

APPLICATION FOR FCC CERTIFICATION

Symbol Technologies Inc.

Spread Spectrum Data Phone

Model: ND3010

FCC ID: H9PND3010

LTO# J99007845

Number of Pages: 24 pp. + Supporting Data and Documents

Date of Report: March 31, 1999

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Intertek Testing Services - Menlo Park

Symbol Technologies Inc., Spread Spectrum
FCC ID: H9PND3010

Date of Test: March 25-30, 1999

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1.0 Summary of Tests

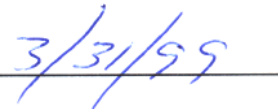
Symbol Technologies Inc. - Model No.: ND3010
FCC ID: H9PND3010

TEST	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
20 dB Bandwidth	15.247(a)(1)	Pass
Min. Channel Separation	15.247(a)(1)	Test was not performed
Min. Hopping Channels	15.247(a)(1)	Test was not performed
Average Channel Occupancy Time	15.47(a)(1)	Test was not performed
Out of Band Antenna Conducted Emission	15.247(c)	Pass
Out of Band Radiated Emission	15.247(c)	Not Applicable
Radiated Emission in Restricted Bands	15.247(c). 15.209(a)	Pass
AC Conducted Emission	15.207	Pass
Radiated Emission from Digital Part	15.109	Pass
Radiated Emission from Receiver L.O.	15.109	Not Applicable
Antenna Requirement	15.203	Pass


Test Engineer:


Barry Smith

Date:



EMC Site Mgr. :


David Chernomordik

Date:



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2.0 General Description

2.1 Product Description

The Symbol Technologies Inc. Model ND3010 is a frequency hopping spread spectrum device.

Overview of the EUT

Applicant	Symbol Technologies Inc.
Trade Name & Model No.	Symbol Technologies, Model No. ND3010
FCC Identifier	H9PND3010
Use of Product	
Manufacturer & Model o Spread Spectrum Module	
Type of Transmission	Frequency Hopping Spread Spectrum
Rated RF Output (mW)	
Frequency Range (MHz)	2402 - 2480
Number of Channel(s)	79
Antenna(s) & Gain, dBi	
Processing Gain Measurements	<input type="checkbox"/> Will be provided to ITS for submission with the application <input checked="" type="checkbox"/> Will be provided directly to the FCC reviewing engineer by the client or manufacturer of the spread spectrum module
Antenna Requirement	<input checked="" type="checkbox"/> The EUT uses a permanently connected antenna. <input type="checkbox"/> The antenna is affixed to the EUT using a unique connector which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector. <input type="checkbox"/> The EUT requires professional installation (attach supporting documentation i using this option).
Manufacturer name & address	Symbol Technologies 2145 Hamilton Avenue San Jose, CA 95125

2.2 Related Submittal(s) Grants

None.

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2.3 Test Methodology

Both AC mains line-conducted and radiated emissions measurements were performed according to the procedures in ANSI C63.4 (1992). Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Data Sheet**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at South San Francisco. This test facility and site measurement data have been fully placed on file with the FCC.

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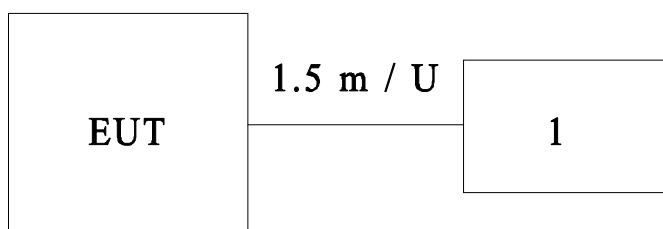
Date of Test: March 25-30, 1999

3.0 System Test Configuration

3.1 Support Equipment

Item #	Descriptio	Model No.	Serial No.	FCC ID
1	Power Supply	EP-3003	D30030012	N/A

3.2 Block Diagram of Test Set



* = EUT ** = No ferrites on video cable	S = Shielded; U = Unshielded	F = With Ferrite
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3.3 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions.

For radiated emission measurements, the EUT is attached to a cardboard box (if necessary) and placed on the wooden turntable. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). The EUT is wired to transmit full power.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

3.5 Mode of Operation During Test

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

3.6 Modifications Required for Compliance

The following modifications were installed during compliance testing in order to bring the product into compliance (Please note that this list does not include changes made specifically by Symbol Technologies Inc. prior to compliance testing):

No modifications were made to the EUT by Intertek Testing Services.

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4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminal , FCC Ref: 15.247(b):

With the hopping function turned OFF:

- The antenna port of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.
- The antenna port of the EUT was connected to the input of a spectrum analyzer. The analyzer was set for maximum RES BW and power was read directly in dBm.

For antennas with gains of 6 dBi or less , maximum allowed transmitter output is 1 watt (+30 dBm).

For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to $(GAIN - 6)/3$ dBm.

NOTE: Hopping function disabled during test

Frequency (MHz)	Output in dBm	Output in mWatt
2402	18.7	74.1
2440	18.9	77.6
2480	18.2	66.1

Cable loss: 0.5 dB

External Attenuation: 0 dB

Cable loss, external attenuation:

included in OFFSET function

added to SA raw reading

EUT Transmit Antenna Gain (2.1 dBi) +18.9 dBm max. output level =21.0 dBm.

Please refer to the attached plots for details:

Plot 1a: Low Channel Output Power

Plot 1b: Middle Channel Output Power

Plot 1c: High Channel Output Power

HP

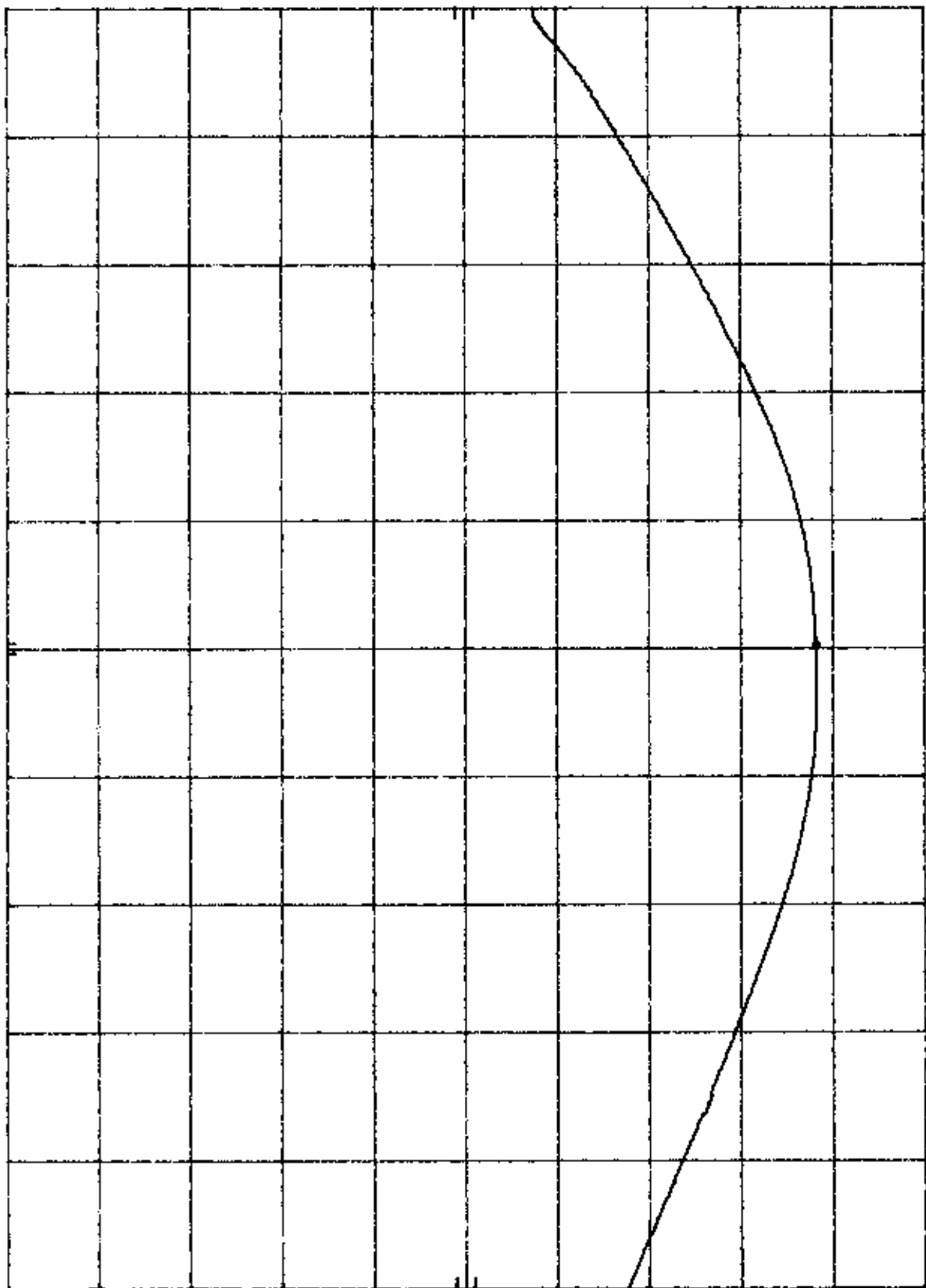
REF 30.5 DBm

ATTEN 40 DB

MKR 2.401 66 GHz
18.70 DBm

10 DB/

OFFSET
0.5
DB



CENTER 2.401 6 GHz
RES BW 3 MHz

VBW 3 MHz

SPAN 10.0 MHz
SWP 20.0 msec

HP

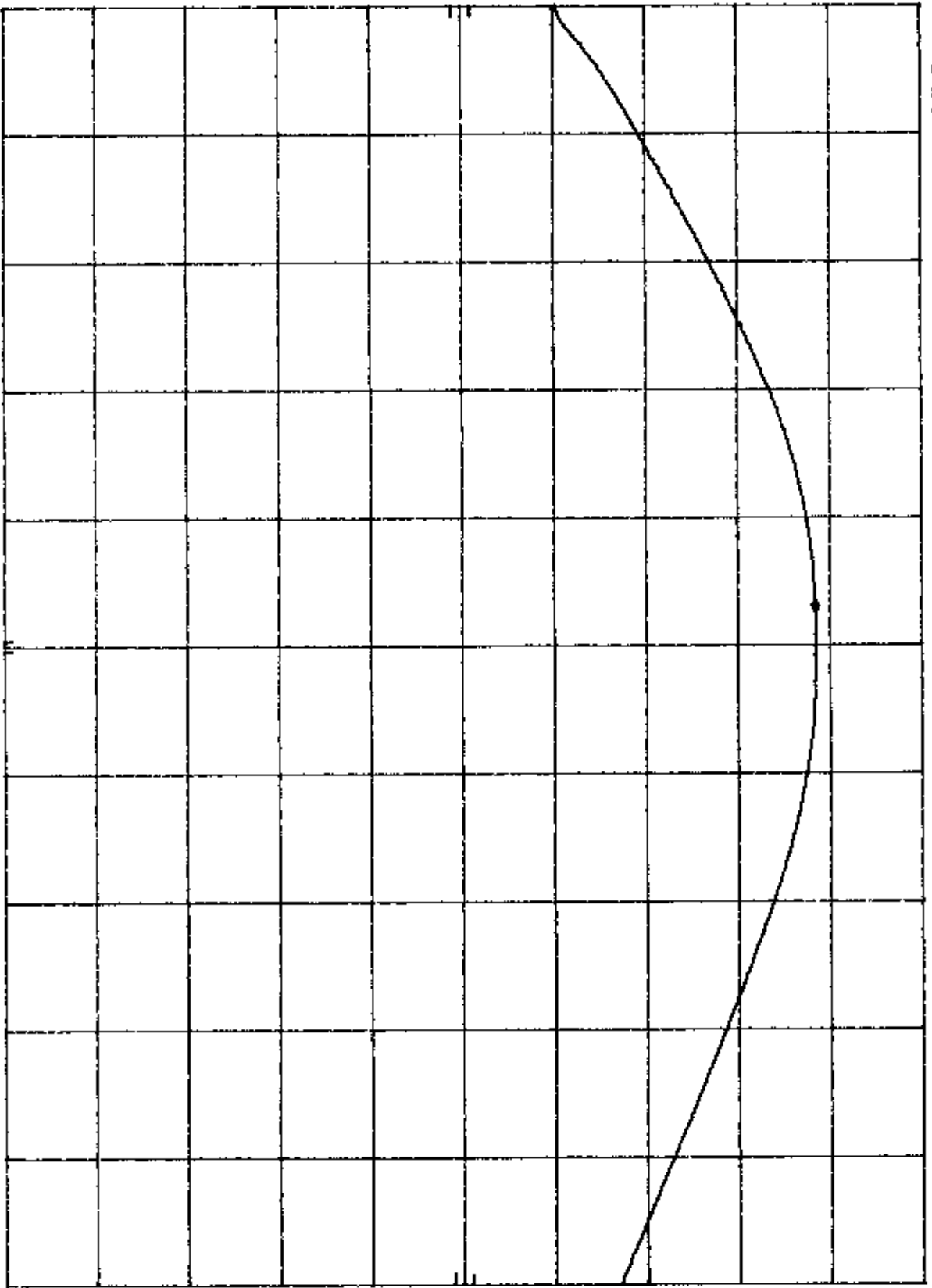
REF 30.5 dBm

ATTEN 40 DB

MKR 2.439 69 GHz
18.90 DBm

10 DB/

OFFSET
0.5
DB



CENTER 2.440 0 GHz
RES BW 3 MHz

VBW 3 MHz

SPAN 10.0 MHz
SWP 20.0 msec

HP

REF 30.5 dBm

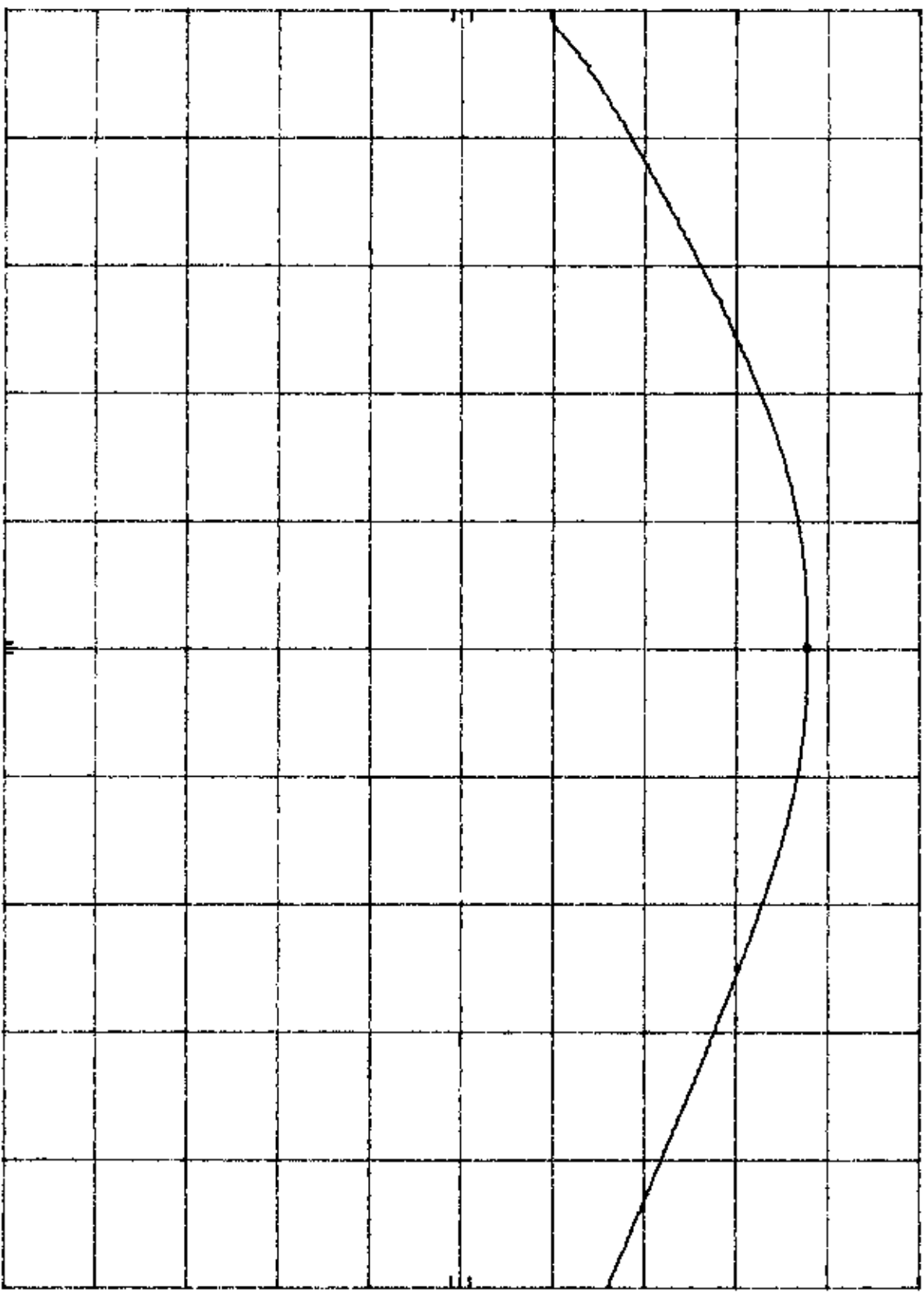
ATTEN 40 dB

MKR 2.479 98 GHz

18.20 dBm

10 dB/

OFFSET
0.5
dB



CENTER 2.480 0 GHz
RES BW 3 MHz

VBW 3 MHz

SPAN 10.0 MHz
SWP 20.0 msec

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4.2 Hopping Channel 20 dB RF Bandwidth, FCC Re : 15.247(a)(1)

