

# Orthomode Transducer Test Program User's Guide

Larry Wurtz, Phd

1 May 2021



- Procedure for OMT test program was taken from a paper entitled “Cheap Method for Accurate Characterization of Orthomode Transducers” by M. Oldoni and D. Tresoldi, 2016 IEEE
- Additional reference paper: “A Technique for the Measurement of the Generalized Scattering Matrix of Overmoded Waveguide Devices” by Antonio Morini, Marco Guglielmi, and Marco Farina, IEEE Transactions of Microwave Theory and Techniques, Vol. 61, No. 7, July 2013
- Additional reference paper: “A Microwave Measurement Procedure for a Full Characterization of Ortho-Mode Transducers”, Oscar Peverini and others, IEEE Transactions on Microwave Theory and Techniques, Vol. 51, No. 4, April 2003
- The following slides provide a step-by-step sequence of instructions to measure the performance of a Millitech OMT22 with SN 132
- A Keysight E8364C network analyzer with 2 hour warm-up and two separate full 2-port calibrations provided the following results.

Press project directory button as last step

Main Display

Enter project directory, best to copy and rename existing project directory

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

**Project Directory** D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition

Process Collected S-Parameters

Close Console

Collect S-Parameters

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Tconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

Save Offset Gconfig S-Parameters

File Identification OMT22\_SN132\_34GHz\_36GHz\_26March2021

Enable Offset Gconfig S-Parameters

Enable (Tau1 + Tau2) / 2 Phase Correction

Clear Processing Notes

Processing Notes

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Shcapv.csv

SHh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Sh.h

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scapvcapv.csv

SvV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shcapv.csv

SvH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svcapv.csv

S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_s\_parameters.s4p

Enter file prefix for all files created

## De-embed circular to rectangular transition

Press once to show required network analyzer connection

Press twice to take measurement, repeat if needed

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition Collect S-Parameters

Process Collected S-Parameters

Close Console

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Tconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

Save Offset Gconfig S-Parameters

File Identification OMT22\_SN132\_34GHZ\_36GHZ\_26March2021

Enable Offset Gconfig S-Parameters

Enable (Tau1 + Tau2) / 2 Phase Correction

Processing Notes Clear Processing Notes

ShH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shcapv.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Sh.csv

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scapvcapv.csv

SvV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shv.csv

SHV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shcapv.csv

SvH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svcaph.csv

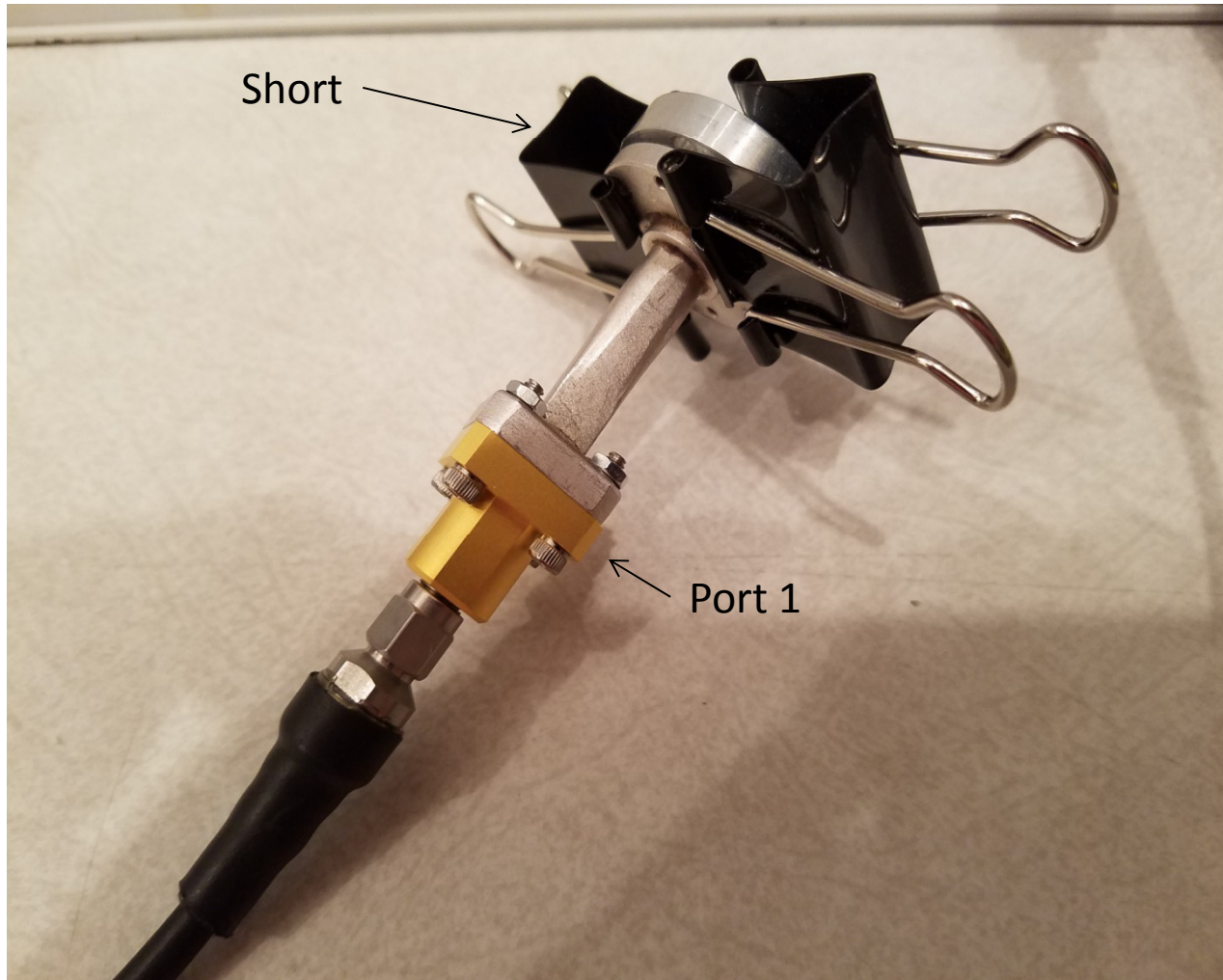
S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_s\_parameters.s4p

Make following connection and shown on next slide

Take S11 of the circular-rectangular transition from its rectangular port while the circular port is closed by a short circuit.



## De-embed circular to rectangular transition



Take Hconfig measurement  
 press once for required setup and twice for measurement  
 Setup shown bottom right and on next slide (repeat if needed)

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition Collect S-Parameters

Process Collected S-Parameters

Close Console

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Iconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Save Offset Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

File Identification OMT22\_SN132\_34GHZ\_36GHZ\_26March2021

Enable Offset Gconfig S-Parameters

Processing Notes Clear Processing Notes Enable (Tau1 + Tau2) / 2 Phase Correction

