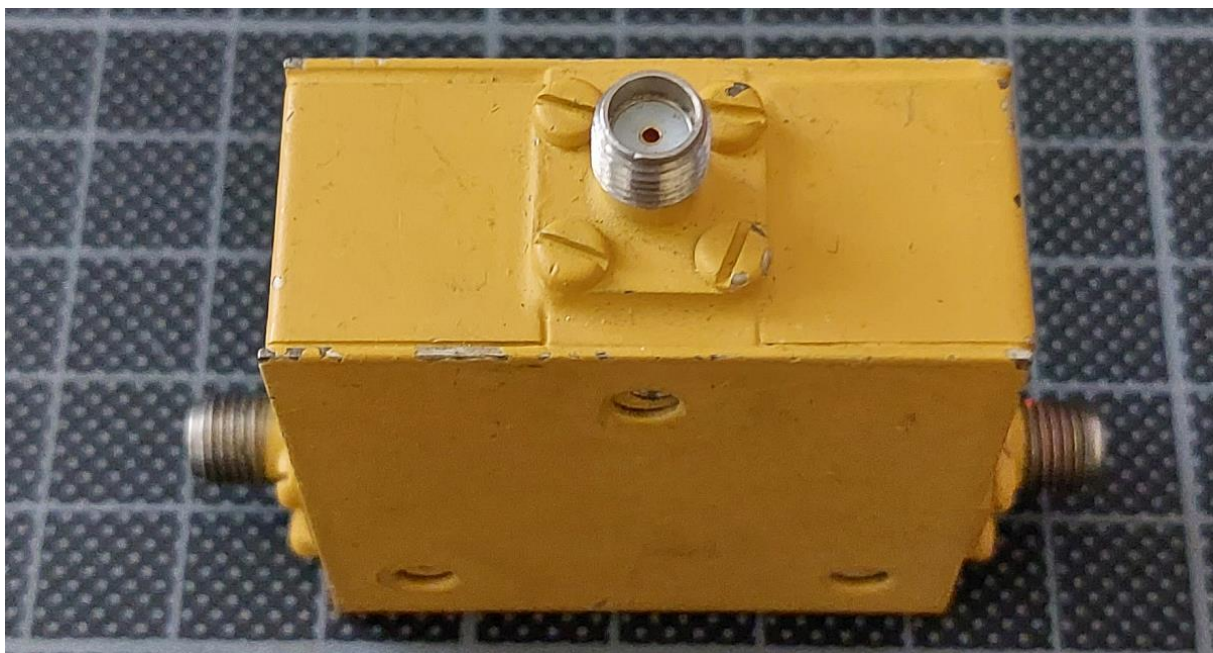


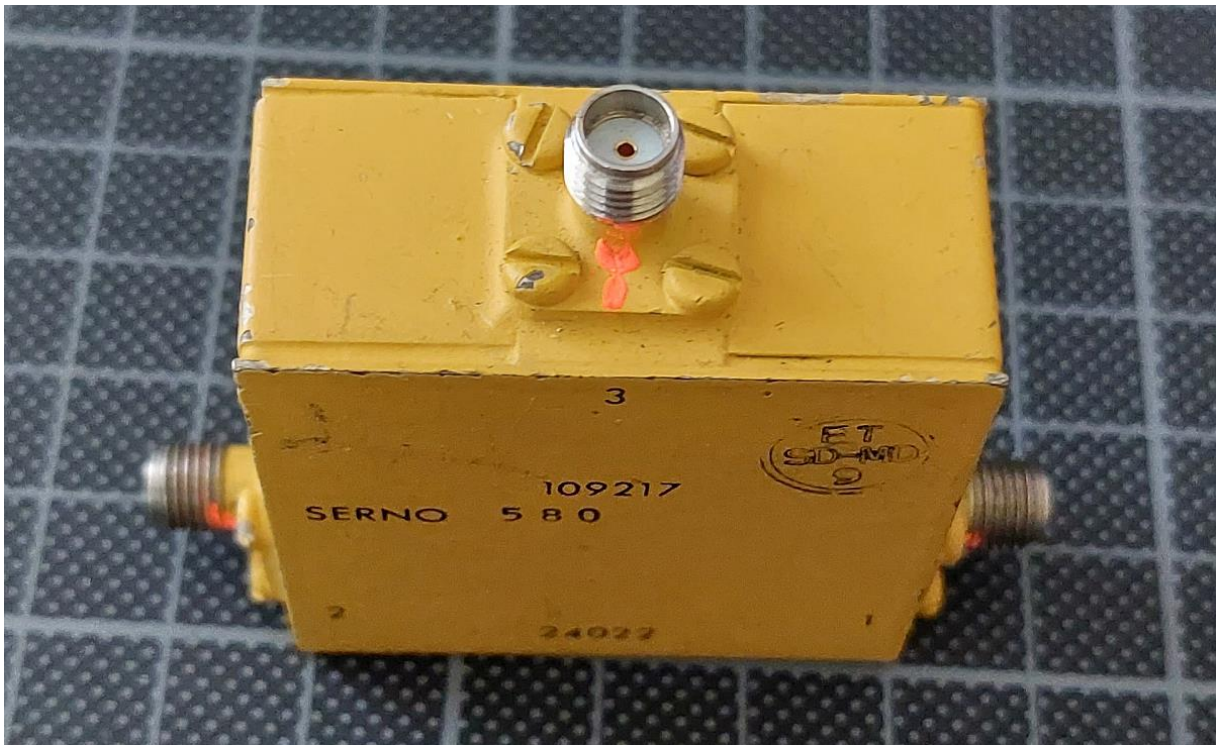
