



15.407 Certification  
FCC ID: EV9N2X5-3S1-16B

EMI TEST REPORT

On

N2-X Ethernet Extender

Prepared for

Wireless Inc.  
19 Davis Drive  
Belmont, CA 94002-3001  
Tel : (650)595-3300  
Fax: (650)595-4907

Prepared by

Electronic Compliance Laboratories Inc.

Test Report Number: A903004  
Date of Test: February 10 - 18, 1999

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## 1.0 TEST FACILITY

Name: Electronic Compliance Laboratories

Location: 1249 Birchwood Dr.  
Sunnyvale, CA 94089

Site Filing: A site description is on file at the Federal Communications Commission  
P.O. Box 429  
Columbia, MD 21045

NVLAP LAB CODE: 200089

Types of Sites: Open Field Radiated and Indoor Screen Room (Line Conducted). All sites are constructed and calibrated to meet ANSI C63.4-1994 requirements.

## 2.0 TEST EQUIPMENT

Description	Manufacturer	Model	SN
EMI Receiver	HP	8546A	3325A00137
Spectrum Analyzer	HP	8563A	3137A01183
Spectrum Analyzer	HP	8564E	3741A00986
Preamp	HP	8447F	3113A05849
Preamp	HP	8449B	3008A00527
LISN	EM	ANS-25/2	2532
Biconical Antenna	EM	EM 6912	414
Log Periodic Ant	EM	EM 6950	311
Double Ridge Horn	EM	EM 6961	6231
Filter BP 1.2-45 GHz	FSY	HM 1160-1155	001
Filter BP 4-10 GHz	FSY	HM 2950-1565	001
Filter BP 10-18 GHz	FSY	HP8601-7SS	001
Filter BP 18-26 GHz	FSY	C21G-6.7G-4SS	001

## 3.0 EUT

N2-X Ethernet Extender - point to point radio link  
Model Number: - 251-110019-401  
Serial Number: - 04-9PP001  
FCC ID: - EV9N2X5-3S1-16B

## 4.0 SUPPORT EQUIPMENT

None

## **5.0 EQUIPMENT CONFIGURATION**

All of the equipment and cables were placed in worst case positions to maximize emissions.

Interconnecting cables were of the type and length specified in the individual equipment requirements.

Grounding was in accordance with the manufacturer requirements and conditions for intended use.

## 6.0 SUMMARY OF TESTS

The N2-X Ethernet Extender is a wireless point to point communications system with a low power radio system operating in the 5.250 -5.350 GHz band. Tests were performed using a 28.5 dB gain antenna. Test firmware resident in the EUT was used to do the test.

### 6.1 15.407(a)(2) Peak Transmit Power

The N2 Link was set to transmit continuously on it's low, middle, and high frequency. The 26 dB bandwidth was measured for each frequency. The peak transmit power limit is the lesser of either 24dBm or 11 dBm + 10Log(26 dB BW). The peak transmit power limit was reduced by the number of dB that the antenna gain exceeded 6 dBi.

The power was measured by setting RBW to 1MHz and VBW to 30MHz. The analyzer span was set to 1 MHz, the trace set for Max Hold, and the frequency set to the center of the selected EUT frequency. The peak reading of the analyzer was recorded. The analyzer frequency was the shifted by 1 MHz and the procedure was repeated. This was done for 10 MHz on each side of the EUT frequency. Table 1 shows the results for each frequency. Data Sheets are shown in **Appendix A**.

Freq. (GHz)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	Limit (dBm) based on 26 dB BW	Limit - Excess Antenna Gain (dBm)	Delta
5.26	-3.32	28.5	21.7	-1.6	-1.7
5.30	-4.24	28.5	21.1	-1.4	-2.8
5.33	-1.82	28.5	20.9	-1.6	-0.2

Table 1. Peak Transmit Power vs. Limit

### Peak Spectral Power Density

Peak Power Spectral Density measurements were taken at the same time as the output power. The peak spectral density limit is 11 dBm in any 1 MHz band. This limit is reduced by the number of dB that the antenna gain exceeds 6 dBi, making the limit -11.5 dBm. The N2 - X does not meet the specification at the three mid points for each frequency. Data Sheets are shown in **Appendix A**.

### 6.2 15.407(a)6

Ratio of the peak excursion of the modulation envelope to the peak transmit power shall not exceed 13 dB.

Freq. (GHz)	Peak Transmit Power (dBm)	Peak Excursion Power (dBm)	Delta	Limit (dB)
5.26	-3.32	3.17	6.49	13
5.30	-4.24	-1.17	3.07	13
5.33	-1.82	2.17	3.99	13

### 6.3 15.407(b)(3) OUT OF BAND EMISSIONS

The spectrum analyzer plots titled " OUT OF BAND - LOWER BAND EDGE " shows the output spectrum of the EUT when set to it's lowest transmitting frequency. The spectrum analyzer plots titled "" OUT OF BAND - UPPER BAND EDGE" shows the output spectrum of the EUT when set to it's highest transmitting frequency. The analyzer was placed in MAX HOLD mode, and several sweeps were recorded. The resultant plots show that the EUT emissions were at least 60 dB down from the band edges to 10MHz above and below the band edges.

The spectrum analyzer plots titled " OUT OF BAND - LOWER BAND EDGE + 10MHz" shows the output spectrum of the EUT when set to it's lowest transmitting frequency. The spectrum analyzer plots titled "" OUT OF BAND - UPPER BAND EDGE + 10 MHz" shows the output spectrum of the EUT when set to it's highest transmitting frequency. The analyzer was placed in MAX HOLD mode, and several sweeps were recorded. The resultant plots show that the EUT emissions were at least 60 dB down for frequencies greater than 10 MHz above and below the band edges.

The spreadsheet in Appendix B shows the EIRP of the out of band emissions, up to 20 MHz away from the band edge, is better than -27 dBm / MHz.

The spectrum analyzer plots labeled "OUT OF BAND <30 MHz - 6 GHz", " OUT OF BAND 6 - 13 GHz", "OUT OF BAND 13 - 26.5 GHz", "OUT OF BAND 26.5 - 31GHz", and "OUT OF BAND 31 - 40 GHz", show that emissions measured in  $\geq 100$  kHz bandwidth are more than 20 dB below the highest level of the desired power outside of the 5.225 - 5.325 GHz band. Test data and plots are shown in **Appendix B**.

### 6.3 15.205 RESTRICTED BAND RADIATION LIMITS

The EUT was placed on a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane of the 3 meter test site. The search antenna was moved in to 1 meter when necessary to improve the noise floor, and the appropriate range factor was applied. While the EUT was transmitting uninterrupted random data on each of the low / mid / high channels and with the spectrum analyzer on MAX HOLD, the turntable was rotated, and the search antenna raised and lowered in an attempt to maximize the received radiated emission level. Test results are attached in **Appendix C** in tabular form showing that no spurious signals were detected above the 74 dBuV/m peak / 54dBuV/m average limits. Peak measurements were made with a RBW and VBW = 1 MHz. Average measurements were made with a RBW = 1 MHz and a VBW = 10 Hz. The N2 harmonics were only measured up to 3rd due to measuring equipment limitations. The Out Of Band plots in Appendix B show that no harmonics are seen above the noise floor.

### 6.4 15.209 RADIATED EMISSIONS

The attached table shows that the Class B radiated limits from 30 - 1000 MHz are not exceeded by the EUT. The EUT was set in a receive only mode during this test. The EUT was placed near one edge of a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane of the 3 meter test site. The search antennas were located at 3 meters. Measurements were made in accordance with ANSI C63.4-1994. Test Data is in **Appendix E**.

### 6.5 15.207 AC LINE CONDUCTED EMISSIONS

The RF line conducted levels for emissions in the 0.45 - 30 MHz band must not exceed 250  $\mu$ V when measured with a LISN. Attached graphs and tabular data show that emissions are below the 250  $\mu$ V (48 dB $\mu$ V) maximum allowed level. Test Data is in **Appendix D**.

### 6.6 15.203 ANTENNA REQUIREMENT

The unit requires professional installation and is therefore exempt from the requirements of 15.203. This product has a standard N type Antenna connector to provide a coupling to the intentional radiator.

Electronic Compliance Laboratories

\_\_\_\_\_  
Chip Matheny  
Technical Officer

\_\_\_\_\_  
Date 6/30/99

## **APPENDIX A**

### **Peak Transmit Power and Peak Power Spectral Density Data Sheets**

5.25 - 5.35 GHz NII		
Output Power / Peak Power Spectral Density		
Date:	2/18/99	Freq (GHz) = 5.2608
Work Order	9021001a	26 dB BW = 9.83Mhz
File Name	90210012ptp.xls	
Tested By	Shawn	Peak Transmit Power Limit
		11dBm+10Log(9.83Mhz)= 20.9 dBm
RBW =	1 MHz	
VBW =	30 kHz	Antenna gain = 28.5 dBi
Span =	1 MHz	Antenna gain - 6dBi = 22.5 dB
Freq (GHZ)	Pout (dBm)	Pout (mW)
5.2508	-56.50	0.000
5.2518	-57.00	0.000
5.2528	-53.30	0.000
5.2538	-48.70	0.000
5.2548	-42.50	0.000
5.2558	-33.10	0.000
5.2568	-29.10	0.001
5.2578	-23.40	0.005
5.2588	-14.20	0.038
5.2598	-9.60	0.110
5.2608	-8.40	0.145
5.2618	-9.40	0.115
5.2628	-13.50	0.045
5.2638	-22.40	0.006
5.2648	-28.60	0.001
5.2658	-33.00	0.001
5.2668	-41.40	0.000
5.2678	-46.50	0.000
5.2688	-53.40	0.000
5.2698	-54.00	0.000
5.2708	-54.00	0.000
		PTP Limit - 22.5 dB = -1.6 dBm
		Ptotal (mW) = 0.47
		Ptotal (dBm) = -3.32
		Ant. Gain (dBi) = 28.50
		EIRP (dBm) = 25.18

5.25 - 5.35 GHz NII		
Output Power / Peak Power Spectral Density		
Date:	2/18/99	Freq (GHz) = 5.30176
Work Order	9021001A	26 dB BW = 10.2
File Name	9021001A1ptp.xls	
Tested By	Suresh	Peak Transmit Power Limit
		11dBm+10Log(10.2Mhz)= 21.1 dBm
RBW =	1 MHz	
VBW =	30 kHz	Antenna gain = 28.5 dBi
Span =	1 MHz	Antenna gain - 6dBi = 22.5 dB
Freq (GHZ)	Pout (dBm)	Pout (mW)
5.29176	-57.00	0.000
5.29276	-57.00	0.000
5.29376	-52.83	0.000
5.29476	-49.67	0.000
5.29576	-42.50	0.000
5.29676	-34.17	0.000
5.29776	-28.83	0.001
5.29876	-24.00	0.004
5.29976	-13.17	0.048
5.30076	-8.00	0.158
5.30176	-9.67	0.108
5.30276	-8.00	0.158
5.30376	-13.00	0.050
5.30476	-23.50	0.004
5.30576	-29.00	0.001
5.30676	-33.50	0.000
5.30776	-41.83	0.000
5.30876	-49.83	0.000
5.30976	-53.33	0.000
5.31076	-56.83	0.000
5.31176	-56.83	0.000
		PTP Limit - 22.5 dB = -1.4 dBm
		Ptotal (mW) = 0.54
		Ptotal (dBm) = -2.71
		Ant. Gain (dBi) = 28.50
		EIRP (dBm) = 25.79

**5.25 - 5.35 GHz NII**  
**Output Power / Peak Power Spectral Density**

**Date:** 2/17/99                      Freq (GHz) = 5.32504  
**Work Order** 9021001A              26 dB BW = 10.2  
**File Name** 9021001Aptp.xls  
**Tested By** Suresh                      **Peak Transmit Power Limit**

11dBm+10Log(10.2Mhz)= 21.1 dBm

**RBW =** 1 MHz  
**VBW =** 30 kHz  
**Span =** 1 MHz

Antenna gain = 28.5 dBi  
 Antenna gain - 6dBi = 22.5 dB

PTP Limit - 22.5 dB = -1.4 dBm

Freq (GHz)	Pout (dBm)	Pout (mW)
5.31504	-56.50	0.000
5.31604	-57.00	0.000
5.31704	-53.30	0.000
5.31804	-48.70	0.000
5.31904	-42.50	0.000
5.32004	-33.10	0.000
5.32104	-29.10	0.001
5.32204	-23.40	0.005
5.32304	-14.20	0.038
5.32404	-9.60	0.110
5.32504	-8.40	0.145
5.32604	-9.40	0.115
5.32704	-13.50	0.045
5.32804	-22.40	0.006
5.32904	-28.60	0.001
5.33004	-33.00	0.001
5.33104	-41.40	0.000
5.33204	-46.50	0.000
5.33304	-53.40	0.000
5.33404	-54.00	0.000
5.33504	-52.00	0.000

Ptotal (mW) = 0.47  
 Ptotal (dBm) = -3.32  
 Ant. Gain (dBi) = 28.50  
 EIRP (dBm) = 25.18

**5.25 - 5.35 GHz NII  
Out of Band**

**Date:** 2/17/99 **RBW =** 1 MHz  
**Work Order** 9021001a **VBW =** 30 kHz  
**File Name** 9021001AOOB.xls **Span =** 1 MHz  
**Tested By** Suresh **Ant. Gain =** 28.5 dBi