Test results:

Channel (Frequency, MHz)	20 dB Bandwidth (kHz)
Low, 2402	986
Middle, 2440	986
High, 2480	980

Please refer to the attached plots for details:

Plot 2a - 2c

HP

REF 30.0 DBm

ATTEN 40 DB

MKR Δ 986 KHZ

10 DB/

OFFSET

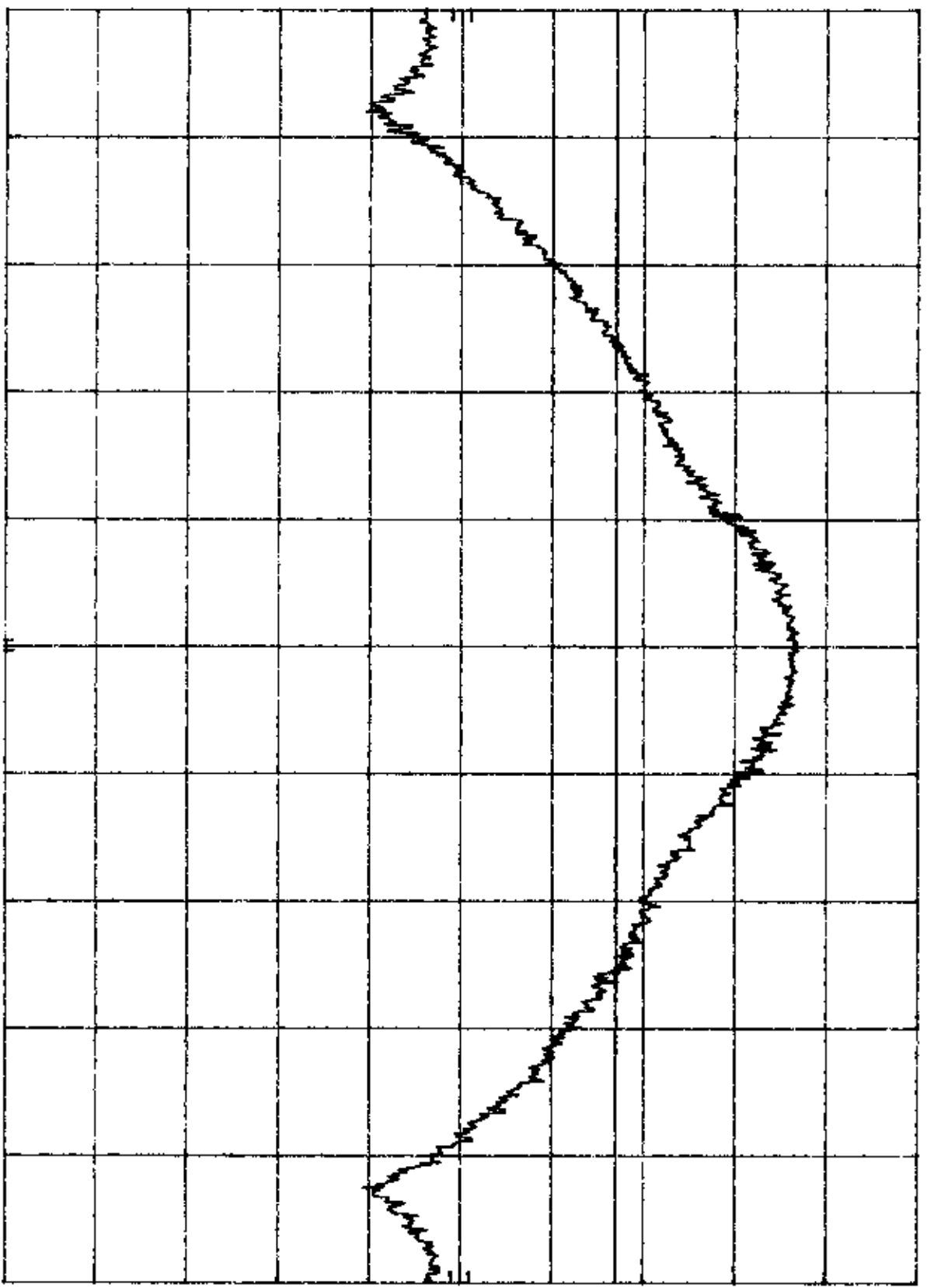
0.5

DB

DL

-3.1

DBm



CENTER 2.402 00 GHZ

RES BW 30 KHZ

VBW 30 KHZ

SPAN 2.00 MHZ

SWP 20.0 msec

HP

REF 30.0 dBm

ATTEN 40 dB

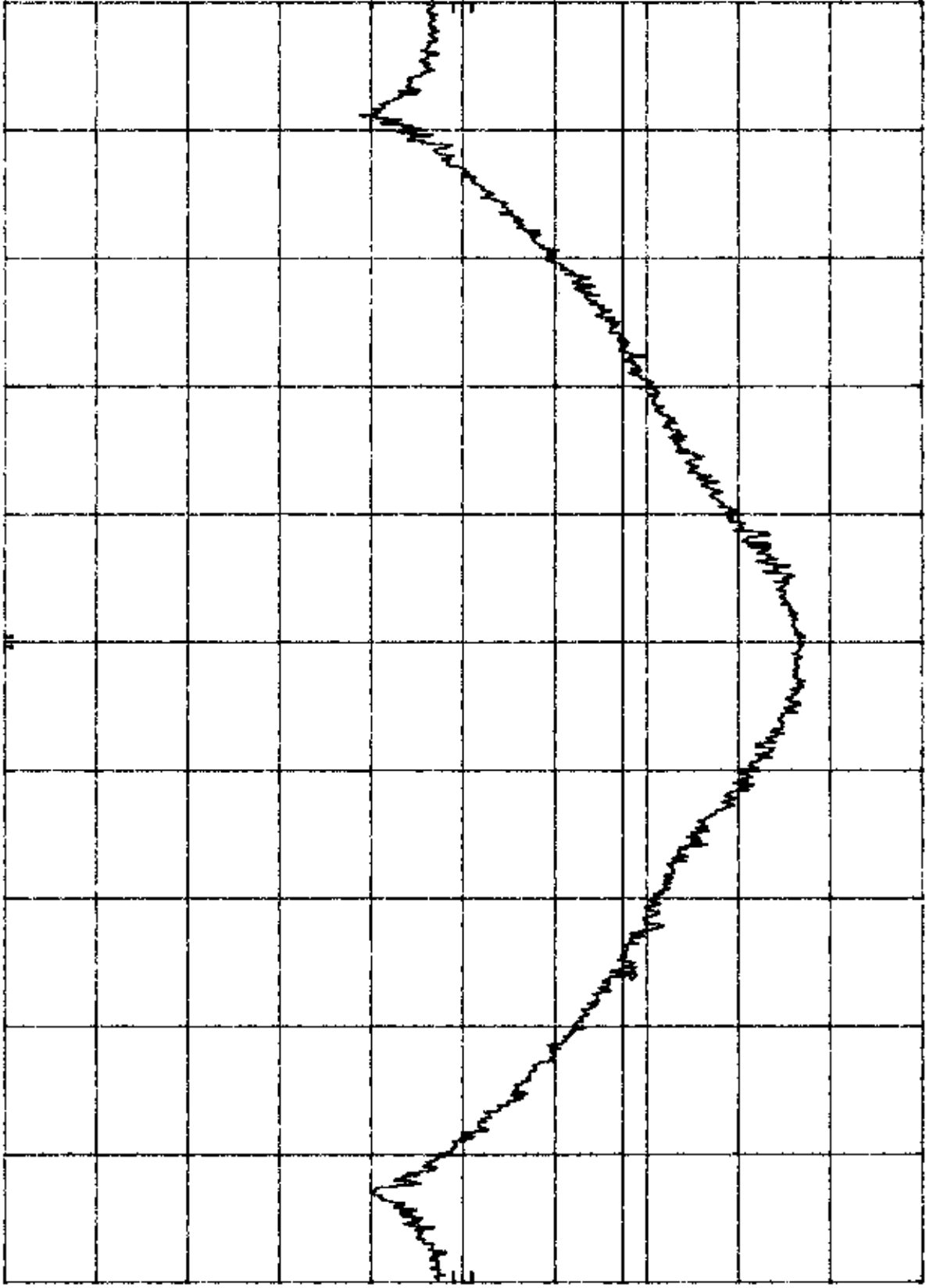
MKR Δ 986 KHz

10 dB/

OFFSET

0.5
dB

DL
-2.7
dBm



CENTER 2.440 00 GHz

RES BW 30 KHz

VBW 30 KHz

SPAN 2.00 MHz
SWP 20.0 msec

HP

REF 30.0 DBm

ATTEN 40 DB

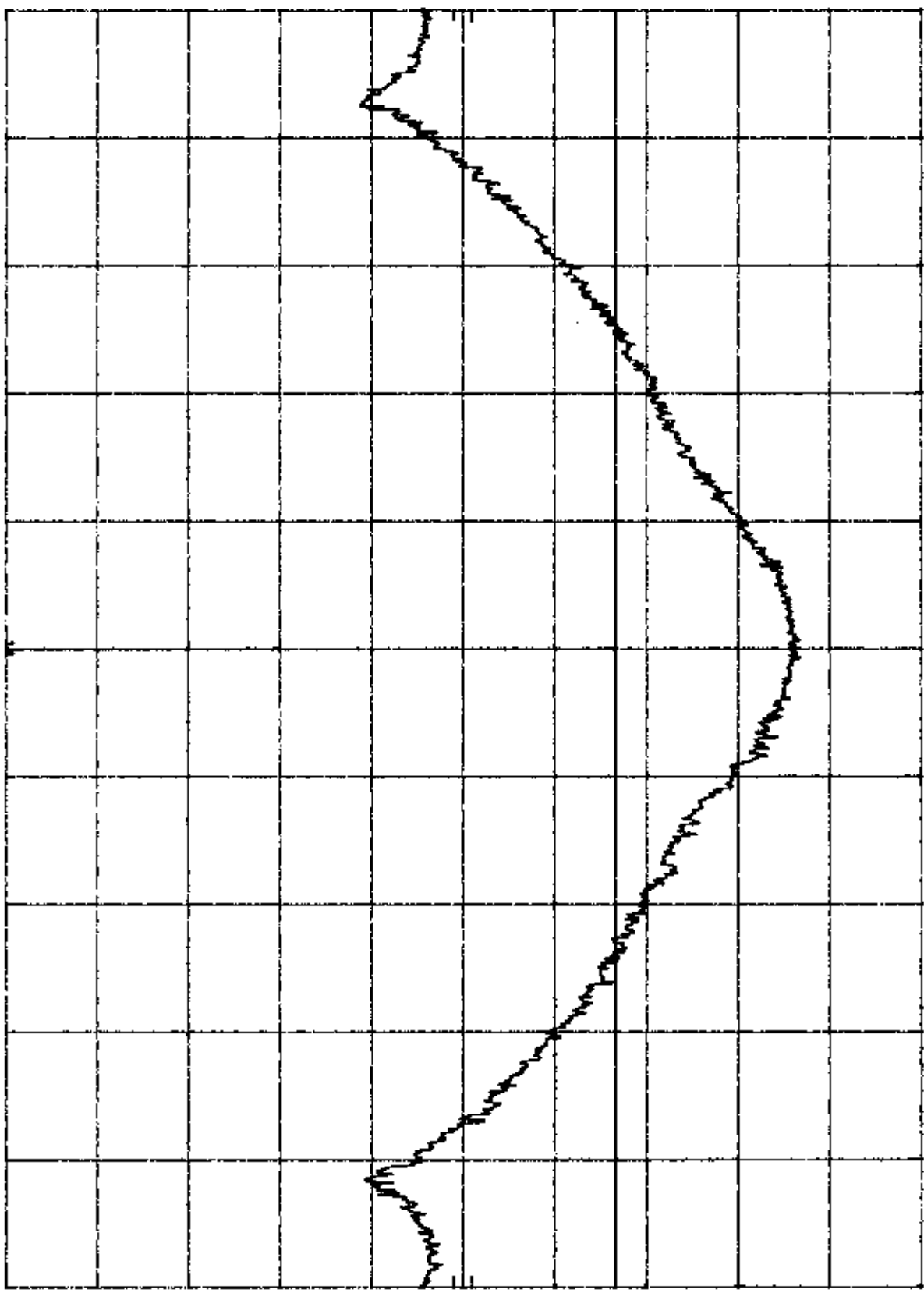
MKR Δ 980 KHz
-0.30 DB

10 DB/

OFFSET

0.5
DB

DL
-3.5
dBm



CENTER 2.480 02 GHz

RES BW 30 KHz

VBW 30 KHz

SPAN 2.00 MHz
SWP 20.0 msec

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4.3 Minimum Hopping Channel Carrier Frequency Separation, FCC Re : 15.247(a)(1)

Using the DELTA MARKER function of the analyzer, the frequency separation between two adjacent channels was measured and compared against the limit.

25 kHz

20 dB bandwidth of hopping channel

Please refer to the attached data and spectrum analyzer Plot # 2a - 2c in section 4.2 for the test result.

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4.4 Minimum Number of Hopping Frequencies, FCC Re : 15.247(a)(1)(i&ii)

The RF passband of the EUT was divided into 2 approximately equal bands. With the analyzer set to MAX HOLD readings were taken for 2 - 3 minutes in each band. The channel peaks so recorded were added together, and the total number compared to the minimum number of channels required in the regulation.

No. of hopping channel	Test was not performed
------------------------	------------------------

Minimum Requirements:

- at least 50 channels for 902 - 928 MHz band;
- at least 75 channels for 2400 - 2483.5 and 5725 - 5850 MHz systems

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4.5 Average Channel Occupancy Time, FCC Re : 15.247(a)(1)(i&ii)

The spectrum analyzer center frequency was set to one of the known hopping channels. The SWEEP was set to 0.4 second, the SPAN was set to ZERO SPAN, and the TRIGGER was set to VIDEO. The time duration of the transmission so captured was measured with the MARKER DELTA function.

The SWEEP was then set to the time required by the regulation (20 seconds for 902-928 MHz devices, 30 seconds for all other bands). The analyzer was set to SINGLE SWEEP, the total ON time was added and compared against the limit (0.4 seconds).

