

**Howell Laboratories, Inc.**

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**ISO 9001:2000 Level III Form QP3-8.2-21, Revision B**

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## **TUNING DATA AND ELECTRICAL TEST CERTIFICATION**

### **RF FILTER OR COMBINER**

Shop Order: 27633

Serial No. 27633-1

Customer Order: \_\_\_\_\_

Customer: Way-FM Media Group

Address: Colorado Springs CO 80962

Model No. 2930-3/3

Additional Description: RE-tune

Notch Filter ☐

Bandpass Filter ☐

Branched Combiner ☒

Balanced Combiner ☐

Frequency: 91.9, 102.7, 104.5 MHz

Input: Other

Output: Other

Enclosed: Smith Chart ☒

VSWR ☒

Insertion Loss ☒

Frequency Response ☒

Isolation ☒

Group Delay ☒

Other ☐ \_\_\_\_\_

Applicable Specifications and Notes: Retuned 104.7 to 104.5 Ref. original SO 25740 output coax same.

The signature below certifies that this equipment has been tested and is in compliance with the applicable specifications for this order.

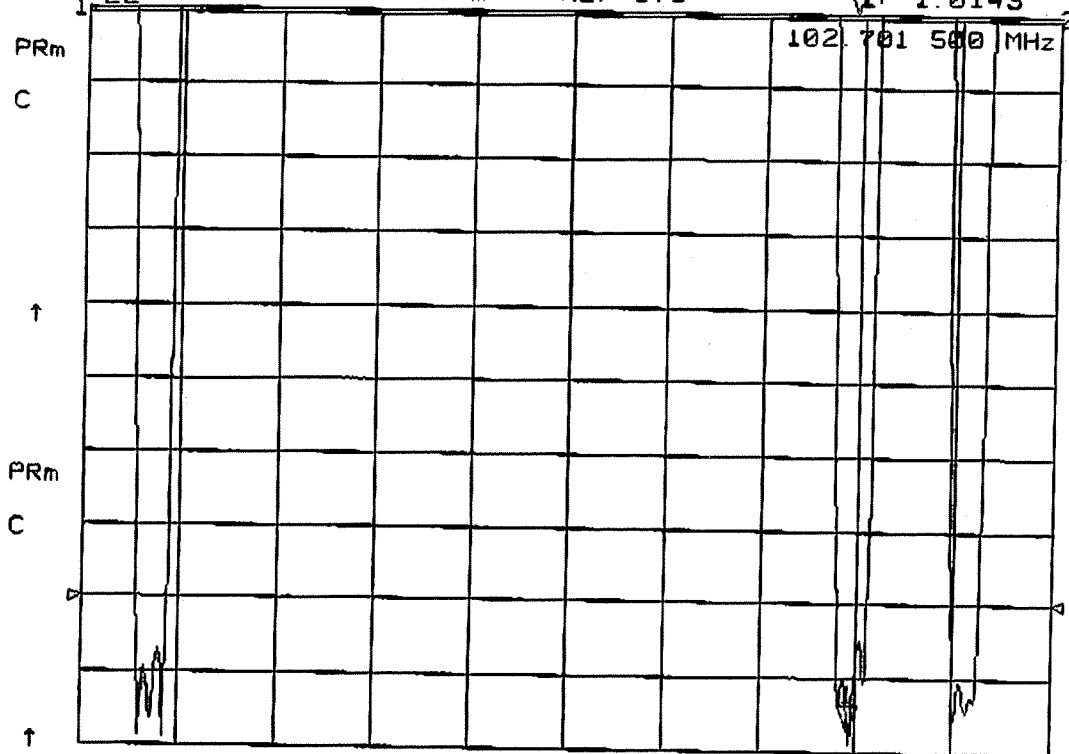
By: Matt Smith

Date: 7/13/09

#### **Instructions:**

1. DO NOT 'Save As.'
2. Complete testing per shop order. Fill in form.
3. Print to Acrobat without saving.

13 Jul 2009 13:46:14  
 CH1 S<sub>11</sub>&M SWR 50 m / REF 1.1 1 154.73  
 CH2 S<sub>22</sub> SWR 50 m / REF 1.1 2 1.0143