Freq = 5.26080 GHZ			Freq = 5.33504 GHZ		
Freq (GHz)	Pout (dBm)	Pout (mW)	Freq (GHz)	Pout (dBm)	Pout (mW)
5.250	-59.17	0.000	5.350	-61.67	0.000
5.249	-60.17	0.000	5.351	-61.50	0.000
5.248	-60.67	0.000	5.352	-61.83	0.000
5.247	-61.00	0.000	5.353	-62.00	0.000
5.246	-61.83	0.000	5.354	-61.33	0.000
5.245	-61.67	0.000	5.355	-62.17	0.000
5.244	-62.00	0.000	5.356	-61.50	0.000
5.243	-61.83	0.000	5.357	-61.83	0.000
5.242	-62.33	0.000	5.358	-62.17	0.000
5.241	-62.00	0.000	5.359	-62.00	0.000
5.240	-61.50	0.000	5.360	-62.33	0.000
5.239	-61.83	0.000	5.361	-61.33	0.000
5.238	-62.00	0.000	5.362	-61.67	0.000
5.237	-62.50	0.000	5.363	-61.50	0.000
5.236	-61.67	0.000	5.364	-61.83	0.000
5.235	-62.00	0.000	5.365	-62.00	0.000
5.234	-62.33	0.000	5.366	-62.50	0.000
5.233	-61.67	0.000	5.367	-62.17	0.000
5.232	-61.17	0.000	5.368	-61.83	0.000
5.231	-61.67	0.000	5.369	-61.67	0.000
5.230	-62.33	0.000	5.370	-61.83	0.000

