

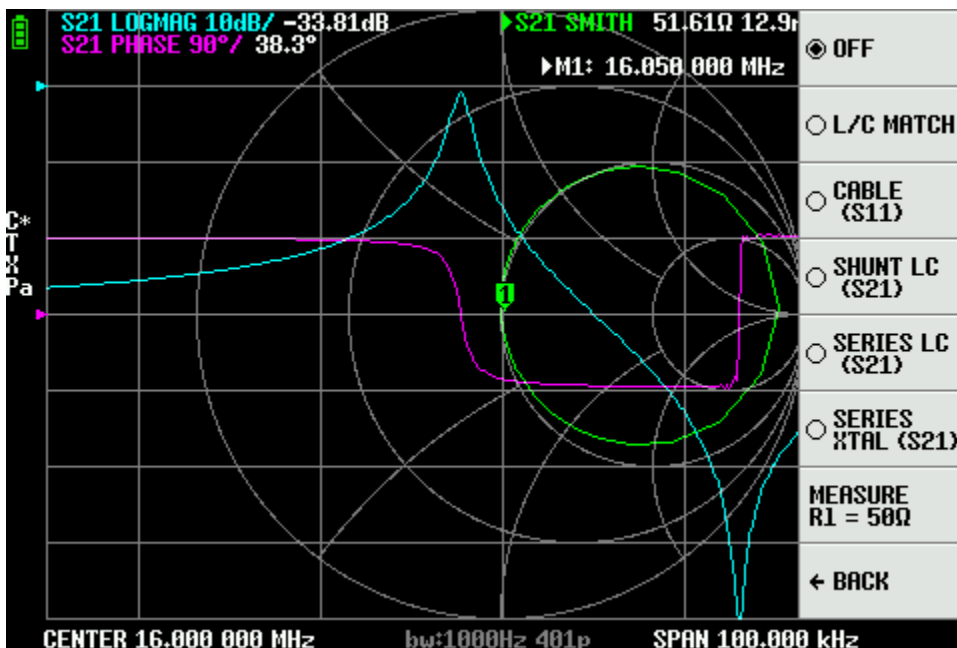
There were many questions about measuring markers in my new firmware (for H / H4, now I'm testing for V2 / V2Plus. Version v1.0.68):

First, about the technique for measuring quartz, you need to read this

Quartz can be measured independently, but now NanoVNA allows you to automate the process, it implements the method

Phase Shift Measurement.

The latest firmware has this menu MARKER-> MEASURE



Click image for larger version. Name: nanovna-h4_screen_2021-07-24_19-46-42.png Hits: 12 Size: 10.7 Kb ID: 361024

The measurement of quartz (and LC filters) includes SHUNT LC / SERIES LC / SERIES XTAL

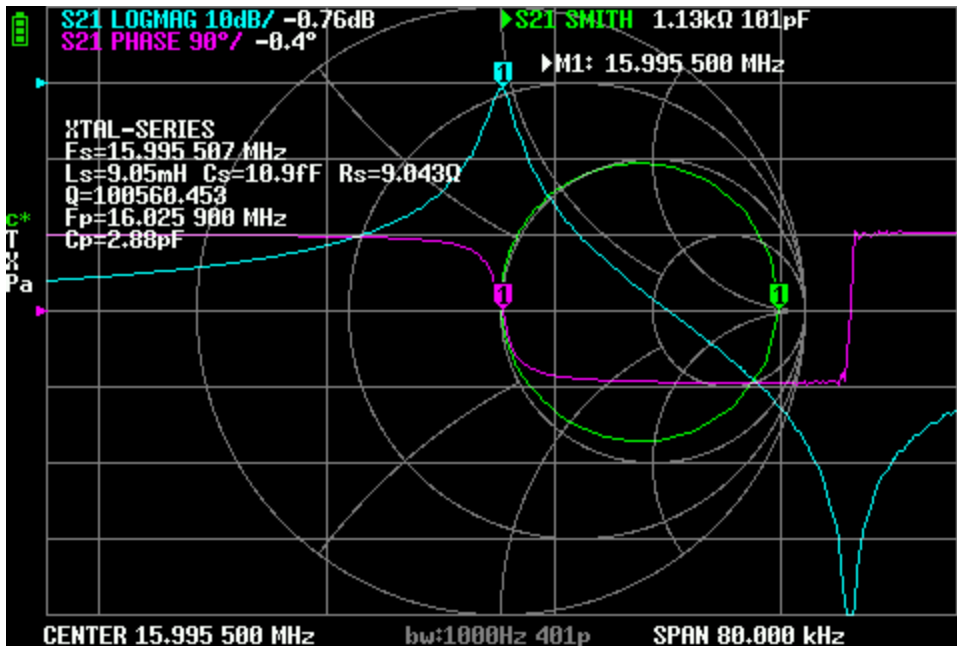
To measure quartz, it is enough to calibrate the S21 port, for this we connect the block, set the desired range (both quartz resonances should be visible on the screen), go to the CALIBRATE-> CALIBRATE menu, make a break on the block (nothing should be connected there) and conduct calibration ISOLN. Next, put a jumper between CH0 and CH1 and calibrate the THRU.