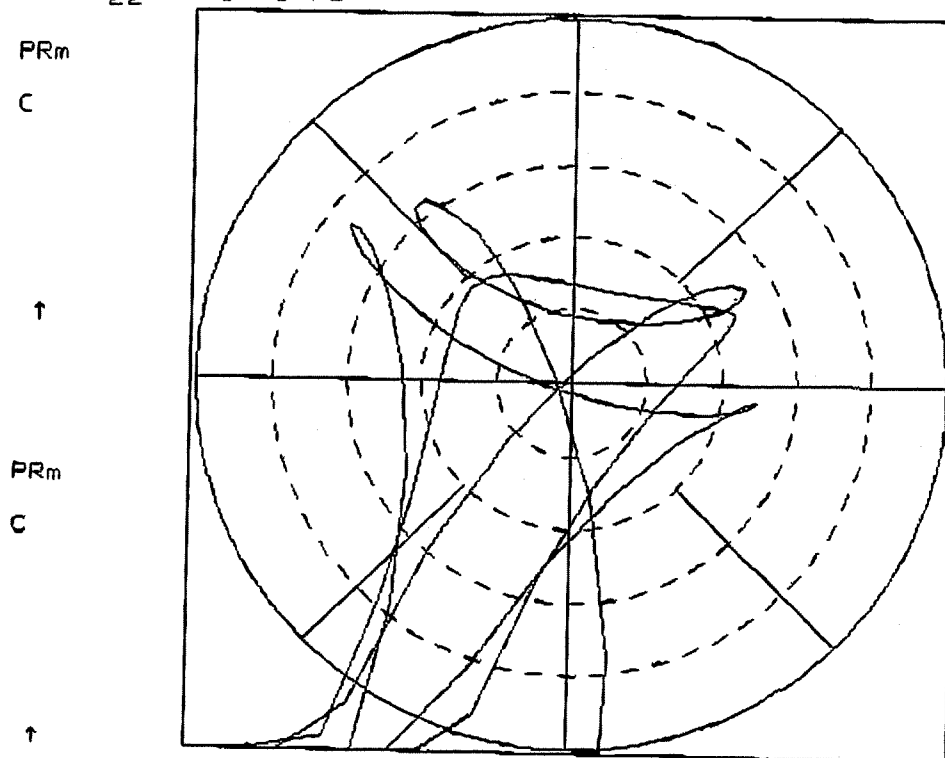


START 90.800 000 MHz

STOP 105.800 000 MHz

CH1 S<sub>11</sub>&M 50 mU FS  
 CH2 S<sub>22</sub> 50 mU FS

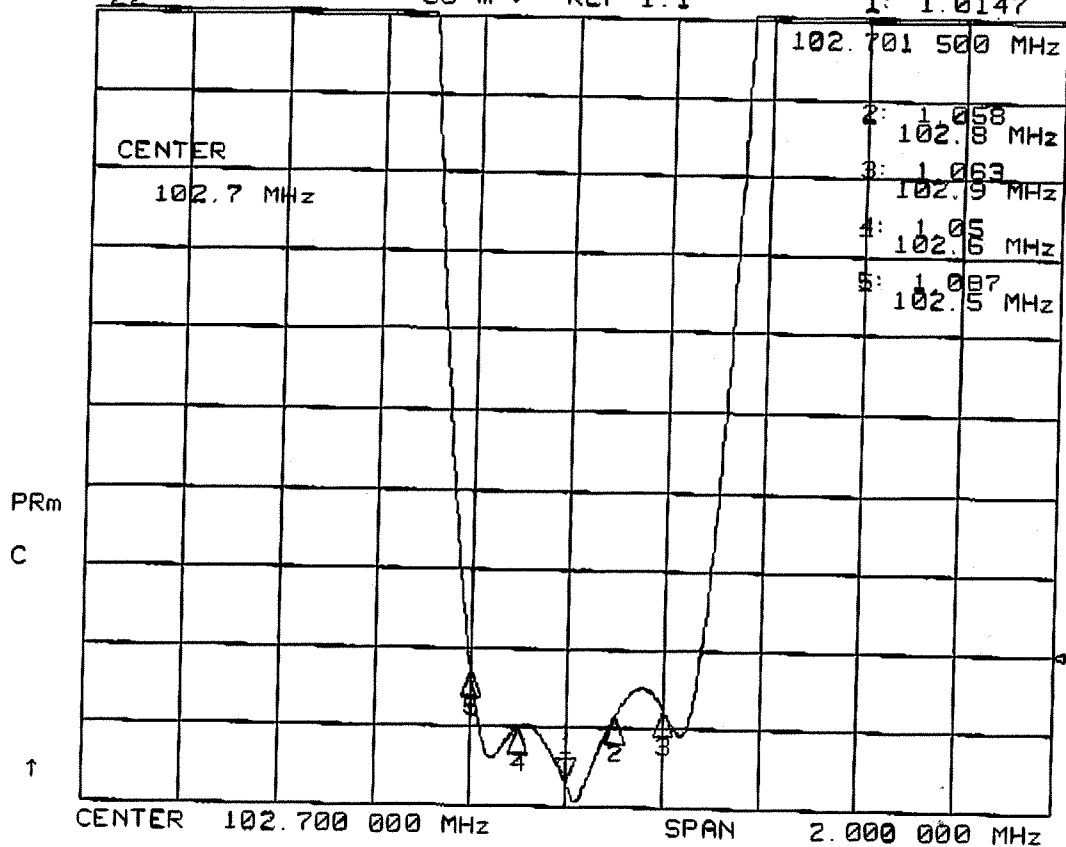
13 Jul 2009 13:47:51



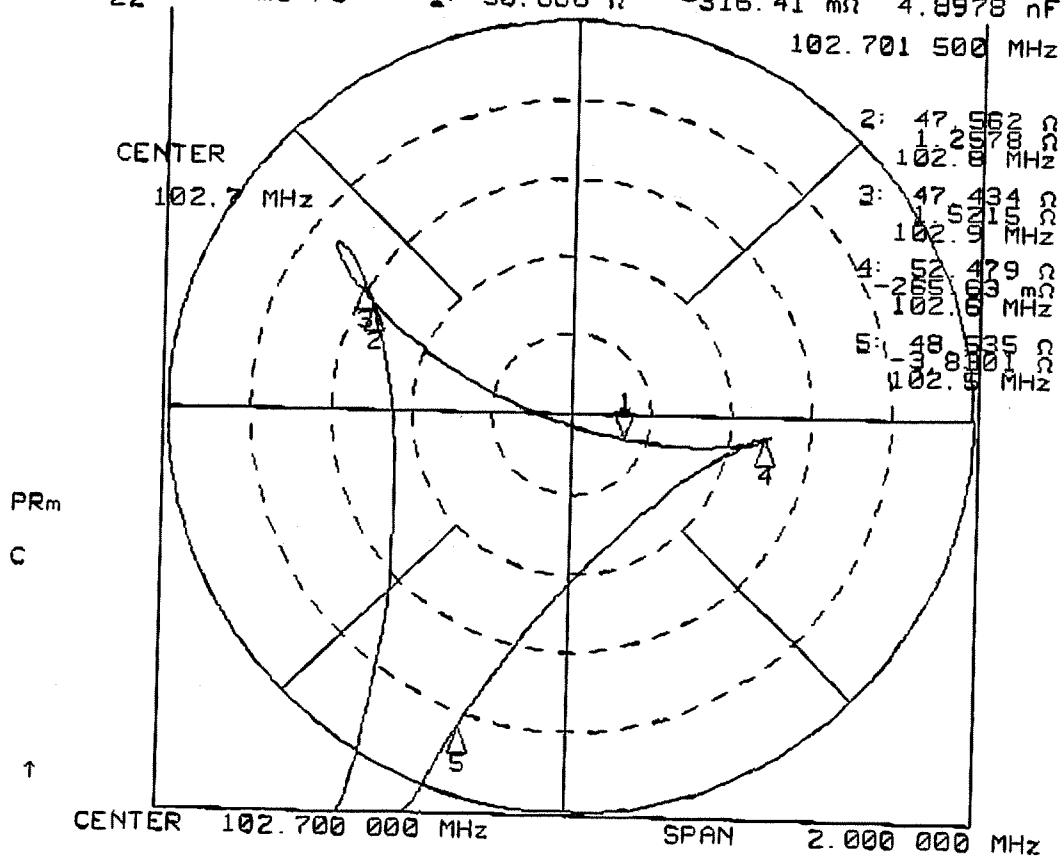
CENTER 98.300 000 MHz

SPAN 15.000 000 MHz

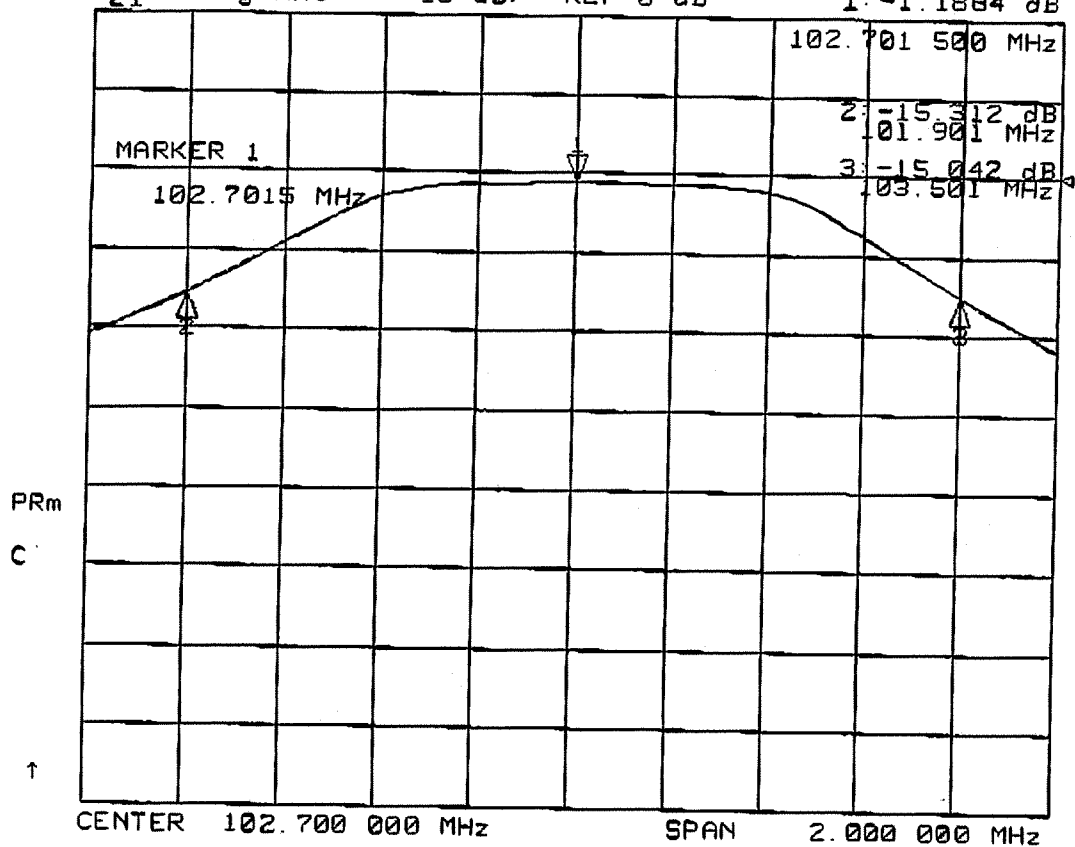