## **APPENDIX B**

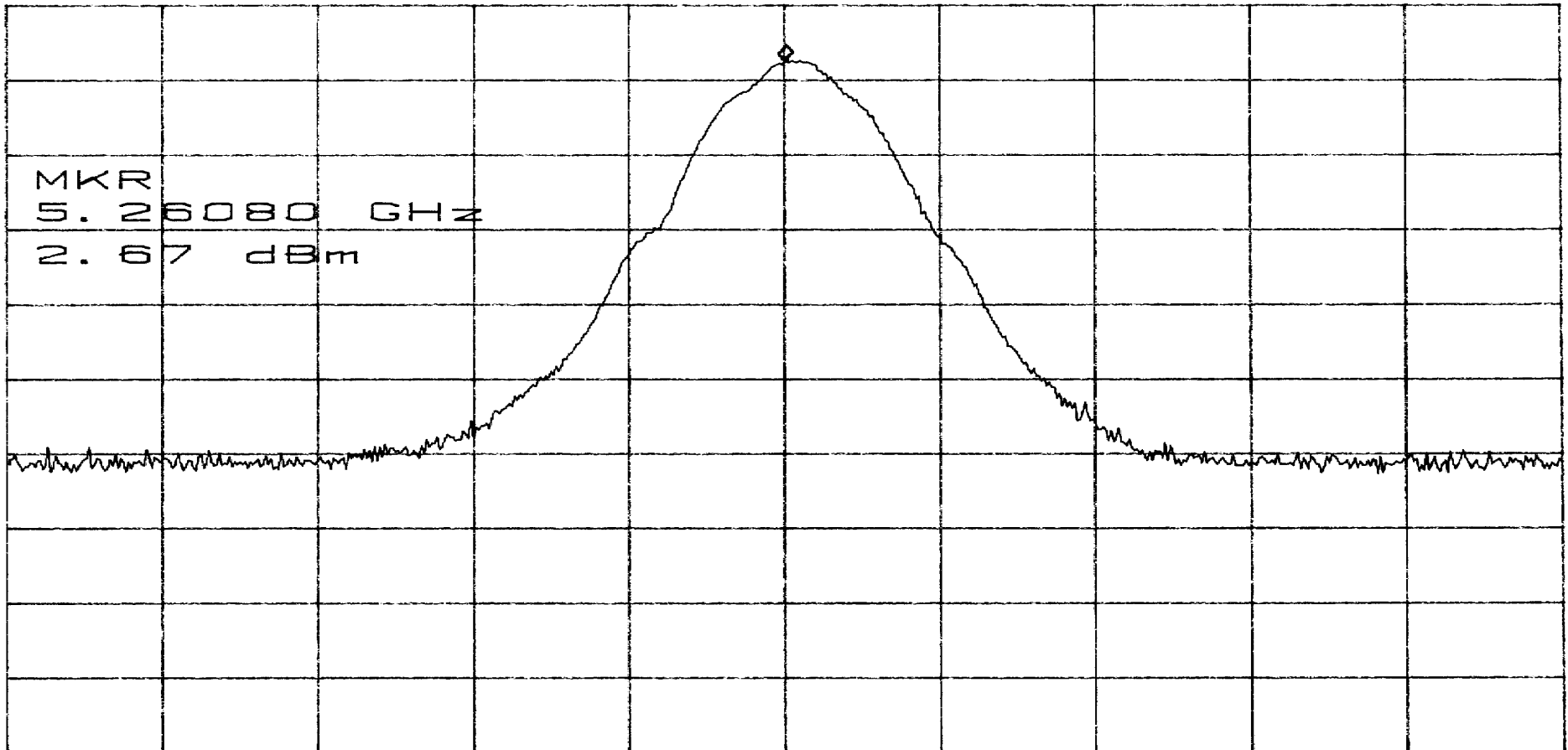
### **Out of Band Data and Plots**

Pout 5.2608 GHz

ATTEN 20dB  
RL 10.0dBm

10dB/

MKR 2.67dBm  
5.26080GHz



CENTER 5.26080GHz

SPAN 50.00MHz

RBW 2.0MHz

VBW 3.0MHz

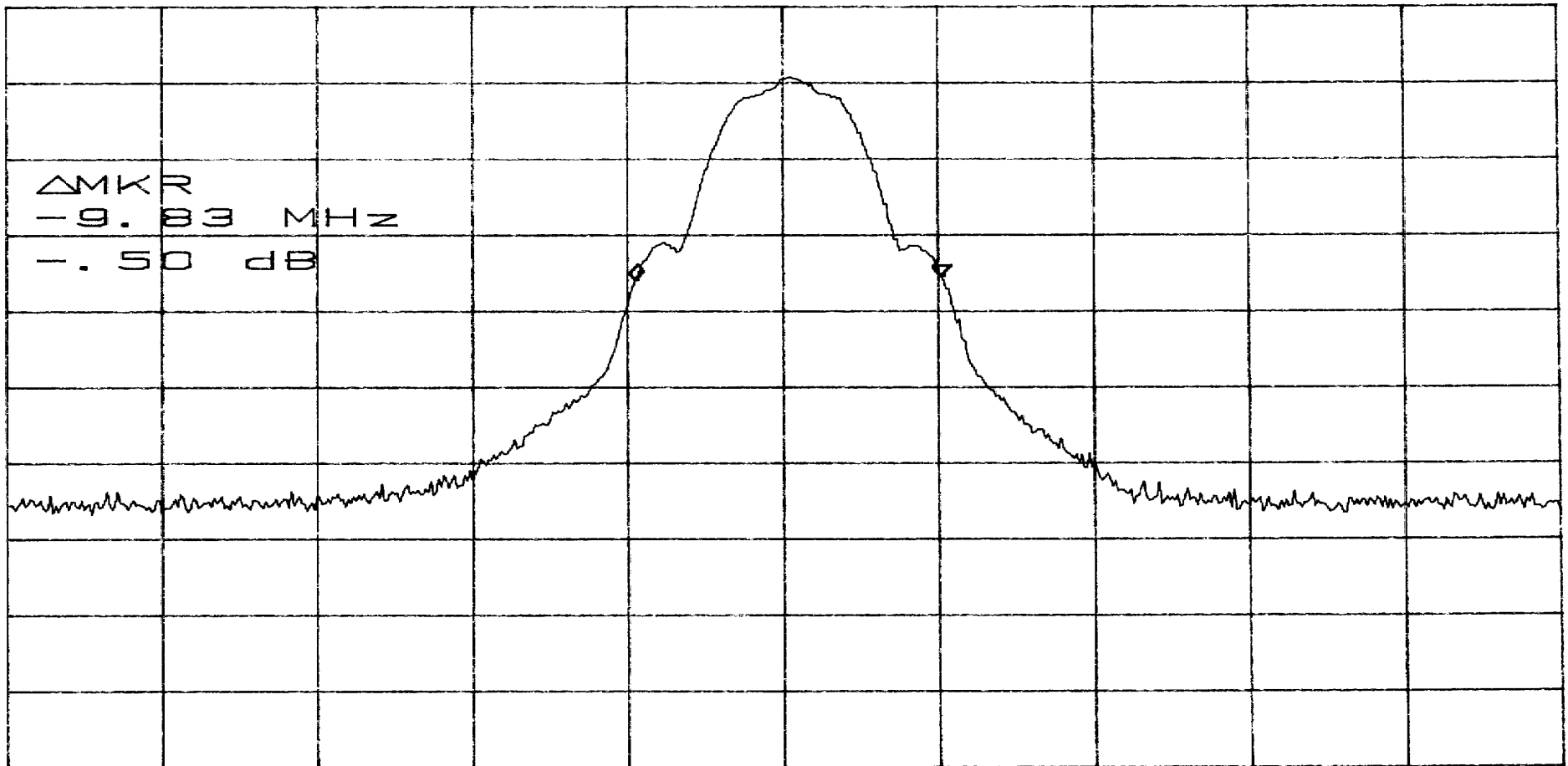
SWP 50ms

# 5.2608 GHz 26 dB Bandwidth

ATTEN 20dB  
RL 10.0dBm

10dB/

$\Delta MKR$  -.50dB  
-9.83MHz



CENTER 5.26080GHz

SPAN 50.00MHz

RBW 1.0MHz

VBW 1.0MHz

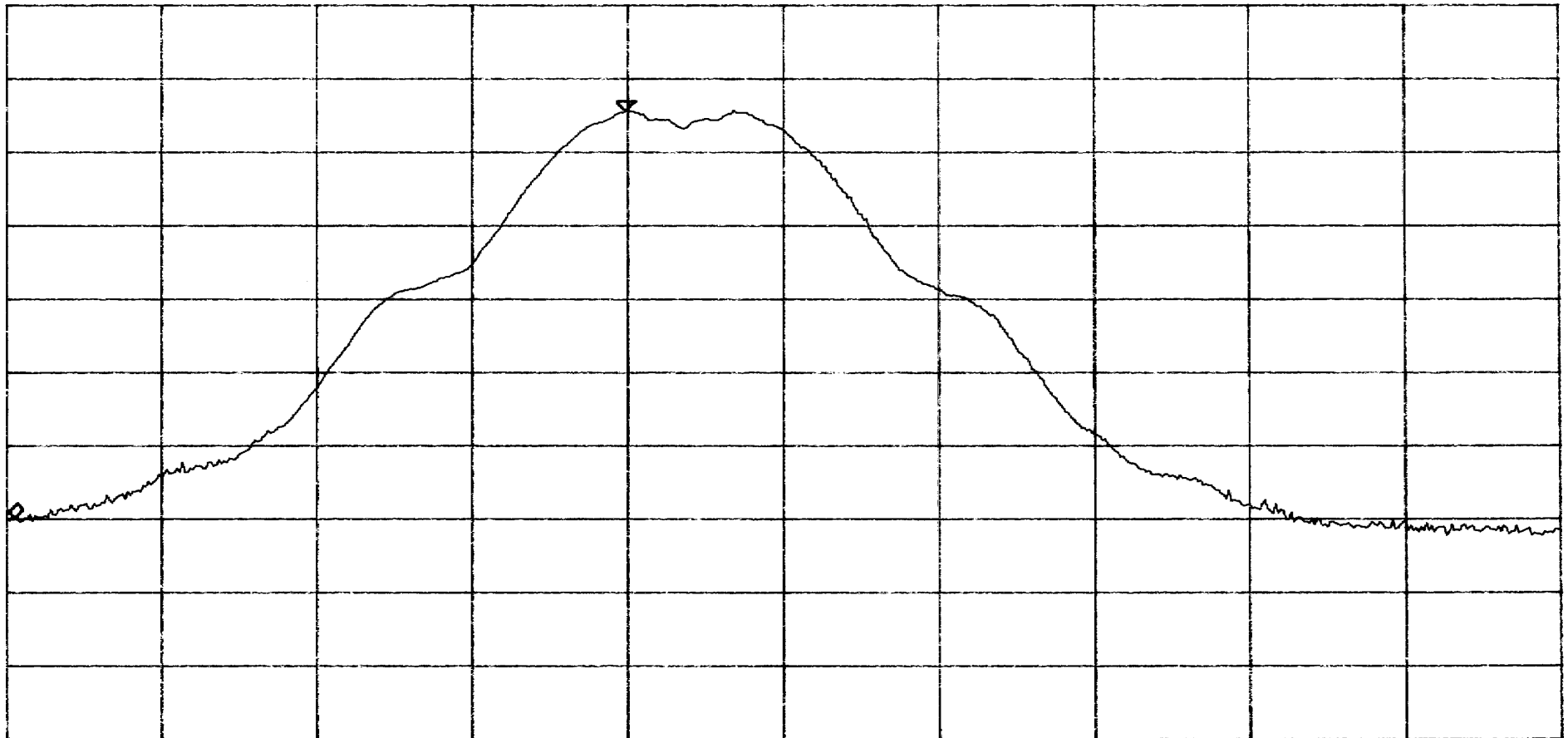
SWP 50ms

5.2608 GHz Out of Band – Band Edge

ATTEN 20dB  
RL 10.0dBm

10dB/

$\Delta MKR$  -55.50dB  
-9.83MHz



START 5.25000GHz

STOP 5.27500GHz

RBW 1.0MHz \*VBW 30kHz

SWP 50ms

5.2608 GHz Out of Band – Band Edge + 10 MHz

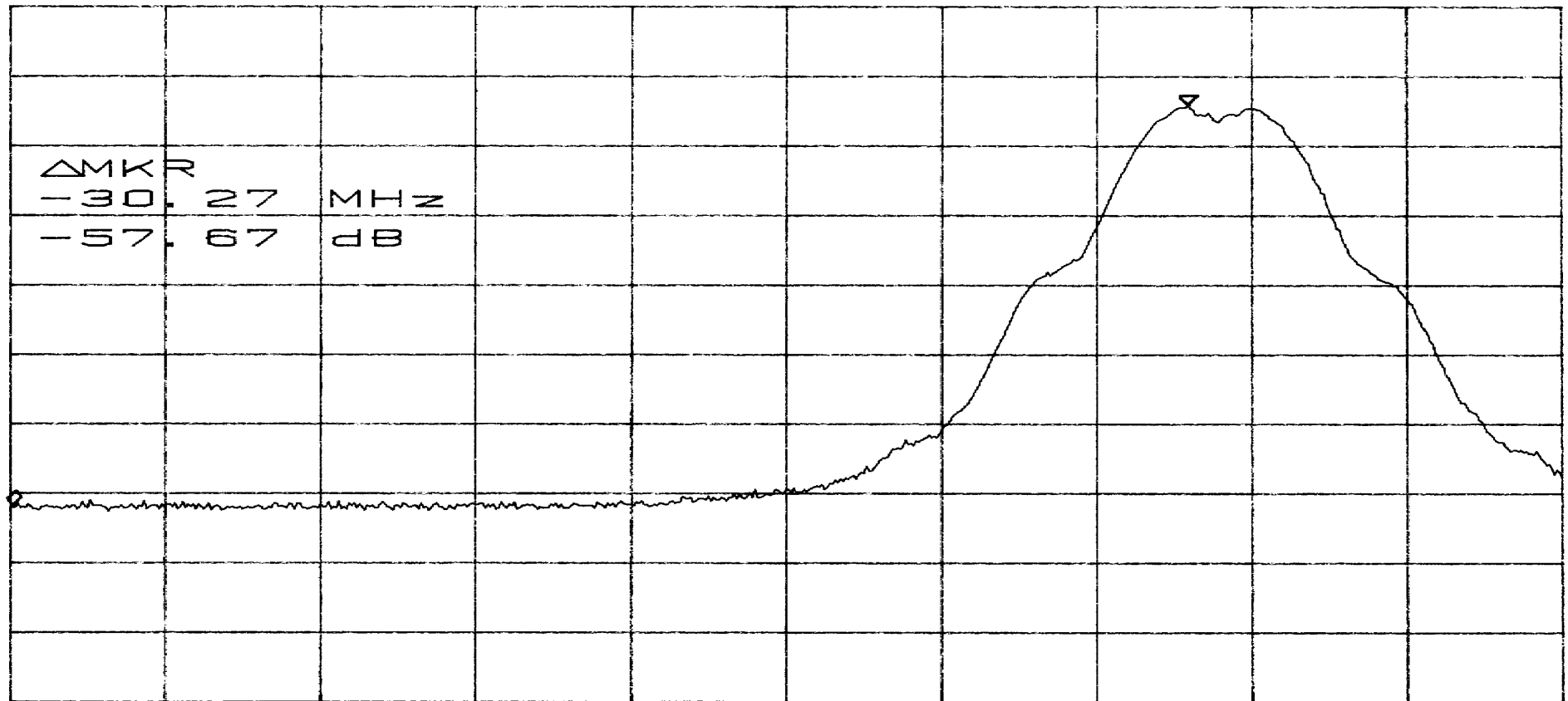
ATTEN 20dB

RL 10.0dBm

10dB/

ΔMKR -57.67dB

-30.27MHz



CENTER 5.25000GHz

RBW 1.0MHz

\*VBW 30kHz

SPAN 40.00MHz

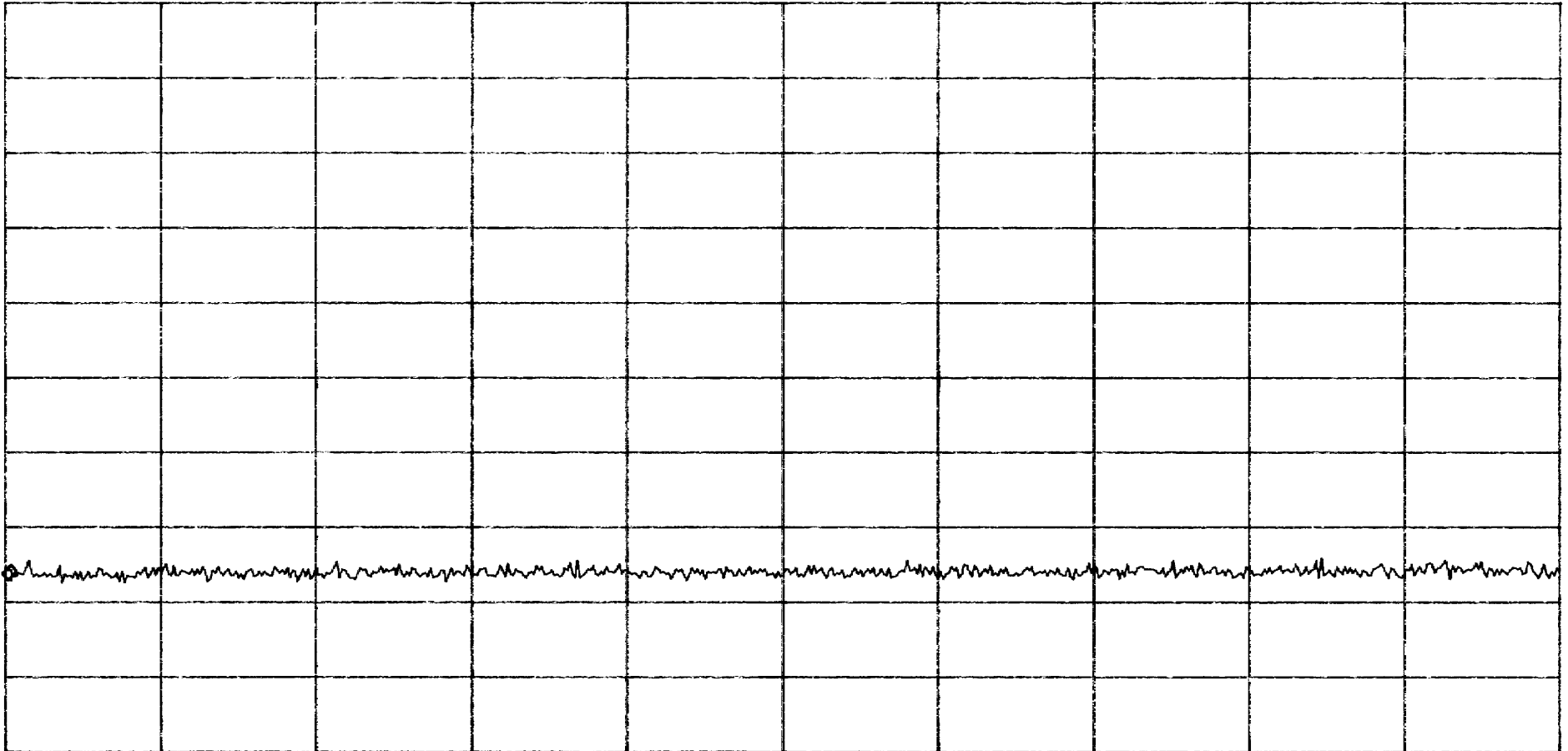
SWP 50ms

5.2608 GHz Out of Band 30 MHz to 1 GHz

ATTEN 20dB  
RL 10.00dBm

10dB/

MKR -67.00dBm  
31.6MHz



START 30.0MHz

STOP 1.00000GHz

RBW 100kHz

VBW 100kHz

SWP 250ms

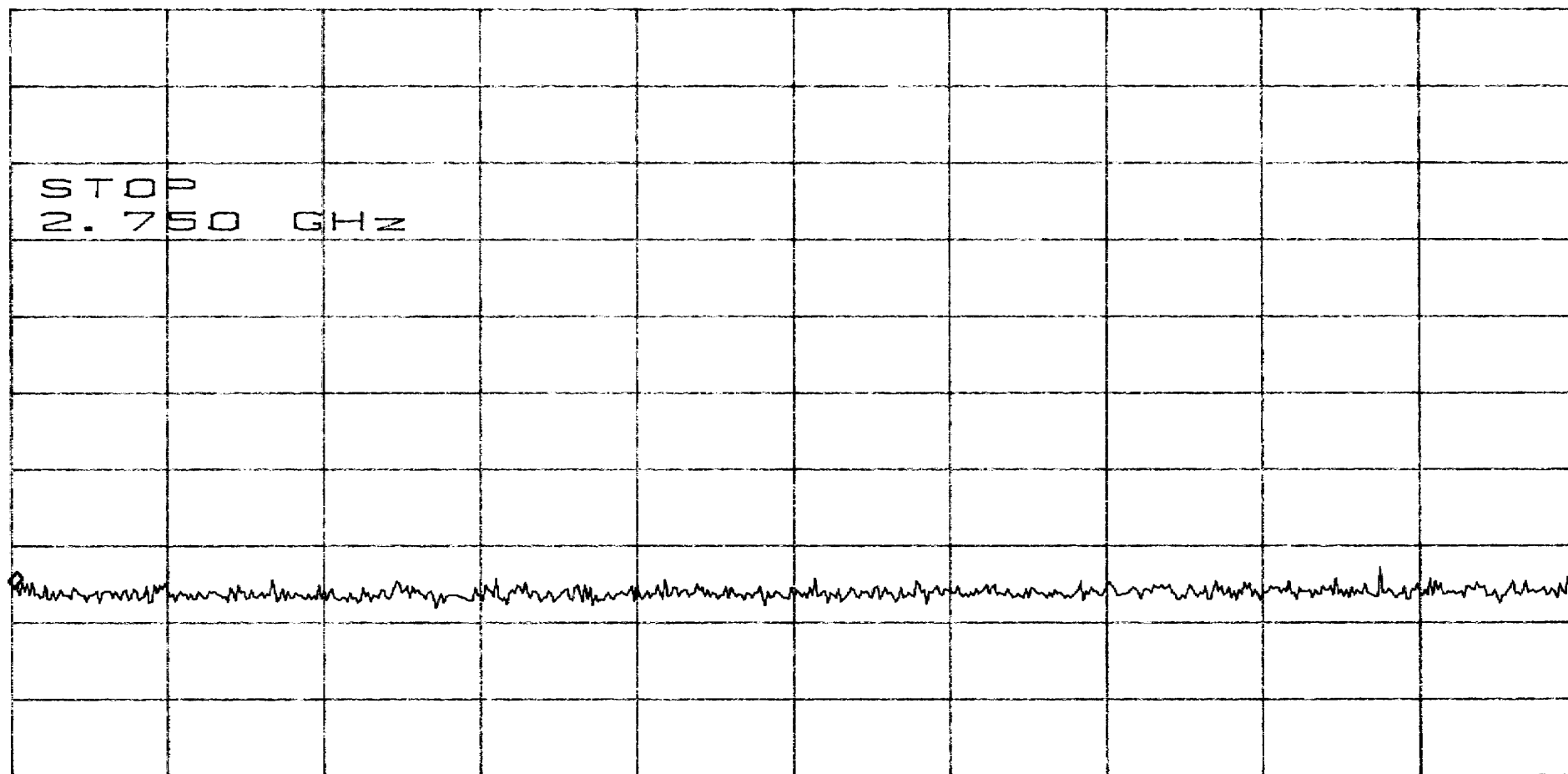
5.2608 GHz Out of Band 1 GHz to 2.75 GHz

