

Description of the Diplexer Elettronica P/N M00090-01-06

January 26th 2018, Matthias Bopp, DD1US

Recently I bought second hand two unknown filters / diplexers. As I did not find any information on the filters in the internet I analyzed them myself and provide below my findings for other possibly interested people.

It turned out that the devices are diplex-filters. The part number is P/N M00090-01-06 and they were produced by a company in Roma/Italy called Elettronica S.p.A. Roma. There is an additional designator on the diplexers which is NSN5985-15-008-3869.

Here are two pictures of the diplexer:

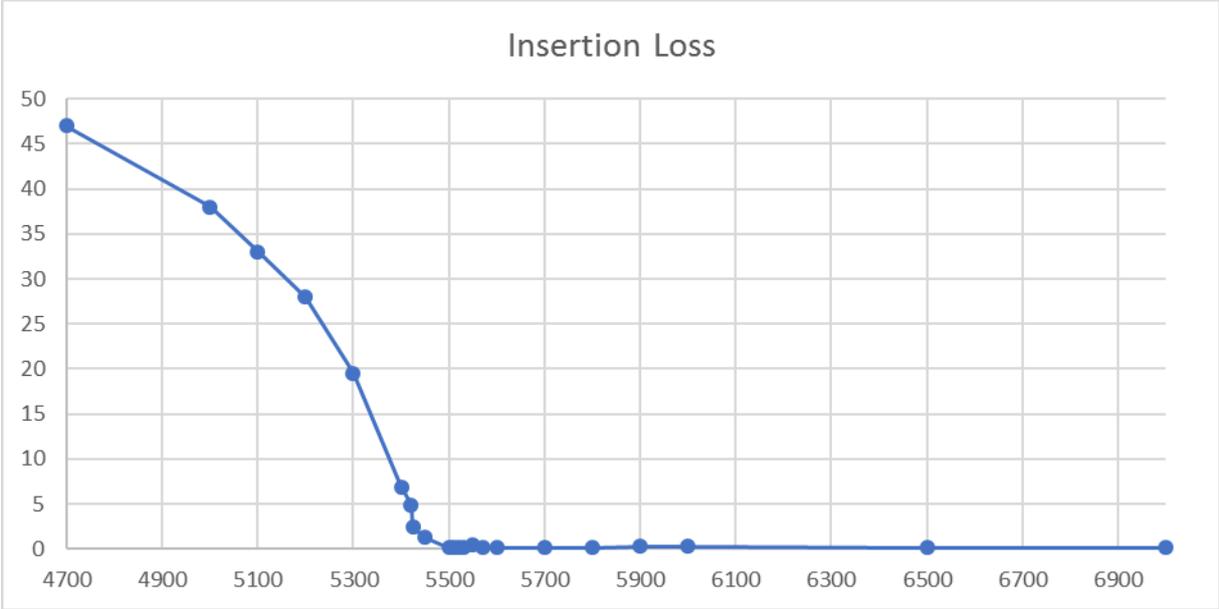


The diplexer has 3 ports with the names „1 S-C-X“, „2 C“ and „3 S-X“. The connectors used are all N-type.

Next I made some measurements of the S21 transfer characteristic of the diplexer. First I used the port “1 S-C-X” as input port and the port “2 C” as the output port. The 3d port “3 S-X” was terminated with a 50 Ohms.