CH2 S22 SWR 50 m / REF 1.1 13 Jul 2009 13:51:56 1: 1.0147



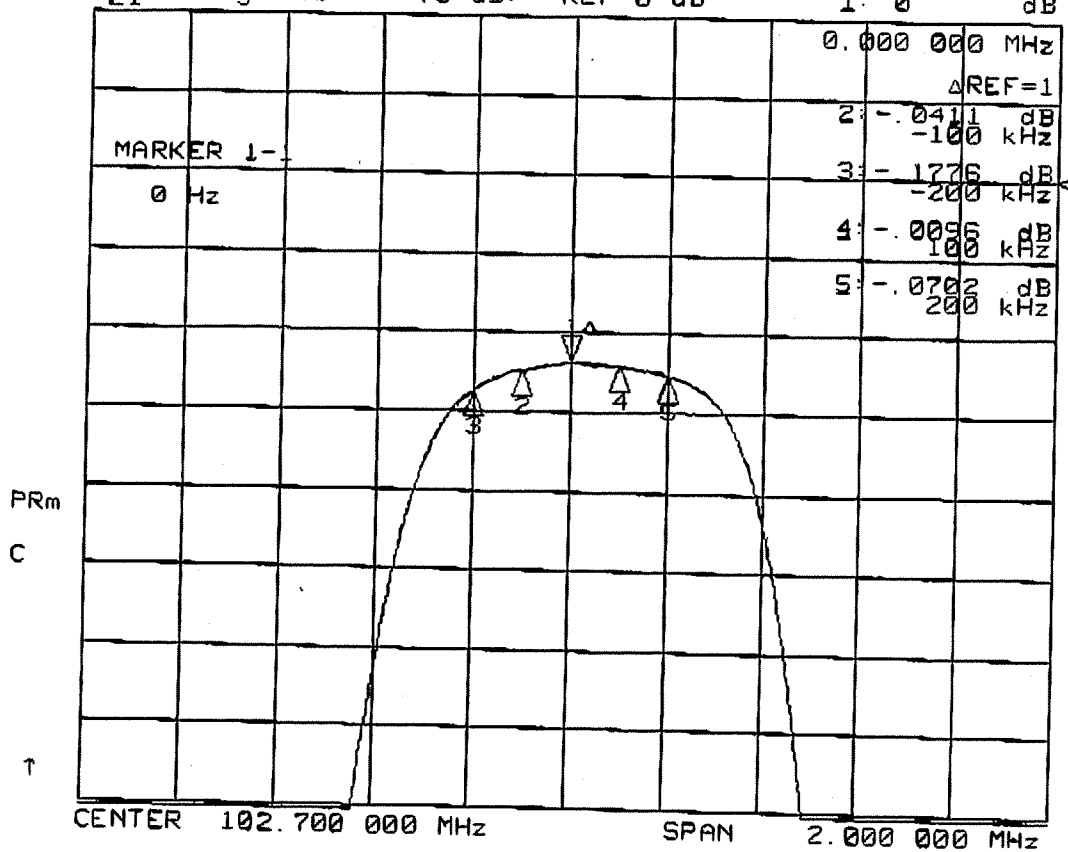
CH2 S22 50 mU FS 1: 50.666  $\Omega$  -316.41 m $\Omega$  4.8978 nF 13 Jul 2009 13:52:05



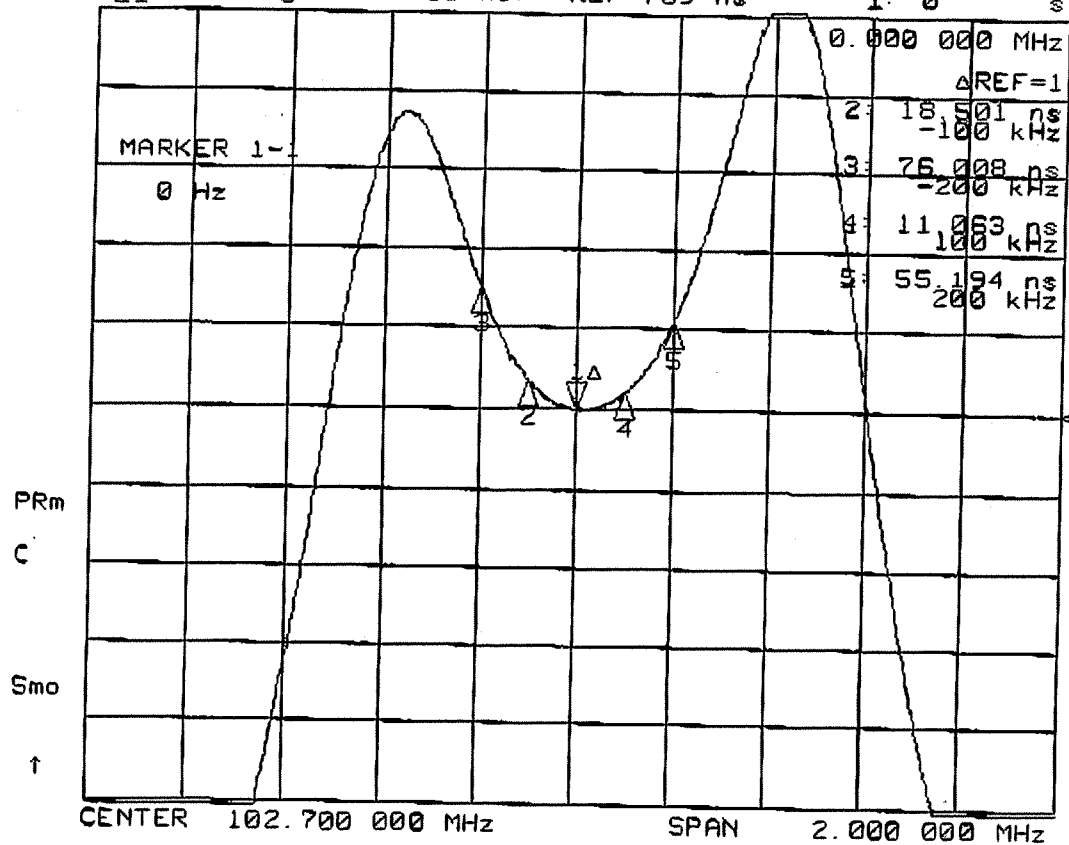
CH2 S21 log MAG 10 dB/ REF 0 dB 13 Jul 2009 13:57:18  
1: -1.1884 dB



