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uniden

Date: April 17, 1998

C E R T I F I C A T I O N

To: Federal Communications Commission

Subject: Change in identification of equipment

Applicant: Toshiba America Consumer Products, Inc.
1420 Toshiba Drive
Lebanon, TN 37087

TYPE OF EQUIPMENT: 900MHz ISM BAND CORDLESS TELEPHONE
(Spread Spectrum System)

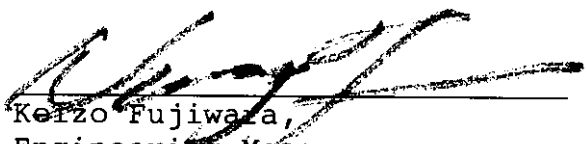
FCC ID: AJXSX2108
MODEL NO(S).: SX-2108(XX)

Manufacturer: Uniden Corporation
2-12-7 Hatchobori,
Chuo-ku, Tokyo 104-8512 Japan

I hereby certify that all the statements made in this application and attached technical data are true and correct, to the best of my knowledge and belief, tests having been conducted in strict adherence to the applicable rules of the Commission and under the most accurate measurement standards possible.

I further certify that all the necessary steps have been taken and are in force to assure that production units of this equipment bearing the applicant's brand and type number will continue to comply with the Commission's requirements.

Uniden Corporation



Keizo Fujiwara,
Engineering Manager
Engineering Department

General:

Modulation	: Direct Sequence Spread Spectrum Modulation
Operating Temperature	: 0 deg. C to +50 deg. C
Security Codes	: 65536 Codes

Base Unit:

Frequency Band	: 902 MHz - 928 MHz
Power Requirements	: 9V DC 350mA (Use with AC Adapter)

Handset:

Frequency Band	: 902 MHz to 928 MHz
Power Requirements	: 3.6V DC (Rechargeable Nickel-Cadmium Battery)

SUPPLEMENTAL INFORMATION

1. Antenna Gain for both Units:

	Gain respect to dipole	Gain respect to isotropic
Base unit:	+ 1.2 dB	+ 3,34 dB (= +1.2 + 2.14)
Handset :	- 0.4 dB	+ 1.74 dB (= -0.4 + 2.14)

Note that antenna gain measurement was conducted based on substitution method using with an half wave dipole antenna.

2. Channel List (Center frequency for both units):

CH	Frequency	CH	Frequency
1	904.200MHz	11	915.600MHz
2	904.800MHz	12	916.800MHz
3	906.000MHz	13	918.000MHz
4	907.200MHz	14	919.200MHz
5	908.400MHz	15	920.400MHz

6	909.600MHz	16	921.600MHz
7	910.800MHz	17	922.800MHz
8	912.000MHz	18	924.000MHz
9	913.200MHz	19	925.200MHz
10	914.400MHz	20	925.800MHz

As you can see in the table above, the lowest frequency is 904.200MHz and the highest frequency is 925.800MHz.

3. Power Control:

During the measurement, the automatic power control circuit was disabled by controlling with personal computer (PC) connected the unit under test. The RF output required for testing would be set by personal computer.

4. Serial port:

The serial port is a terminal that is mainly used as command port for setting the unit for specified test mode and/or read out the data from the unit under test to verify the operational condition. Note that Bit Error Ratio (B.E.R) of the unit may be available through this port as well.

Nature of impedance for serial port would be classified as CMOSs input/output port level, therefore, connection of serial port would not affect the power to the antenna.

5. Maximum allowable output power:

Please be advised that we designed the rated output power for both unit as +18 dBm (= 0.063 W: 2dB below 0.1 watts).

Just for your reference, the units (both base and handset) could be automatically changed the RF output power levels as follows;

Hi - Power : +18dBm
MID -Power : +7dBm
LO - Power : -3dBm

EXHIBIT - 4

SCHEMATIC DIAGRAMS AND BLOCK DIAGRAMS

EXHIBIT - 5

MEASUREMENT PROCEDURE AND TEST RESULTS

To whom it may concern,

As an original model of Uniden EXS9110, the 900MHz ISM band Spread Spectrum cordless telephone is in the process of being filed under the FCC ID of AMWUC604.

Simultaneously, we, Uniden Corporation is offering to Toshiba America for marketing the product with their own model name of SX-2108(XX) (FCC ID: AJXSX2108) as OEM business basis.

Toshiba SX-2108(XX)(FCC ID: AJXSX2108) is electrically and mechanically identical to the original models of Uniden EXS9110 (FCC ID: AMWUC604), therefore, we omitted the measurement data in accordance with section 2.933 of FCC rule and regulation.

Note:
Copy of Test Data is being supplied if needed.
JRH 5/5/98

Date: April 17, 1998

Signature

Kenji Fujiwara
Engineering Manager
Uniden Corporation

COMPATIBLE ELECTRONICS
REPORT NO. B80418D1
DATE: APRIL 9, 1998

FCC PART 15 SUBPART C
TEST REPORT
for
900 MHZ SPREAD SPECTRUM
CORDLESS TELEPHONE
Model: EXS9110

Prepared for
UNIDEN AMERICA CORPORATION
ENGINEERING SERVICES OFFICE
216 JOHN STREET
PO BOX 580, LAKE CITY, SOUTH CAROLINA 29560

Prepared by
COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATES OF TEST: APRIL 13, 14, 15, AND 17, 1998

	REPORT BODY	APPENDICES					TOTAL
		A	*B*	*C*	*D*	*E*	
PAGES	20	79	11	8	3	2	123

TABLE OF CONTENTS

DESCRIPTION		PAGE
SUMMARY OF TEST REPORT		1
1.	PURPOSE	2
2.	DESCRIPTION OF TEST SAMPLE	3
3.	PROCESSING GAIN	4
4.	TRANSMITTER	4
5.	TRANSMITTER POWER	5
6.	CHANNEL NUMBER AND FREQUENCIES	5
7.	CHIPPING RATE	5
8.	SPREADING GAIN	6
9.	ANTENNA GAIN	6
10.	TEST EQUIPMENT	6
Table 1	List of Test Equipment	7
11.	TEST PROCEDURE	8
Conducted Test		8
Radiated Test		10
Processing Gain		11
Transceiver Requirements Per Section 15.247.		12
12.	TEST RESULTS	13
Table 2	Conducted Emission Results - Base	13
Table 3	Radiated Emission Results (Spurious) - Base	13
Table 4	Radiated Emission Results (Spurious)- Handset	14
Table 5	Radiated Emission Results (Harmonics)- Base	14
Table 6	Radiated Emission Results (Harmonics) - Handset	15
13.	SAMPLE CALCULATIONS	16
14.	CONCLUSION	17

LIST OF FIGURES

FIGURE 1 - Conducted Test Setup

FIGURE 1a - Processing Gain Setup

FIGURE 2 - Radiated Test Site Layout

APPENDICES

APPENDIX	A	-	DATA SHEETS
APPENDIX	B	-	EUT CONFIGURATION AND CABLE INFORMATION
APPENDIX	C	-	ANTENNA FACTORS AND EFFECTIVE GAIN FACTORS
APPENDIX	D		MODIFICATIONS TO THE EUT
APPENDIX	E		ADDITIONAL MODELS COVERED UNDER THIS REPORT

REPORT NO. B80418D1
DATE: APRIL 24, 1998

SUMMARY OF TEST REPORT

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent consulting firm. The test report is based on the emission data measured by Compatible Electronics personnel according to the ANSI C63.4 1992 measurement procedure. The site attenuation measurement data for the firm's open field test site is filed with FCC, according to the ANSI C63.4 1992. The test results, provided with this report, indicate that the electromagnetic emissions from the equipment tested are within the specification limits defined by FCC Title 47, Part 15, Subpart C, Section 15.247.

Device Tested:	900 MHz Spread Spectrum Cordless Phone Model: EXS9110	
Manufacturer:	Uniden America Corporation Engineering Service Office, 216 John Street, PO Box 580 Lake City, South Carolina, 29560	
Frequency Ranges of the Test:	Conducted: Radiated:	450 kHz to 30 MHz 10 kHz to 9.28 GHz
Test Location:	114 Olinda Drive, Brea, California 92823	
Test Dates:	April 13, 14, 15, and 17, 1998	

The measurement data and conclusions are a true and accurate representation of the electromagnetic emissions characteristics of the test sample described in this report.

Report prepared by:

Kyle Fujimoto

Kyle Fujimoto
Test Engineer
Compatible Electronics, Inc.

Approved by:

Scott McCutchan

Scott McCutchan
Lab Manager
Compatible Electronics, Inc.

1. PURPOSE

This test report describes the electromagnetic emissions tests performed and the results obtained on the equipment described herein, based on the emission data measured by Compatible Electronics personnel. The measurements were performed according to the ANSI C63.4 1992 measurement procedure to determine whether the electromagnetic emissions from the equipment tested are within the specification limits defined by FCC Title 47, Part 15, Subpart C., Section 15.247.

2. DESCRIPTION OF TEST SAMPLE

The components of the EUT were tested separately.

Specifics of the EUT and Peripherals Tested

Handset being tested: The 900 MHz Spread Spectrum Cordless Phone-Handset Model: EXS9110 (EUT) was placed on the wooden table and tested in three orthogonal axis. The low (channel 1), medium (channel 10), and high (channel 20) channels were tested. The handset was transmitting to and receiving from the 900 MHz Spread Spectrum Cordless Phone base. The EUT was investigated for emissions while off hook. The radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix B.

Base being tested: The 900 MHz Spread Spectrum Cordless Phone - Base Model: EXS9110 (EUT) was placed on the wooden table. The low (channel 1), medium (channel 10), and high (channel 20) channels were tested. The base was connected to a line simulator and AC adapter via its RJ-11 and power ports, respectively. The line simulator was connected to the Comdial telephone. The base was transmitting and receiving from the 900 MHz Spread Spectrum Cordless Phone handset. The 900 MHz Spread Spectrum Cordless Phone handset was also used to dial out a number on the simulator that caused the Comdial telephone to ring. The conducted as well as radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix B.

3. PROCESSING GAIN

The Processing Gain was measured using the CW jamming margin method. Figure 1a shows the test configuration. The test consists of stepping a signal generator in 50 kHz increments across the passband of the system (up to 750 kHz away from the center frequency). The passband of the system is 1.4 MHz (±700 kHz). At each point, the generator level required to produce the recommended Bit Error Rate (BER) (Set at BER=10 to the negative third power) is recorded. This level is the jamming level. The output power of the transmitter unit is measured at the same point. The Jammer to Signal (J/S) ratio is then calculated. Discard the worst 20% of the J/S data point. The lowest remaining J/S ratio is used to calculate the processing gain. The maximum implementation loss a system can claim in calculating processing gain is 2 dB. The equation to calculate the processing gain (Gp) is the following:

$Gp=(S/N)o + Mj + Lsys$

Where Lsys = system implementation loss = 2dB
Mj = jamming margin (J/S) in dB,
(S/N)o = signal to noise ratio required for a DBPSK system with BER of 10 to the negative third power.

The theoretical GP is 11 dB

4. TRANSMITTER

The transmitter takes baseband data, high pass filters it to remove any DC contributed by bias networks, then lowpass filters it to provide spectral shaping. After filtering, the resultant signal is modulated to the synthesized RF carrier. The modulated signal is then amplified to one of the three transmit power levels. The harmonics of the amplified signal are removed with a 1.2 GHz lowpass filter. Finally, the signal is routed through the T/R switch for transmission by the antenna.

5. TRANSMITTER POWER

Transmit power is herein defined as the power delivered to a 50 Ohm load at the antenna port of the T/R switch.

Power Level	Power	Accuracy
high	18 dBm	+2/ -2 dB
medium	9 dBm	+3/ -3 dB
low	-1 dBm	+3/ -3 dB

6. CHANNEL NUMBER AND FREQUENCIES

The RF channels occupy the frequency band 904.2-925.8 MHz and are numbered 1 to 20.

Channel Number	Channel center Frequency (MHz)
1	904.2
2	904.8
3	906.0
4	907.2
5	908.4
6	909.6
7	910.8
8	912.0
9	913.2
10	914.4
11	915.6
12	916.8
13	918.0
14	919.2
15	920.4
16	921.6
17	922.8
18	924.0
19	925.2
20	925.8

7. CHIPPING RATE

A 12-chip spreading code is used. The spreading code cyclic duration is 12 times that of the encoded data. The code starts and stops on encoded bit boundaries.

8. SPREADING GAIN

The spreading gain is 11 dB.

9. ANTENNA GAIN

The antenna gain is +3.34 dBi for the base, and +1.74 dBi for the handset.

10. TEST EQUIPMENT

The test equipment used during the test described in this report are listed in Table 1.

Test Equipment Modes and Settings

Conducted Test

The HP 8566B spectrum analyzer was used as a measuring meter along with the HP 85650A quasi-peak adapter. The data was collected by the spectrum analyzer in peak detect mode with the "Max Hold" feature activated. The quasi-peak detection was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the spectrum analyzer input stage protection and the program settings were adjusted accordingly to indicate the actual reading in the program output. One LISN output was read by the HP 8566B spectrum analyzer at a time while the output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Radiated Test

The HP 8566B spectrum analyzer was used as a measuring meter along with the HP 85650A quasi-peak adapter.

The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. The quasi-peak detection was used only for those readings which are marked accordingly in the data sheet. The effective measurement bandwidth used for the radiated emissions test was 200 Hz from 10 kHz to 150 kHz, 9 kHz from 150 kHz to 30 MHz, 120 kHz from 30 MHz to 1 GHz, and 1 MHz from 1 GHz to 9.28 GHz.

Broadband loop, biconical, log periodic, and horn antennas were used as transducers during the measurement. The frequency spans were wide (10 - 150 kHz, 150 - 540 kHz, 540 kHz - 1.6 MHz, 1.6 - 5 MHz, 5 - 10 MHz, 10 - 30 MHz, 30 - 88 MHz, 88 - 216 MHz, 216 - 300 MHz, 300 MHz - 1 GHz, and 1 GHz - 9.8 GHz) during preliminary investigations. However, the final data was taken with a frequency span of 1 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

TABLE 1 LIST OF TEST EQUIPMENT

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Spectrum Analyzer	Hewlett Packard	8566B	2729A04566	July 2, 1997	1 Year
Preamplifier	Com Power	PA-102	1017	February 16, 1998	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2521A00924	June 16, 1997	1 Year
RF Attenuator	Com-Power	A-410	1602	November 25, 1997	1 Year
LISN	Com Power	LI-200	1764	January 3, 1998	1 Year
LISN	Com Power	LI-200	1771	January 3, 1998	1 Year
LISN	Com Power	LI-200	1775	January 3, 1998	1 Year
LISN	Com Power	LI-200	1780	January 3, 1998	1 Year
Biconical Antenna	Com Power	AB-100	1548	March 24, 1998	1 Year
Log Periodic Antenna	Com Power	AL-100	1012	February 13, 1998	1 Year
Computer	Hewlett Packard	HP98561A	2522A05178	N/A	N/A
Microwave Amplifier	Com-Power	8349B	2548A00432	February 18, 1998	N/A
Horn Antenna	Antenna Research	DRG-118/A	1053	December 8, 1995	N/A
Loop Antenna	Com-Power	AL-130	25309	February 5, 1998	N/A
Computer	Sony	PCV-240	5104422	N/A	N/A
Plotter	Hewlett Packard	7440A	8726K38417	N/A	N/A
Signal Generator	Giga-Tronics	6062A	9620906	June 16, 1997	1 Year
Microwave Amplifier	Com-Power	PA-122	001	March 31, 1998	N/A

11. TEST PROCEDURE

Conducted Test

Test Setup

The EUT was set up as a table top equipment as shown in Figure 1. The test data was collected using the Hewlett Packard spectrum analyzer Model: 8566B and the Hewlett-Packard quasi-peak adapter Model: 85650A.

The conducted test for the table top EUT was performed on a 1.0 by 1.5 meter wooden test table. (see Figure 1). The test bench has its top surface 0.8 meter above the ground plane. The EUT is powered through the Line Impedance Stabilization Network (LISN) bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up on the rear of the wooden test bench 40 cm away from the vertical conductive surface and at least 80 cm away from the LISNs as specified in ANSI C63.4 1992. The excess power cord was wrapped in a figure 8 pattern to form a bundle approximately 8 cms in length.