ATTEN 20dB  
RL 10.0dBm

10dB/

MKR -65.33dBm  
1.000GHz

STOP  
2.750 GHz



START 1.000GHz

STOP 2.750GHz

RBW 100kHz

VBW 100kHz

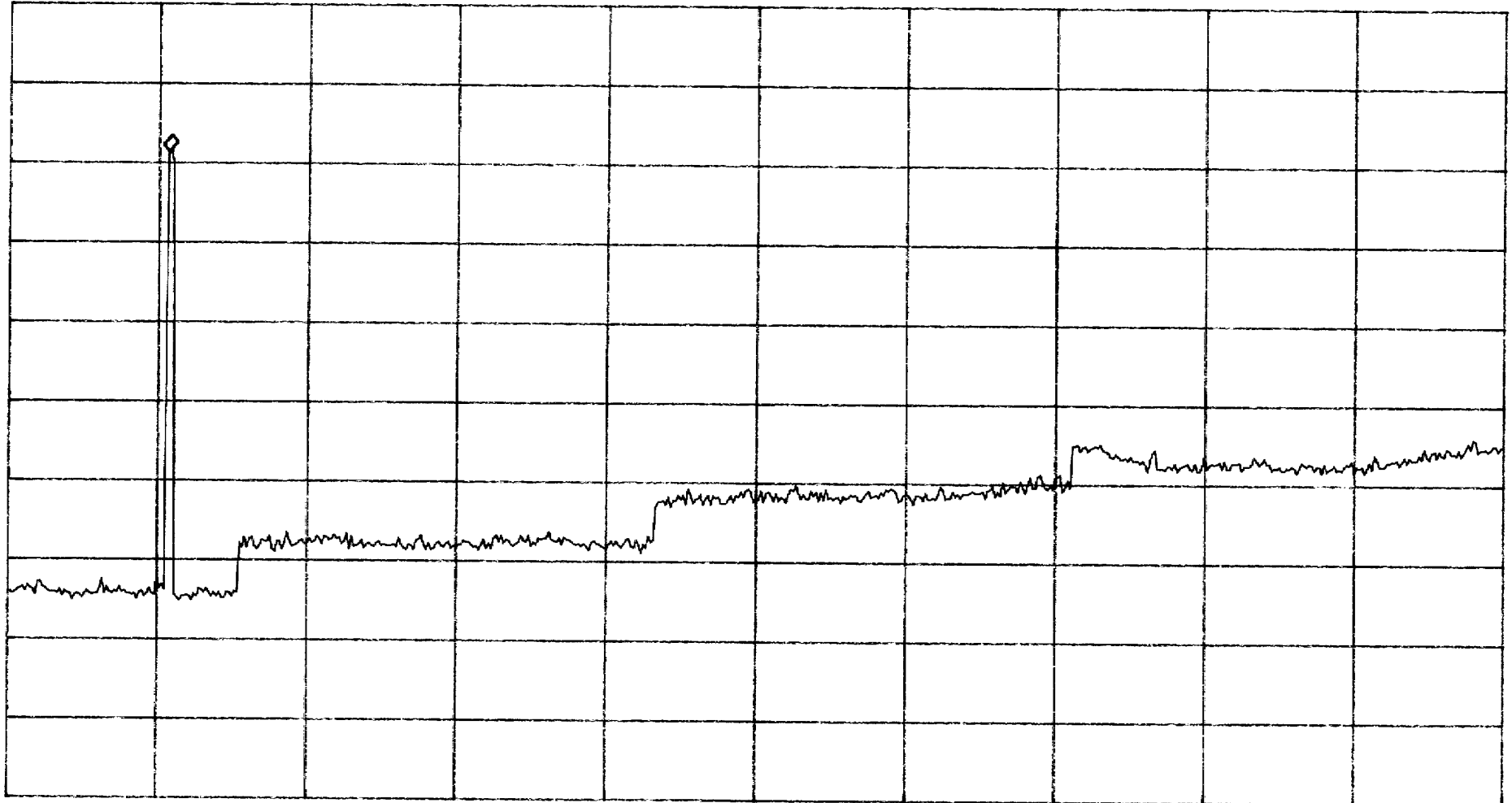
SWP 40ms

5.2608 GHz Out of Band 2.75 GHz to 26.5 GHz

ATTN 20dB  
RL 10.0dBm

10dB/

MKR -8.50dBm  
5.28GHz



START 2.75GHz

STOP 26.50GHz

RBW 100kHz

VBW 100kHz

SWP 6.0sec

5.2608 GHz Out of Band 26.5 GHz to 40 GHz

OUT OF BAND 9021001A Low BAND

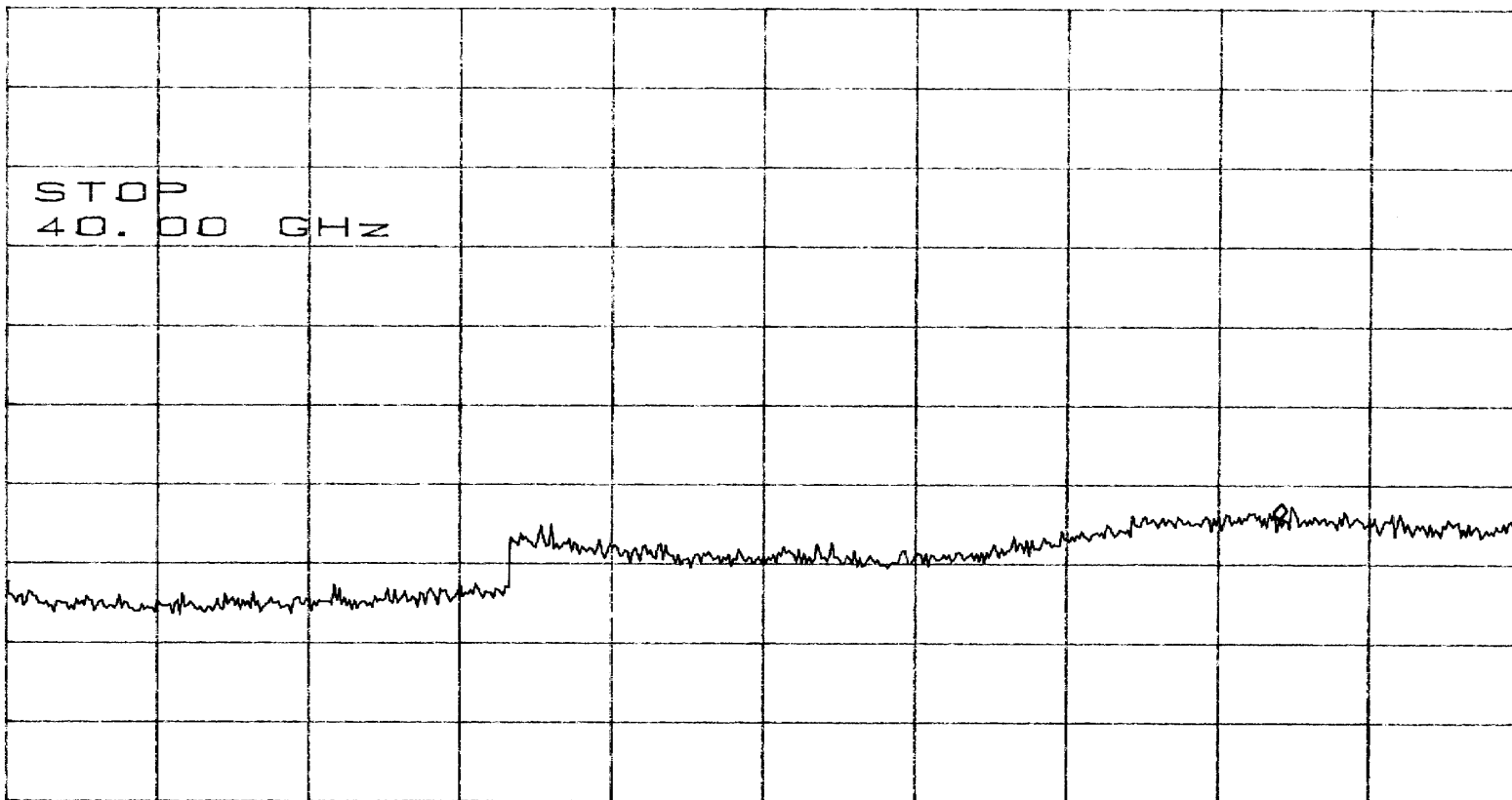
ATTEN 10dB

MKR -64.33dBm

RL 0dBm

10dB/

37.84GHz



START 26.50GHz

STOP 40.00GHz

\*RBW 100kHz

VBW 100kHz

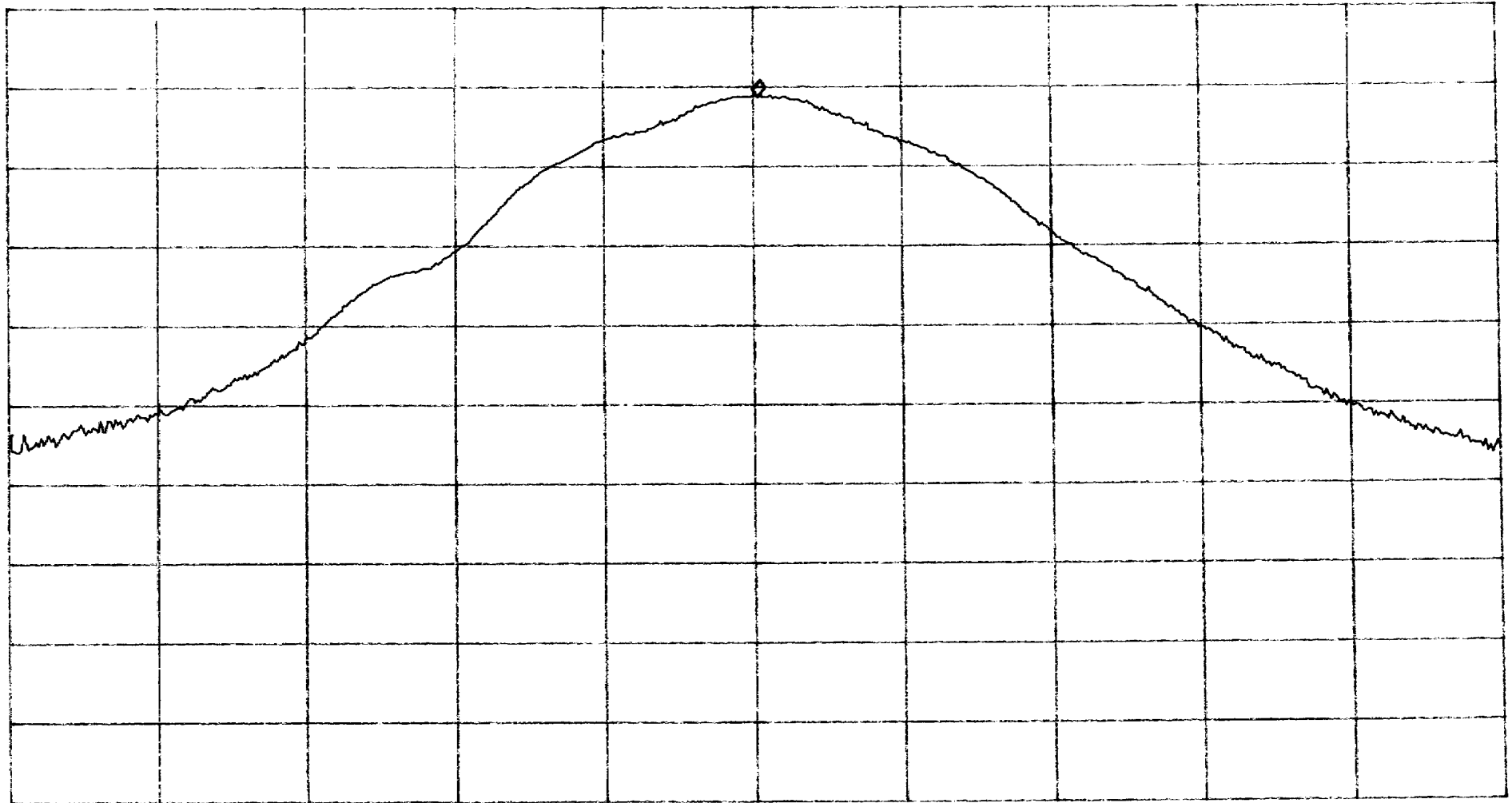
SWP 3.40sec

Pout 5.3017 GHz

ATTEN 20dB  
RL 10.0dBm

10dB/

MKR -1.17dBm  
5.30183GHz



CENTER 5.30176GHz  
-RBW 2.0MHz VBW 3.0MHz

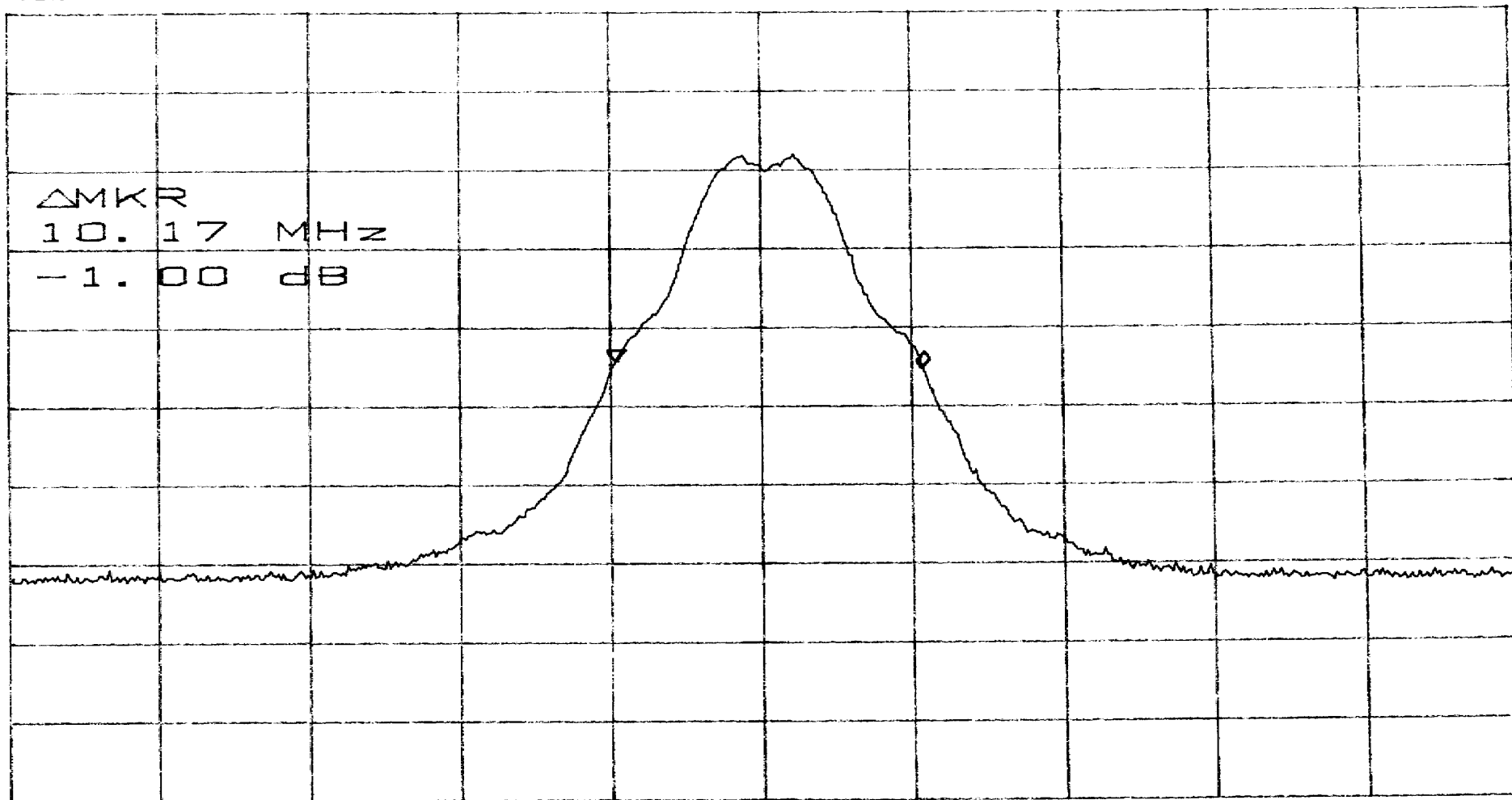
SPAN 20.00MHz  
SWP 50ms

# 5.3017 GHz 26 dB Bandwidth

ATTEN 20dB  
RL 10.0dBm

10dB/

ΔMKR -1.00dB  
10.17MHz



CENTER 5.30176GHz  
RBW 1.0MHz \*VBW 30kHz

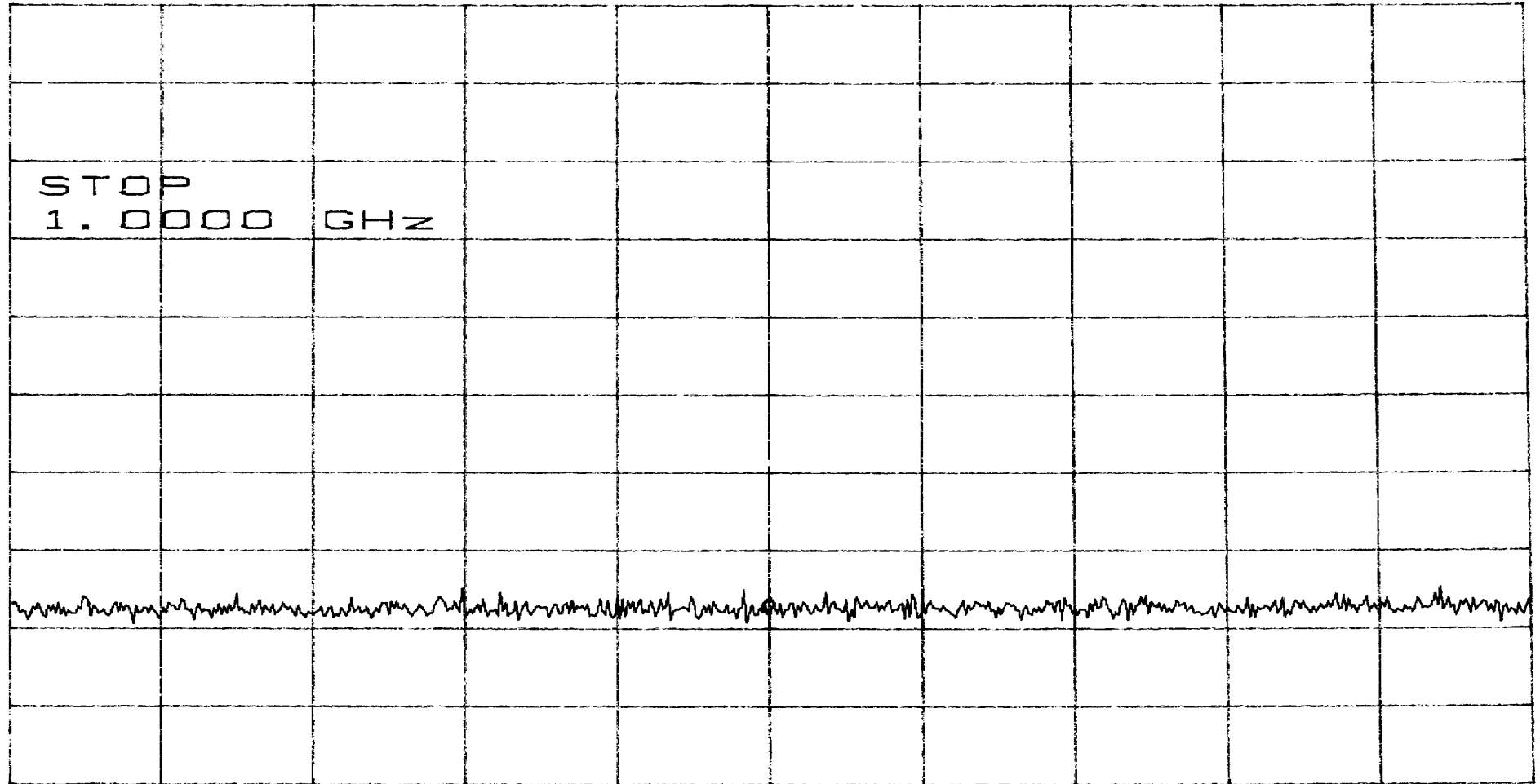
SPAN 50.00MHz  
SWP 50ms

5.3017 GHz Out of Band 30 MHz to 1 GHz

ATTEN 20dB  
RL 10.00dBm

10dB/

MKR -68.00dBm  
513.4MHz



START 30.0MHz

STOP 1.0000GHz

RBW 100kHz

VBW 100kHz

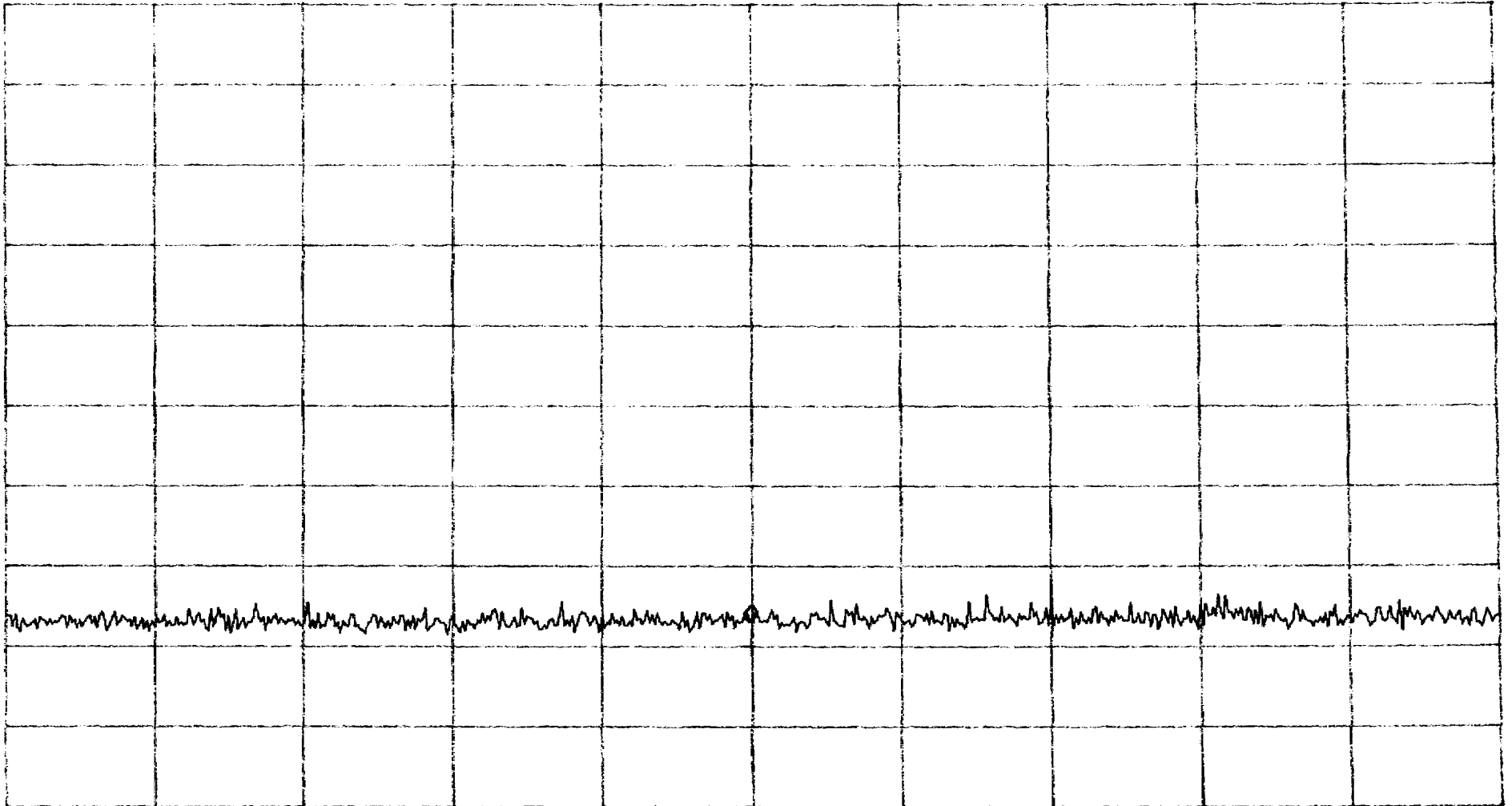
SWP 250ms

5.3017 GHz Out of Band 1 GHz to 2.75 GHz

ATTN 20dB  
RL 10.0dBm

10dB/

MKR -66.83dBm  
1.872GHz



START 1.000GHz