Average 0.4 seconds maximum occupancy in 20 seconds, 902-928 MHz

Average 0.4 seconds maximum occupancy in 30 seconds, 2400-2483.5/5725-5850 MHz

Test was not performed

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4.6 Out of Band Conducted Emissions, FCC Re : 15.247(c)

For EUT antenna conducted output frequencies from 1 MHz to the 10th harmonic of the transmitter operating frequency (or 40 GHz, whichever is lower):

In any 100 kHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, or else shall meet the general limits for radiated emissions at frequencies outside the passband, whichever results in lower attenuation.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Please refer to the attached Plots for details:

Low Channe	Plots 4.a.1 - 4.a.6
Middle Channe	Plots 4.b.1 - 4.b.6
High Channe	Plots 4.c.1 - 4.b.6

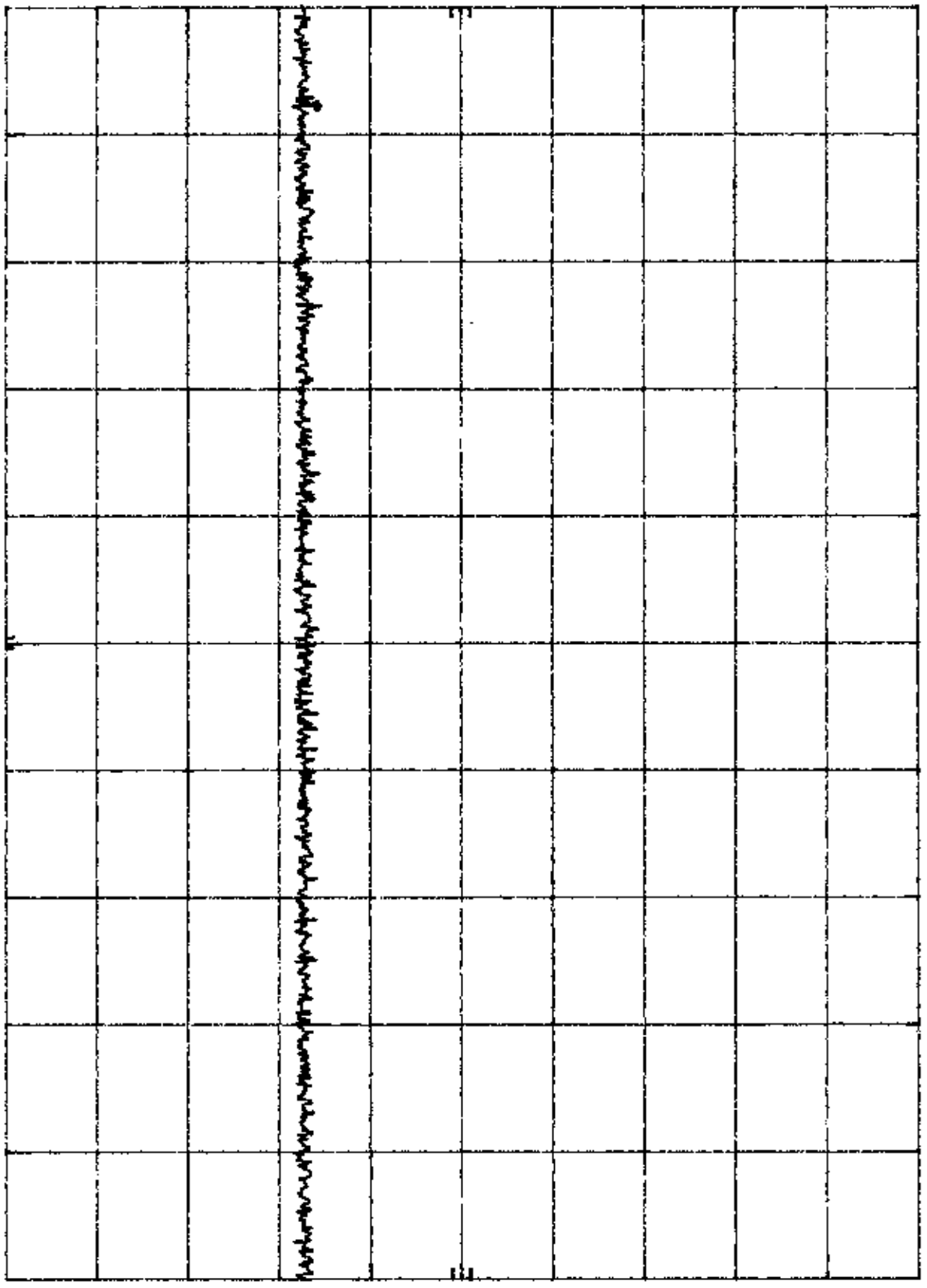
HP

REF 20.0 DBm ATTEN 40 DB

MKR 8.62 MHz
-45.00 DBm

10 DB/

OFFSET
0.5
DB



START 1.0 MHz
 RES BW 100 KHZ
 VBW 100 KHZ
 STOP 100.0 MHz
 SWP 500 mseg

HP

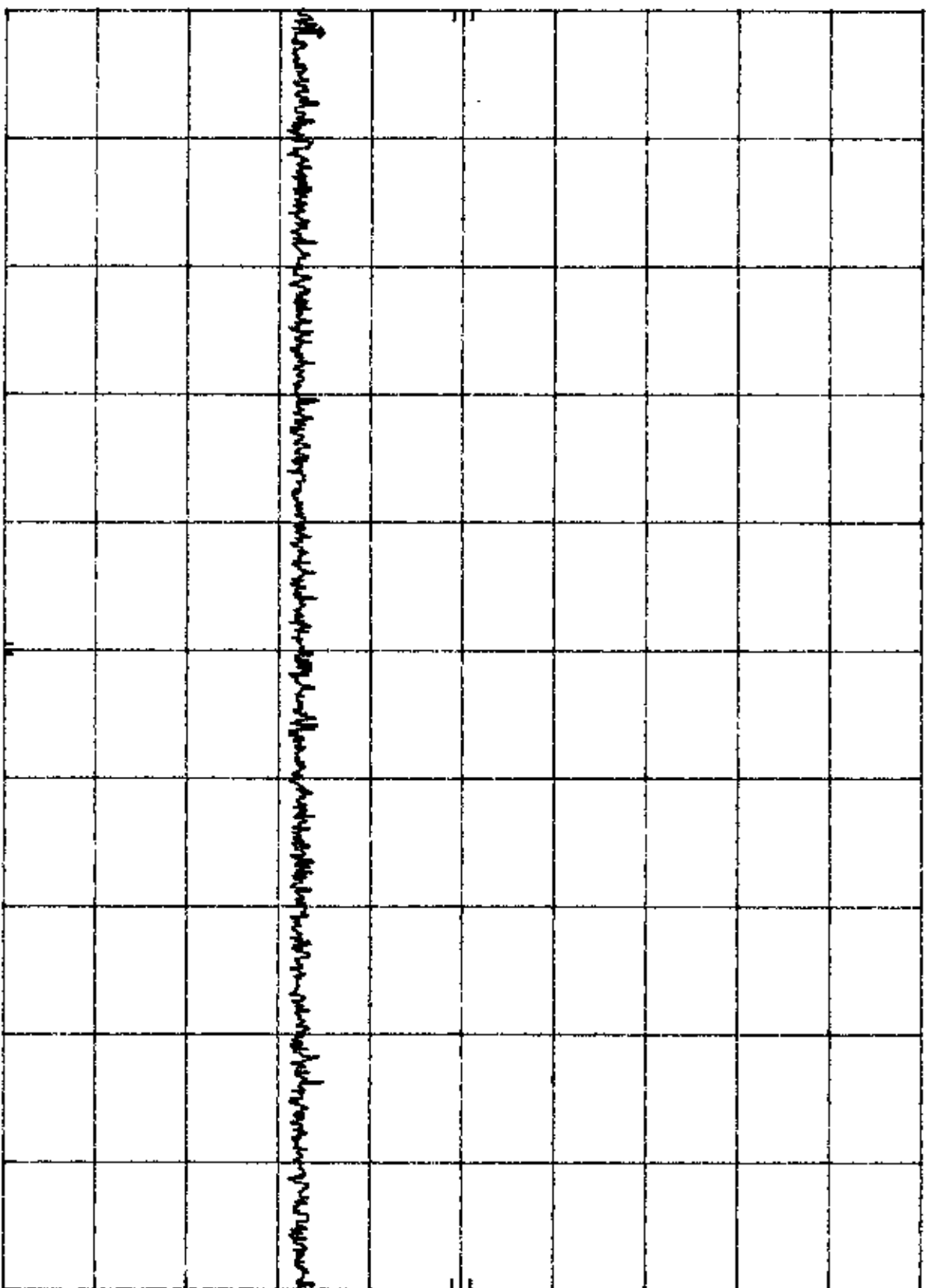
REF 20.0 DBM

ATTEN 40 DB

MKR 115.3 MHZ
-45.70 DBM

10 DB/

OFFSET
0.5
DB



START 100 MHZ RES BW 100 KHZ VBW 100 KHZ STOP 1.000 GHZ
