

Anritsu Wideband Preamplifier MA8610A

Matthias, DD1US, August 9th 2022

Recently I acquired a wide band amplifier from Anritsu. The part number is MA8610A.

I found it difficult to find a description or detailed specifications on this amplifier in the internet. What I found out that it was part of the MA8611A EMI probe kit. I am not sure it was also sold stand alone. The preamplifier features a female N-connector at its input and a male N-connector at its output as it was meant to be mounted directly on the input socket of the spectrum analyzer.

The bits and pieces of specification I found are:

Frequency range	9 kHz ... 2.2 GHz
Impedance	50 Ohm
Gain	20 dB
Frequency response	±0.5 dB (20 kHz ... 1 GHz)
Noise figure	6 dB (≤1 GHz)
Absolute max. RF input power	+10dBm
Absolute max. DC input voltage	±50 V DC

The amplifier had a special DC connector which I could not find. Also, the supply voltage was not stated anywhere. I assume that the preamplifier could be supplied with DC directly from some of the Anritsu spectrum analyzers.

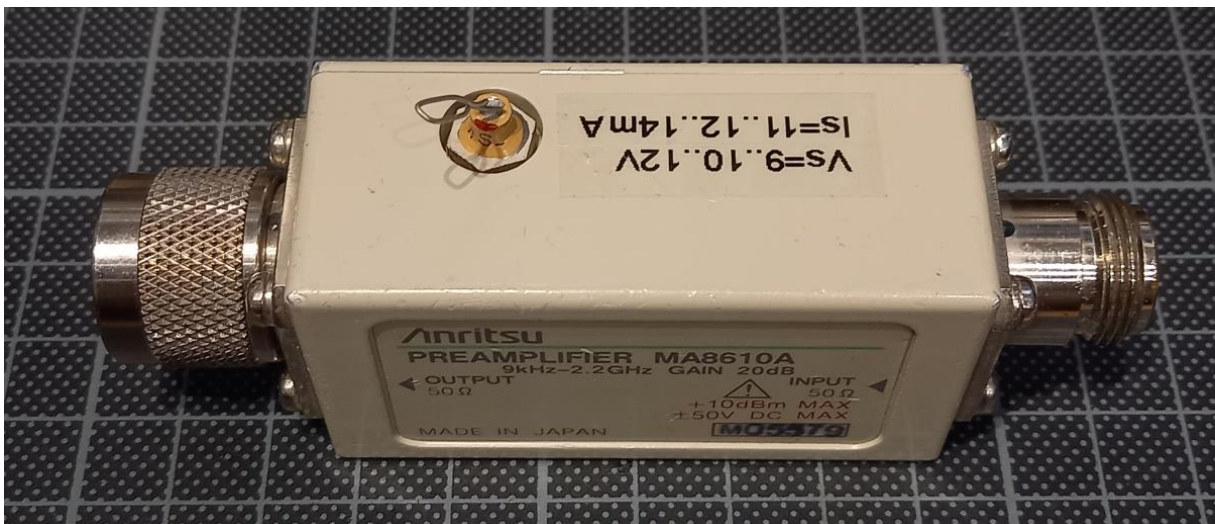
My preamplifier has the serial number M05579.

Thus, I decided to replace the special connector by a 1nF DC feedthrough capacitor and find out the supply voltage myself.

