

Field Service Report FM Combiner and Antenna System

Fairmead ~ Clovis, CA.
ERI Antenna SHPX-8AC6-HW-SP
ERI 973-4 "TEE" Combiner System
KLVY – 91.1 MHz.
KOND – 92.1 MHz.
ERI Project # 17171B

March 24, 2010

Submitted By:

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INTRODUCTION

Listed below is a summary of the data and attached are the plots collected from the KLVY ~ KOND transmission site in Fresno, CA. by Jeff Taylor March 24, 2010.

- The antenna is an SHPX-8AC6-HW-SP.
- The combiner is a 973-4 "TEE"Combiner with forced air cooling and Group Delay Equalizers
- Equipment used for combiner testing is an Rohde & Schwarz ZVL Network Analyzer.
- Equipment used for antenna testing is an Rohde & Schwarz ZVL Network Analyzer High RF setup.
- All measurements of the combiner were taken at the inputs and output of the combiner with directional couplers.
- All measurements of the antenna were taken at the output of the 6 1/8" directional coupler.

The reason for this Field Service Trip was to tune the antenna, install the filters and proof the combined system.

SUMMARY and RECOMMENDATIONS

All measurements were taken by Jeff Taylor of Electronics Research Inc. March, 2010.

Sincerely

Jeff Taylor

DRAWINGS

Figure 1: Combiner Drawing

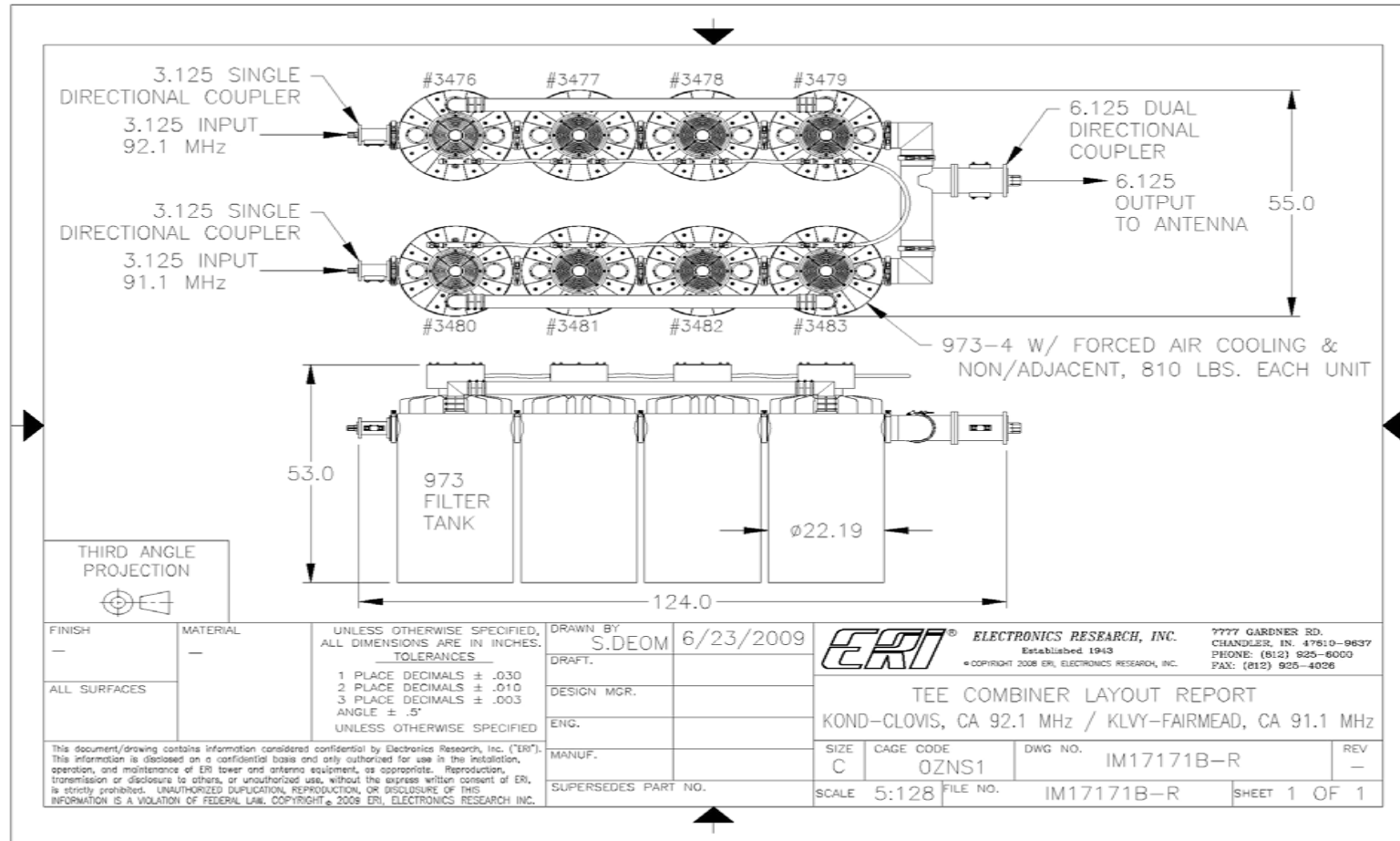


Figure 2: Antenna Drawing

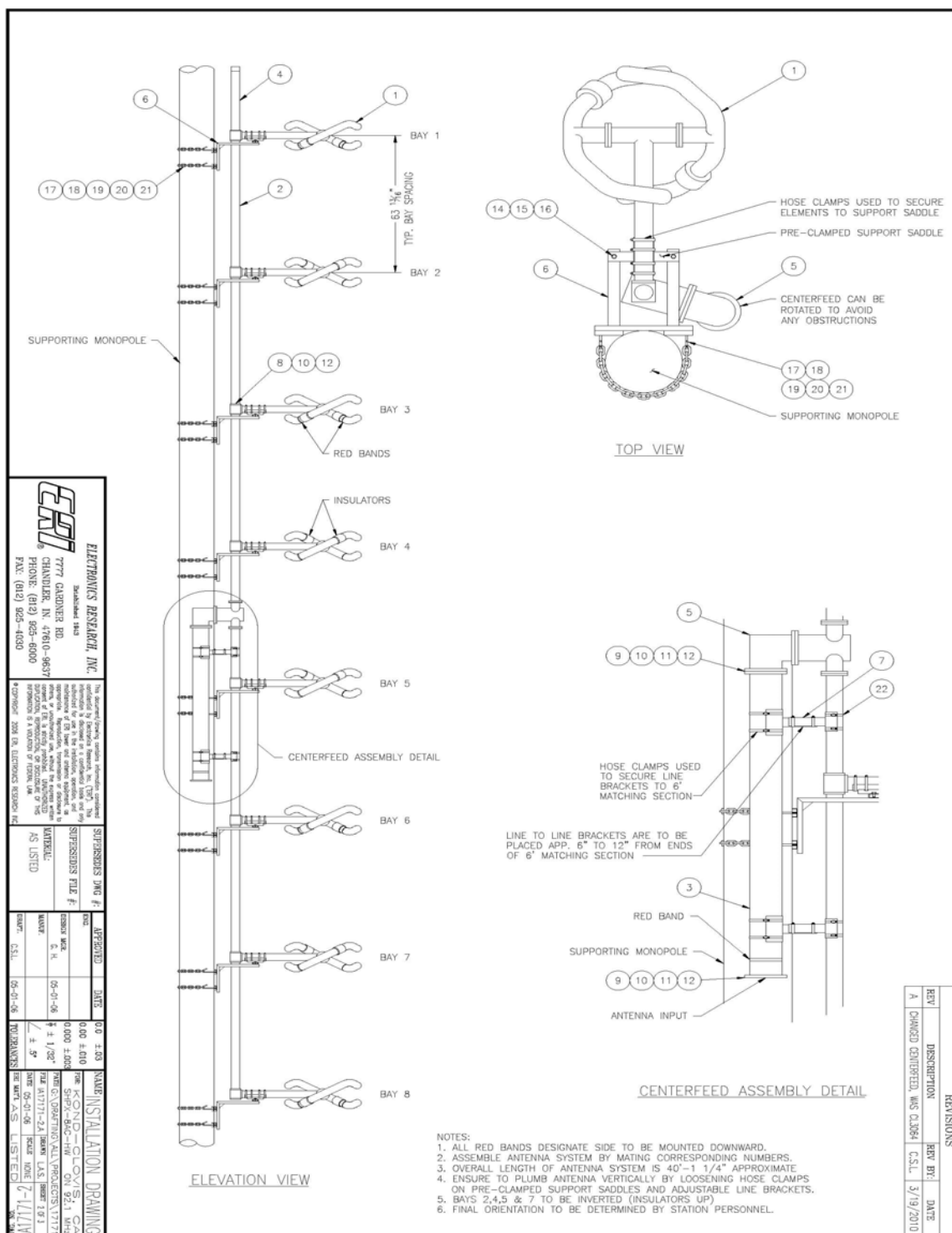
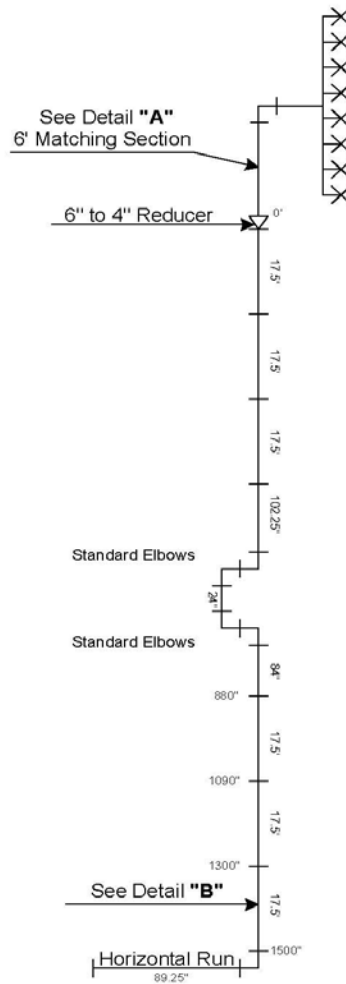
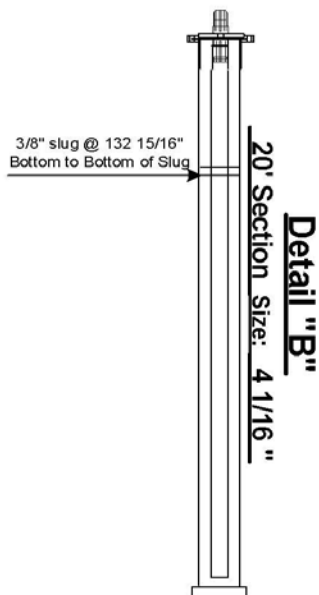
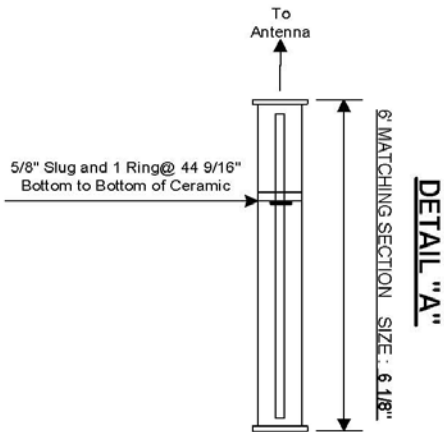


Figure 3: Feedline Layout

Tuning Slug Location for Fresno, CA.