 SWP 500 msec

HP

REF 20.0 DBm

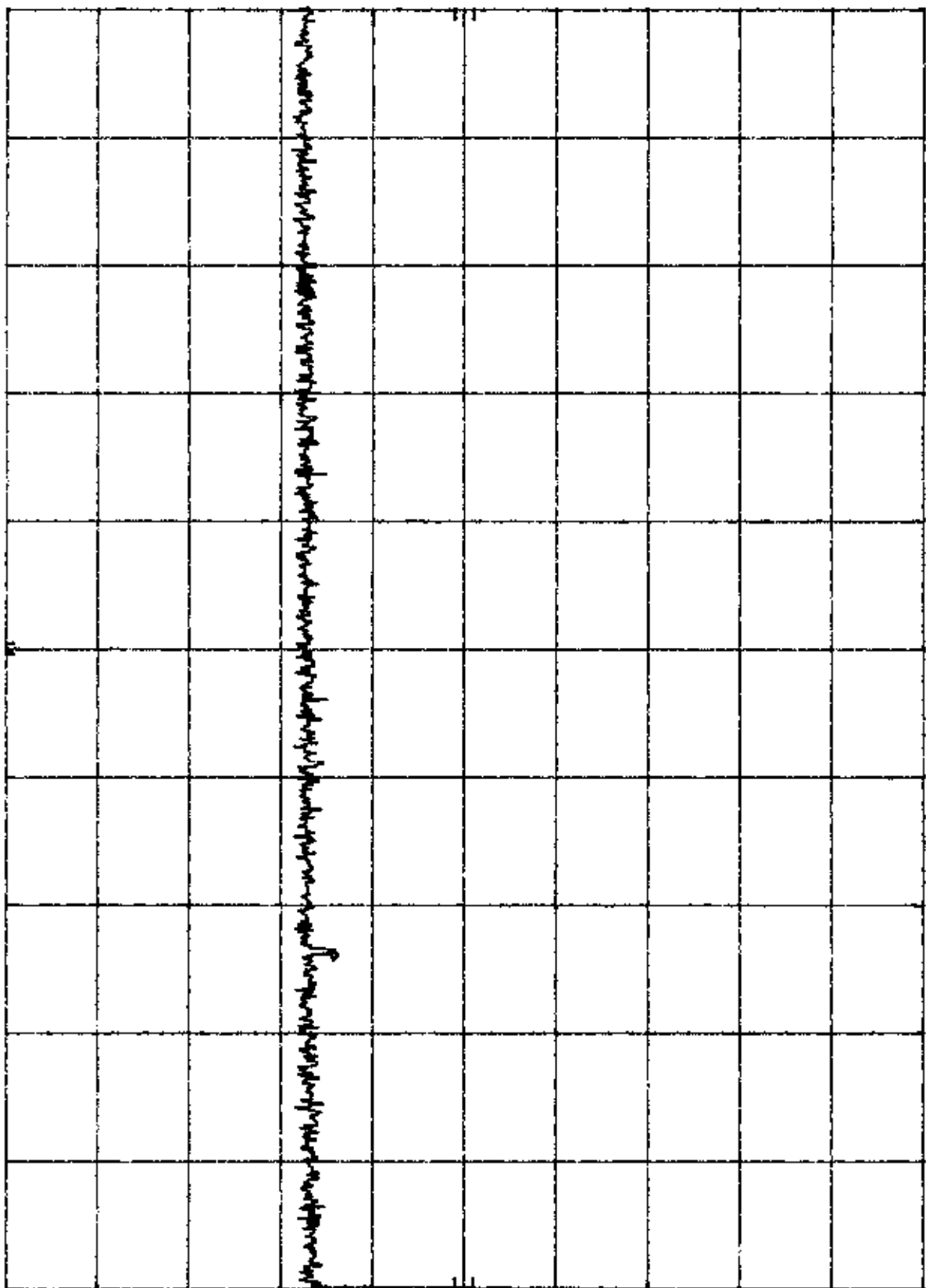
ATTEN 40 DB

MKR 2.053 GHz

-44.20 DBm

10 DB/

OFFSET
0.5
DB



START 1.00 GHz

RES BW 100 KHz

VBW 100 KHz

STOP 2.40 GHz
SWP 500 msec

HP

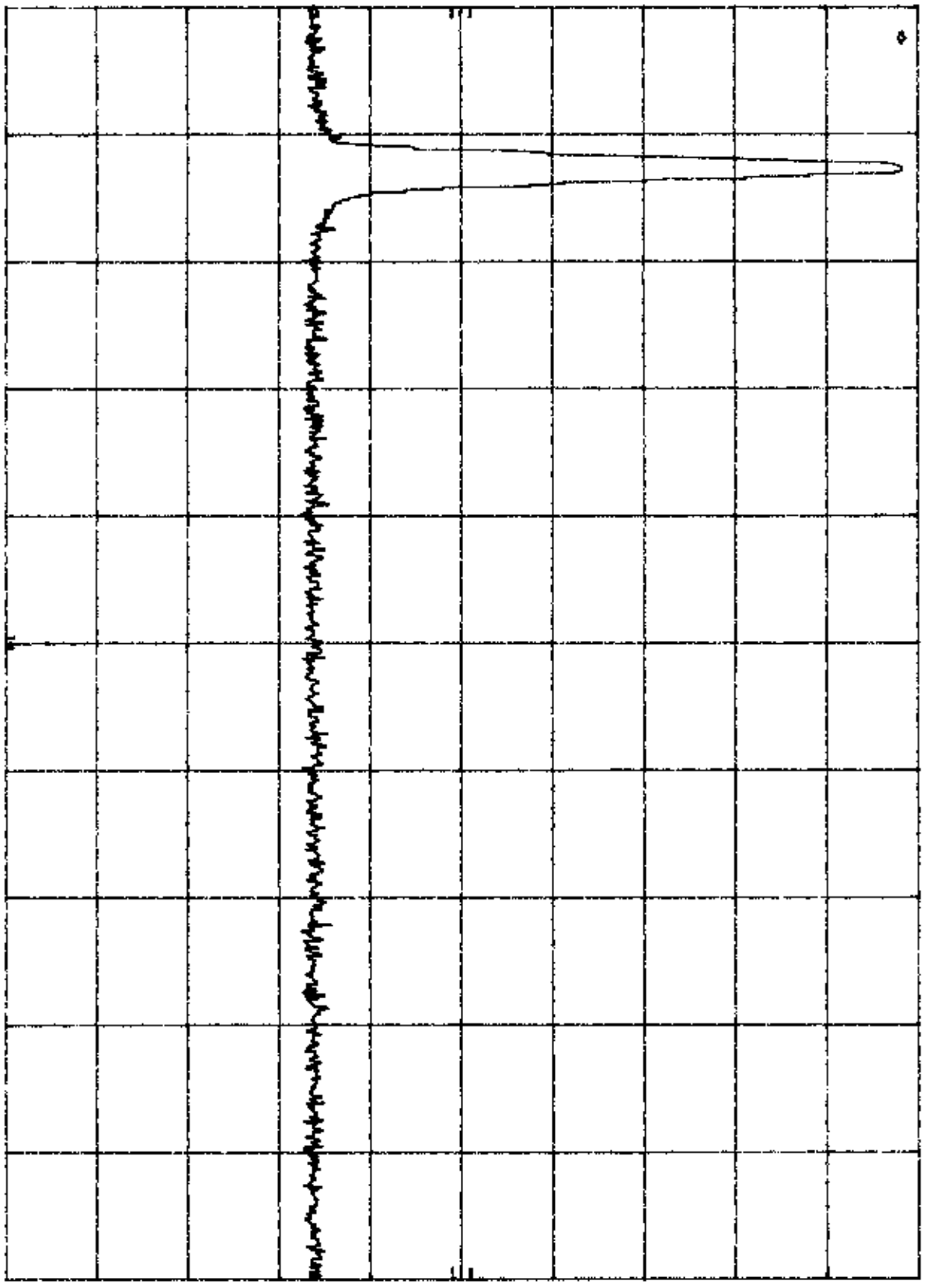
REF 20.0 DBM

ATTEN 40 DB

MKR Δ-2.23 MHZ
-64.30 DB

10 DB/

OFFSET
0.5
DB



START 2.390 0 CHZ

RES BW 100 KHZ

VBW 100 KHZ

STOP 2.483 0 CHZ
SWP 500 msec

HP

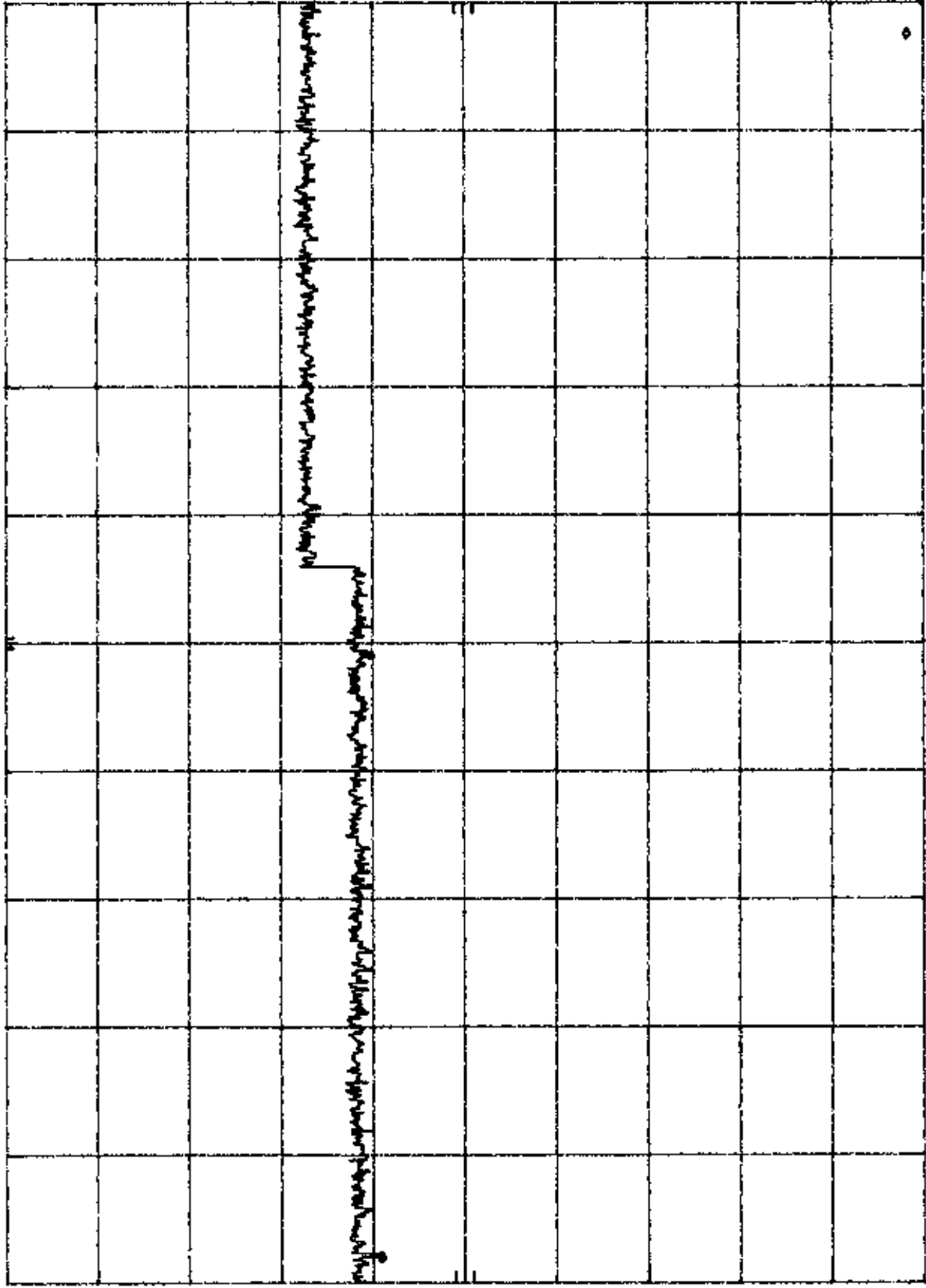
REF 20.0 DBm

ATTEN 40 DB

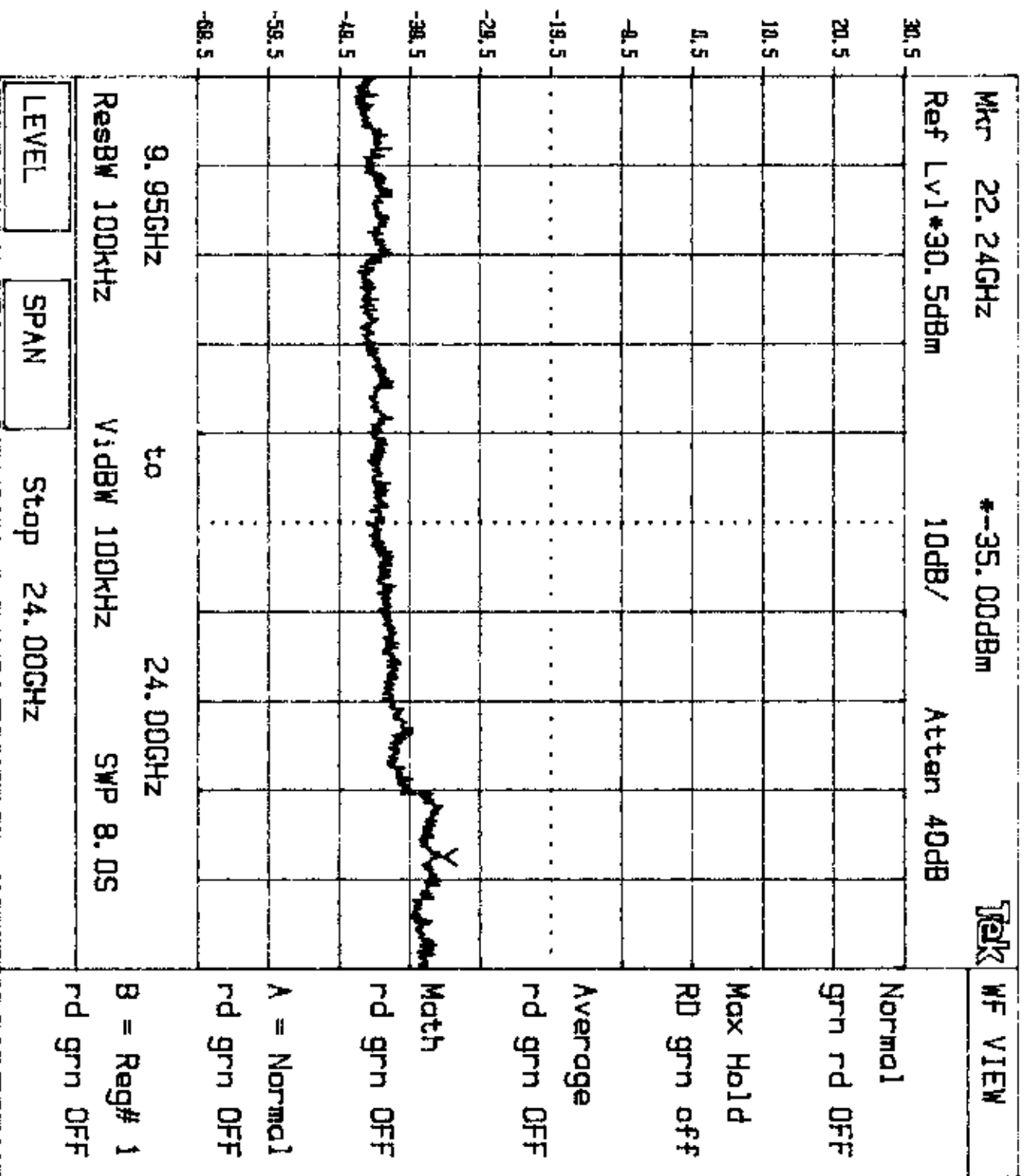
MKR Δ 7.182 GHz
-57.30 DB

10 DB/

OFFSET
0.5
DB



START 2.48 GHz RES BW 100 KHZ VBW 100 KHZ STOP 10.00 GHz
 SWP 2.26 sec



Mkr 22.24GHz

*-35.00dBm



WF VIEW

Ref Lvl*30.5dBm

10dB/

Atten 40dB

9.95GHz

to

24.00GHz

Normal

ResBW 100kHz

VisBW 100kHz

SWP 8.05

grn rd OFF

LEVEL

SPAN

Stop 24.00GHz

Max Hold

RD grn off

RD grn off

Average

rd grn OFF

Math

Math

A = Normal

rd grn OFF

B = Reg# 1

rd grn OFF

rd grn OFF

rd grn OFF

KNOB 2

KNOB 1

KEYPAD

Tektronix

2784

HP

REF 20.0 DBm

ATTEN 40 DB

MKR 54.66 MHz

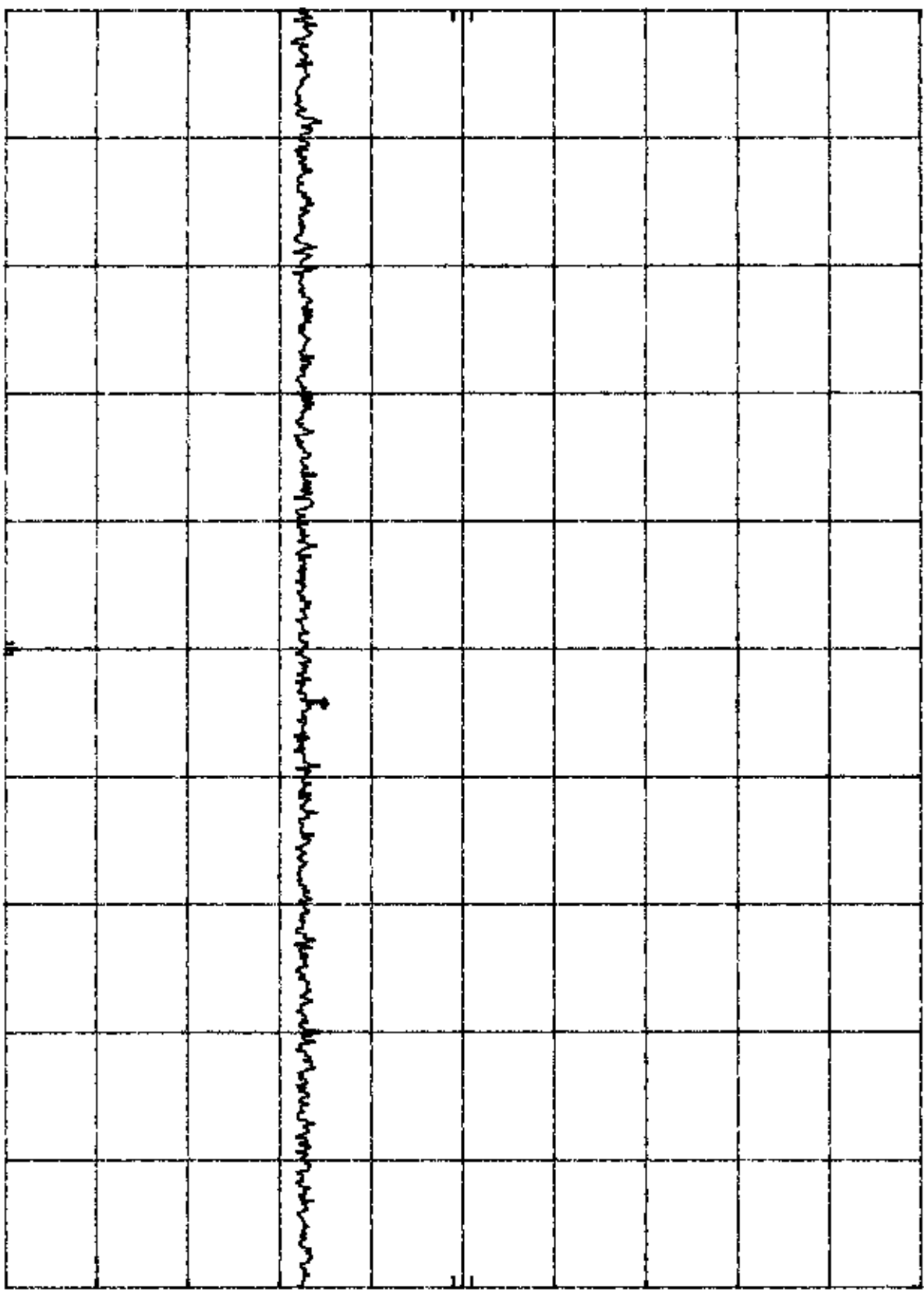
-45.10 DBm

10 DB/

OFFSET

0.5

DB



START 1.0 MHz

RES BW 100 KHz