Preliminary Conducted Test

The initial test data was taken in manual mode to investigate the worst emission configuration. While scanning the frequencies in the ranges of 0.45 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz, the conducted emissions from the EUT were investigated for maximizing operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

Final Conducted Data

The EUT configuration was set for the highest emission frequency and data was collected under program control by the HP 9153B controller for the conducted test. The data was collected by the HP controller in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.

The spectrum analyzer collected the maximum peak readings over each spectrum. The six highest emission levels and corresponding frequencies were sorted by the computer and are listed in Table 2.0.

Radiated Test

The open field test site of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is set up according to the ANSI C63.4 1992 and the site attenuation data has been filed with the FCC. Figure 2 shows the layout of the open field test site. The turntable is remote controlled using a motor. The turn table supporting the EUT permits EUT rotation over 360 degrees to determine the highest emission levels. The antenna mast allows height variation of the antenna from 1 meter to 4 meters.

Preliminary Testing and Monitoring

Preliminary testing was done at a distance of 3 meters to determine the predominant frequencies from the system and to investigate the EUT configuration that produced the maximum levels of emissions. An open field test site was used for the preliminary investigations. Broad band antennas were used to scan large frequency bands while manipulating cables. All significant frequencies were further examined carefully at a reduced frequency span on the spectrum analyzer, while optimizing the cables, and changing the antenna height and EUT orientation. The EUT was tested at a 3 meter test distance to obtain final test data as described below.

Final Radiated Test

The receiving antenna was mounted on the antenna positioning mast, which is motor controlled and allows antenna height variation from 1 meter to 4 meters above the ground plane. The antenna height was varied to find the highest level of radiated emission at each frequency found during the preliminary test described above. The six highest emission readings and the corresponding frequencies for non-harmonic spurious emissions (excluding the fundamental) are listed in Table 3.0 for the base and Table 4.0 for the handset. The six highest emission readings and the corresponding frequencies for the fundamental and harmonics are listed in Table 5.0 for the base, Table 6.0 for the handset.

Processing Gain - base station output to handset input

The base was connected by its test connector (an internal serial port) to the communications analyzer (computer) via com port 1. 43.3 dB of attenuation was placed on the output of the base. The output of the base was combined with the output of the signal generator through a combiner. The handset was connected by its test connector (an internal serial port) to the communications analyzer (computer) via com port 2. The signal generator was stepped in 50 kHz increments across the passband (± of the fundamental transmit frequency. The Bit Error Rate used was 0.1%. When this error rate was achieved (displayed on the computer), the reading of the signal generator was taken. This reading was then subtracted from the signal level of the base station (while adding in the combiner loss and signal generator calibration factor) to obtain the J/S ratio. The J/S ratio was then combined with the system loss (2 dB) and signal to noise ratio (8 dB) of the unit to obtain the processing gain.

Processing Gain - handset output to base station input

The handset was connected by its test connector (an internal serial port) to the communications analyzer (computer) via com port 1. 43.3 dB of attenuation was placed on the output of the handset. The output of the handset was combined with the output of the signal generator through a combiner. The base was connected by its test connector (an internal serial port) to the communications analyzer (computer) via com port 2. The signal generator was stepped in 50 kHz increments across the passband of the fundamental transmit frequency. The Bit Error Rate used was 0.1%. When this error rate was achieved (displayed on the computer), the reading of the signal generator was taken. This reading was then subtracted from the signal level of the base station (while adding in the combiner loss and signal generator calibration factor) to obtain the J/S ratio. The J/S ratio was then combined with the system loss (2 dB) and signal to noise ratio (8 dB) of the unit to obtain the processing gain.

Transceiver Requirements Per Section 15.247 (FCC- Subpart C).

Both the handset and the base have a bandwidth of at least 500 kHz. The bandwidth is measured at the -6dB points. (Please see data sheets located in Appendix A). [section 15.247 (a)(2)]

Both the handset and the base have a peak output power of less than 1 Watt (30 dBm) [section 15.247 (b)]

No radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency is within 20 dB of the limit or exceeds the general radiated emission limits specified in section 15.209(a) while using a 100 kHz bandwidth. (Please see the data sheets located in Appendix A.) [section 15.247 (c)].

The spectral density output averaged over any 1 second interval using a resolution bandwidth of 3 kHz is not greater than 8dBm for both the handset and the base. (Please see data sheets located in Appendix A.) [section 15.247 (d)].

The processing gain of a direct sequence system is at least 10 dB. (Please see data sheets located in Appendix A) [section 15.247 (e)]

12. TEST RESULTS

Table 2.0 CONDUCTED EMISSION RESULTS
900 MHz Spread Spectrum Cordless Phone
BASE – MODEL: EXS9110

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
.4576	40.2	48.0	-7.2
.4732	41.1	48.0	-6.9
.5082	40.2	48.0	-7.8
.5367	40.3	48.0	-7.7
.5692	40.6	48.0	-7.4
.5812	41.1	48.0	-6.9

Table 3.0 RADIATED EMISSION RESULTS (SPURIOUS)
900 MHz Spread Spectrum Cordless Phone
BASE – MODEL: EXS9110

Freq MHz	Meter Reading dBuV	Effective Gain dB	Ant Factor dB	Corrected Reading dBuV	Spec Limit dBuV	Delta dB
201.64	60.10	37.58	15.84	38.36	43.50	-5.14
220.84	62.20	37.35	16.30	41.15	46.00	-4.85
364.85	61.10	36.79	15.89	40.20	46.00	-5.80
384.04	59.90	36.59	18.08	41.39	46.00	-4.62
403.24	55.80	36.47	19.61	38.94	46.00	-7.06
921.63	50.20	33.09	23.17	40.27	46.00	-5.73

* Complete emissions data are given in Appendix A of this report.

** The effective gain factor includes the cable loss. The correction factors for the antenna and effective gain are attached in Appendix C of this report.

Table 4.0 RADIATED EMISSION RESULTS (SPURIOUS)
900 MHz Spread Spectrum Cordless Phone
HANDSET – MODEL: EXS9110

Freq MHz	Meter Reading dBuV	Effective Gain dB	Ant. Factor dB	Corr'd Reading dBuV	Spec Limit dBuV	Delta DB
403.23	52.80	36.47	19.61	35.94	46.00	-10.06
441.63	56.30	36.08	16.15	36.37	46.00	-9.63
489.63	56.20	36.16	16.35	36.39	46.00	-9.61
508.84	55.30	36.02	16.49	35.77	46.00	-10.23
528.03	55.50	35.64	16.26	36.12	46.00	-9.88
812.69	47.70	33.60	21.98	36.08	46.00	-9.92

Table 5.0 RADIATED EMISSION RESULTS (HARMONICS)
900 MHz Spread Spectrum Cordless Phone
BASE – MODEL: EXS9110

Freq MHz	Meter Reading dBuV	Effective Gain dB	Ant. Factor dB	Corr'd Reading dBuV	Spec Limit dBuV	Delta dB
3616	38.0#	17.0	29.6	50.6	54.0	-3.4
3658	38.9#	17.0	29.6	51.5	54.0	-2.5
3703	38.9#	17.0	29.6	51.5	54.0	-2.5
4629	32.4#	13.5	30.9	49.8	54.0	-4.2
7315	34.8#	20.6	36.8	51.0	54.0	-3.0
8332	31.3#	18.0	37.1	50.4	54.0	-3.6

* Complete emissions data are given in Appendix A of this report.

** The effective gain factor includes the cable loss. The correction factors for the antenna and effective gain are attached in Appendix C of this report.

\# Average Measurement.

Table 6.0 RADIATED EMISSION RESULTS (HARMONICS)
900 MHz Spread Spectrum Cordless Phone
HANDSET – MODEL: EXS9110

Freq. MHz	Meter Reading dBuV	Effective Gain dB	Ant. Factor dB	Corr'd Reading dBuV	Spec Limit dBuV	Delta dB
3616	38.7#	17.0	29.6	51.3	54.0	-2.7
3704	38.6#	17.0	29.6	51.2	54.0	-2.8
4521	33.0#	13.5	30.9	50.4	54.0	-3.6
7315	34.2#	20.6	36.8	50.4	54.0	-3.6
8138	31.3#	18.0	37.1	50.4	54.0	-3.6
8219	31.1#	18.0	37.1	50.2	54.0	-3.8

* Complete emissions data are given in Appendix A of this report.

** The effective gain factor includes the cable loss. The correction factors for the antenna and effective gain are attached in Appendix C of this report.

\# Average Measurement.

13. SAMPLE CALCULATIONS

The use of the Com-Power Preamplifier Model: PA-102, the Hewlett-Packard Microwave Amplifier Model: 8349B, and the Com-Power Microwave Amplifier Model: PA-122 during the radiated emissions test requires that the effective gain must be subtracted from the spectrum analyzer (meter) reading. In addition, a correction factor for the antenna, amplifier, cable loss, and a distance factor, if any, must be applied to the meter reading before a true field strength reading can be obtained.

The equation can be derived in the following manner:

Corrected meter reading = meter reading + F - G

where, F = antenna factor
G = effective gain = (amplifier gain-cable loss)

The correction factors for the antenna and the effective gain are attached in Appendix C of this report. The data sheets are attached in Appendix A.

There is no correction factor for the distance because the final data is always taken at 3 meters which is the FCC specification test distance.

14. CONCLUSION

The 900 MHz Spread Spectrum Cordless Phone Model: EXS9110 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C Section 15.247.

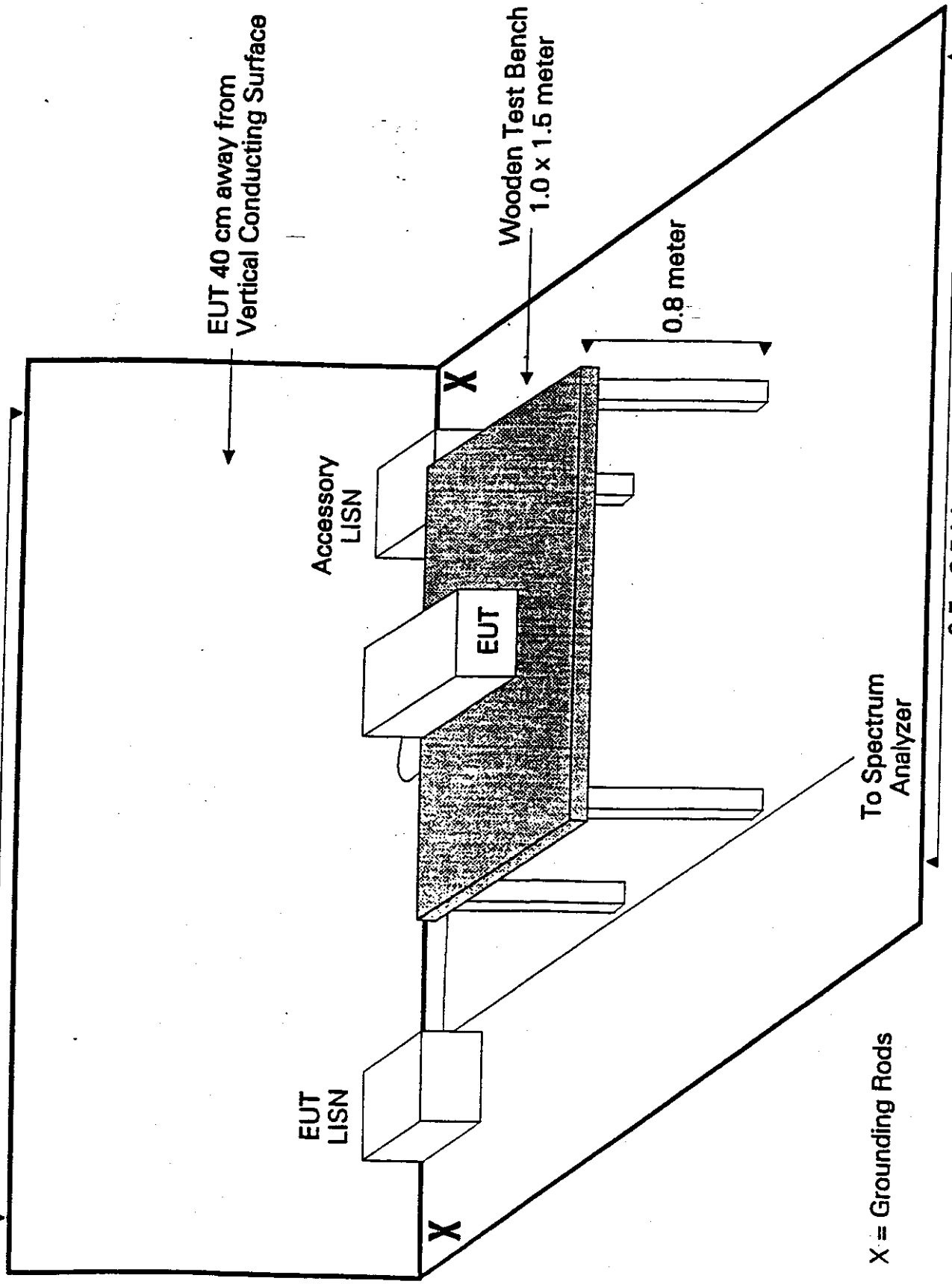


FIGURE 1 - CONDUCTED EMISSIONS TEST SETUP SITE D

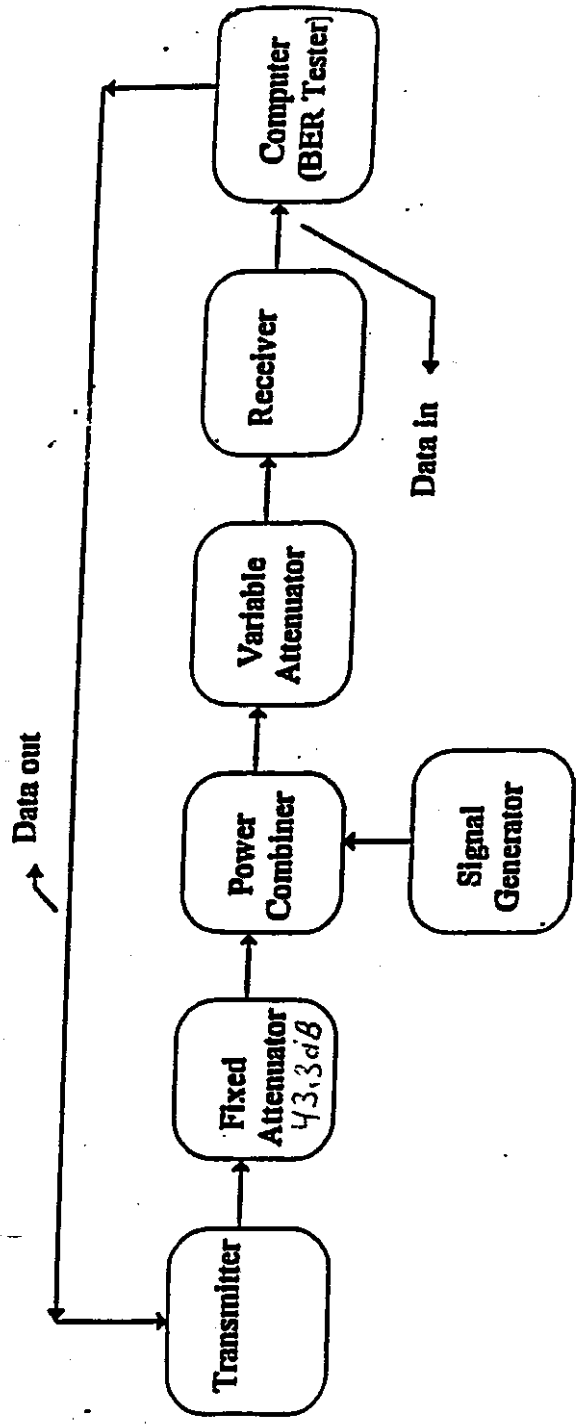

Computer (BER Tester)
Receiver
Data in
Variable Attenuator
Power Combiner
Signal Generator
Fixed Attenuator 43.3dB
Transmitter
Data out