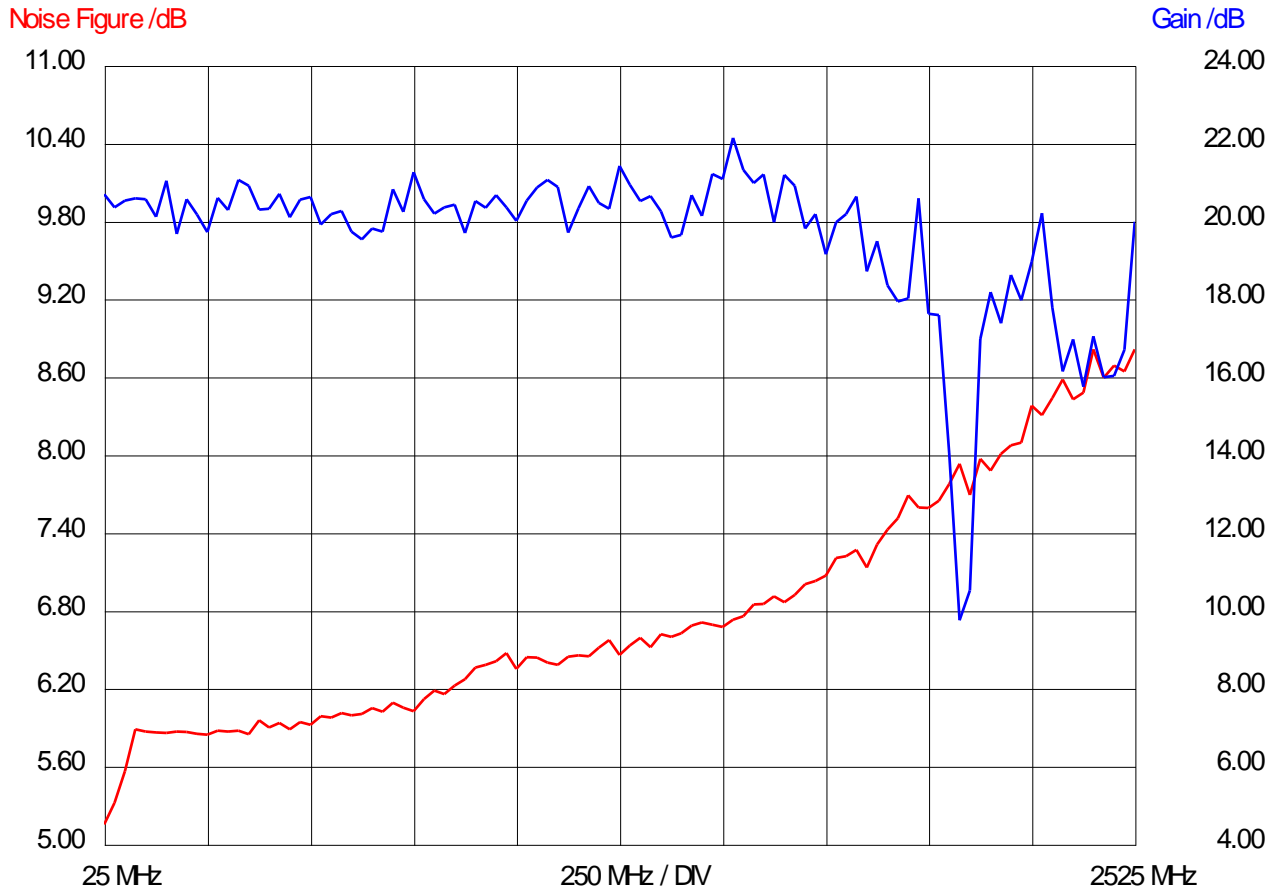
Measuring current consumption, gain and noise figure versus supply voltage I decided that a supply voltage range from 9 V to 12 V was best.

Supply voltage /V	Supply current /mA	Gain @ 1 GHz /dB	Noise figure @ 1 GHz /dB
5	6	12.36	7.76
7	9	18.64	6.51
9	11	20.42	6.34
10	12	20.35	6.47
12	14	20.50	6.33

Here are some pictures of my device (after the modification of the DC plug):



Next please find the measured gain (blue) and noise figure (red) of the device in the range from 25 MHz up to 2525 MHz at a supply voltage of 10 V. The current consumption was 12 mA.