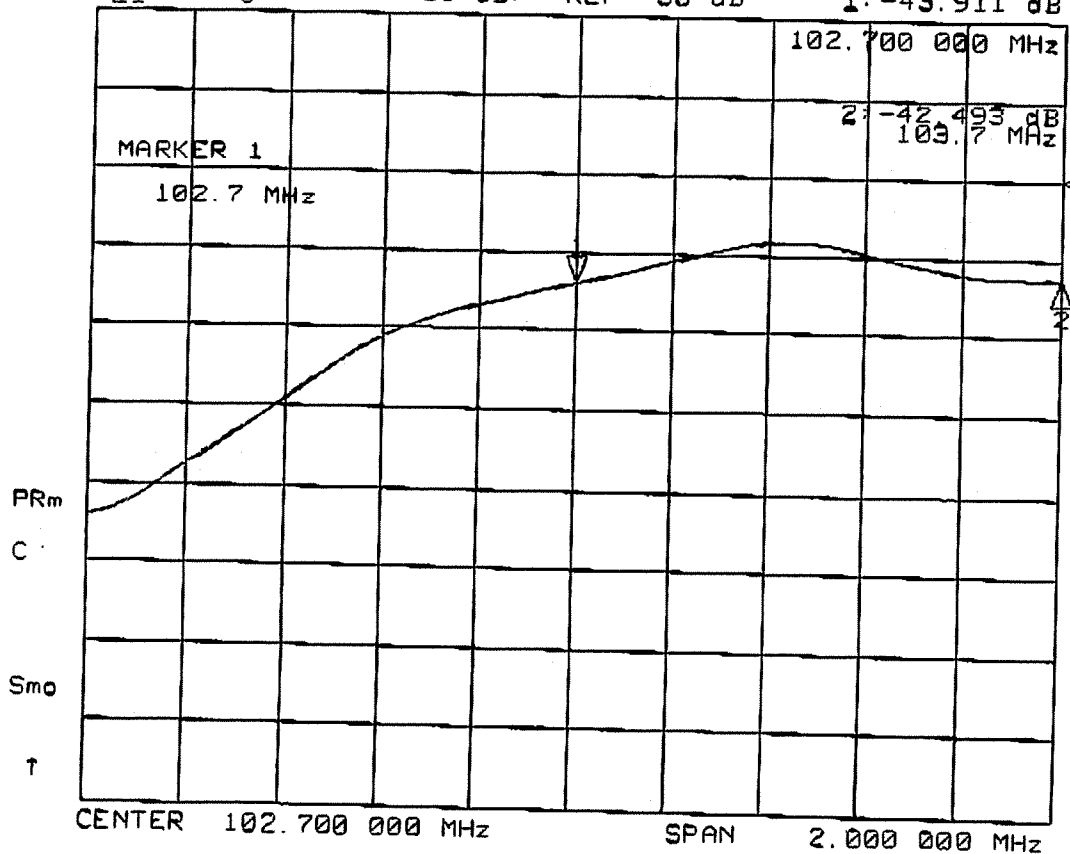
CH2 S21 log MAG .5 dB/ REF 0 dB 13 Jul 2009 13:58:17  
1: 0 dB