STOP 2.750GHz

RBW 100kHz

VBW 100kHz

SWP 440ms

5.3017 GHz Out of Band 2.75 GHz to 26.5 GHz

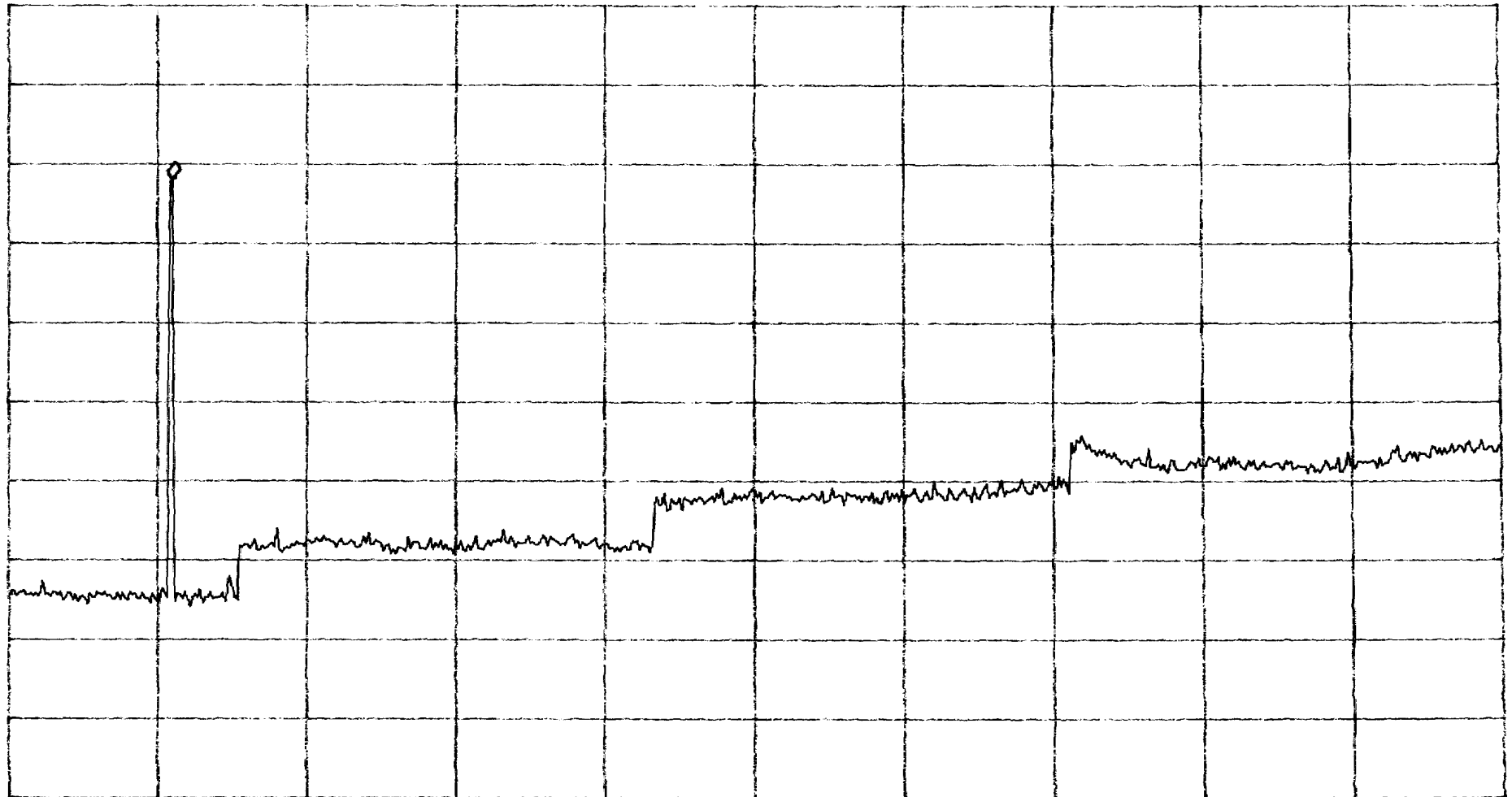
ATTEN 20dB

MKR -11.83dBm

RL 10.00dBm

10dB/

5.36GHz



START 2.75GHz

STOP 26.50GHz

RBW 100kHz

VBW 100kHz

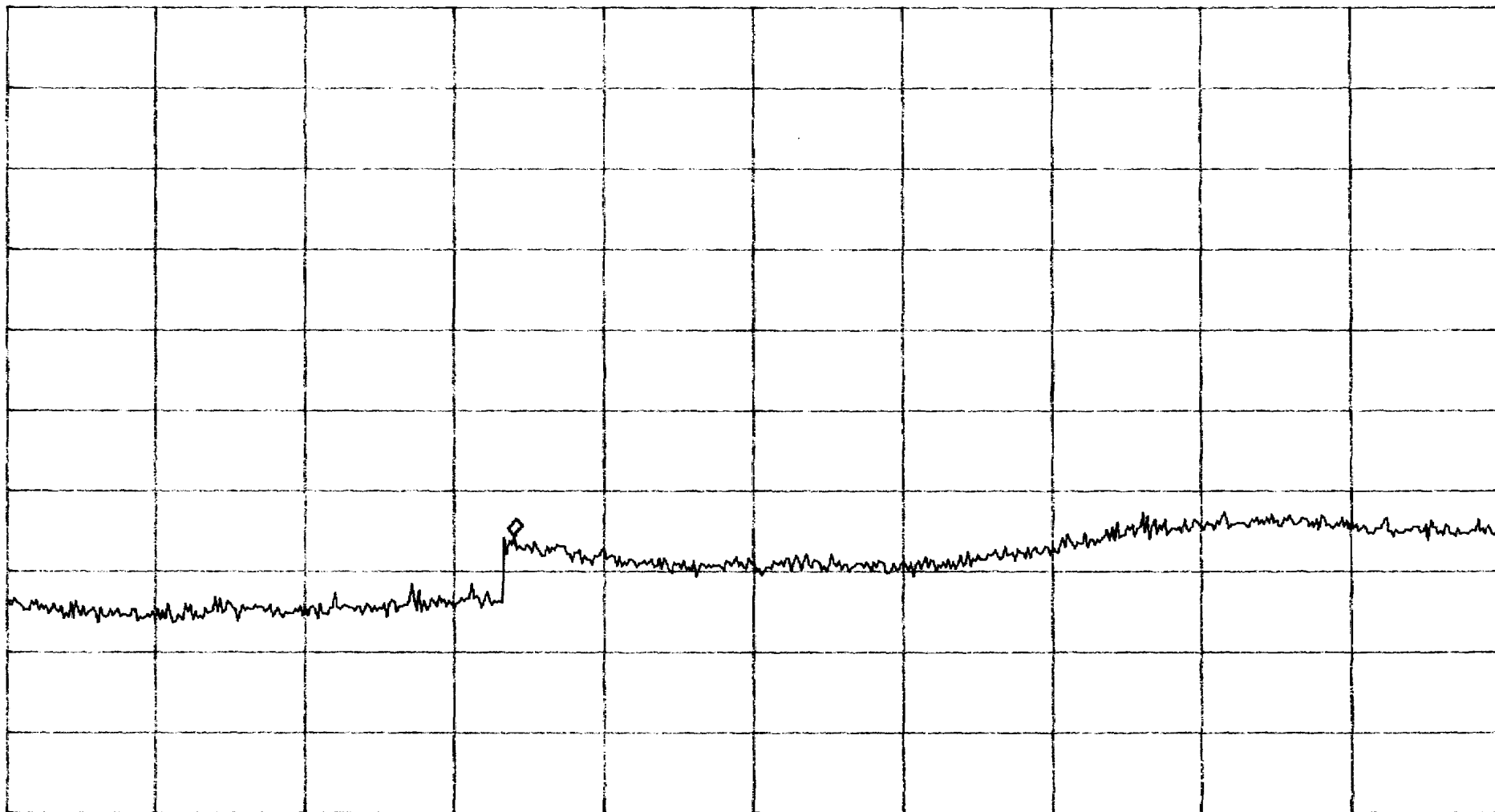
SWP 6.0sec

5.3017 GHz Out of Band 26.5 GHz to 40 GHz

ATTEN 10dB  
RL 0dBm

10dB/

MKR -65.50dBm  
31.09GHz



START 26.50GHz

STOP 40.00GHz

RBW 100kHz

VBW 100kHz

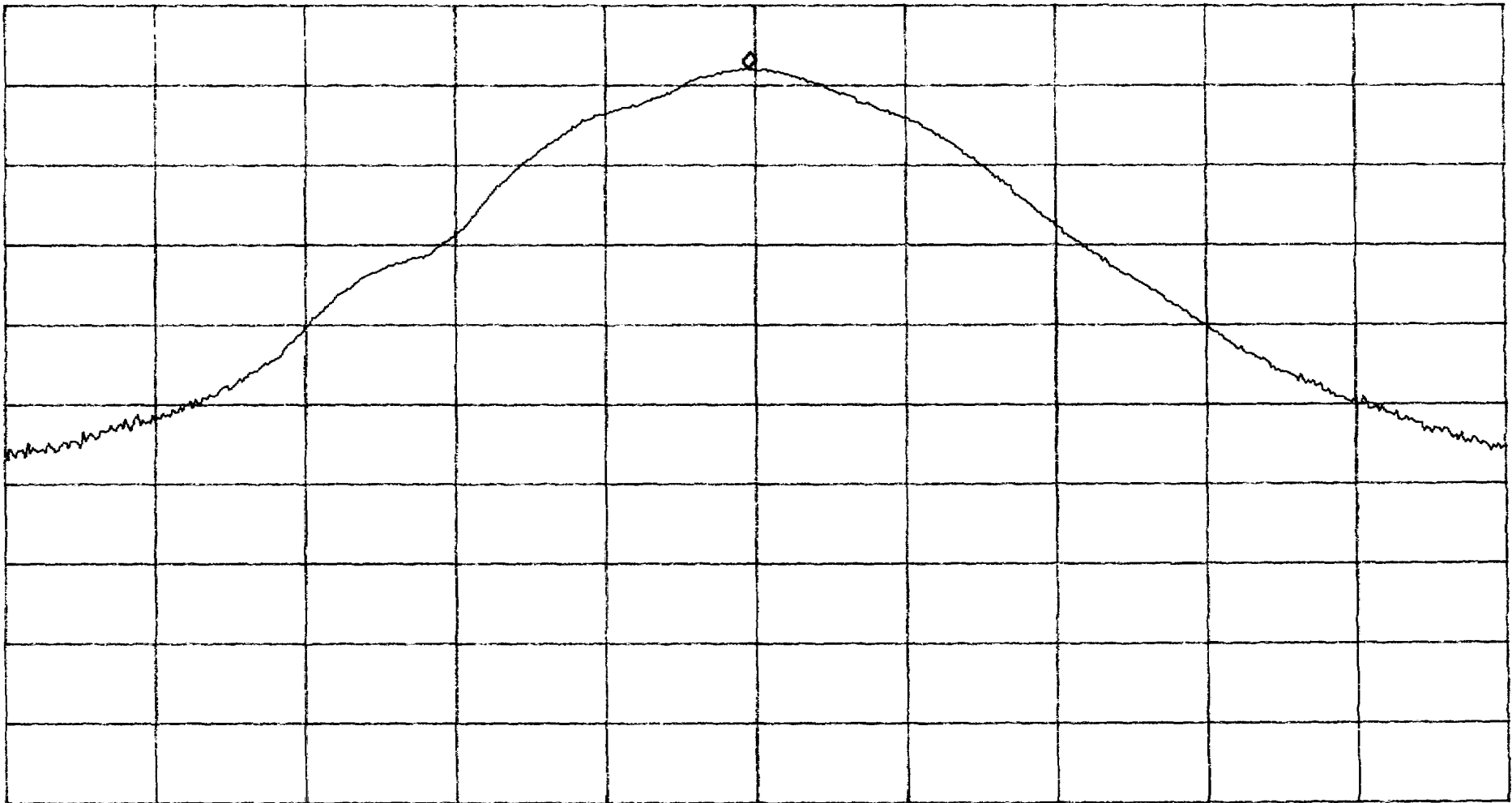
SWP 3.40sec

Pout 5.3377 GHz

ATTEN 20dB  
RL 10.0dBm

10dB/

MKR 2.17dBm  
5.33760GHz



CENTER 5.33770GHz

SPAN 20.00MHz

RBW 2.0MHz

VBW 3.0MHz

SWP 50ms

5.3377 GHz 26 dB Bandwidth

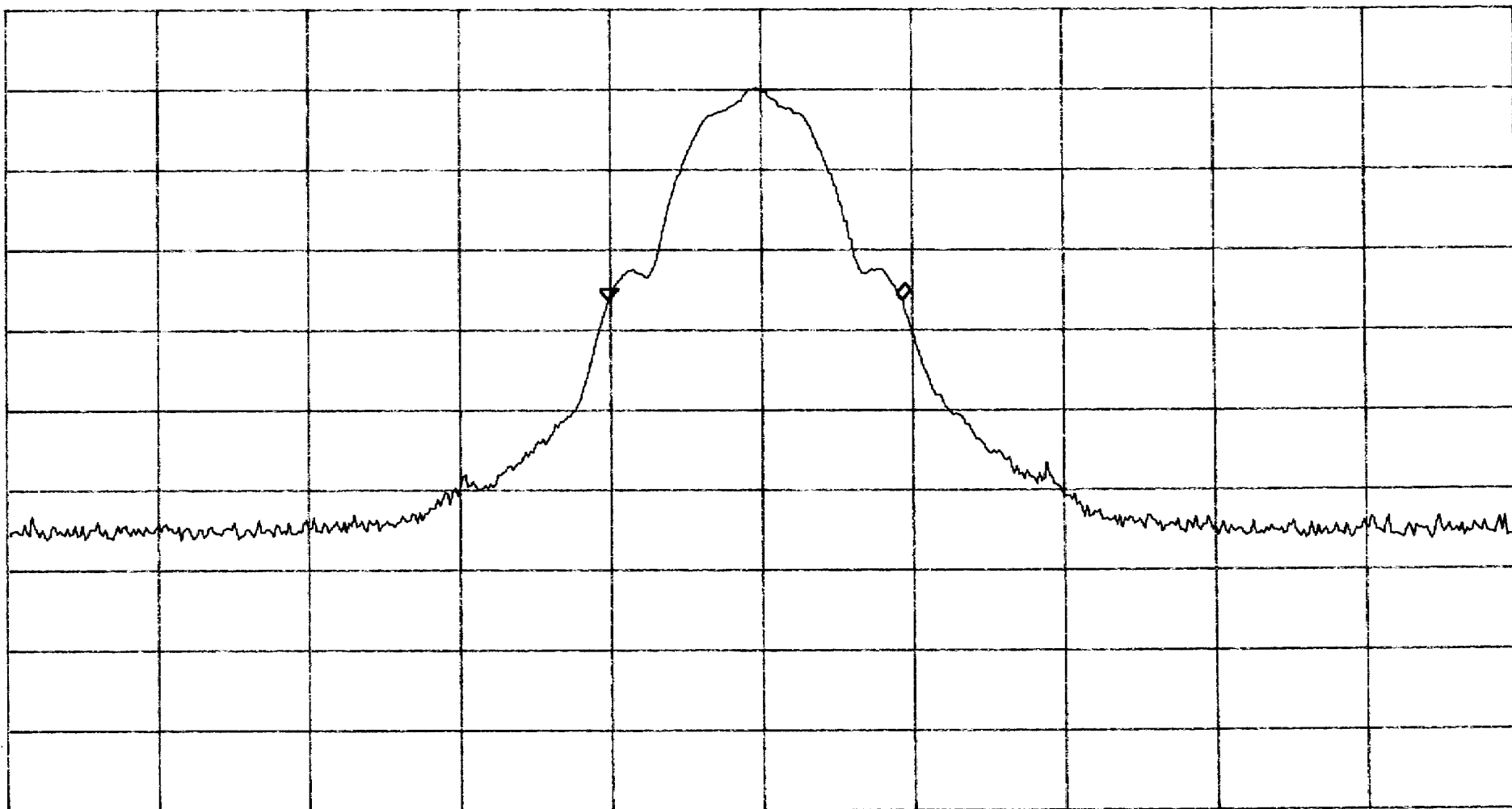
ATTEN 20dB

ΔMKR 0dB

RL 10.0dBm

10dB/

9.75MHz



CENTER 5.33792GHz

SPAN 50.00MHz

RBW 1.0MHz

VBW 1.0MHz

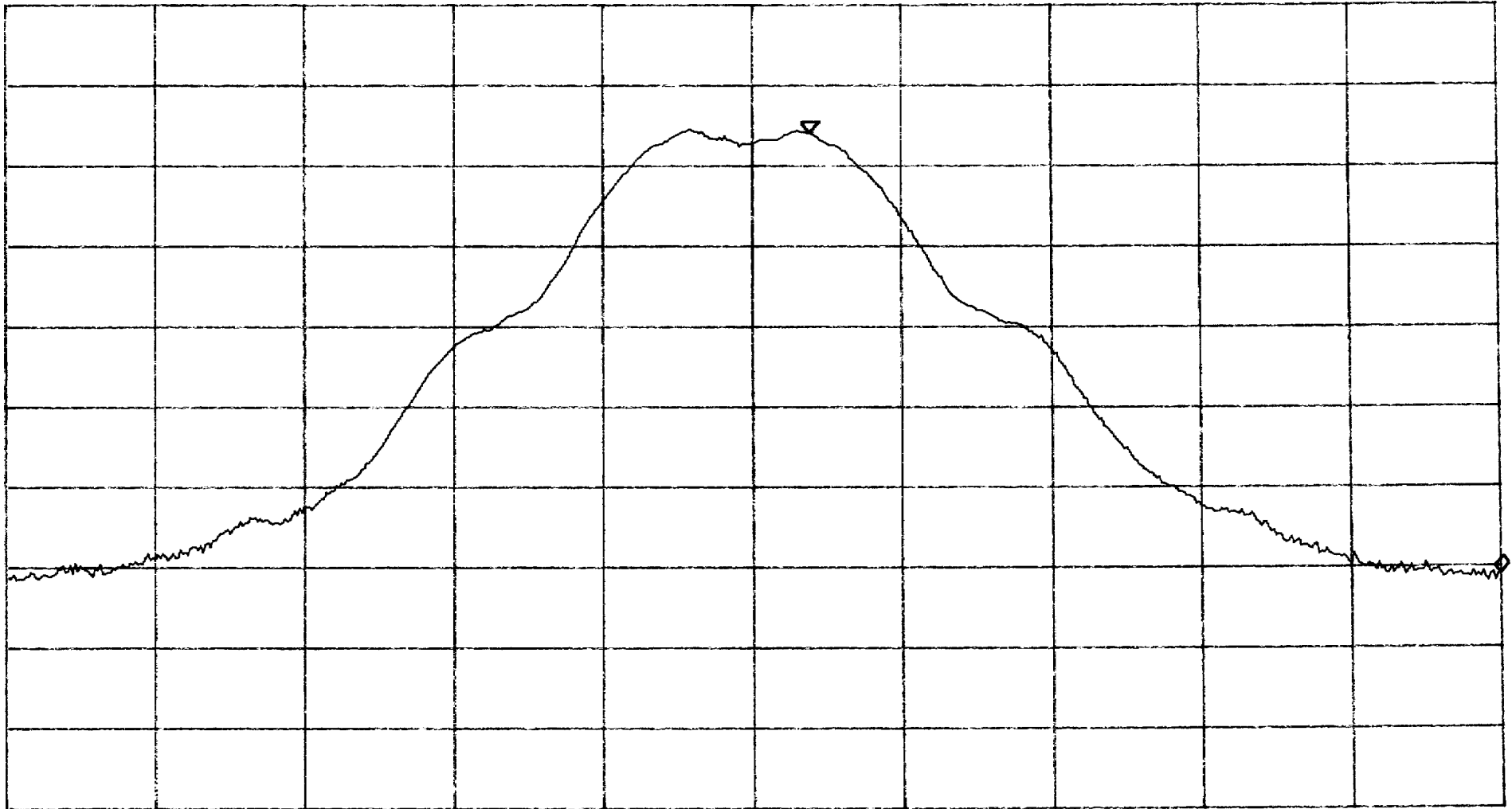
SWP 50ms

5.3377 GHz Out of Band – Band Edge

ATTEN 20dB  
RL 10.0dBm

10dB/

$\Delta$ MKR -55.00dB  
11.29MHz



START 5.32554GHz

STOP 5.35000GHz

RBW 1.0MHz

\*VBW 30kHz

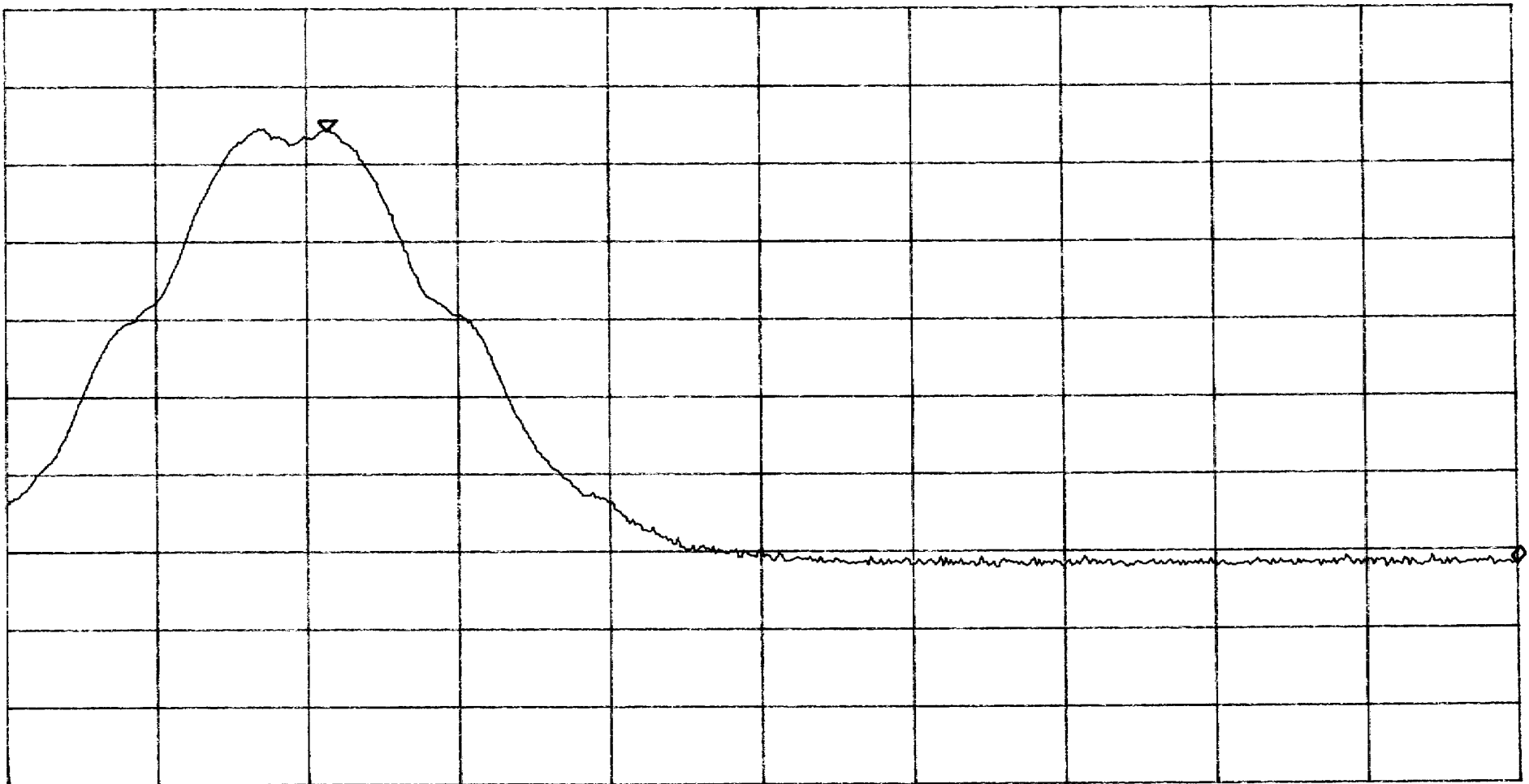
SWP 50ms

5.3377 GHz Out of Band – Band Edge + 10 MHz

ATTEN 20dB  
RL 10.0dBm

10dB/

$\Delta MKR$  -56.16dB  
31.47MHz



CENTER 5.35000GHz  
RBW 1.0MHz \*VBW 30kHz

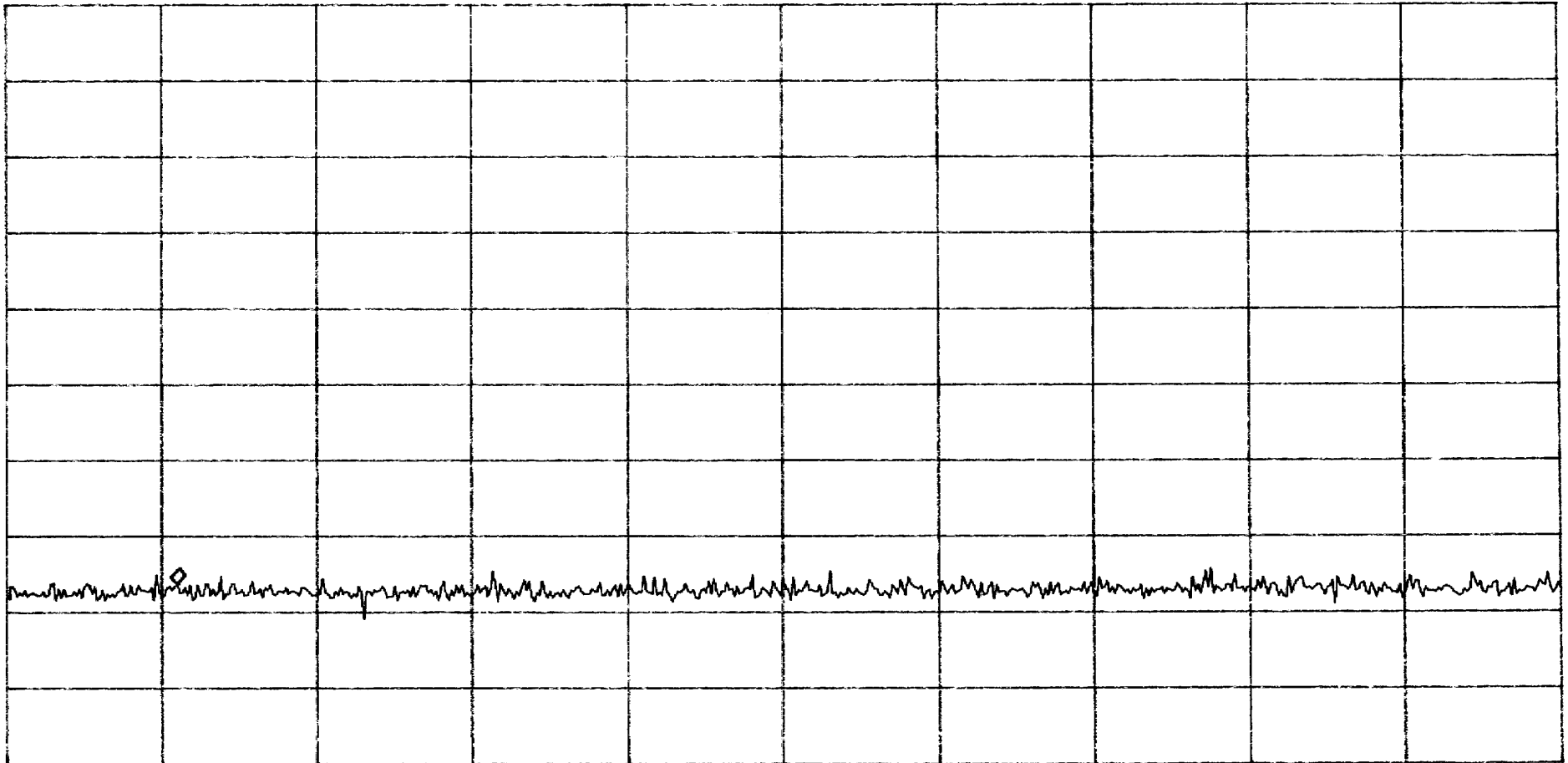
SPAN 40.00MHz  
SWP 50ms