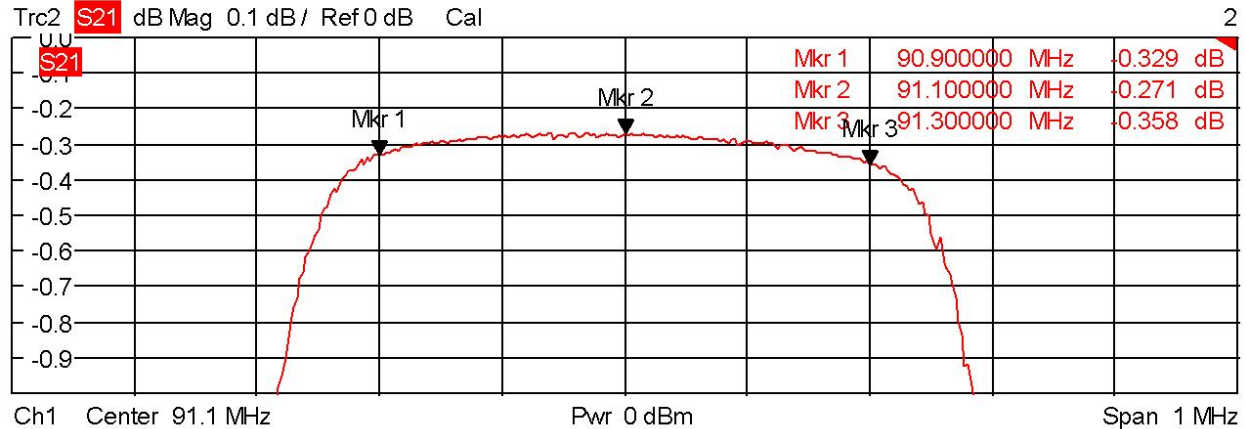
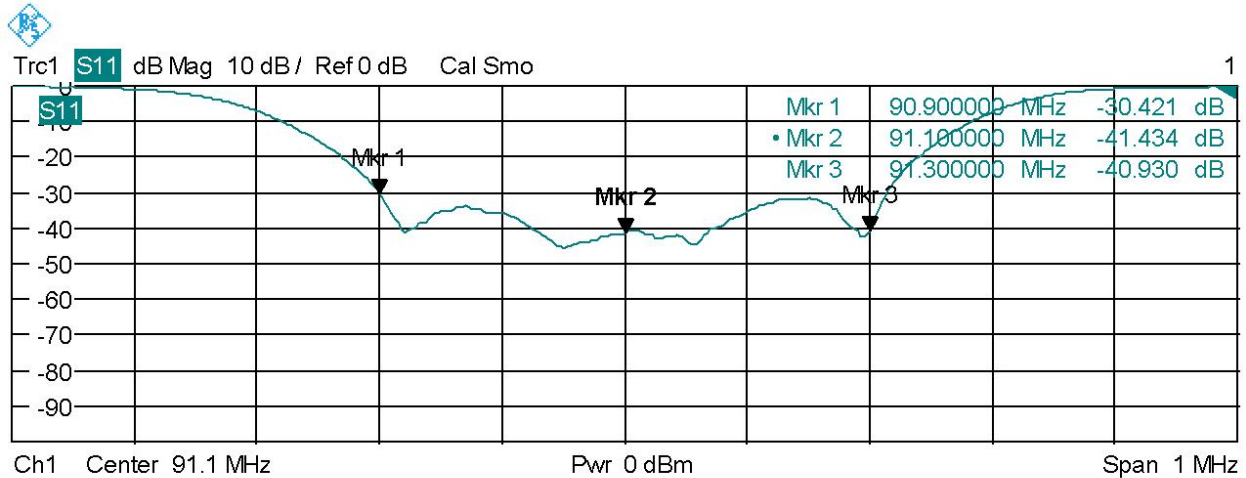
SHPX-8AC6-HW-SP

KLTV - 91.1 MHz. / KOND - 92.1 MHz.



PROJECT # : 17171B DATE: 3-23-10 LINE SIZE: 4 1/16" ERI MACXLine SECTION LENGTHS: 17.5'

Measurement 1: Match and Insertion Loss of 91.1 MHz.

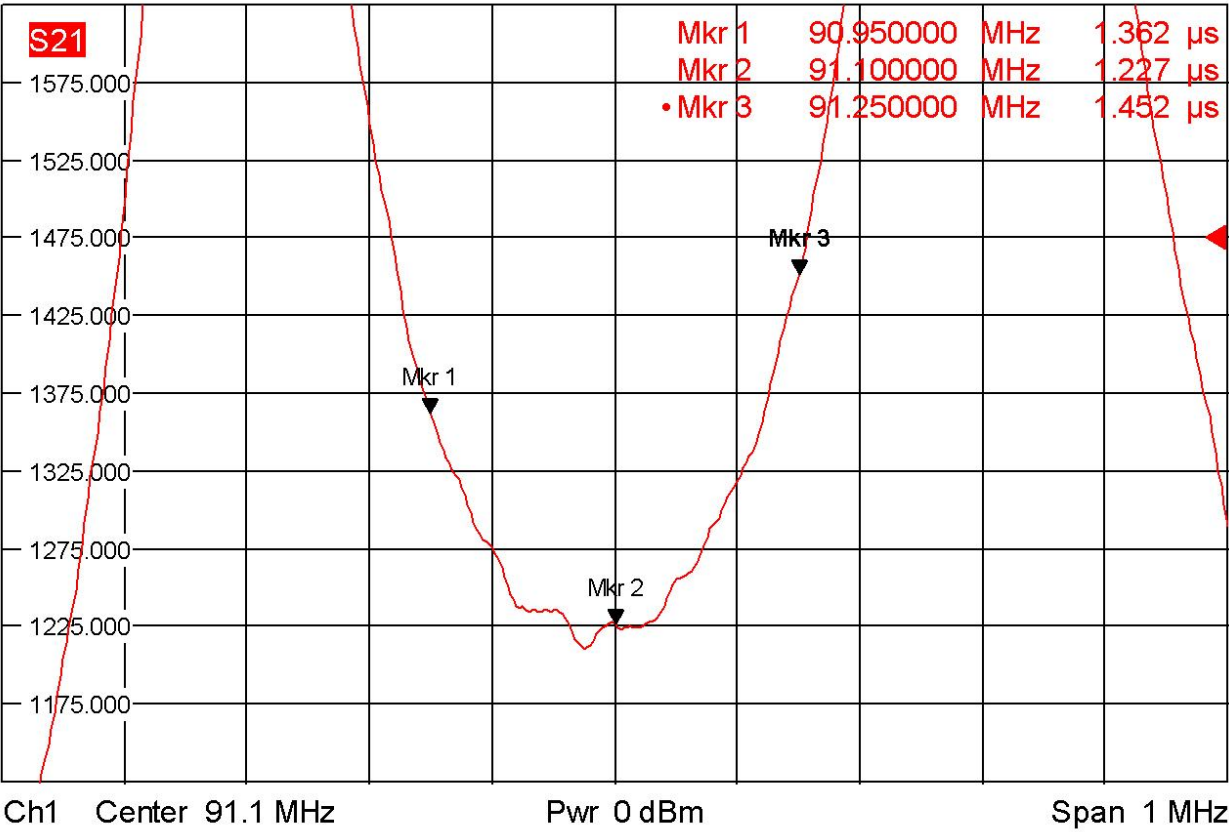


Date: 24.MAR.2010 12:56:14

Measurement 2: Group Delay of 91.1 MHz.



Trc2 **S21** Delay 50 ns/ Ref 1.475 μ s Cal Smo 2 of 2 (Max)



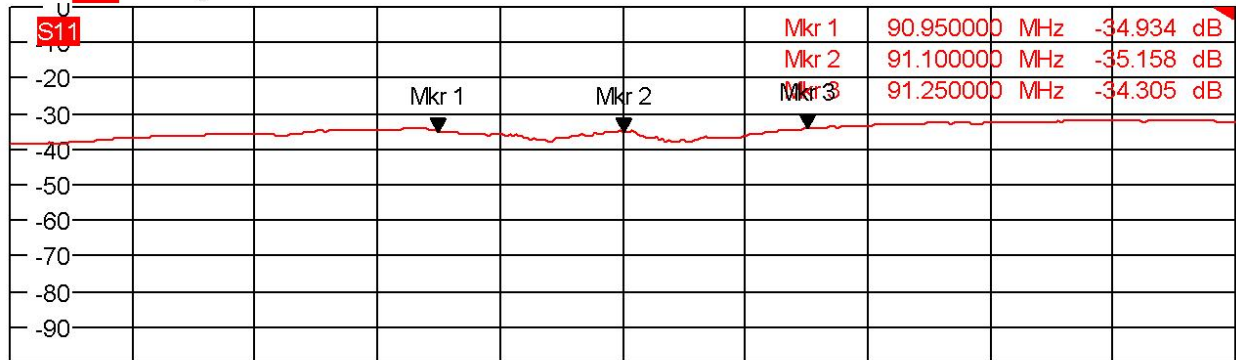
Date: 24.MAR.2010 12:59:18

Measurement 3: Match and Group Delay of Equalizer 91.1 MHz.