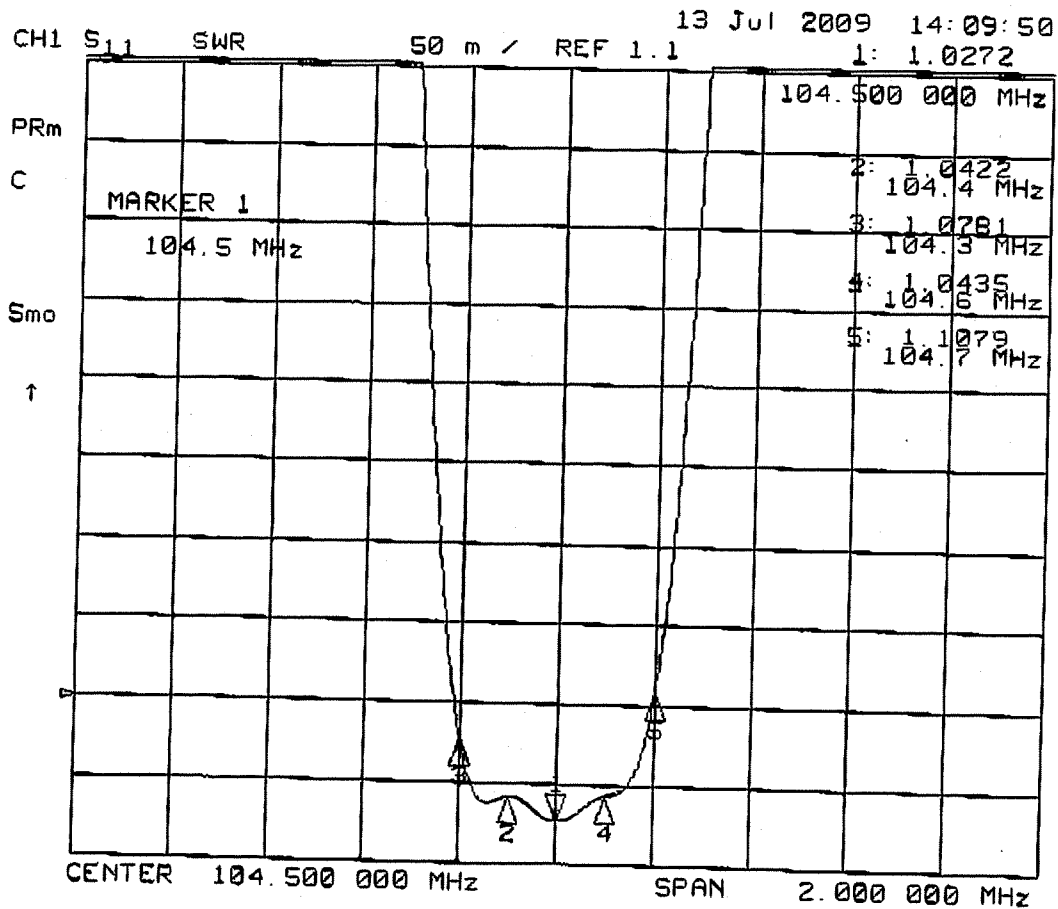
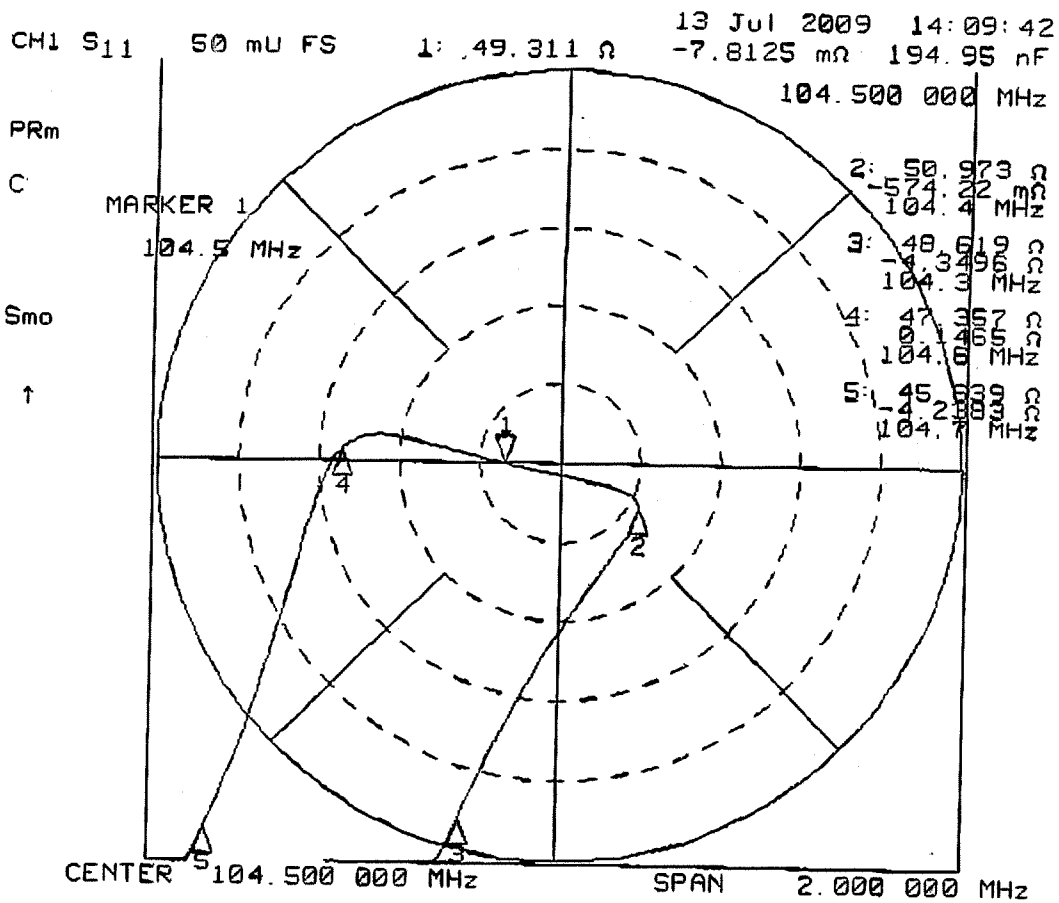