Below please find a table with the corresponding measurement values:

Frequency	Gain/dB	NF/dB	Frequency	Gain/dB	NF/dB
25 MHz	20.69	5.15	450 MHz	20.70	5.93
50 MHz	20.36	5.32	475 MHz	20.10	5.89
75 MHz	20.53	5.56	500 MHz	20.55	5.94
100 MHz	20.59	5.89	525 MHz	20.61	5.92
125 MHz	20.56	5.87	550 MHz	19.92	5.99
150 MHz	20.11	5.86	575 MHz	20.18	5.97
175 MHz	21.03	5.86	600 MHz	20.26	6.01
200 MHz	19.67	5.87	625 MHz	19.73	5.99
225 MHz	20.56	5.87	650 MHz	19.53	6.00
250 MHz	20.17	5.85	675 MHz	19.81	6.05
275 MHz	19.72	5.84	700 MHz	19.73	6.02
300 MHz	20.60	5.88	725 MHz	20.82	6.09
325 MHz	20.29	5.87	750 MHz	20.24	6.05
350 MHz	21.07	5.88	775 MHz	21.26	6.02
375 MHz	20.91	5.85	800 MHz	20.56	6.12
400 MHz	20.30	5.96	825 MHz	20.20	6.19
425 MHz	20.32	5.90	850 MHz	20.36	6.16

Frequency	Gain /dB	NF /dB	Frequency	Gain /dB	NF /dB
875 MHz	20.42	6.22	1725 MHz	19.81	7.00
900 MHz	19.70	6.27	1750 MHz	20.18	7.03
925 MHz	20.52	6.36	1775 MHz	19.15	7.07
950 MHz	20.34	6.38	1800 MHz	19.97	7.21
975 MHz	20.67	6.41	1825 MHz	20.18	7.22
1000 MHz	20.35	6.47	1850 MHz	20.63	7.27
1025 MHz	20.01	6.35	1875 MHz	18.71	7.13
1050 MHz	20.53	6.44	1900 MHz	19.49	7.31
1075 MHz	20.87	6.44	1925 MHz	18.35	7.42
1100 MHz	21.06	6.40	1950 MHz	17.94	7.51
1125 MHz	20.87	6.38	1975 MHz	18.02	7.69
1150 MHz	19.70	6.44	2000 MHz	20.59	7.59
1175 MHz	20.33	6.45	2025 MHz	17.63	7.59
1200 MHz	20.90	6.45	2050 MHz	17.59	7.64
1225 MHz	20.47	6.51	2075 MHz	14.04	7.78
1250 MHz	20.32	6.57	2100 MHz	9.76	7.93
1275 MHz	21.42	6.46	2125 MHz	10.51	7.69
1300 MHz	20.93	6.53	2150 MHz	16.97	7.97
1325 MHz	20.52	6.59	2175 MHz	18.18	7.88
1350 MHz	20.64	6.52	2200 MHz	17.38	8.01
1375 MHz	20.25	6.62	2225 MHz	18.62	8.07
1400 MHz	19.58	6.60	2250 MHz	17.97	8.10
1425 MHz	19.65	6.63	2275 MHz	18.95	8.38
1450 MHz	20.67	6.68	2300 MHz	20.20	8.31
1475 MHz	20.13	6.71	2325 MHz	17.77	8.44
1500 MHz	21.21	6.69	2350 MHz	16.14	8.58
1525 MHz	21.08	6.68	2375 MHz	16.96	8.43
1550 MHz	22.13	6.73	2400 MHz	15.75	8.48
1575 MHz	21.31	6.76	2425 MHz	17.04	8.81
1600 MHz	20.97	6.85	2450 MHz	15.99	8.59
1625 MHz	21.20	6.85	2475 MHz	16.03	8.69
1650 MHz	19.97	6.91	2500 MHz	16.70	8.64
1675 MHz	21.19	6.86	2525 MHz	19.99	8.81
1700 MHz	20.91	6.92			

I am not sure about the origin of the dip in gain at 2100 MHz. My recommendation is to use the preamplifier in the frequency range 9 kHz to 1.8 GHz where the gain is quite flat and the noise figure is below 7.2 dB.

I am always grateful to get feedback and will be happy to answer questions.

Please direct them to the Email address which you will find below.

Best regards

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