Trc1 S11 dB Mag 10 dB / Ref 0 dB Cal Smo

1



Ch1 Center 91.1 MHz

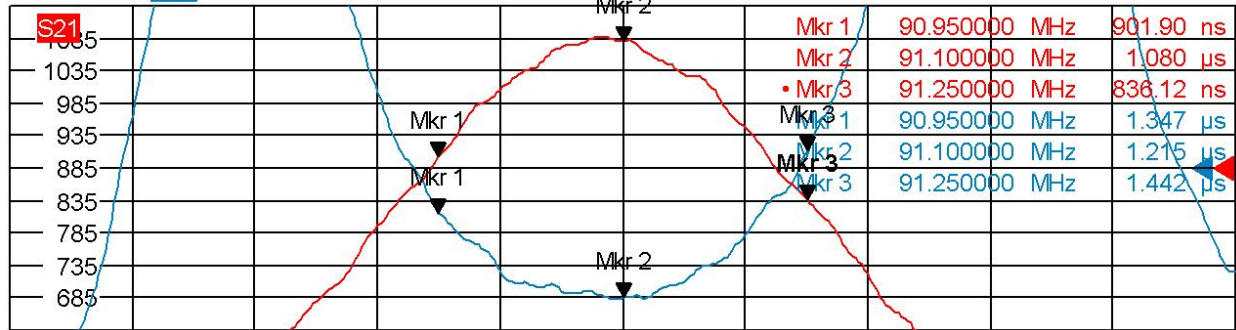
Pwr 0 dBm

Span 1 MHz

Trc2 S21 Delay 50 ns / Ref 885 ns Cal Smo

2

Mem3[Trc2] S21 Delay 50 ns / Ref 1.415 μ s Smo



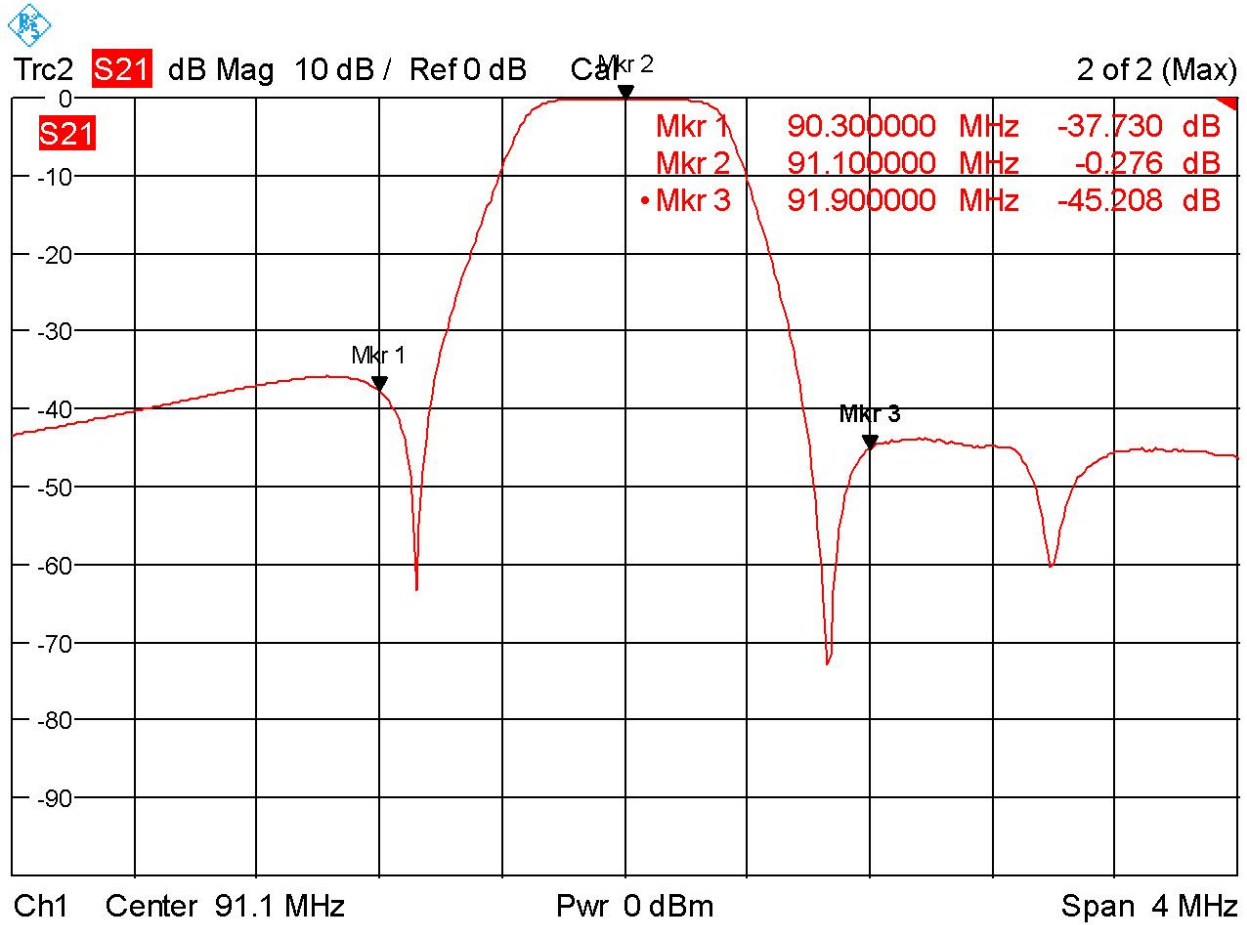
Ch2 Center 91.1 MHz

Pwr 0 dBm

Span 1 MHz

Date: 26.MAR.2010 16:16:55

Measurement 4: Isolation +/- 800 KHz. of 91.1 MHz.



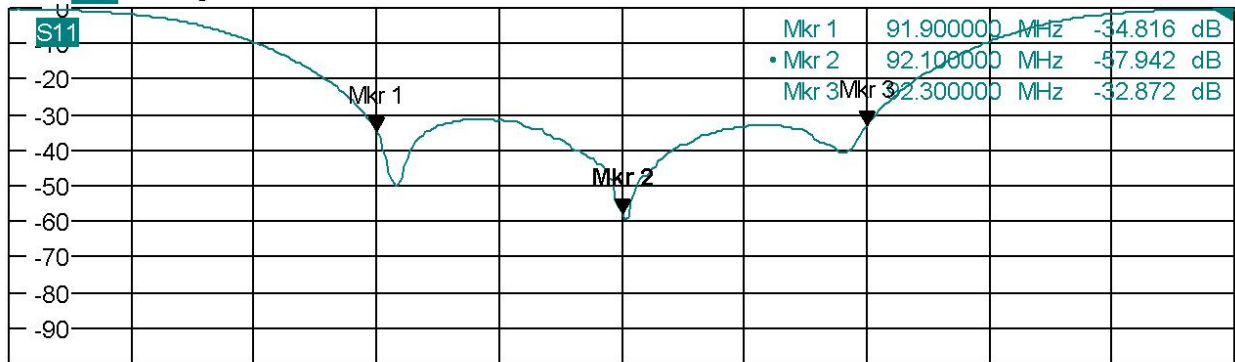
Date: 24.MAR.2010 13:00:32

Measurement 5: Match and Insertion Loss of 92.1 MHz.



