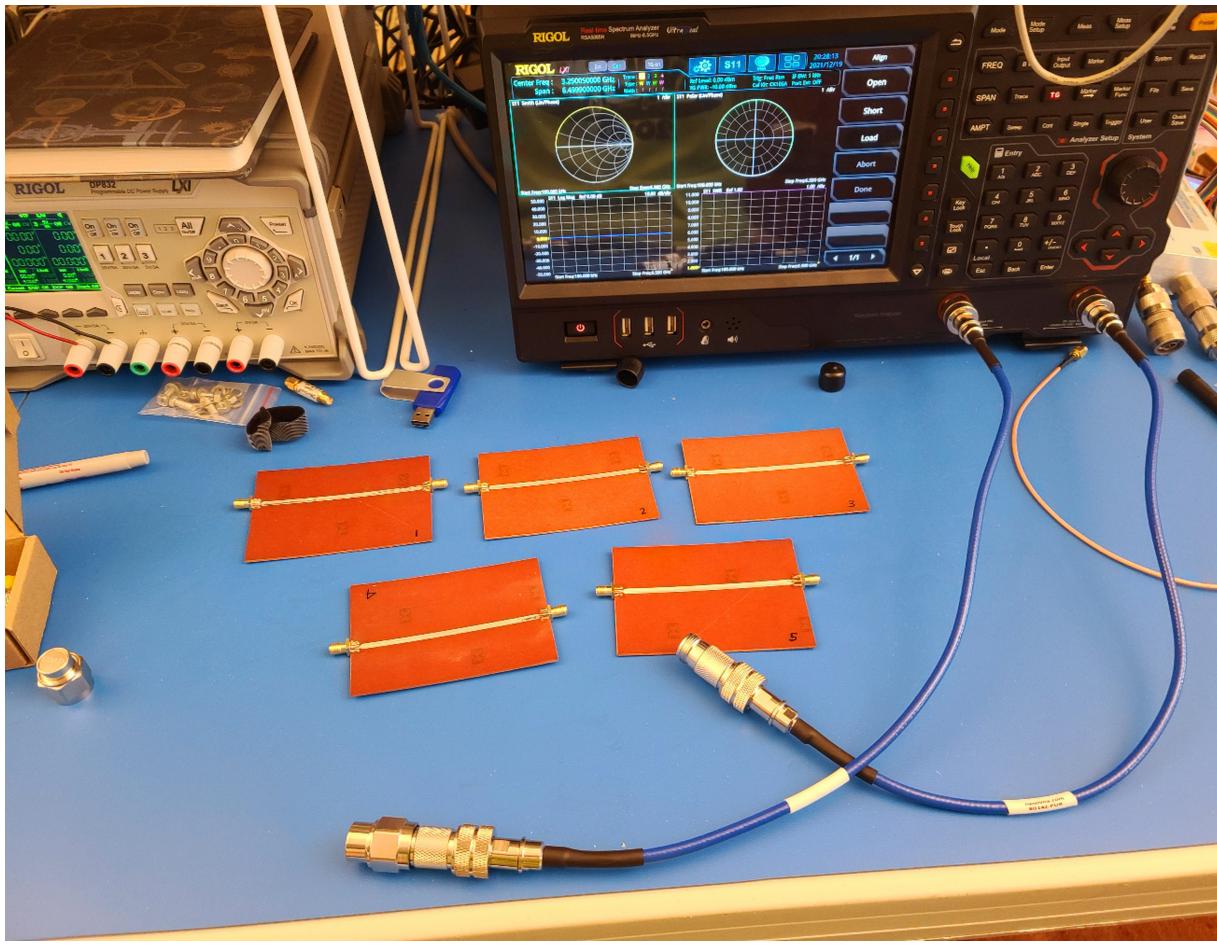


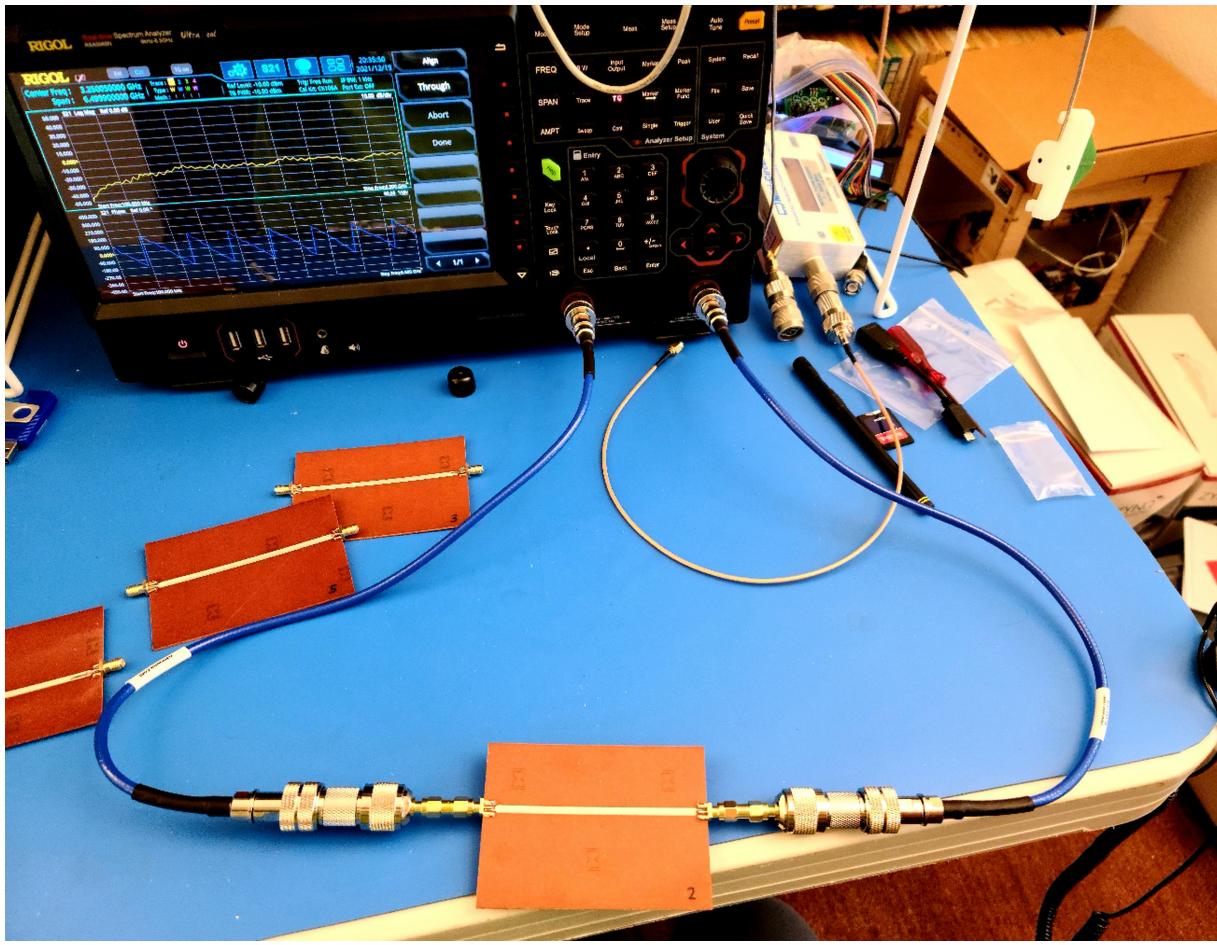
Five boards with 10 GHz transmission lines and SMA connectors were printed using the Voltera circuit printer, “Perky Pegasus” version ink, and ink-compatible solder. The PCBs were copper clad on one side and blank on the other, described as uxcell Single-Sided Copper Clad Laminate PCB Circuit Board, FR4 100x70mm 3.94x2.76 inch, 1.5mm Thickness DIY Prototyping PCB Boards. SMA Female Jack Edge 1.6mm PCB Mount Straight RF Connectors were ordered. Boards were printed and the SMA connectors soldered on each end of the transmission line.

The purpose of this test was to confirm the ink worked well enough at microwave frequencies to prototype boards quickly in the lab.

Jay Francis prepared the Gerber file and Michelle Thompson printed and constructed the boards. The boards were tested on two VNAs in Remote Lab West by Paul Williamson and Michelle Thompson on 19 December 2021.