5.3377 GHz Out of Band 30 MHz to 1 GHz

ATTEN 20dB  
RL 10.0dBm

10dB/

MKR -66.17dBm  
136.7MHz



START 30.0MHz

STOP 1.0000GHz

RBW 100kHz

VBW 100kHz

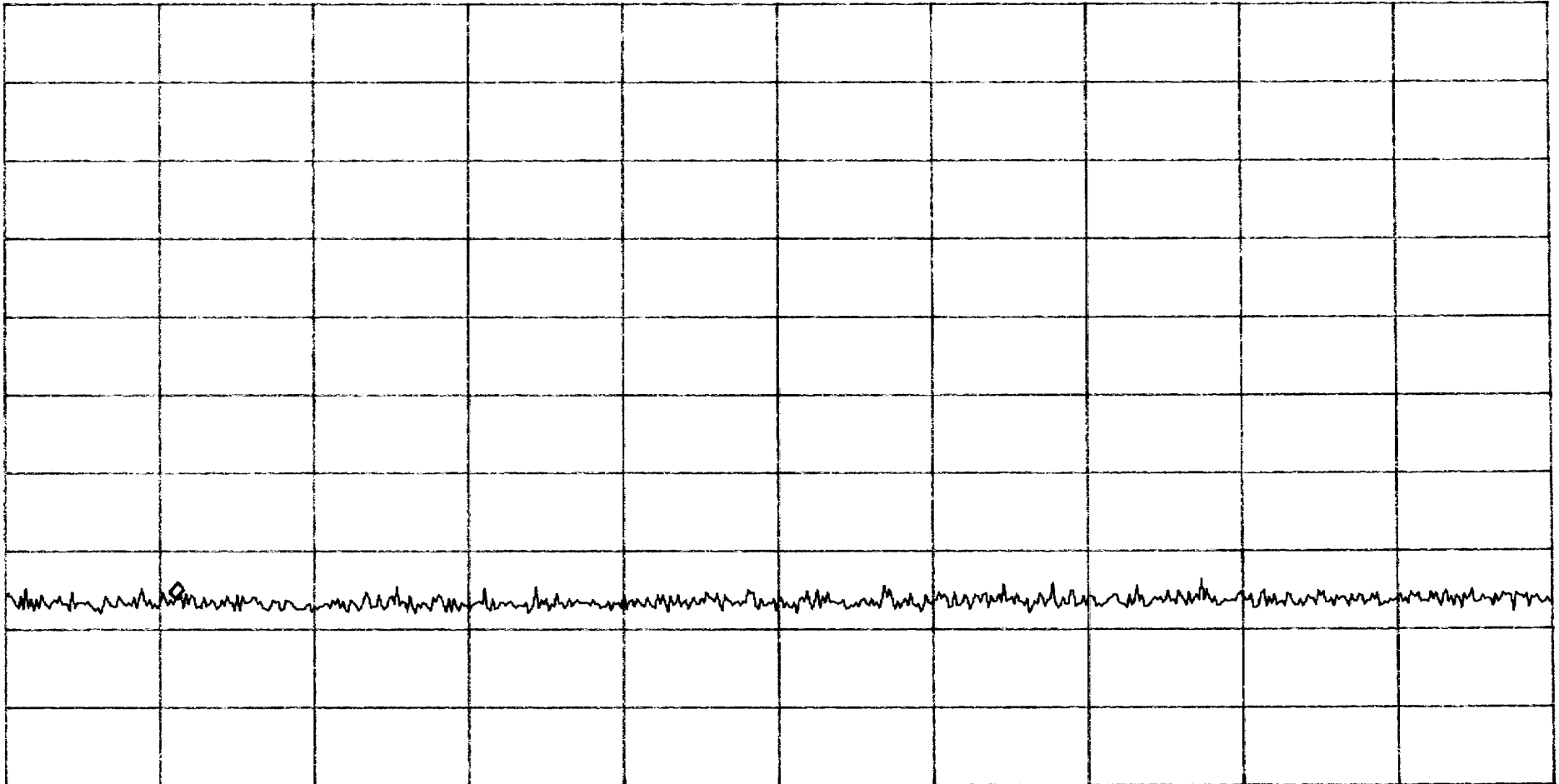
SWP 250ms

5.3377 GHz Out of Band 1 GHz to 2.75 GHz

ATTEN 20dB  
RL 10.00dBm

10dB/

MKR -66.00dBm  
1.193GHz



START 1.000GHz

STOP 2.750GHz

RBW 100kHz

VBW 100kHz

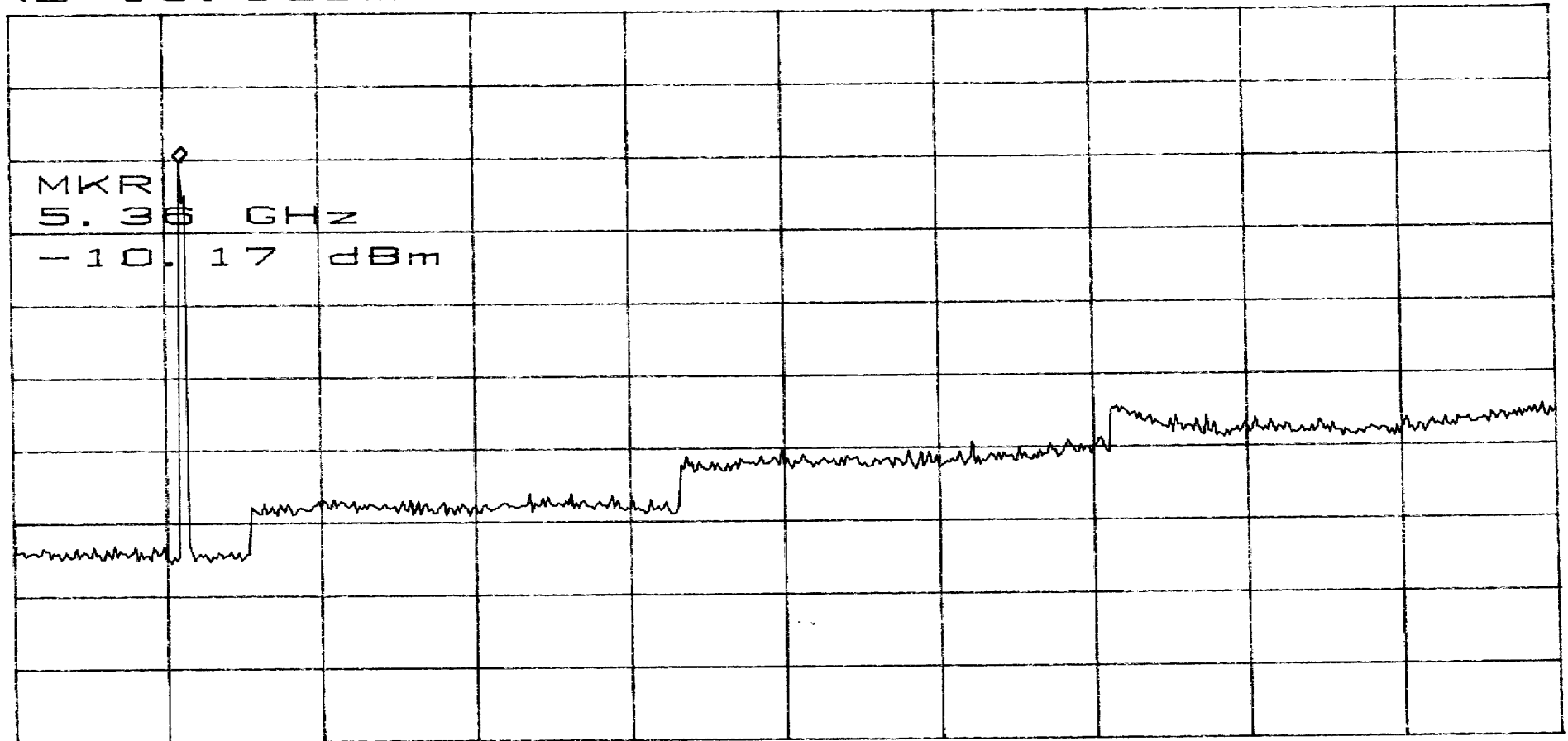
SWP 440ms

5.3377 GHz Out of Band 2.75 GHz to 26.5 GHz

ATTEN 20dB  
RL 10.0dBm

10dB/

MKR -10.17dBm  
5.36GHz



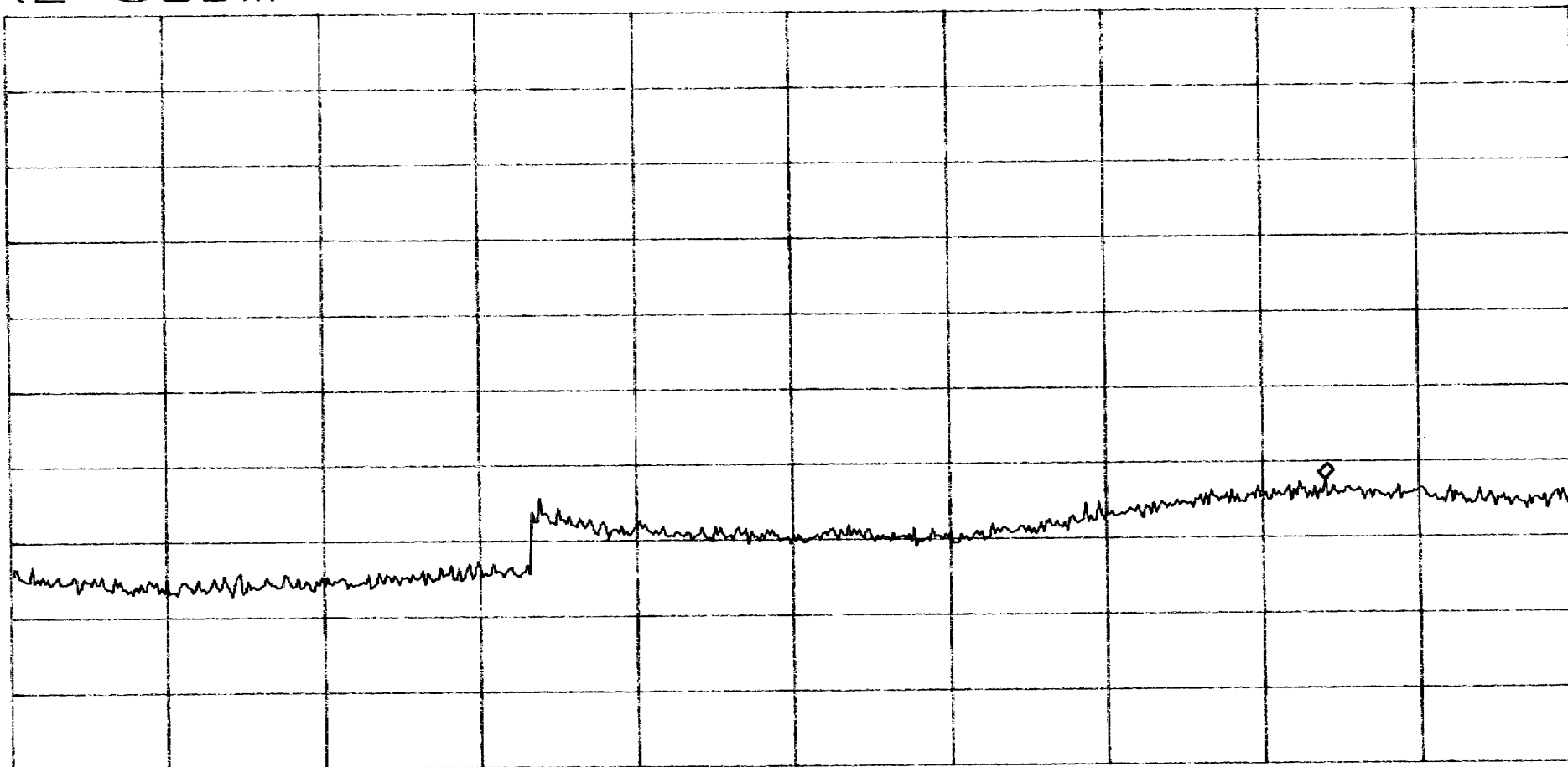
START 2.75GHz STOP 26.50GHz  
RBW 100kHz VBW 100kHz SWP 6.0sec

5.2608 GHz Out of Band 26.5 GHz to 40 GHz

ATTEN 10dB  
RL 0dBm

10dB/

MKR -62.33dBm  
37.84GHz



START 26.50GHz

STOP 40.00GHz

RBW 100kHz

VBW 100kHz

SWP 3.40sec

## **APPENDIX C**

### **Restricted Band Data**

# FCC RADIATED DATA SHEET

EUT: 5.25Ghz TRANSCEIVER  
S/N: PROTO  
RULE PART: 15.247

DATE: MAR. 9, 1999  
CUSTOMER NAME: WIRELESS  
WORK ORDER: 9021001  
FILE: 9021001A.XLS

ANTENNA: HORN OTHER CAL FACTORS: ATTN dB: 0  
MODULATION TYPE: DUTY dB: 0  
TESTED BY: SHAWN HP IL dB: 0  
COMMENTS: DIST dB: 0

FREQ.	READING	Pk, QP,	A.F.	Cable loss	AMP	O.C.F.	TOTAL,	LIMIT	DELTA
MHz	dB(uV)	or Av	dB	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
Fund = 5206.8									
10413.6	38.2	Pk	38.6	21.5	35.0	0.0	63.3	74.0	-10.7