Trc1 S11 dB Mag 10 dB / Ref 0 dB Cal Smo

1



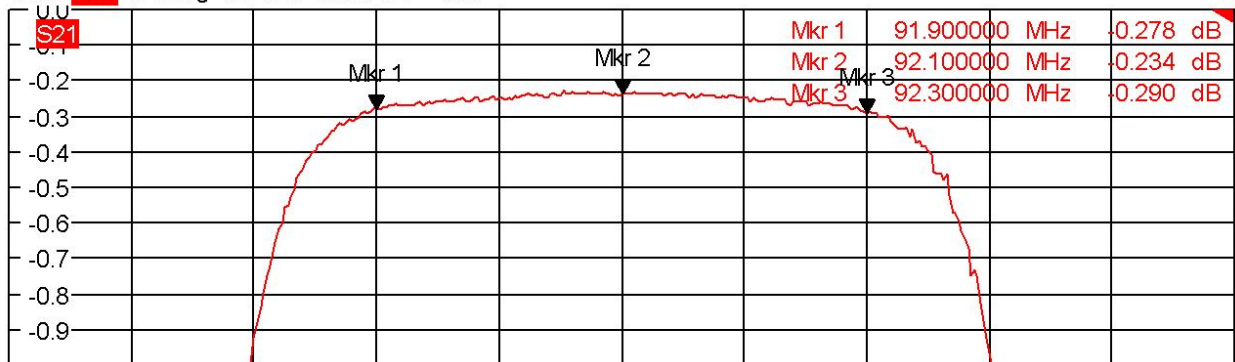
Ch1 Center 92.1 MHz

Pwr 0 dBm

Span 1 MHz

Trc2 S21 dB Mag 0.1 dB / Ref 0 dB Cal

2



Ch1 Center 92.1 MHz

Pwr 0 dBm

Span 1 MHz

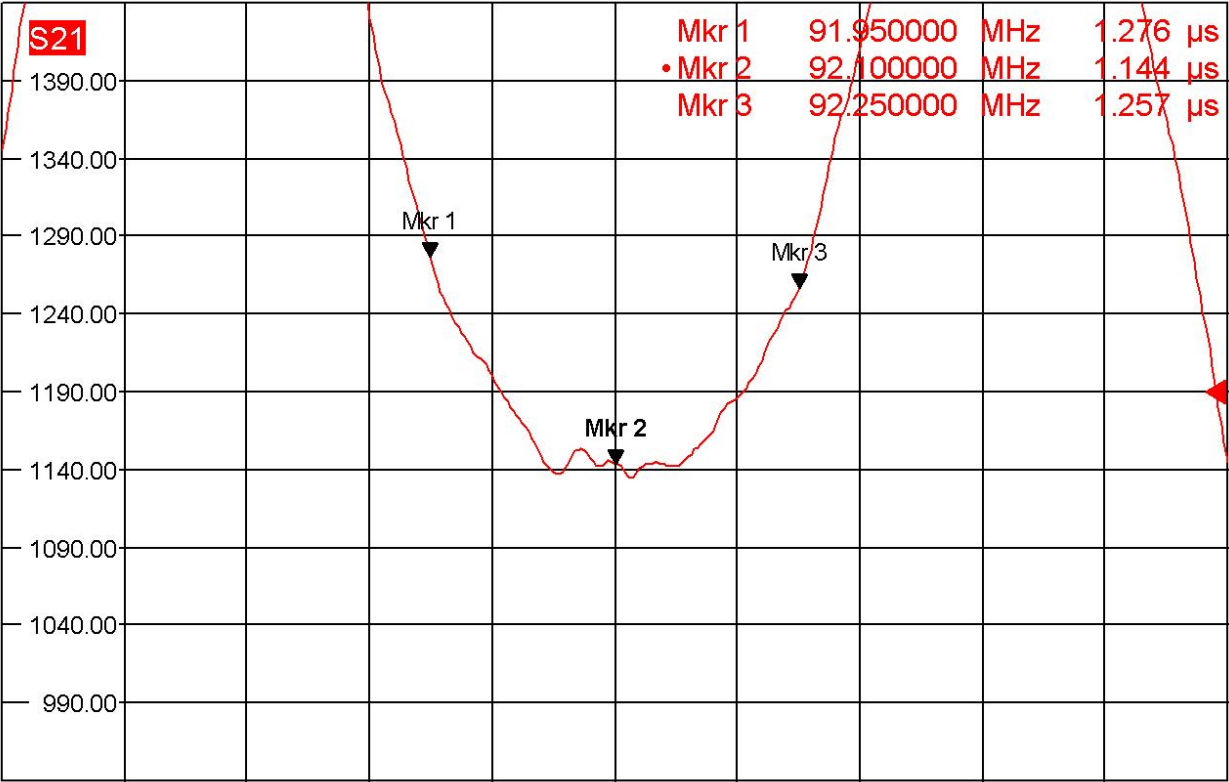
Date: 24.MAR.2010 13:03:08

Measurement 6: Group Delay of 92.1 MHz.



Trc2 **S21** Delay 50 ns/ Ref 1.19 μ s Cal Smo

2 of 2 (Max)



Ch1 Center 92.1 MHz

Pwr 0 dBm

Span 1 MHz

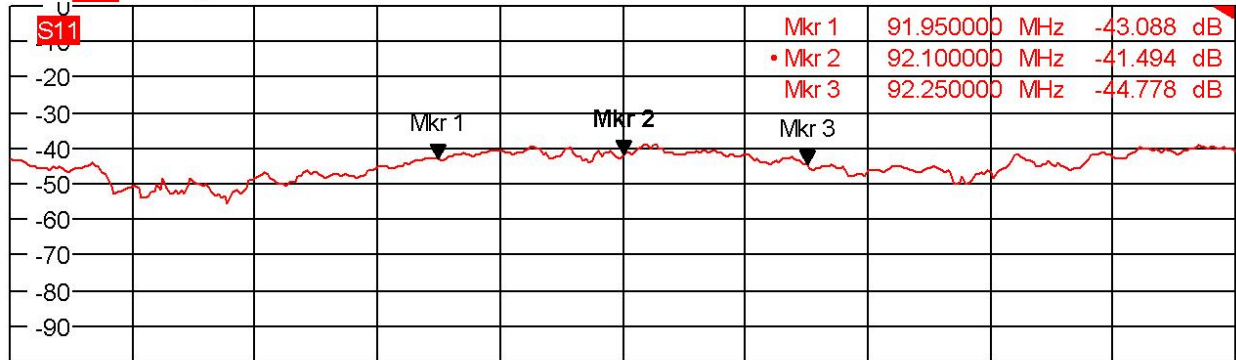
Date: 24.MAR.2010 13:06:44

Measurement 7: Match and Group Delay of Equalizer 92.1 MHz.



Trc1 **S11** dB Mag 10 dB / Ref 0 dB Cal Smo

1



Ch1 Center 92.1 MHz

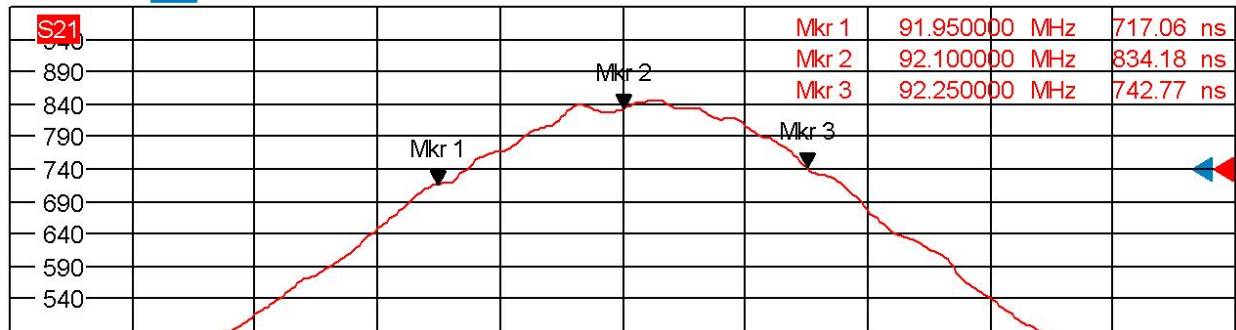
Pwr 0 dBm

Span 1 MHz

Trc2 **S21** Delay 50 ns / Ref 740 ns Cal Smo

2

Mem3[Trc2] **S21** Delay 50 ns / Ref 1.19 μ s Invisible



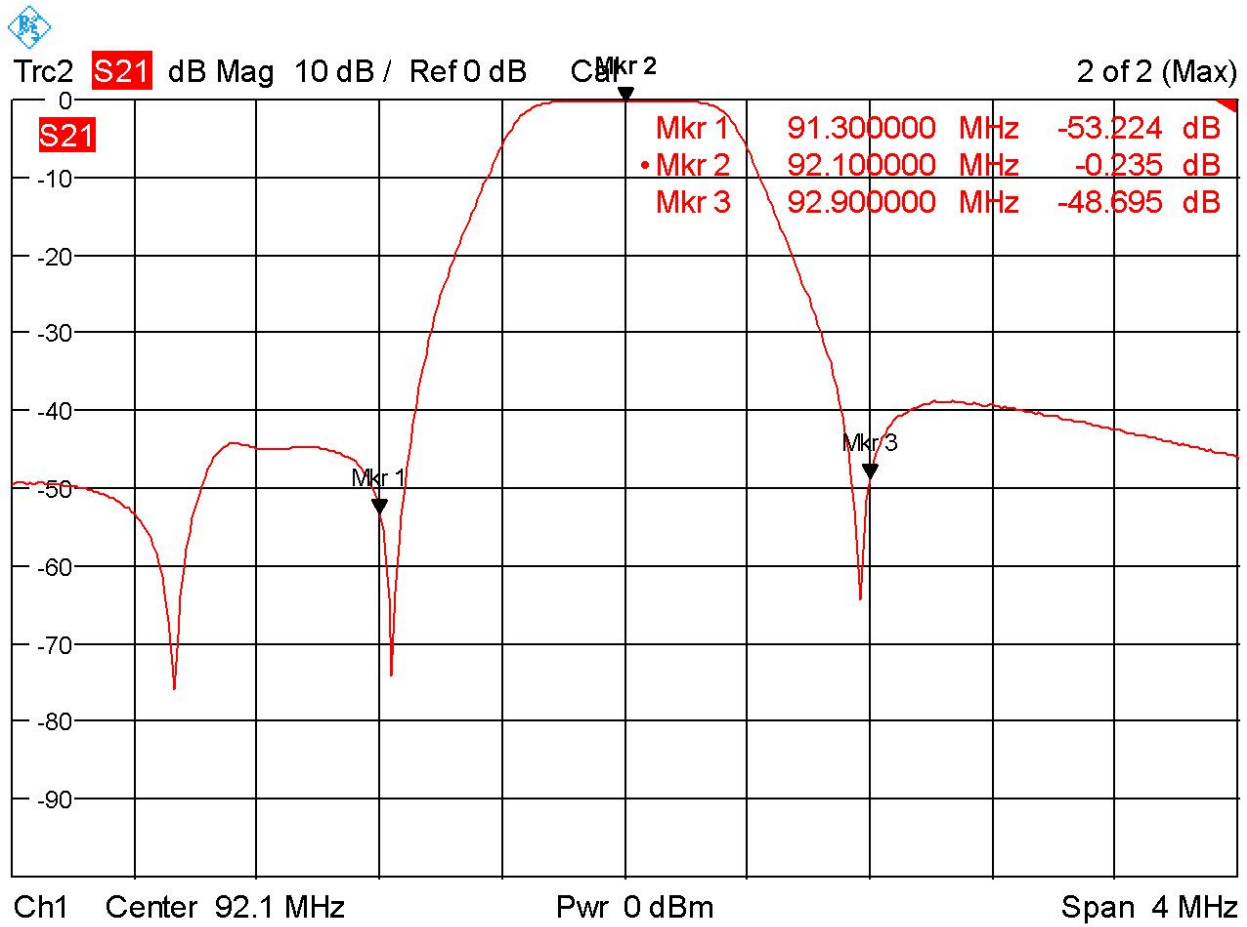
Ch2 Center 92.1 MHz

Pwr 0 dBm

Span 1 MHz

Date: 26.MAR.2010 17:20:58

Measurement 8: Isolation +/- 800 KHz. of 92.1 MHz.