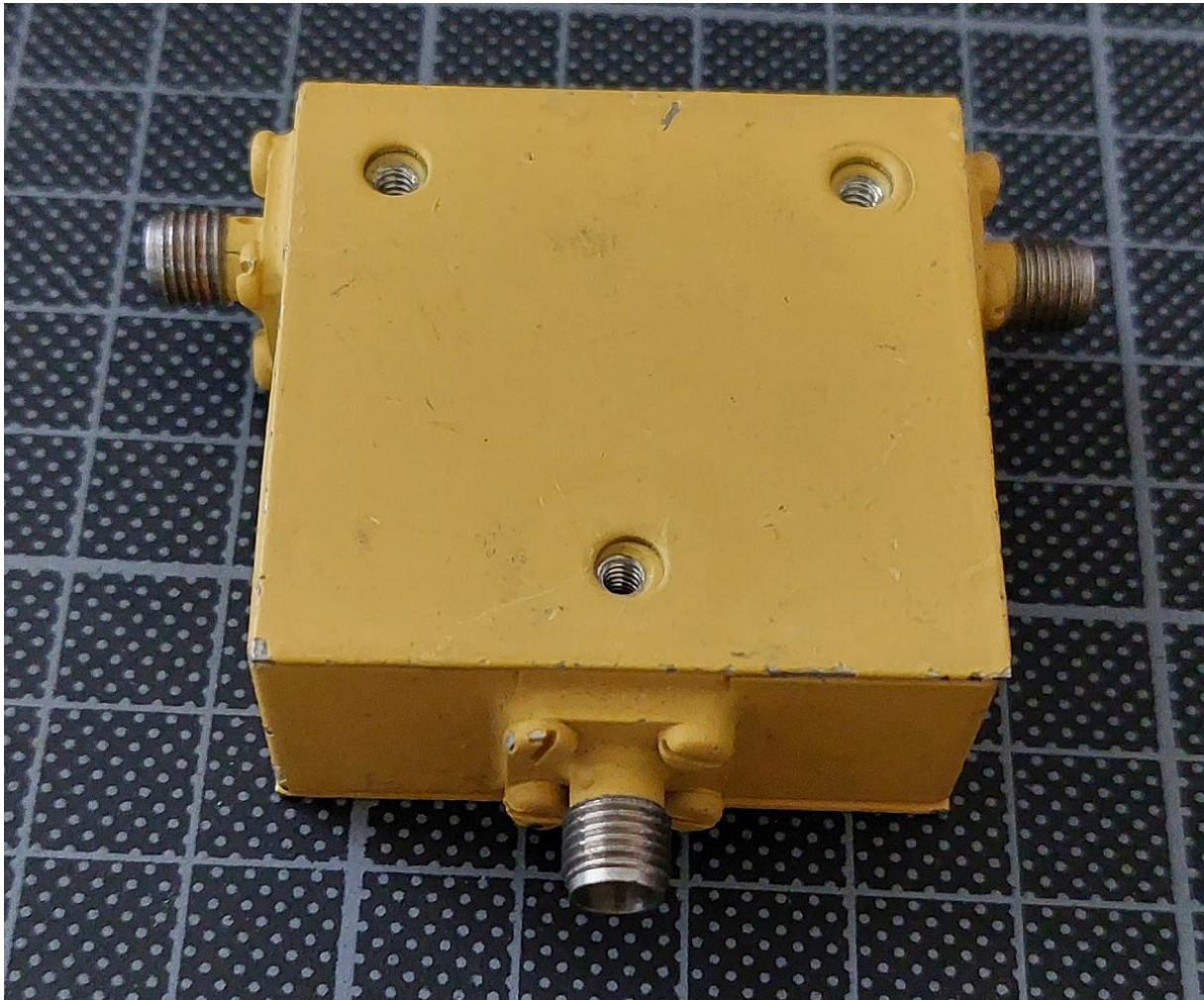
13cm isolator unknown source