Figure 1a

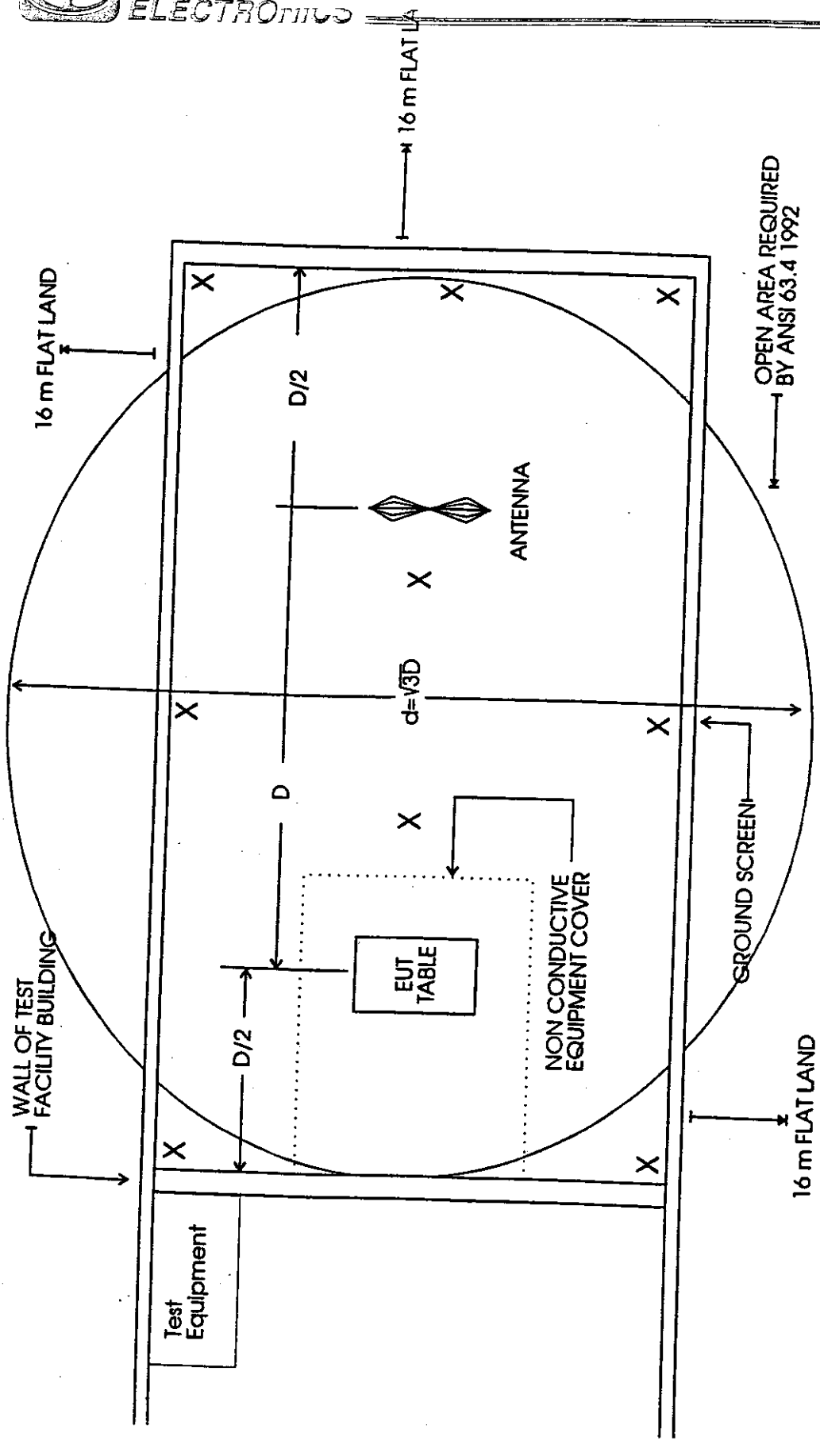


Figure 2: Plot Map and Layout of Test Site "D"

APPENDIX A

DATA SHEETS

SECTION 15.247 (a)(2)

BANDWIDTH AT -6dB POINTS FOR HANDSET

PAGE A3 - CHANNEL 1
PAGE A4 - CHANNEL 10
PAGE A5 - CHANNEL 20

4-14-98

BANDWIDTH OF HANDSET CH. 1

hp REF 30.0 dBm ATTEN 40 dB

MKR Δ 1.385 MHz
-0.20 dB

10 dB/

MARKER Δ
1.385 MHz
-0.20 dB

DL
-10.0
dBm

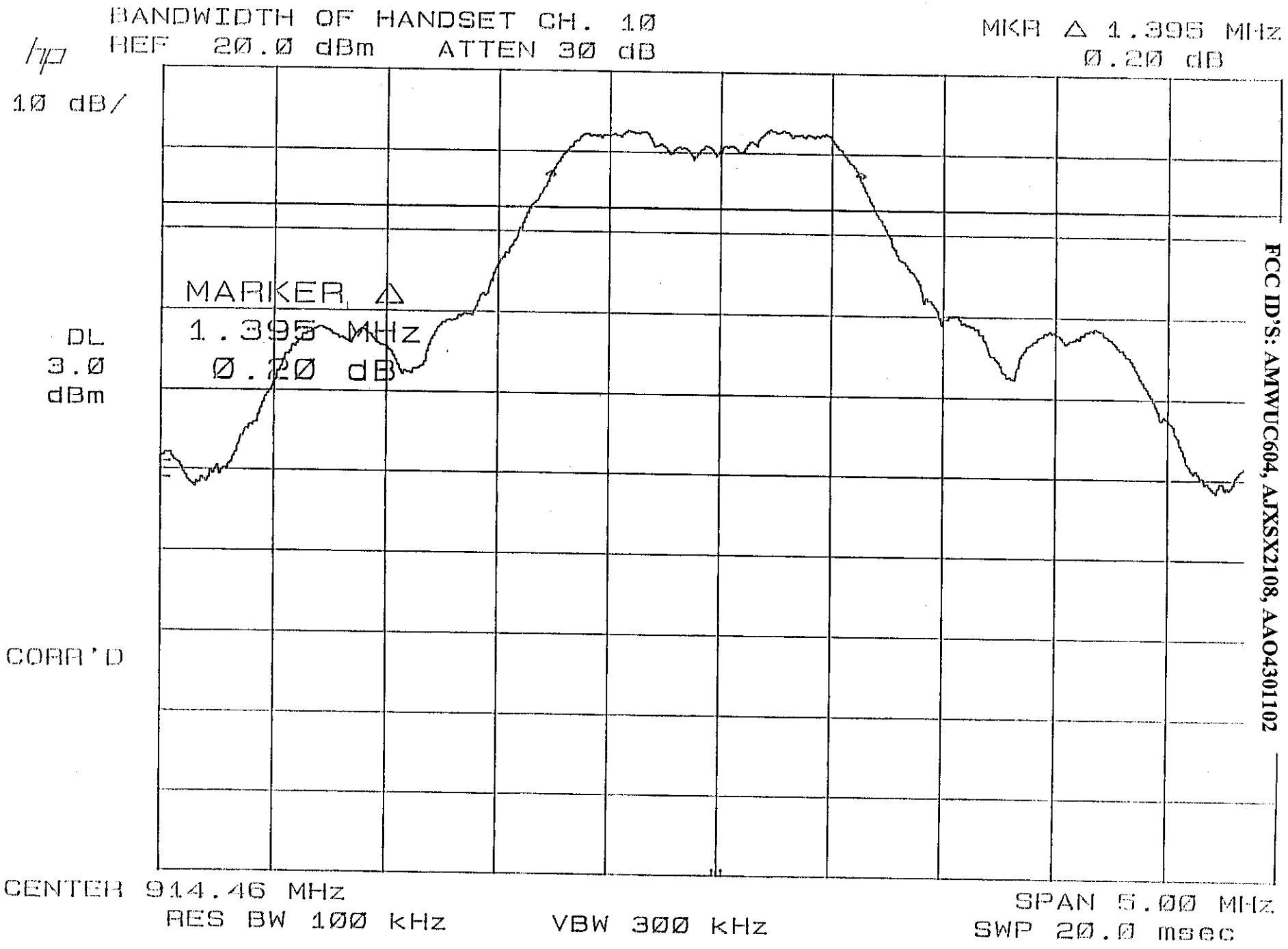
CORR'D

CENTER 904.20 MHz
RES BW 100 kHz VBW 300 kHz SPAN 5.00 MHz
SWP 20.0 msec

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE A3

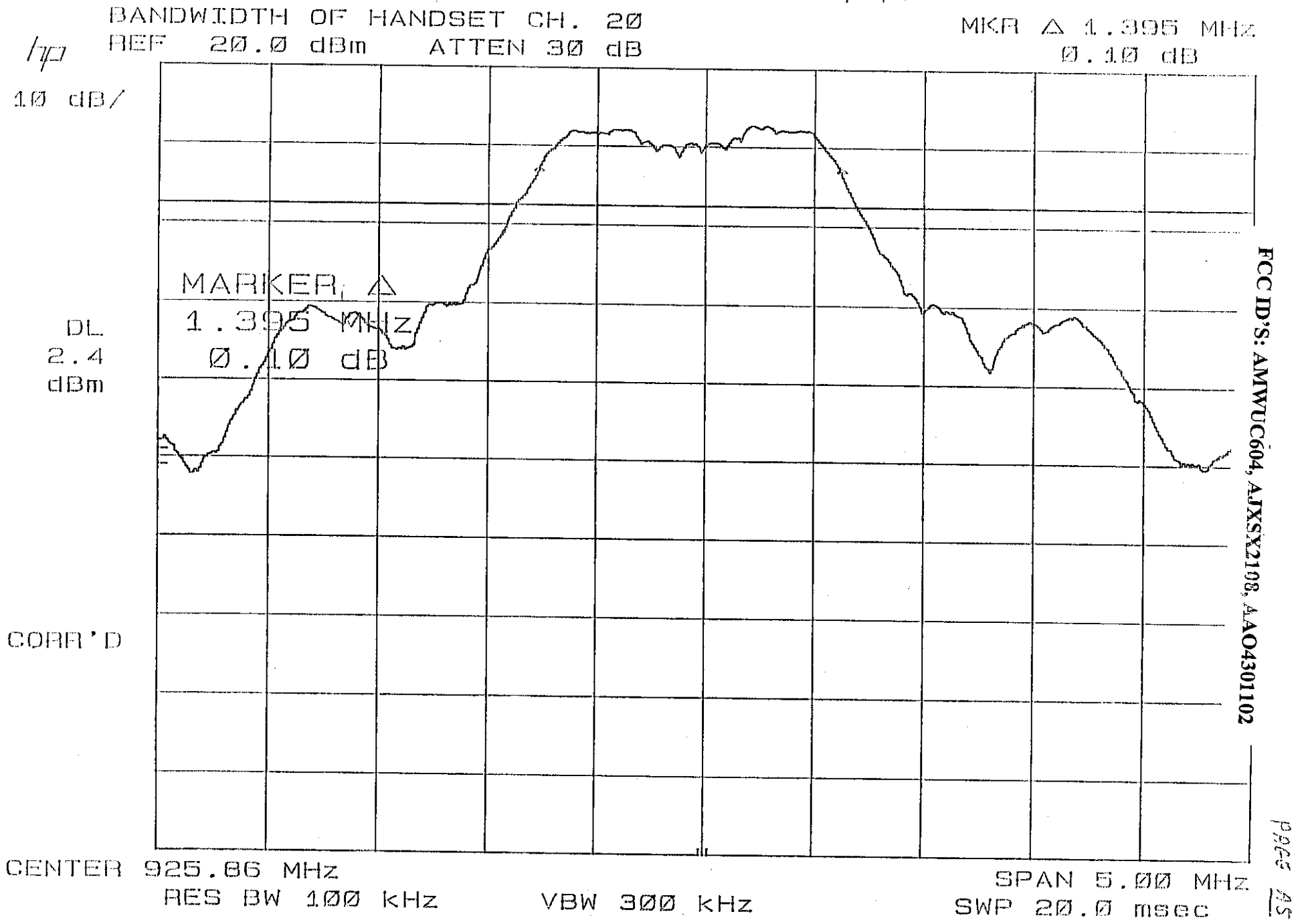
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 44

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

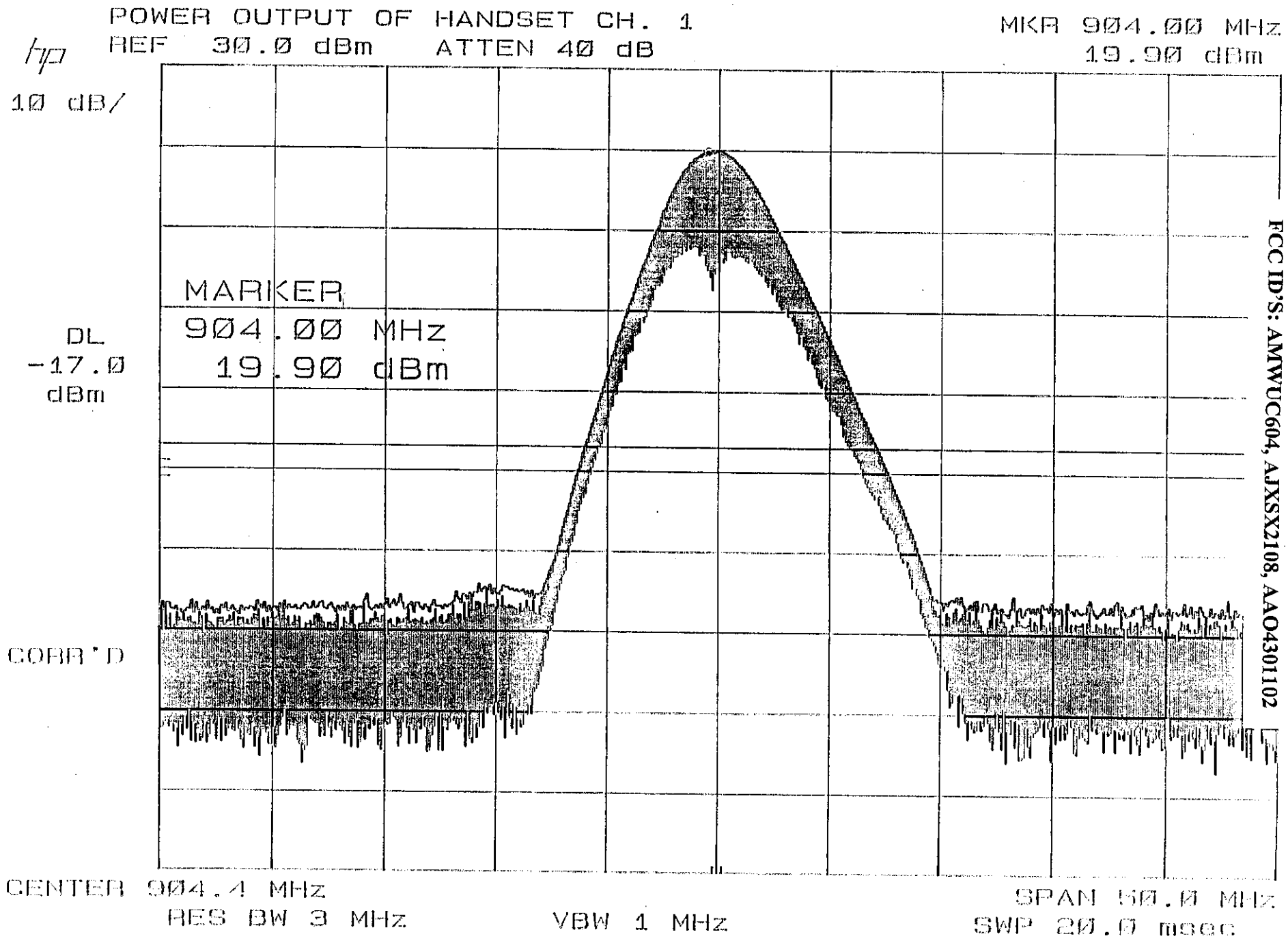
PAGE 45

SECTION 15.247 (b)

