

| | | | |
|-------------------------------|------------|------------------|---------------|
| MODEL NO. | MP-A-1012 | SERIAL NO. | 103R |
| + 12 VDC Min +15 VDC Max ⊕ | 900 mA NOM | Actual +12 VDC ⊕ | <u>286</u> mA |
| | | Actual +15 VDC ⊕ | <u>286</u> mA |

TEST DATA SHEET

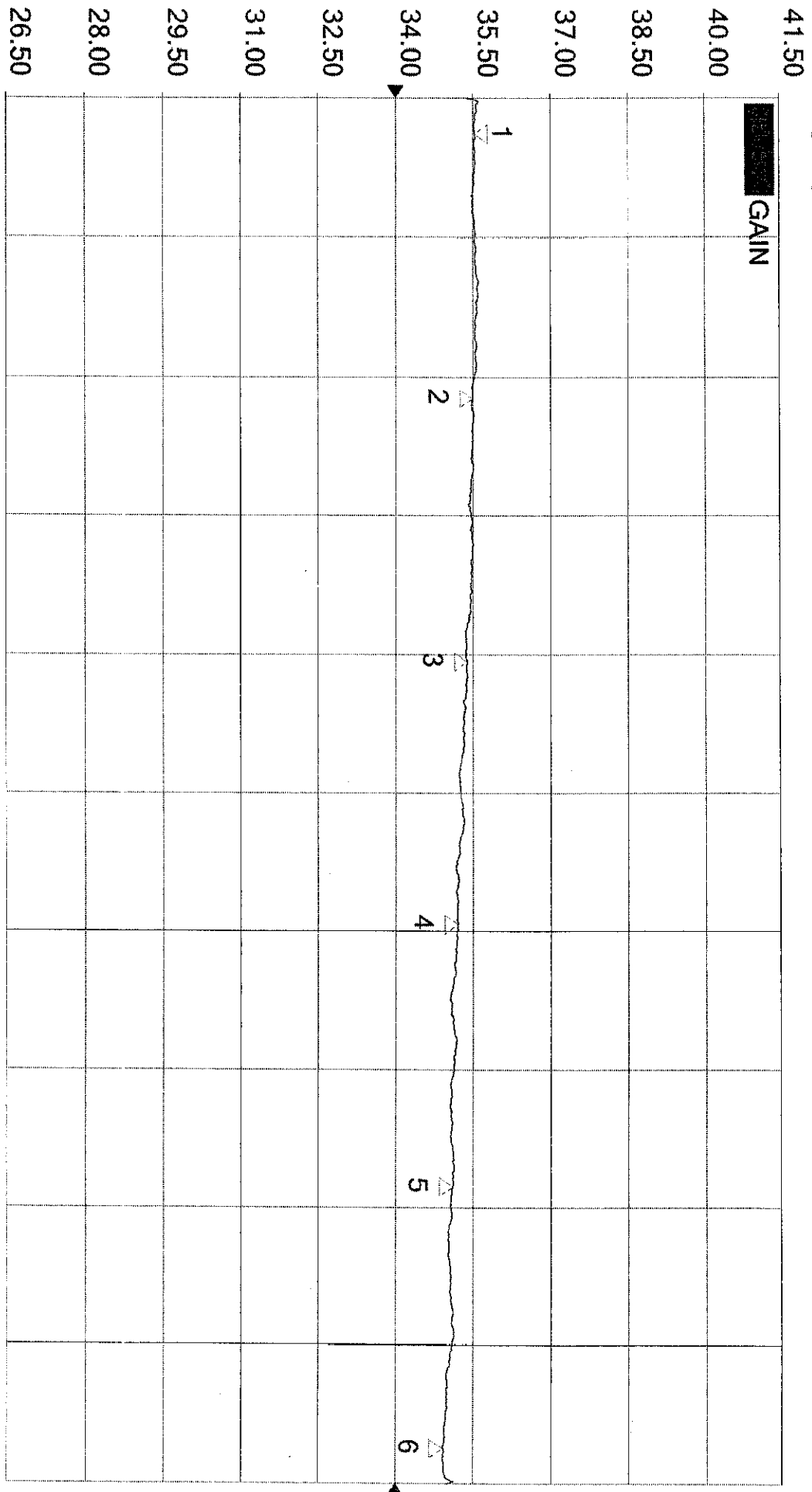
MICROWAVE PHOTONIC SYSTEMS, INC.
882 SOUTH MATLACK ST. UNIT 104
WEST CHESTER, PA 19382

| FREQUENCY (GHz) | GAIN (dB) | INPUT VSWR | OUTPUT VSWR | NOISE FIGURE (dB) | IP3 | OUTPUT POWER COMPRESSION ⊕ +28 dBm MIN |
|----------------------|--------------------------|----------------|----------------|---------------------------|----------------------------|---|
| 10.9 | | | | 1.81 | 36.41 | 0.7 |
| 11.27 | REFER TO "S21" | REFER TO "S11" | REFER TO "S22" | 1.88 | — | 0.7 |
| 11.64 | PLOTTED | PLOTTED | PLOTTED | 2.61 | 36.00 | 0.6 |
| 12.38 | DATA | DATA | DATA | 1.95 | — | 0.6 |
| 12.75 | | | | 1.88 | 36.25 | 0.6 |
| SPECIFICATION LIMITS | 34 dB MIN 36.5 dB MAX | 2.0:1 MAX | 2.0:0 MAX | 2.5 dB MAX ⊕ +23 DEG C | +36 dBm MIN +38 dBm TYP | 1.0 dB MAX |

| | | | | | |
|---------|--------|-----------|--|--------------|--|
| DATE | 7/7/06 | TEST ENGR | | PROJECT ENGR | |
| QUALITY | | MFG | | CSI | |

S/N 1036

Window 1 (1) S21 dB
LogMag C 2-Port



Ch1: Start 10.8500 GHz —

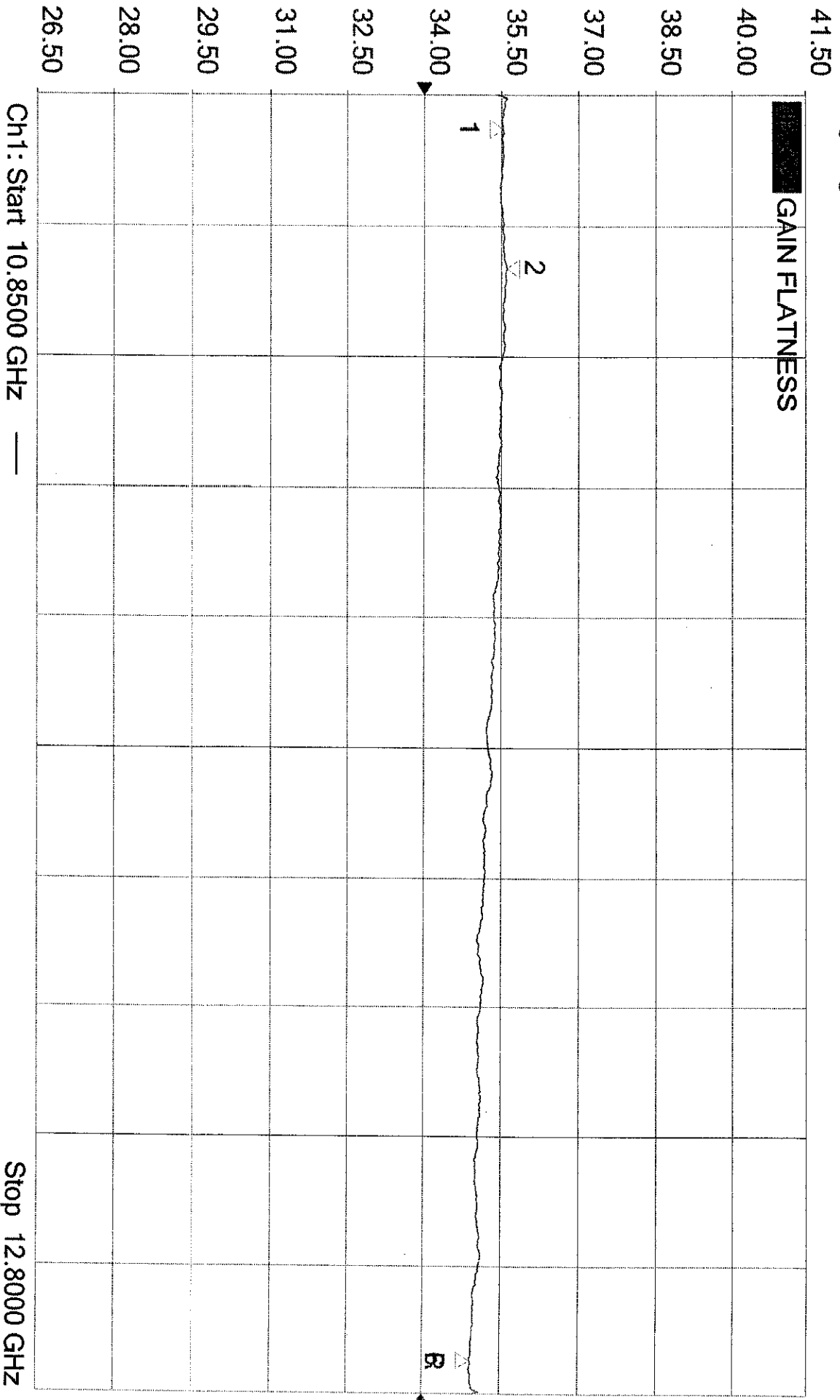
Stop 12.8000 GHz

Trace Attributes

| Window | ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
|--------|-----|-------|----------|------------|--------|---------|--------|-----------|-----------|
| 1 | S21 | 1 | C 2-Port | 2.87 | | | 1 | 10900 MHz | 35.530 dB |
| | | | | | | | 2 | 11270 MHz | 35.494 dB |
| | | | | | | | 3 | 11640 MHz | 35.391 dB |
| | | | | | | | 4 | 12010 MHz | 35.203 dB |
| | | | | | | | 5 | 12380 MHz | 35.103 dB |
| | | | | | | | 6 | 12750 MHz | 34.921 dB |