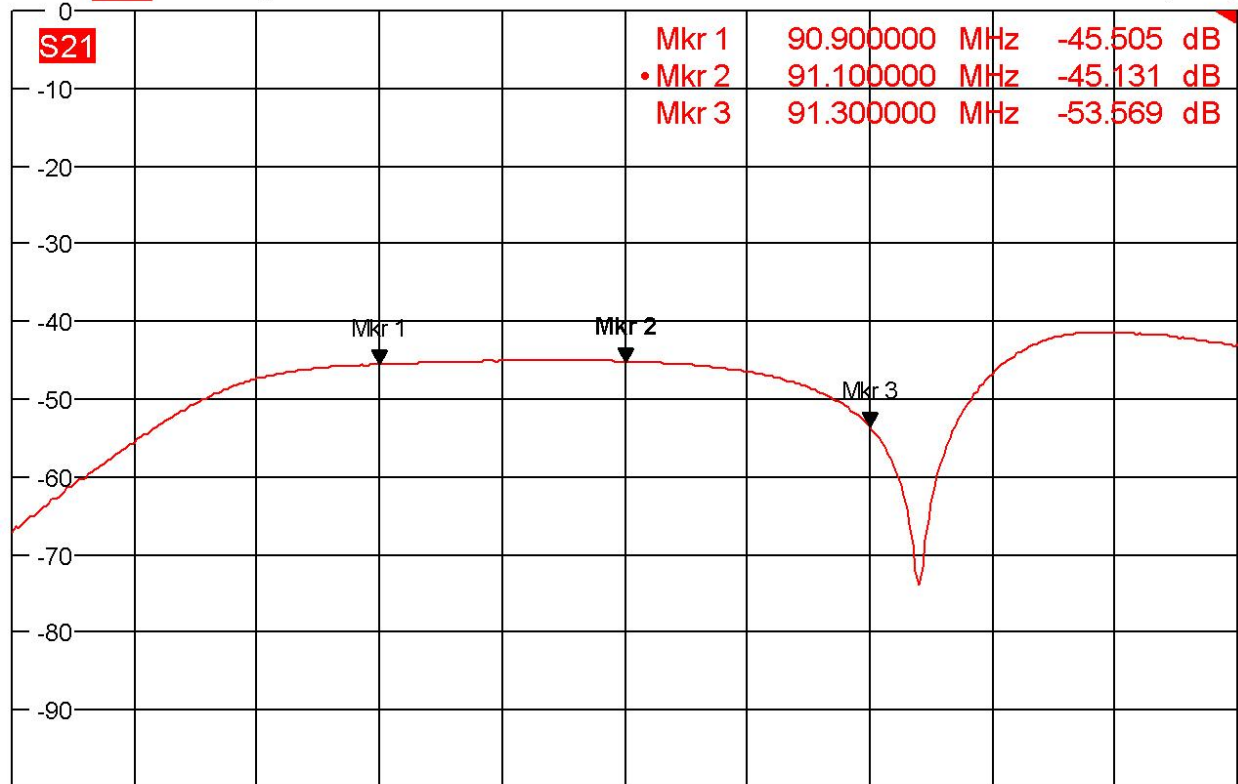


Date: 24.MAR.2010 13:04:24

Measurement 9: Port to Port Isolation From 91.1 to 92.1 MHz.



Trc2 **S21** dB Mag 10 dB / Ref 0 dB Cal 2 of 2 (Max)



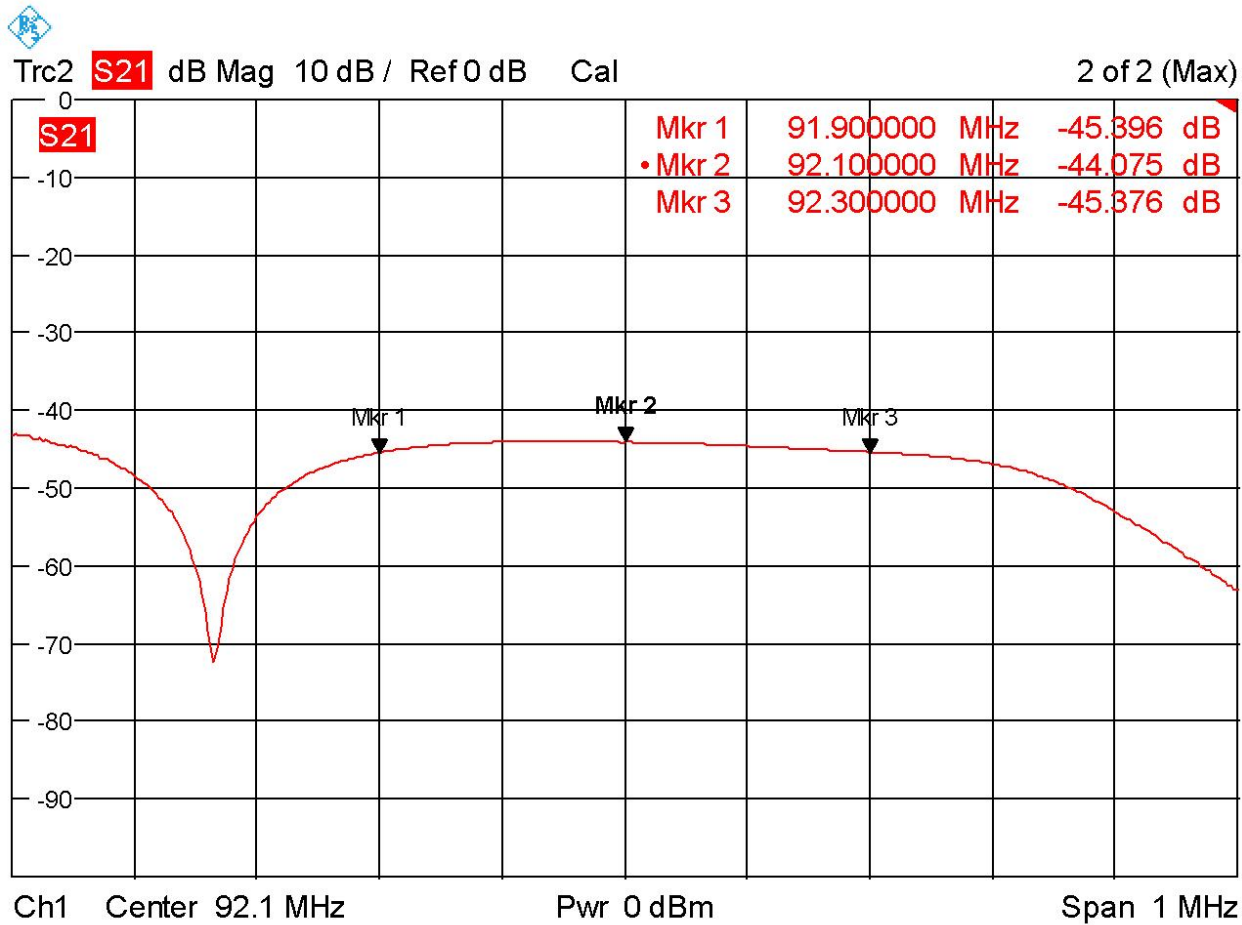
Ch1 Center 91.1 MHz

Pwr 0 dBm

Span 1 MHz

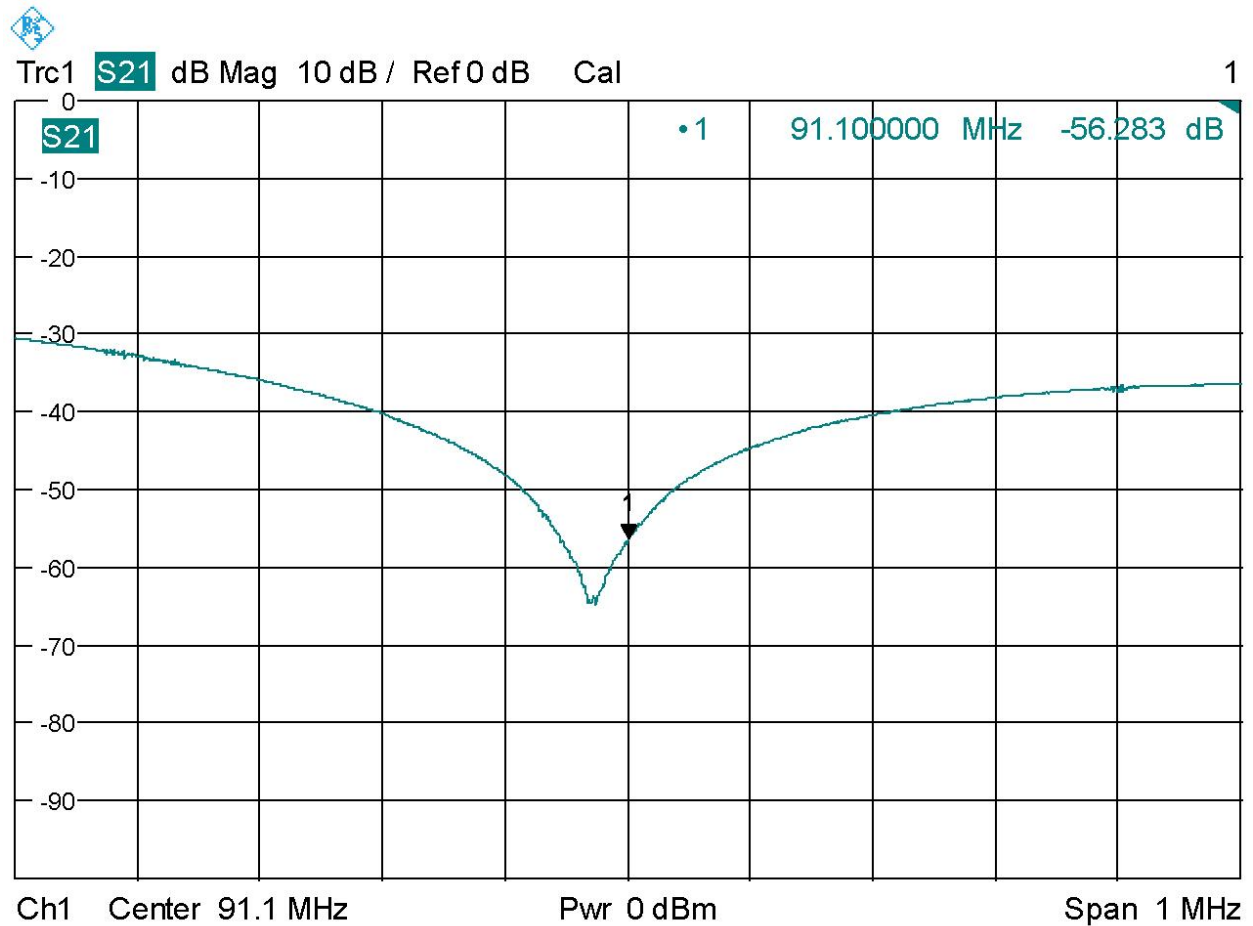
Date: 24.MAR.2010 13:16:07

Measurement 10: Port to Port Isolation from 92.1 to 91.1 MHz.



