

What's inside the PolyPhaser 101-0103S-A Lightning Protector

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Hello,

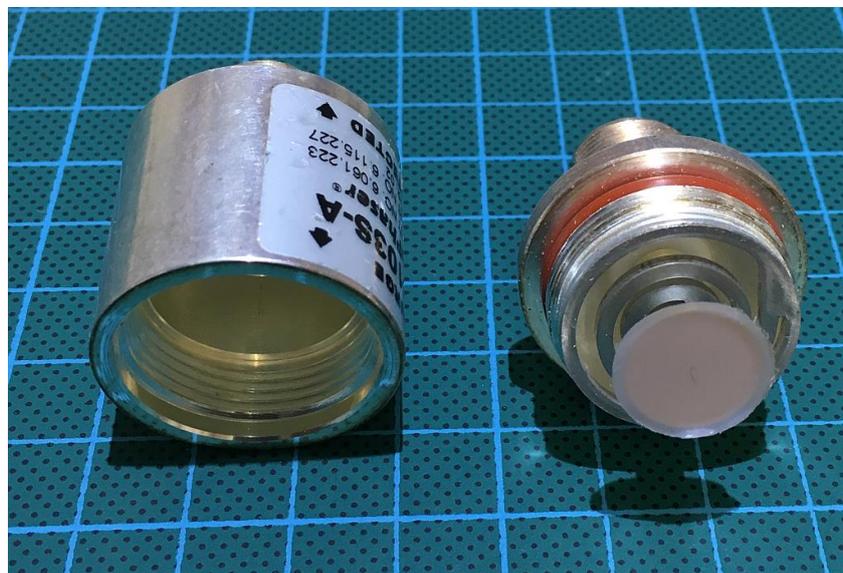
cleaning out my collection of lightning protection devices I found some 101-0103S-A lightning protectors from PolyPhaser. As I did not find any information in the internet I decided to open one of them to see how it is built.

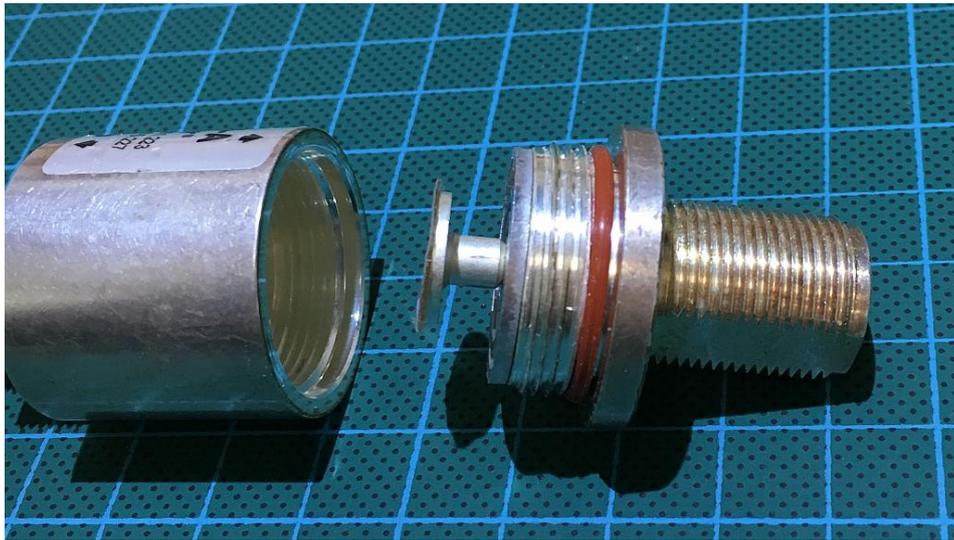
Here is how the device looks like:



On the left side you see the N-Jack which is the unprotected side and should for instance be connected to the antenna, on the right side you can see the SMA-Jack which is protected and DC-decoupled from the antenna.

Opening the device is not a problem as the two parts of the encasing are simply screwed together. Here you can see what's inside:



