Wideband Amplifier MITEQ AFS3-08500960-15-10P-TC-4

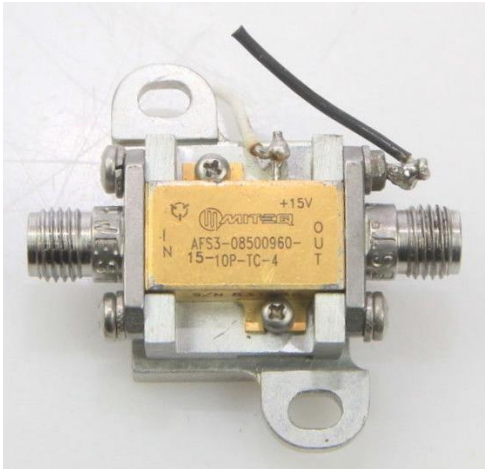
Matthias, DD1US, August 27th 2018

As I am planning to get ready to receive X-Band signal for instance from deep space probes I bought a surplus amplifier from MITEQ. The part number is AFS3-08500960-15-10P-TC-4.

I found the following data in the internet:

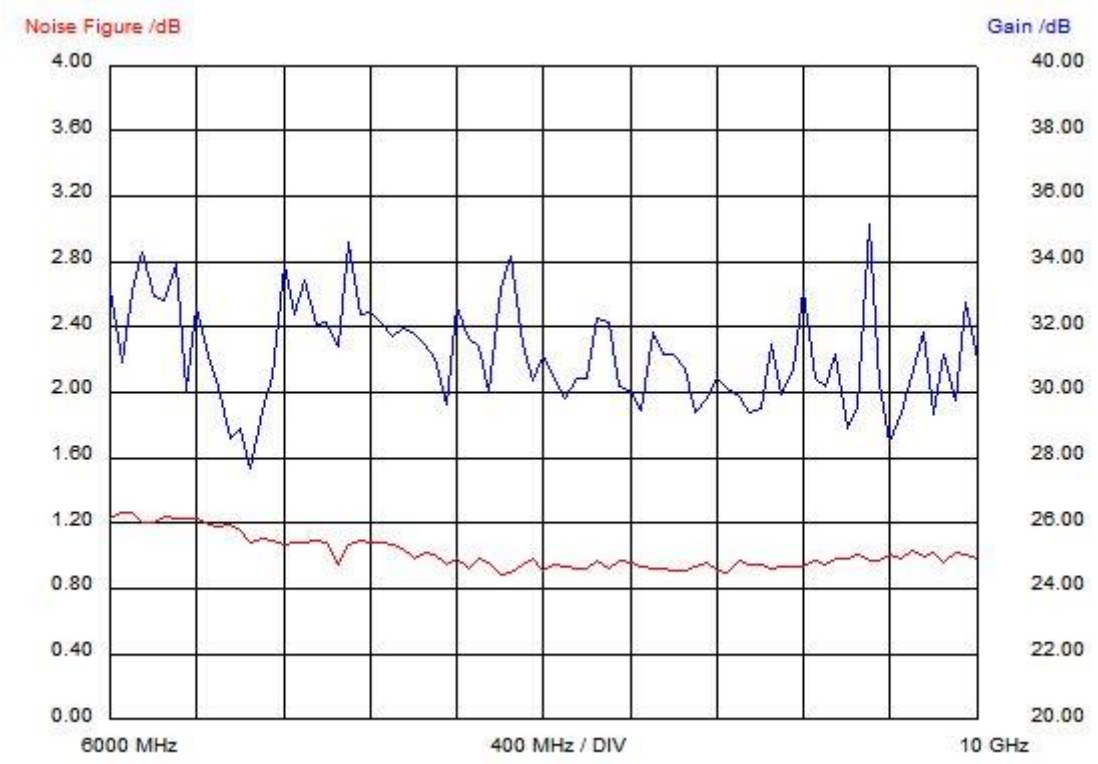
Specifications at 23 °C:
Frequency: 8.5 to 9.6 GHz
Gain: 26 dB min.
Gain Flatness: 0.75 dB+/- max.
Noise Figure: 1.5 dB max.
Noise Temperature: 119.6 K max.
VSWR In: 1.5:1 max.
VSWR Out: 1.5:1 max.
P1dB Out: 10 dBm min.
Output IP3 Typ.: 20 dBm
Voltage: 15 V nom.
Current: 80 mA nom.
Operating Temp: -54 to 85 °C

Here are some pictures of such a device device:

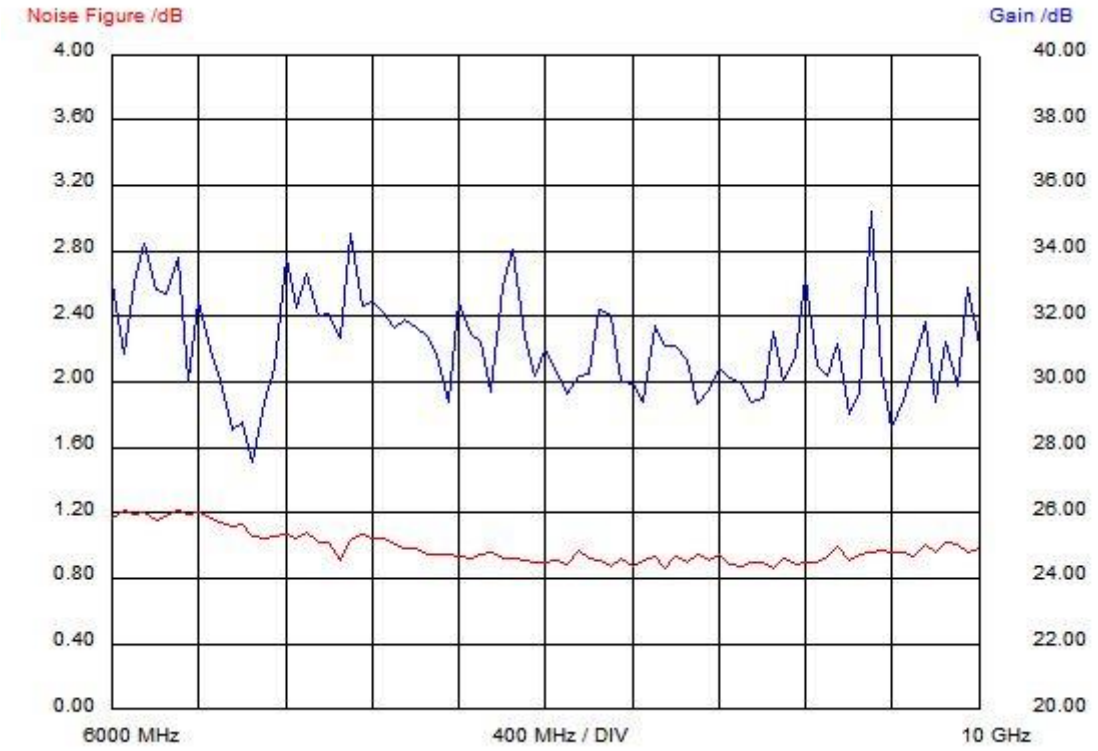


I have not yet mounted the amplifier on a heatsink but will do so as I measured a current consumption of 100mA at a supply voltage of 15V. Also, at 12V the supply current is almost 100mA. As the amplifier dissipates quite some heat it is certainly better to keep it cool using a heatsink as low noise figure and high temperature do not get along well.

First, I measured the gain and the noise figure between 6 GHz and 10 GHz using a supply voltage of 15V.



Then I checked the same data at a supply voltage of 12V.



As can be seen both diagrams are virtually identical. The gain is about 32dB in this wide frequency range. The noise figure is 1.2dB at the lower end and about 0.9dB in the center. Thus, the device has higher gain and lower noise figure than the specified values.

Finally, here is a table of the measurement values from 7.7 GHz to 9.35 GHz (Vs=15V).

Frequency	Gain /dB	NF /dB
7700 MHz	31.23	0.95
7750 MHz	29.73	0.96
7800 MHz	32.92	0.92
7850 MHz	34.05	0.93
7900 MHz	31.32	0.91
7950 MHz	30.19	0.89
8000 MHz	30.96	0.90
8050 MHz	30.27	0.91
8100 MHz	29.63	0.88
8150 MHz	30.18	0.97
8200 MHz	30.25	0.92
8250 MHz	32.18	0.91
8300 MHz	32.03	0.87
8350 MHz	30.02	0.92
8400 MHz	29.96	0.87
8450 MHz	29.37	0.91
8500 MHz	31.72	0.94
8550 MHz	31.08	0.86
8600 MHz	31.09	0.93
8650 MHz	30.69	0.90
8700 MHz	29.34	0.95
8750 MHz	29.78	0.90
8800 MHz	30.41	0.95
8850 MHz	30.09	0.88
8900 MHz	29.94	0.87
8950 MHz	29.36	0.89
9000 MHz	29.54	0.89
9050 MHz	31.54	0.86
9100 MHz	29.98	0.92
9150 MHz	30.80	0.88
9200 MHz	33.17	0.90
9250 MHz	30.51	0.90
9300 MHz	30.18	0.94
9350 MHz	31.16	1.00

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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