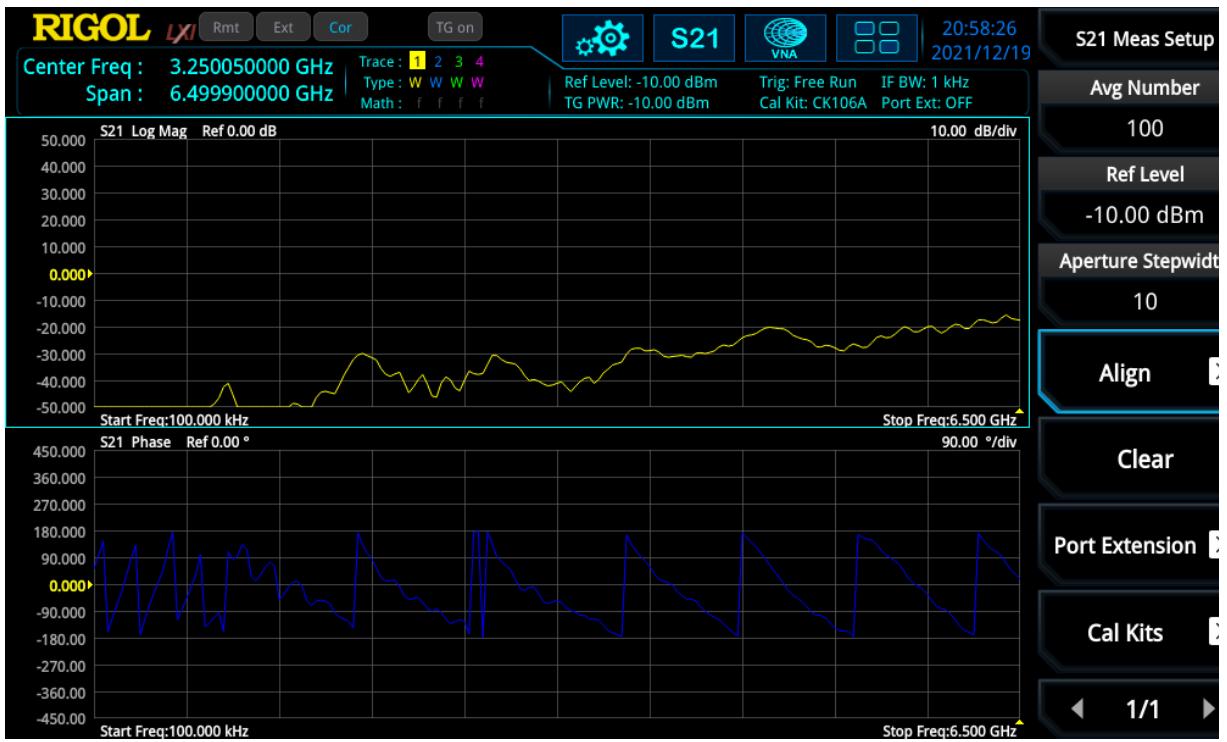
First, the Rigol 5065N. The Rigol was calibrated.