Matthias, DD1US, August 7th 2022

Hello,

at the flea market in Friedrichshafen, I found an unknown circulator. The size was about right to make it suitable for the 13cm band and thus I bought it for little money. It turns out I was right. There are two numbers marked on the device: 109217 and 24022 as well as a serial number SERNO 580. Here are pictures of the device:

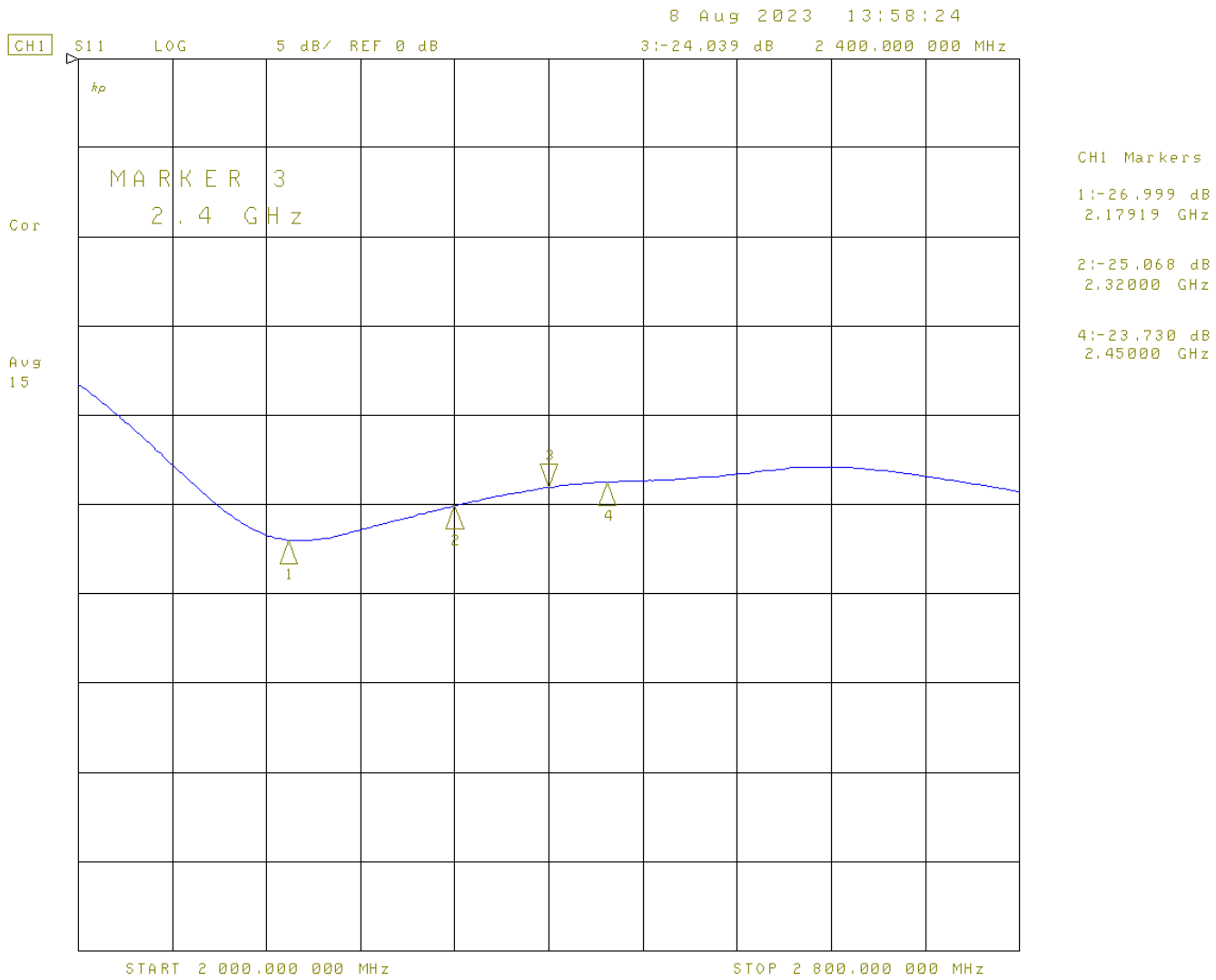




The circulator is in a solid metal case and has female SMA connectors at all 3 ports. On the backside there are 3 threads and thus it can be bolted to a heatsink or chassis.

Below you will find some measurement results of this S-band isolator. All measurements were done in the frequency range 2.0GHz to 2.8GHz.

First, I measured the S11 return loss / input matching:



The measured return loss values are 27.0dB@2180MHz, 25.1dB@2320MHz, 24.0dB@2400MHz and 23.7dB@2450MHz.