Date: 24.MAR.2010 13:14:11

Measurement 11: Final Antenna of 91.1 MHz.



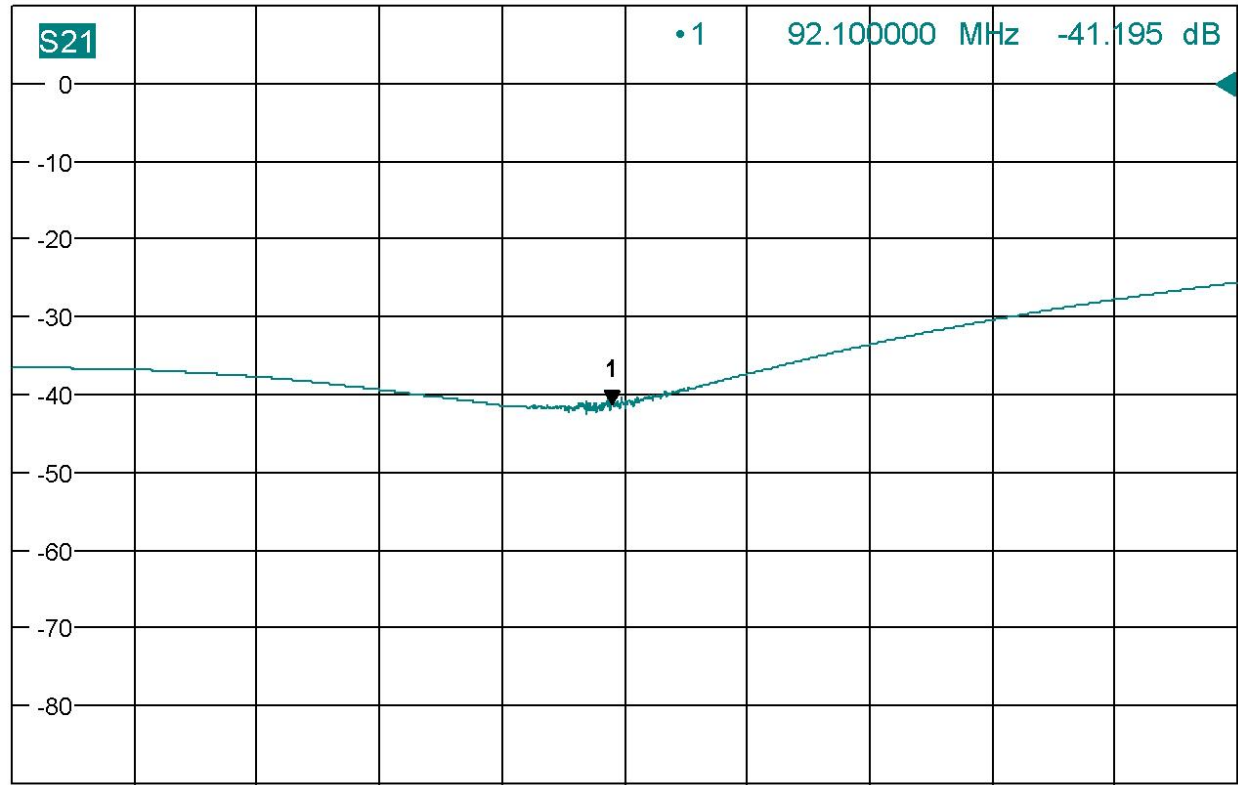
Date: 23.MAR.2010 18:37:06

Measurement 12: Final Antenna of 92.1 MHz.