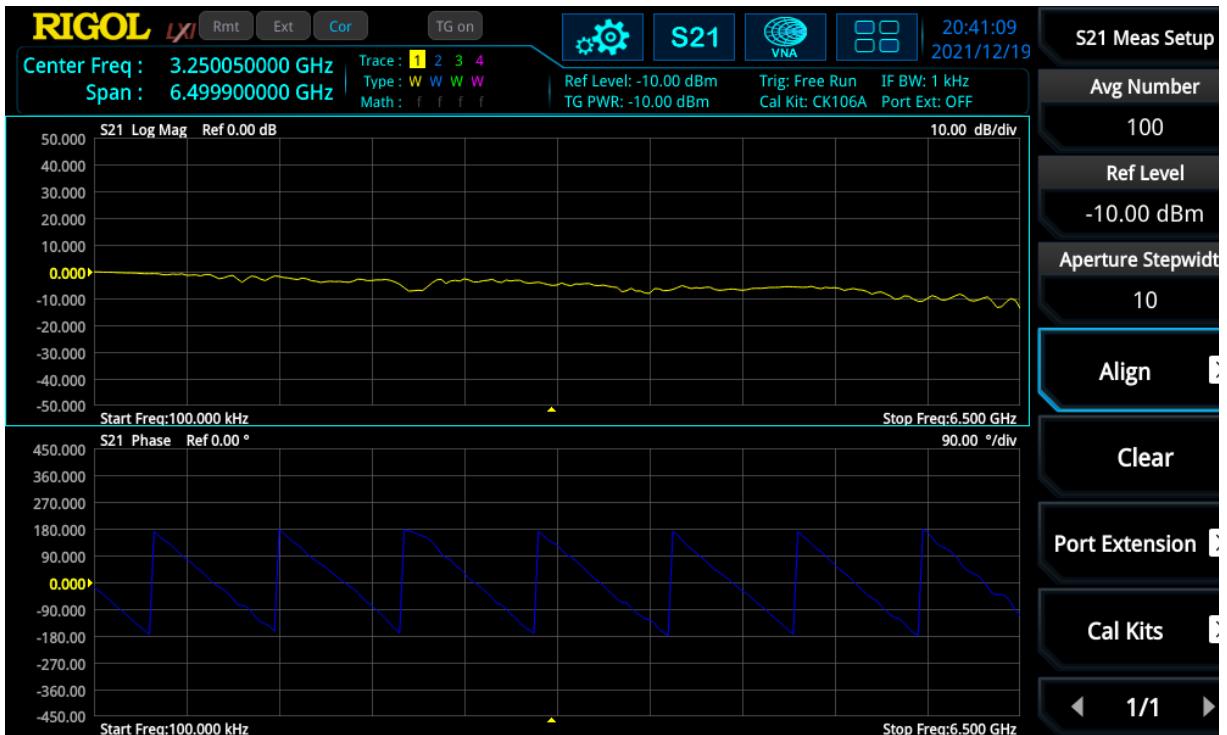


Board #1 was damaged during connection. Solder repairs failed. The ink is extremely brittle and the end of the transmission line split in a way that could not be reconnected.

Board #2 had problems at DC due to a cracked trace. It was capacitively coupled at higher frequencies. Board #2 is below.