ShH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shcaph.csv

ShH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shh.csv

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scapvcapv.csv

SvV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shv.csv

SHV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shcapv.csv

SVH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svcapv.csv

S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_s\_parameters.s4p

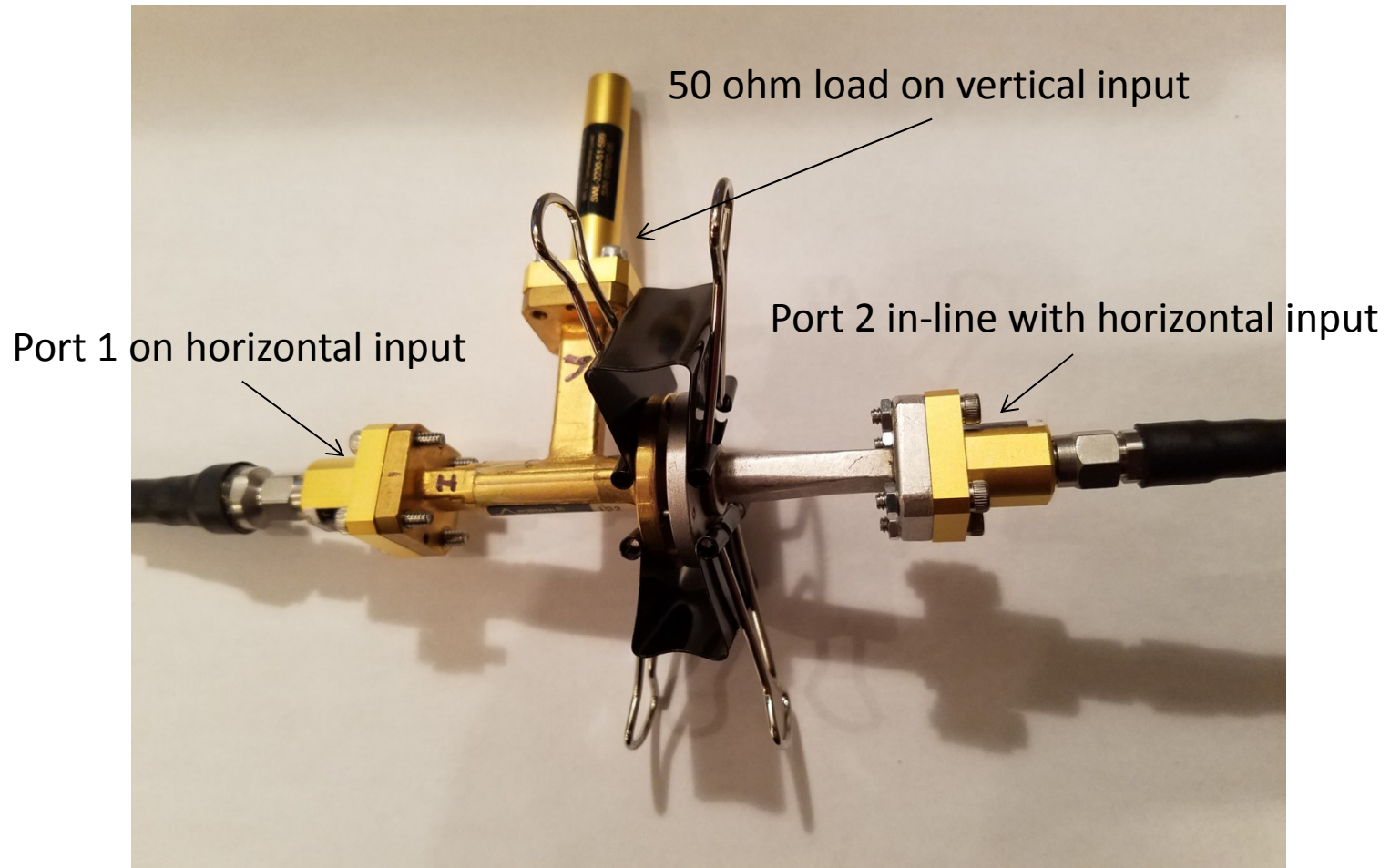
To VNA Port 1 H Matched V Matched

Matched h v  $\Gamma$

H config. (between H and h) C-R

To VNA Port 2

## Hconfig measurement



Take hconfig measurement  
 press once for required setup and twice for measurement  
 Setup shown bottom right and on next slide (repeat if needed)

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition Collect S-Parameters

Process Collected S-Parameters

Close Console

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Iconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Save Offset Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

File Identification OMT22\_SN132\_34GHz\_36GHz\_26March2021

Enable Offset Gconfig S-Parameters

Enable (Tau1 + Tau2) / 2 Phase Correction

Processing Notes Clear Processing Notes

ShH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shcaph.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shh.csv

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svcapv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shv.csv

SHV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shcapv.csv

SVH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svcaph.csv

S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_s\_parameters.s4p

To VNA Port 1 Matched

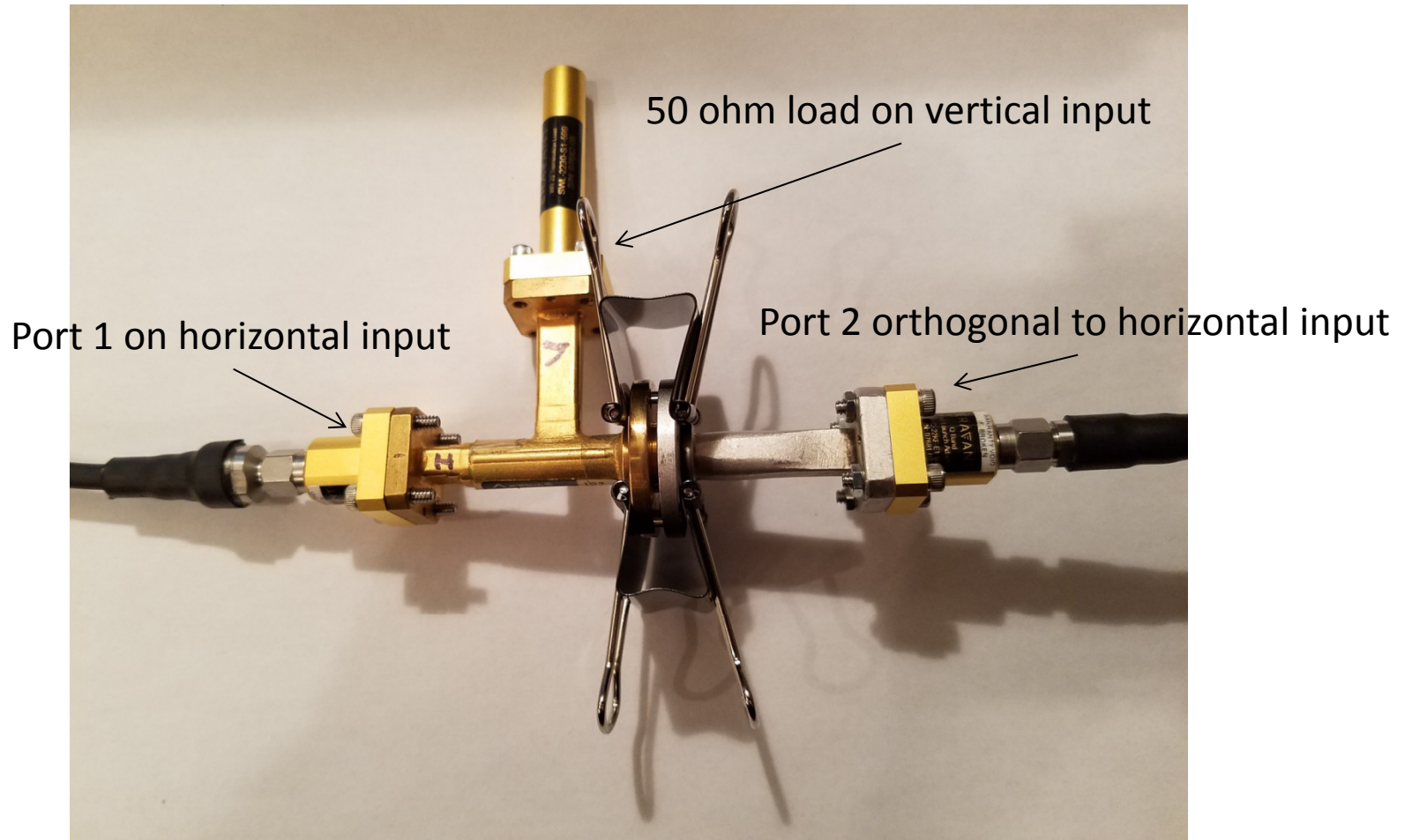
To VNA Port 2 Matched

h config. (between H and v)

C-R



## hconfig measurement



Take vconfig measurement  
press once for required setup and twice for measurement  
Setup shown bottom right and on next slide (repeat if needed)

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition Collect S-Parameters

Process Collected S-Parameters

Close Console

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Tconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

Save Offset Gconfig S-Parameters

File Identification OMT22\_SN132\_34GHz\_36GHz\_26March2021

Enable Offset Gconfig S-Parameters

Processing Notes Clear Processing Notes Enable (Tau1 + Tau2) / 2 Phase Correction

ShH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shcaph.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shh.csv

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scapvcapv.csv

SvV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shv.csv

SHV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_shvcapv.csv

SVh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_svcapv.csv

S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHz\_36GHz\_26March2021\_s\_parameters.s4p

Matched

Matched

Matched

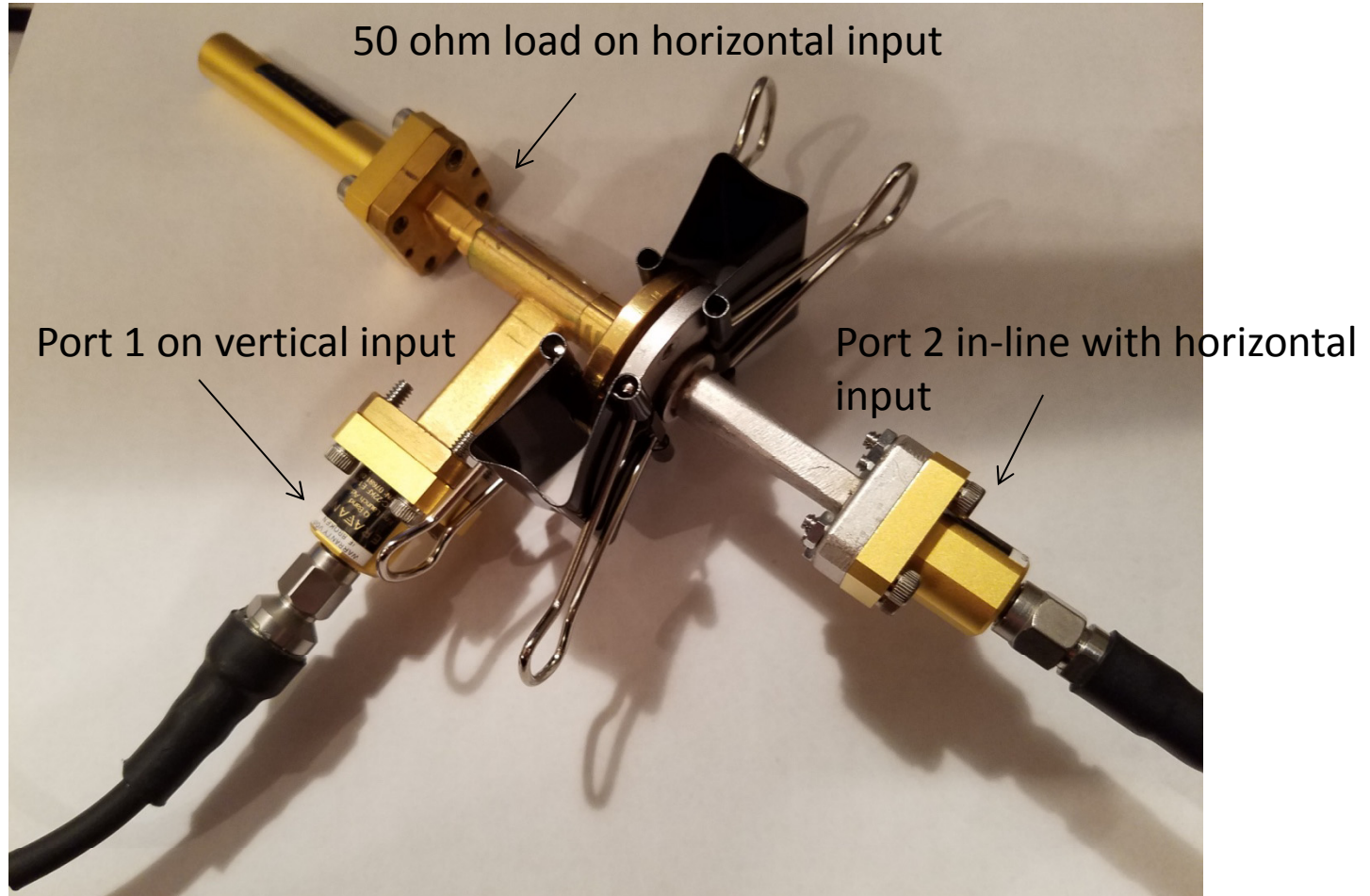
V config. (between V and h)