VBW 100 KHz

STOP 100.0 MHz

SWP 29.7 msec

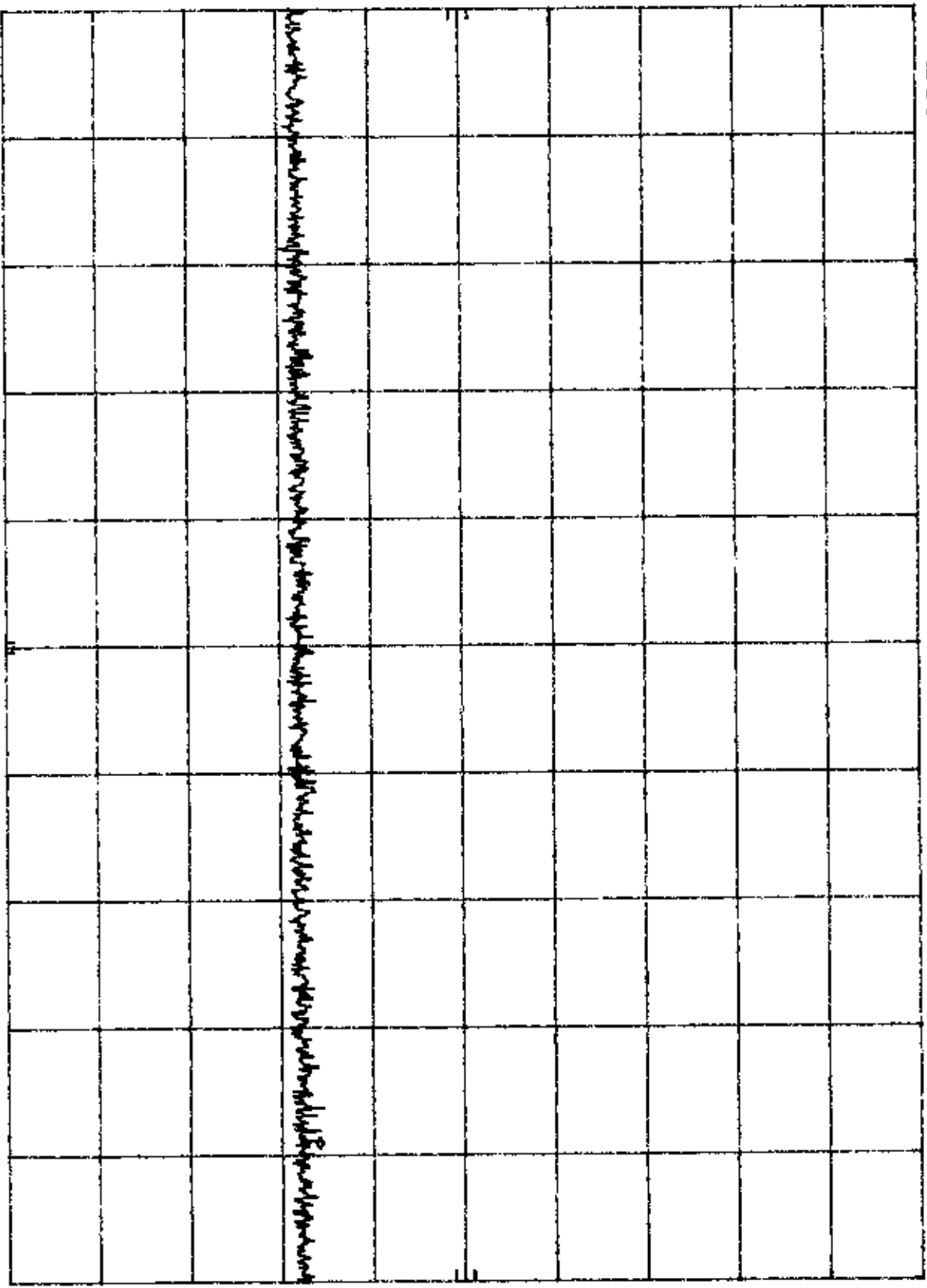
HP

REF 20.0 dBm ATTEN 40 dB

MKR 901.0 MHz
-45.90 dBm

10 dB/

OFFSET
0.5
dB



START 100 MHz STOP 1.000 GHz
RES BW 100 KHZ VBW 100 KHZ SWP 270 msec

HP

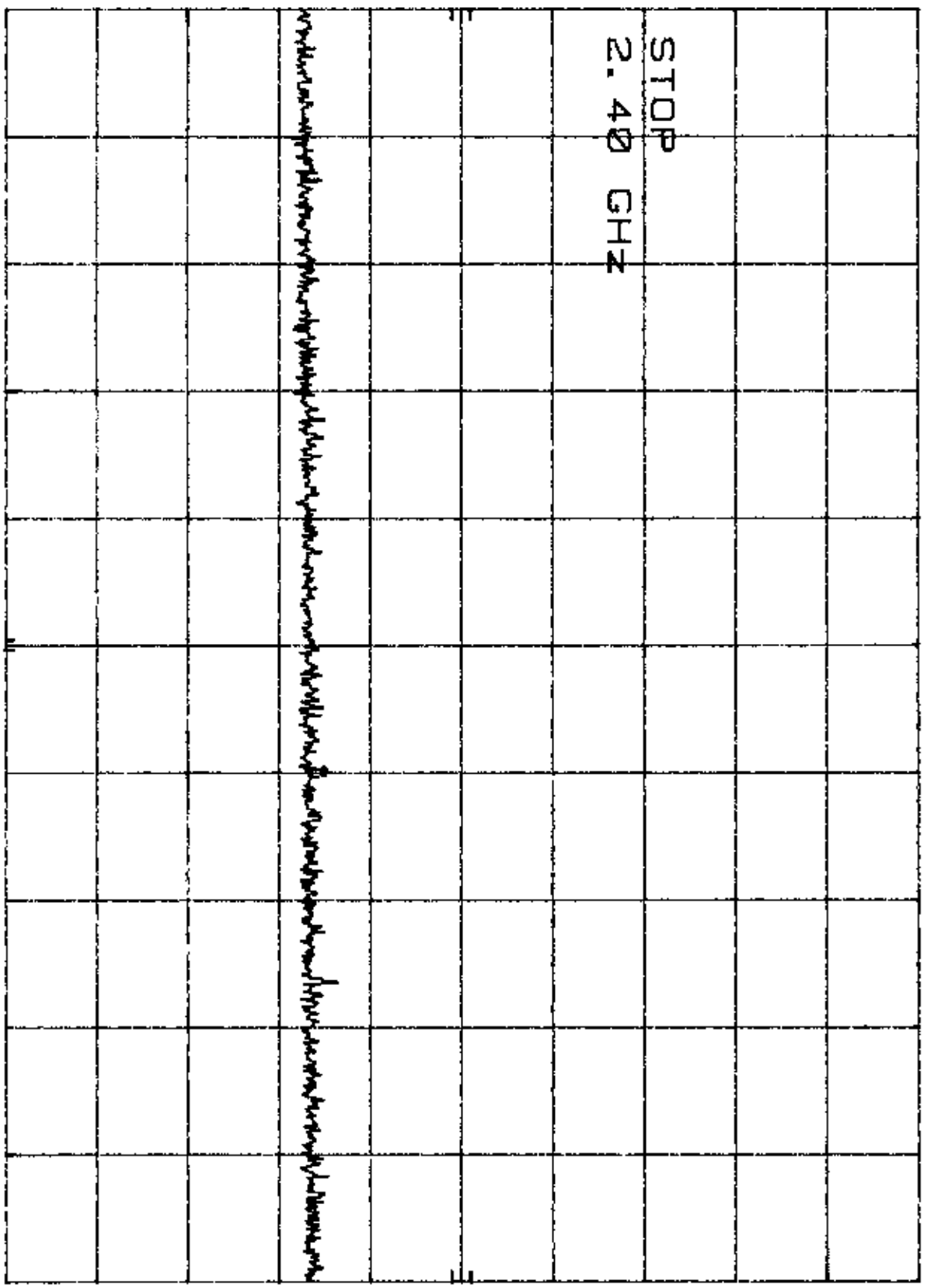
REF 20.0 DBm

ATTEN 40 DB

MKR 1.037 GHz
-45.10 DBm

10 DB/

OFFSET
0.5
DB



STOP
2.40 GHz

START 1.00 GHz
RES BW 100 KHZ
VBW 100 KHZ
SWP 420 msec
STOP 2.40 GHz

HP

REF 20.0 DBM

ATTEN 40 DB

MKR 2.440 08 GHZ

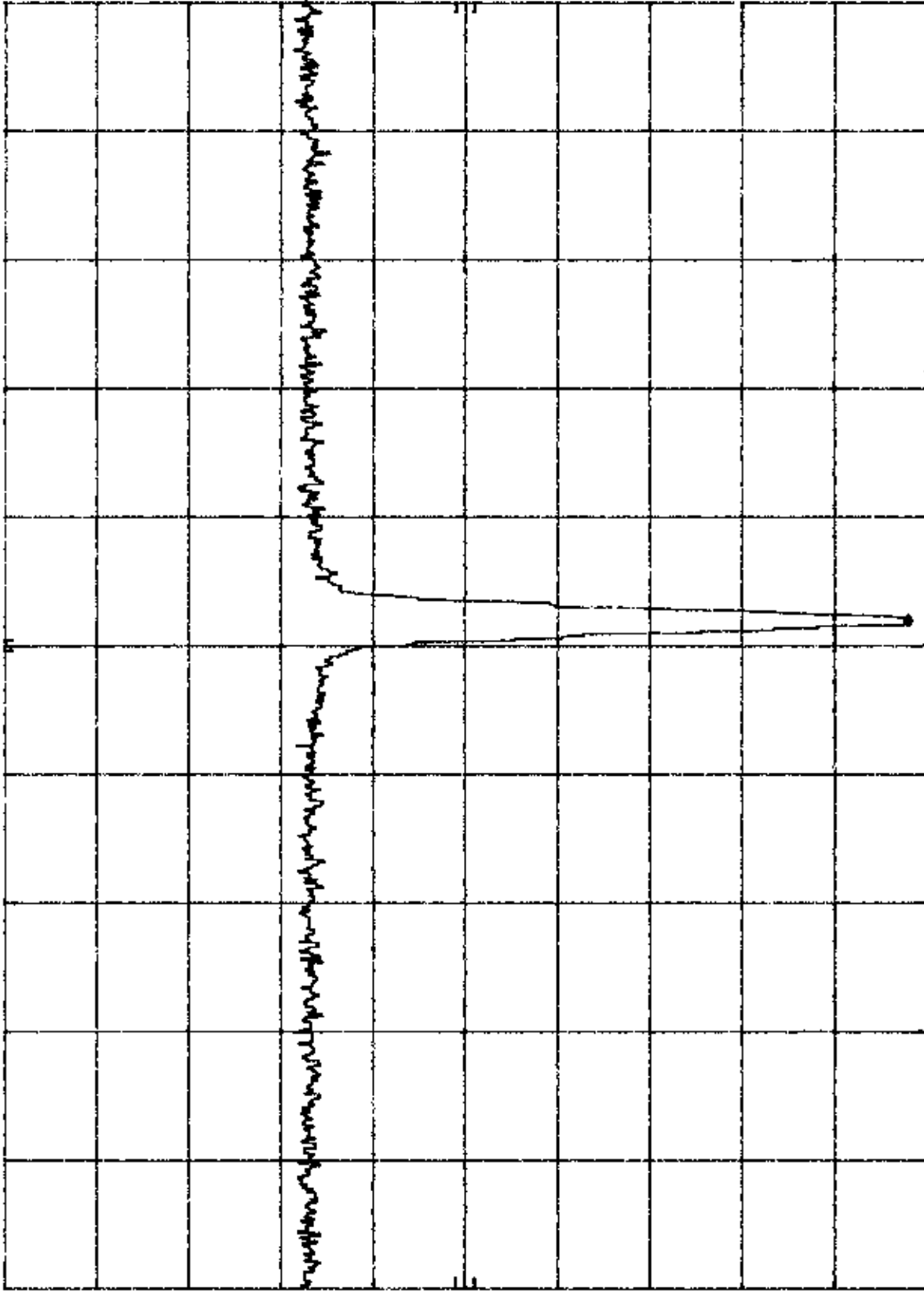
18.00 DBM

10 DB/

OFFSET

0.5

DB



START 2.400 0 GHZ

RES BW 100 KHZ

VBW 100 KHZ

STOP 2.483 5 GHZ

SWP 25.1 msec

HP

REF 20.0 DBM

ATTEN 40 DB

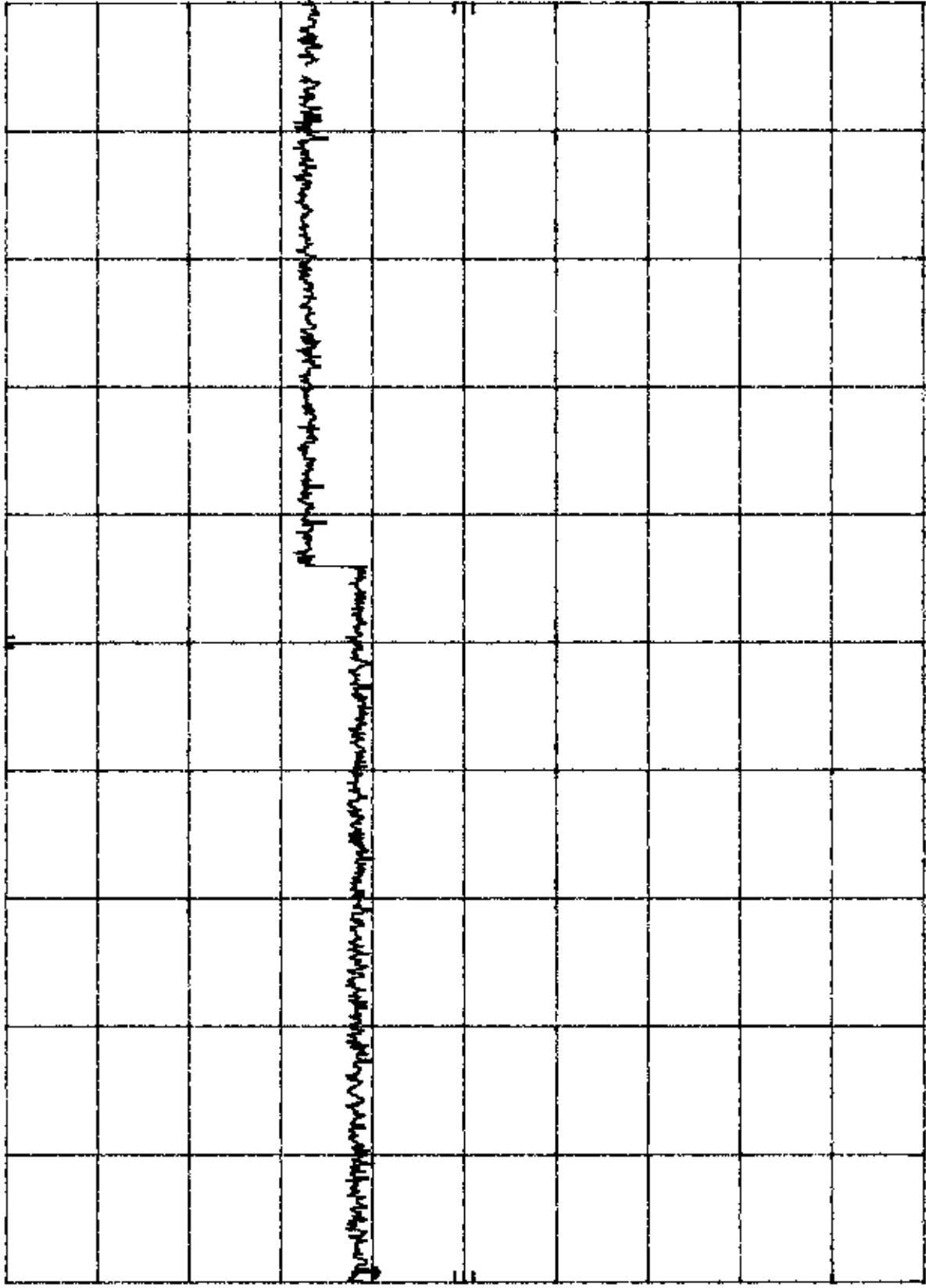
MKR 9.932 GHz

-39.60 DBM

10 DB/

OFFSET

0.5 DB



START 2.48 GHz

RES BW 100 KHz

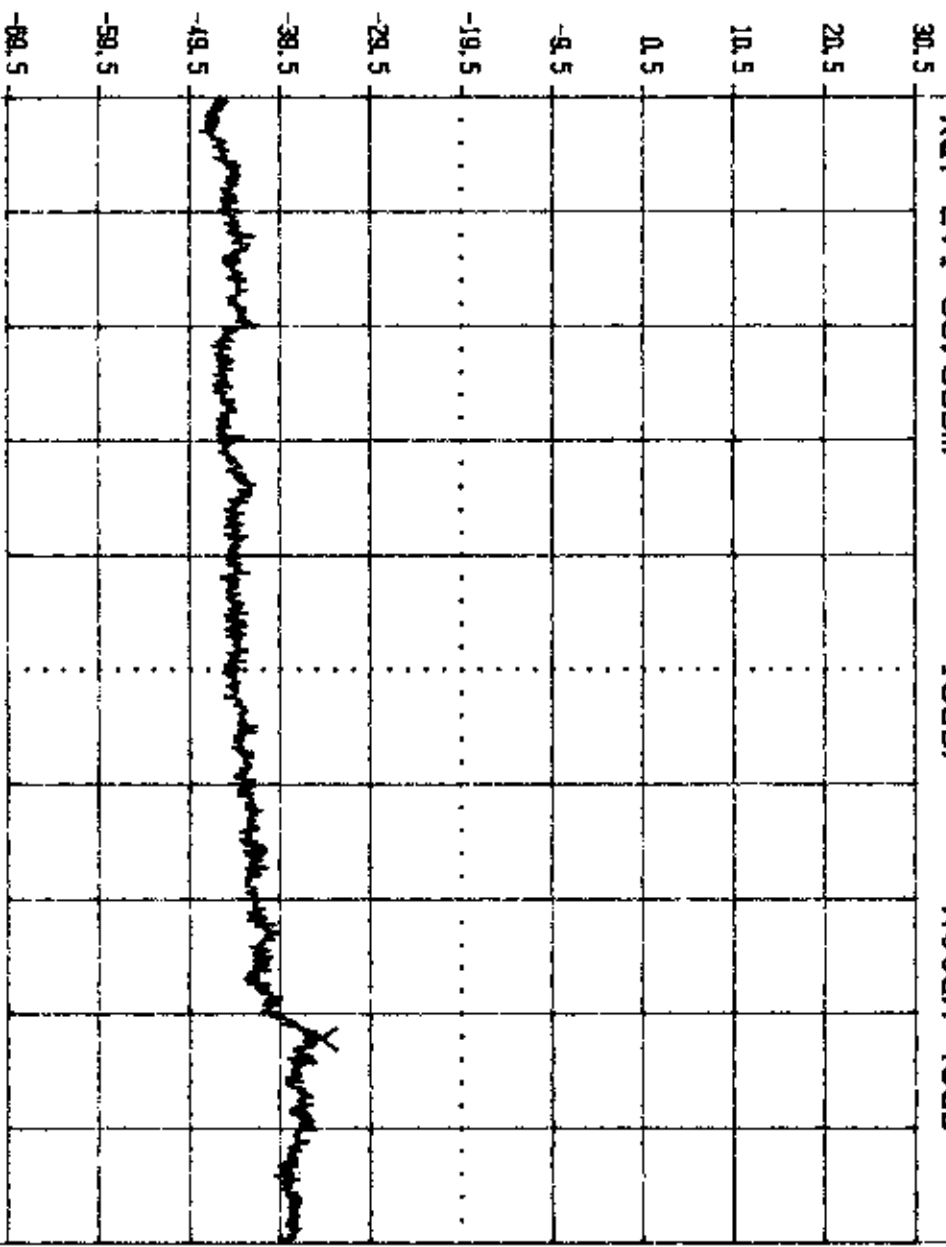
VBW 100 KHz

STOP 10.00 GHz

SWP 2.26 sec

Mkr 21.50GHz *-35.30dBm **TEK** WF VIEW

Ref Lvl*30.5dBm 10dB/ Atten 40dB



9.95GHz to 24.00GHz
 ResBW 100kHz VidBW 100kHz SWP 8.05
 LEVEL SPAN Stop 24.00GHz

Normal
 grn rd OFF
 Max Hold
 RD grn off
 Average
 rd grn OFF
 Math
 rd grn OFF
 A = Normal
 rd grn OFF
 B = Reg# 1
 rd grn OFF