10413.6	23.0	Avg	38.6	21.5	35.0	0.0	48.1	54.0	-5.9
15620.4	32.5	Pk	41.7	30.1	35.0	0.0	69.3	74.0	-4.7
15620.4	15.0	Avg	41.7	30.1	35.0	0.0	51.8	54.0	-2.2
20827.2	31.5	Pk	40.2	30.1	35.0	0.0	66.8	74.0	-7.2
20827.2	16.0	Avg	40.2	30.1	35.0	0.0	51.3	54.0	-2.7
Fund = 5301.7									
10603.4	38.0	Pk	39.6	21.8	35.0	0.0	64.4	74.0	-9.6
10603.4	23.5	Avg	39.6	21.8	35.0	0.0	49.9	54.0	-4.1
15905.1	31.9	Pk	41.7	30.1	35.0	0.0	68.7	74.0	-5.3
15905.1	14.7	Avg	41.7	30.1	35.0	0.0	51.5	54.0	-2.5
21206.8	31.5	Pk	40.3	30.1	35.0	0.0	66.9	74.0	-7.1
21206.8	15.0	Avg	40.3	30.1	35.0	0.0	50.4	54.0	-3.6
Fund = 5337.6									
10675.2	38.2	Pk	39.6	22.0	35.0	0.0	64.8	74.0	-9.2
10675.2	22.8	Avg	39.6	22.0	35.0	0.0	49.4	54.0	-4.6
16012.8	32.0	Pk	41.4	30.1	35.0	0.0	68.5	74.0	-5.5
16012.8	15.0	Avg	41.4	30.1	35.0	0.0	51.5	54.0	-2.5
21350.4	31.8	Pk	40.3	30.1	35.0	0.0	67.2	74.0	-6.8
21350.4	15.2	Avg	40.3	30.1	35.0	0.0	50.6	54.0	-3.4

**APPENDIX D**  
**15.209 Radiated Emissions**

Electronic Compliance Laboratories, Inc.  
1249 Birchwood Ave.  
Sunnyvale, CA

Radiated Emissions  
Frequency range: 30MHz-1000MHz

10 Meter Open Site  
Site Calibrated: June 1997

Government Agency and Limit: FCC Class A  
-----

QP = Quasi-Peak      Note: Ignore peak readings when Quasi-Peak reading exists  
PK = Peak

Customer:                      WIRELESS                      Operator:                      SHAWN  
