

EXHIBIT D

[FCC Ref. 2.1033(b)(6)]

"Report of Measurements"

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PRODUCT DESCRIPTION

The Model 25830XXX-M (handset unit) is a 2.4GHz single line, spread spectrum, frequency hopping, cordless handset with caller ID, that operates from 2409.696 to 2473.632 MHz.

Refer to Exhibit B(1)-11 and B(1)-12 for channel frequency table.

NOTE: 1. The handset uses 75 Channels.

TEST FACILITY AND EQUIPMENT LIST

FACILITIES

Radiated	ANSI C63.4 (FCC OET/55) open field 3 metre test range. This test range is protected from the cold and moisture by a non-conductive enclosure.
Conducted	2.5m Anechoic Chamber

EQUIPMENT

Anritsu 2601A Spectrum Analyzer
Advantest R3261A Spectrum Analyzer
Hewlett-Packard RF generator # 8640 B with an 002 doubler
A.H. Systems biconical antenna; 20 MHz to 330 MHz
A.H. Systems log periodic antenna; 300 MHz to 1.8 GHz
Compliance Design P950 Preamp (16 dB) ... 25 MHz to 1.0 GHz

NOTE:

The Anritsu 2601A Spectrum Analyzer and the Advantest R3261A Spectrum Analyzer are calibrated annually, and that calibration is directly traceable to the National Research Council of Canada. (NRC)
This equipment is only used by qualified technicians and only for the purpose of EMI measurements.
The three metre test range has been carefully evaluated to the ANSI document C63.4 and will be remeasured for reflections and losses every three years.

ADDITIONAL TEST EQUIPMENT LIST

1. Spectrum Analyzer: HP 8591EM, S/N 3639A00995, (9KHz - 1.8GHz), Calibrated April 2003
2. Spectrum Analyzer: ANRITSU 2601A, S/N MT64544, (10KHz - 2.2GHz), Calibrated May 2003
3. Spectrum Analyzer: IFR AN940, S/N 635001039, (9KHz - 26.5GHz), Calibrated March 2003
4. Preamp: HP 8449B, S/N 3008A00378, (1 - 26.5GHz), Calibrated August 2002
5. Horn Antenna: Q-PAR 6878/24, S/N 1721, (1.5-18GHz)
6. Horn Antenna: A. H. Systems SAS 572, S/N 164 (18 - 26.5GHz)
7. Line Impedance Stabilization Network.: Marstech, Cal. July 2003

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD. 21046

September 20, 2000

Electrohome Electronics Ltd.
809 Wellington St. N.
Kitchener, Ontario N2G 4J6
Canada

Registration Number: 90578

Attention: Gerry Gallagher

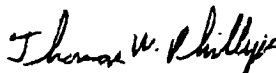
Re: Measurement facility located at Roseville
3 meter-site
Date of Listing: September 20, 2000

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that this filing must be updated for any changes made to the facility, and at least every three years from the date of listing the data on file must be certified as current.

If requested, the above mentioned facility has been added to our list of those who perform these measurement services for the public on a fee basis. An up-to-date list of such public test facilities is available on the Internet on the FCC Website at WWW.FCC.GOV, E-Filing, OET Equipment Authorization Electronic Filing.

Sincerely,



Thomas W Phillips
Electronics Engineer

15.205(c)/15.209

**SPURIOUS RADIATED EMISSIONS INCLUDING
RESTRICTED BANDS**

Procedure

The test procedure used was ANSI STANDARD C63.4-1992 and DA-00-705 using an appropriate spectrum analyzer, as listed in the Test Equipment List. The bandwidth (RBW) of the spectrum analyzer was 100KHz/120KHz up to 1GHz with an appropriate sweep speed. The RBW above 1.0GHz was = 1.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the EUT was 24°C with a humidity of 60%.

Requirements:

Emissions that fall in the restricted bands (15.205) must be less than 54dB μ V/m

Test Data:

Refer to Exhibit D(1)-7

15.205(c)/15.209

FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS**HANDSET UNIT**

Frequency Band MHz	Meter Reading (Peak) @3m dBμV/M	Meter Reading (Average) @3m dBμV/M	Antenna and Polarization	Cable & Antenna Factor	Peak F. S. dBμV/M	Average F. S. dBuV/M	Average FCC Limit	Margin dB
Channel 1								
2409.696	91.00	---	Horn V	33.08	124.08	---	---	---
4819.392	23.00	2.00	Horn H	38.28	61.28	40.28	54	-13.72
7229.088	---							
Channel 33								
2437.344	90.00	---	Horn V	33.20	123.20	---	---	---
4874.688	21.00	2.00	Horn H	38.47	59.47	40.47	54	-13.53
7312.032	---							
Channel 75								
2473.632	89.00	---	Horn V	33.23	122.23	---	---	---
2483.50	24.00	3.00	Horn V	33.89	57.89	36.89	54	-17.11
4947.264	18.00	0.00	Horn H	40.30	58.30	40.30	54	-13.70
7420.896	---							

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also;
3. The peak measurement cannot exceed the average limit +20dB.

15.247(a)(1) HOPPING CHANNEL SEPARATION

Requirements:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

Measurement Procedure

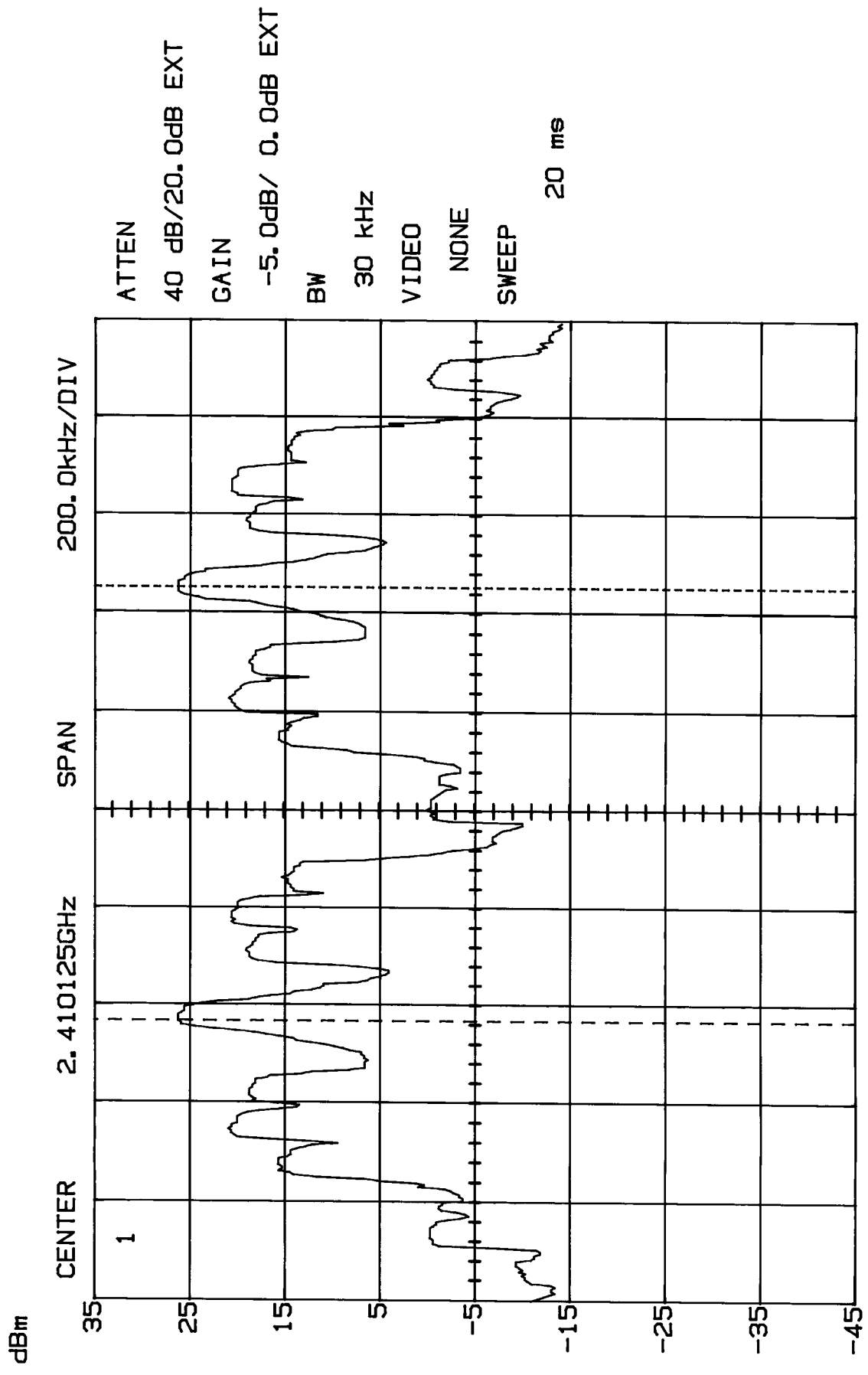
1. Position the EUT without connection to the Spectrum Analyzer (SA). Turn on the EUT and connect it to the SA. Then set it to any one convenient frequency within its operating range.
2. By using the MaxHold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by SA MARK function and then plot the result on the SA screen.
4. Repeat above procedures until all frequencies measured were complete.