Window 2 (1) S21 dB
LogMag C 2-Port

S/N 103R

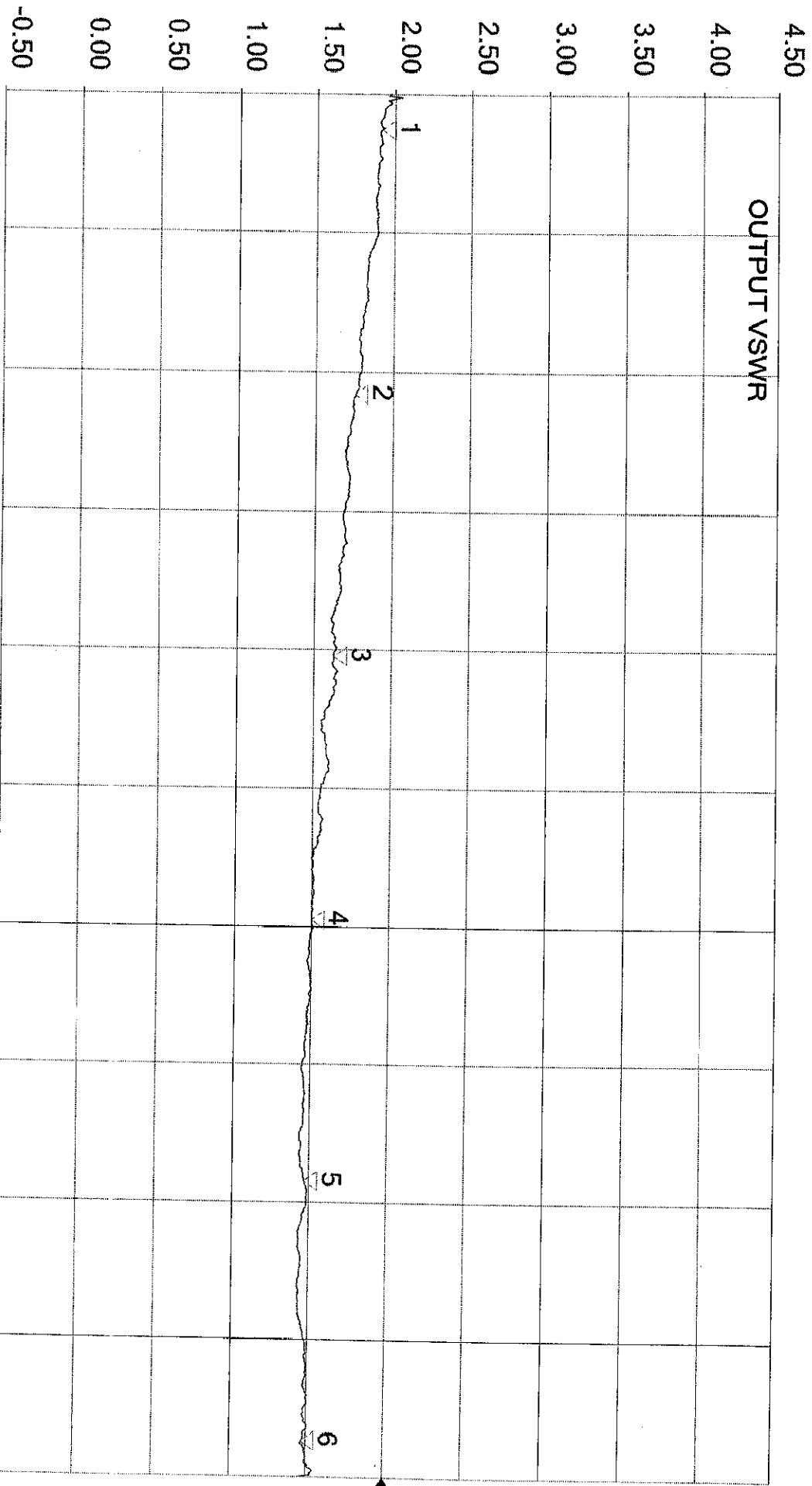


Trace Attributes

| Window | ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
|--------|----|-------|---------|------------|--------|---------|--------|---------------|------------|
| 2 | 1 | S21 | 1 | C 2-Port | 2.87 | | 1 | 10900 MHz | 35.530 dB |
| | | | | | | | 2 | -1641.625 MHz | 0.68638 dB |
| | | | | | | | 6 | 12750 MHz | 34.921 dB |
| | | | | | | | R | 12750 MHz | 34.921 dB |

Window 4 (1) S22 NV M Units
SWR C 2-Port

S/N 105R



Ch1: Start 10.8500 GHz

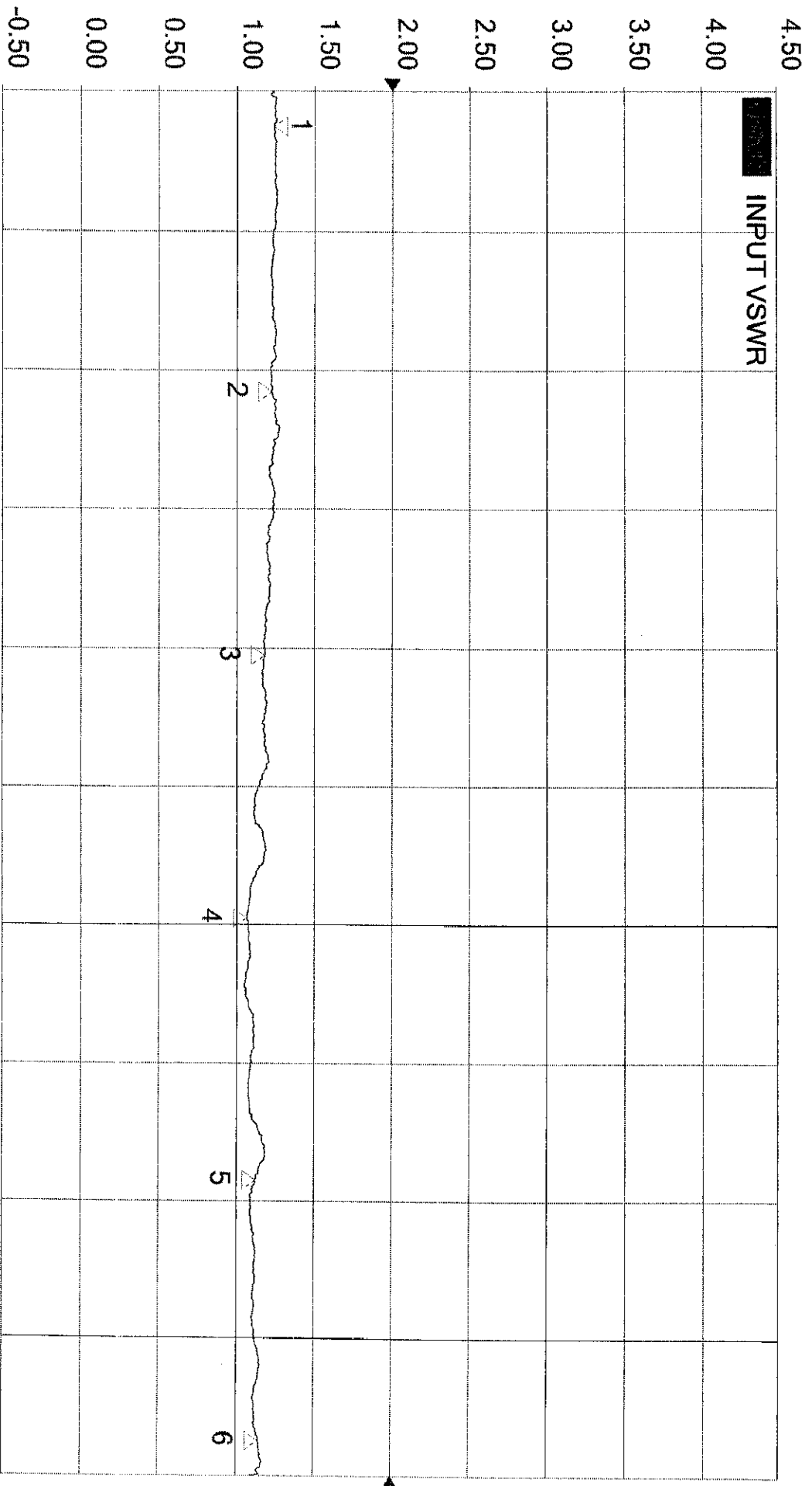
Stop 12.8000 GHz

Trace Attributes

| Window ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
|-----------|-----------|----------|------------|--------|---------|--------|-----------|----------|
| 1 | S22 NV M1 | C 2-Port | 2.87 | | | 1 | 10900 MHz | 1.9192 |
| | | | | | | 2 | 11270 MHz | 1.7546 |
| | | | | | | 3 | 11640 MHz | 1.6308 |
| | | | | | | 4 | 12010 MHz | 1.4982 |
| | | | | | | 5 | 12380 MHz | 1.4695 |
| | | | | | | 6 | 12750 MHz | 1.4661 |

Window 3 (1) S11 Units
SWR C 2-Port

S11 103R



Ch1: Start 10.8500 GHz —

Stop 12.8000 GHz

Trace Attributes

| Window/ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
|-----------|-------|---------|------------|--------|---------|--------|-----------|----------|
| 1 | S11 | 1 | C 2-Port | 2.87 | | 1 | 10900 MHz | 1.2378 |
| | | | | | | 2 | 11270 MHz | 1.2231 |
| | | | | | | 3 | 11640 MHz | 1.1778 |
| | | | | | | 4 | 12010 MHz | 1.0612 |
| | | | | | | 5 | 12380 MHz | 1.1206 |
| | | | | | | 6 | 12750 MHz | 1.1406 |

SN 103R

* Agilent 16:41:30 Jul 6, 2006

DUT Amplifier Sys Downconv Off

| Freq | NoiseFig dB | Gain dB |
|----------------------|--------------|---------------|
| 10.900000 GHz | 1.818 | 36.206 |
| 11.270000 GHz | 1.885 | 36.513 |
| 11.640000 GHz | 2.018 | 36.159 |
| 12.010000 GHz | 1.989 | 35.709 |
| 12.380000 GHz | 1.956 | 35.776 |
| 12.750000 GHz | 1.889 | 35.635 |

Start 10.90000 GHz BW 4 MHz Points 6 Stop 12.75000 GHz
 Tcold 296.50 K Avgs Off Att --/0 dB Loss Off Corr