C-R

To VNA Port 1

To VNA Port 2

## vconfig measurement



Take Vconfig measurement  
 press once for required setup and twice for measurement  
 Setup shown bottom right and on next slide (repeat if needed)

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory: D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition

Process Collected S-Parameters

Close Console

Collect S-Parameters

Save Hconfig Hh S-Parameters Save hconfig Hh S-Parameters Save Iconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Save Offset Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

File Identification: OMT22\_SN132\_34GHz\_36GHz\_26March2021

Enable Offset Gconfig S-Parameters

Processing Notes: Clear Processing Notes Enable (Tau1 + Tau2) / 2 Phase Correction

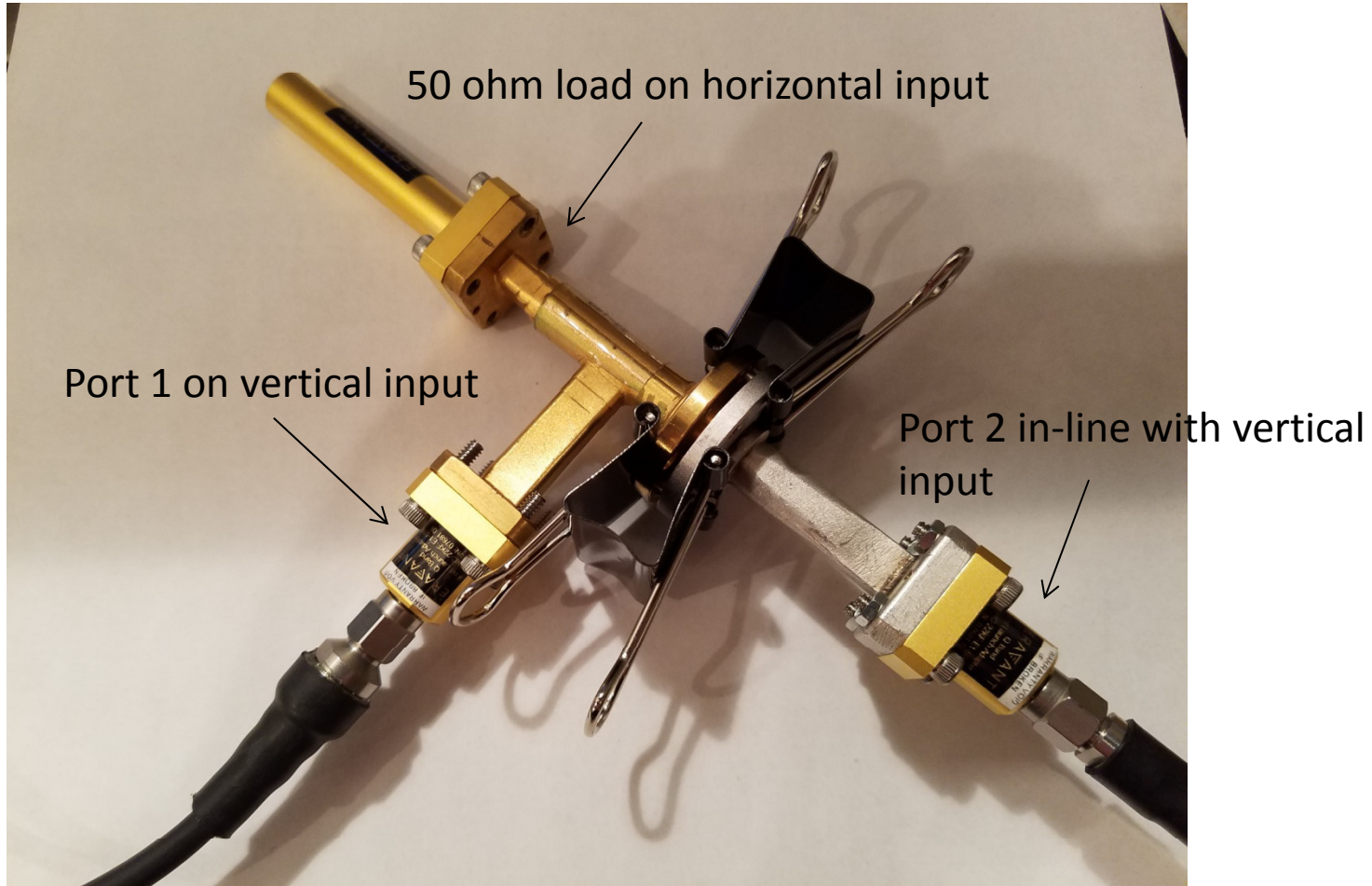
Processing Notes:

```

SHh saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_shcaph.csv
SHh saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_scaphh.csv
Shh saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_shh.csv
SVV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_scapvcapv.csv
SvV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_svcapv.csv
SVv saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_scapvv.csv
Svv saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_svcapvv.csv
Shv saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_shv.csv
SHV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_scaphcapv.csv
ShV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_shcapv.csv
SVH saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_svcaph.csv
S-parameters saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHz_36GHz_26March2021_s_parameters.s4p
  
```



## Vconfig measurement



Take Tconfig measurement  
 press once for required setup and twice for measurement  
 Setup shown bottom right and on next slide (repeat if needed)

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory: D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition

Process Collected S-Parameters

Close Console

Collect S-Parameters

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Tconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Save Offset Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

File Identification: OMT22\_SN132\_34GHZ\_36GHZ\_26March2021

Enable Offset Gconfig S-Parameters

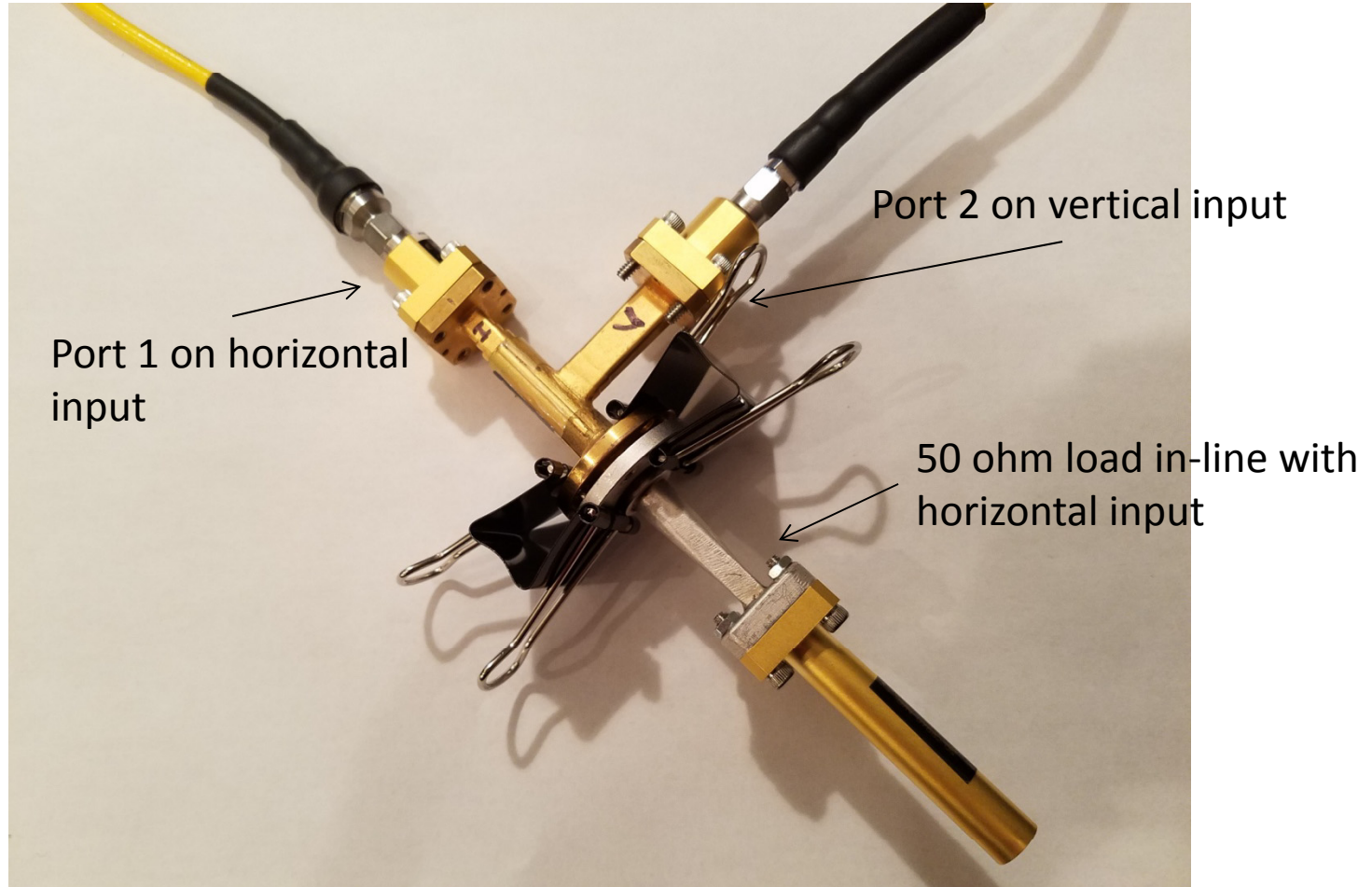
Processing Notes: Clear Processing Notes Enable (Tau1 + Tau2) / 2 Phase Correction