Measurement Data - Refer Exhibit D(1)-9 to -11 for plotted data

Handset Unit

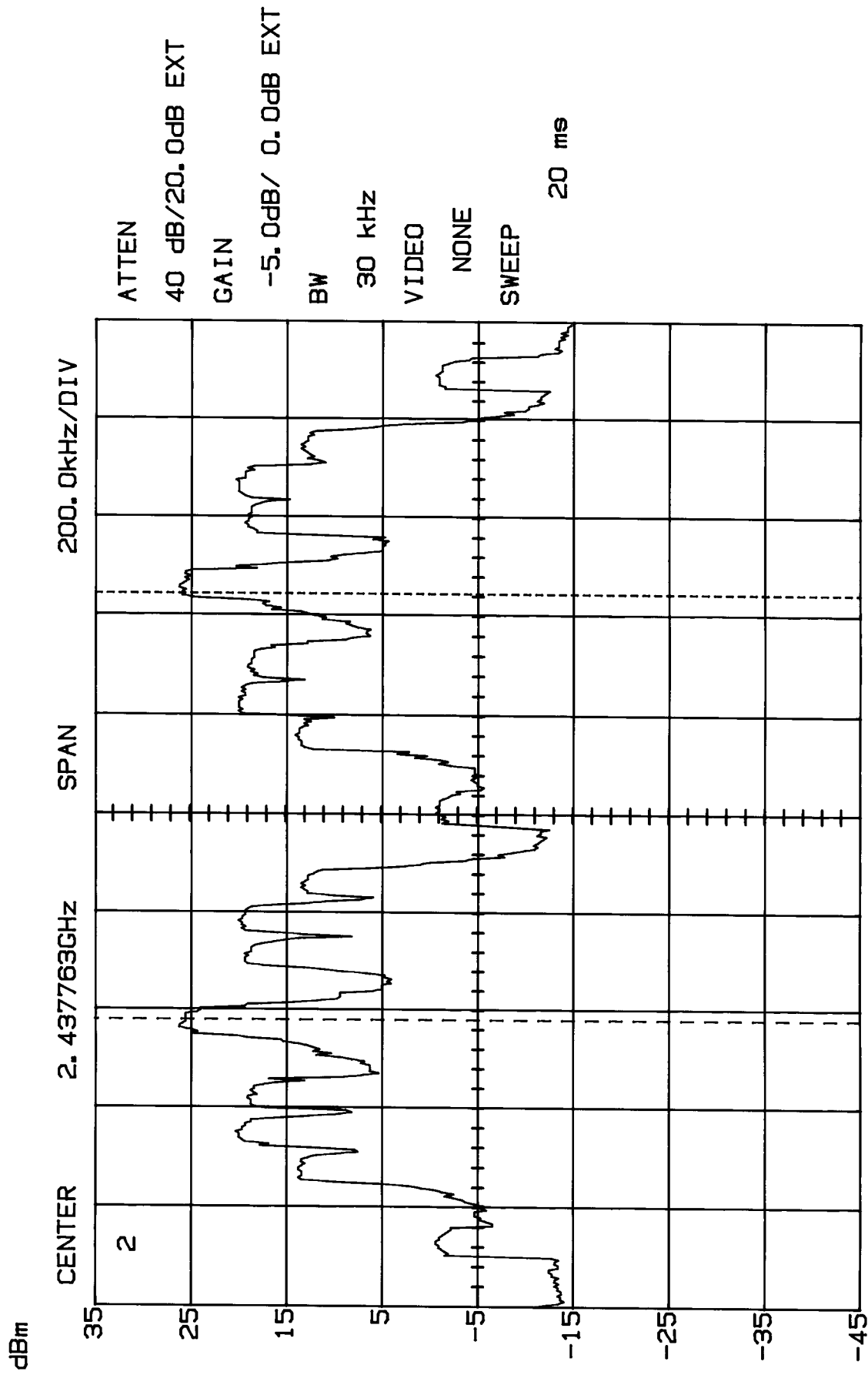
Low Channel:	Adjacent Hopping Channel Separation is 884 kHz.
Mid Channel:	Adjacent Hopping Channel Separation is 864 kHz.
High Channel:	Adjacent Hopping Channel Separation is 876 kHz.