Frequency

Freq Mode
Sweep

Start Freq
10.9000000 GHz

Stop Freq
12.7500000 GHz

Center Freq
11.8250000 GHz

Freq Span
1.85000000 GHz

Fixed Freq
14.7500000 GHz

More
1 of 2

SN103R

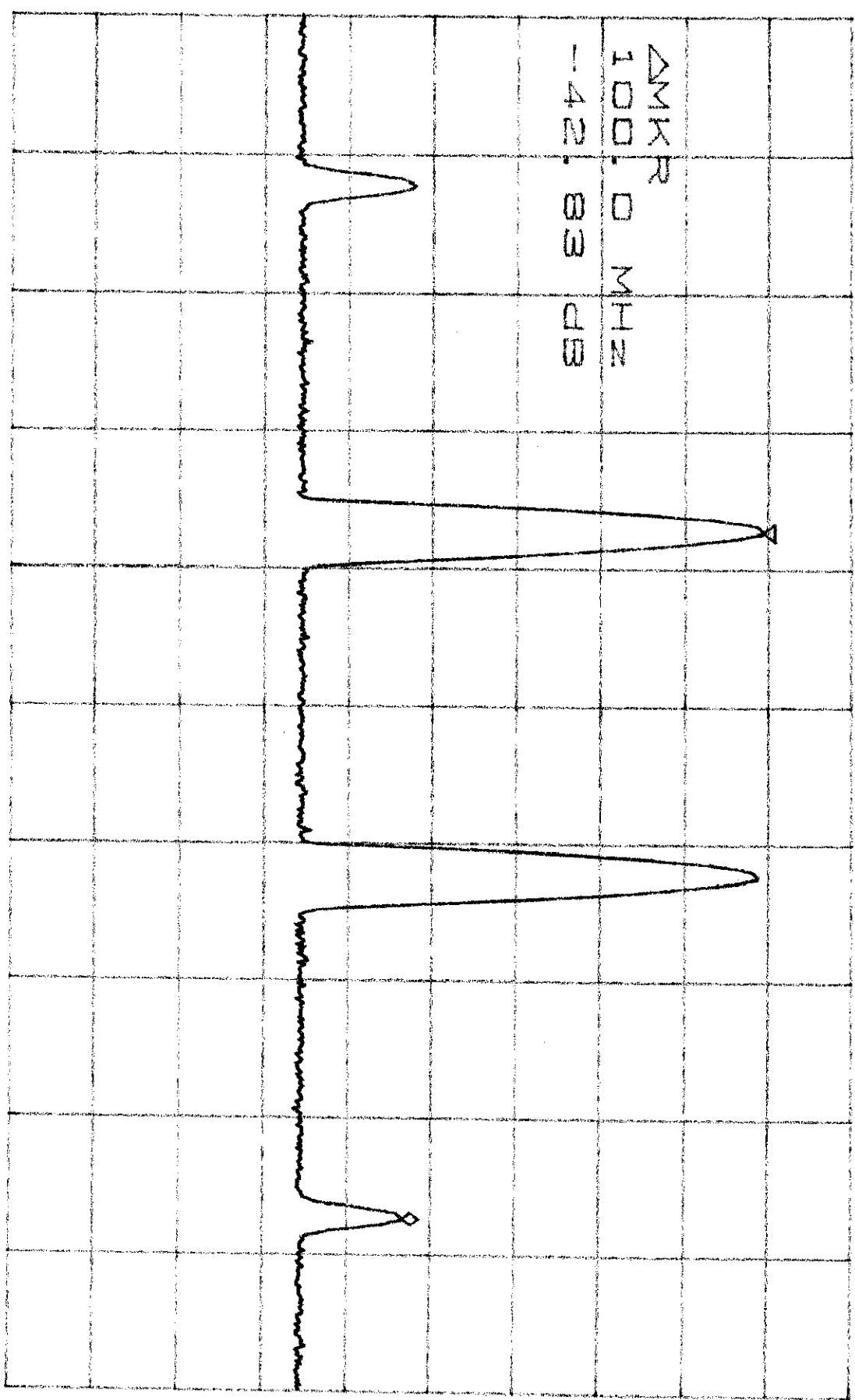
715dBm

ATTEN 40DB
RL 22.6DB

10DB/

AMKR -42.83DB
100.0MHZ

$$\frac{42.83}{2} + 15 = 36.415$$



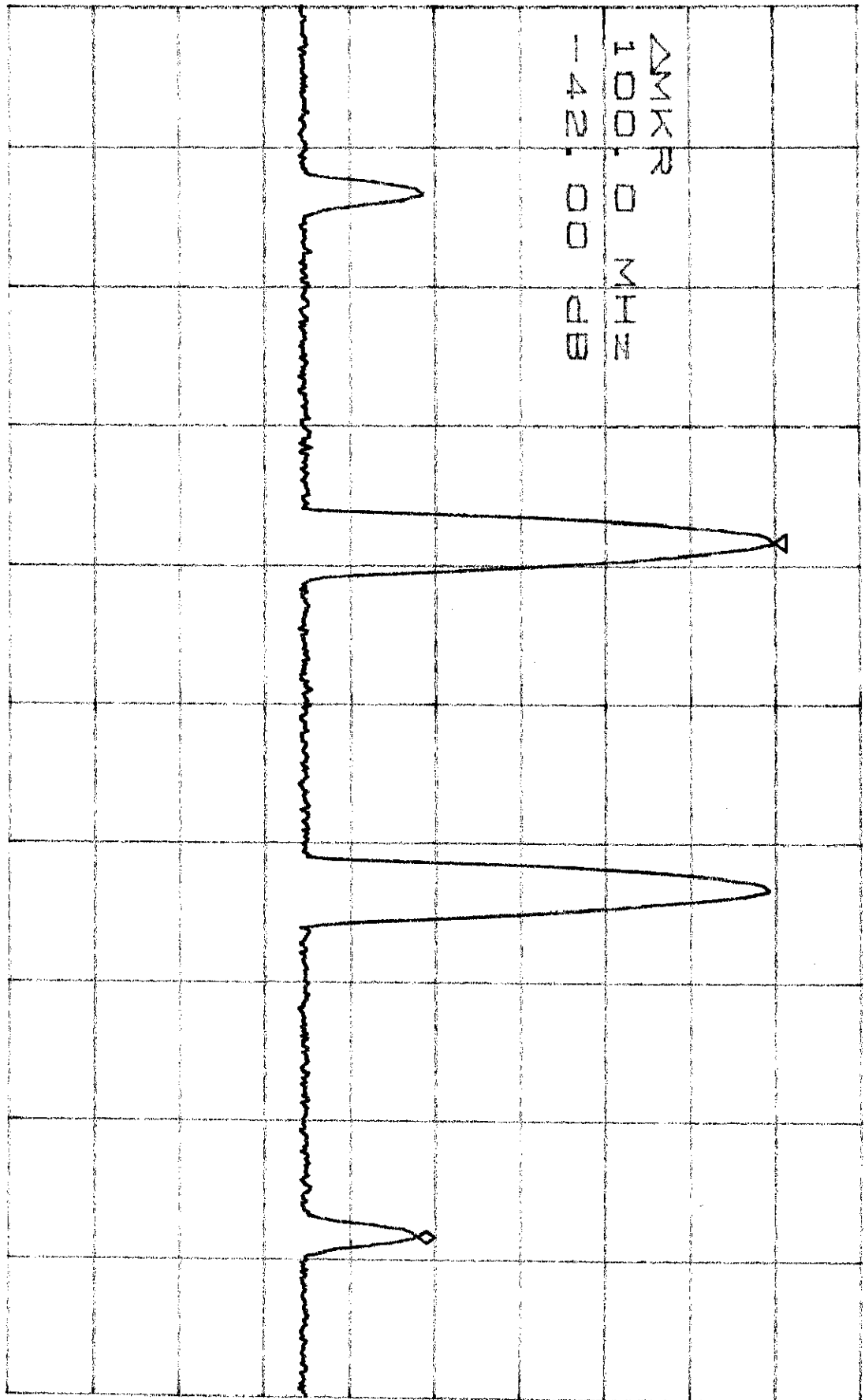
CENTER 10.8260GHZ SPAN 200.0MHZ
 *RBW 2.0MHZ *VBW 10KHZ SWP 50.0MHz