Processing Notes:

```

SHh saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_shcaph.csv
SHh saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_scaphh.csv
Shh saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_Sh.h.csv
SVV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_scapvcapv.csv
SvV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_svcapv.csv
SVv saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_svpv.csv
Svv saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_svcapv.csv
Shv saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_shv.csv
SHV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_scaphcapv.csv
ShV saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_shcapv.csv
SVH saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_svcapv.csv
S-parameters saved to D:\Littrell_delay_line\Ortho_mode_transducer_files\OMT22_SN132_34GHz_36GHz_26March2021_Files\ OMT22_SN132_34GHZ_36GHZ_26March2021_s_parameters.s4p
  
```

## Tconfig measurement



Take Gconfig measurement  
 press once for required setup and twice for measurement  
 Setup shown bottom right and on next slide (repeat if needed)

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition Collect S-Parameters

Process Collected S-Parameters

Close Console

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Tconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

Save Offset Gconfig S-Parameters

File Identification OMT22\_SN132\_34GHZ\_36GHZ\_26March2021

Enable Offset Gconfig S-Parameters

Processing Notes Clear Processing Notes Enable (Tau1 + Tau2) / 2 Phase Correction

SHh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shcaph.csv

SHh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shh.csv

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scapvcapv.csv

SvV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shvcapv.csv

SHV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_shvcapv.csv

SVH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_svcapv.csv

S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_s\_parameters.s4p

To VNA Port 1 H Matched

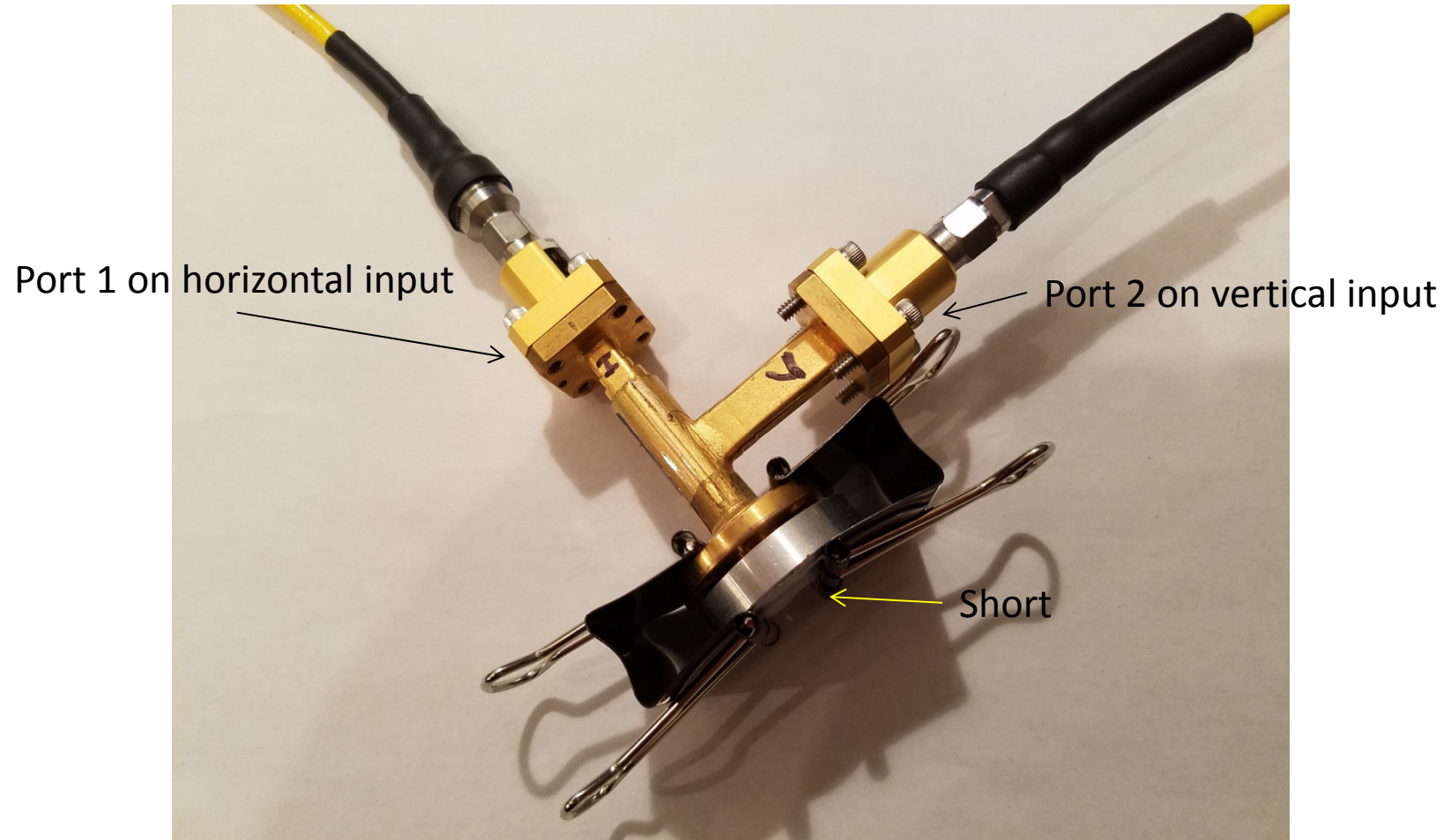
To VNA Port 2 V Matched

$\Gamma_O = -1$   $\Gamma_O = -1$

G(-1) config.



## Gconfig measurement



# Take Offset Gconfig measurement

press once for required setup and twice for measurement

Setup shown bottom right and on next slide (repeat if needed)

This measurement needed only if pole condition(s) appear in results

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files

De-embed Cir to Rect Transition Collect S-Parameters

Process Collected S-Parameters

Close Console

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Tconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Save Offset Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

File Identification OMT22\_SN132\_34GHZ\_36GHZ\_26March2021

Enable Offset Gconfig S-Parameters

Processing Notes Clear Processing Notes Enable (Tau1 + Tau2) / 2 Phase Correction

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shcapv.csv

SHh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shv.csv

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scapvcapv.csv

SvV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Svv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shv.csv

SHV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shcapv.csv

SvH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Svcaph.csv

S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files\ OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_s\_parameters.s4p

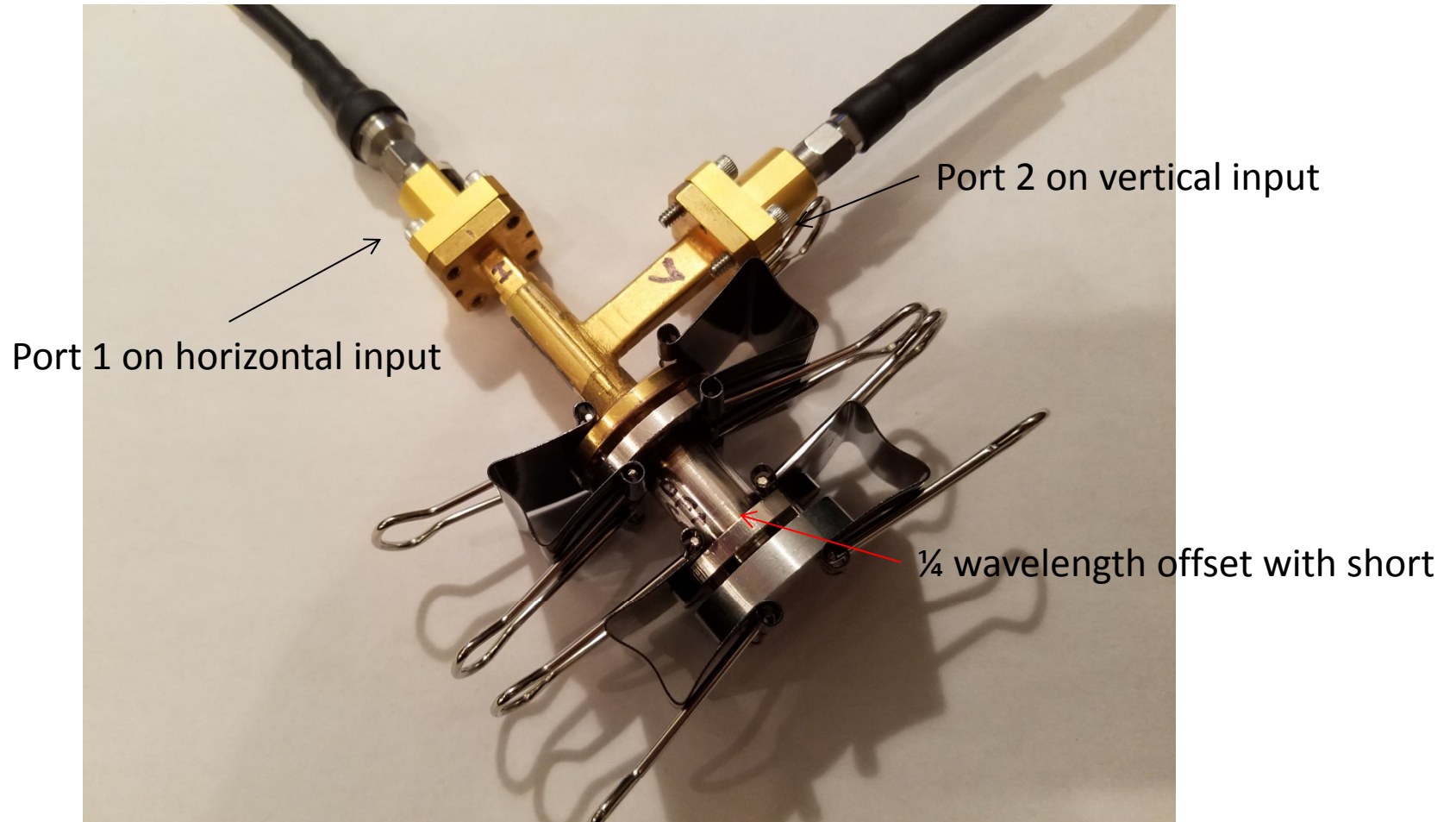
To VNA Port 1 H Matched To VNA Port 2 V Matched