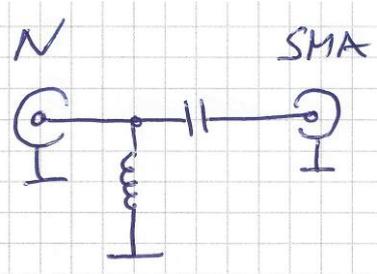




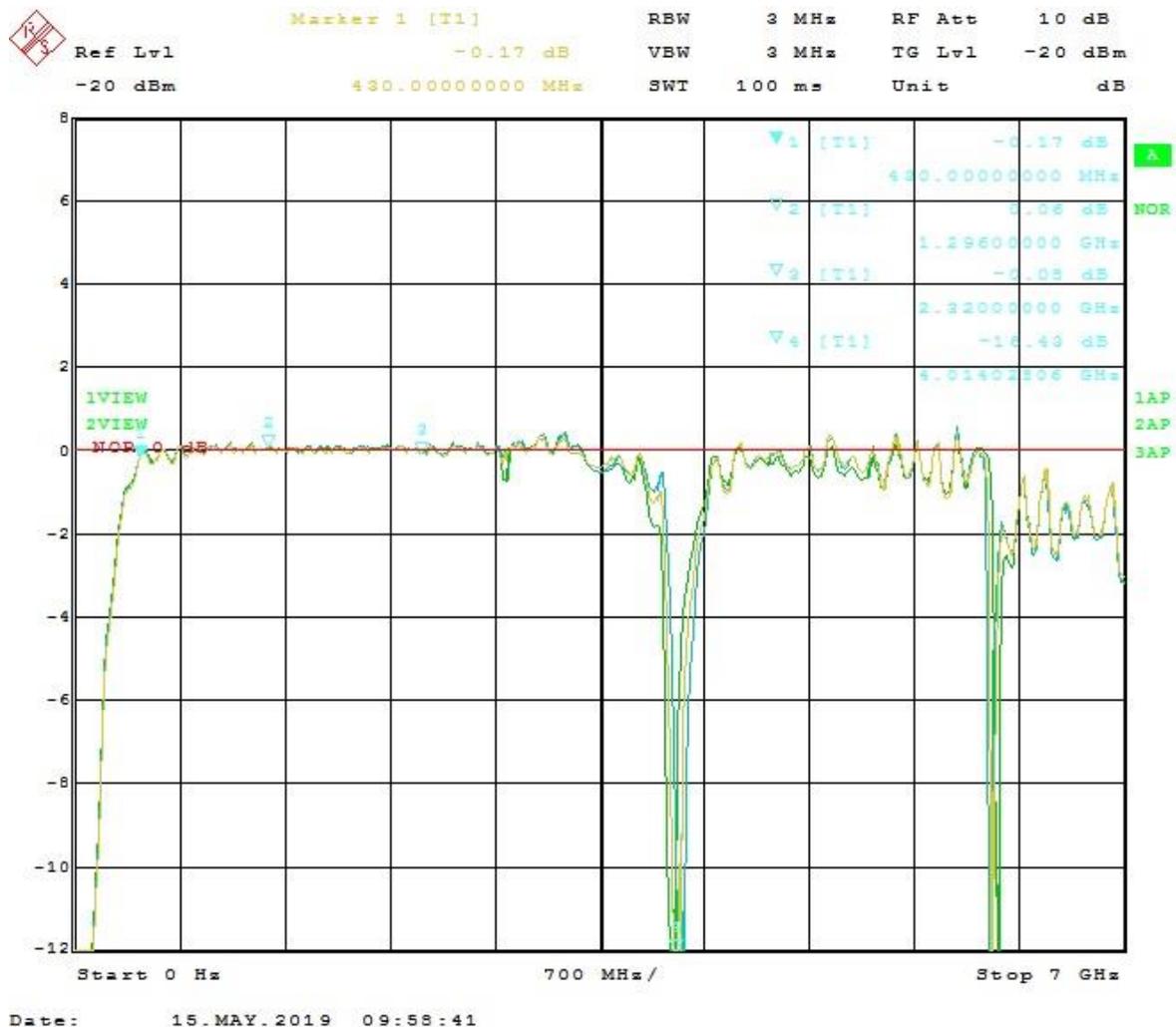
Here are some more pictures with the internals further disassembled:



Thus, we can see that the lightning protector is a simple but very nice made high pass filter, consisting of an inductor to ground and a series capacitor. Here is a sketch of the simple schematic:



The second plot shows S21 of 3 units. They behave almost identically.



Meanwhile I got the following specifications for this device:

- Frequency range: 800 MHz to 2.3 GHz @VSWR <= 1.1:1
(700MHz to 2.7 GHz @VSWR 1.2:1)
- Insertion loss: <=0.1dB (800 MHz to 2.3 GHz)
- Continuous power: 300 Watt
- Surge: 20kA (IEC 1000-4-5 8/20us waveform)
- Let through voltage: <=3 V for 3kA (@ 8/20us waveform)
- Throughput energy: <=0.5uJ for 3kA (@8/20us waveform)
- Operating temperature: -40 to +85 degree C

Based on this data and the measurements shown above this device is excellent for the 23cm and 13cm bands.

I am always grateful for any comments or further hints. I will be also happy to answer any questions. Please address them by Email to me.

Best regards

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