and gain instrumentation uncertainties to ± 0.25 and ± 0.45 dB, respectively.

By contrast, the MT868C not only reduces the second stage error contribution through reduced noise figure, but also eliminates the tracking error thus retaining the basic instrumentation uncertainty of the noise figure meter: typically, ± 0.05 dB for noise figure and ± 0.15 dB for gain (Maury MT2075C/06 noise gain analyzer).

Specifications

Model	MT868C
Frequency Range	1.8 to 18 GHz
Noise Figure – typical	4.0 dB
– maximum	5.0 dB
Conversion Gain – typical	14 dB
– minimum	9 dB
Gain Flatness	± 2.5 dB
Input VSWR	2.5 (maximum)
Input Power for 1 dB Compression	-25 dBm (typical)
Maximum Input Power	-10 dBm
LO Input Power	0 dBm
IF Output Frequency – specified	30 MHz
– useable	10 to 500 MHz
LO Input Connector	SMA (female)
RF Input Connector	7mm
IF Output Connector	SMA (female)
AC Input	100, 120, 220, 230, 240 VAC +10% 75 VA, 47-440 Hz
Size	See <i>Dimensions</i>
Weight – net	6 lbs. (2.7 kg.)
– shipped	7 lbs. (3.2 kg.)

Dimensions



1 See data sheets 4T-050B, 4T-054 and 4T-057 for system and software details.

2 Simpson, G. R. and Pastori, W. E., "Using a Load Tuner To Improve The Accuracy of Noise Characterization", 33rd ARFTG Conference, Long Beach, CA, June, 1989.

3 System is also compatible with the HP8970B.