CH1 S11 1 U FS 3:53.309 Ω 5.6758 Ω 376.39 pH 2 400.000 000 MHz

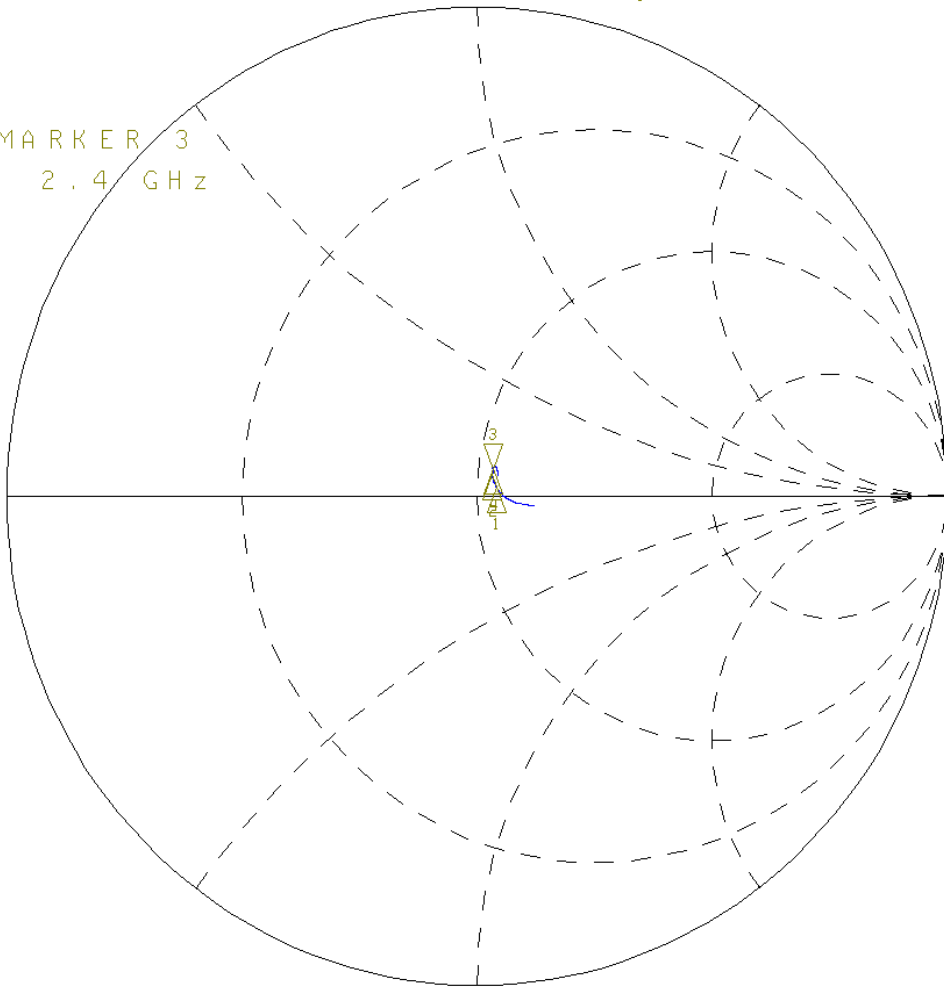
hp

MARKER 3
2.4 GHz

Cor

Avg
13

↑