HP

REF 20.0 DBm

ATTEN 40 DB

MKR 92.08 MHz

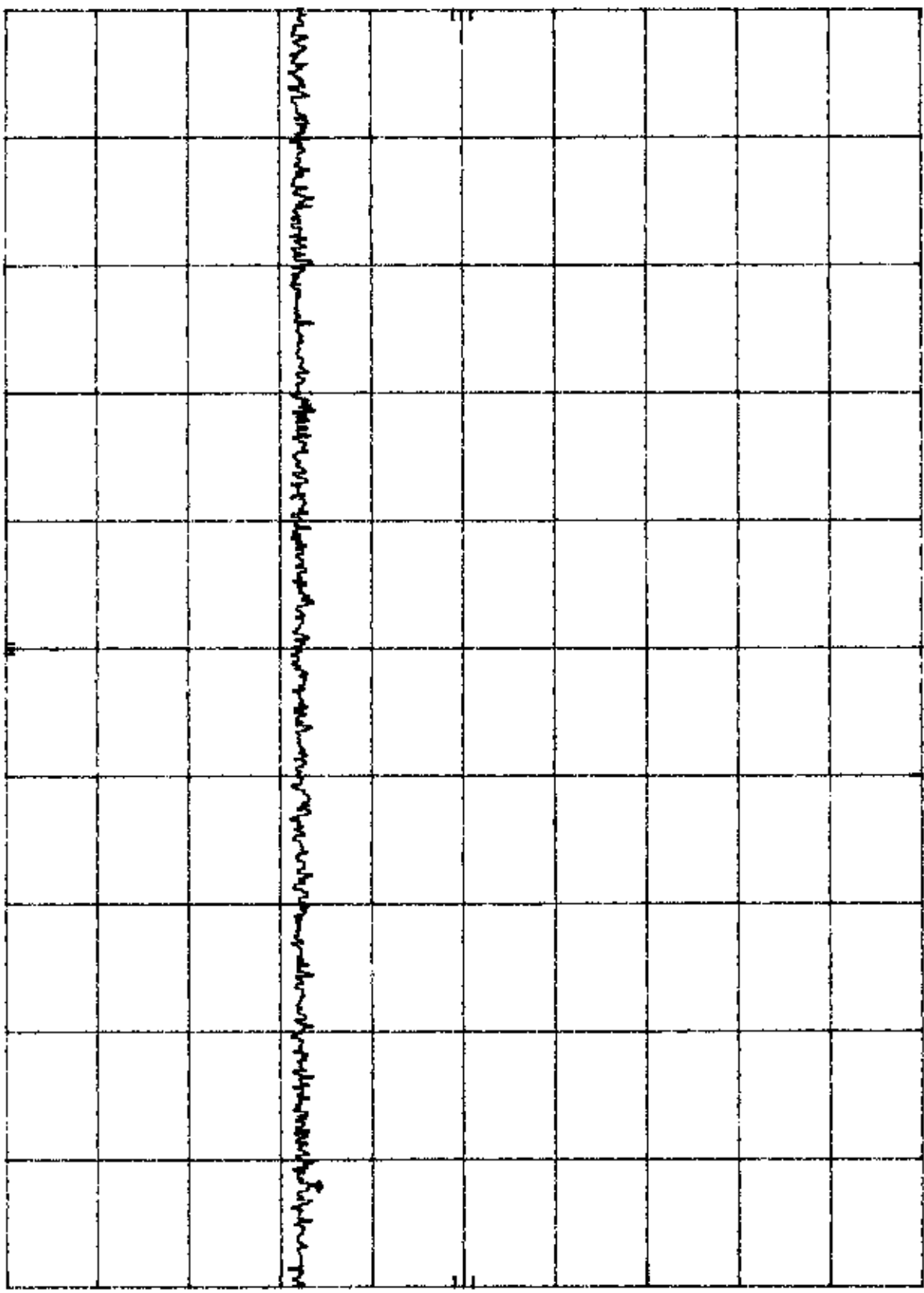
-45.90 DBm

10 DB/

OFFSET

0.5

DB



START 1.0 MHz

RES BW 100 KHz

VBW 100 KHz

STOP 100.0 MHz

SWP 29.7 msec

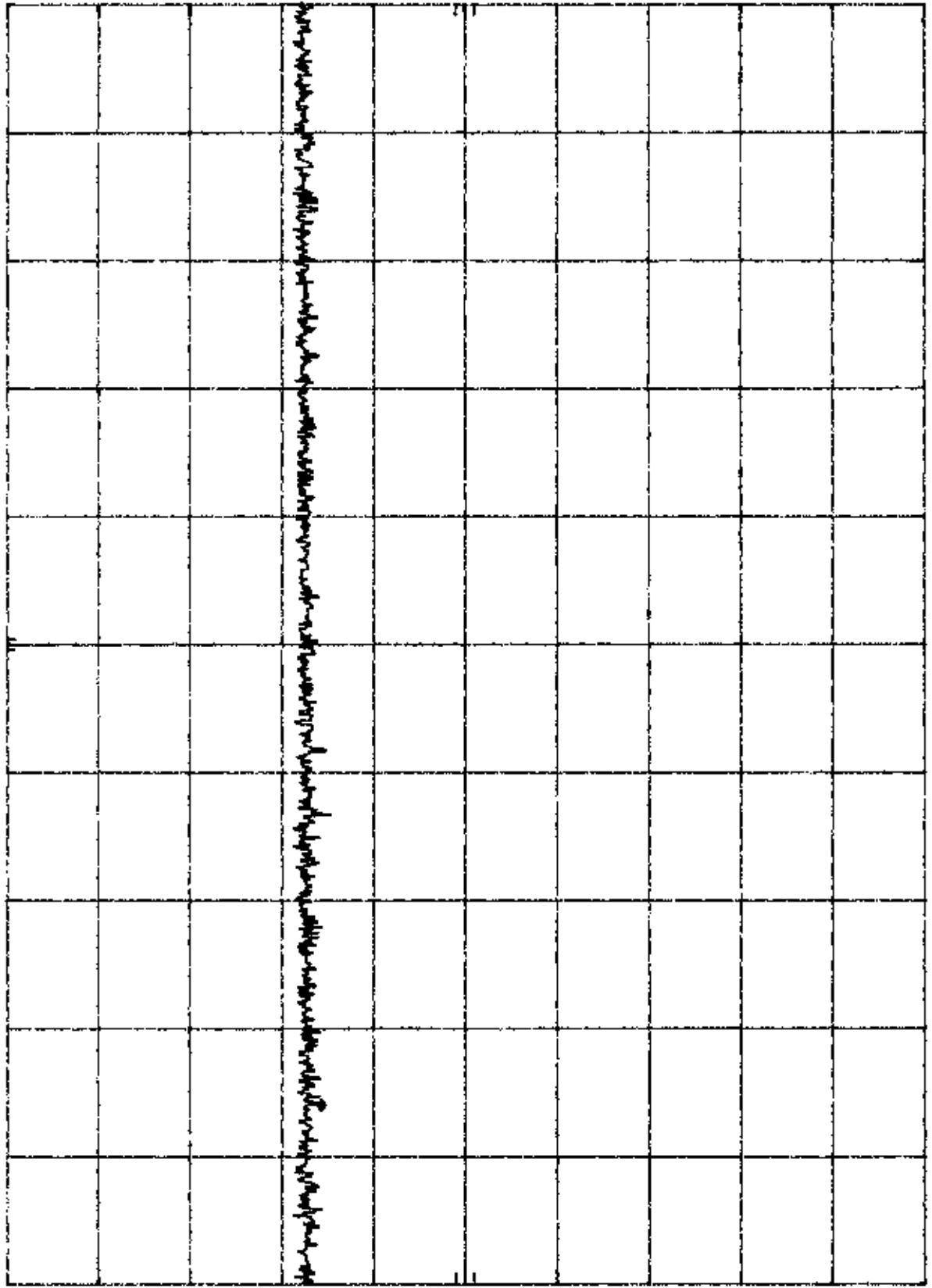
HP

REF 20.0 dBm ATTEN 40 DB

MKR 879.1 MHz
-45.70 dBm

10 dB/

OFFSET
0.5
dB



START 100 MHz RES BW 100 KHZ VBW 100 KHZ STOP 1.000 GHz
 SWP 270 msec

HP

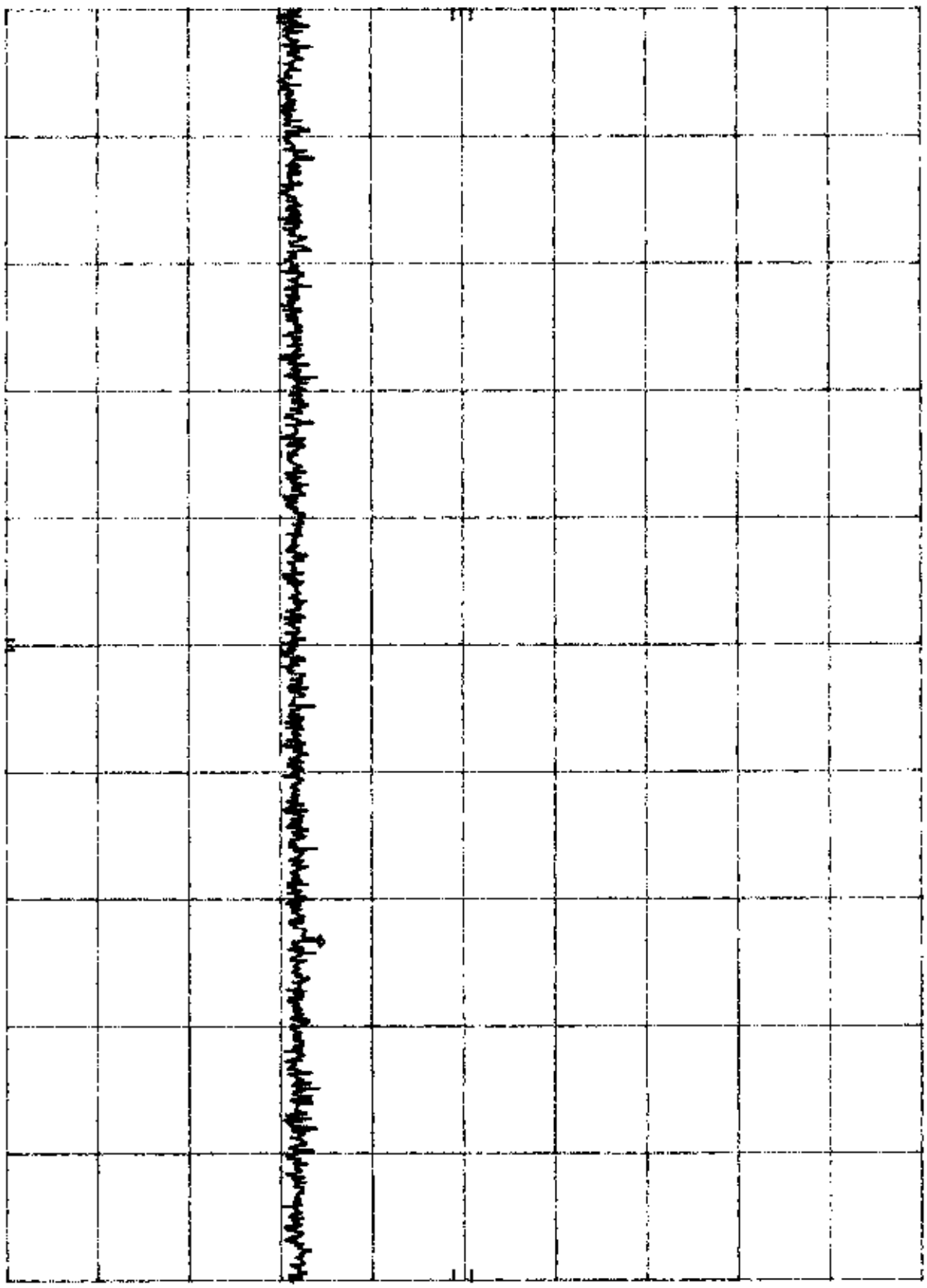
REF 20.5 dBm ATTEN 40 dB

MKR 2.025 GHz
-45.00 dBm

10 dB/

OFFSET
0.5
dB

CORR'D

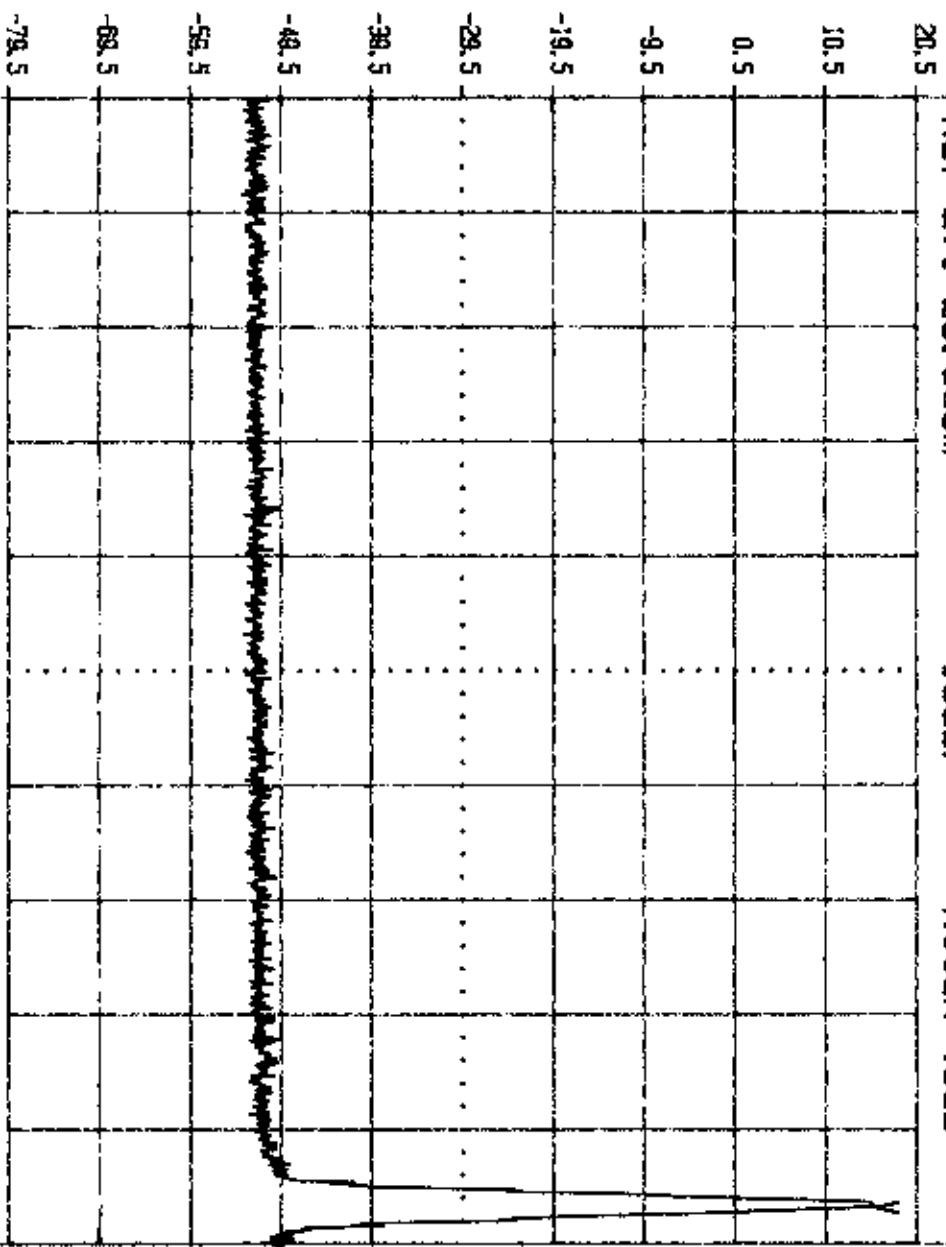


START 1.00 GHz RES BW 100 KHZ VBW 100 KHZ STOP 2.40 GHz SWP 500 msec

Mkr-Δ 2.59MHz Δ-66.40dB

Ref Lvl*20.5dBm 10dB/ Atten 40dB

TEK DELTA MKRS



2.400 00GHz to 2.483 50GHz
 ResBW 30kHz VidBW 30kHz SWP 530ms
 LEVEL SPAN VIDBW 30kHz

Delta Mkrs
ON off

Swap Ref

Marker

Zoom Delta

HP

REF 20.0 DBm

ATTEN 40 DB

MKR 2.585 GHz

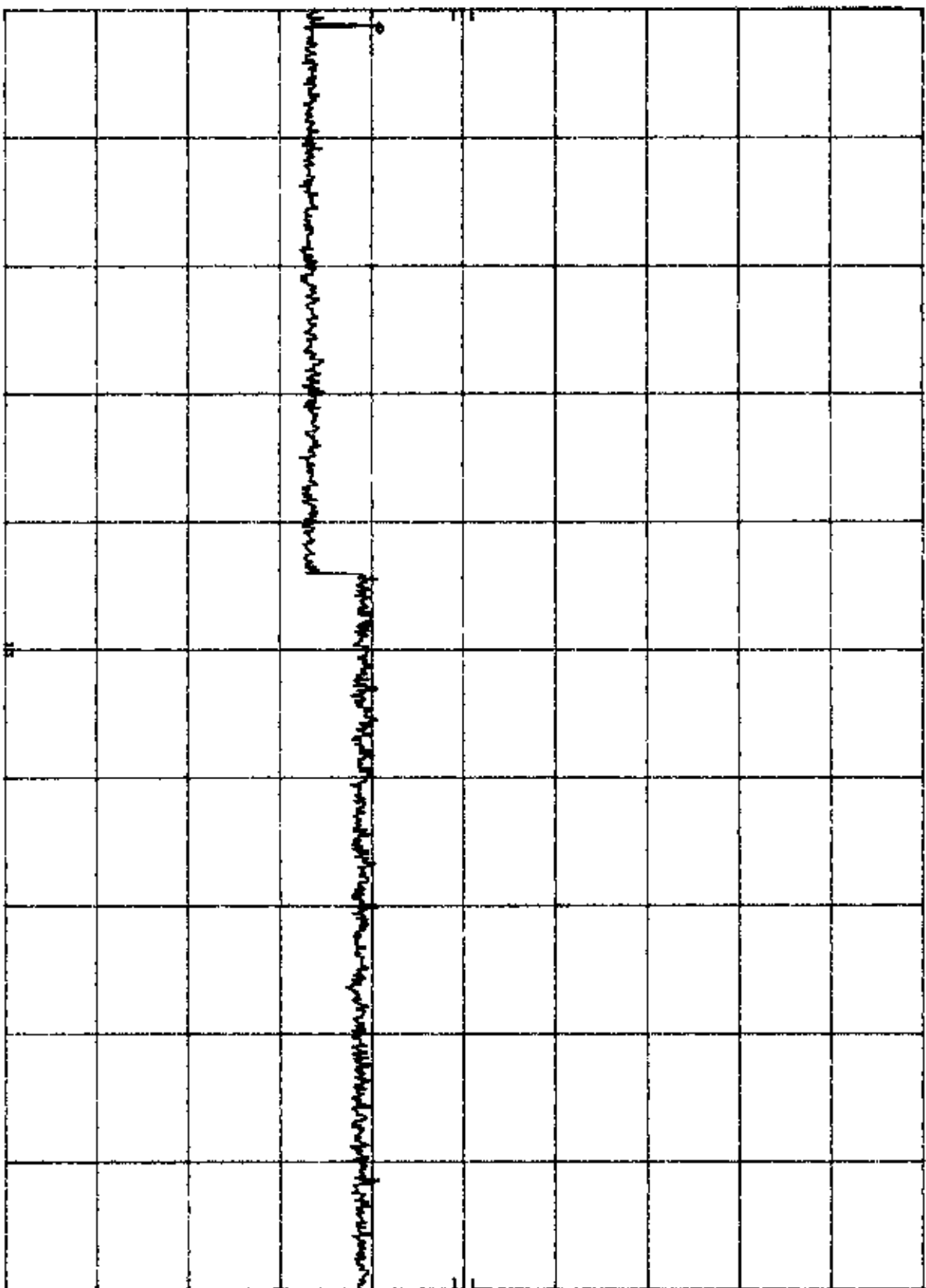
--39.10 DBm

10 DB/

OFFSET

0.5

DB



START 2.48 GHz

RES BW 100 KHz

VBW 100 KHz

STOP 10.00 GHz

SWP 2.26 sec

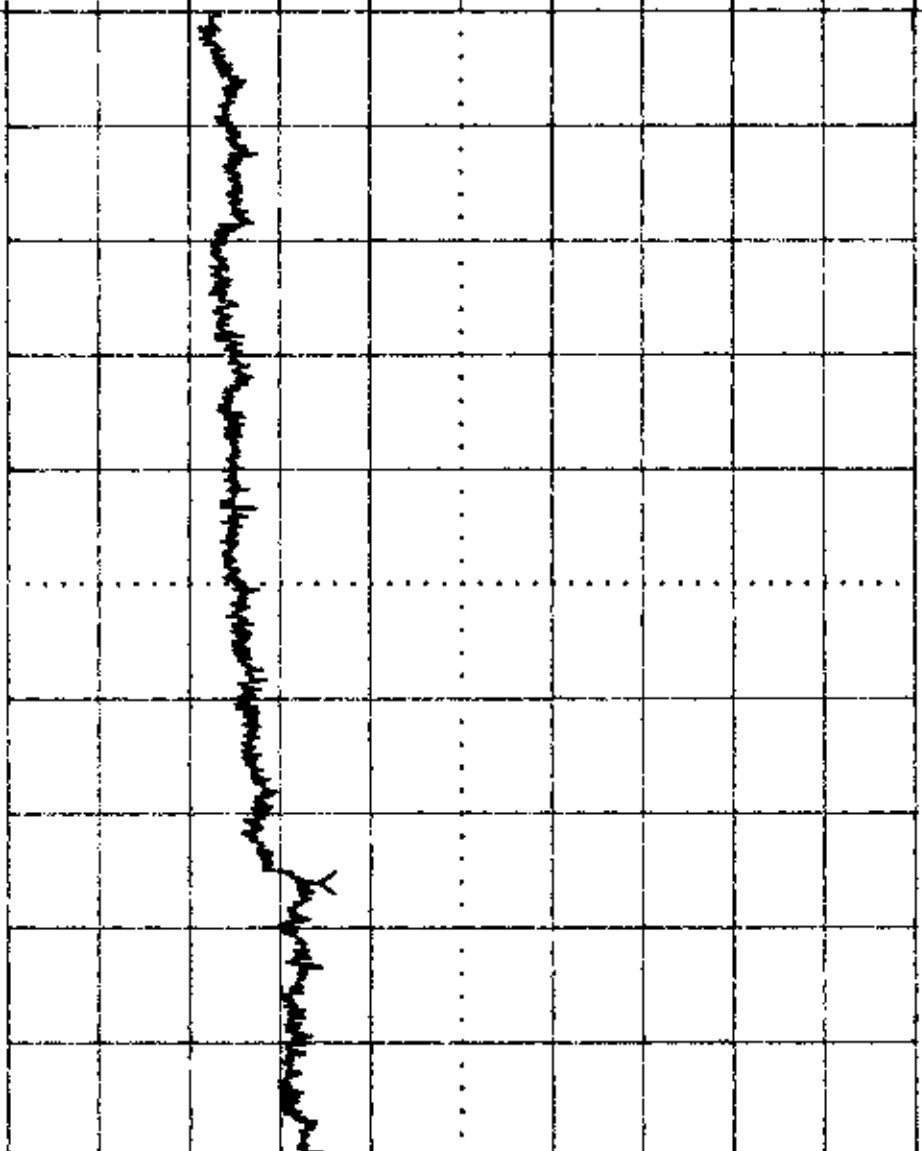
Mkr 21.40GHz *-35.60dBm



WF VIEW

Ref Lvl*30.5dBm 10dB/ Atten 40dB

30.5
20.5
10.5
0.5
-8.5
-18.5
-28.5
-38.5
-48.5
-58.5
-68.5



9.95GHz to 25.00GHz
 ResBW 100kHz VidBW 100kHz SWP 8.65
 LEVEL SPAN Stop 25.00GHz

Normal
 grn rd OFF
 Max Hold
 RD grn off
 Average
 rd grn OFF
 Math
 rd grn OFF
 A = Normal
 rd grn OFF
 B = Reg# 1
 rd grn OFF

Intertek Testing Services - Menlo Park

Symbol Technologies Inc., Spread Spectrum
FCC ID: H9PND3010

Date of Test: March 25-30, 1999

4.7 Out of Band Radiated Emissions (for emissions in § 4.6 above that are less than 26 dB below carrier), FCC Ref: 15.247(c)

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Test results are attached.

Not required, all emissions more than 26 dB below fundamenta

Intertek Testing Services - Menlo Park

Symbol Technologies Inc., Spread Spectrum
FCC ID: H9PND3010

Date of Test: March 25-30, 1999

4.8 Transmitter Radiated Emissions in Restricted Bands, FCC Re : 15.247(c),

Radiated emission measurements were performed from 30 MHz to 24000 MHz. Analyzer resolution is 100 kHz or greater for frequencies from 30 MHz to 1000 MHz and 1 MHz for frequencies above 1000 MHz.

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection and average detection (above 1 GHz) unless otherwise specified.

On the following pages, the emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter is in full radiated power.