CH2 S21 delay 50 ns/ REF 709 ns 13 Jul 2009 13:59:36 1: 0 s

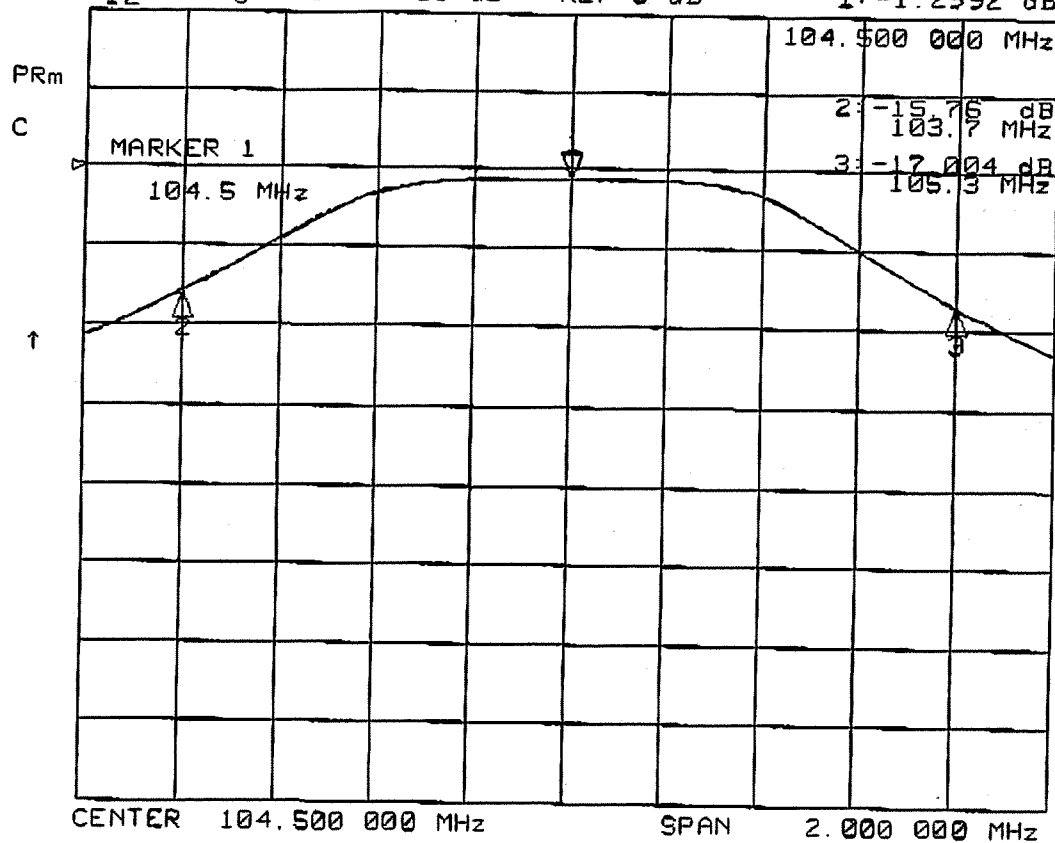


CH2 S21 log MAG 10 dB/ REF -30 dB 13 Jul 2009 14:01:13 1: -43.911 dB

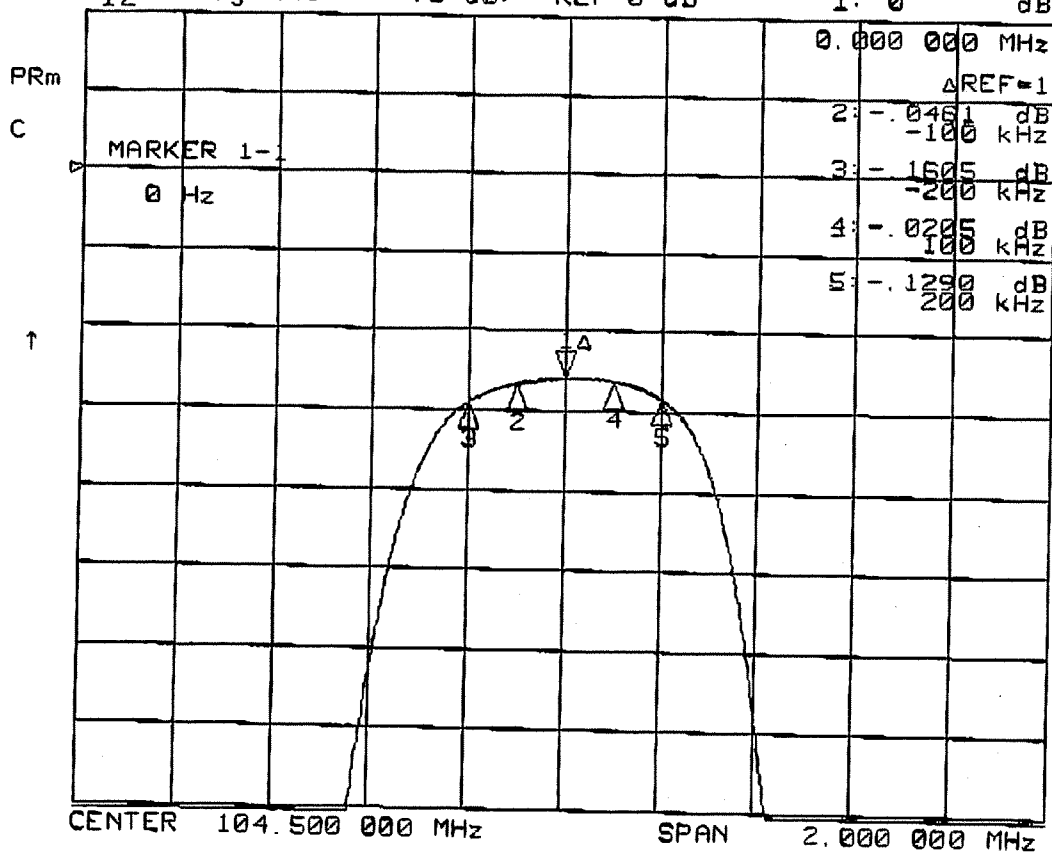




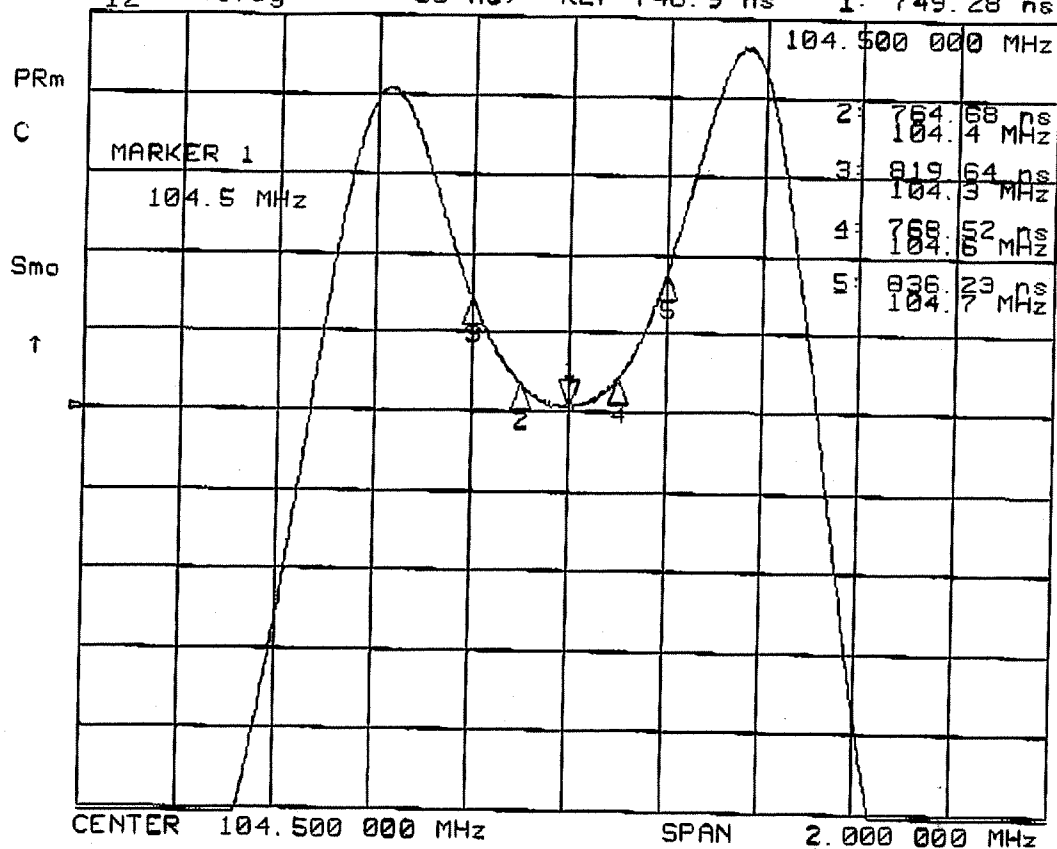
CH1 S<sub>12</sub> log MAG 10 dB/ REF 0 dB 13 Jul 2009 14:06:37  
1: -1.2992 dB



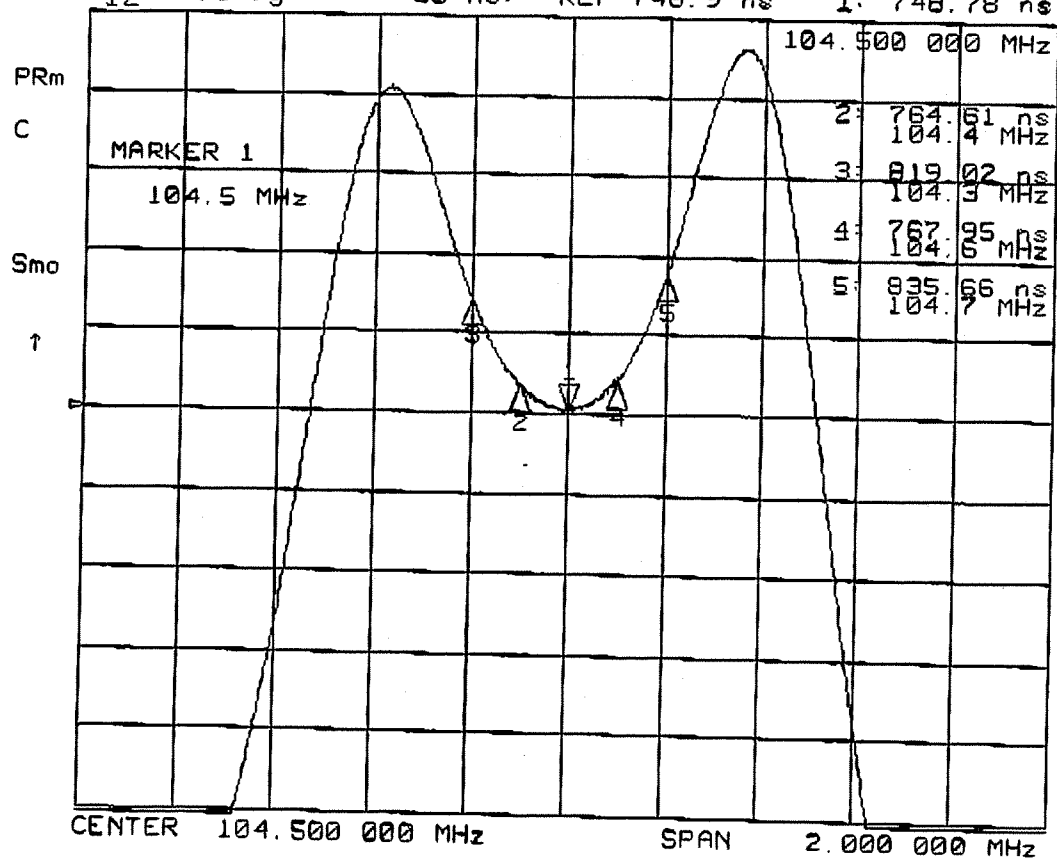
CH1 S<sub>12</sub> log MAG .5 dB/ REF 0 dB 13 Jul 2009 14:07:42  
1: 0 dB