POWER OUTPUT OF HANDSET

PAGE A7 - CHANNEL 1
PAGE A8 - CHANNEL 10
PAGE A9 - CHANNEL 20

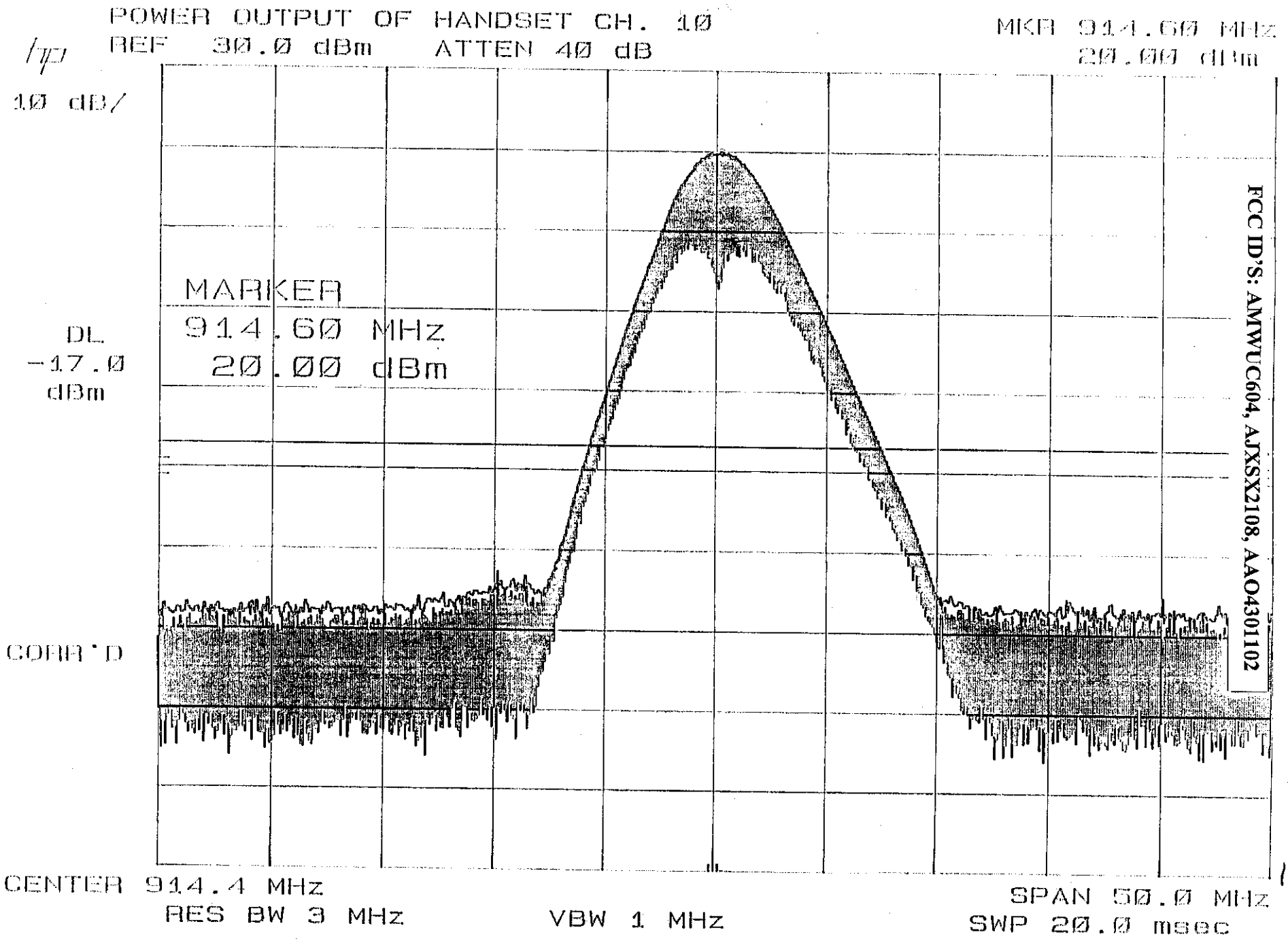
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 42

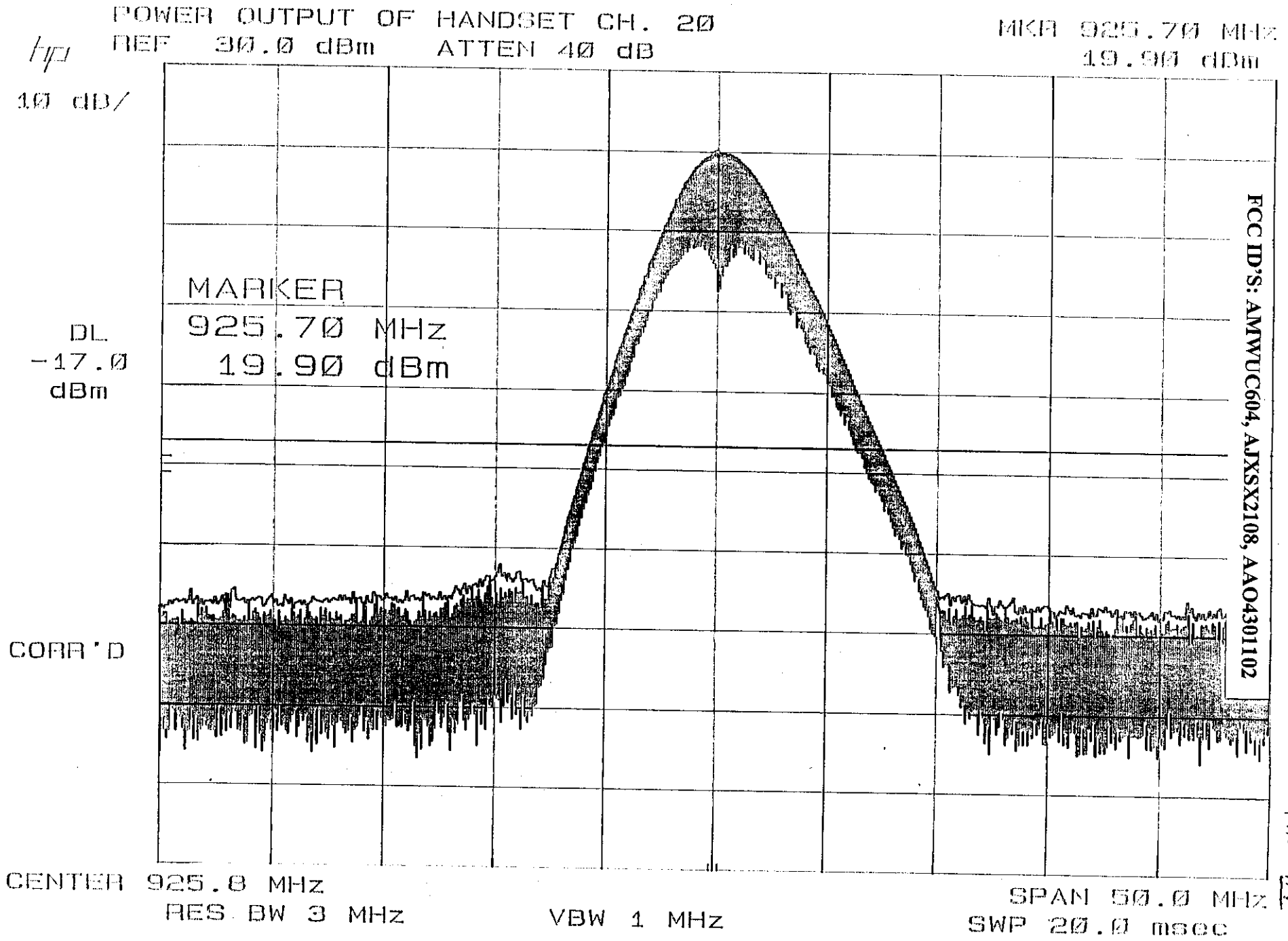
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 18

4-14-98

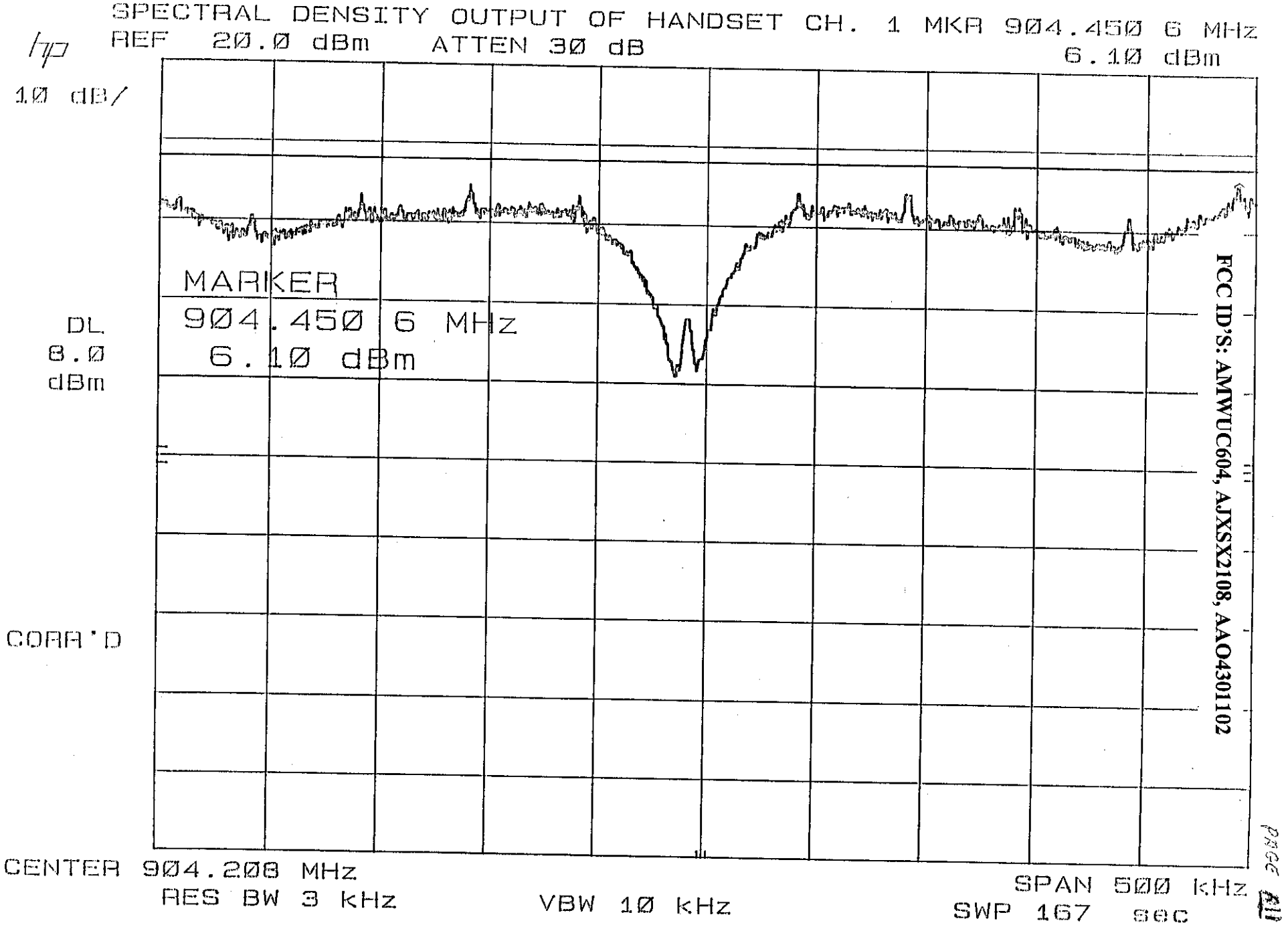

POWER OUTPUT OF HANDSET CH. 20
REF 30.0 dBm ATTEN 40 dB
MKR 925.70 MHz
19.90 dBm
10 dB/
MARKER
925.70 MHz
19.90 dBm
DL
-17.0
dBm
CORR'D
FCC ID'S: AMWUC604, AJXSX2108, AAO4301102
CENTER 925.8 MHz
RES BW 3 MHz
VBW 1 MHz
SPAN 50.0 MHz
SWP 20.0 msec

SECTION 15.247 (d)

SPECTRAL DENSITY OUTPUT OF HANDSET

PAGE A11 - CHANNEL 1
PAGE A12 - CHANNEL 10
PAGE A13 - CHANNEL 20

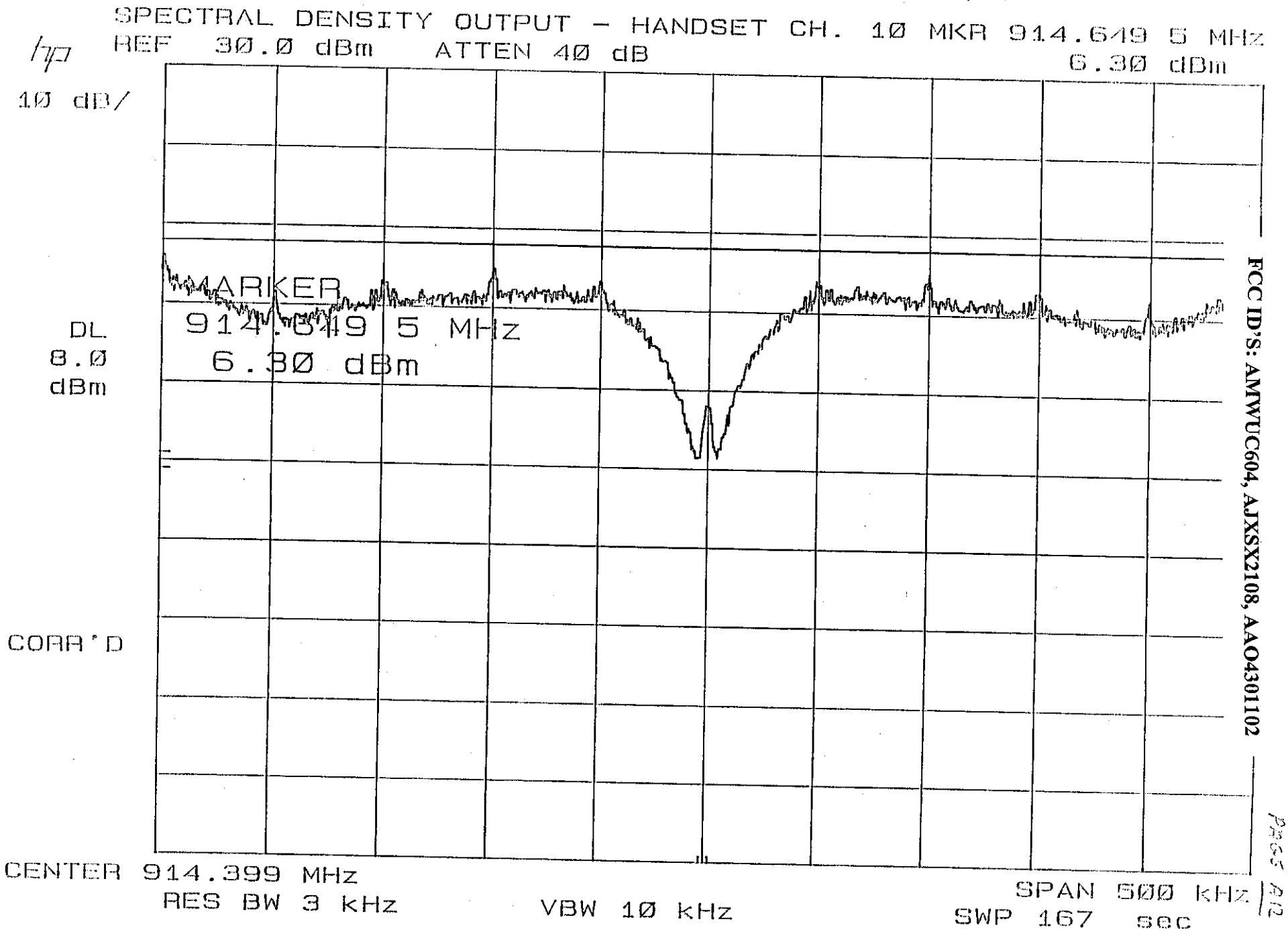
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO430102

