

Analysis of the 10 MHz Inserter Extractor from Global Professional

Rev 1.0
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Hello,

In my setup for transmitting and receiving the geostationary EsHail-2 satellite I also plan to experiment with a modification of the Octagon LNB with injecting the reference signal for the PLL via the coaxial cable.

In order to do this, I need a diplexer to insert the 10 MHz reference signal from the receiver side into the coaxial cable and extract it at the LNB side. This must be separated from the DC supply to the LNB and the received IF signal coming from the LNB to the receiver. Also, the 10 MHz should not reach the receiver with a strong level in order to avoid interferences.

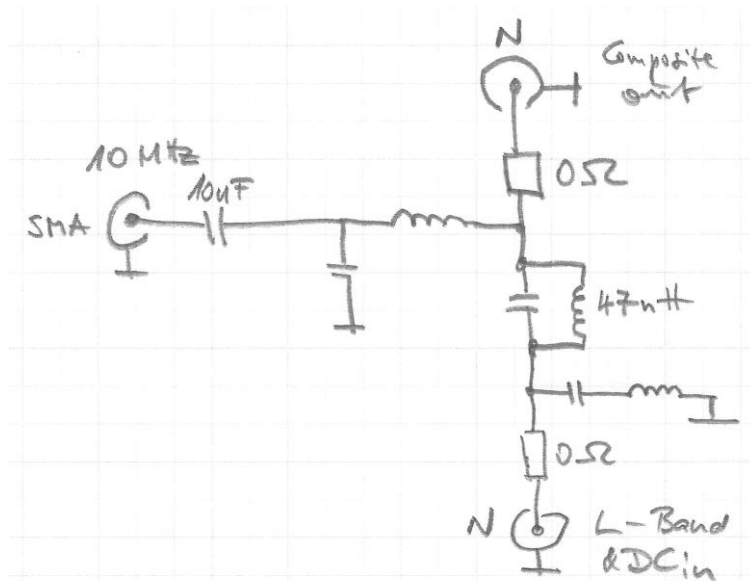
I found an inexpensive surplus device on Ebay and decided to give it a try.

The unit is from Global Professional, the part number is F800486PRO. It features a “10 MHz in” port which can be used to insert or extract a 10 MHz signal to/from the “composite out” port. The third port “L band & DC in” receives the IF signal from the composite port and supplies DC to it. In my application the “Composite out” port will be connected to the LNB and the “L band & DC in” to the receiver.

Here is a picture of the device:

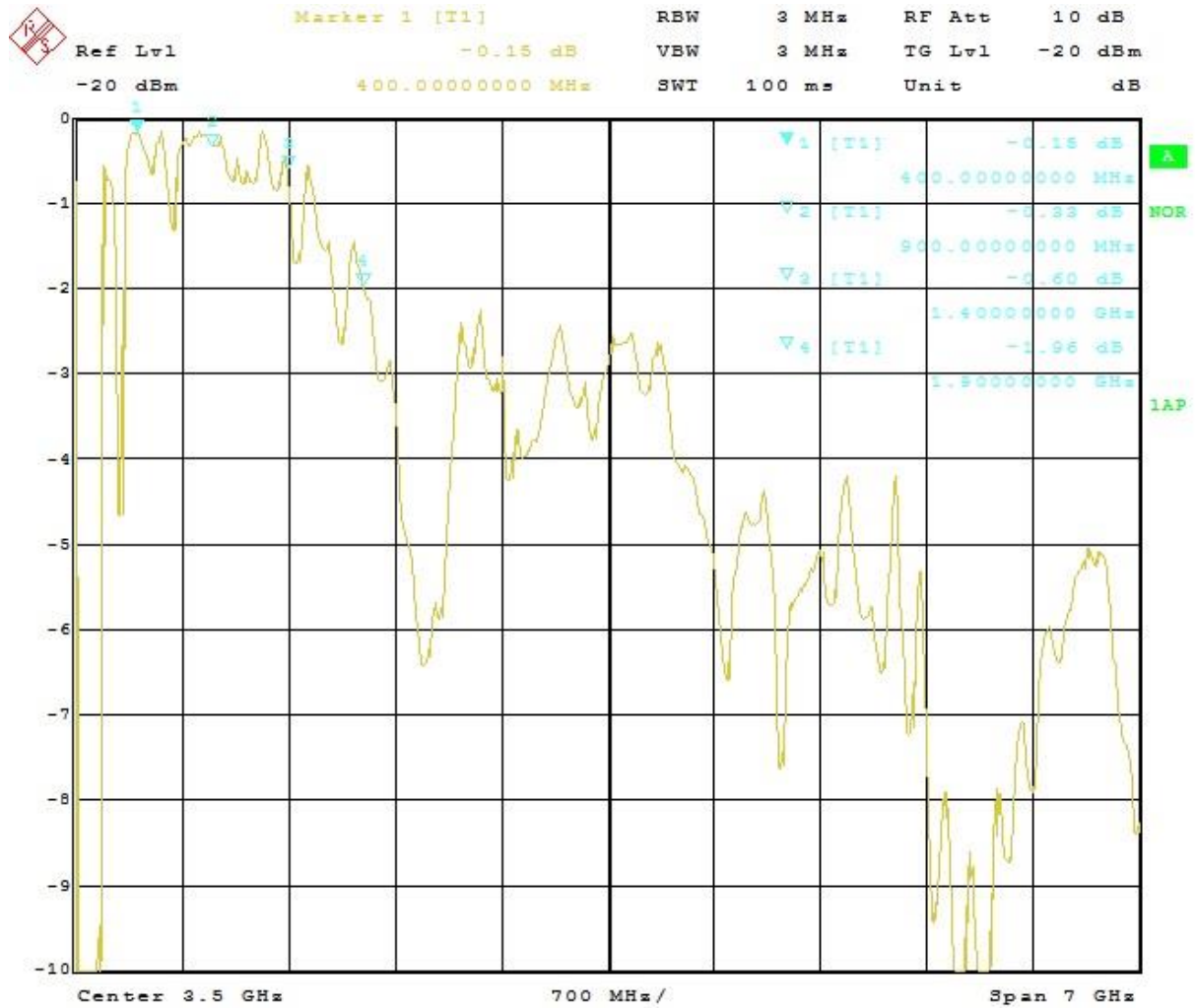


Inside the unit is the following network of lumped elements:



When I have time, I will extract the missing values of the components.

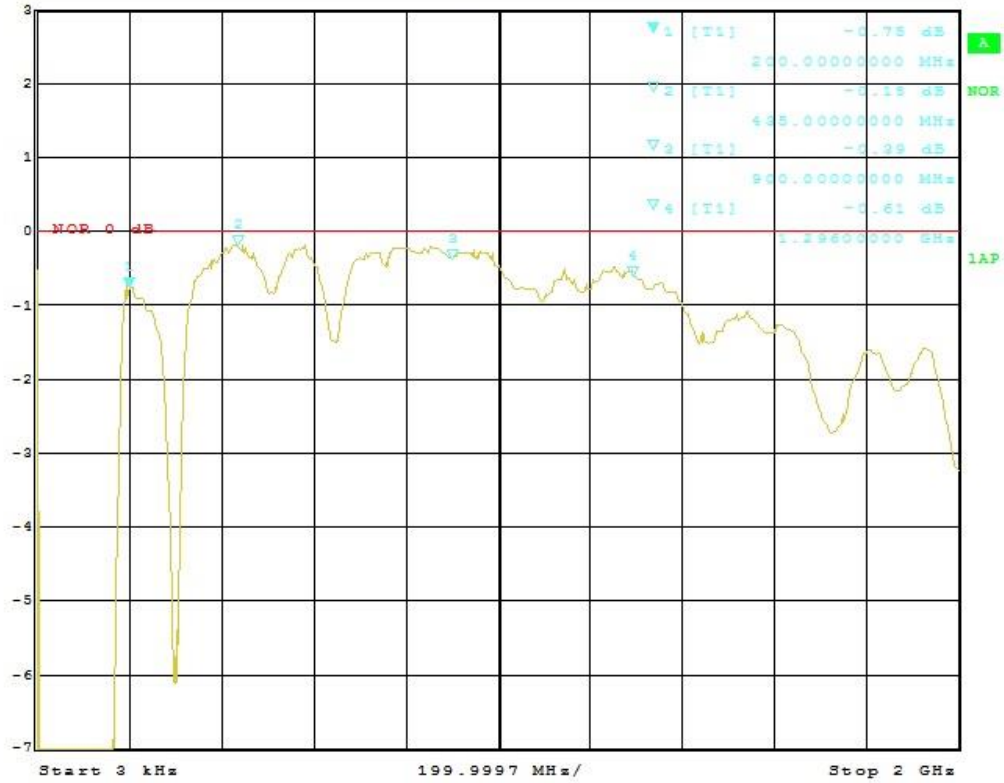
Next, I measured the transfer characteristic between the ports “L-Band & DCin” and “Composite out”:



Date: 1.JAN.2019 23:25:29



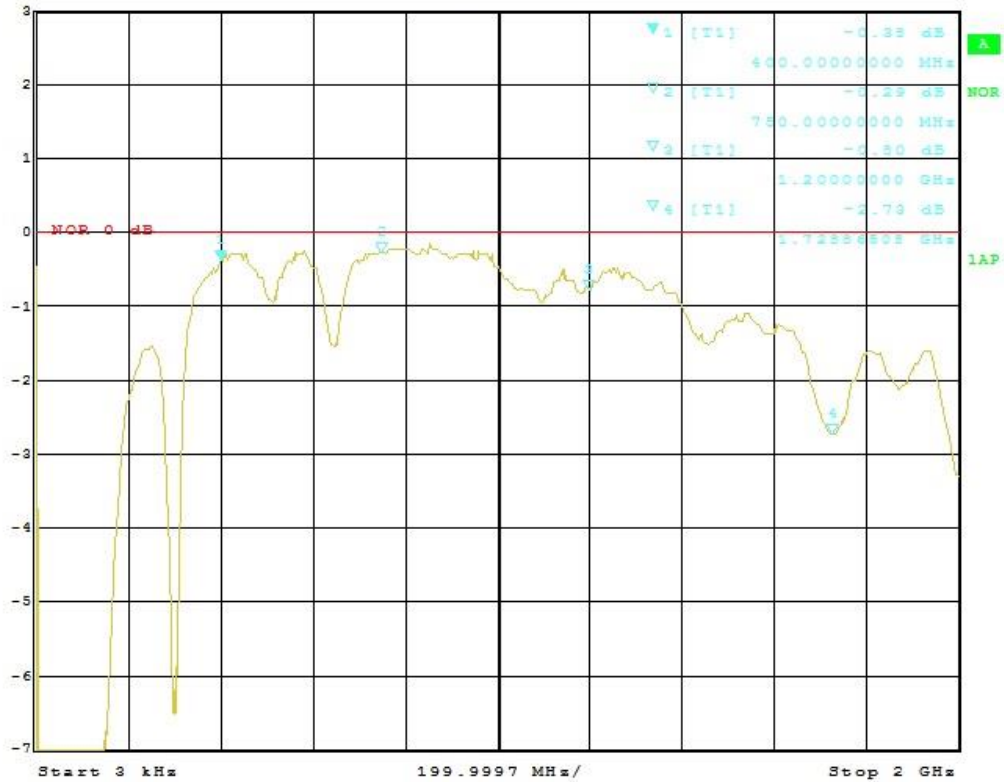
Marker 1 [T1] RBW 3 MHz RF Att 10 dB
 Ref Lvl -0.75 dB VBW 3 MHz TG Lvl -20 dBm
 -20 dBm 200.00000000 MHz SWT 100 ms Unit dB



Date: 2.JAN.2019 00:38:54



Marker 1 [T1] RBW 3 MHz RF Att 10 dB
 Ref Lvl -0.98 dB VBW 3 MHz TG Lvl -20 dBm
 -20 dBm 400.00000000 MHz SWT 100 ms Unit dB



Date: 2.JAN.2019 00:41:11

Low frequency signals such as the 10 MHz signal are suppressed as to be expected. The insertion loss in the IF frequency range between 400 MHz and 1.9 GHz is between 0.15 and 2dB. This should be fine for my application as the gain of my LNB is high and the additional insertion loss due to the diplexer of max. 2dB is no problem.

Next, I measured the transfer characteristic between the ports “10 MHz in” and “Composite out”:



The insertion loss at 10 MHz is 0.2dB and even at 145 MHz is still below 2dB. The attenuation at 500 MHz is almost 20dB.

If anyone has more information about this device please let me know.

I always appreciate feedback. Please send it to the Email address below.

Best regards

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