

DC-coupled Low Noise Amplifier

1 Introduction

The TBLNA-110M-50 is a DC-coupled amplifier with a gain of 40 dB in the frequency range DC–110 MHz.

Application:

External pre-amplifier for measurement receiver TBMR-110M

Pre-amplifier for amplifying low level input signals to spectrum analyzers

General-purpose LNA for low and very low frequency applications, where conventional LNAs sometimes suffer from an increase in noise figure.



2 Specification

General specification

Frequency range:	DC – 110 MHz
Gain:	40 dB, typ. ($\cong$ linear voltage gain 100)
RF-connectors:	BNC-female

Input specification

Input impedance:	50 Ω
Input return loss:	> 16 dB, typ.
Input Noise Voltage:	< 1.5 nV/ $\sqrt{\text{Hz}}$; 500 Hz – 60 MHz: typ. 1 nV/ $\sqrt{\text{Hz}}$
Maximum input level:	-25 dBm ($\cong$ 0.036 V _{pp}); for output saturation
Input protection:	Pin-diode limiter
Maximum ratings:	+30 dBm in a 50 Ohm system / $\pm$ 0.7V DC max. input rating ($\pm$ 1.5V DC, 1s)

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Output specification

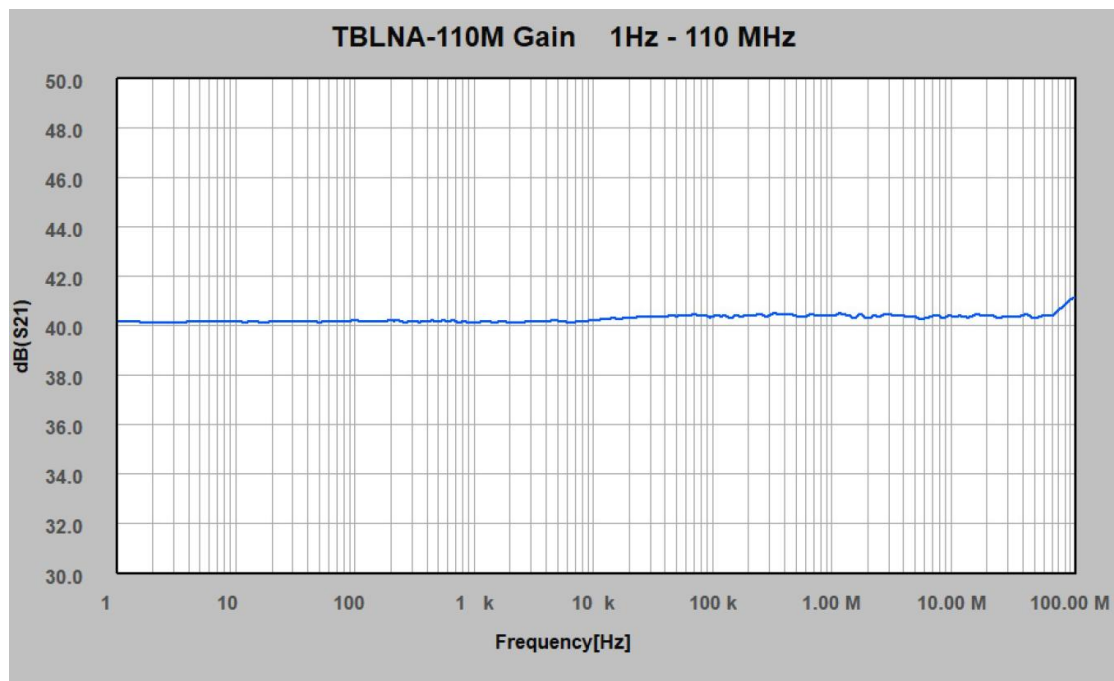
Output impedance:	50 Ω
Output return loss:	> 30 dB, typ.
P1dB _{out} :	+15 dBm ($\cong 3.5$ V _{pp}); output saturation
IP3 _{out} :	+28 dBm
DC offset:	< 10mV at output; input terminated with 50 Ohm

Supply specification

Power-connector:	Coaxial power socket; 2 mm / 5.5 mm; positive center conductor
Indicator LEDs:	Power ON, Power Good
Operating voltage:	12 V; external power supply 100 V – 240 V, 50/60 Hz
Current consumption:	250 mA
Operating temperature range:	-20°C to +50°C
Dimensions:	W 135 mm x H 40 mm x L 110 mm;
Weight:	330 g