SN 103K

41598m

ATTEN 40dB RL 22.6dBm 10dB/ 100.0MHz

42.00
± 15
36.005
MK



CENTER 11.6640GHz SPAN 200.0MHz
 *RBW 2.0MHz *VBW 10kHz SWP 50.0MHz

SN 103R

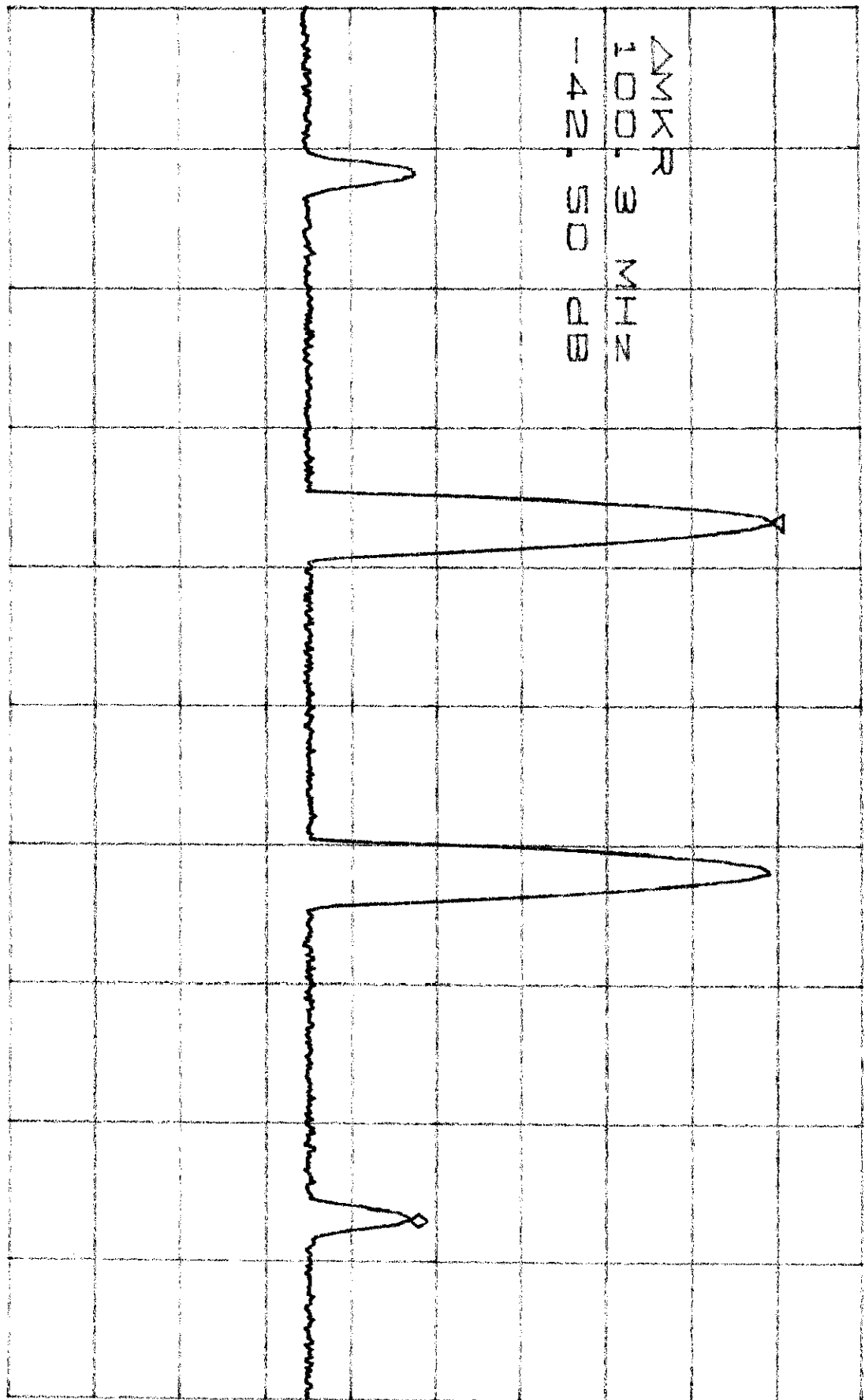
7/5 dpm

ATTEN 40dB
RF IN 100dB

100dB

AMKR -42.50dB
100.3MIN

42.50
+ 15
- 2
36.25 S



CENT 12.7270GHZ SPAN 200.0MHZ
 *RBW 2.0MHZ *VBW 10KHZ SWP 50.0MS

| | | | |
|-------------------------------|------------|------------------|---------------|
| MODEL NO. | MP-A-1012 | SERIAL NO. | 104R |
| + 12 VDC Min +15 VDC Max ⊕ | 900 mA NOM | Actual +12 VDC ⊕ | <u>886</u> mA |
| | | Actual +15 VDC ⊕ | <u>886</u> mA |

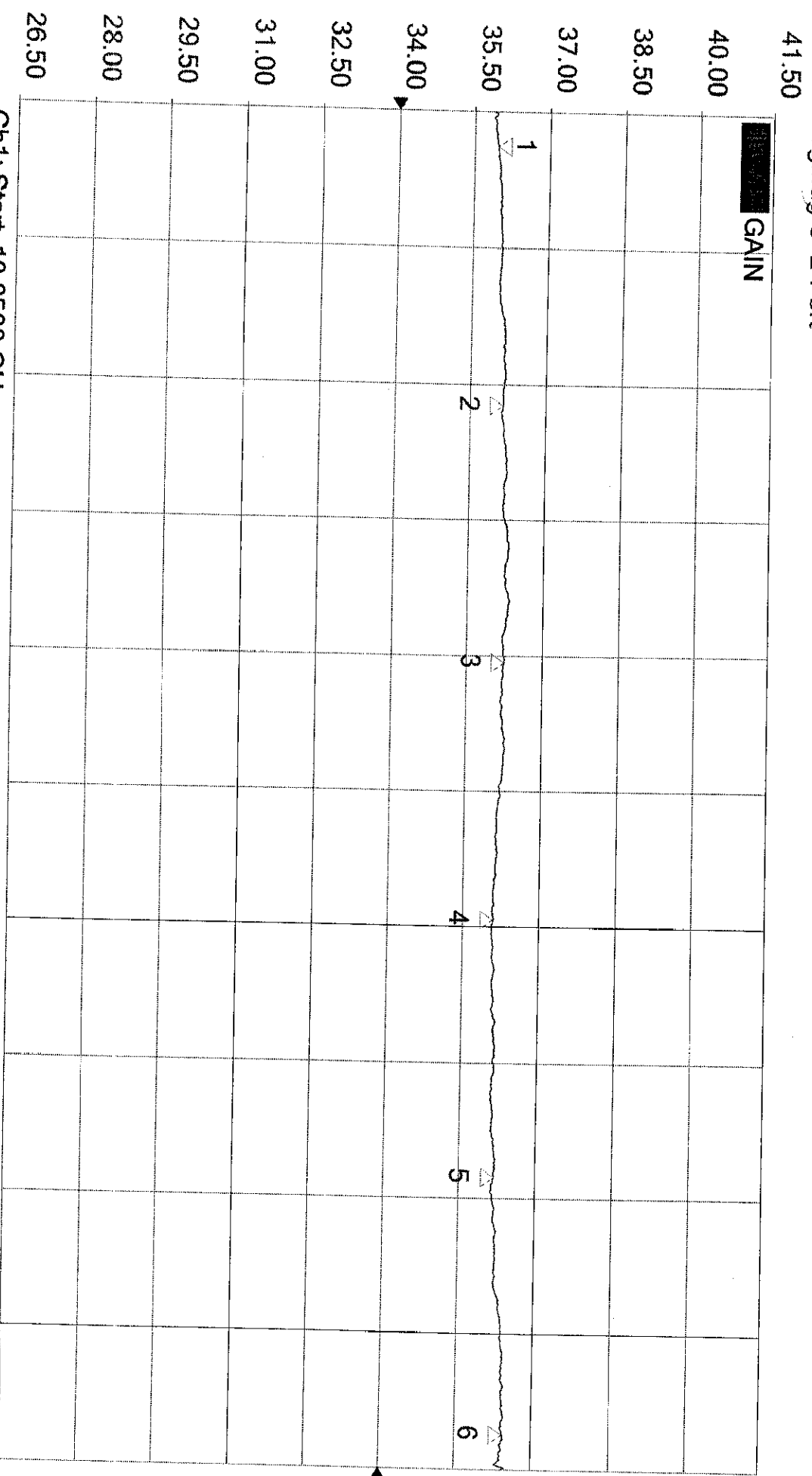
TEST DATA SHEET

MICROWAVE PHOTONIC SYSTEMS, INC.
882 SOUTH MATLACK ST. UNIT 104
WEST CHESTER, PA 19382

| FREQUENCY (GHz) | GAIN (dB) | INPUT VSWR | OUTPUT VSWR | NOISE FIGURE (dB) | IP3 | OUTPUT POWER COMPRESSION ⊕ +28 dBm MIN |
|----------------------|--------------------------|----------------|----------------|---------------------------|----------------------------|---|
| 10.9 | | | | 2.02 | 36.33 | 0.7 |
| 11.27 | REFER TO "S21" | REFER TO "S11" | REFER TO "S22" | 2.11 | — | 0.7 |
| 11.64 | PLOTTED | PLOTTED | PLOTTED | 2.21 | 36.33 | 0.7 |
| 12.38 | DATA | DATA | DATA | 2.27 | — | 0.6 |
| 12.75 | | | | 2.09 | 37.00 | 0.7 |
| SPECIFICATION LIMITS | 34 dB MIN 36.5 dB MAX | 2.0:1 MAX | 2.0:0 MAX | 2.5 dB MAX ⊕ +23 DEG C | +36 dBm MIN +38 dBm TYP | 1.0 dB MAX |

| | | | | | |
|---------|--------|-----------|--|--------------|--|
| DATE | 7/7/06 | TEST ENGR | | PROJECT ENGR | |
| QUALITY | | MFG | | CSI | |

Window 1 (1) S21 dB
LogMag C 2-Port



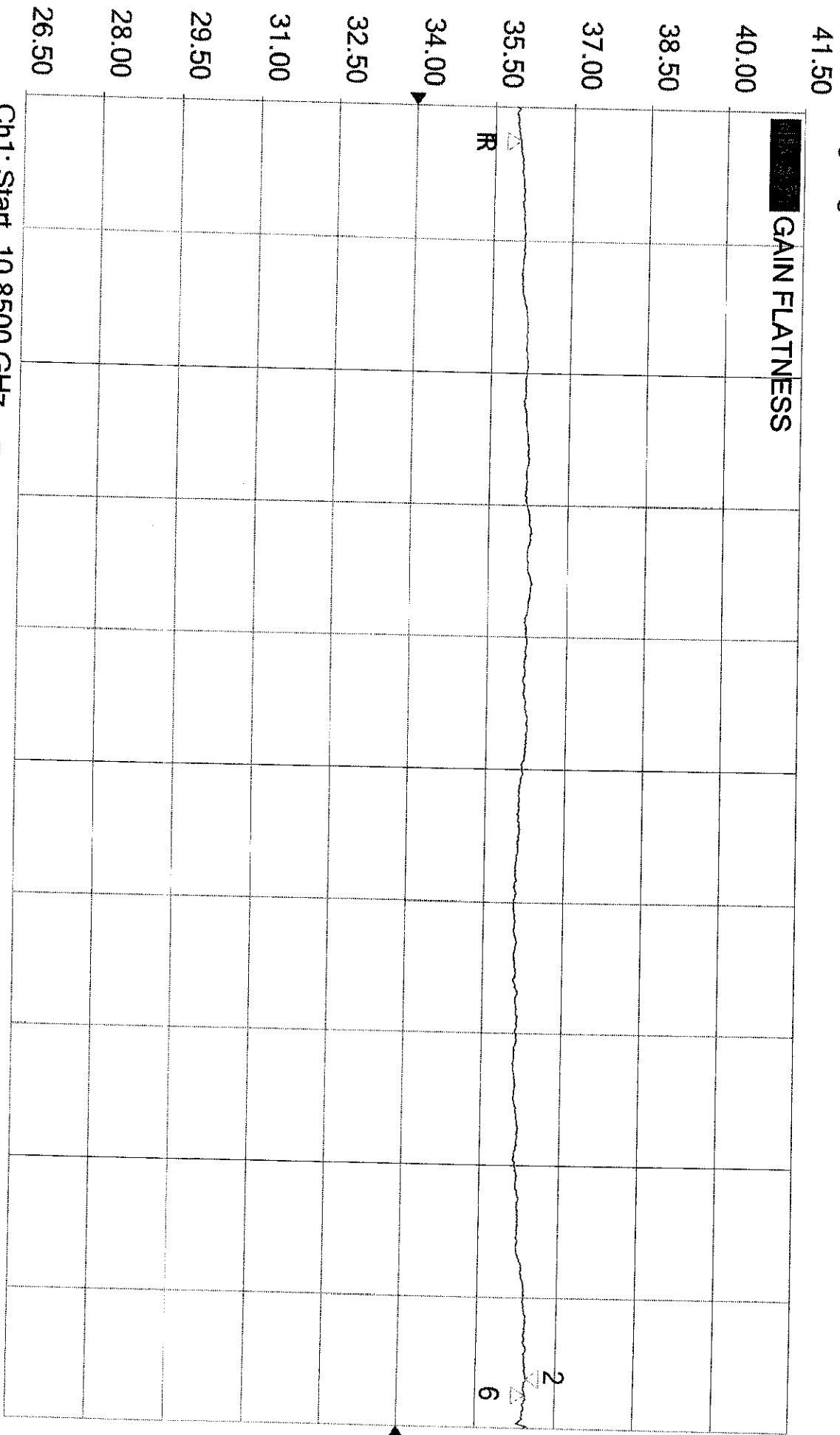
Ch1: Start 10.8500 GHz

Stop 12.8000 GHz

Trace Attributes

| Window | ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
|--------|-----|-------|----------|------------|--------|---------|--------|-----------|-----------|
| 1 | S21 | 1 | C 2-Port | 2.87 | | | 1 | 10900 MHz | 35.981 dB |
| | | | | | | | 2 | 11270 MHz | 36.154 dB |
| | | | | | | | 3 | 11640 MHz | 36.249 dB |
| | | | | | | | 4 | 12010 MHz | 36.095 dB |
| | | | | | | | 5 | 12380 MHz | 36.180 dB |
| | | | | | | | 6 | 12750 MHz | 36.430 dB |