HOPPING CHANNEL SEPARATION
Handset - Low Channel
MODEL 25830XXX-M

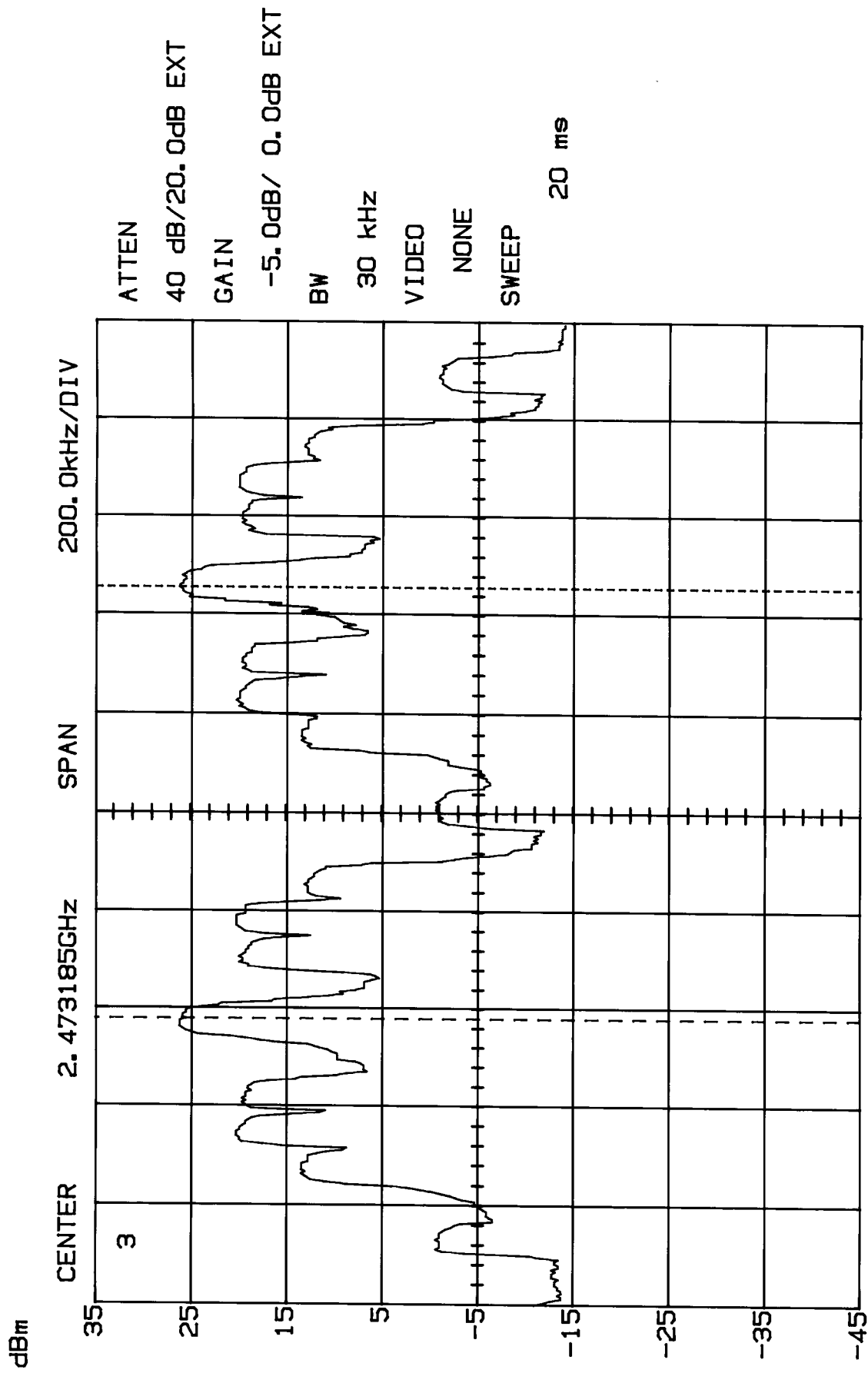


M1 26.25dB/ 2.409696GHz Δ 0.00dB/ 884.000kHz

HOPPING CHANNEL SEPARATION
Handset - Mid Channel
MODEL 25830XXX-M



HOPPING CHANNEL SEPARATION Handset - High Channel MODEL 25830XXX-M



15.247(a)(1)(ii) FREQUENCY HOPPING SYSTEMS**Page 1 of 2****NUMBER OF HOPPING FREQUENCIES USED****Requirements:**

Frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 non-overlapping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems which use fewer than 75 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.
2. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all of the signals from each channel until each one has been recorded.
3. Set the SA on View mode and plot the results on SA screen.
4. Repeat the above procedures until all frequencies measured are complete.

Measurement Data

The handset has 75 hopping frequencies. **Refer Exhibit D(1)-13 and -15 for plotted data.**

CHANNEL BANDWIDTH [15.247(a)]**Requirements:**

The 20dB bandwidth of the hopping channel is less than 1 MHz.

Measurement Procedure

1. Position the EUT without connection to the Spectrum Analyzer (SA). Turn on the EUT and connect it to the SA. Then set it to any one convenient frequency within its operating range. Set a reference level on the SA equal to the highest peak value.
2. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
3. Repeat above procedures until all frequencies measured were complete.

Measurement Data - **Refer Exhibit D(1)-16 to -18 for plotted data**

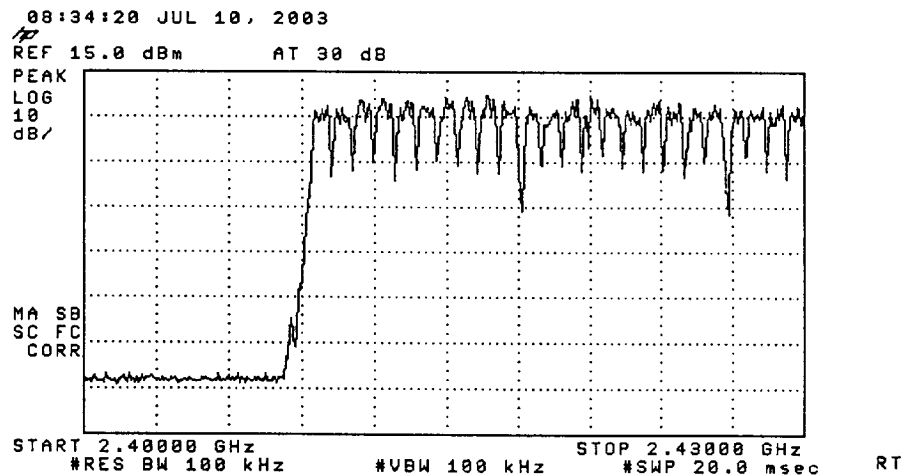
<u>Handset</u>	Channel 1:	Channel Bandwidth is 654 kHz.
	Channel 33:	Channel Bandwidth is 653 kHz.
	Channel 75:	Channel Bandwidth is 656 kHz.

3 NUMBER OF HOPPING FREQUENCIES

Para. No.: 15.247 (a)(1) (ii)

Requirement: 75 minimum

Test Result: Base: 75 frequencies (= 23 + 29 + 23 from 3 consecutive plots)
Handset: 75 frequencies (= 24 + 34 + 17 from 3 consecutive plots)



Number of Hopping Frequency Channel 0 ~ 23

Handset

1 of 3

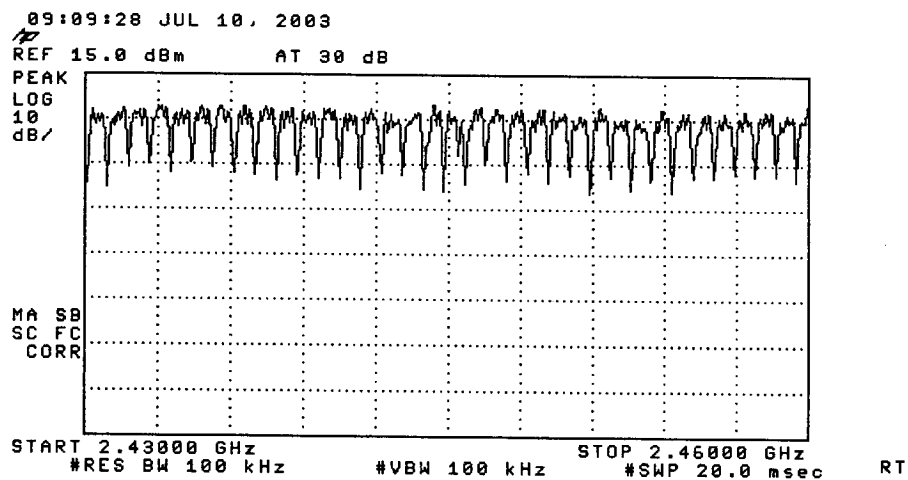
Test Condition:

Handset working in normal mode

Power on both handset & base. Press "talk" key on handset after link action is done between base and handset.

HOPPING FREQUENCY (Handset) - Channel 0 ~ 23
MODEL 25830XXX-M

HOPPING FREQUENCY (Handset) - Channel 24 ~ 57
MODEL 25830XXX-M



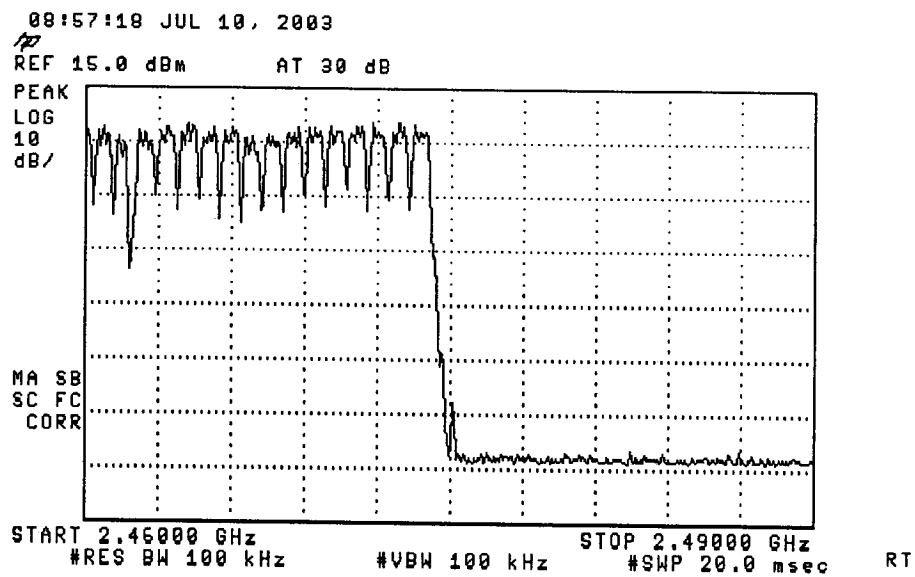
Number of Hopping Frequency Channel 24 ~ 57
Handset
2 of 3

Test Condition:

Handset working in normal mode

Power on both handset & base. Press "talk" key on handset after link action is done between base and handset.