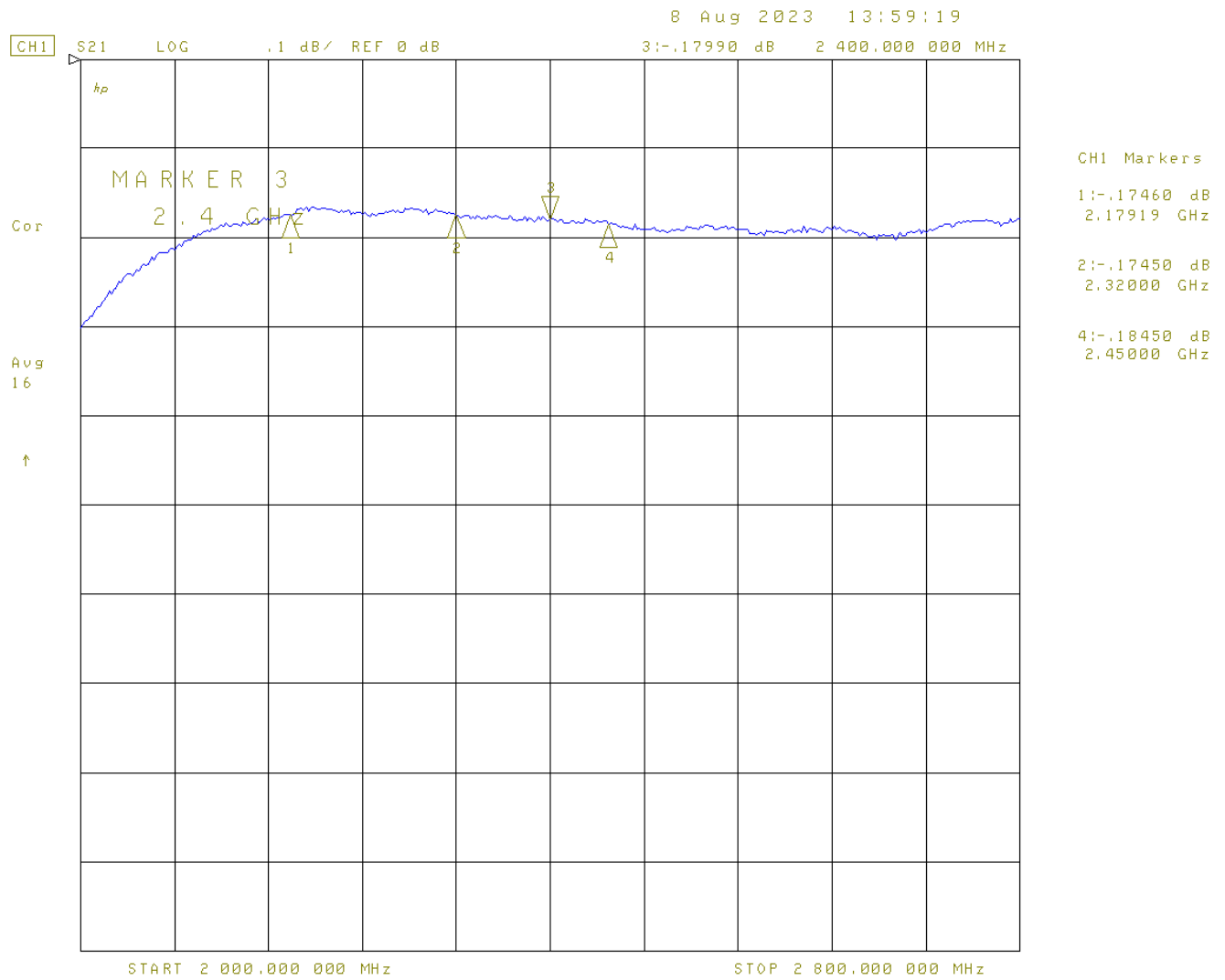
CH1 Markers

- 1: 54.287 Ω
1.9863 Ω
2.17919 GHz
- 2: 53.211 Ω
4.8828 Ω
2.32000 GHz
- 4: 53.205 Ω
5.9941 Ω
2.45000 GHz