Window 2 (1) S21 dB
 LogMag C 2-Port

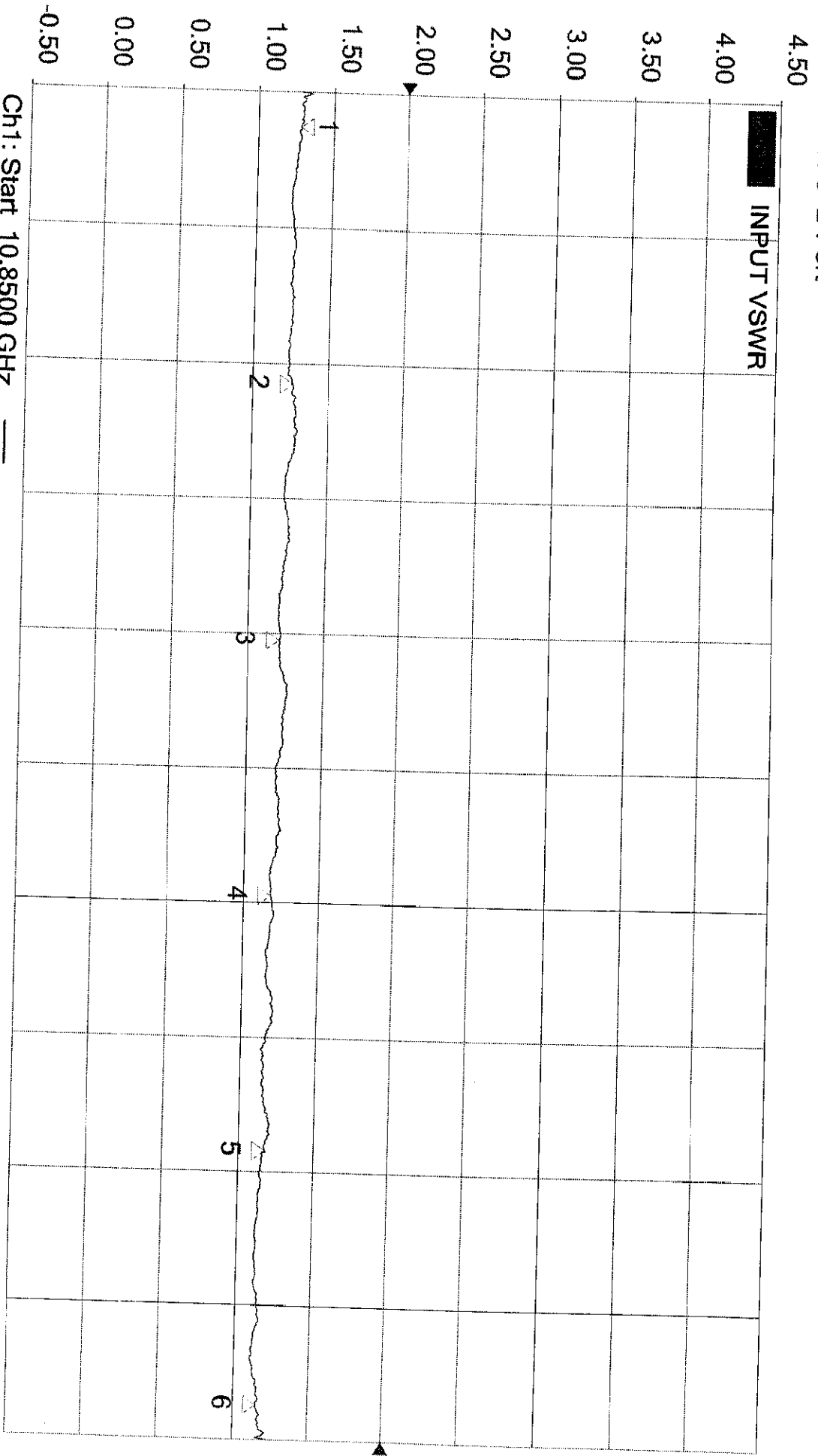


Ch1: Start 10.8500 GHz —

Stop 12.8000 GHz

Trace Attributes

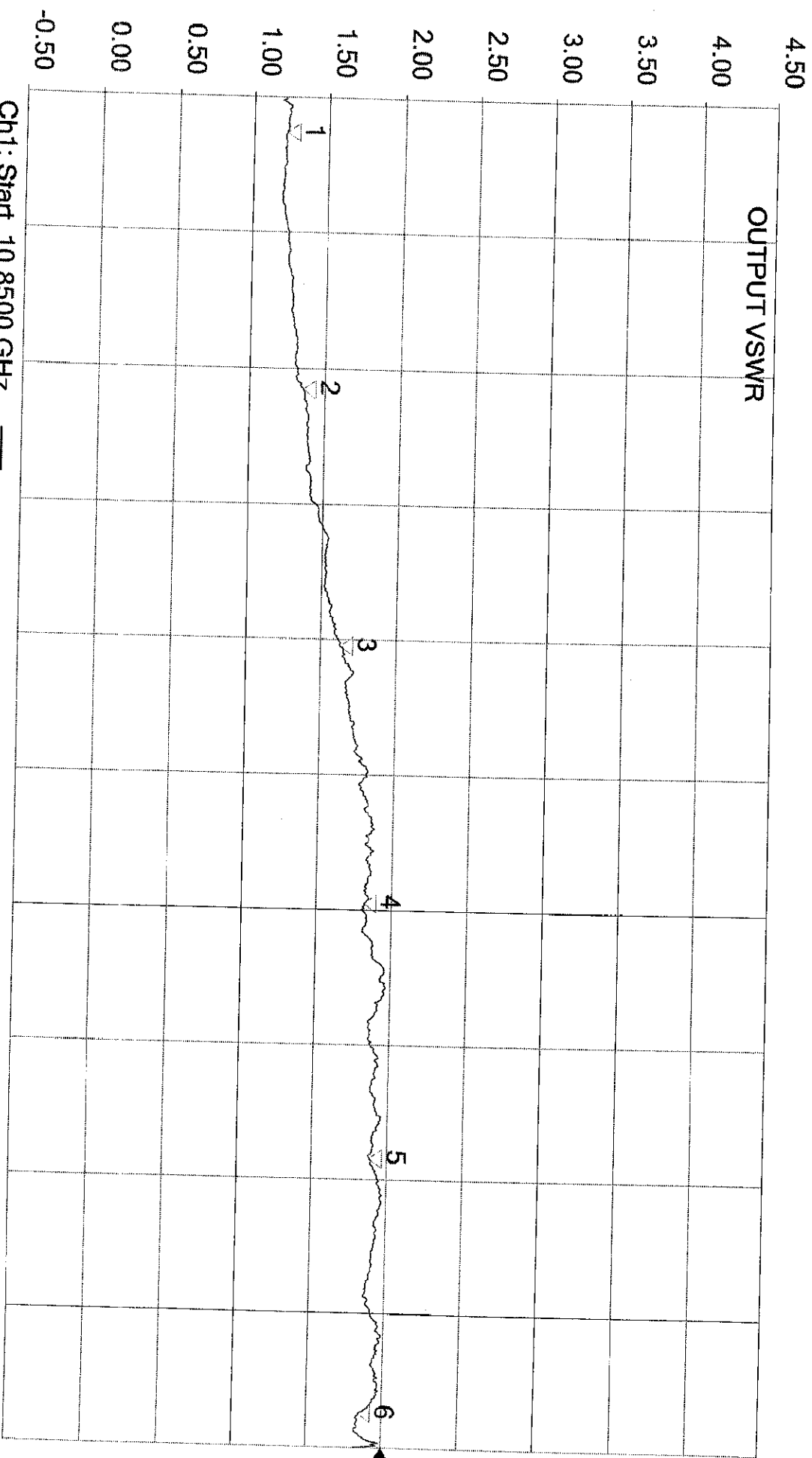
| Window | ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
|--------|----|-------|---------|------------|--------|---------|--------|---------------|------------|
| | 1 | S21 | 1 | C 2-Port | 2.87 | | 1 | 10900 MHz | 35.981 dB |
| | | | | | | | 2 | 1825.4125 MHz | 0.45975 dB |
| | | | | | | | 6 | 12750 MHz | 36.430 dB |
| | | | | | | | R | 10900 MHz | 35.981 dB |



| Trace Attributes | | | | | | | | |
|------------------|-------|---------|------------|--------|---------|--------|-----------|----------|
| Window/ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
| 1 | S11 | 1 | C 2-Port | 2.87 | | 1 | 10900 MHz | 1.2809 |
| | | | | | | 2 | 11270 MHz | 1.2613 |
| | | | | | | 3 | 11640 MHz | 1.2052 |
| | | | | | | 4 | 12010 MHz | 1.1807 |
| | | | | | | 5 | 12380 MHz | 1.1750 |
| | | | | | | 6 | 12750 MHz | 1.1506 |

Window 4 (1) S22 NV M Units
SWR C 2-Port

S/N 104K



Ch1: Start 10.8500 GHz —

Stop 12.8000 GHz

Trace Attributes

| Window ID | Trace | Channel | Correction | Smooth | Options | Marker | Position | Response |
|-----------|----------|---------|------------|--------|---------|--------|-----------|----------|
| 1 | S22 NV M | 1 | C 2-Port | 2.87 | | 1 | 10900 MHz | 1.2214 |
| | | | | | | 2 | 11270 MHz | 1.3573 |
| | | | | | | 3 | 11640 MHz | 1.6305 |
| | | | | | | 4 | 12010 MHz | 1.8171 |
| | | | | | | 5 | 12380 MHz | 1.8859 |
| | | | | | | 6 | 12750 MHz | 1.8434 |

DUT Amplifier Sys Downconv Off

| Freq | NoiseFig dB | Gain dB |
|----------------------|--------------|---------------|
| 10.900000 GHz | 2.026 | 36.305 |
| 11.270000 GHz | 2.115 | 36.309 |
| 11.640000 GHz | 2.210 | 36.378 |
| 12.010000 GHz | 2.260 | 37.048 |
| 12.380000 GHz | 2.272 | 37.608 |
| 12.750000 GHz | 2.098 | 37.766 |