HOPPING FREQUENCY (Handset) - Channel 58 ~ 74
MODEL 25830XXX-M



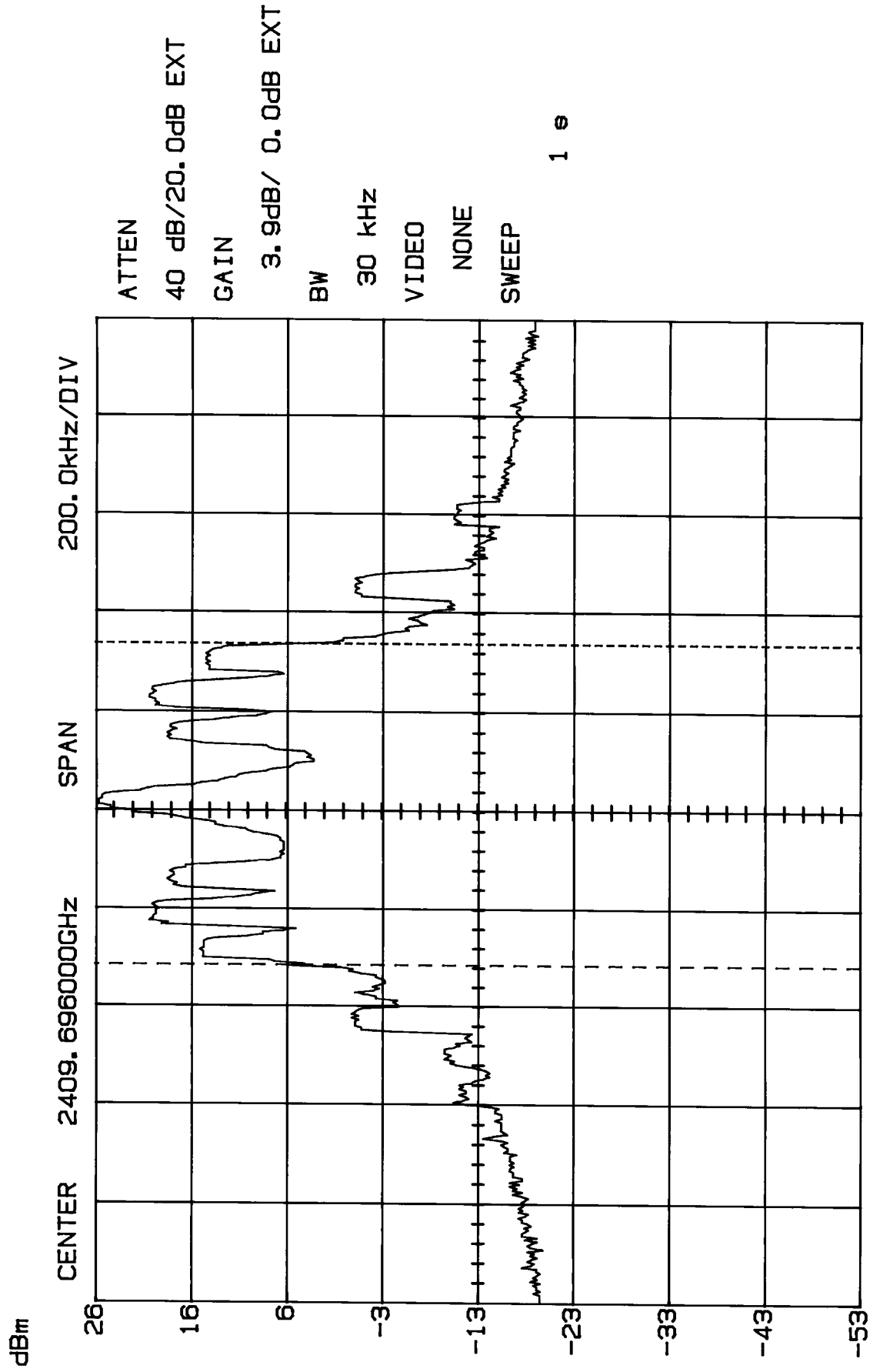
Number of Hopping Frequency Channel 58 ~ 74
Handset
3 of 3

Test Condition:

Handset working in normal mode

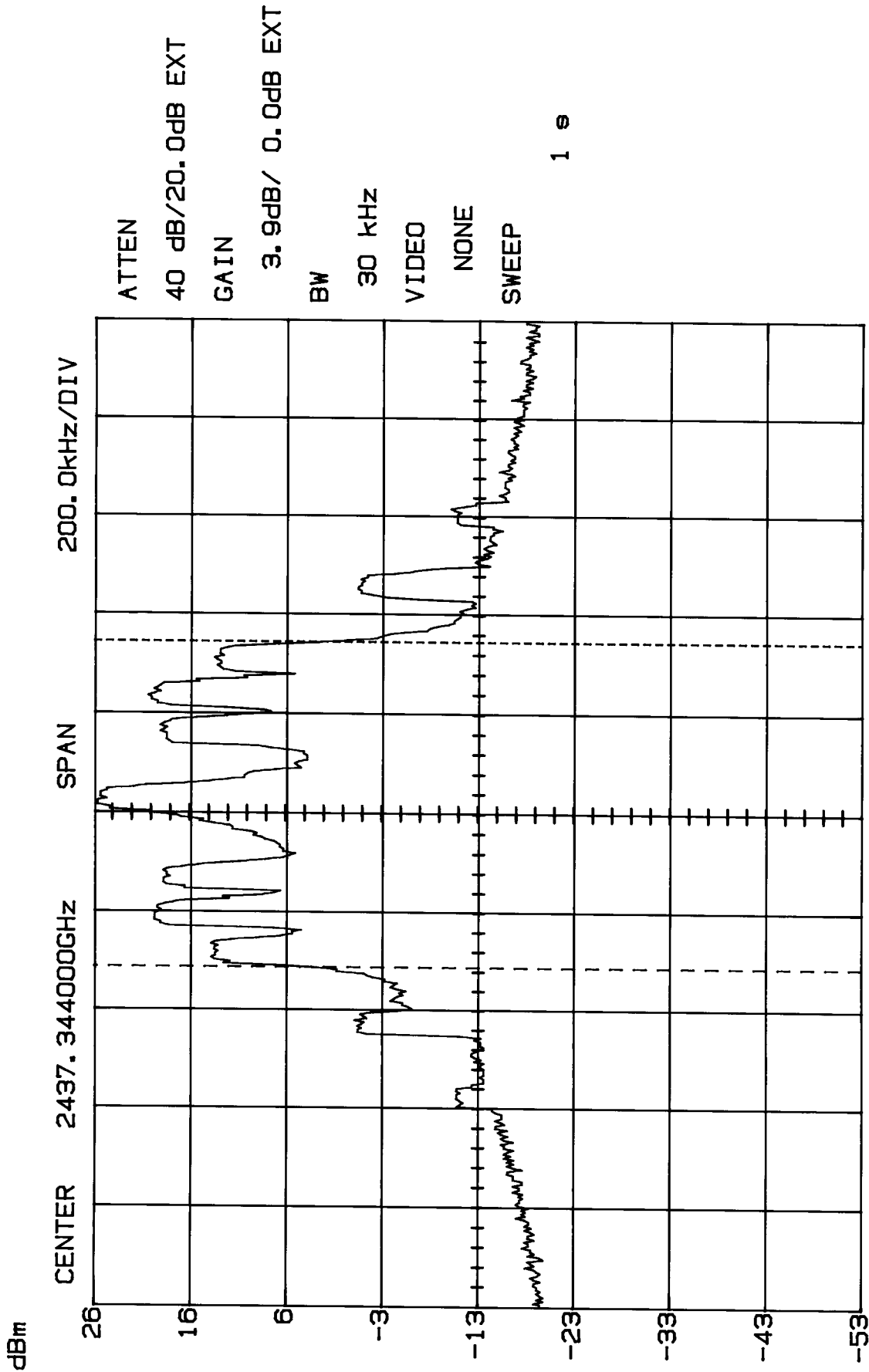
Power on both handset & base. Press "talk" key on handset after link action is done between base and handset.