$\Gamma_O = -1$   $\Gamma_O = -1$

G(-1) config.

Terminate with 1/4 wavelength offset short.

## Offset Gconfig measurement



# Process S-parameter measurements

Select Offset Gconfig measurements only if pole condition(s) appear in results

Orthomode Transducer Test Program - Agilent E8364C - Wurtz, Wednesday, 21 April 2021, 8:03 P.M.

Logo Main Display CR Transition Phase Delay Plot CR Transition S11 Plot Port VSWR Plots Transmission Plots Isolation Plots Cross Polarization Plots

Project Directory D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files

De-embed Cir to Rect Transition

Process Collected S-Parameters

Close Console

Collect S-Parameters

Save Hconfig Hh S-Parameters Save hconfig Hv S-Parameters Save Tconfig S-Parameters

Save vconfig Vh S-Parameters Save Vconfig Vv S-Parameters Save Gconfig S-Parameters

Measurements from an Agilent E8364C PNA

Save Offset Gconfig S-Parameters

File Identification OMT22\_SN132\_34GHZ\_36GHZ\_26March2021

Enable Offset Gconfig S-Parameters

Enable (Tau1 + Tau2) / 2 Phase Correction

Clear Processing Notes

Processing Notes

ShH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shcapv.csv

SHh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scaphh.csv

Shh saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Sh.csv

SVV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scapvcapv.csv

SvV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Svcapv.csv

SVv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scapvv.csv

Svv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Svv.csv

Shv saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shv.csv

SHV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Scaphcapv.csv

ShV saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Shcapv.csv

SvH saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Svcapv.csv

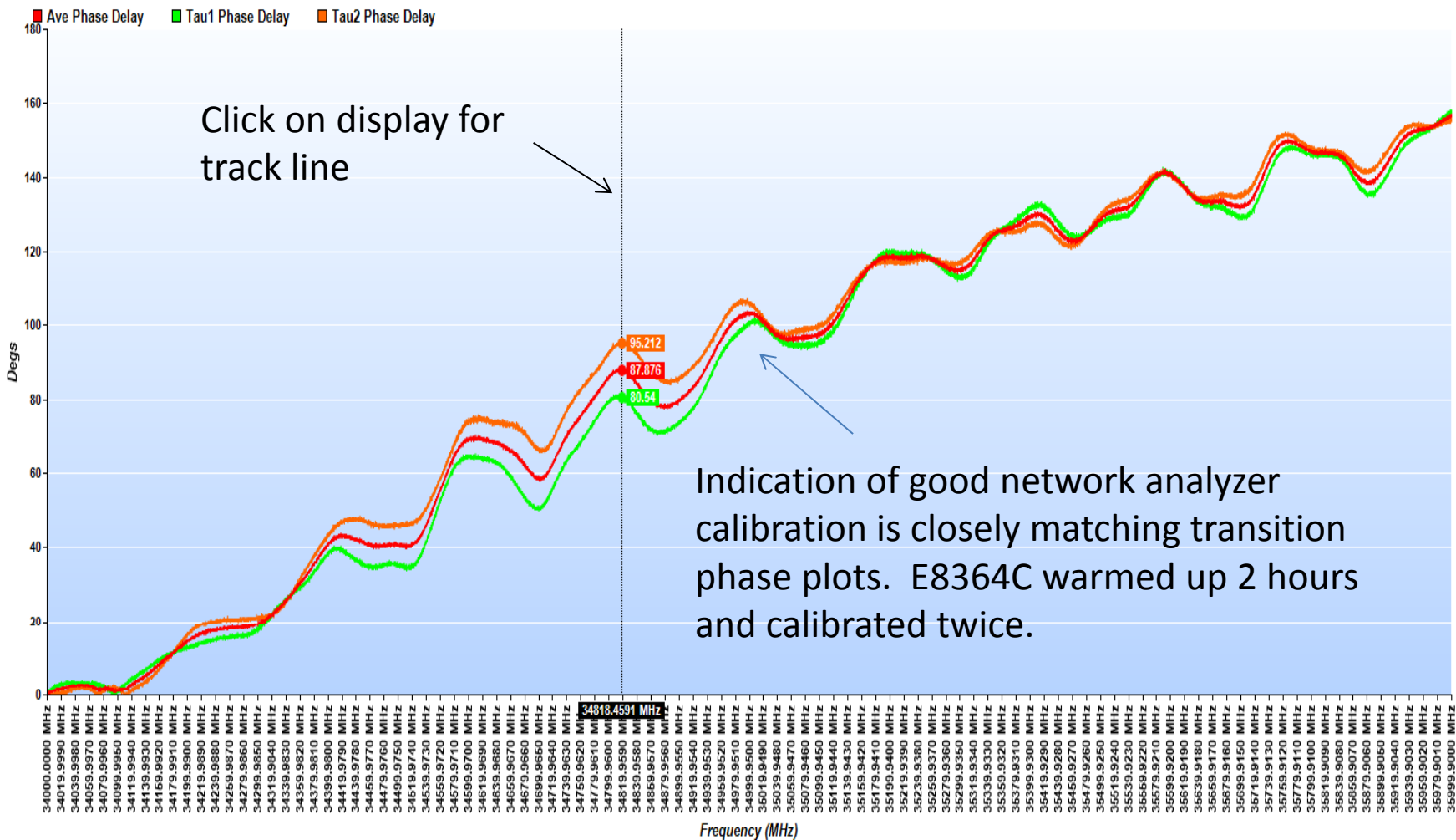
S-parameters saved to D:\Littrell\_delay\_line\Ortho\_mode\_transducer\_files\OMT22\_SN132\_34GHz\_36GHz\_26March2021\_Files\OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_s\_parameters.s4p