Start 10.90000 GHz BW 4 MHz Points 6 Stop 12.75000 GHz
 Tcold 296.50 K Avgs Off Att --/0 dB Loss Off Corr

| |
|--------------------------------------|
| Frequency |
| Freq Mode Sweep |
| Start Freq 10.9000000 GHz |
| Stop Freq 12.7500000 GHz |
| Center Freq 11.8250000 GHz |
| Freq Span 1.850000000 GHz |
| Fixed Freq 14.7500000 GHz |
| More 1 of 2 |

SN 104R

+15 dBm

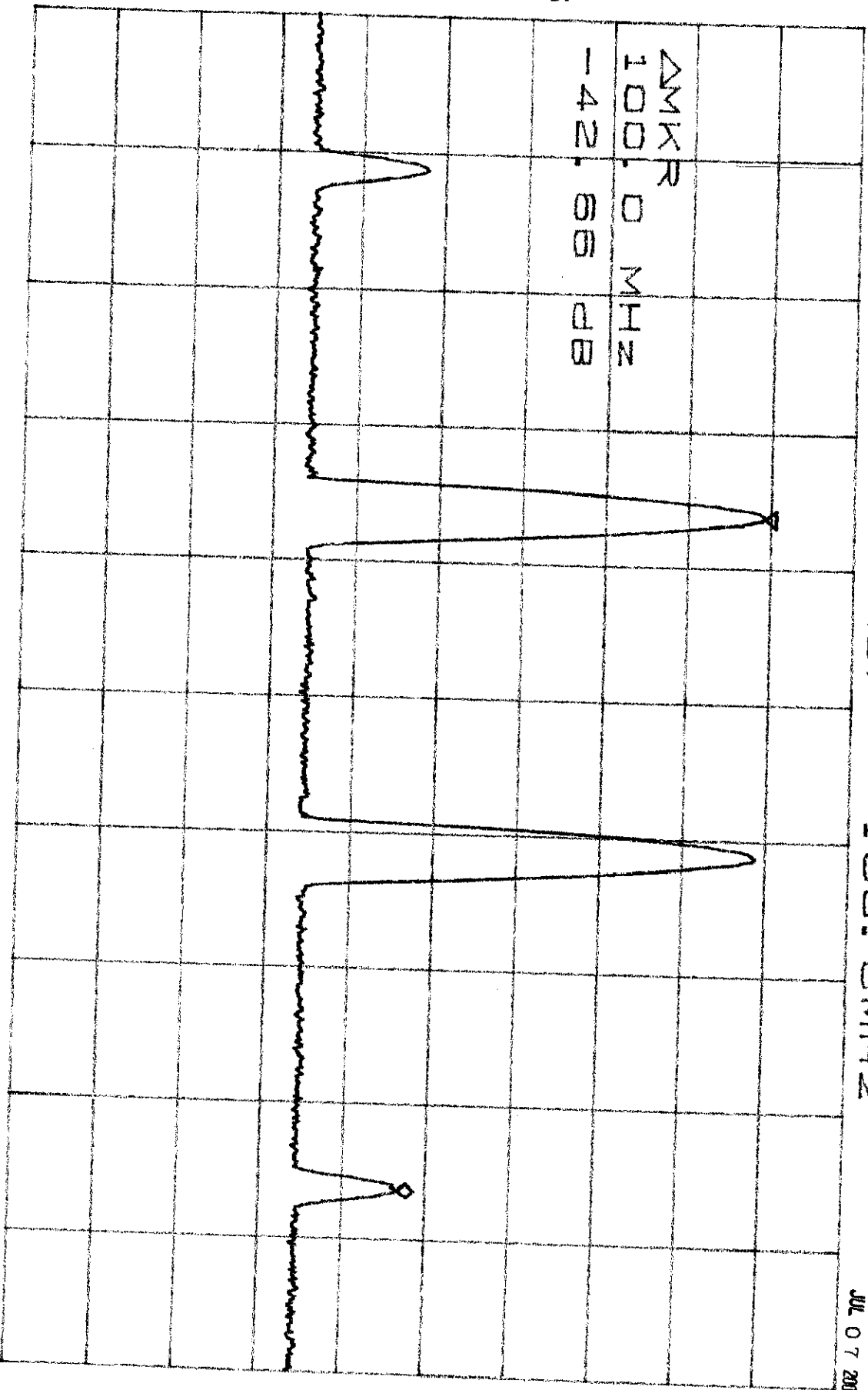
ATTEN 40 DB
RL 22.66 DB

10 DB /

ΔMKR -42.66 DB
100.0 MHZ

JUL 07 2006

$$\frac{42.66}{2} + 15 = 36.33 \text{ S}$$



CENTER 10.9280 GHz SPAN 200.0 MHz
 *RBW 2.0 MHz *VBW 10 kHz SWP 50.0 MHz

| | | | |
|-------------------------------|------------|------------------|---------------|
| MODEL NO. | MP-A-1012 | SERIAL NO. | 105 |
| + 12 VDC Min +15 VDC Max ⊕ | 900 mA NOM | Actual +12 VDC ⊕ | <u>943</u> mA |
| | | Actual +15 VDC ⊕ | <u>943</u> mA |

TEST DATA SHEET
 MICROWAVE PHOTONIC SYSTEMS, INC.
 882 SOUTH MATLACK ST. UNIT 104
 WEST CHESTER, PA 19382

| FREQUENCY (GHz) | GAIN (dB) | INPUT VSWR | OUTPUT VSWR | NOISE FIGURE (dB) | IP3 | OUTPUT POWER COMPRESSION ⊕ +28 dBm MIN |
|----------------------|--------------------------|----------------|----------------|---------------------------|----------------------------|---|
| 10.9 | | | | <2.5 | — | 0.4 |
| 11.27 | REFER TO "S21" | REFER TO "S11" | REFER TO "S22" | <2.5 | — | 0.3 |
| 11.64 | PLOTTED | PLOTTED | PLOTTED | <2.5 | 37.67 | 0.3 |
| 12.38 | DATA | DATA | DATA | <2.5 | — | 0.2 |
| 12.75 | | | | <2.5 | — | 0.2 |
| SPECIFICATION LIMITS | 34 dB MIN 36.5 dB MAX | 2.0:1 MAX | 2.0:0 MAX | 2.5 dB MAX ⊕ +23 DEG C | +36 dBm MIN +38 dBm TYP | 1.0 dB MAX |

| | | | | | |
|---------|---------|-----------|--|--------------|--|
| DATE | 7/12/06 | TEST ENGR | | PROJECT ENGR | |
| QUALITY | | MFG | | CSI | |