20 dB BANDWIDTH (Handset) - CH1
MODEL 25830XXX-M



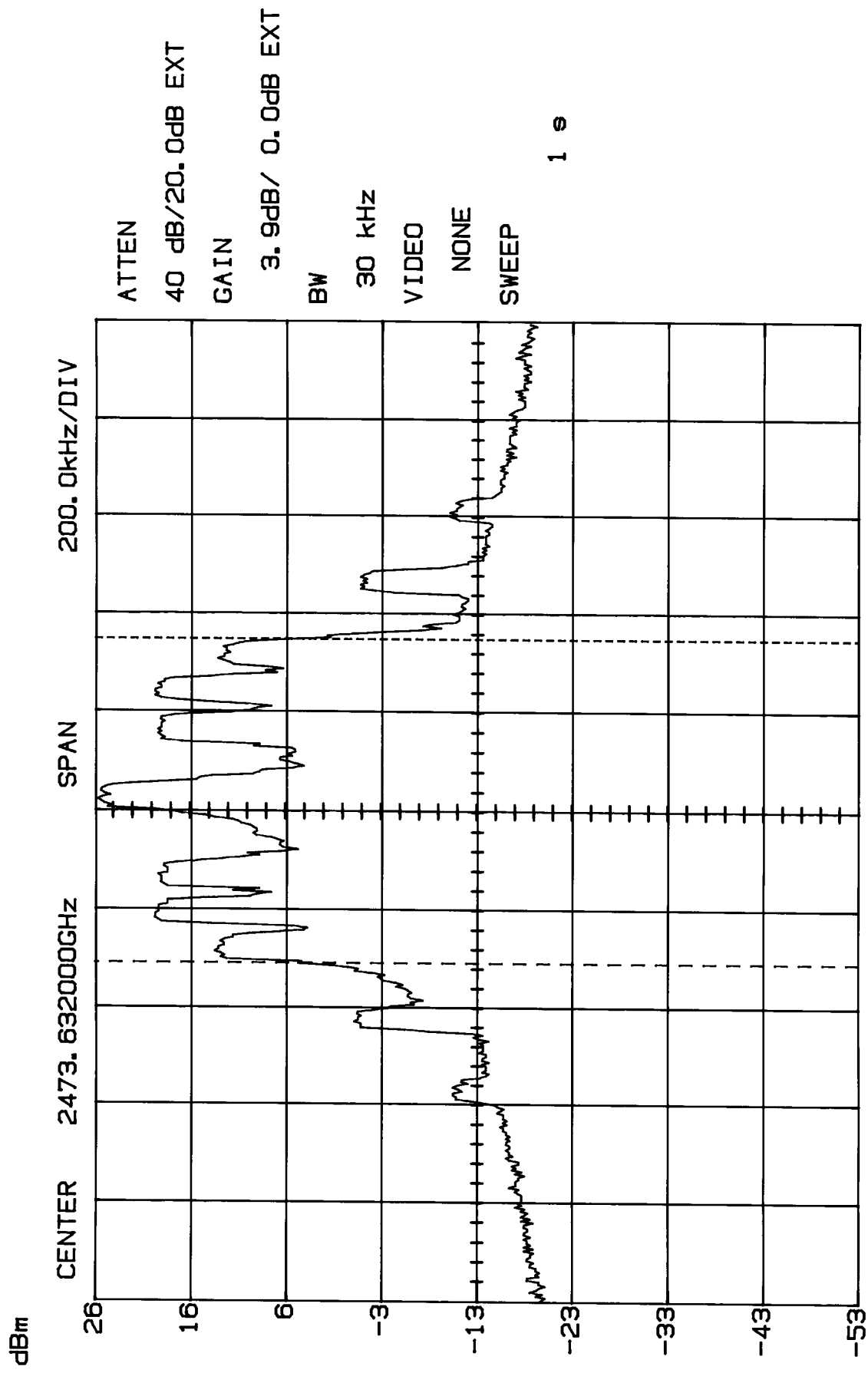
M2 6.72dB/ 2.410034GHz Δ 0.94dB/ 654.000kHz

20 dB BANDWIDTH (Handset) - CH33
MODEL 25830XXX-M



M1 2.97dB/ 2.437035GHz Δ 0.31dB/ 653.000kHz

20 dB BANDWIDTH (Handset) - CH 75
MODEL 25830XXX-M



M2 6.41dB/ 2.473982GHz Δ 1.56dB/ 656.000kHz

15.247(a)(1)(ii) FREQUENCY HOPPING SYSTEMS (continued)

Page 2 of 2

DWELL TIME ON EACH CHANNEL

Requirements:

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a (0.4 x 75) 30 second period.

Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.
2. Adjust the centre frequency of SA on any frequency to be measured and set SA to zero span mode. Set RBW and VBW of SA to proper value.
3. Measure the time duration of one transmission on the measured frequency and then plot the result with the time difference of this time duration.
4. Repeat the above procedures until all frequencies measured were complete.

Measurement Data - Refer Exhibit D(1)-20 to -21 for plotted data.

Handset Unit

The dwell time is $(0.8625 \text{ mS} \times 40) = 34.5 \text{ mS}$

The maximum time of occupancy for a particular channel is 34.5 mS in any 30 second period.

DWELL TIME
Handset
MODEL 25830XXX-M

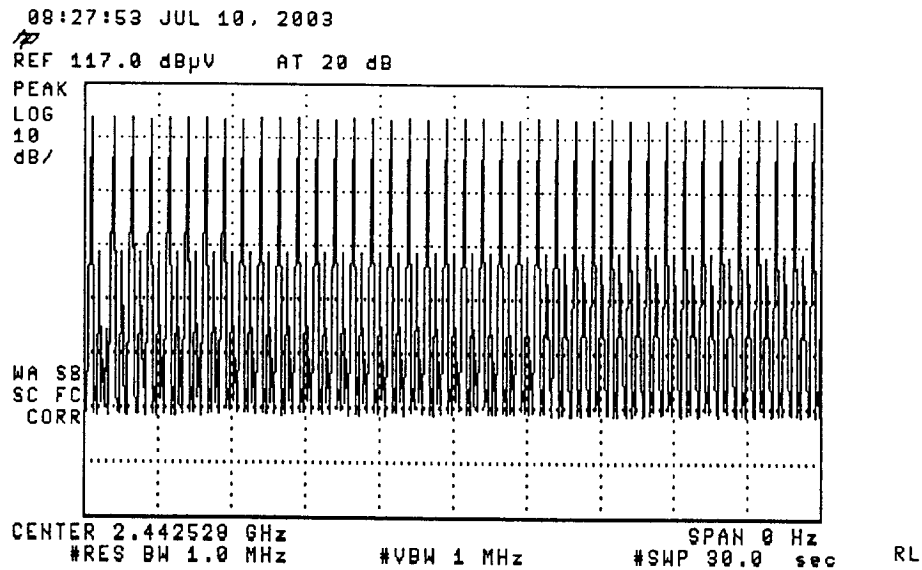
4 TIME OF OCCUPANCY

Para. No.: 15.247 (a)(1)(ii)

Requirement: ≤ 0.4 s with 30 s period

Test Result: Complies

Measurement Data: Maximum Dwell Time in 30 s Period On Any Channel:
Base:
40 * 825 us = 33 ms
Portable:
40 * 862.5 us = 34.5 ms



Time of Occupancy

Hopping "on"