PAGE 11

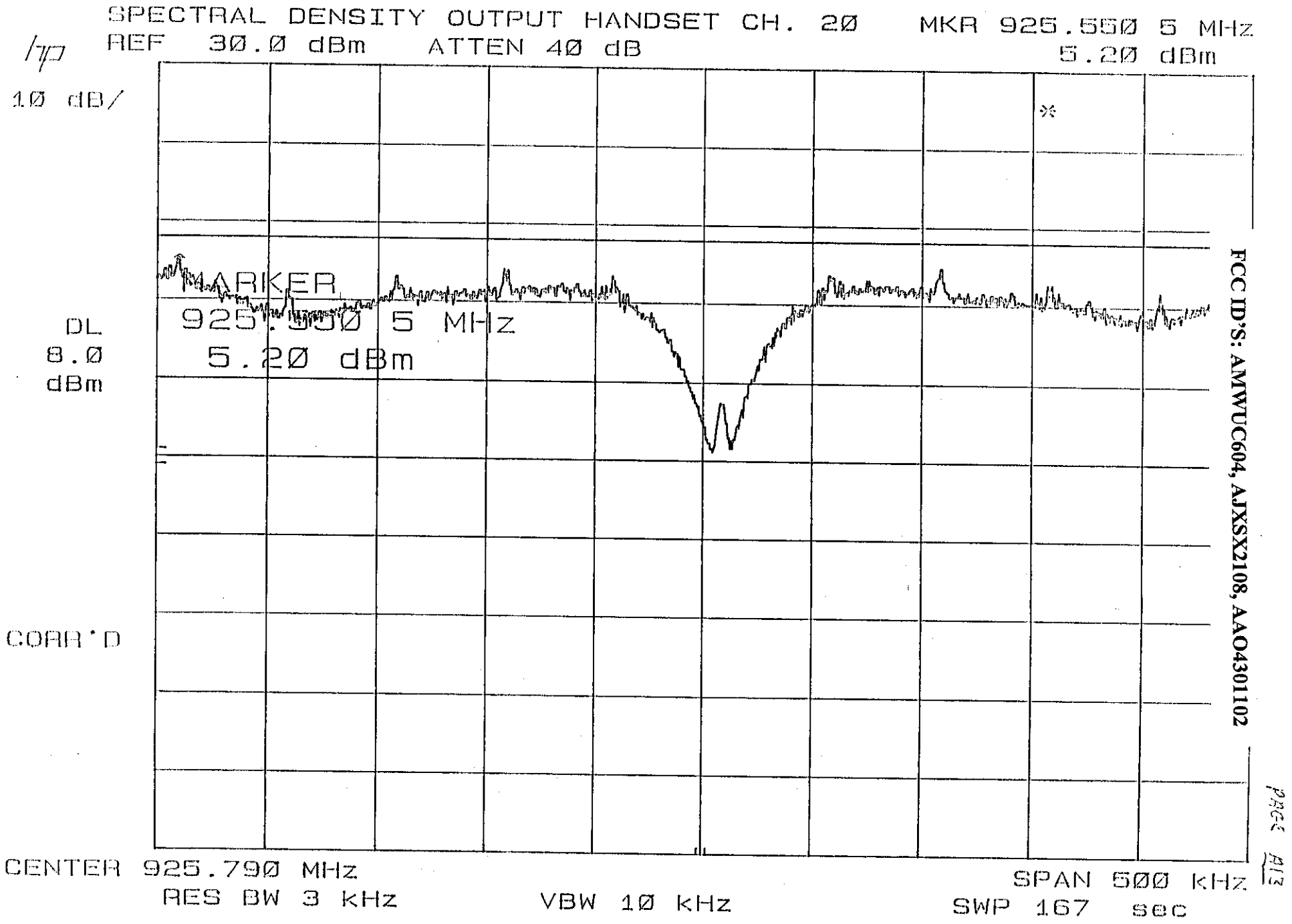
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 12

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

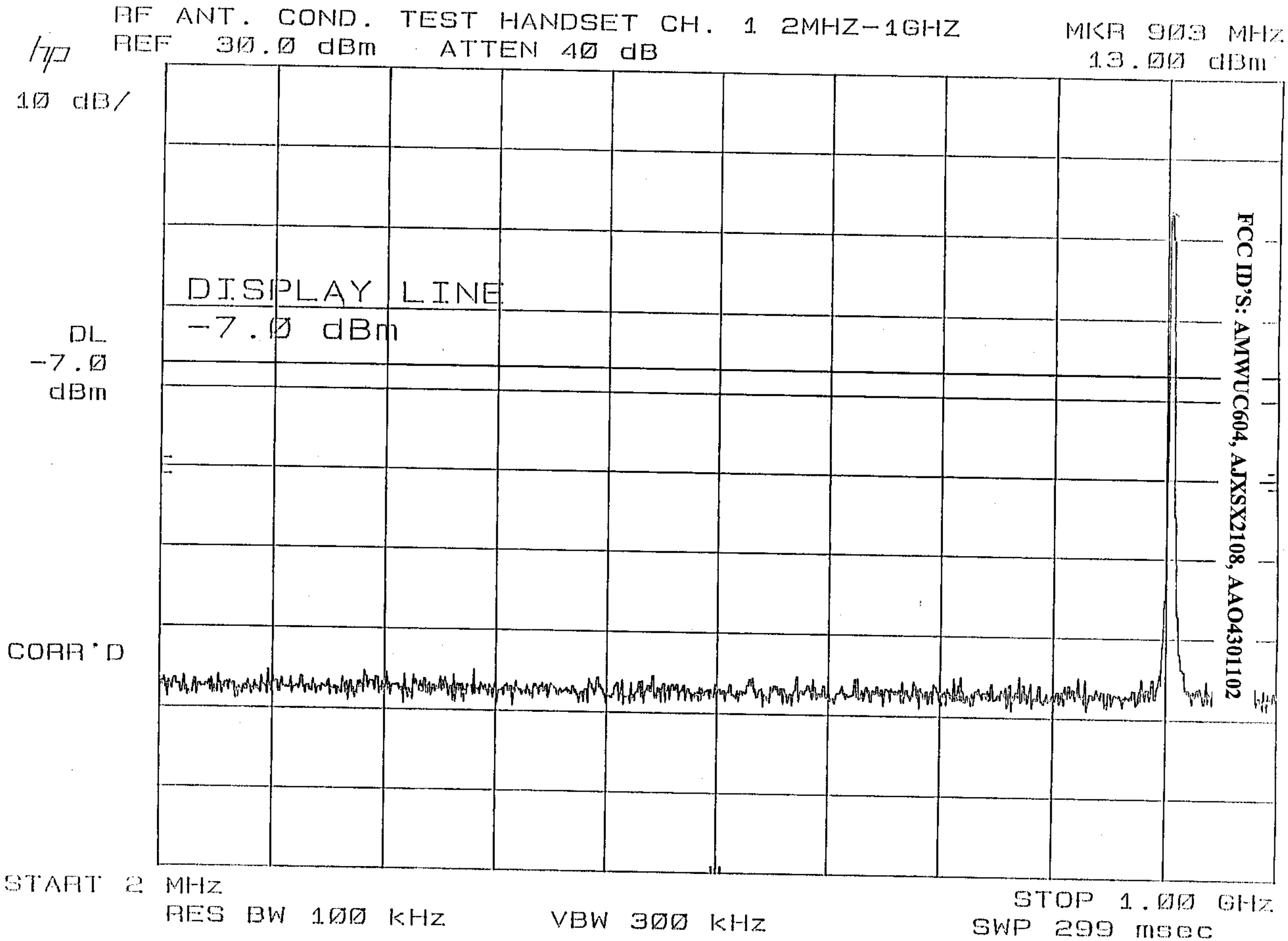
PAGE 113

SECTION 15.247 (c)