Date:                            02-12-1999                      Time:                            08:59:16  
Temperature Range:      48                      Deg F                      Percent Humidity: 62  
E.U.T.:                          5.25 Ghz TRANSCEIVER  
Serial Number:              PROTO  
Modifications:              None  
Report File Name:          F:\TESTDATA\9021001a.RF

Antenna Type:              BICONICAL

TEST FREQ	TEST dBuV	ACTUAL dBuV/m	CLASS A LIMIT	VERSUS A LIMIT	TABLE DEGREES	ANTENNA HEIGHT	POLAR- IZATION	DETECTOR Type
=====	=====	=====	=====	=====	=====	=====	=====	=====
112.000	43.7	32.3	43.5	-11.2	45	1.5	V	PK
114.500	44.7	33.6	43.5	-9.9	75	2.0	V	PK
124.200	48.5	38.2	43.5	-5.3	90	2.0	V	PK
124.200	46.0	35.7	43.5	-7.8	90	2.0	V	QP
240.000	32.0	24.2	46.4	-22.2	90	2.0	V	PK
280.000	33.6	27.8	46.4	-18.6	0	1.5	V	PK
280.000	28.7	22.9	46.4	-23.5	45	2.0	H	PK
240.000	29.0	21.2	46.4	-25.2	75	2.0	H	PK
120.000	36.6	26.1	43.5	-17.4	45	2.0	H	PK
CHANGED ANTENNA TO LOG PERIODIC -----								
360.000	32.0	23.3	46.4	-23.1	120	2.0	V	PK
448.000	32.5	25.9	46.4	-20.5	90	1.5	V	PK
360.000	28.9	20.2	46.4	-26.2	0	2.0	H	PK

**APPENDIX E**

**Test Set-up Photographs**



**FCC 15.209 Class B  
Radiated Emissions**



**FCC 15.205 Restricted Band**



**SP2-5.2 Antenna  
FCC 15.407 Conducted RF**