S/N 105

12 Jul 2006 16:41:20

CH1 TRN LOG 1.5 dB/REF 34 dB

1: 35.613 dB 10.900 000 000 GHz

PRM
Smo
Cor

H1d

CH1 Markers

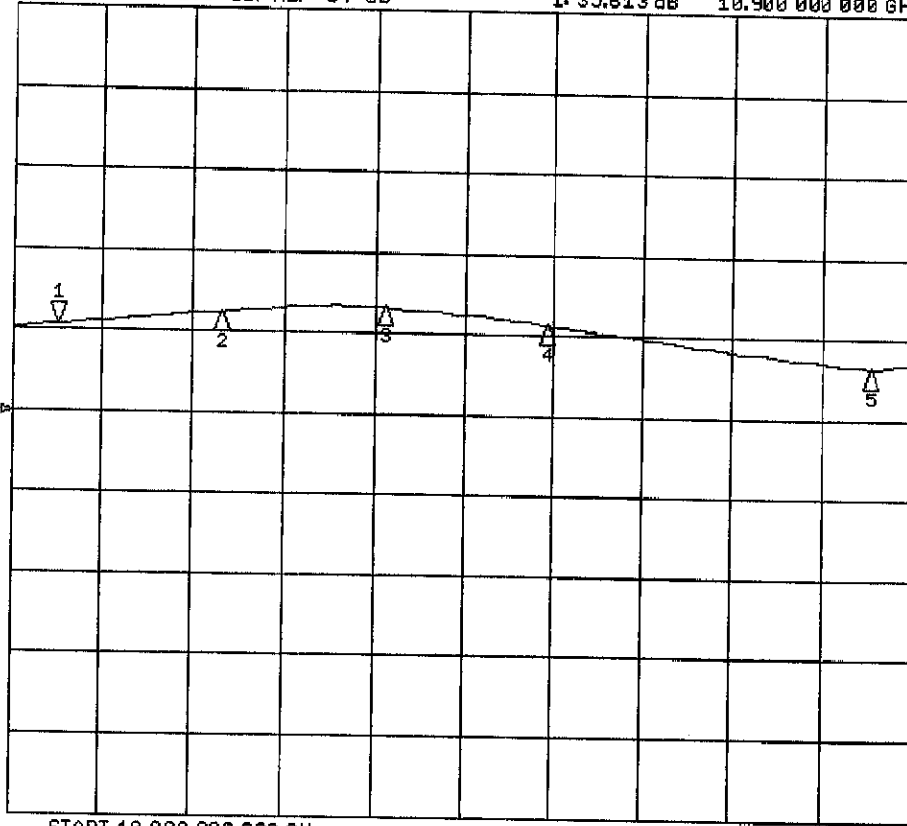
2: 35.863 dB
11.2700 GHz

3: 35.983 dB
11.6400 GHz

4: 35.677 dB
12.0100 GHz

5: 34.956 dB
12.7500 GHz

GAIN



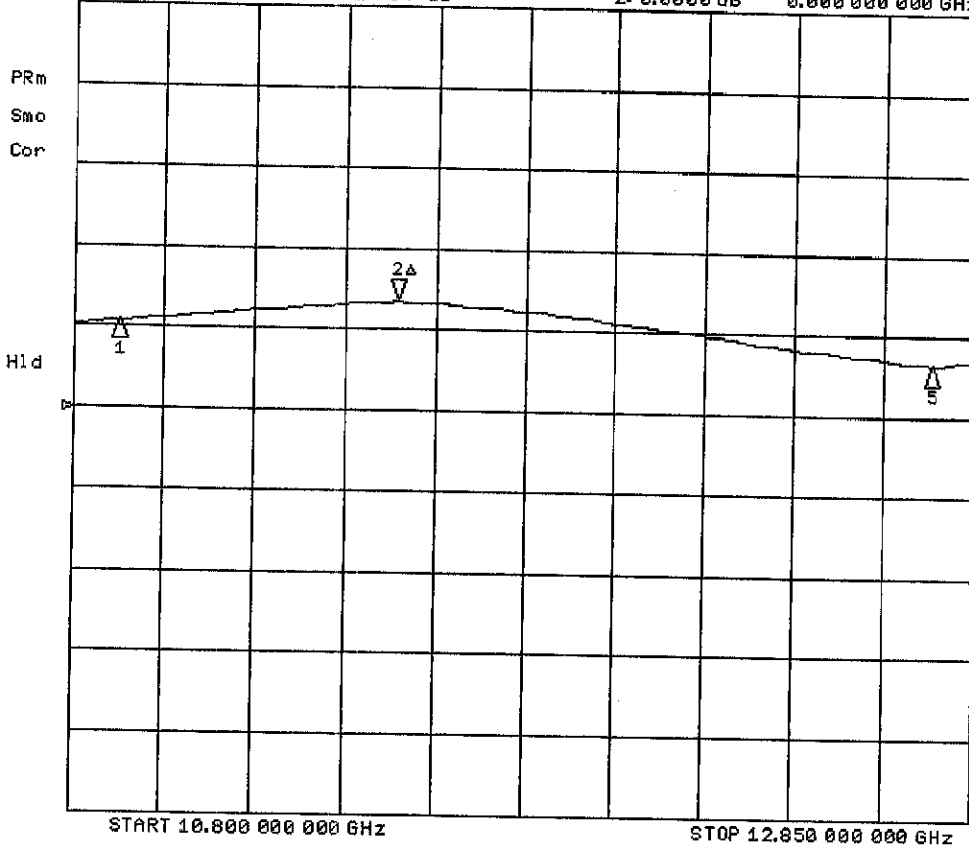
START 10.800 000 000 GHz

STOP 12.850 000 000 GHz

S/N105

12 Jul 2006 16:42:05

CH1 TRN LOG 1.5 dB/REF 34 dB 2: 0.0000 dB 0.000000000 GHz



CH1 Markers
Δ REF=2
1: -4.0700 dB
-627.750 MHz

5: -1.0640 dB
1.22225 GHz

GAIN FLATNESS

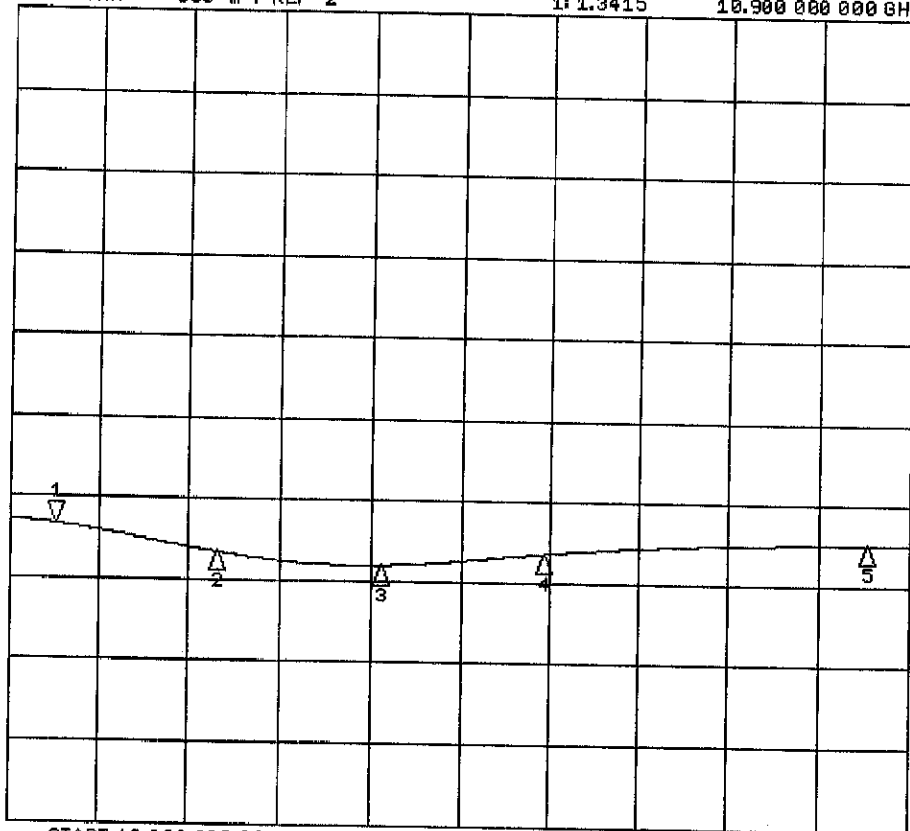
S/N 105

12 Jul 2006 16:40:11

CH2 RFL SWR 500 m / REF 2

1: 1.3415 10.900 000 000 GHz

PRm
Smo
Cor
H1d



CH2 Markers

2: 1.1774
11.2700 GHz

3: 1.0953
11.6400 GHz

4: 1.1791
12.0100 GHz

5: 1.2577
12.7500 GHz

INPUT VSWR

START 10.800 000 000 GHz

STOP 12.850 000 000 GHz

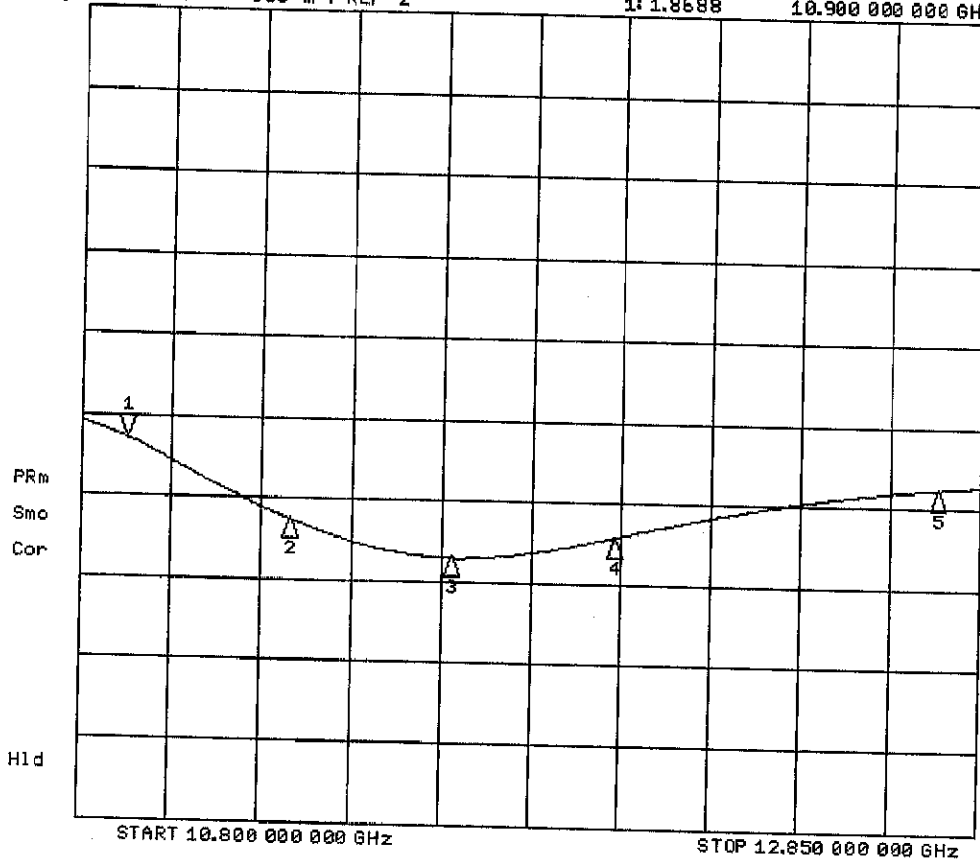
S/N 105

CH2 RFL SWR 500 m / REF 2

12 Jul 2006 16:39:38

1: 1.8688

10.900 000 000 GHz



CH2 Markers

2: 1.3799
11.2700 GHz

3: 1.1469
11.6400 GHz

4: 1.2866
12.0100 GHz

5: 1.6148
12.7500 GHz

OUTPUT VSWR

| | | | |
|-----------------------------|------------|----------------|--------|
| MODEL NO. | MP-A-1012 | SERIAL NO. | 108 |
| + 12 VDC Min +15 VDC Max | 900 mA NOM | Actual +12 VDC | 952 mA |
| | | Actual +15 VDC | 952 mA |

TEST DATA SHEET
 MICROWAVE PHOTONIC SYSTEMS, INC.
 882 SOUTH MATLACK ST. UNIT 104
 WEST CHESTER, PA 19382

| FREQUENCY (GHz) | GAIN (dB) | INPUT VSWR | OUTPUT VSWR | NOISE FIGURE (dB) | IP3 | OUTPUT POWER COMPRESSION |
|----------------------|--------------------------|----------------|----------------|-------------------------|----------------------------|--------------------------|
| 10.9 | | | | < 2.5 | — | 0.5 |
| 11.27 | REFER TO "S21" | REFER TO "S11" | REFER TO "S22" | < 2.5 | — | 0.5 |
| 11.64 | PLOTTED | PLOTTED | PLOTTED | < 2.5 | 37.83 | 0.4 |
| 12.38 | DATA | DATA | DATA | < 2.5 | — | 0.4 |
| 12.75 | | | | < 2.5 | — | 0.4 |
| SPECIFICATION LIMITS | 34 dB MIN 36.5 dB MAX | 2.0:1 MAX | 2.0:0 MAX | 2.5 dB MAX +23 DEG C | +36 dBm MIN +38 dBm TYP | 1.0 dB MAX |

| | | | | | |
|---------|---------|-----------|--|--------------|--|
| DATE | 7/12/06 | TEST ENGR | | PROJECT ENGR | |
| QUALITY | | MFG | | CSI | |