RF ANTENNA CONDUCTED EMISSIONS TEST FOR HANDSET

PAGES A15-A18 - CHANNEL 1
PAGES A19-A21 - CHANNEL 10
PAGES A22-A25 - CHANNEL 20

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

4-14-98

RF ANT. COND. TEST HANDSET 1GHZ - 2GHZ CH. 1 MKR 1.808 GHz

hp REF 10.0 dBm ATTEN 20 dB -32.50 dBm

10 dB/

DL
-7.0
dBm

MARKER
1.808 GHz
-32.50 dBm

CORR'D

START 1.00 GHz

RES BW 100 kHz VBW 300 kHz STOP 2.00 GHz

SWP 300 msec

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 16

4-14-98

RF ANT. COND. TEST HANDSET 2GHZ-10GHZ

hp

REF 10.0 dBm ATTEN 20 dB

MKR 9.016 GHz
-55.60 dBm

10 dB/

DL
-7.0
dBm

MARKER
9.016 GHz
-55.60 dBm

CORR'D

START 2.00 GHz
RES BW 100 kHz

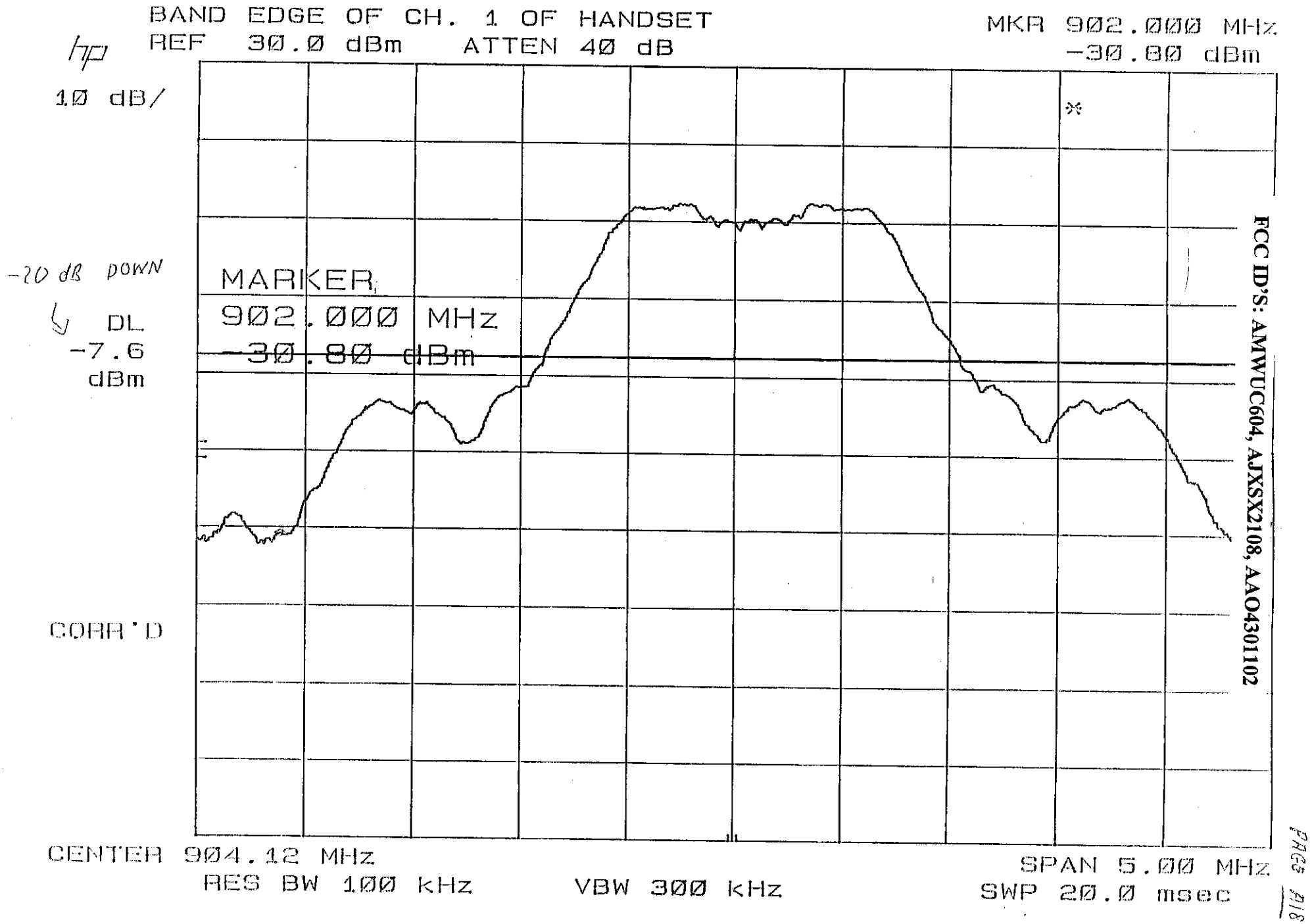
VBW 300 kHz

STOP 10.00 GHz
SWP 2.40 sec

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

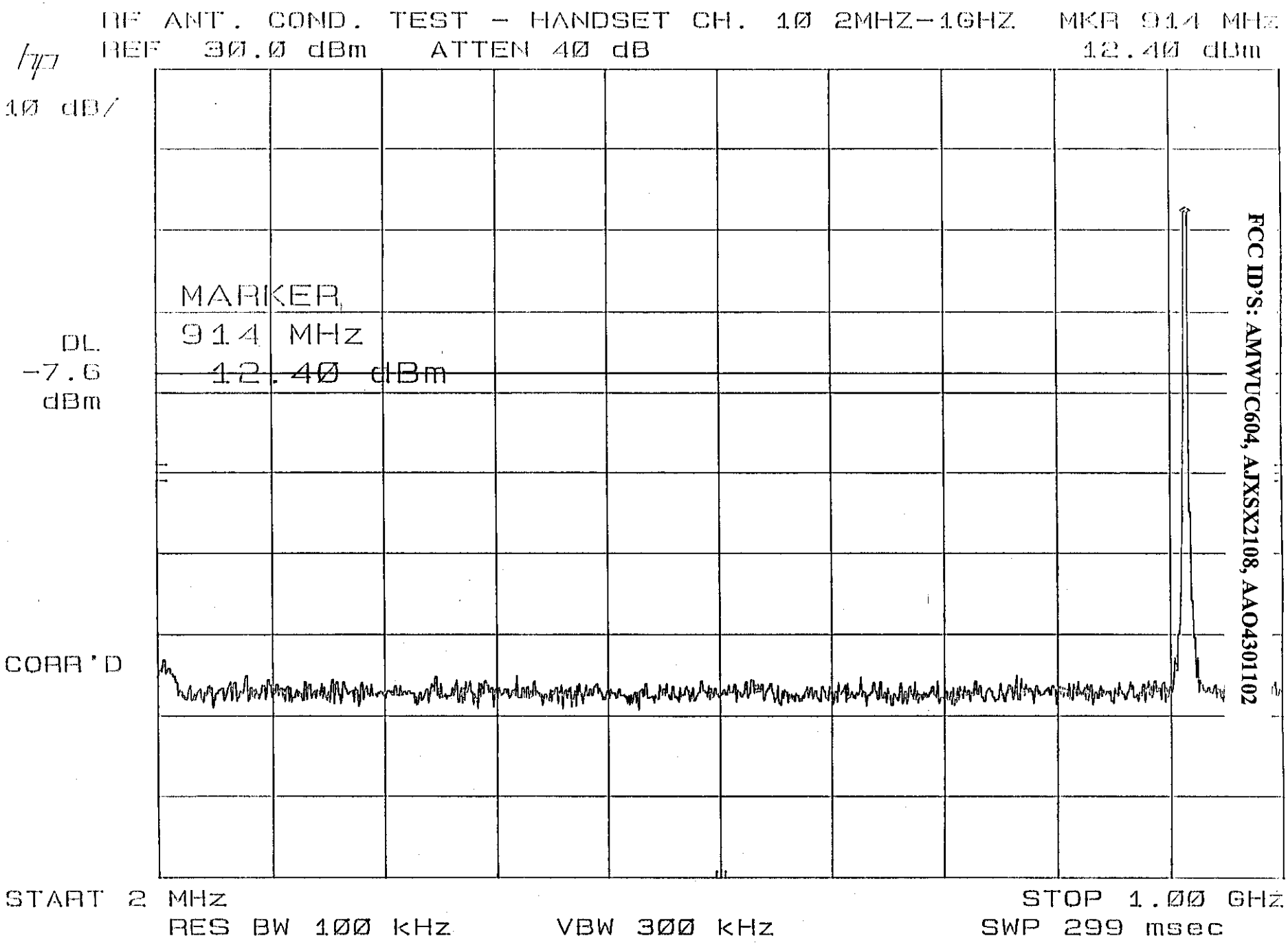
PAGE 4D

4-14-98



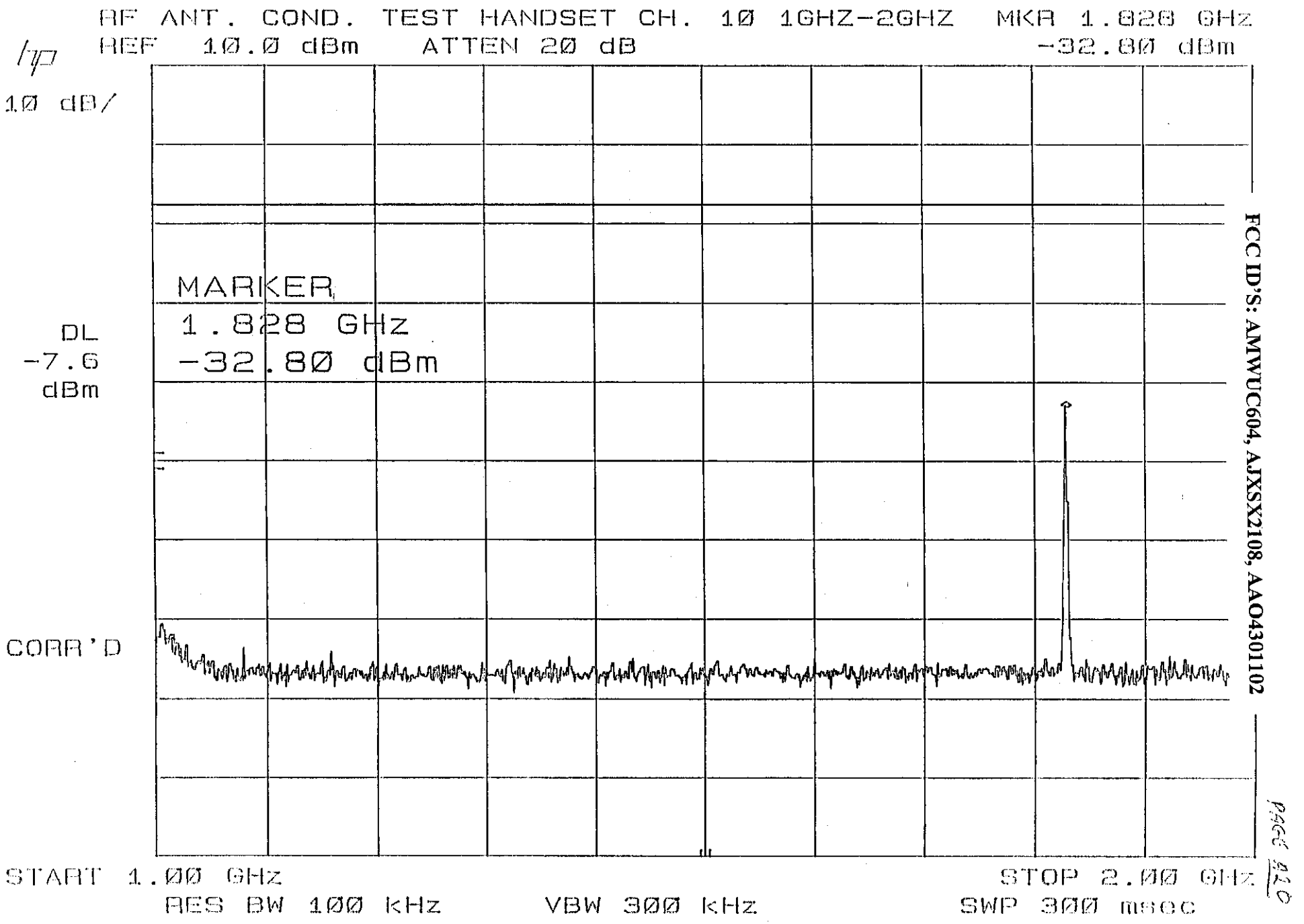
PAGE #18

4-14-98



PAGE A19

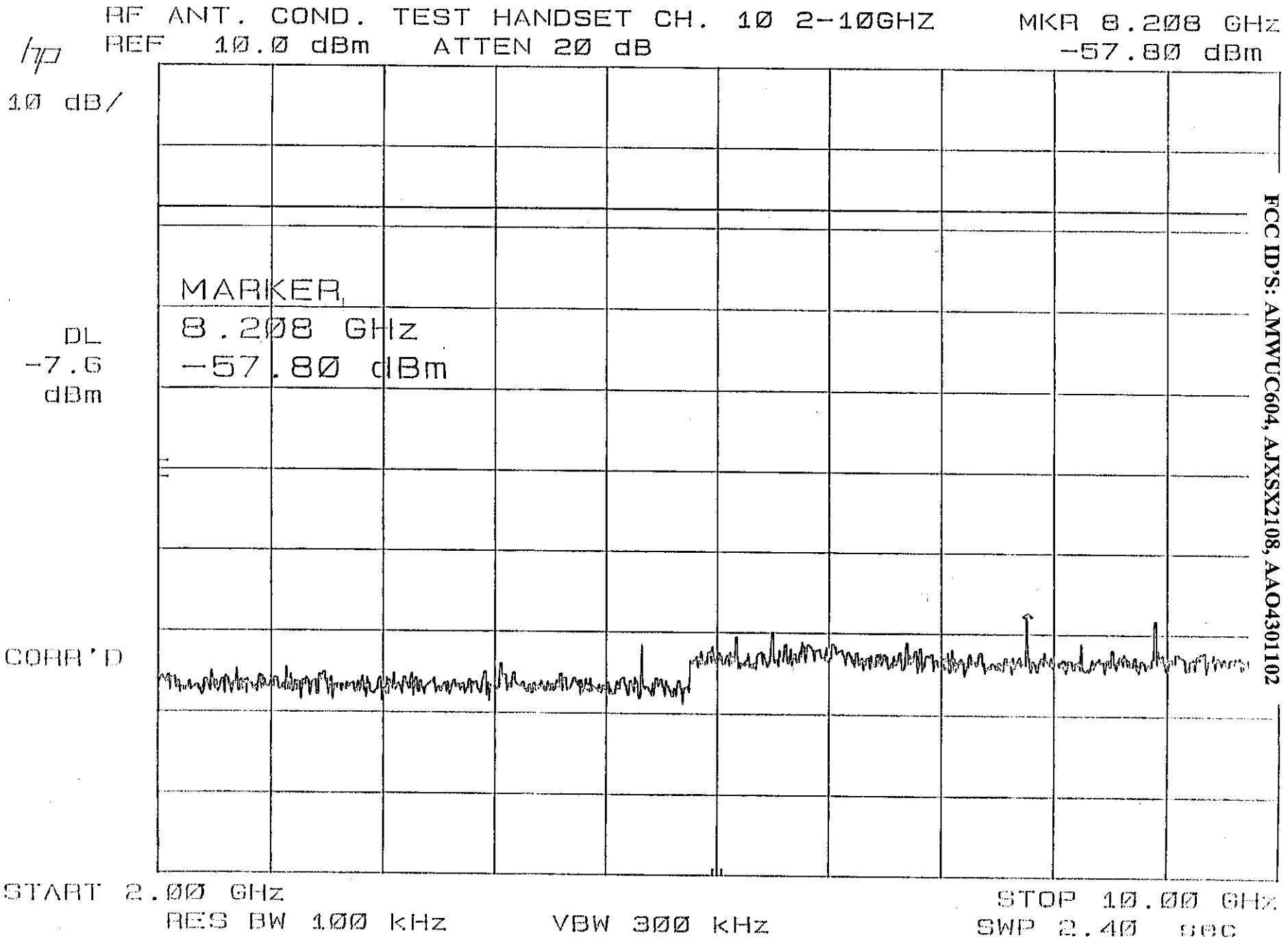
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 8.10

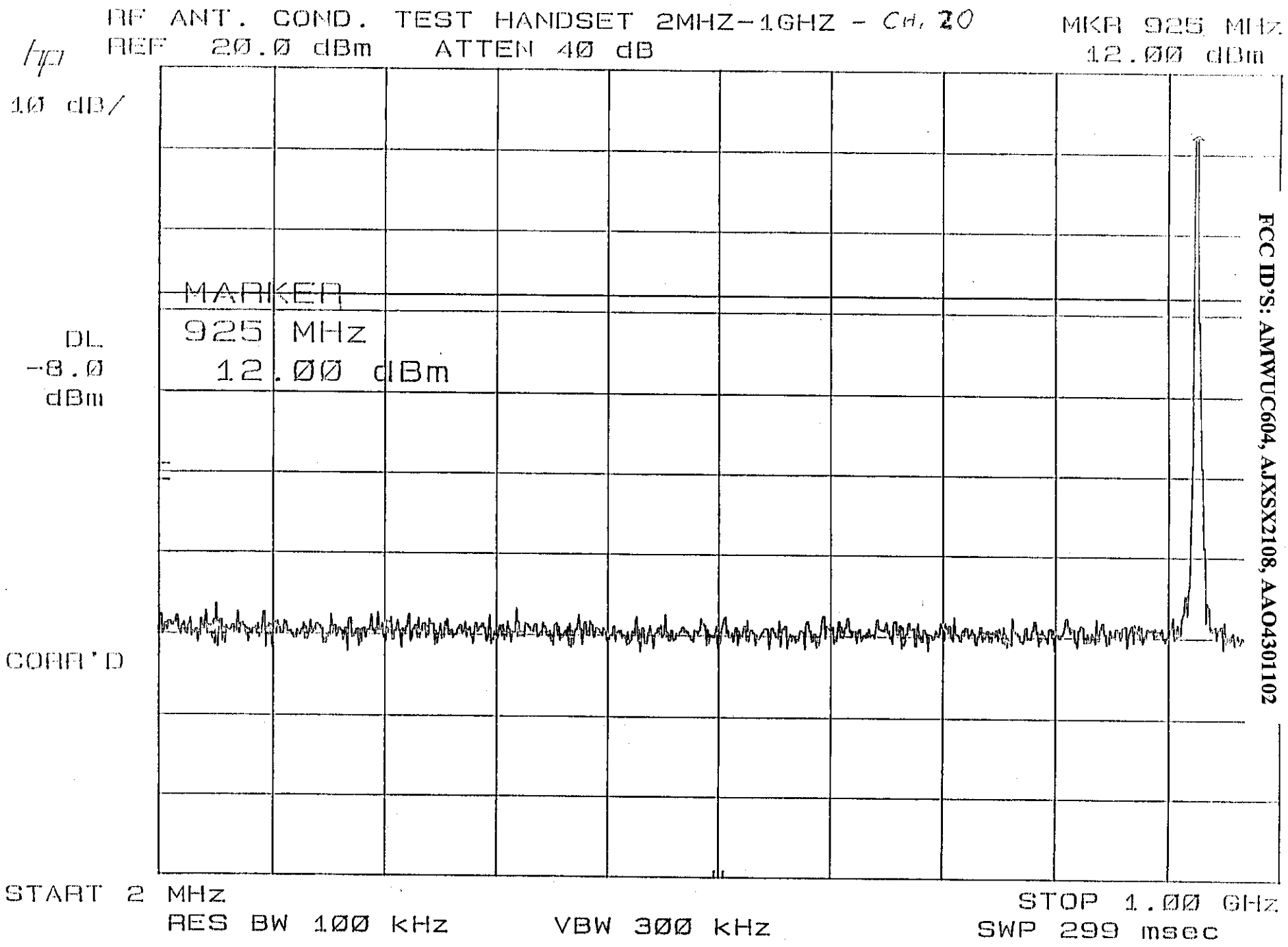
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 821

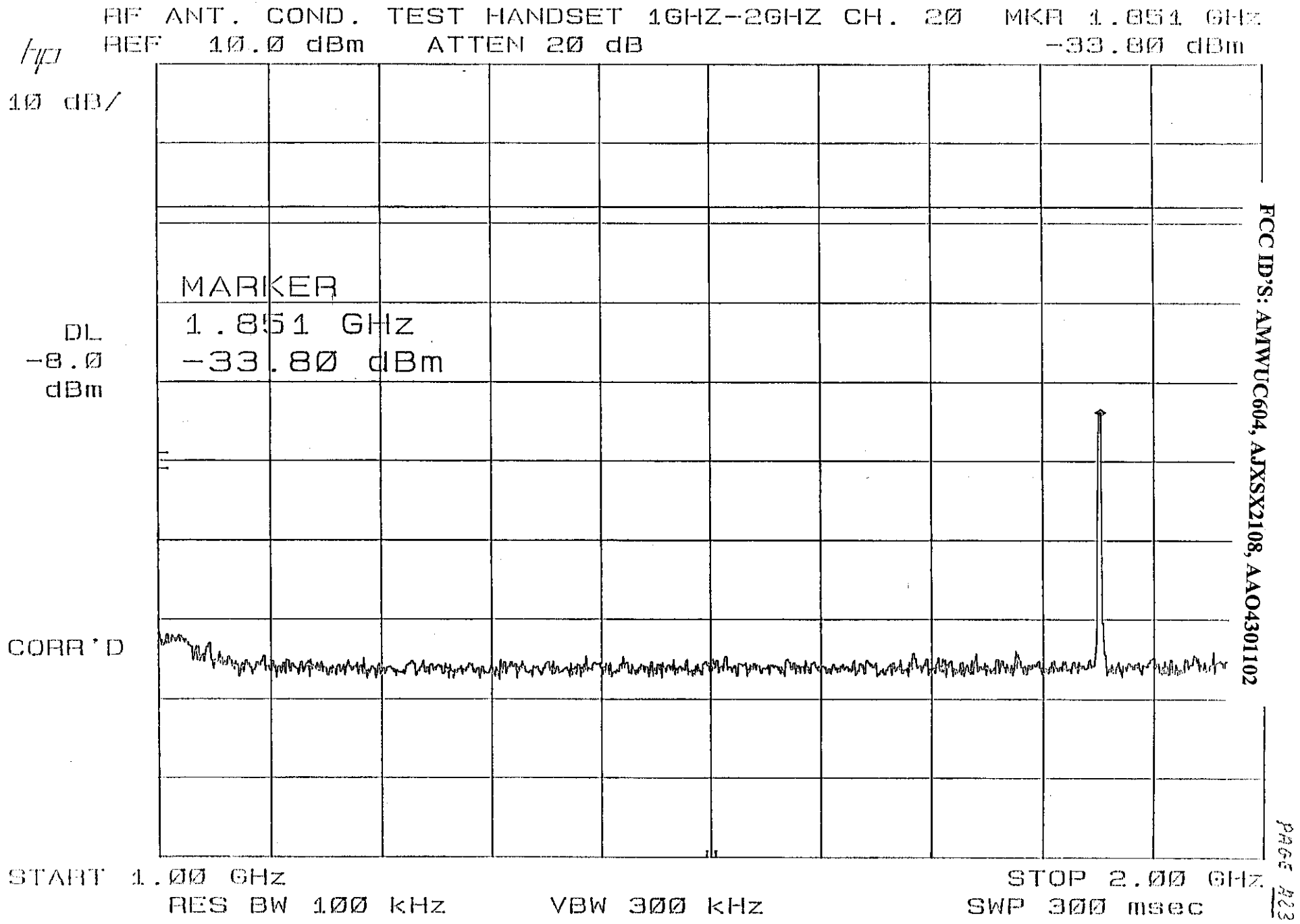
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