Handset

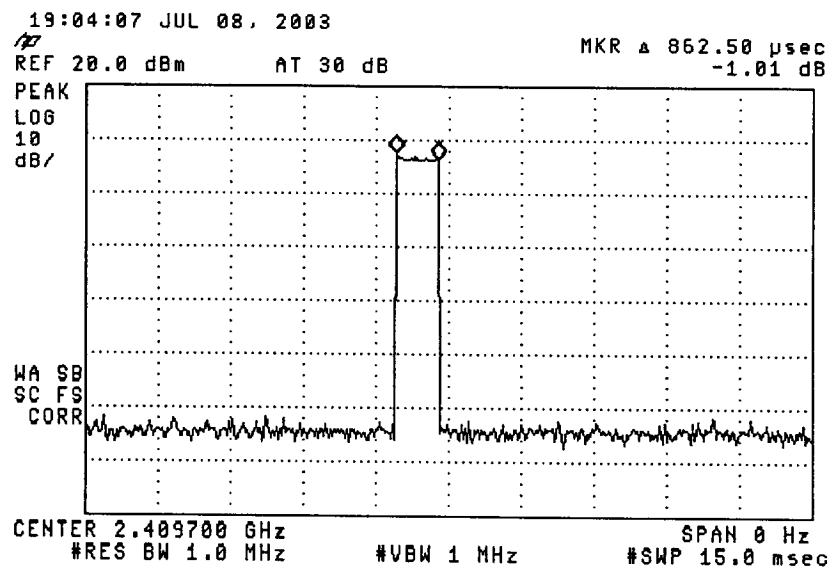
Time Occupied < 36 ms (SW protocol limit 40*900uS)

Test Condition:

Handset working in normal mode

Power on both handset & base. Press "talk" key on handset after link action is done between base and handset.

DWELL TIME
Handset
MODEL 25830XXX-M



Handset
TX-on time = 862.5 us

Test Condition:
Handset
Test Mode 2, XY = 00

15.247(b) (1) MAXIMUM PEAK OUTPUT POWER

Requirements:

For frequency hopping systems in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 Watt. For all other frequency hopping systems in the 2400-2483.5 band: 0.125 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

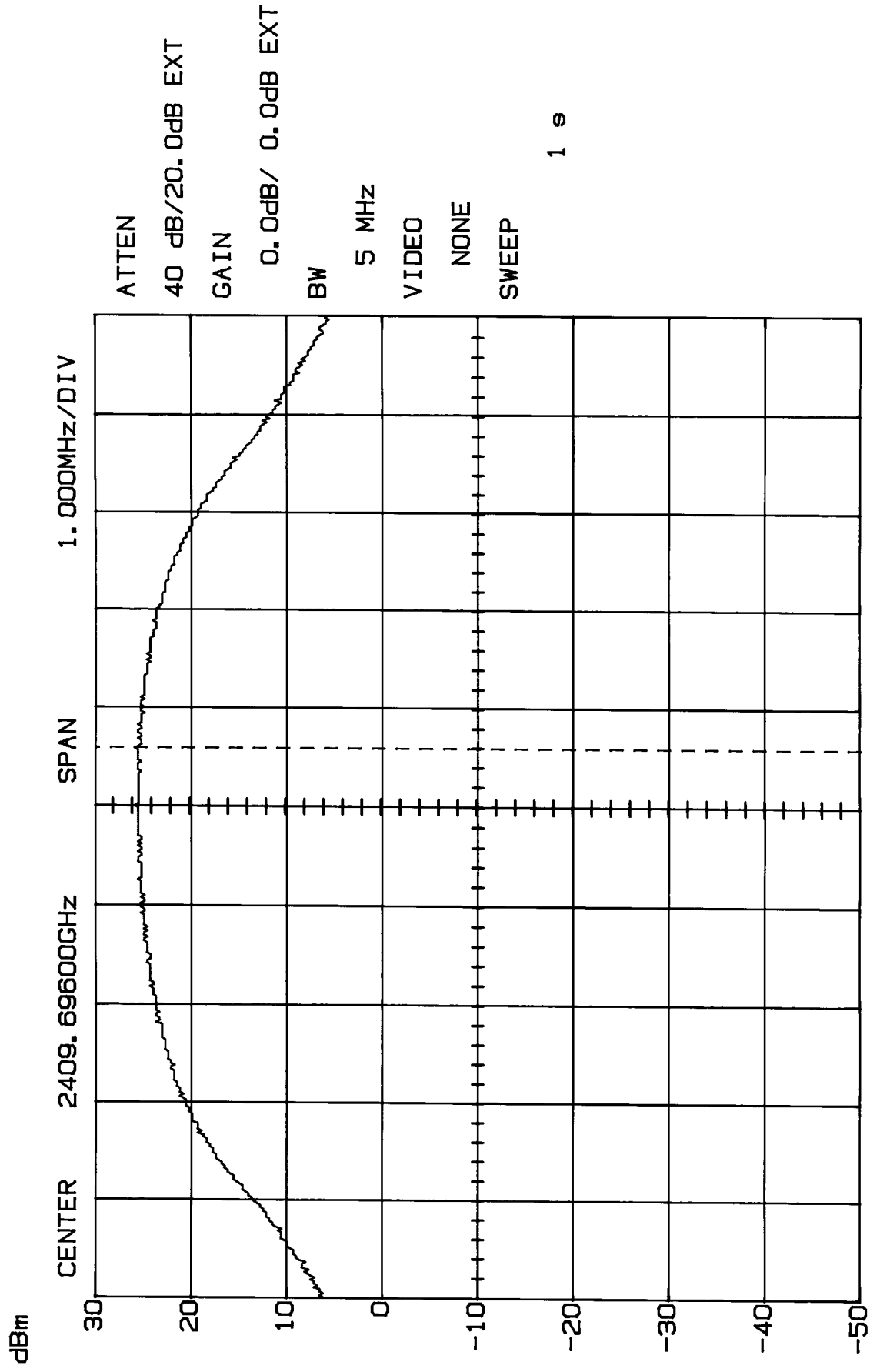
Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.
2. Set RBW of SA to 5MHz and VBW to NONE.
3. Measure the highest amplitude appearing on spectral display and record the level to calculate result data.
4. Repeat the above procedures until all frequencies measured were complete.

Measurement Data - Refer Exhibit D(1)-23 to -25 for plotted data

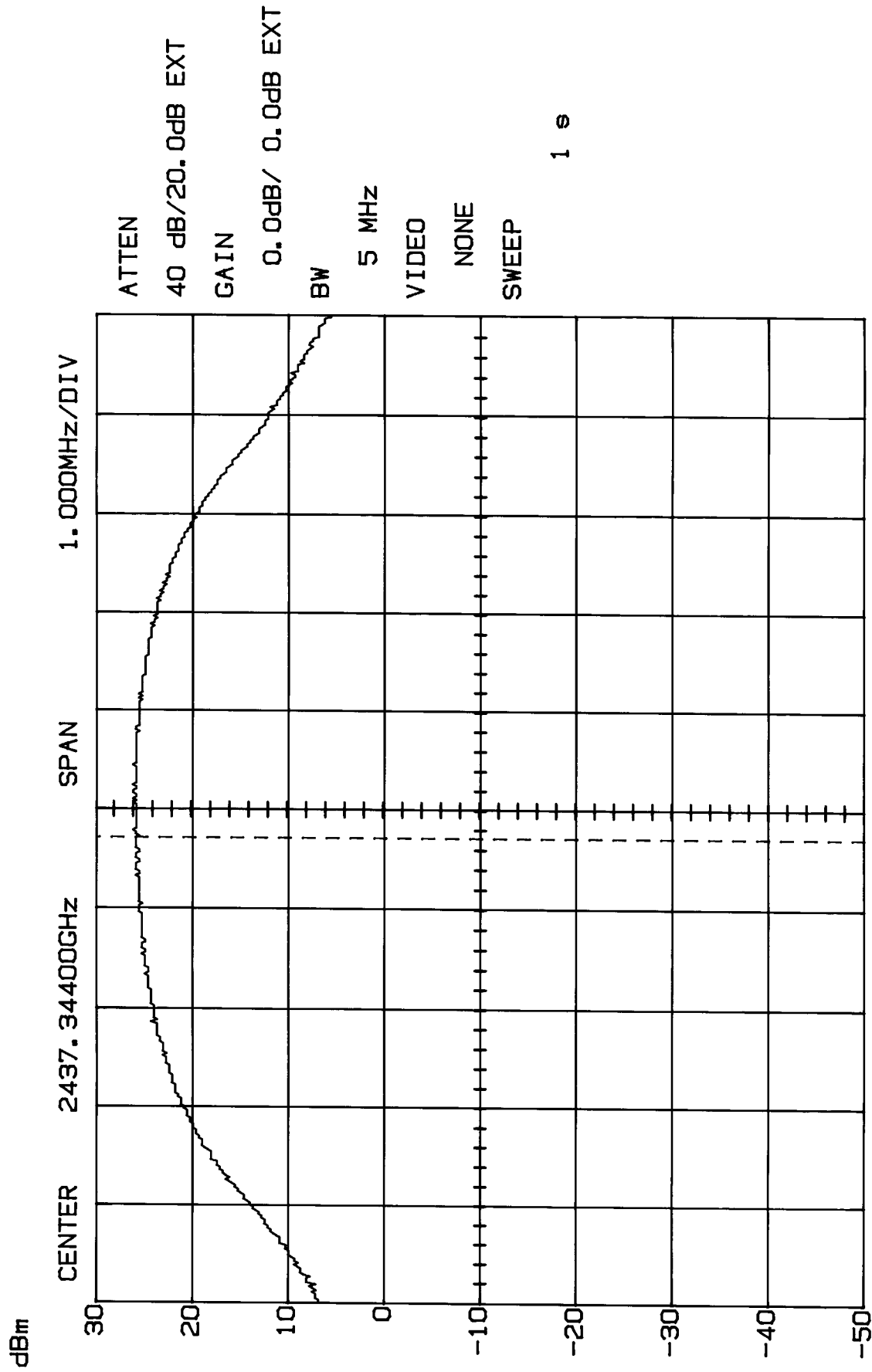
<u>Handset</u>	Channel 1:	Output Peak Power is 25.93 dBm = 0.39 W.
	Channel 33:	Output Peak Power is 25.93 dBm = 0.39 W.
	Channel 75:	Output Peak Power is 25.93 dBm = 0.39 W.