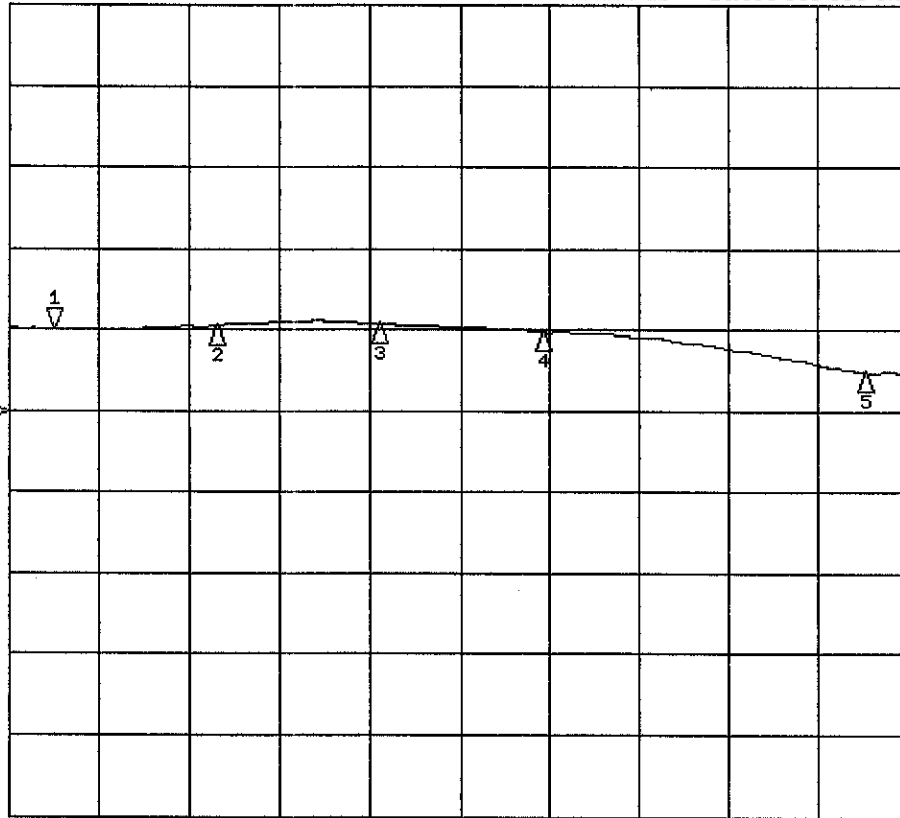
S/N 108

12 Jul 2006 16:56:35

CH1 TRN LOG 1.5 dB/REF 34 dB 1: 35.507 dB 10.900 000 000 GHz

* PRm
Smo
Cor

H1d



CH1 Markers
2: 35.574 dB
11.2700 GHz
3: 35.620 dB
11.6400 GHz
4: 35.460 dB
12.0100 GHz
5: 34.719 dB
12.7500 GHz

GAIN

START 10.800 000 000 GHz

STOP 12.850 000 000 GHz

S/N 108

12 Jul 2005 16:57:42

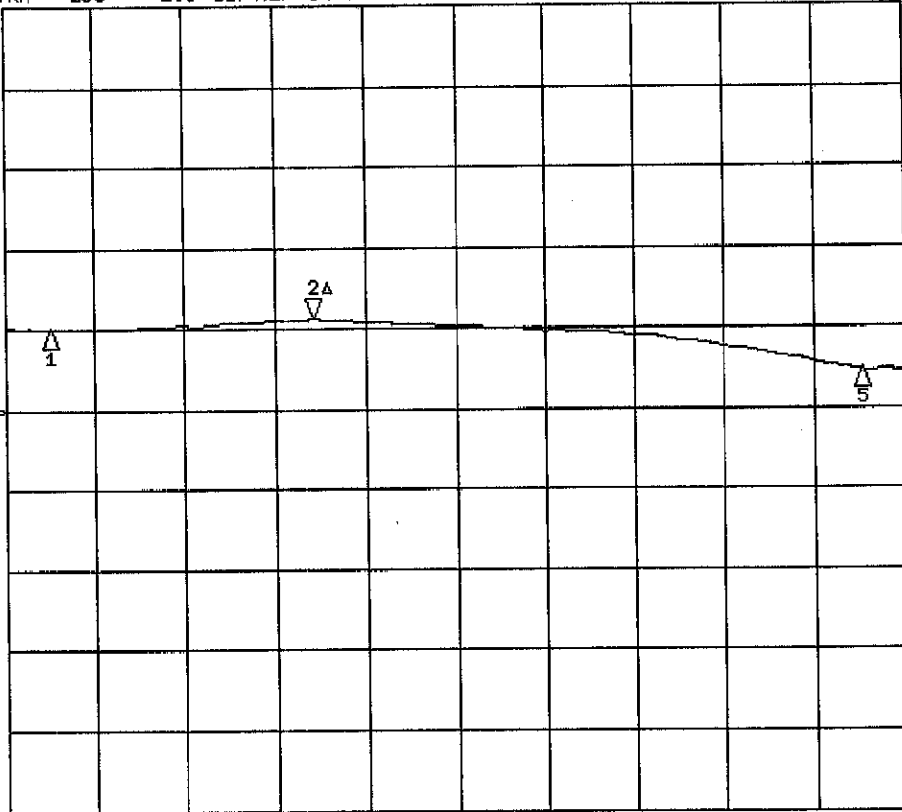
CH1 TRN LOG 1.5 dB/REF 34 dB 2: 0.0000 dB 0.000000 000 GHz

* PRm
Smc
Cor

H1d

CH1 Markers
AREF=2
1: -1.5800 dB
-599.562 MHz

5: -947.00 dB
1.25043 GHz



GAIN FLATNESS

S/N 108

12 Jul 2006 16:56:10

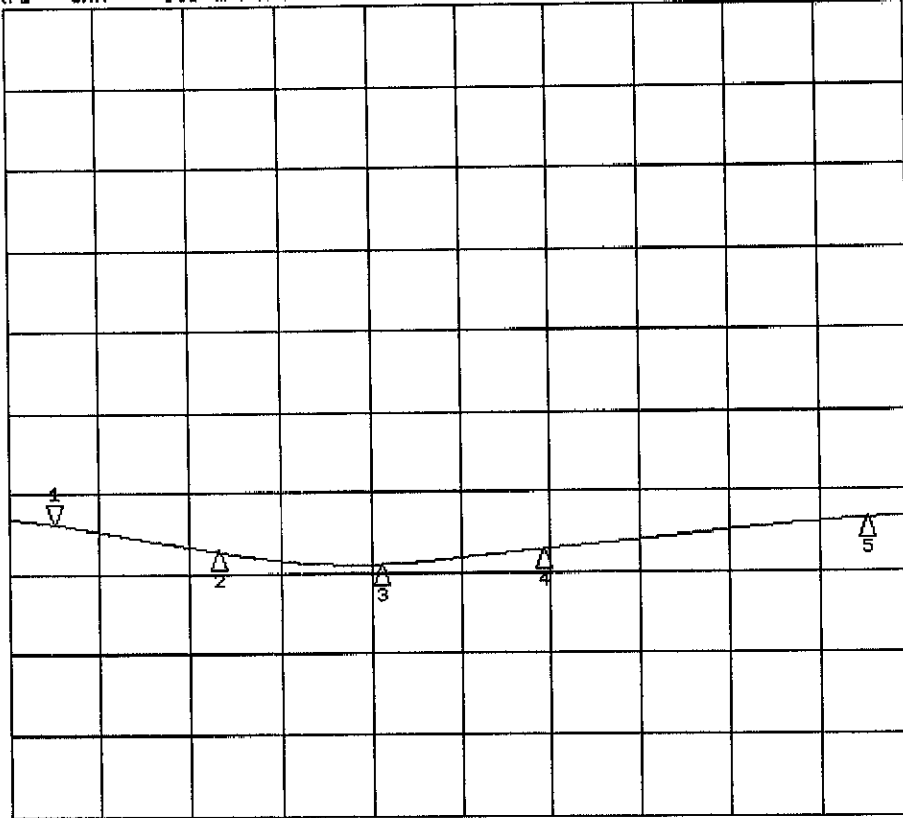
[CH2] RFL SMR 500 m / REF 2

1: 1.3087 10.900 000 000 GHz

*

PRm
Smo
Cor

H1d



CH2 Markers

2: 1.1352
11.2700 GHz

3: 1.0514
11.6400 GHz

4: 1.1451
12.0100 GHz

5: 1.3307
12.7500 GHz

INPUT VSWR

START 10.800 000 000 GHz

STOP 12.850 000 000 GHz

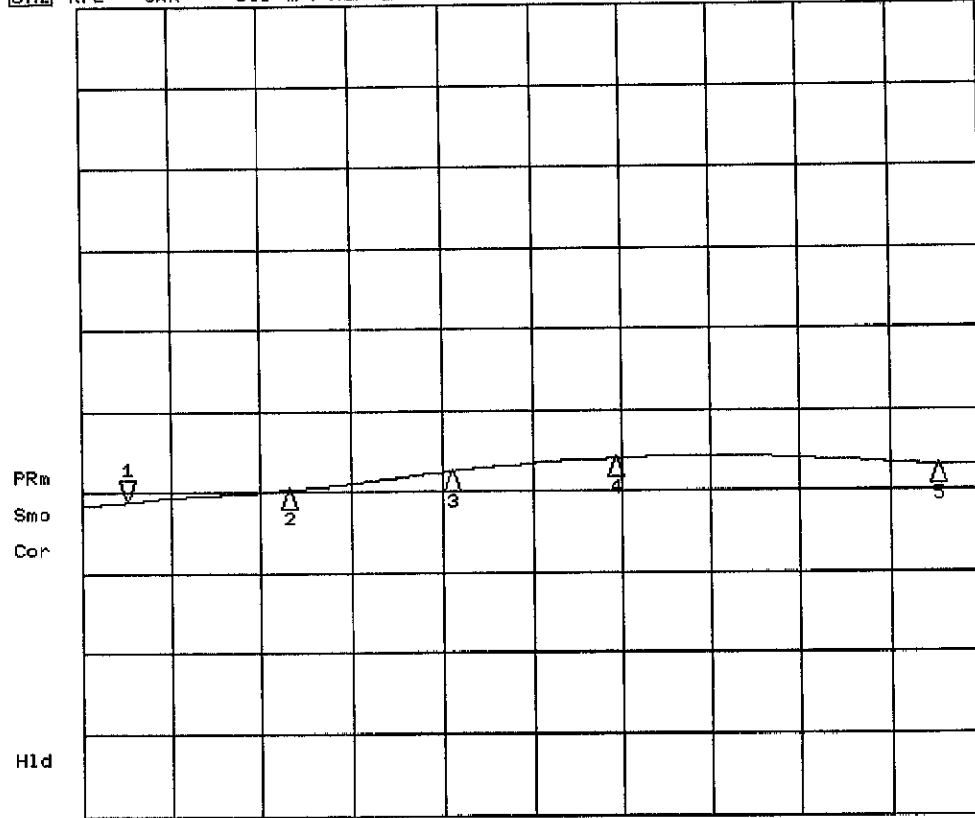
S/N 108

12 Jul 2006 16:51:39

CH2 RFL SWR 500 m / REF 2

1: 1.4408

10.900 000 000 GHz



CH2 Markers

2: 1.5111
11.2700 GHz

3: 1.6227
11.6400 GHz

4: 1.7020
12.0100 GHz

5: 1.6584
12.7500 GHz

OUTPUT VSWR

START 10.800 000 000 GHz

STOP 12.850 000 000 GHz