3 Measurement Plots

3.1 Gain



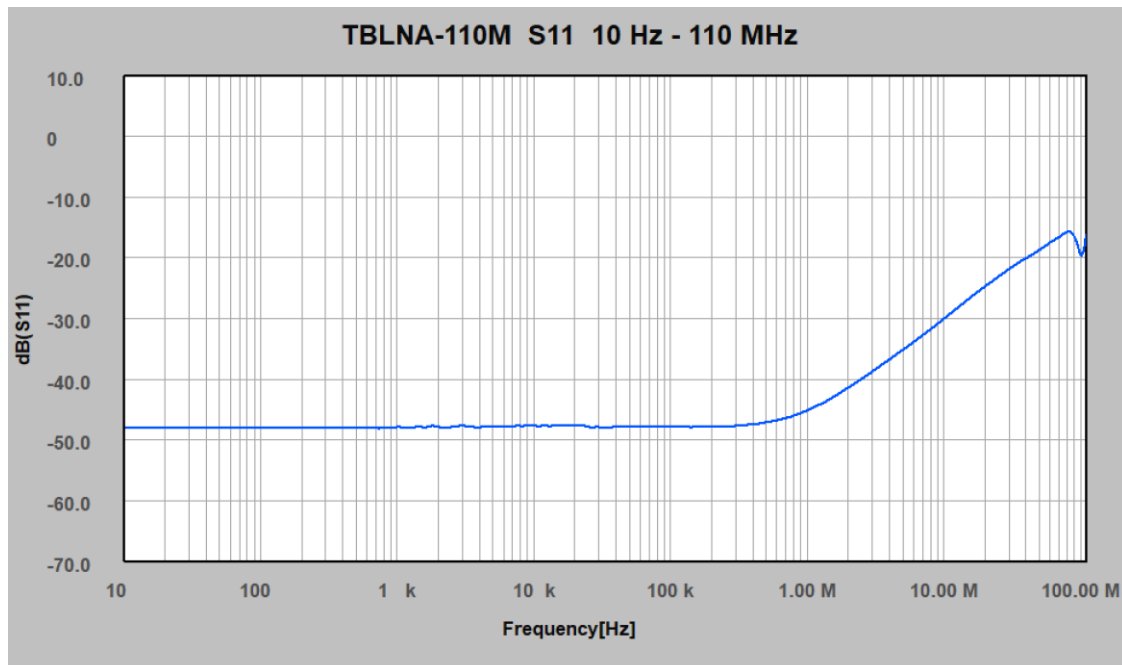
TBLNA-110M-50, Gain, DC – 110 MHz, typ.

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Frequency [MHz]	Gain [dB]	Frequency [MHz]	Gain [dB]
DC	40,12	50	40,28
0.000001	40,12	60	40,38
0.00001	40,12	70	40,37
0.0001	40,19	75	40,50
0.001	40,12	80	40,62
0.01	40,17	85	40,70
0.1	40,34	90	40,80
1	40,37	95	40,92
10	40,36	100	41,03
20	40,36	105	41,08
30	40,35	110	41,07
40	40,38		

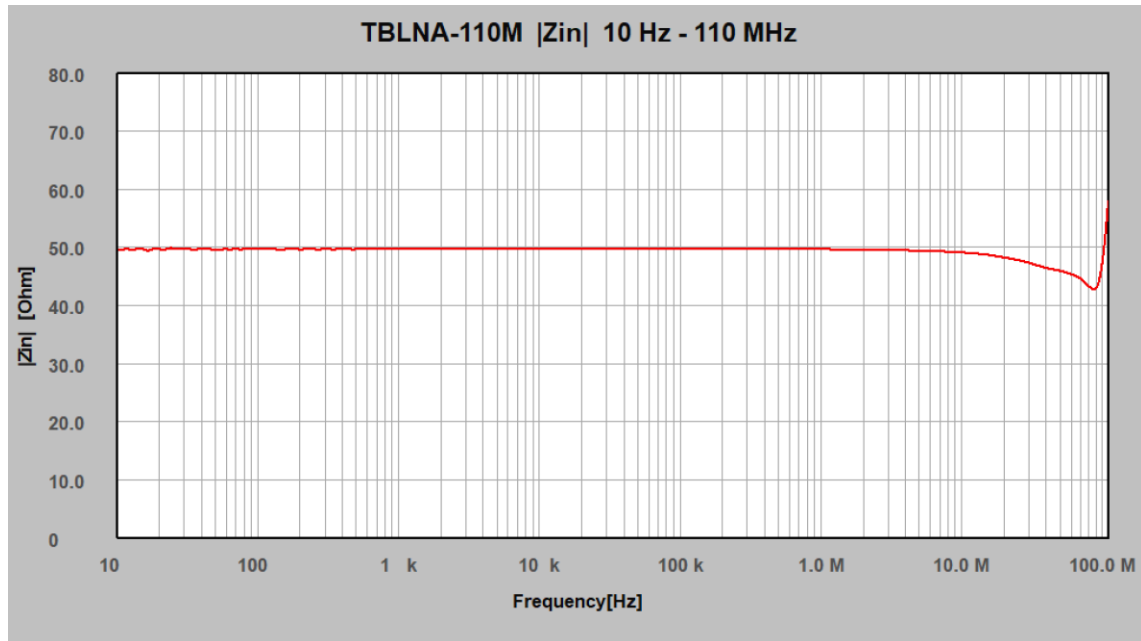
TBLNA-110M-50, Gain Table, DC – 110 MHz, typ.