The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz.

The transmitter was setup to transmit at the highest channel. The spectrum analyzer with resolution bandwidth 1 MHz was connected to the antenna terminal of the transmitter. The antenna conducted emissions in the band 2400 - 2483.5 MHz were measured and plotted. The difference (delta) between the levels on fundamental frequency and on the frequency 2483.5 MHz was determined. Then the field strength (E_0 in dBuV/m) of radiated emission at the fundamental frequency at 3 m was measured.

The radiated emission (E_1 in dBuV/m) at 2483.5 MHz was calculated as follows:

$$E_1 = E_0 - \text{delta.}$$

The same procedure was used to measure the radiated emissions at the frequency 2390 MHz and down to 2310 MHz.

For the test results, see data sheet below.

For transmitters with hopping channel ON times < 100 msec, DUTY CYCLE CORRECTION is permitted for emissions above 1000 MHz: Duty Cycle of -20 dB was used.

4.9 Radiated Emission Configuration Photograph



Intertek Testing Services

Company: Symbol
Project #: 599007845
Model: H9PND3010 (Low Ch.)
Engineer: Barry s.
Date of test: March 25,1999

FCC 15.247 Radiated Emissions

Frequency	Antenna Polarity	Reading dB(uV)	Antenna Factor dB(l/m)	Pre-amp dB	Distence fact dB	Cable Loss dB	Duty Cycle dB	corrected reading dB(uV/m)	Limit dB(uV/m)	Margin dB
2402.0	V	81.9	27.5	0.0	0.0	2.3	0.0	111.7*		
2402.0	V	79.5	27.5	0.0	0.0	2.3	0.0	109.3		
2390.0	V							#47.4*	74.0	-26.6
2390.0	V							#45.0	54.0	-9.0
4804.0	V	45.8	35.0	-28.3	0.0	3.0	-10.0	45.5*	74.0	-28.5
4804.0	V	42.0	35.0	-28.3	0.0	3.0	-10.0	41.7	54.0	-12.3
7206.0	H	48.6	38.2	-28.0	0.0	4.2	-10.0	53.0*	74.0	-21.0
7206.0	H	41.2	38.2	-28.0	0.0	4.2	-10.0	45.6	54.0	-8.4
12010.0	H	41.0	41.5	-39.0	0.0	8.4	-10.0	41.9*	74.0	-32.1
12010.0	H	30.5	41.5	-39.0	0.0	8.4	-10.0	31.4	54.0	-22.6
19216.0	H	39.0	40.3	-28.5	-9.5	7.2	-10.0	38.5*	74.0	-35.5
19216.0	H	28.0	40.3	-28.5	-9.5	7.2	-10.0	27.5	54.0	-26.5
21618.0	H	39.0	40.3	-24.2	-9.5	8.4	-10.0	44.0*	74.0	-30.0
21618.0	H	29.0	40.3	-24.2	-9.5	8.4	-10.0	34.0	54.0	-20.0

- Note:**
1. All measurement were made at 3 meters
 2. Negative signs (-) in the margin column signify levels below the limit.
 3. Frequences with * were peak-reading
 4. Reading with # were fundamental frequencies mines 64.3 dB (from plot 4.a.4)



Intertek Testing Services

Company: Symbol
Project #: 599007845
Model: H9PND3010 (Mid Ch.)
Engineer: Barry s.
Date of test: March 25,1999