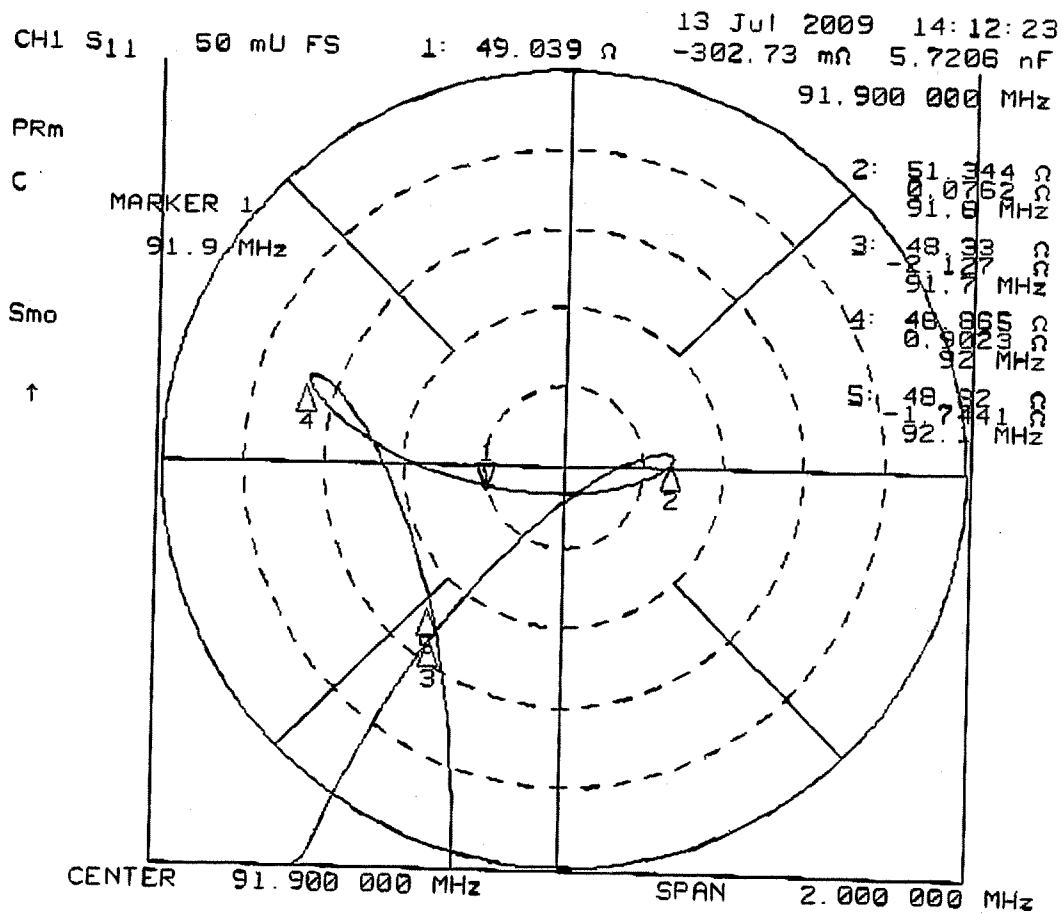
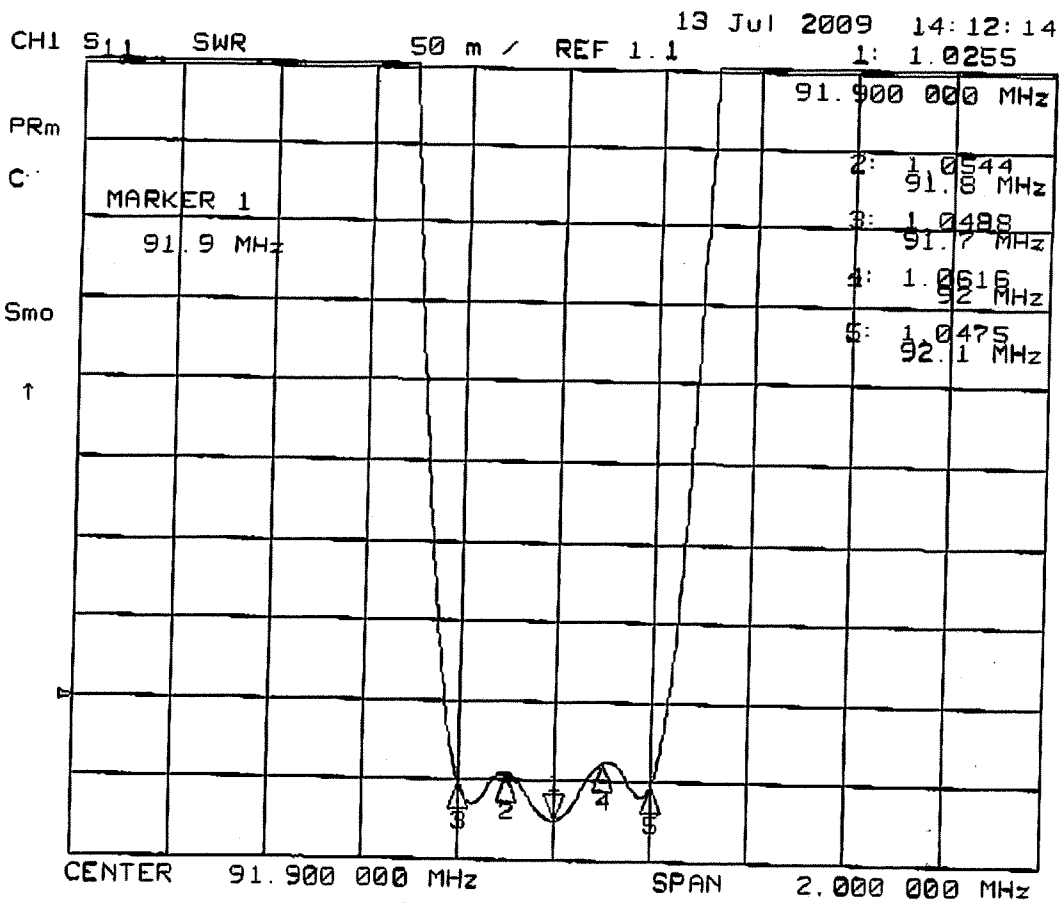
13 Jul 2009 14:09:07  
 CH1 S<sub>12</sub> delay 50 ns/ REF 746.9 ns 1: 749.28 ns