3.2 Input return loss and impedance



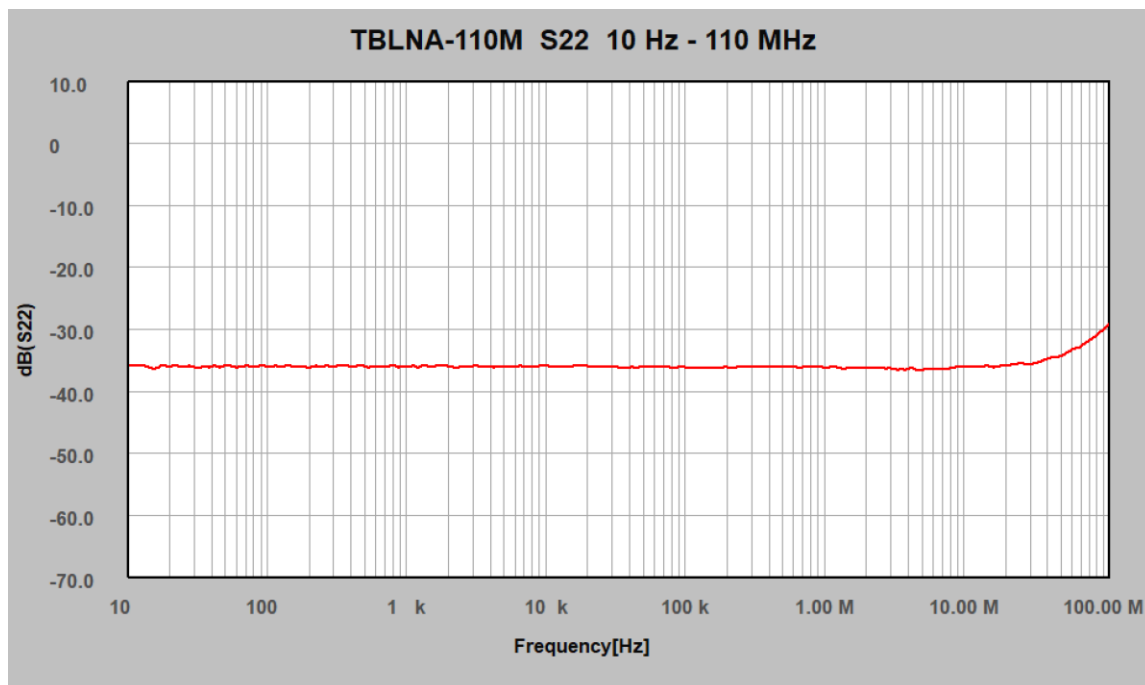
TBLNA-110M-50, S11, 10Hz – 110 MHz, typ.