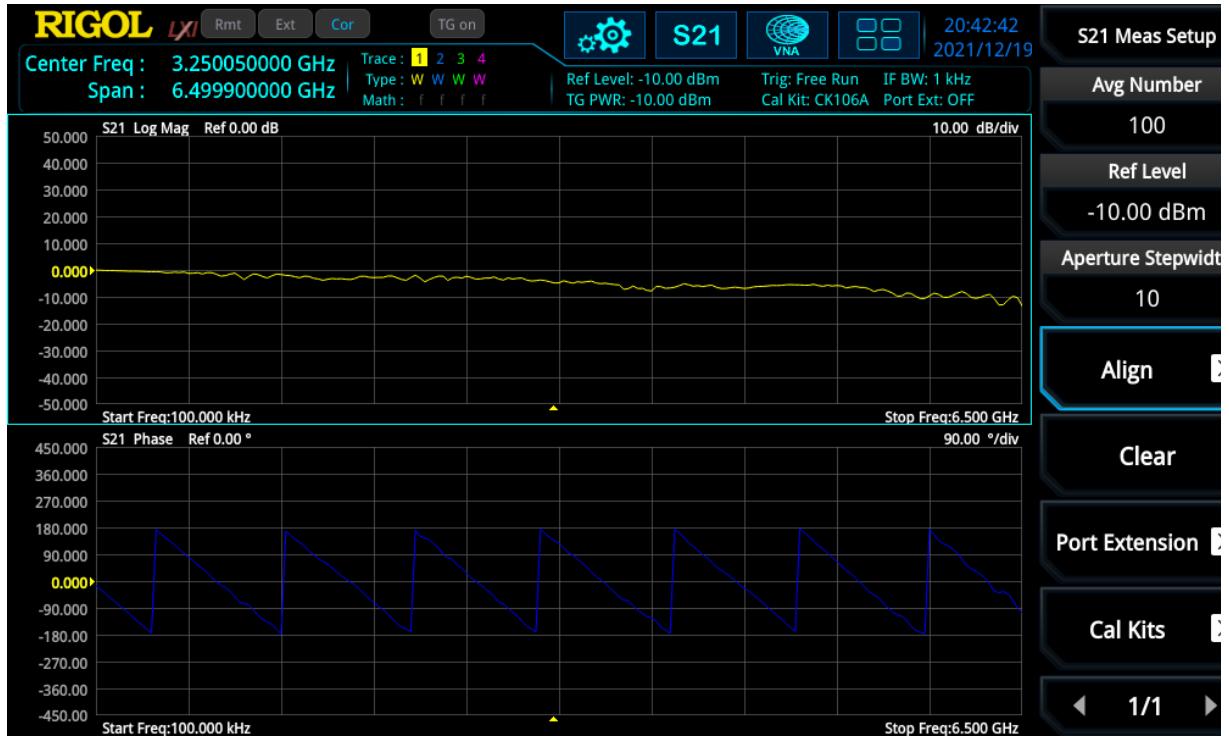
Board #3



Board #4



Board #5



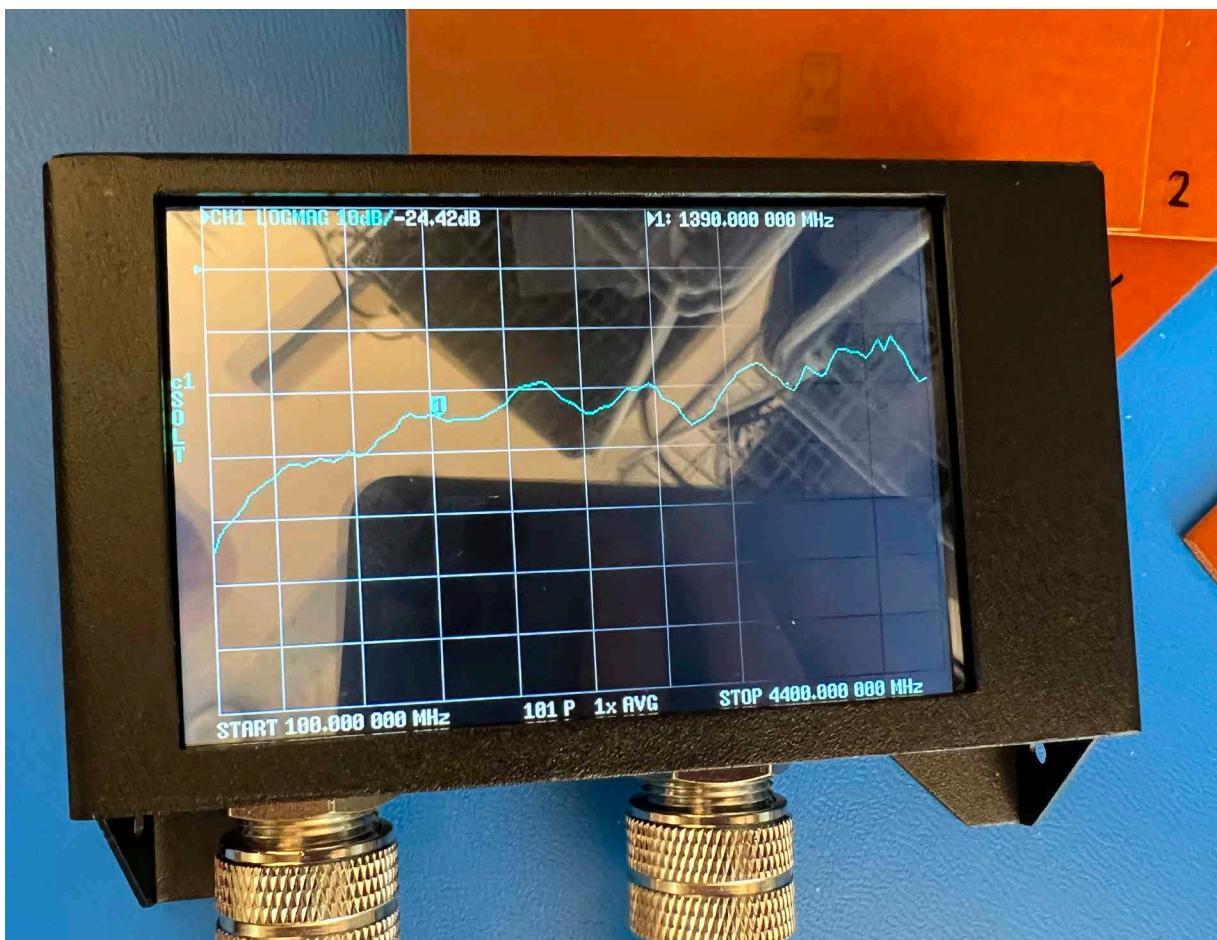
Second, a Nano VNA SAA2 was used to measure the boards. VNA was calibrated. Measurements were made with 900 MHz scan and 4400 MHz scan.