If you do not need to save, then we do DONE IN RAM, while the calibration coefficients will be loaded into memory (but will not be saved in ROM)

We connect the investigated quartz instead of a jumper (I have quartz at 16 MHz)

We turn on the graphs S21 LOGMAG, S21 PHASE, S21 SMITH (carefully watch that the channel is S21)

Turn on MEASURE-> SERIES XTAL



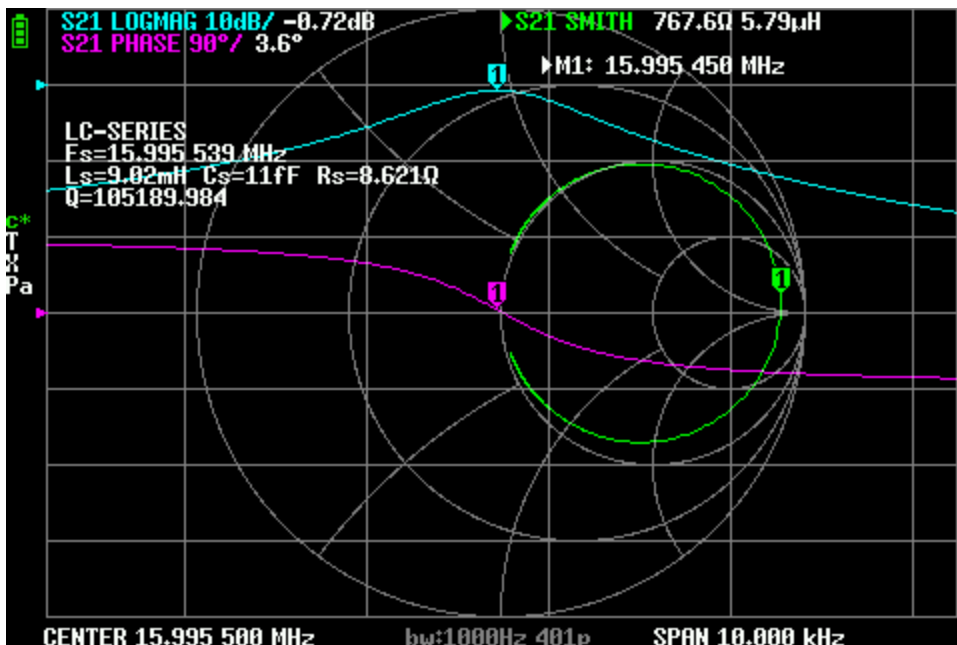
Click image for larger version. Name: nanovna-h4_screen_2021-07-24_20-08-01.png Hits: 13 Size: 10.5 Kb ID: 361027

NanoVNA found a peak in the S21 logmag data, calculated the R_s of quartz from it (for this there is an additional parameter in the menu $R_I = 50 \text{ Ohm}$, this is the impedance of the nana ports, if a block with a different matching is used, then it must be entered here)

Next, the phase shift points of ± 45 degrees are sought, and L_s and C_s are calculated from the frequency delta and R_s . The minimum is searched for and C_p is calculated by the frequency of the minimum and maximum.

All this can be done manually by yourself, read the methodology and follow it.

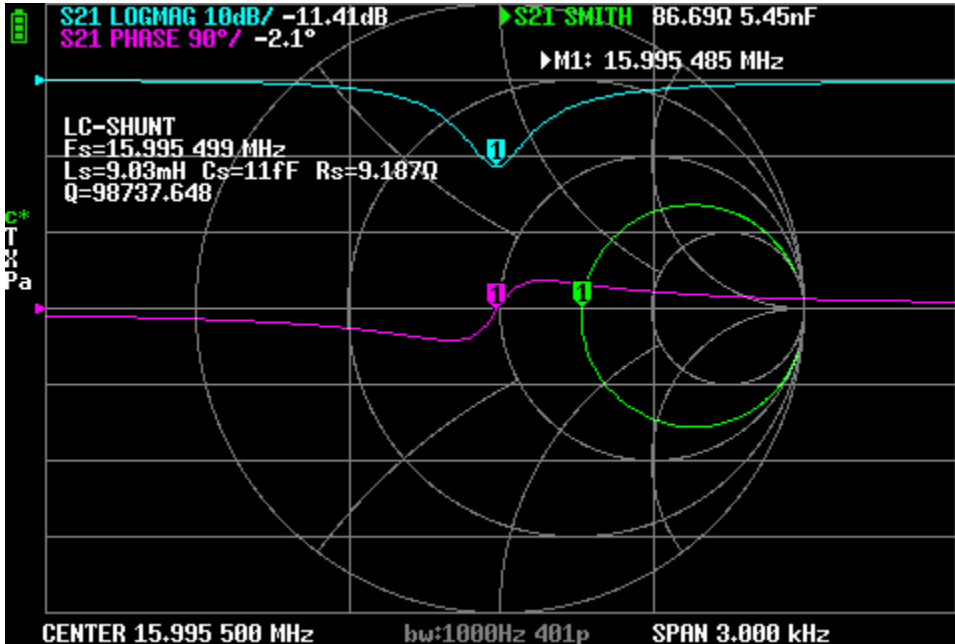
SERIES LC - this is what is seen at the peak of quartz (I increased it a little), in this case you can just watch the LC chain connected in series



Click image for larger version. Name: nanovna-h4_screen_2021-07-24_20-10-30.png Hits: 12 Size: 9.9 Kb ID: 361028

SHUNT LC is a measurement of the LC chain (or quartz), shorted to ground (there is a jumper between the CH0 - CH1 ports, and the quartz or LC is to ground)

Here is the same quartz connected in this way



Click image for larger version. Name: nanovna-h4_screen_2021-07-24_20-06-08.png Hits: 12 Size: 8.9 Kb ID: 361026

When the measurement is on, markers are automatically placed (if they are on), 1 - for the peak logmag, 2 for phase -45, 3 for phase +45, 4 for minimum logmag

Ps.: I have revealed a little the new calibration option in the device, now it has become a little easier

Last edited by DiSlord; Today at 20:30.