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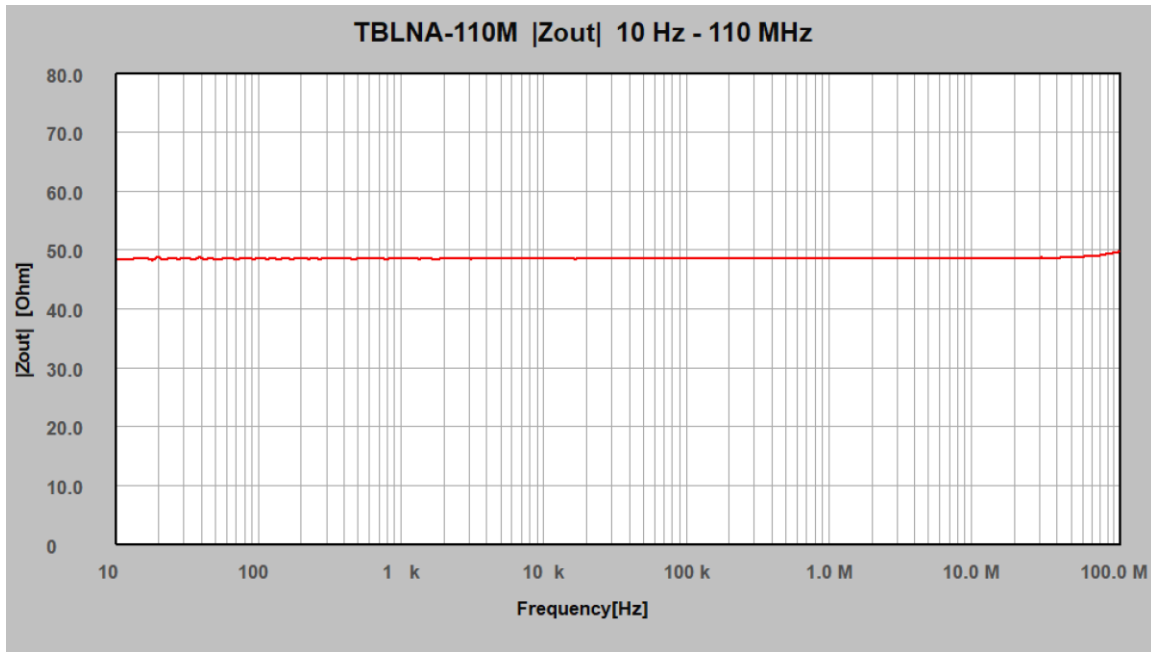
TBLNA-110M-50, Input Impedance, 10Hz – 110 MHz, typ.

3.3 Output return loss and impedance



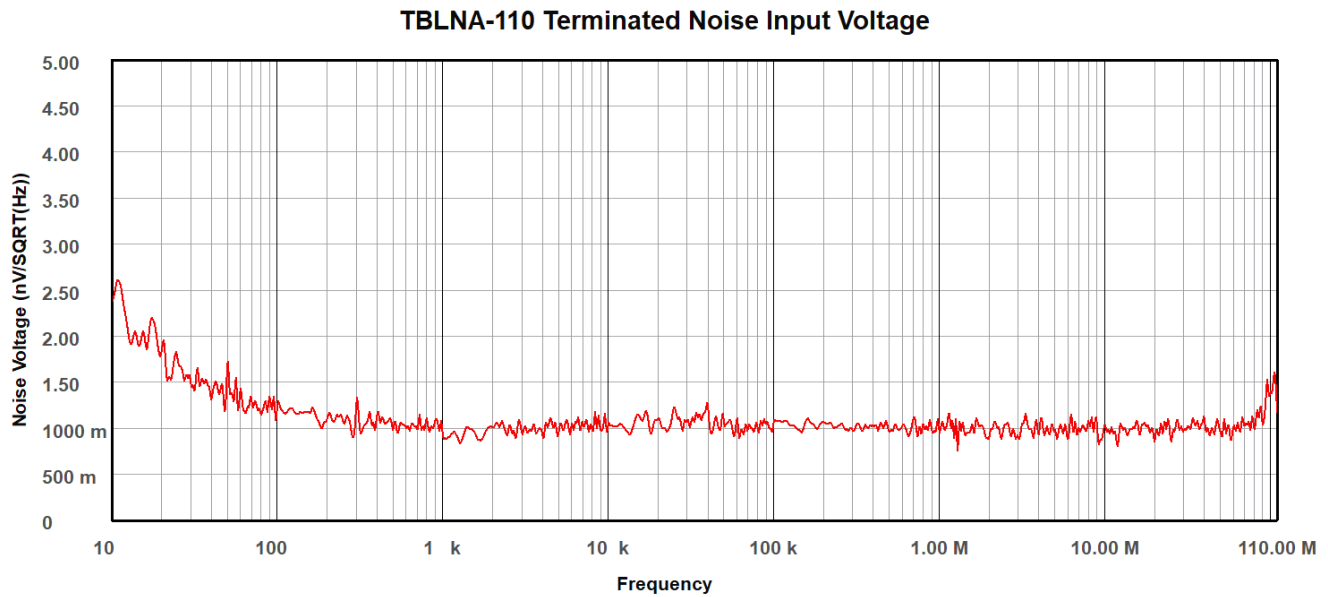
TBLNA-110M-50, S₂₂, 10Hz – 110 MHz, typ.

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TBLNA-110M-50, Output Impedance, 10Hz – 110 MHz, typ.

3.4 Noise Spectral Density



TBLNA-110M-50, Input referred noise density versus frequency, 10Hz – 110 MHz, typ.

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4 Ordering Information

Part Number	Description
TBVNA-110M-50	DC-coupled LNA, 110V-240V power supply

5 History

Version	Date	Author	Changes
V1.0	23.12.2024	Mayerhofer	Creation of the document