Select transition phase offset to be used for calculations

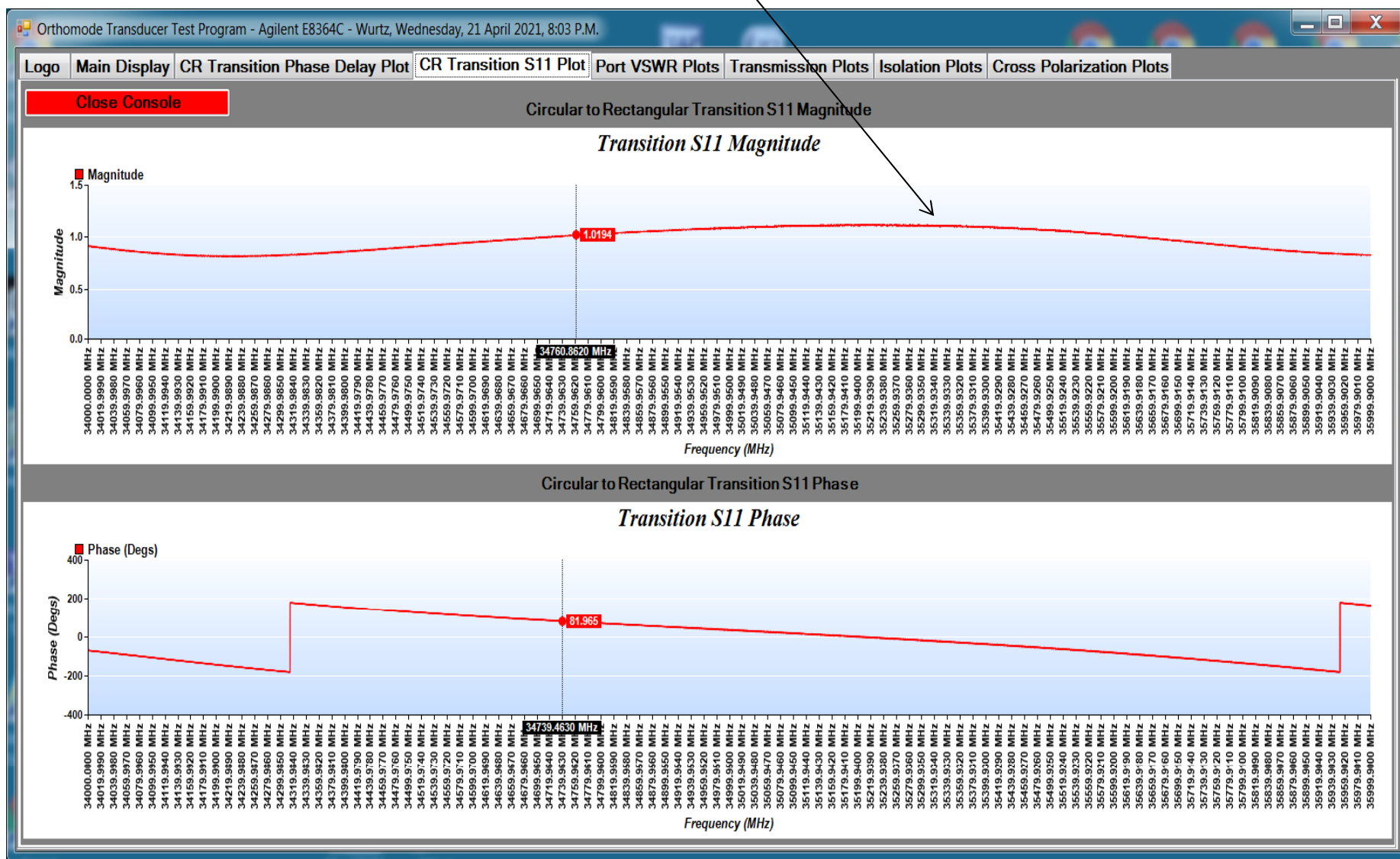


Close Console Zoom

### Circular-to-Rectangular Transition Phase Delay



Indicates quality of circular to rectangular transition  
Perfect result should be 1.0 for 100% reflection

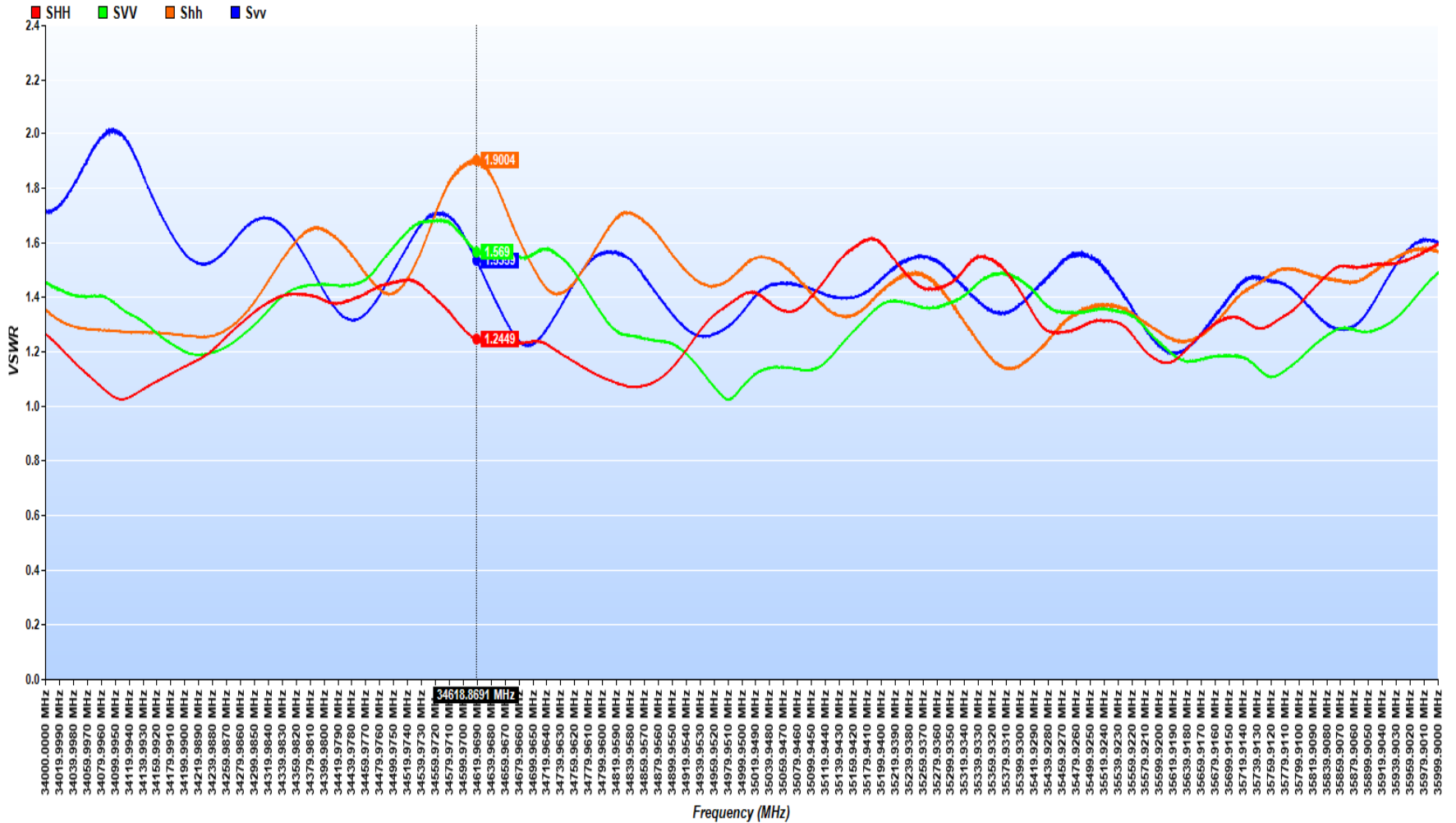


Close Console

Zoom

VSWR

### Port VSWR

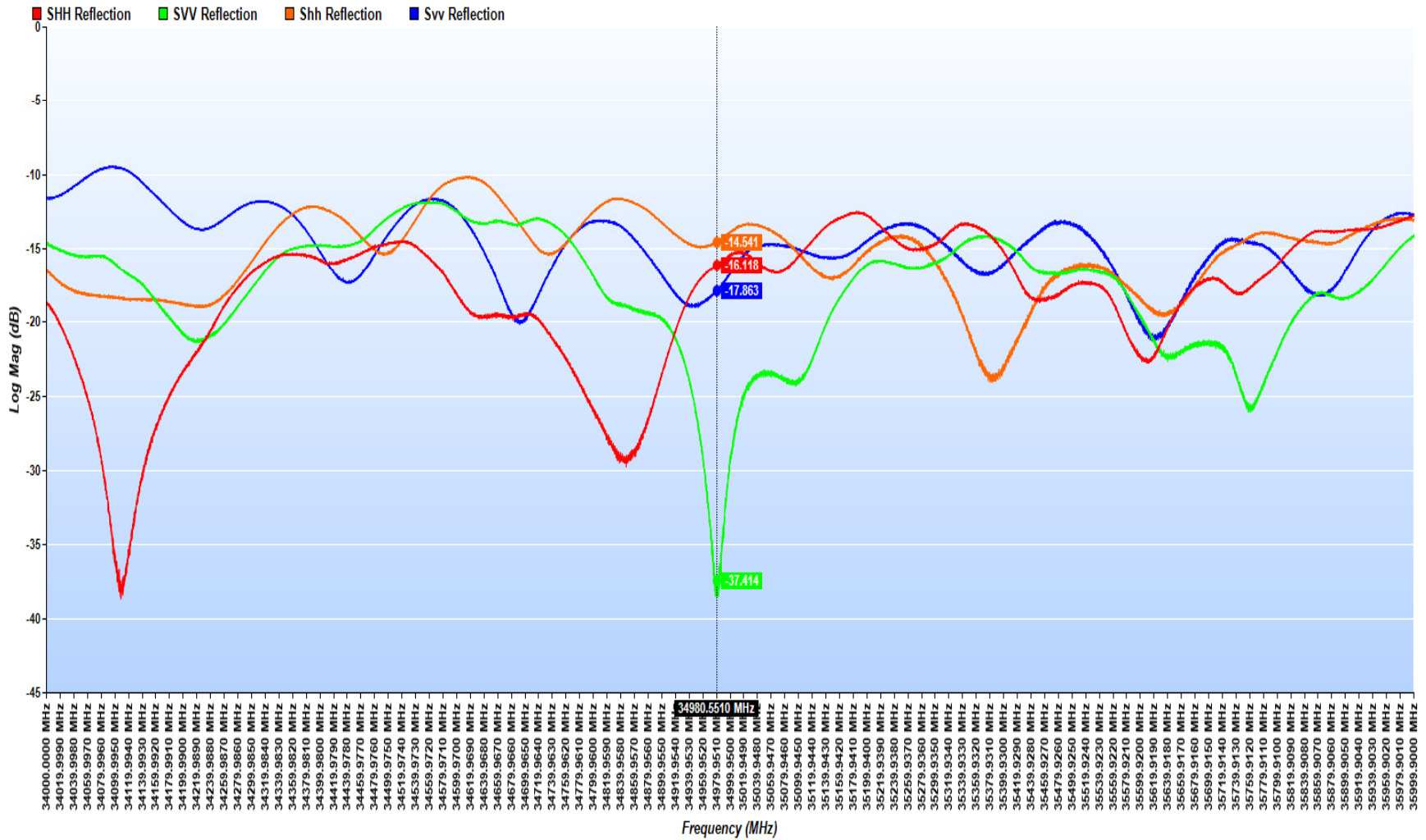


Close Console

Zoom

Log Mag (dB)