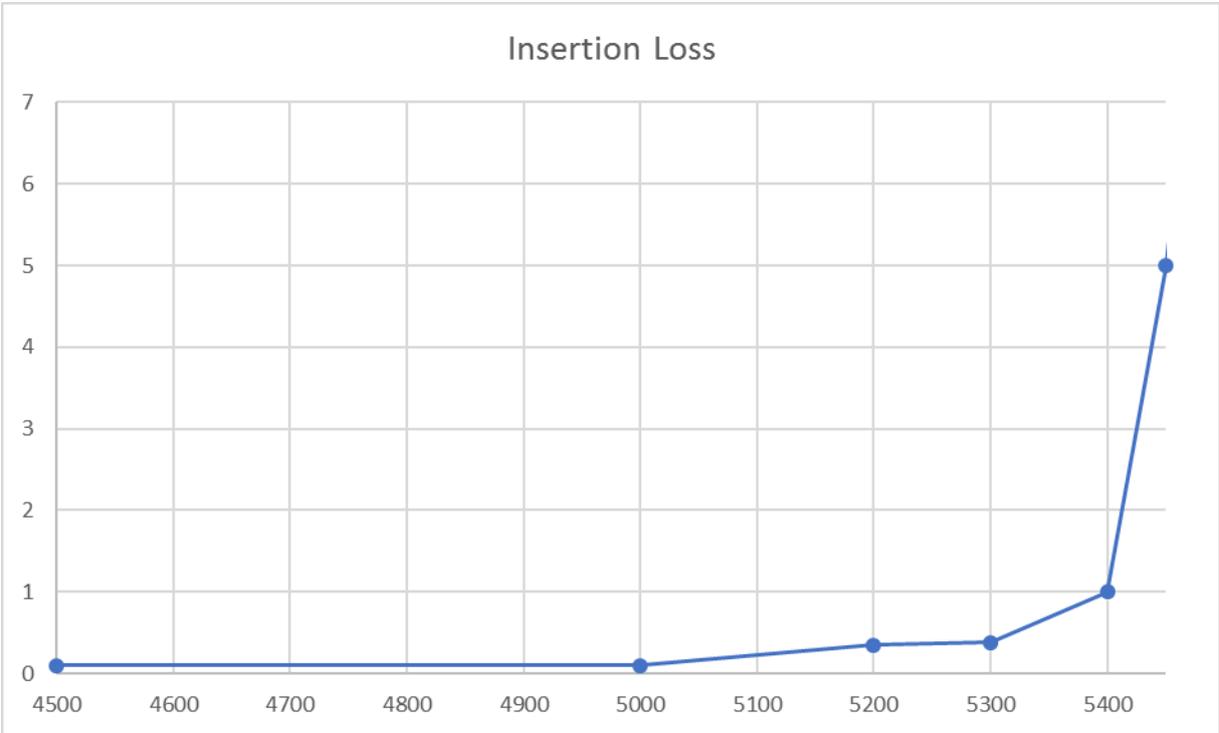
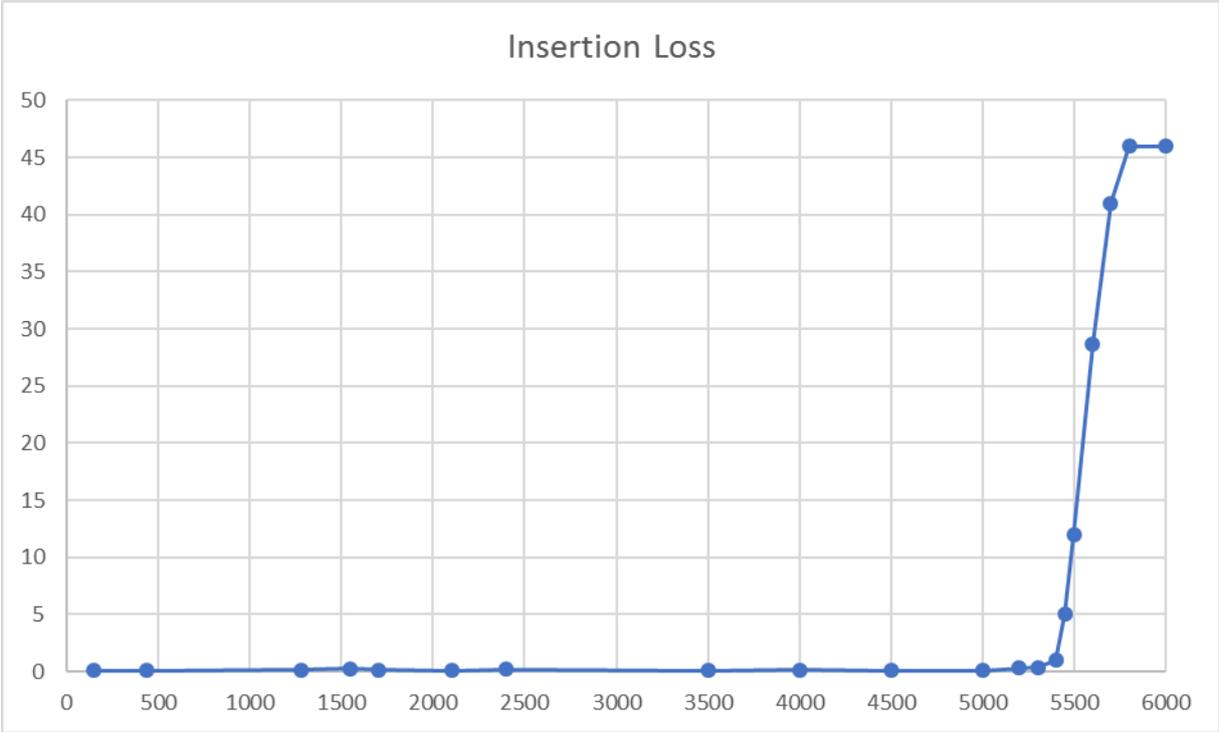
The measurement was done with a spectrum analyzer with tracking generator which covers the frequency range 9 kHz to 7 GHz.

Here are the results (horizontal axis frequency in MHz, vertical axis insertion loss in dB):



Next I repeated the same measurements, using again port “1 S-C-X” as input port but this time port “3 S-X” as the output port. Port “2 C” was terminated with 50 Ohms.

Here are the results (horizontal axis frequency in MHz, vertical axis insertion loss in dB):



Finally, I checked the S21 characteristics between the ports 2 and 3 while port 1 was terminated with 50 Ohms.

The Isolation between the two ports 2 and 3 is generally higher than 46 dB (limit of my measurement setup) except in the transition band between the two diplexer filter branches, where I found a very sharp transmission band with the following data:

| | |
|------------|-----------------|
| F=5260 MHz | IL=26 dB |
| F=5429 MHz | IL=6.5dB (peak) |
| F=6520 MHz | IL=26dB |

We can see that the device is a diplex-filter with a very sharp transition band and extremely low loss in the passbands. The transition frequency of my first device with the serial number S/N 888 is 5425 MHz, of the second device with the serial number S/N 693 it is 5429 MHz All the measurements above were made at the device with the S/N 888. I double checked the measurements and the two devices are almost identical in their performance.

In summary, the performance of this diplexer is very nice. Besides its intended use as a diplexer it can also be used as a lowpass-filter or highpass-filter when the unused port is properly terminated with 50 Ohms.

I always appreciate feedback and additional information. Please send them to my Email address which you can find below. Many thanks in advance.

Best regards

Matthias

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