Trc1 S21 dB Mag 10 dB / Ref 0 dB Cal

1



Ch1 Center 92.11 MHz

Pwr 0 dBm

Span 1 MHz

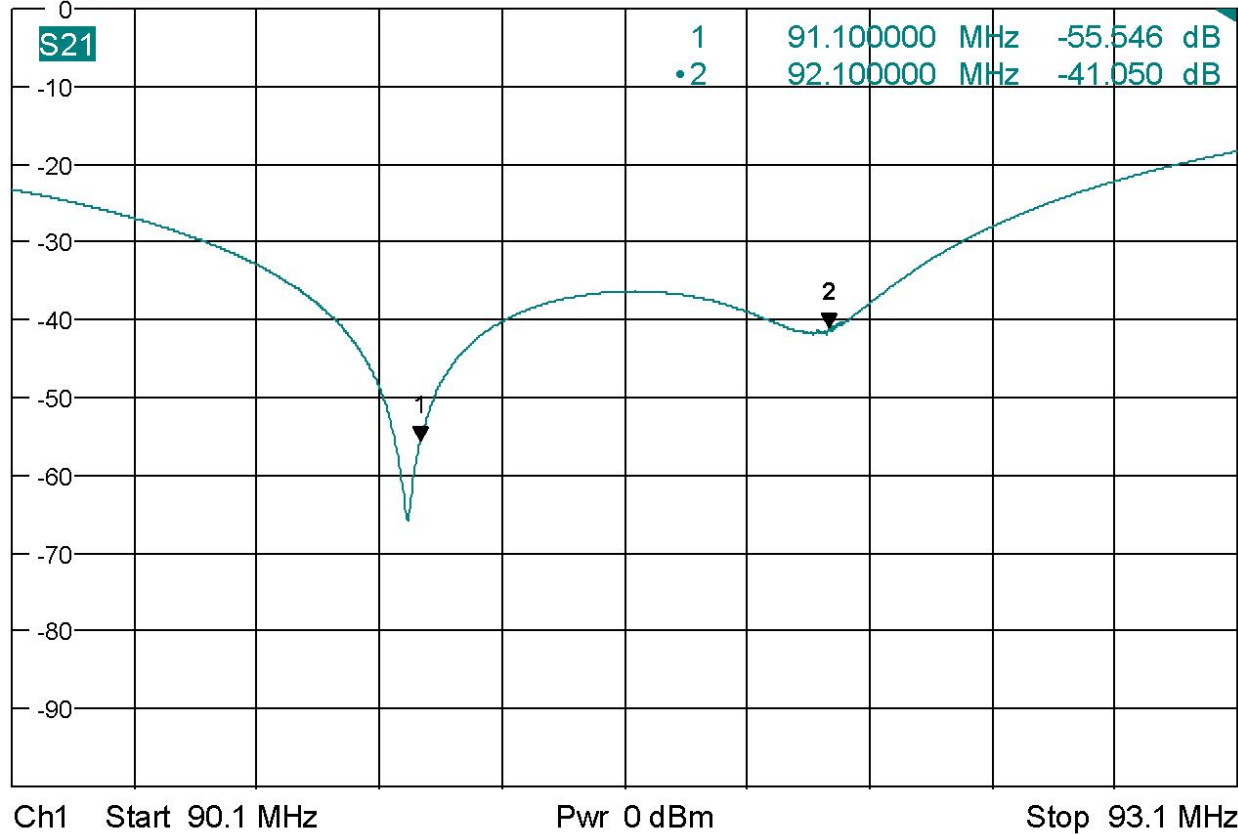
Date: 23.MAR.2010 18:39:12

Measurement 13: 3 MHz. Sweep of Final Antenna



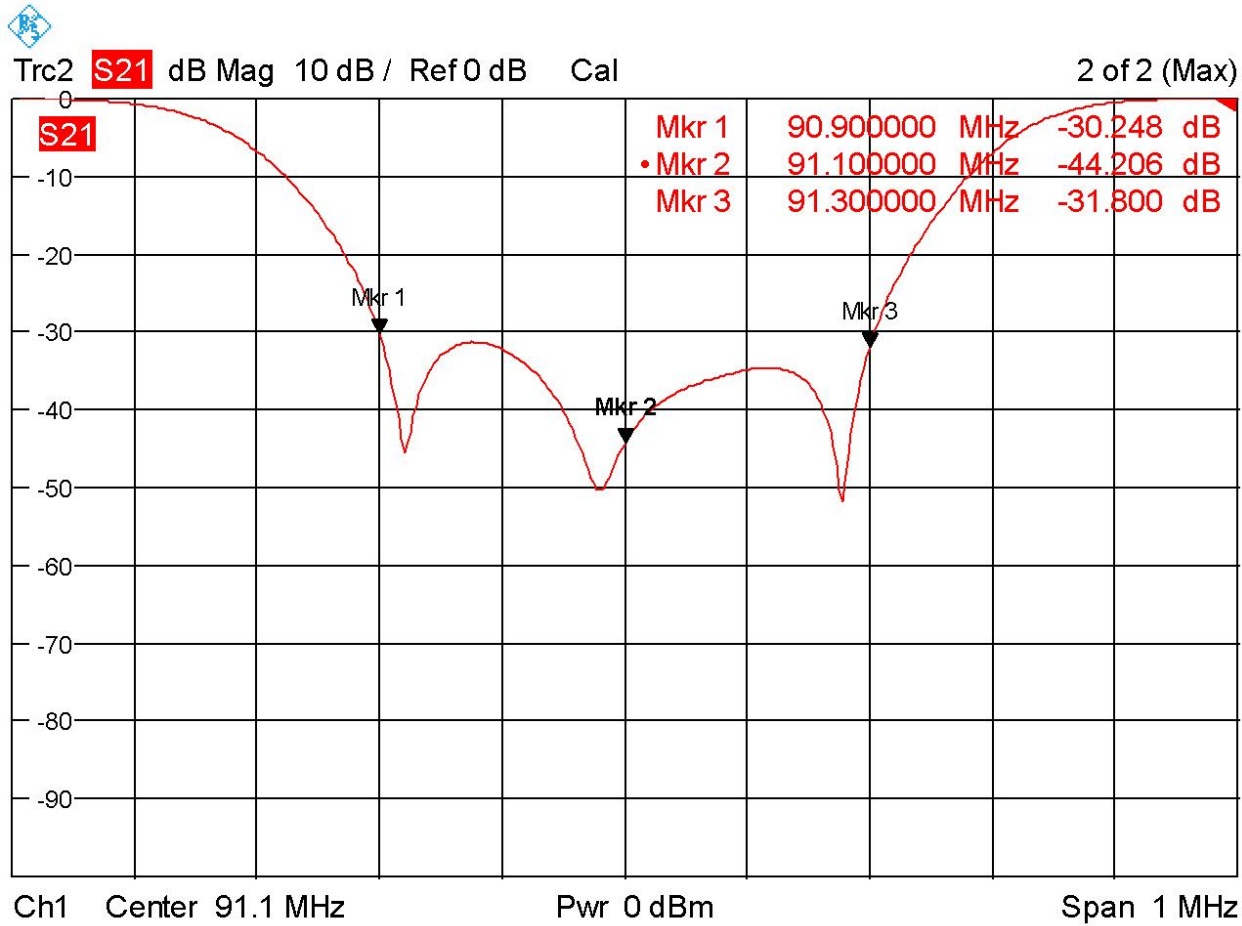
Trc1 S21 dB Mag 10 dB / Ref 0 dB Cal

1



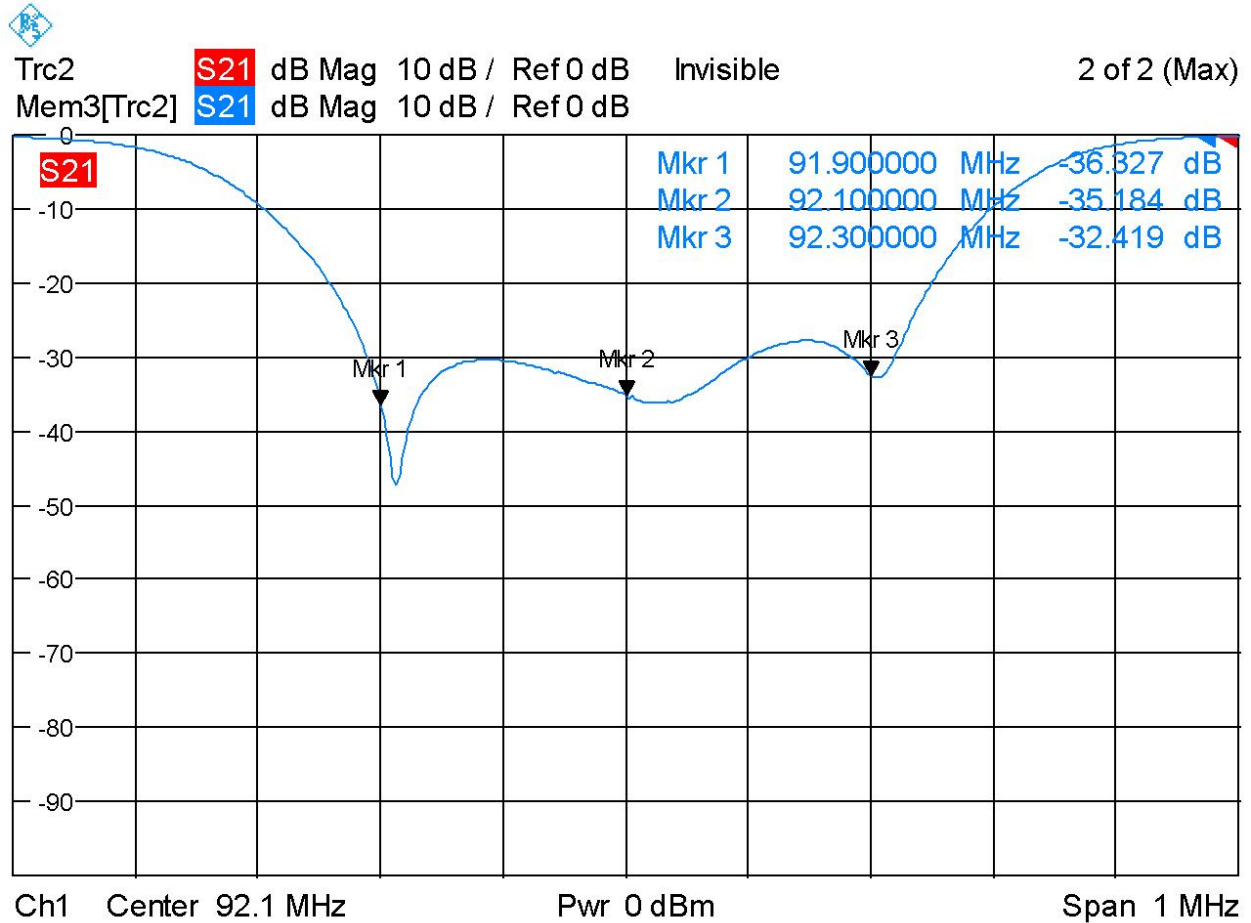
Date: 23.MAR.2010 18:35:38

Measurement 14: Final Filter to Antenna of 91.1 MHz.



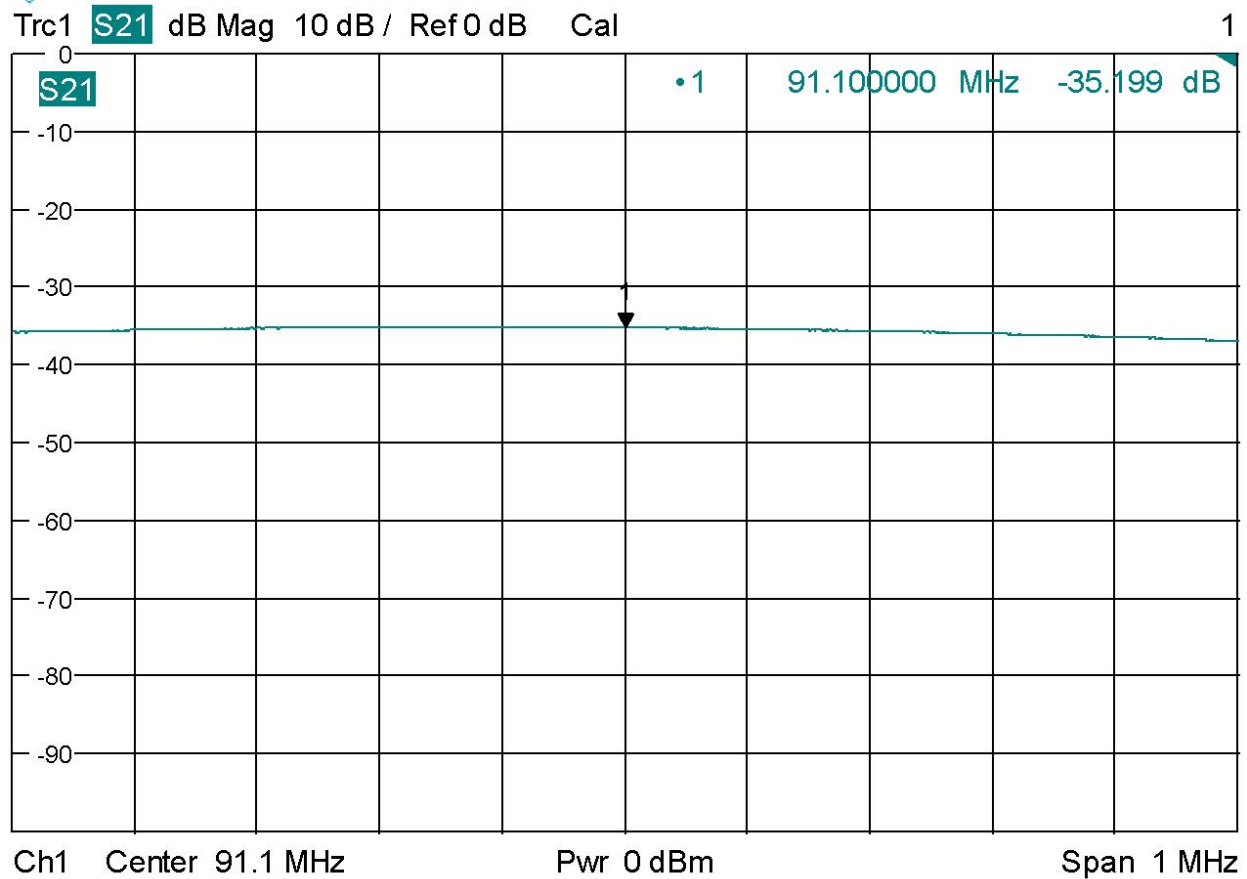
Date: 24.MAR.2010 14:00:29

Measurement 15: Final Filter to Antenna of 92.1 MHz.



Date: 24.MAR.2010 14:01:36

Measurement 16: 1 MHz. Sweep of Feedline with 50 ohm Load at 91.1 MHz.