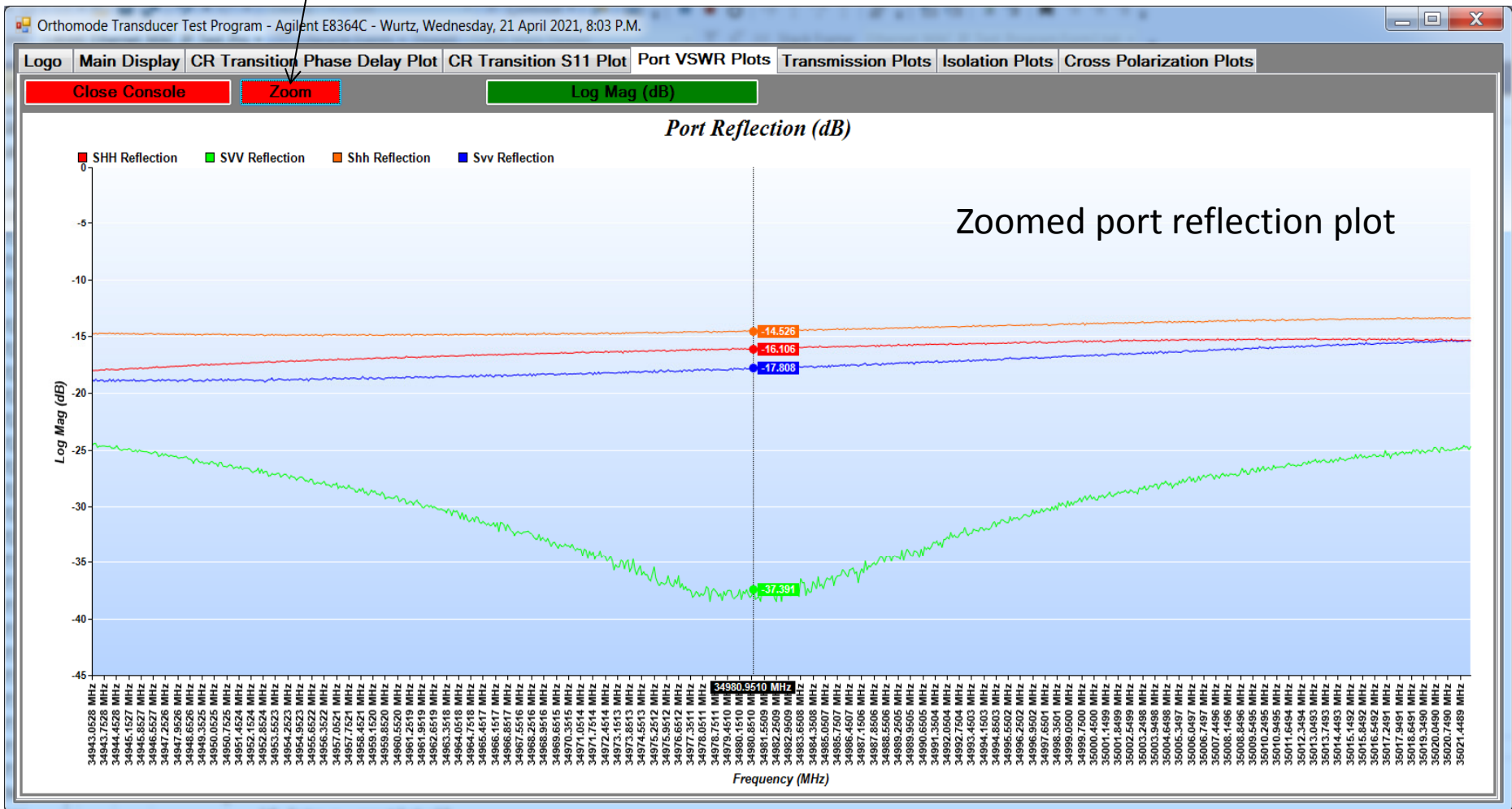
### Port Reflection (dB)





To zoom plot:

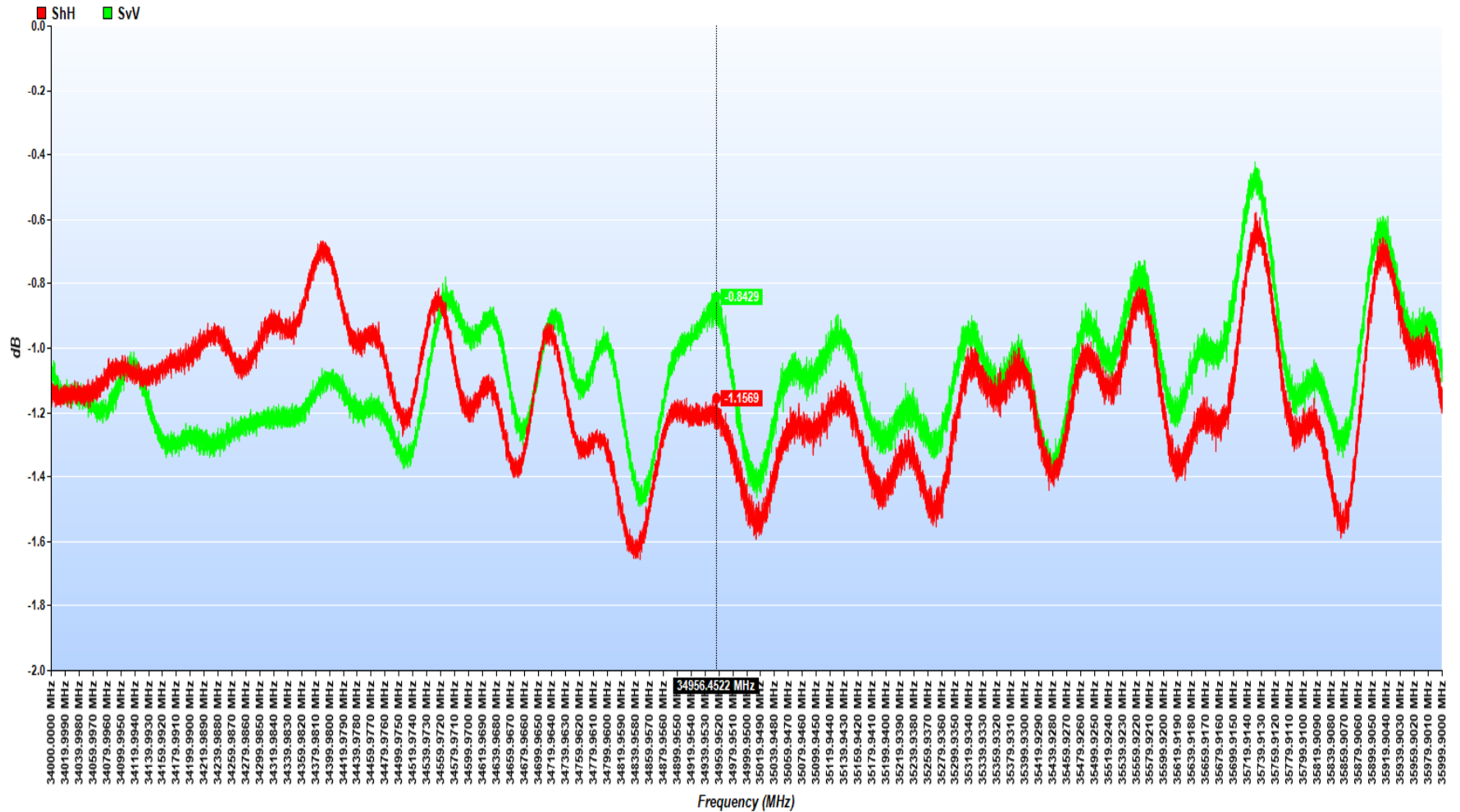
1. Press zoom button (will turn green)
2. Click on display start point
3. Click on display stop point (display will zoom and button will turn red)
4. Press zoom button twice for full display