MAXIMUM PEAK POWER
Handset - Channel 1
MODEL 25830XXX-M



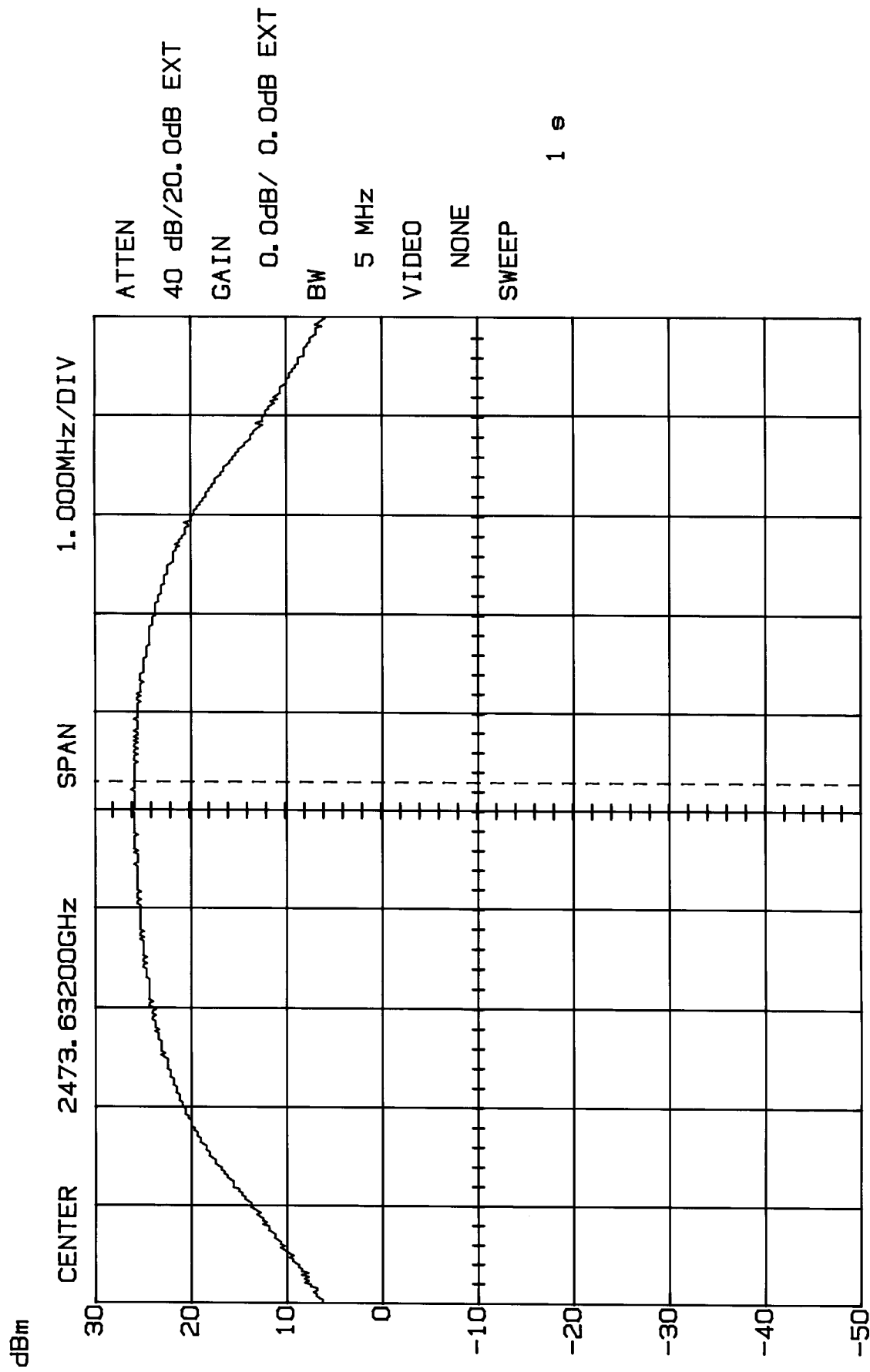
M1 25.93dB/ 2.41029GHz

MAXIMUM PEAK POWER
Handset - Channel 33
MODEL 25830XXX-M



M1 25.93dB/ 2.43704GHz

MAXIMUM PEAK POWER
Handset - Channel 75
MODEL 25830XXX-M



M1 25.93dB/ 2.47393GHz

15.247(c) BANDWIDTH OF BAND EDGE MEASUREMENT

Requirements:

In any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.
2. Set RBW to 120 kHz and suitable frequency span 500 KHz or 1000 kHz; VBW = none.
3. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
4. Repeat the above procedures until all frequencies measured were complete.
5. Note: Measurements made with hopping and modulation.