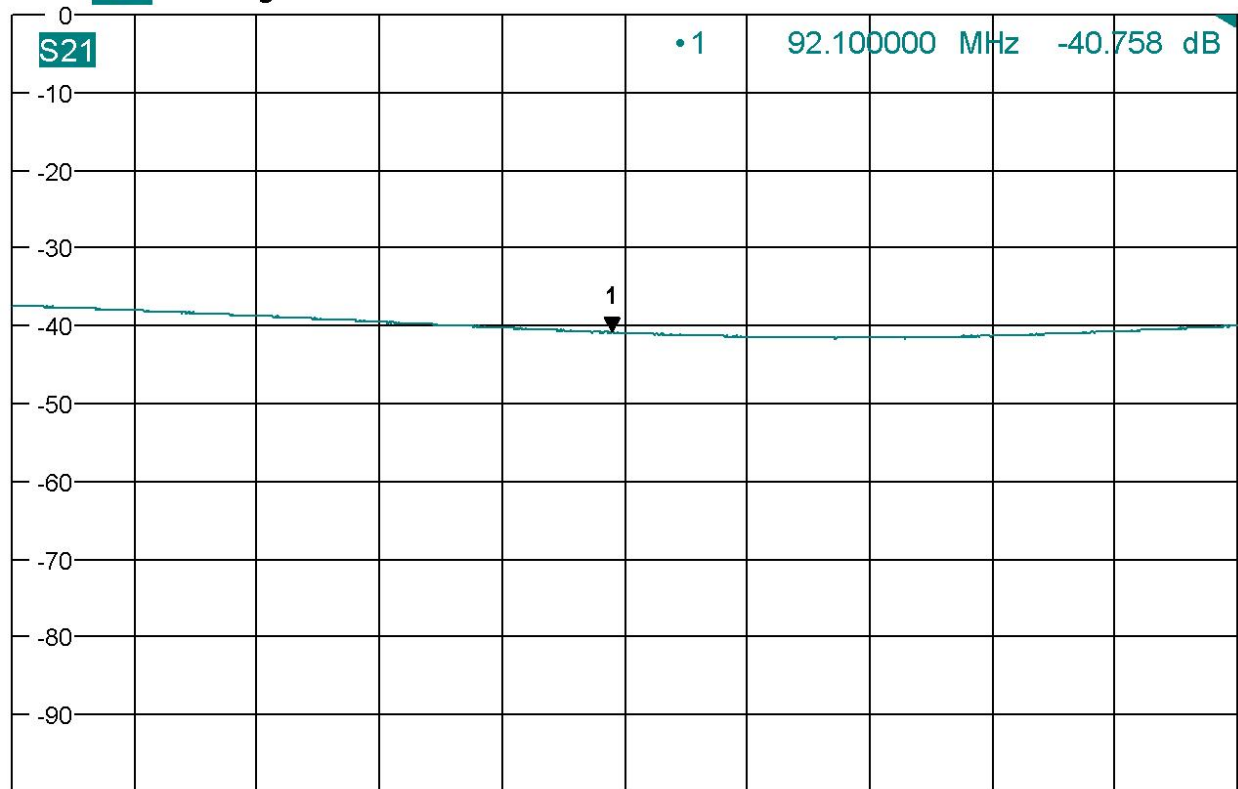


Date: 23.MAR.2010 16:06:15

Measurement 17: 1 MHz. Sweep of Feedline with 50 ohm Load at 92.1 MHz.



Trc1 **S21** dB Mag 10 dB / Ref 0 dB Cal 1



Ch1 Center 92.11 MHz Pwr 0 dBm Span 1 MHz

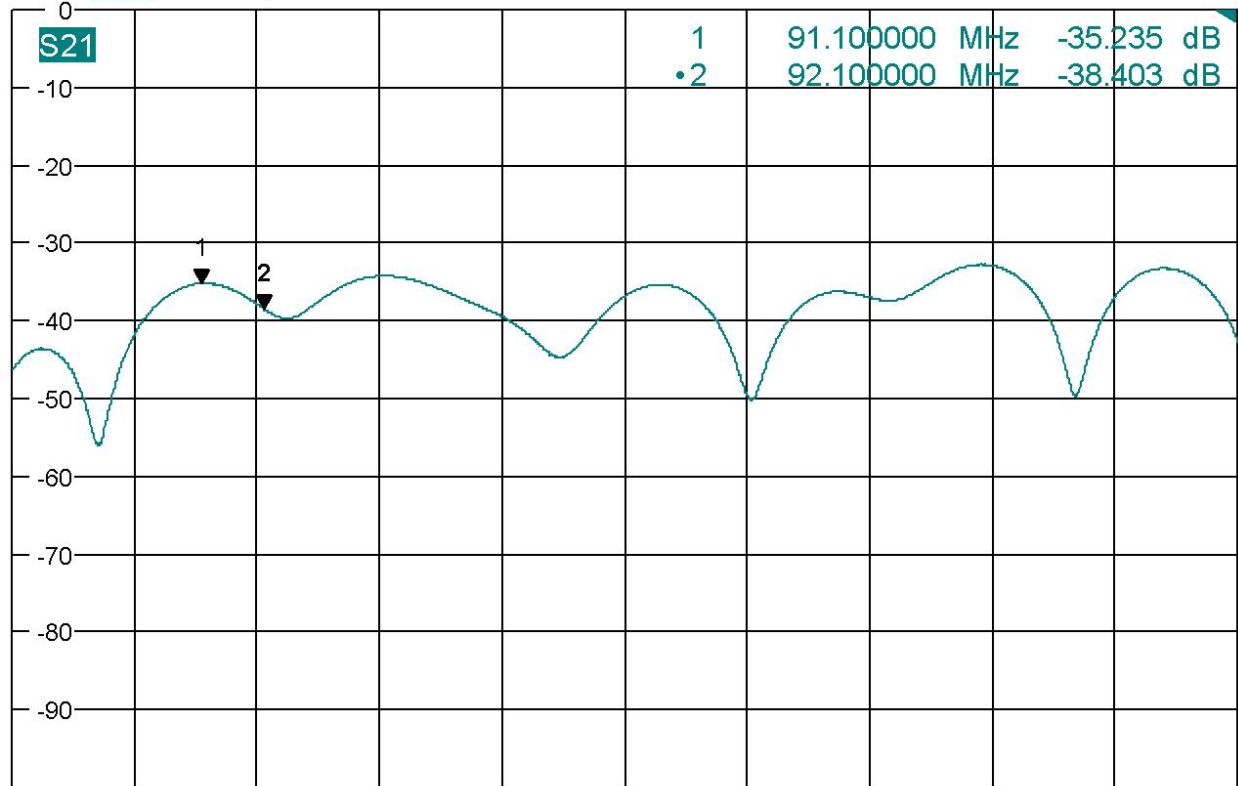
Date: 23.MAR.2010 16:07:48

Measurement 18: 88 to 108 MHz. Sweep of Feedline with 50 ohm Load.



Trc1 S21 dB Mag 10 dB / Ref 0 dB Cal

1



Ch1 Center 98 MHz

Pwr 0 dBm

Span 20 MHz

Date: 23.MAR.2010 16:09:22

Measurement 19: TDR of Feedline with 50 ohm Load.

Mkr#1 is Test Measurement Point @ 0'.

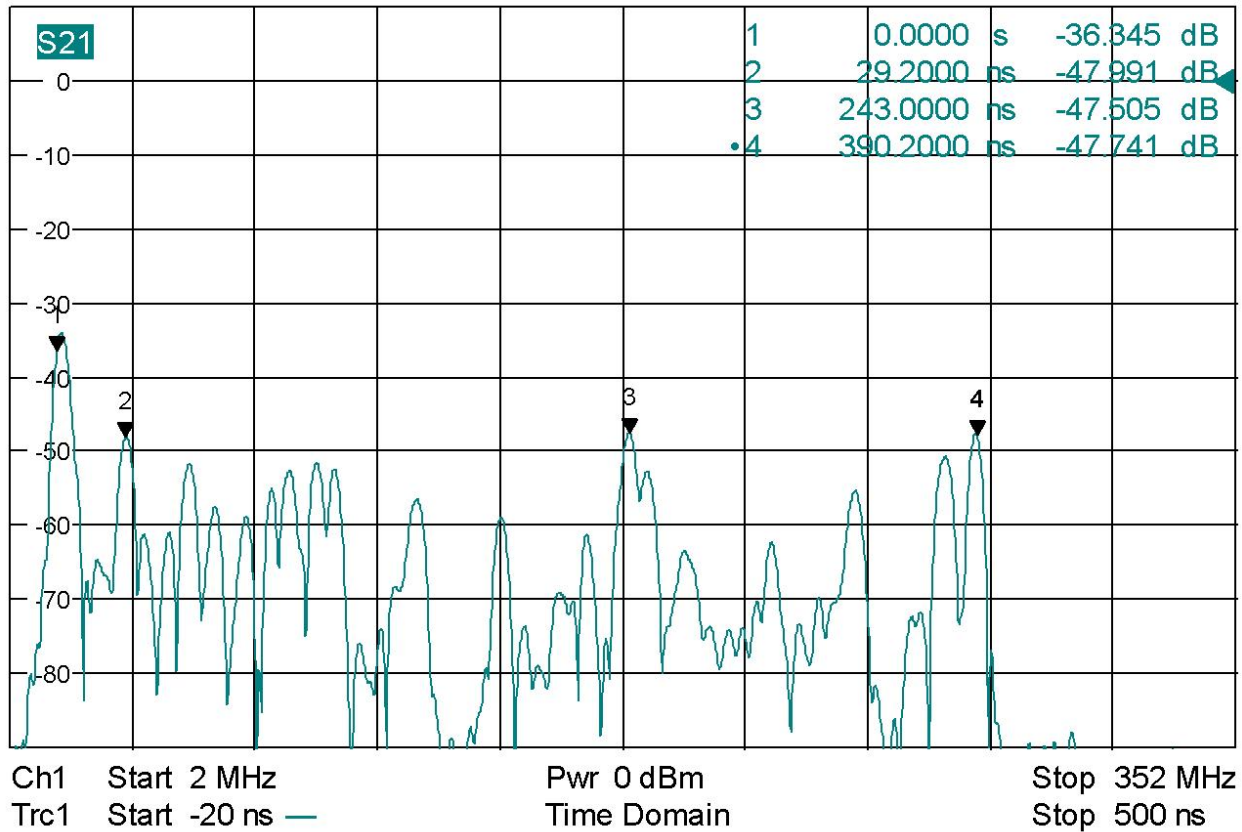
Mkr# 2 is Gas Block Approximately 23' from Test Point.

Mkr# 3 is Elbow Complex Approximately 119' from Test Point.

Mkr# 4 End of Transmission Line During Testing @ 191'.



Trc1 **S21** dB Mag 10 dB / Ref 0 dB Cal 1 of 2 (Max)



Date: 23.MAR.2010 16:13:11