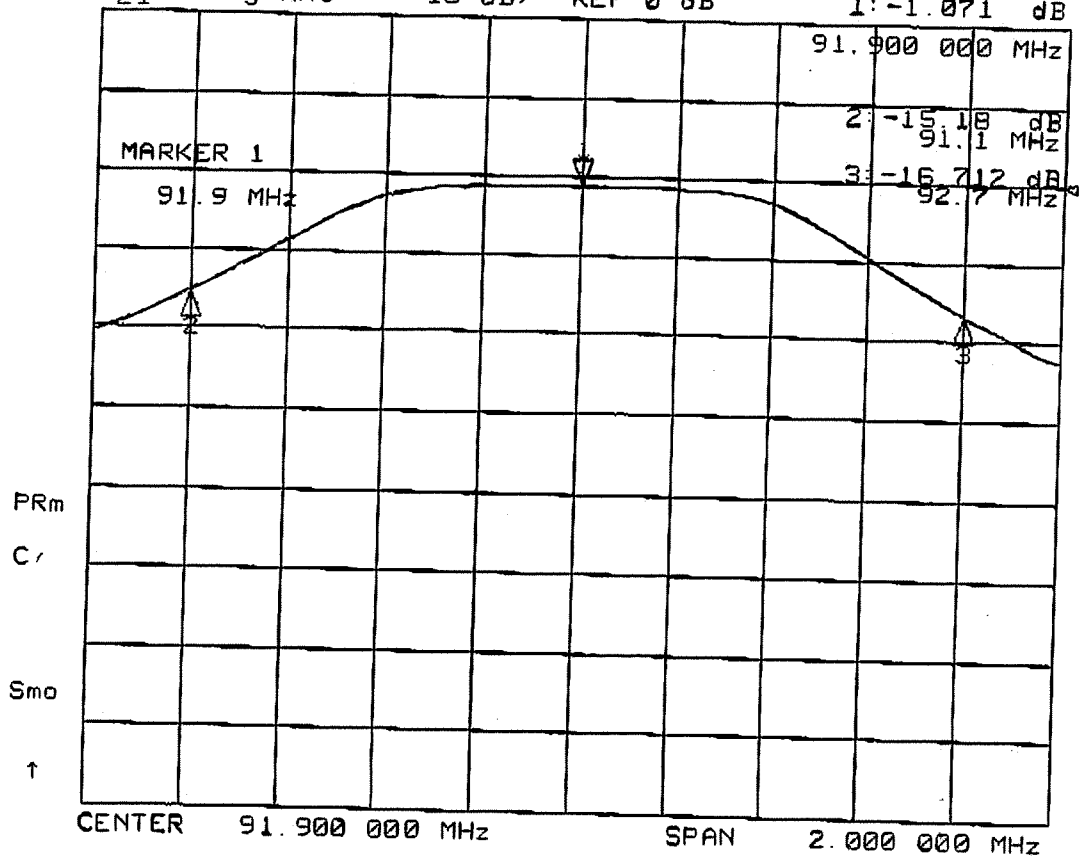
13 Jul 2009 14:09:19  
 CH1 S<sub>12</sub> delay 50 ns/ REF 746.9 ns 1: 748.78 ns



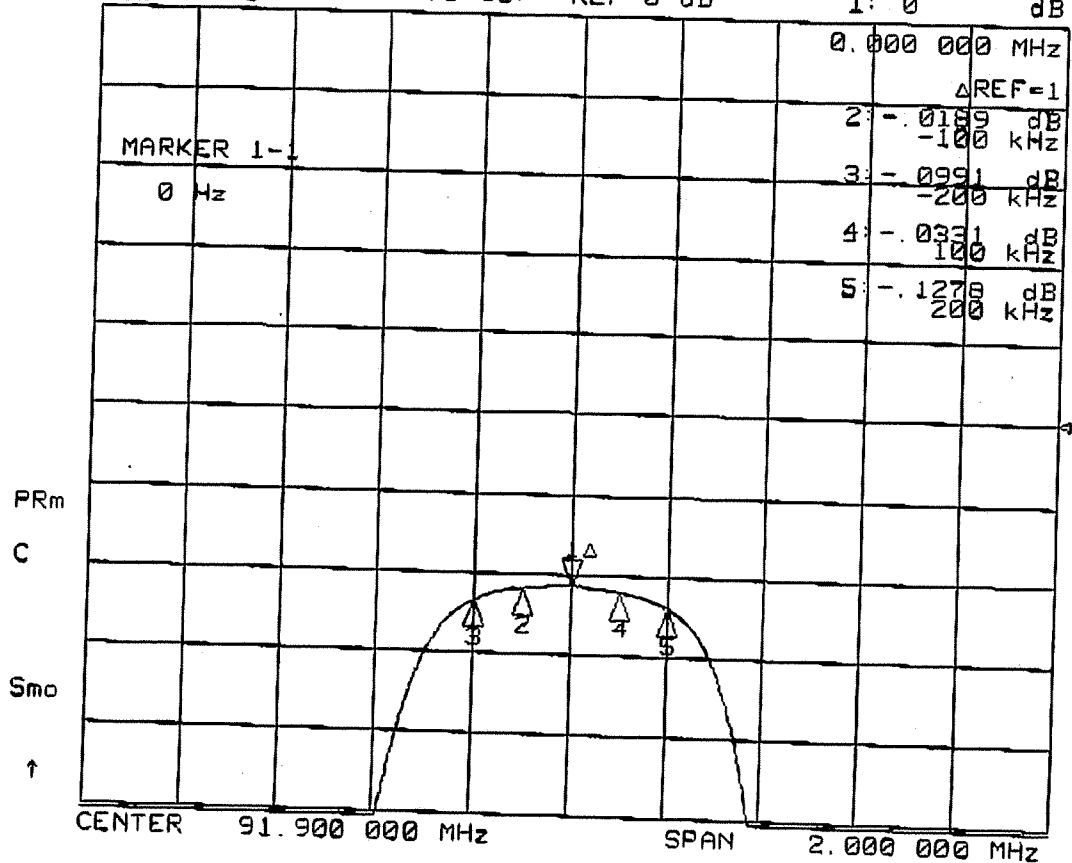




CH2 S21 log MAG 10 dB/ REF 0 dB 13 Jul 2009 14:13:39  
 1: -1.071 dB



CH2 S21 log MAG .5 dB/ REF 0 dB 13 Jul 2009 14:15:17  
 1: 0 dB



13 Jul 2009 14:16:04

CH2 S21 delay

50 ns/ REF 718 ns

1: 0 s