START 2 000.000 000 MHz

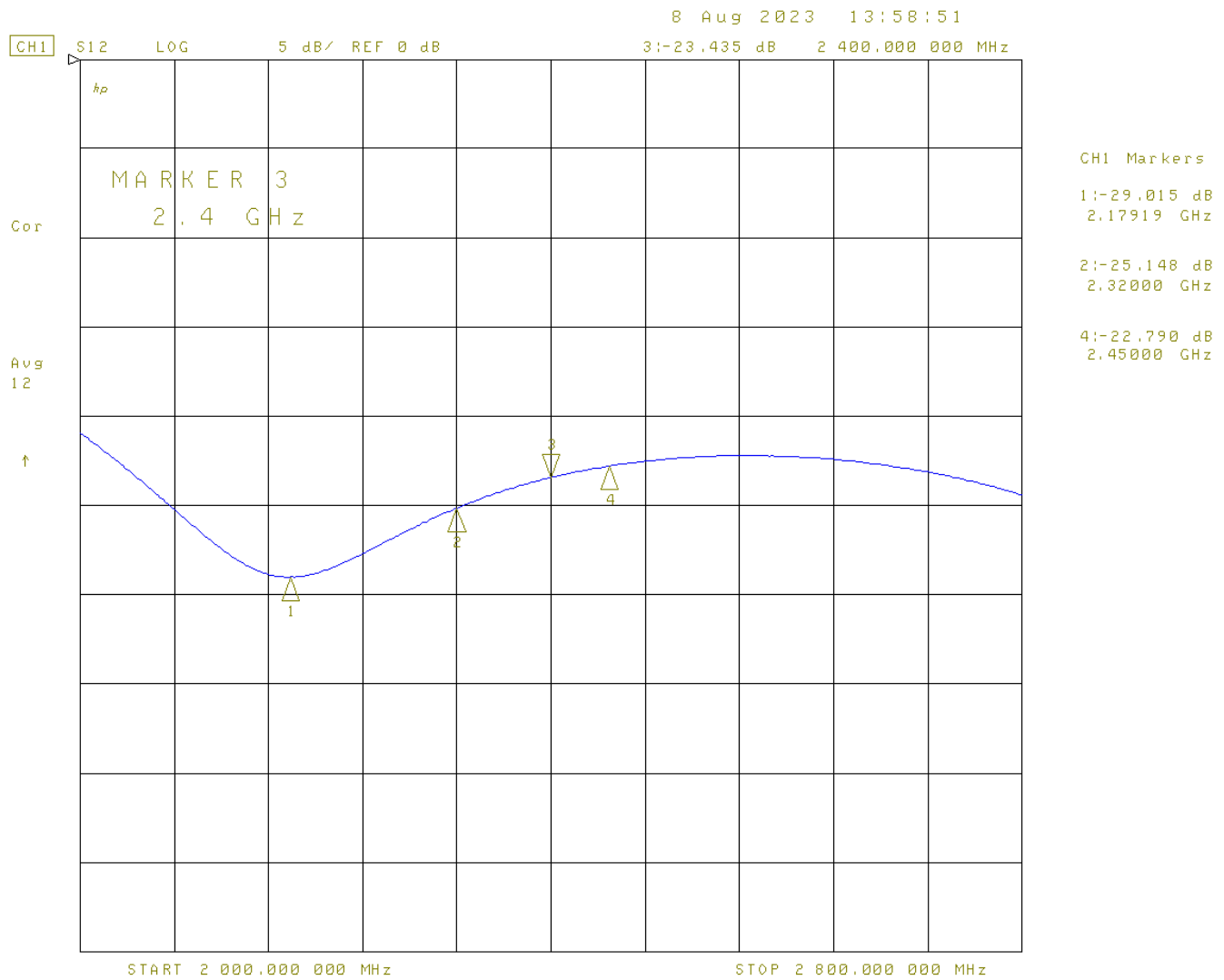
STOP 2 800.000 000 MHz

Next, I measured the S21 forward transmission / insertion loss:



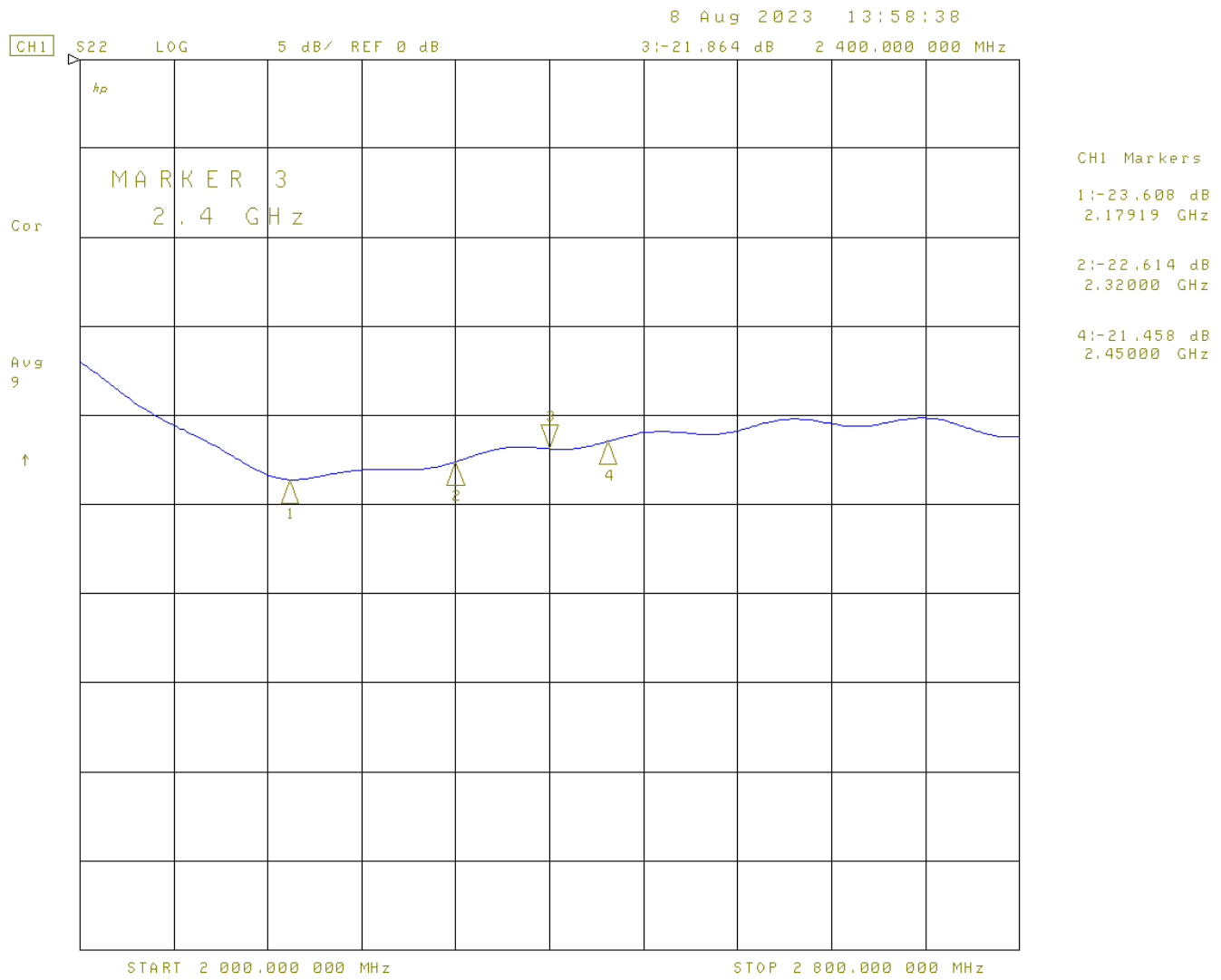
The measured insertion loss values are 0.175dB@2180MHz, 0.175dB@2320MHz, 0.180dB@2400MHz and 0.185dB@2450MHz.

I then measured the S12 reverse transmission / isolation of the circulator:

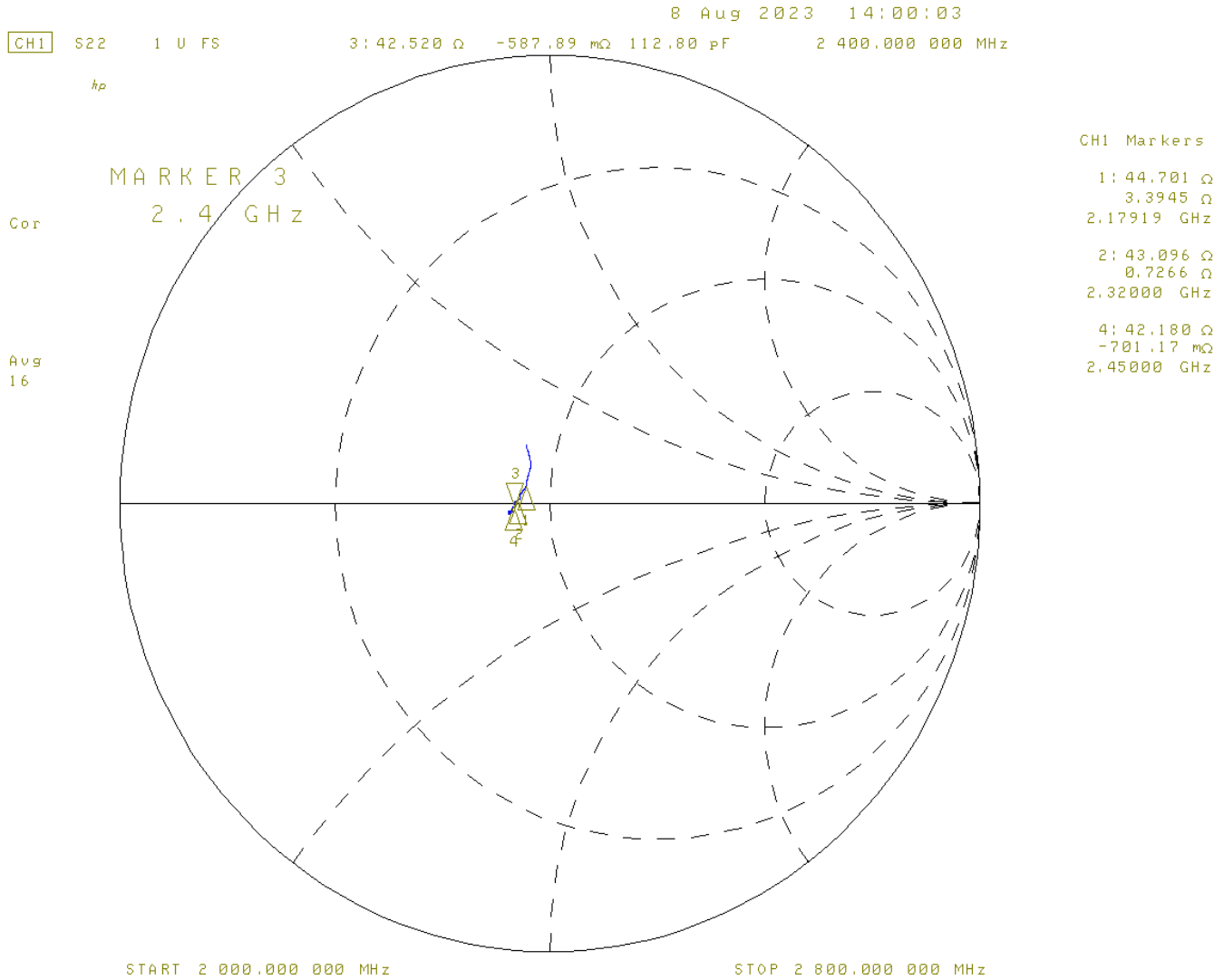


The measured isolation values are 29.0dB@2180MHZ, 25.1dB@2320MHZ, 23.4@2400MHZ and 22.8dB@2450MHZ

Finally, I measured the S22 return loss / output matching:



The measured return loss values are: 23.6dB@2180MHz, 22.6dB@2320MHz, 21.9dB@2400MHz, 21.5dB@2450MHz



The measurements show that this isolator is very well suited to cover the frequency range 2.1 – 2.8GHz. I did not measure it beyond that frequency but as the frequency response is rather flat the useful range might be higher.

At 2320MHz it features an excellent low insertion loss of 0.17dB and a good isolation of 25.1dB. Input and output return loss are 25.1dB and 22.6dB respectively.

Similarly, at 2400MHz it features an excellent low insertion loss of 0.18dB and a good isolation of 23.4dB. Input and output return loss are 24.0dB and 21.9dB respectively.

I wonder what the source / supplier of this isolator is and what the maximum power handling of this circulator might be. If anyone has more data then please let me know.

I will be happy to answer questions and always appreciate feedback. Many thanks in advance.

Best regards

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