Having a comparison between the two categories of VNAs was desired.

The Nano VNA goes up to 4400 MHz, which does not match the Rigol 5065N at 6000 MHz. The results of the Nano VNA were not as accurate or steady as the Rigol, but the overall characteristics of the transmission line were consistent between the two pieces of test equipment.

Board #2

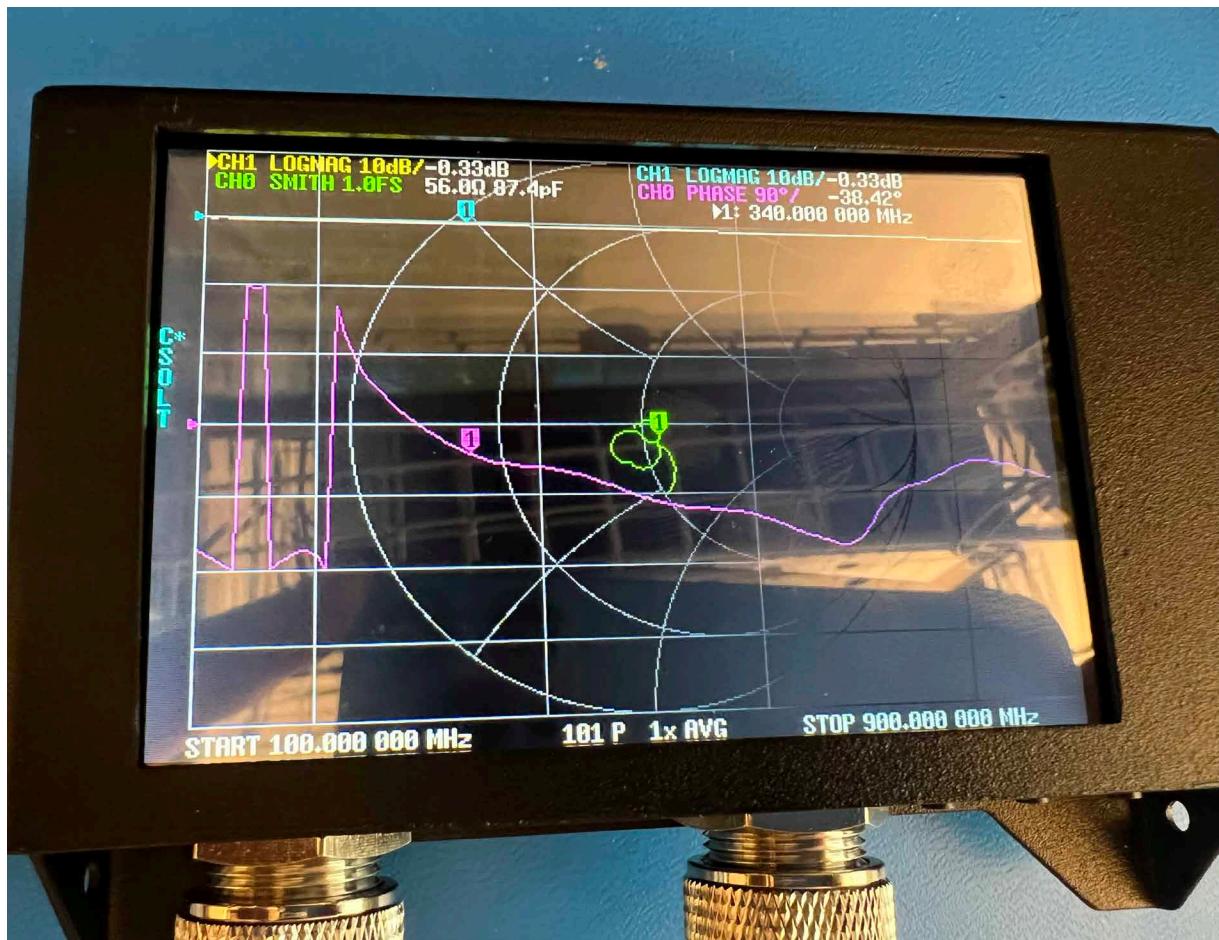




Board #3



Board #4





Board #5