FCC 15.247 Radiated Emissions

Frequency	Antenna Polarity	Reading dB(uV)	Antenna Factor dB(1/m)	Pre-amp dB	Distence fact dB	Cable Loss dB	Duty Cycle dB	Corrected reading dB(uV/m)	Limit dB(uV/m)	Margin dB
4880.0	V	52.3	35.0	-28.3	0.0	3.0	-10.0	52.0*	74.0	-22.0
4880.0	V	49.2	35.0	-28.3	0.0	3.0	-10.0	48.9	54.0	-5.1
7420.0	H	51.4	38.2	-28.0	0.0	4.2	-10.0	55.8*	74.0	-18.2
7420.0	H	44.6	38.2	-28.0	0.0	4.2	-10.0	49.0	54.0	-5.0
12200.0	H	38.0	41.5	-39.0	0.0	8.4	-10.0	38.9*	74.0	-35.1
12200.0	H	28.0	41.5	-39.0	0.0	8.4	-10.0	28.9	54.0	-25.1
19520.0	H	38.0	40.3	-28.5	-9.5	7.2	-10.0	37.5"	74.0	-36.5
19520.0	H	28.0	40.3	-28.5	-9.5	7.2	-10.0	27.5	54.0	-26.5
21960.0	H	38.0	40.3	-24.2	-9.5	8.4	-10.0	43.0*	74.0	-31.0
21960.0	H	29.0	40.3	-24.2	-9.5	8.4	-10.0	34.0	54.0	-20.0

- Note:**
- 1. All measurement were made at 3 meters**
 - 2. Negative signs (-) in the margin column signify levels below the limit.**
 - 3. Frequences with * were peak-reading**



Company: Symbol
Project #: 599007845
Model: H9PND3010 (High Ch.)
Engineer: Barry s.
Date of test: March 25,1999

FCC 15.247 Radiated Emissions

Frequency	Antenna Polarity	Reading dB(uV)	Antenna Factor dB(l/m)	Pre-amp dB	Distence fact dB	Cable Loss dB	Duty Cycle dB	corrected reading dB(uV/m)	Limit dB(uV/m)	Margin dB
2480.0	V	82.0	27.5	0.0	0.0	2.3	0.0	111.8*		
2480.0	V	80.0	27.5	0.0	0.0	2.3	0.0	109.8		
2483.5	V							#45.4*	74.0	-28.6
2483.5	V							#43.4	54.0	-10.6
4960.0	H	54.8	35.0	-28.3	0.0	3.0	-10.0	54.5'	74.0	-19.5
4960.0	H	51.7	35.0	-28.3	0.0	3.0	-10.0	51.4	54.0	-2.6
7440.0	H	51.9	38.2	-28.0	0.0	4.2	-10.0	56.3*	74.0	-17.7
7440.0	H	41.0	38.2	-28.0	0.0	4.2	-10.0	45.4	54.0	-8.6
12400.0	V	42.0	41.5	-39.0	0.0	8.4	-10.0	42.9*	74.0	-31.1
12400.0	V	32.0	41.5	-39.0	0.0	8.4	-10.0	32.9	54.0	-21.1
19840.0	V	39.0	40.3	-28.5	-9.5	7.2	-10.0	38.5*	74.0	-35.5
19840.0	V	28.0	40.3	-28.5	-9.5	7.2	-10.0	27.5	54.0	-26.5
22320.0	V	38.0	40.3	-24.2	-9.5	8.4	-10.0	43.0*	74.0	-31.0
22320.0	V	29.0	40.3	-24.2	-9.5	8.4	-10.0	34.0	54.0	-20.0

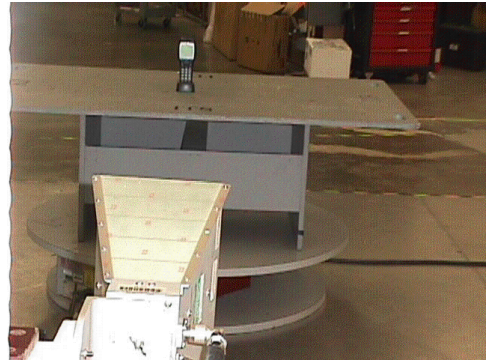
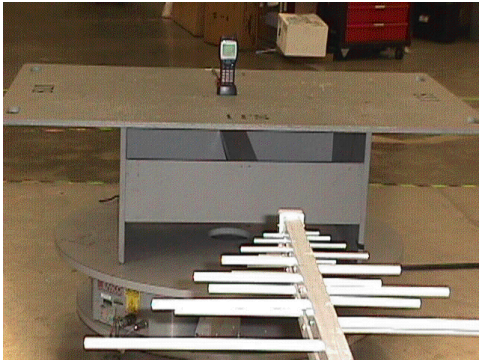
- Note:**
1. All measurement were made at 3 meters
 2. Negative signs (-) in the margin column signify levels below the limit.
 3. Frequences with * were peak-reading
 4. Reading with # were fundamental frequencies mines 66.4 dB (from plot 4.C.4)

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Symbol Technologies Inc., Spread Spectrum
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4.9 Radiated Emission Configuration Photograph



Intertek Testing Services - Menlo Park

Symbol Technologies Inc., Spread Spectrum
FCC ID: H9PND3010

Date of Test: March 25-30, 1999

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

Not Applicable - No digital part

Test results are attached

Radiated Emissions Test Data

*Company: Symbol	Model #: H9PND3010	Standard_	FCC Part 15B
EUT: Data Phone	S/N*: OF573455	Limits_	2
Project #: J99007845	Test Date: 3/25/98	Test Distance	3 meters
Test Mode: Receive 2440	Engineer: Barry S.		

Number	Antenna Used		Pre-Amp Used			Cable Used			O.C.F.	
	2	1	0	1	0	1	0	0		
Model:	EMCO 3143	None	None	HP 8447D	None	None	RG214U	None	Grn M+L	None

Frequency	Reading	Detector	Ant. #	Amp. #	Ant. Pol.	Ant. Factor	Pre-Amp	Insert. Loss	D. C. F.	Net	Limit @3m	Margin
MHZ	dB(uV)	P/A/Q	#	#	HN	dB(1/m)	dB	dB	dB	dB(uV/m)	dB(uV/m)	dB
40.90	43.1	Peak	2	1	V	6.8	27.1	0.6	0.0	23.4	40.0	-16.6
120.00	42.3	Peak	2	1	V	7.1	27.1	1.1	0.0	23.4	43.5	-20.1
140.00	42.2	Peak	2	1	H	8.7	27.0	1.2	0.0	25.1	43.5	-18.4
160.00	42.4	Peak	2	1	H	9.1	27.0	1.4	0.0	25.9	43.5	-17.6
180.00	49.7	Peak	2	1	H	9.4	27.1	1.5	0.0	33.5	43.5	-10.0
200.00	44.8	Peak	2	1	H	11.2	27.0	1.6	0.0	30.6	43.5	-12.9
220.00	46.5	Peak	2	1	H	11.4	27.0	1.6	0.0	32.5	46.0	-13.5
240.00	35.3	Peak	2	1	H	11.7	26.9	1.7	0.0	21.8	46.0	-24.2
260.00	38.7	Peak	2	1	H	12.8	27.0	1.8	0.0	26.3	46.0	-19.7
280.00	34.7	Peak	2	1	H	12.7	26.9	2.0	0.0	22.5	46.0	-23.5
300.00	46.5	Peak	2	1	H	13.9	27.0	2.0	0.0	35.4	46.0	-10.6
320.00	39.1	Peak	2	1	H	14.9	27.0	2.0	0.0	29.0	46.0	-17.0

- Notes:**
- a) O.C.F.:Other Correction Factor; D.C.F.:Distance Correction Factor
 - b) Insert. Loss = Cable A + Cable B + Cable C + OCF.
 - c) Negative signs (-) in Margin column signify levels below the limits.
 - d) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

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Symbol Technologies Inc., Spread Spectrum
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- 4.11 Radiated Emissions from Receiver Section of Transceiver (L.O. Radiation), FCC Ref:
15.109, 15.111
- [X] Not required - EUT operation above 960 MHz only
- [] Not Applicable - EUT is transmitter only
- [] Not performed; exempt until June 1999
- [] Test results are attached

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Symbol Technologies Inc., Spread Spectrum
FCC ID: H9PND3010

Date of Test: March 25-30, 1999

4.12 AC Line Conducted Emission, FCC Rule 15.207:

Not required; battery operation only

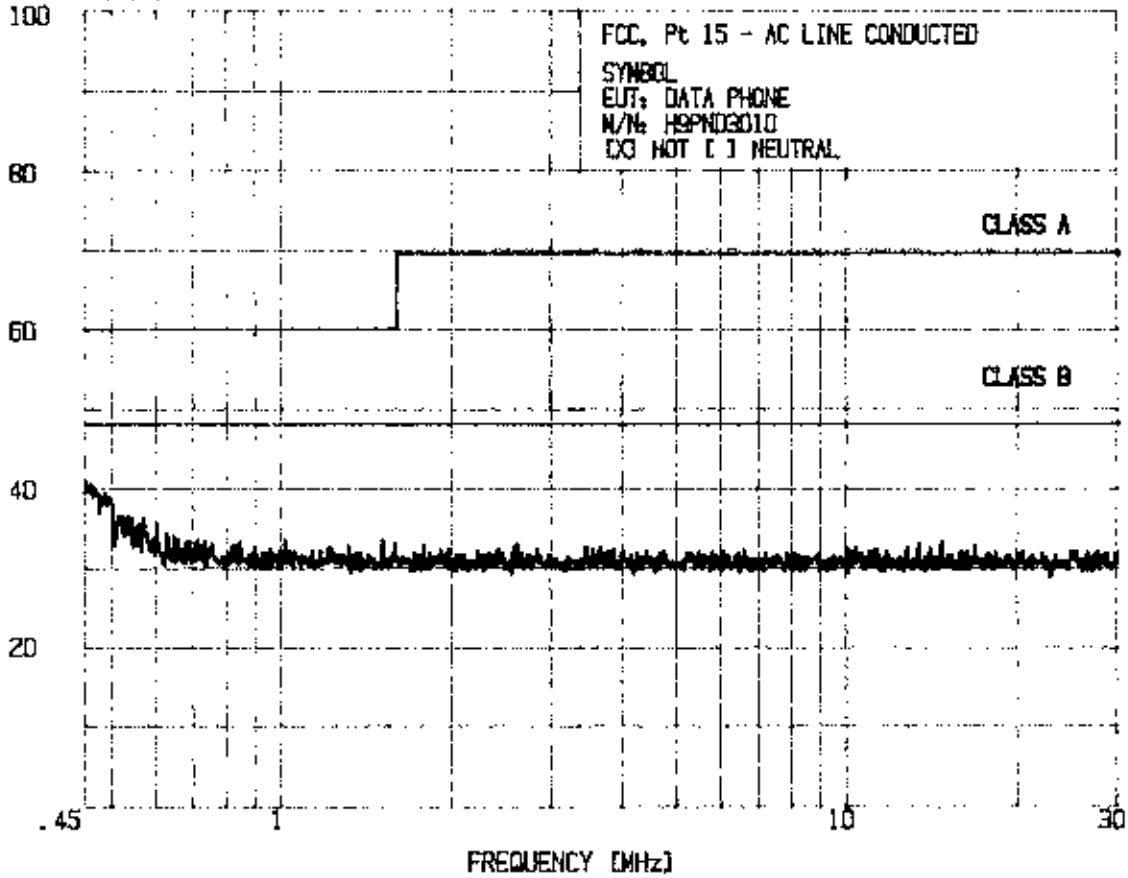
Test data attached

hp

26 Mar 1999 08:25:31

EMISSION LEVEL [dBuV]

FCC, Pt 15 - AC LINE CONDUCTED
SYMBOL
EUT: DATA PHONE
M/N: HSPND3010
DO NOT [] NEUTRAL

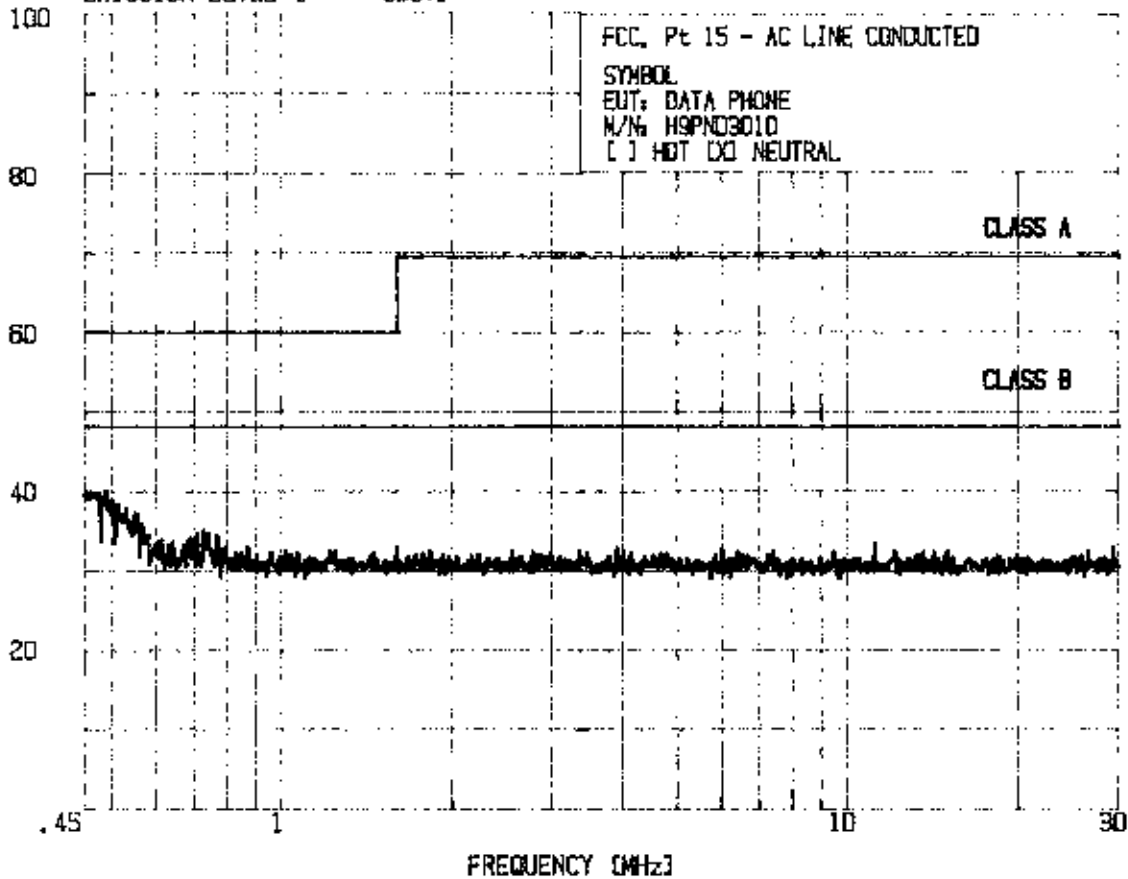


hp

26 Mar 1999 08:31:26

EMISSION LEVEL [dBuV]

FCC, Pt 15 - AC LINE CONDUCTED
SYMBOL
EUT: DATA PHONE
M/N: HSPND3010
[] HOT [] NEUTRAL



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4.13 AC Line Conducted Configuration Photograph



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Symbol Technologies Inc., Spread Spectrum
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5.0 Equipment Photographs

Photographs of the EUT are attached.

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Symbol Technologies Inc., Spread Spectrum
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6.0 Product Labelling

6.1 Label Artwork

6.2 Label Location

See attached pages.

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7.0 Technical Specifications

7.1 Circuit Diagram

See attached page.

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7.2 Block Diagram

See attached page.

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7.3 Antenna gain and Mounting Information

See attached pages.

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8.0 Instruction Manual

Attached is a preliminary copy of the Instruction Manual.

Please note that the required FCC Information to the User can be found on Page ____ of this manual.

This manual will be provided to the end-user with each unit sold/leased in the United States.