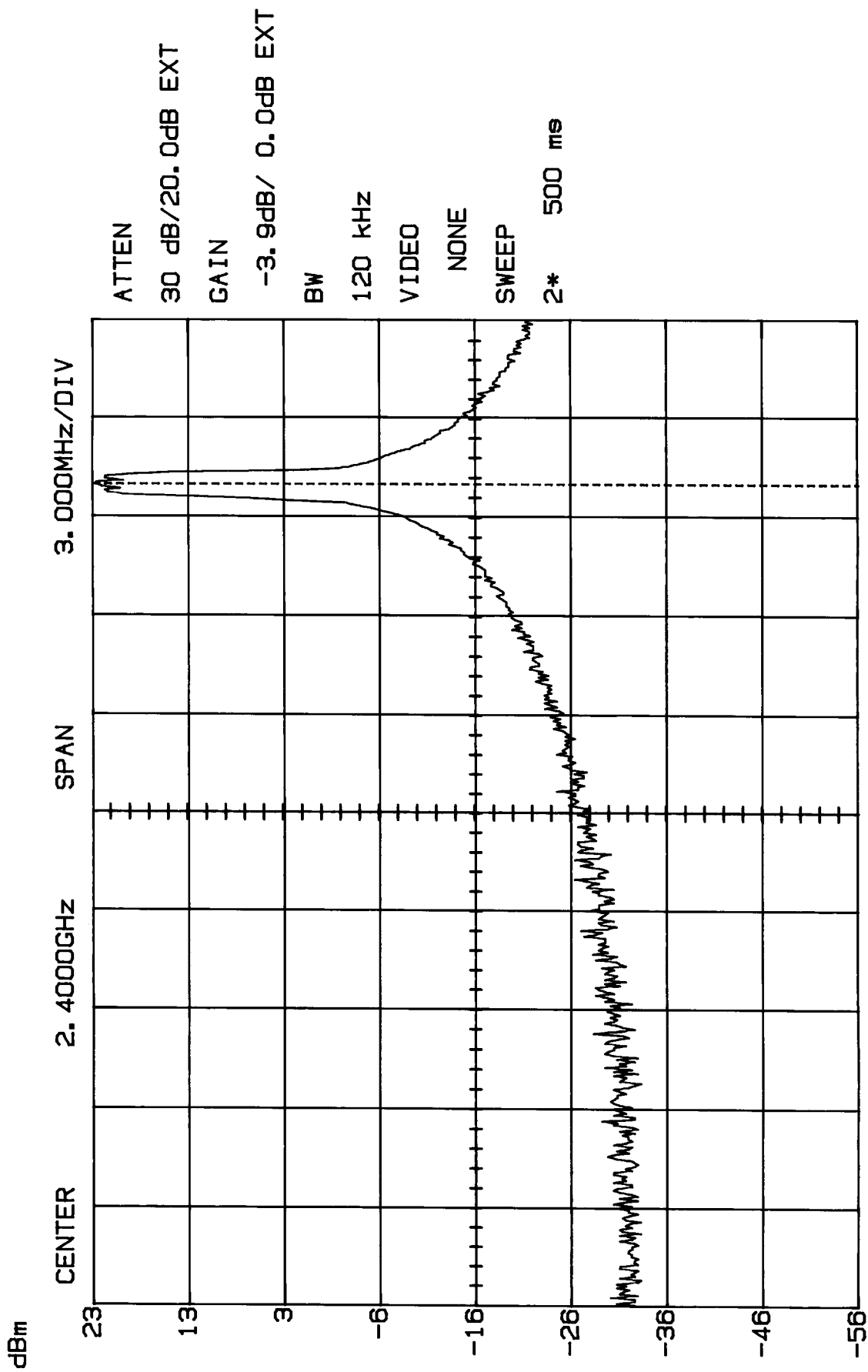
Measurement Data - Refer Exhibit D(1)-27 to -28 for plotted data

Handset Unit

Channel 1: All emissions in this 100 kHz bandwidth are attenuated more than 50.97 dB.

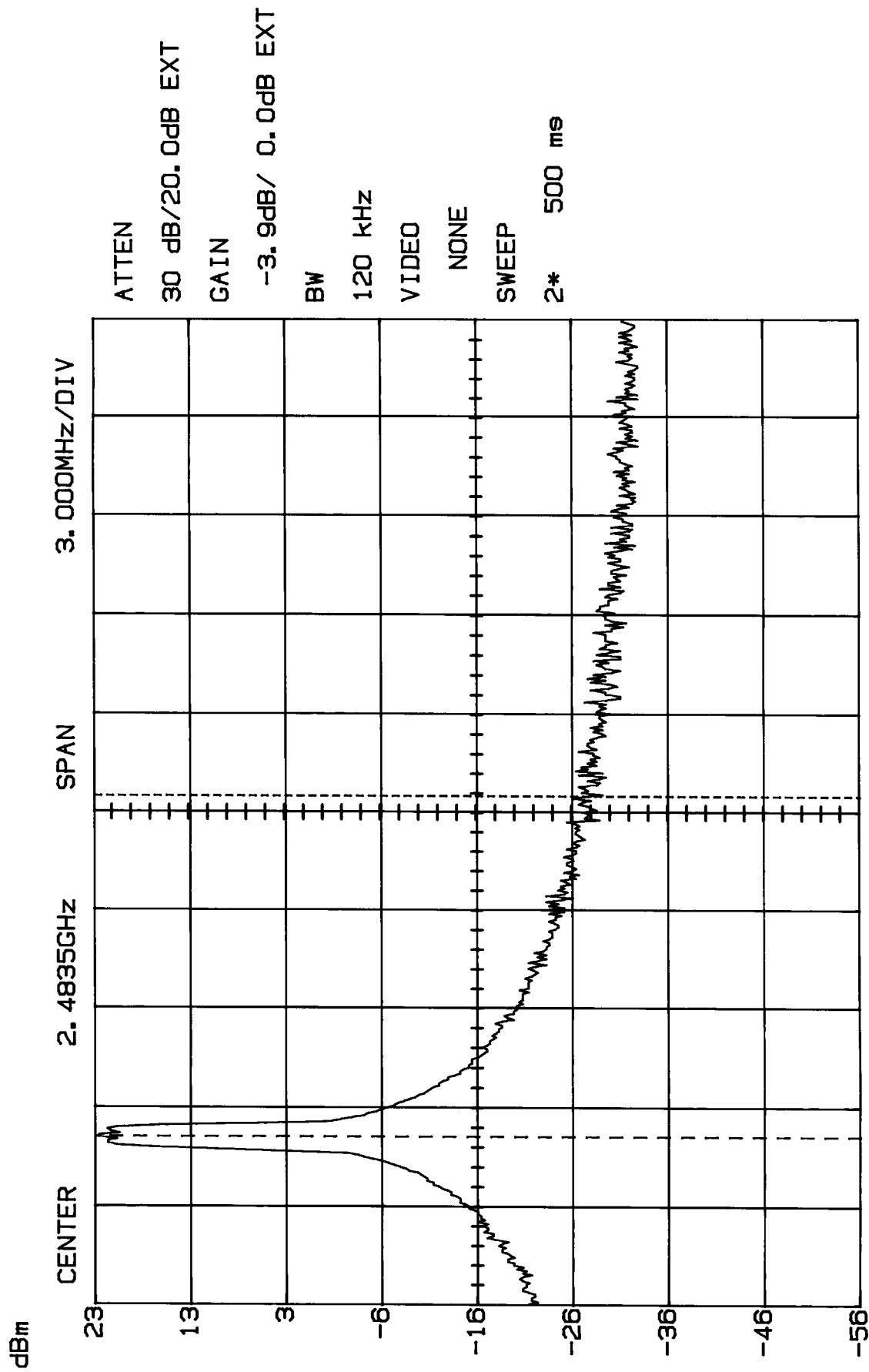
Channel 75: All emissions in this 100 kHz bandwidth are attenuated more than 50.35 dB.

BAND EDGE - Handset (CH1)
MODEL 25830XXX-M



M1 -27.97dB/ 2.4000GHz Δ50.97dB/ 10.0MHz

BAND EDGE - Handset (CH75)
MODEL 25830XXX-M



M1 23.00dB/ 2473.6320GHz Δ50.35dB/ 10.4MHz

Part 15.247(g): Exhibit D(1)-30 provides information on how the system is designed while the transmitter is presented with a continuous voice stream and a description of the system transmitting short bursts.

Part 15.247(h): Exhibit D(1)-30 provides information concerning the avoidance of simultaneous occupancy of hopping frequencies by multiple transmitters, system synchronization procedure, frequency hopping algorithm, hopping tables, and dual slot diversity.

Part 15.247 (g). Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both transmitter and the receiver, must be designed to comply with all the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing a short transmission burst must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

In active mode (there is voice communication), the information (voice) are transmitted continuously.

In idle mode (there is no voice communication), the base will broadcast a pilot signal which is distributed in 16 channels.

Part 15.247 (h). The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

We do not use co-ordination frequency system. The system will adjust its hopping sequence and hopping channel according to the operating mode.

In idle mode, the base will continue to check the pilot signal from other base. If the sequence of pilot signal is same, the base will change to another sequence to avoid the jamming.

In active mode, the base and handset will continue to check the jamming from other system. When a jamming is found, the jammed channel will be skipped, but the total number of channel will be kept greater than 15.