Close Console

Zoom

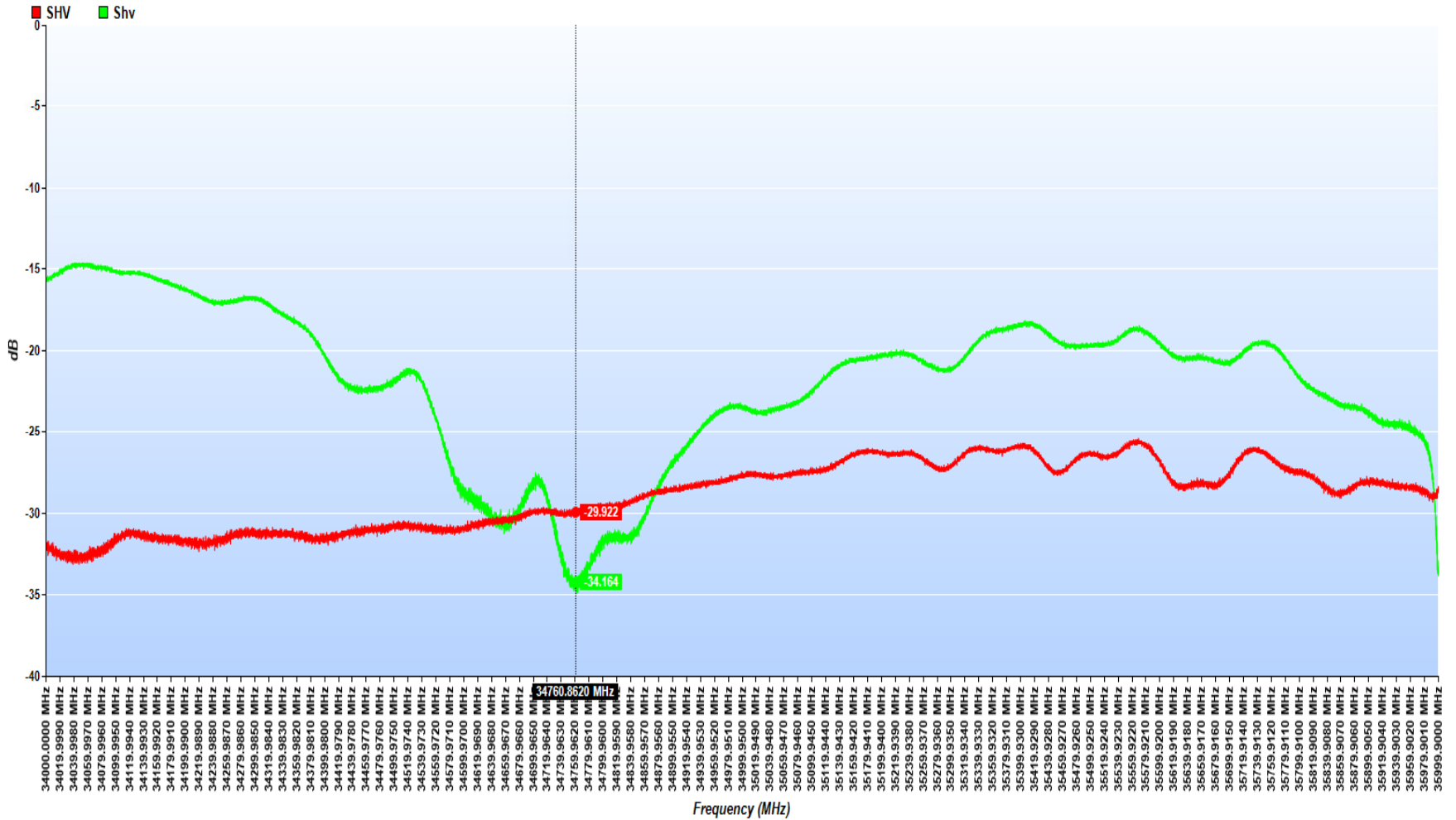
### Transmission S-Parameters



Close Console

Zoom

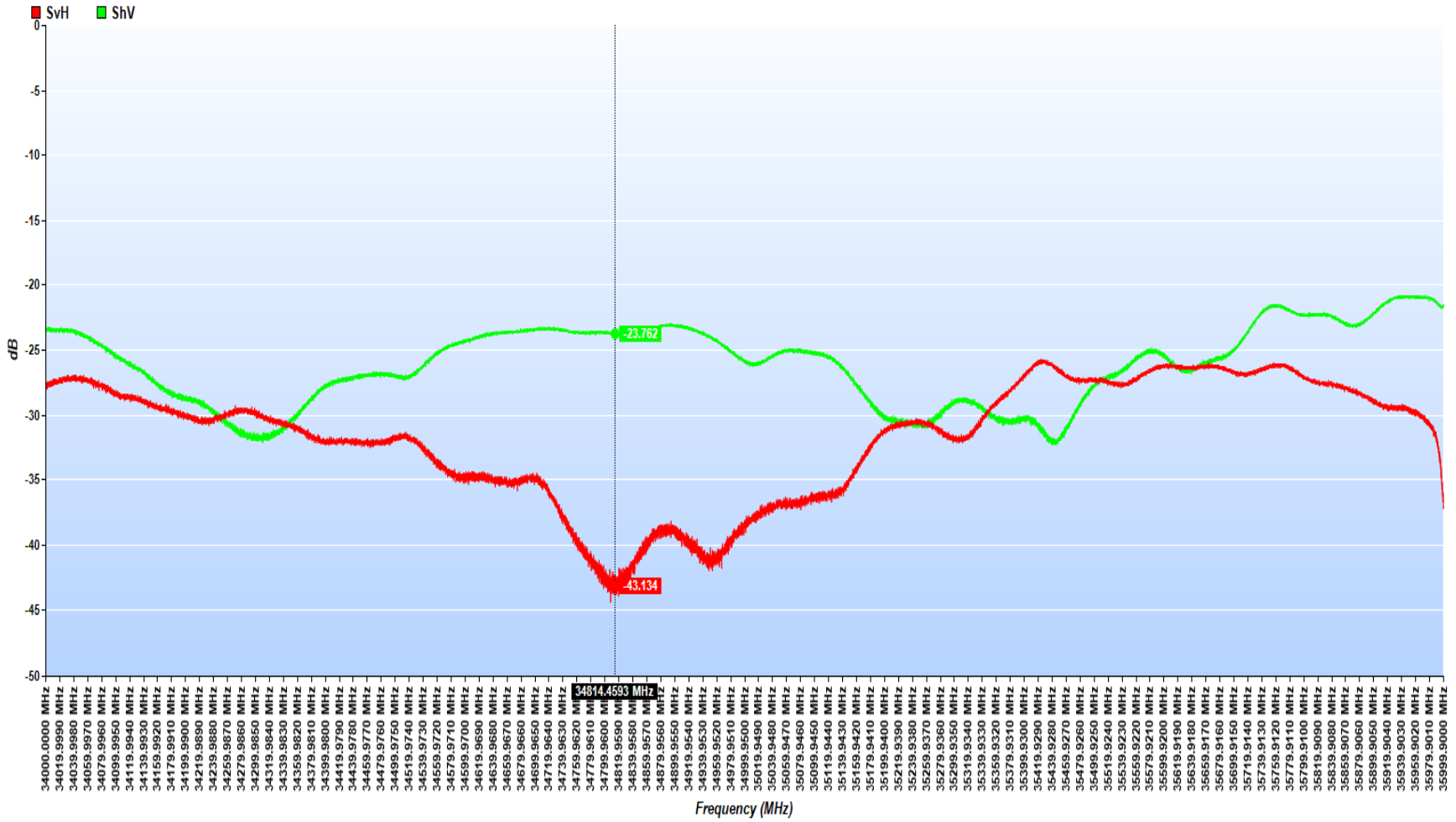
### Isolation S-Parameters



Close Console

Zoom

### Cross Polarization S-Parameters





Files saved in project directory:  
 OMT22\_SN132\_34GHZ\_36GHZ\_26March2021\_Files

Name	Date modified	Type	Size
Documents	4/22/2021 7:32 PM	File folder	
Pictures	4/22/2021 5:16 PM	File folder	
OMT22_SN132_34GHZ_36GHZ_26March2021_s_parameters.s4p	4/22/2021 5:00 PM	Text File	11,420 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Scaphcaph.csv	4/22/2021 5:00 PM	CSV File	1,363 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Scaphcapv.csv	4/22/2021 5:00 PM	CSV File	1,038 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Scaphh.csv	4/22/2021 5:00 PM	CSV File	1,052 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Scapvcapv.csv	4/22/2021 5:00 PM	CSV File	1,364 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Scapvw.csv	4/22/2021 5:00 PM	CSV File	1,057 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Shcapv.csv	4/22/2021 5:00 PM	CSV File	1,047 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Shcapv.csv	4/22/2021 5:00 PM	CSV File	1,038 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Shh.csv	4/22/2021 5:00 PM	CSV File	1,374 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Shv.csv	4/22/2021 5:00 PM	CSV File	1,039 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Svcaph.csv	4/22/2021 5:00 PM	CSV File	1,038 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Svcapv.csv	4/22/2021 5:00 PM	CSV File	1,050 KB
OMT22_SN132_34GHZ_36GHZ_26March2021_Svv.csv	4/22/2021 5:00 PM	CSV File	1,377 KB
Gconfig.dat	3/26/2021 4:58 PM	DAT File	3,126 KB
Hconfig_Hh.dat	3/26/2021 4:41 PM	DAT File	3,126 KB
hconfig_Hv.dat	3/26/2021 4:41 PM	DAT File	3,126 KB
offset_Gconfig.dat	3/10/2021 4:17 PM	DAT File	3,126 KB
offset1_Gconfig.dat	3/10/2021 4:12 PM	DAT File	3,126 KB
offset2_Gconfig.dat	3/10/2021 4:17 PM	DAT File	3,126 KB
s11_transition.dat	3/26/2021 4:39 PM	DAT File	782 KB
samplespersweep.dat	12/11/2020 11:46 ...	DAT File	1 KB
start_frequency.dat	12/11/2020 11:47 ...	DAT File	1 KB
stop_frequency.dat	12/11/2020 11:47 ...	DAT File	1 KB
Tconfig.dat	3/26/2021 4:57 PM	DAT File	3,126 KB
vconfig_Vh.dat	3/26/2021 4:47 PM	DAT File	3,126 KB
Vconfig_Vv.dat	3/26/2021 4:49 PM	DAT File	3,126 KB

Touchstone-like S parameter File

.csv files hold S-parameters for each plot

.dat files hold S-parameter measurements for OMT

Samples per sweep

Start frequency

Stop frequency