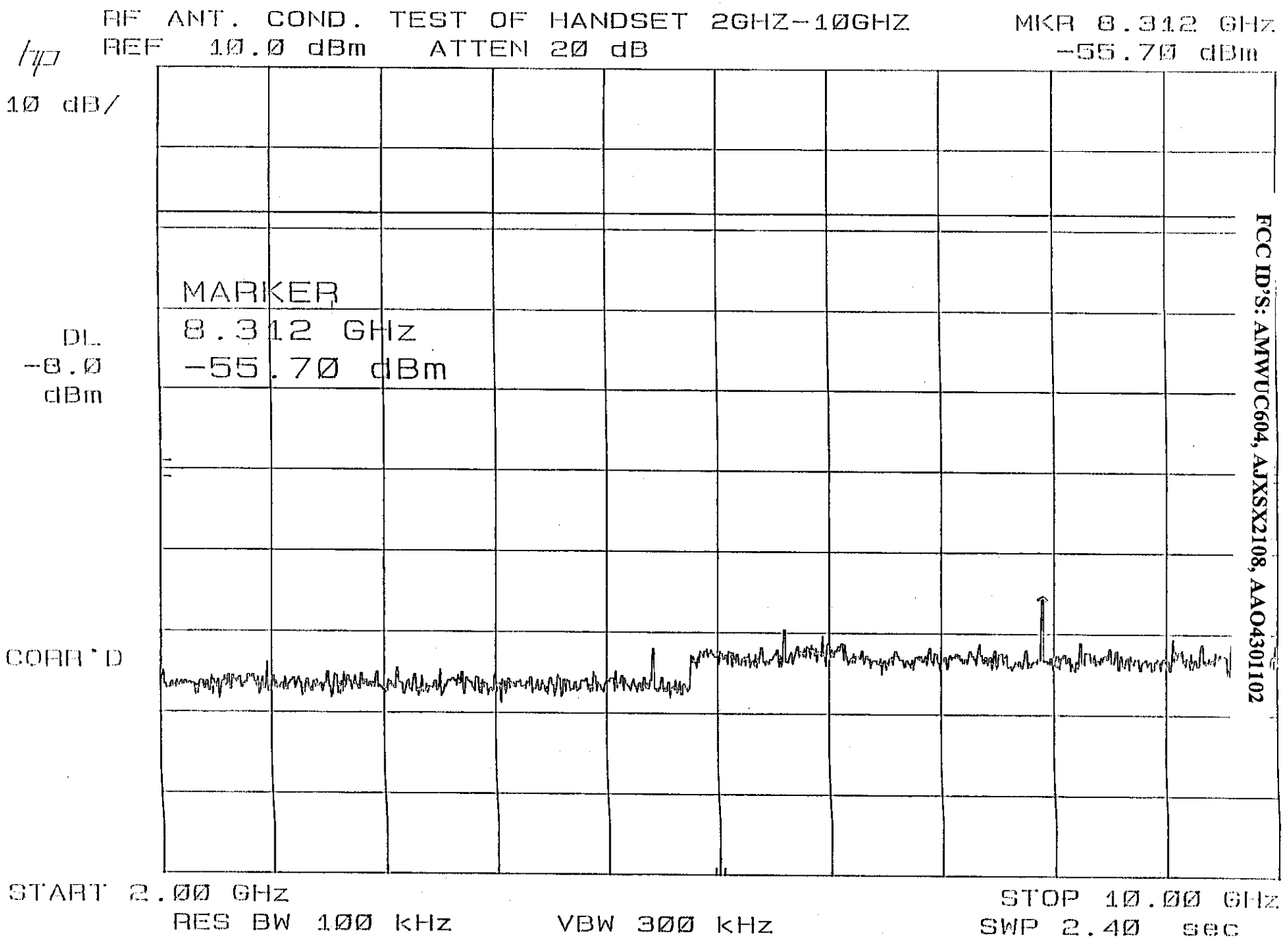
PAGE 22

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

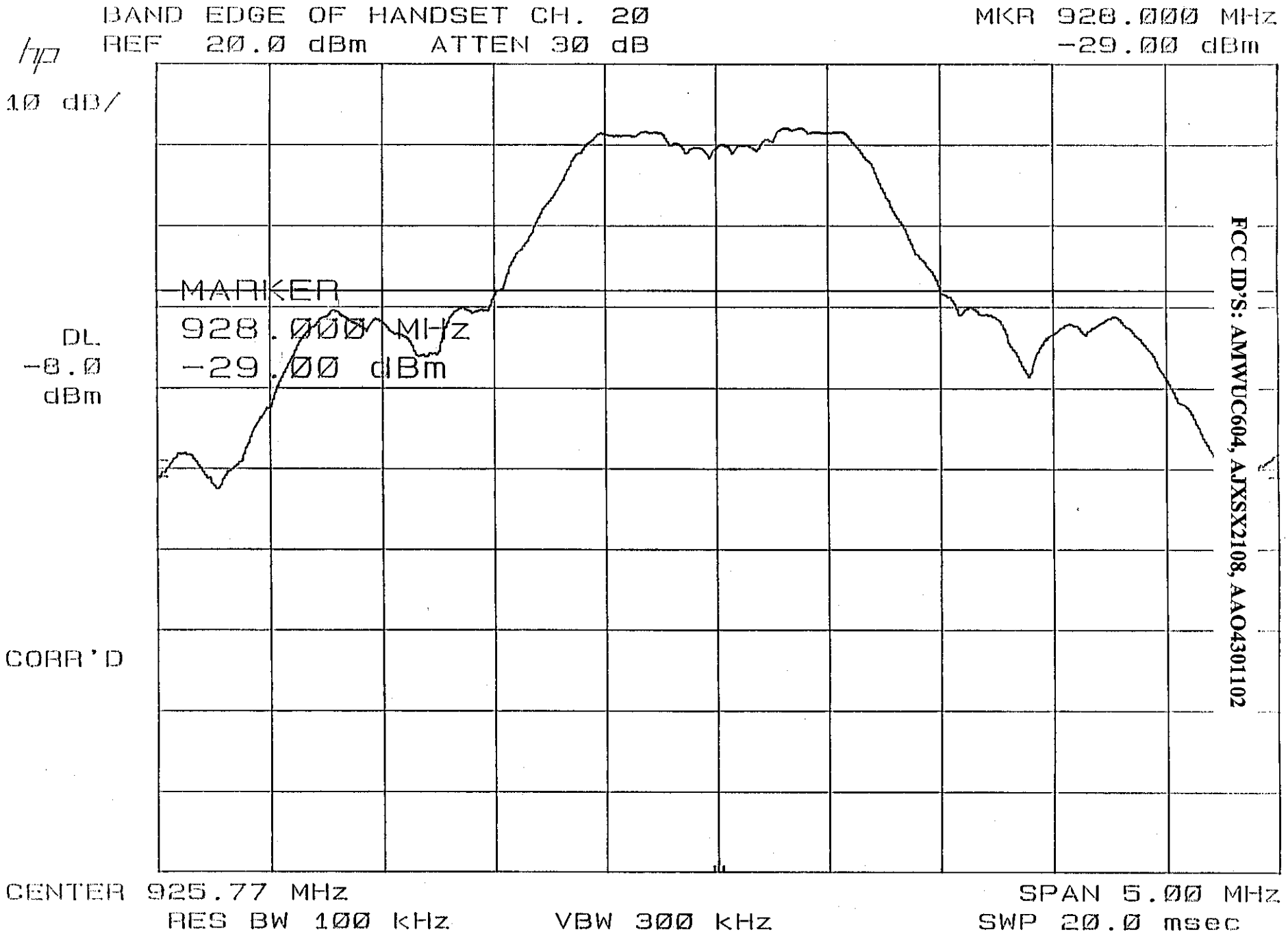
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 8 OF 8

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 405

SECTION 15.247 (c)

RADIATED EMISSIONS FOR THE HANDSET

COMPATIBLE ELECTRONICS

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION DATE: 4-13-98

EUT: 900 MHz SPREAD SPECTRUM CORDLESS PHONE EUT S/N: PROTOTYPE

EUT MODEL: EXS 911D LOCATION: ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 CLASS: ____ TEST DISTANCE: 3M LAB: D

ANTENNA: ■ LOOP ☐ BICONICAL ☐ LOG ☐ HORN POLARIZATION: ☐ VERT ☐ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ☐ ENGINEER: KYLE F.

NOTES: HANDSET

Frequency (kHz)	Peak Reading (dBuV)	Avg. ☐ Q.P. ☐ (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
			NO EMISSIONS FOUND						
			BETWEEN 10KHZ AND 30MHZ						
			FOR THE HANDSET.						

* CORRECTED READING = METER READING - DISTANCE FACTOR - ANTENNA GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

Test location: Compatible Electronics
Customer : UNIDEN CORPORATION Date : 4/13/1998
Manufacturer : UNIDEN CORPORATION Time : 13.41
EUT name : 900 MHZ SPREAD SPECTRUM CORDLESS PHONE Model: EXS9110
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
HANDSET - SPURIOUS EMISSIONS
TEMPERATURE 60 DEGREES F.
RELATIVE HUMIDITY 55%

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	36.05	55.20	0.50	12.17	38.96	28.91	40.00	-11.09
2V	48.05	53.40	0.58	11.50	39.00	26.48	40.00	-13.52
3V	80.89	53.60	0.71	8.78	38.31	24.78	40.00	-15.22
4V	120.03	50.90	0.98	10.90	38.90	23.88	43.50	-19.62
5V	161.61	38.40	1.29	14.17	38.60	15.26	43.50	-28.24
6V	182.43	42.30	1.40	14.96	38.72	19.94	43.50	-23.56
7V	201.63	43.90	1.40	15.84	38.98	22.16	43.50	-21.34
8V	220.83	49.90	1.40	16.30	38.75	28.85	46.00	-17.15
9V	240.04	49.10	1.52	16.82	38.64	28.80	46.00	-17.20
10V	259.24	49.70	1.64	17.91	38.64	30.61	46.00	-15.39
11V	302.45	44.30	1.80	14.01	38.61	21.50	46.00	-24.50
12V	316.85	44.60	1.83	14.07	38.70	21.80	46.00	-24.20
13V	336.04	47.80	1.87	14.14	38.82	25.00	46.00	-21.00
14V	350.45	44.00	1.90	14.25	38.89	21.26	46.00	-24.74
15V	355.25	48.70	1.91	14.80	38.84	26.57	46.00	-19.43
16V	364.84	47.90	1.93	15.89	38.72	27.00	46.00	-19.00
17V	369.64	45.70	1.94	16.44	38.66	25.41	46.00	-20.59
18V	384.04	49.70	1.97	18.08	38.56	31.19	46.00	-14.81
19V	393.63	44.90	1.99	19.17	38.53	27.54	46.00	-18.46
20V	398.43	49.60	2.00	19.72	38.51	32.81	46.00	-13.19
21V	403.23	52.80	2.01	19.61	38.48	35.94	46.00	-10.06
22V	412.83	46.90	2.05	18.74	38.42	29.27	46.00	-16.73
23V	422.44	52.00	2.09	17.88	38.37	33.61	46.00	-12.39
24V	427.23	50.70	2.11	17.45	38.34	31.92	46.00	-14.08
25V	432.03	49.40	2.13	17.02	38.31	30.24	46.00	-15.76
26V	436.83	51.80	2.15	16.59	38.28	32.25	46.00	-13.75
27V	441.63	56.30	2.17	16.15	38.25	36.37	46.00	-9.63
28V	446.43	52.60	2.19	15.72	38.22	32.29	46.00	-13.71
29V	451.23	53.20	2.21	15.43	38.21	32.62	46.00	-13.38
30V	456.04	52.70	2.24	15.54	38.26	32.22	46.00	-13.78

Test location: Compatible Electronics
Customer : UNIDEN CORPORATION Date : 4/13/1998
Manufacturer : UNIDEN CORPORATION Time : 13.41
EUT name : 900 MHZ SPREAD SPECTRUM CORDLESS PHONE Model: EXS9110
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
HANDSET - SPURIOUS EMISSIONS
TEMPERATURE 60 DEGREES F.
RELATIVE HUMIDITY 55%

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
31V	460.84	54.60	2.27	15.66	38.31	34.22	46.00	-11.78
32V	465.64	52.20	2.29	15.78	38.36	31.91	46.00	-14.09
33V	470.44	54.40	2.32	15.89	38.40	34.21	46.00	-11.79
34V	489.63	56.20	2.44	16.35	38.60	36.39	46.00	-9.61
35V	494.44	54.10	2.47	16.47	38.64	34.39	46.00	-11.61
36V	508.84	55.30	2.57	16.49	38.59	35.77	46.00	-10.23
37V	513.64	55.00	2.61	16.44	38.54	35.51	46.00	-10.49
38V	518.11	50.00	2.64	16.38	38.48	30.54	46.00	-15.46
39V	528.03	55.50	2.72	16.26	38.36	36.12	46.00	-9.88
40V	547.24	53.00	2.88	16.03	38.13	33.78	46.00	-12.22
41V	604.84	42.50	3.04	18.78	38.51	25.81	46.00	-20.19
42V	812.69	47.70	4.20	21.98	37.80	36.08	46.00	-9.92
43V	996.75	44.60	4.21	22.44	37.65	33.59	54.00	-20.41

Test location: Compatible Electronics
Customer : UNIDEN CORPORATION Date : 4/13/1998
Manufacturer : UNIDEN CORPORATION Time : 14.30
EUT name : 900 MHZ SPREAD SPECTRUM CORDLESS PHONE Model: EXS9110
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
HANDSET - SPURIOUS EMISSIONS
TEMPERATURE 60 DEGREES F.
RELATIVE HUMIDITY 55%

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1H	74.27	53.30	0.70	9.37	38.47	24.90	40.00	-15.10
2H	115.31	41.60	0.96	10.62	38.81	14.37	43.50	-29.13
3H	185.79	51.90	1.40	15.12	38.77	29.65	43.50	-13.85
4H	336.04	51.70	1.87	14.14	38.82	28.90	46.00	-17.10
5H	355.24	53.20	1.91	14.80	38.84	31.07	46.00	-14.93
6H	374.44	54.50	1.95	16.99	38.61	34.83	46.00	-11.17
7H	403.23	47.10	2.01	19.61	38.48	30.24	46.00	-15.76
8H	412.83	49.10	2.05	18.74	38.42	31.47	46.00	-14.53
9H	432.04	46.80	2.13	17.02	38.31	27.64	46.00	-18.36
10H	441.64	50.60	2.17	16.15	38.25	30.67	46.00	-15.33
11H	460.84	50.80	2.27	15.66	38.31	30.42	46.00	-15.58
12H	528.04	49.10	2.72	16.26	38.36	29.72	46.00	-16.28
13H	604.83	44.50	3.04	18.78	38.51	27.81	46.00	-18.19

COMPA ELECTRONICS FCC ID'S: AMWUC604, AJXSX2108, AAO4301102 E 1 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHZ SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXS9110 **LOCATION:** ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN **POLARIZATION:** ☒ VERT ☐ HORIZ

☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: HANDSET - CH. 1

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
1.904	110.0	104.0	1.5	90	23.3	—	33.3	94.0	—	—
1.809	68.6	62.6	3.0	0	24.5	5.9	29.0	64.0	-10.0	74.0
2.712	44.0	38.0	1.0	90	28.2	5.5	26.8	44.9	-9.1	54.0
3.616	43.1	37.1	1.0	90	29.6	6.9	23.9	49.7	-4.3	54.0
4.521	39.0	33.0	1.0	180	30.9	8.6	22.1	50.4	-3.6	54.0
5.425	41.2	35.2	1.0	90	32.4	9.2	32.0	44.8	-9.2	54.0
6.329	40.3	34.3	1.0	90	34.3	10.3	32.0	46.9	-27.1	74.0
7.233	38.4	32.4	1.0	90	36.8	11.4	32.0	48.6	-5.4	54.0
8.138	37.3	31.3	1.0	90	37.1	12.5	30.5	50.4	-3.6	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHz SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXI9110 **LOCATION:** ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN **POLARIZATION:** ☐ VERT ☒ HORIZ

☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: HANDSET - CH. 1

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.904	105.2	102.2	1.0	0	23.3	-	33.3	92.2	-	-
1.808	53.0	47.0	1.0	0	24.5	5.9	29.0	48.4	-25.6	74.0
2.712	42.8	36.8	1.0	0	26.2	5.5	26.8	43.7	-10.3	54.0
3.616	44.7	38.7	1.0	0	28.6	6.9	23.9	51.3	-2.7	54.0
4.520	38.7	32.7	1.0	0	30.9	8.6	22.1	50.1	-3.9	54.0
5.425	37.3	31.3	1.0	0	32.4	9.2	32.0	40.9	-13.1	54.0
6.330	45.0	39.0	1.0	180	34.3	10.3	32.0	51.6	-22.4	74.0
7.233	39.4	33.4	1.0	180	36.8	11.9	32.0	49.6	-4.4	54.0
8.137	36.1	30.1	1.5	180	37.1	12.5	30.5	49.2	-4.8	54.0

*** CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

**** DELTA** = CORRECTED READING - SPECIFICATION LIMIT

COMPA ELECTR FCC ID'S: AMWUC604, AJXSX2108, AAO4301102 3 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHz SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXS9110 **LOCATION:** ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3m **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ■ LOG ■ HORN **POLARIZATION:** ■ VERT ☐ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F

NOTES: HARNESS ~ CH 1/0

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.914	110.10	104.1	1.0	0	23.2	-	33.2	94.1	—	—
1.828	70.1	64.1	1.0	0	24.5	5.9	29.0	65.5	-8.6	74.1
2.743	43.3	37.3	1.0	0	28.2	5.5	26.8	44.2	-9.8	54.0
3.657	43.6	37.6	1.5	90	29.6	6.9	23.9	50.2	-3.8	54.0
4.571	38.7	32.7	1.0	0	30.9	8.6	22.1	50.1	-3.9	54.0
5.486	40.5	34.5	1.0	90	32.4	9.2	32.0	44.1	-9.9	54.0
6.400	45.6	39.6	1.0	0	34.3	10.3	32.0	52.2	-21.9	74.1
7.316	40.0	34.0	1.0	0	36.8	11.4	32.0	50.2	-3.8	54.0
8.228	36.5	30.5	1.0	0	37.1	12.6	30.6	49.6	-4.4	54.0

*** CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

**** DELTA** = CORRECTED READING - SPECIFICATION LIMIT

COMP ELECTRONICS

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102 PAGE 9 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHz SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXS9110 **LOCATION:** ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3 M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ■ LOG ■ HORN **POLARIZATION:** ☐ VERT ■ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: HANDSET - CH. 10

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.914	106.1	102.1	1.0	0	23.2	-	33.2	92.1	—	—
1.828	56.8	50.8	3.0	0	29.5	5.9	29.0	52.2	-21.9	74.1
2.743	42.4	36.4	1.0	0	28.2	5.5	26.8	43.3	-10.7	54.0
3.657	42.9	36.9	2.0	0	29.6	6.9	23.9	49.5	-4.5	54.0
4.571	36.3	30.3	1.0	0	30.9	8.6	22.1	47.7	-6.3	54.0
5.486	37.3	31.3	1.0	90	32.4	9.2	32.0	40.9	-13.1	54.0
6.400	43.2	37.2	1.5	90	34.3	10.3	32.0	49.8	-24.3	74.1
7.315	40.2	34.2	2.0	90	36.8	11.4	32.0	50.4	-3.6	54.0
8.229	37.1	31.1	1.0	90	37.1	12.5	30.5	50.2	-3.8	54.0

* **CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** **DELTA** = CORRECTED READING - SPECIFICATION LIMIT

COMPA... ELECTR... FCC ID'S: AMWUC604, AJXSX2108, AAO4301102 PAGE 5 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION DATE: 4-17-98

EUT: 900 MHZ SPREAD SPECTRUM PHONE EUT S/N: PROTOTYPE

EUT MODEL: EXS9110 LOCATION: ■ BREA □ SILVERADO □ AGOURA

SPECIFICATION: FCC 15.247 CLASS: ____ TEST DISTANCE: 3M LAB: D

ANTENNA: □ LOOP □ BICONICAL ■ LOG ■ HORN POLARIZATION: ■ VERT □ HORIZ

■ QUALIFICATION □ ENGINEERING □ MFG. AUDIT ENGINEER: KYLE F.

NOTES: HANDSET - CH. 20

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.926	110.2	104.2	2.0	0	23.2	-	33.1	94.3	-	-
1.851	68.7	62.7	1.0	0	24.5	5.7	29.1	63.8	-11.5	75.3
2.777	47.6	41.6	2.0	0	29.7	6.4	28.2	49.5	-4.5	54.0
3.703	44.5	38.5	3.0	0	29.6	6.9	23.9	51.1	-2.9	54.0
4.628	38.5	32.5	1.0	90	30.9	8.6	22.1	49.9	-4.1	54.0
5.554	38.9	32.9	1.5	270	32.4	9.2	32.0	42.5	-11.5	54.0
6.480	45.0	39.0	1.0	0	34.3	10.3	32.0	51.6	-23.7	75.3
7.406	36.9	30.9	1.0	0	36.8	11.4	32.0	47.1	-6.9	54.0
8.332	36.4	30.4	1.0	0	37.1	12.5	30.5	49.5	-4.5	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHz SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXS9110 **LOCATION:** ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ■ LOG ■ HORN **POLARIZATION:** ☐ VERT ■ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: HANDSET - CH. 20

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.926	111.2	105.2	1.0	0	23.2	–	33.1	95.3	~	~
1.852	54.7	48.4	3.0	180	24.5	5.7	29.1	49.5	-25.8	75.3
2.777	45.3	39.3	1.0	180	29.7	6.4	28.2	47.2	-6.8	54.0
3.704	44.6	38.6	1.5	180	29.6	6.9	23.9	51.2	-2.8	54.0
4.629	38.6	32.6	1.0	180	30.9	8.6	22.1	50.0	-4.0	54.0
5.554	36.3	30.3	1.0	90	32.4	9.2	32.0	39.9	-14.1	54.0
6.480	45.3	39.3	3.0	90	34.3	10.3	32.0	51.9	-23.4	75.3
7.407	39.0	33.0	2.0	90	36.8	11.4	32.0	49.2	-4.8	54.0
8.332	36.4	30.4	3.0	90	37.1	12.5	30.5	49.5	-4.5	54.0

*** CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

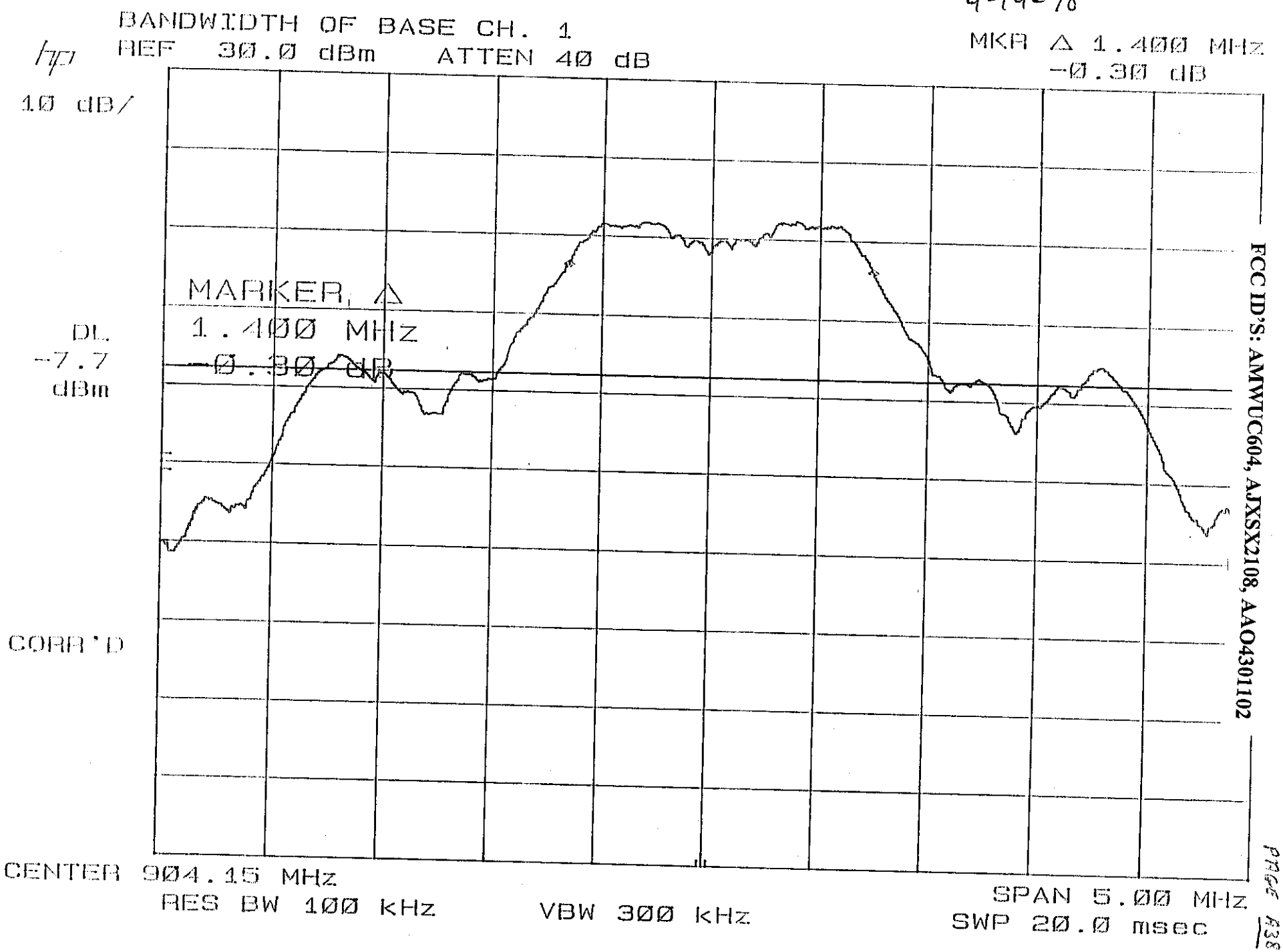
**** DELTA** = CORRECTED READING - SPECIFICATION LIMIT

SECTION 15.247 (a)(2)

BANDWIDTH AT -6dB POINTS FOR BASE

PAGE A38 - CHANNEL 1
PAGE A39 - CHANNEL 10
PAGE A40 - CHANNEL 20

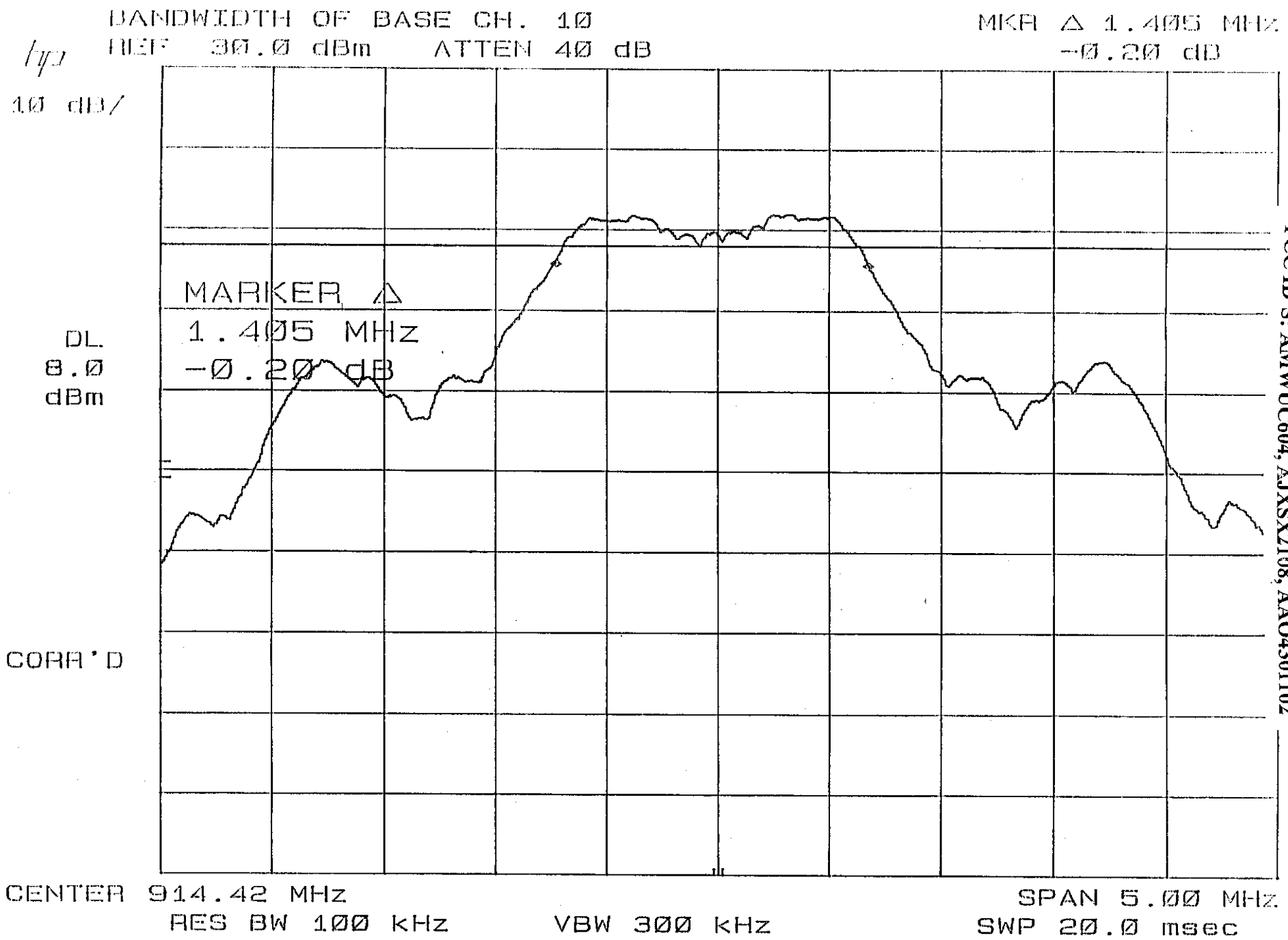
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 438

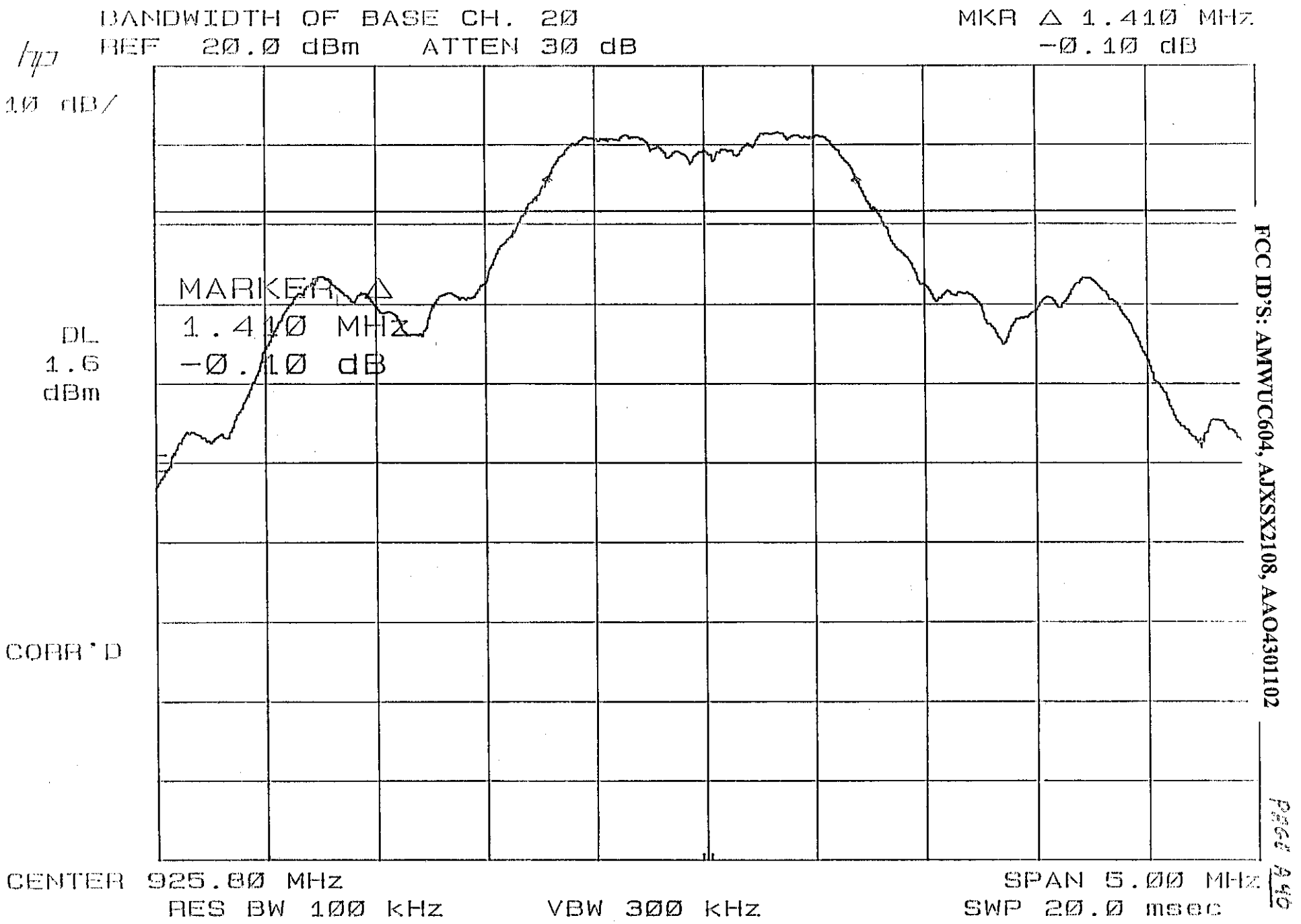
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE #39

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

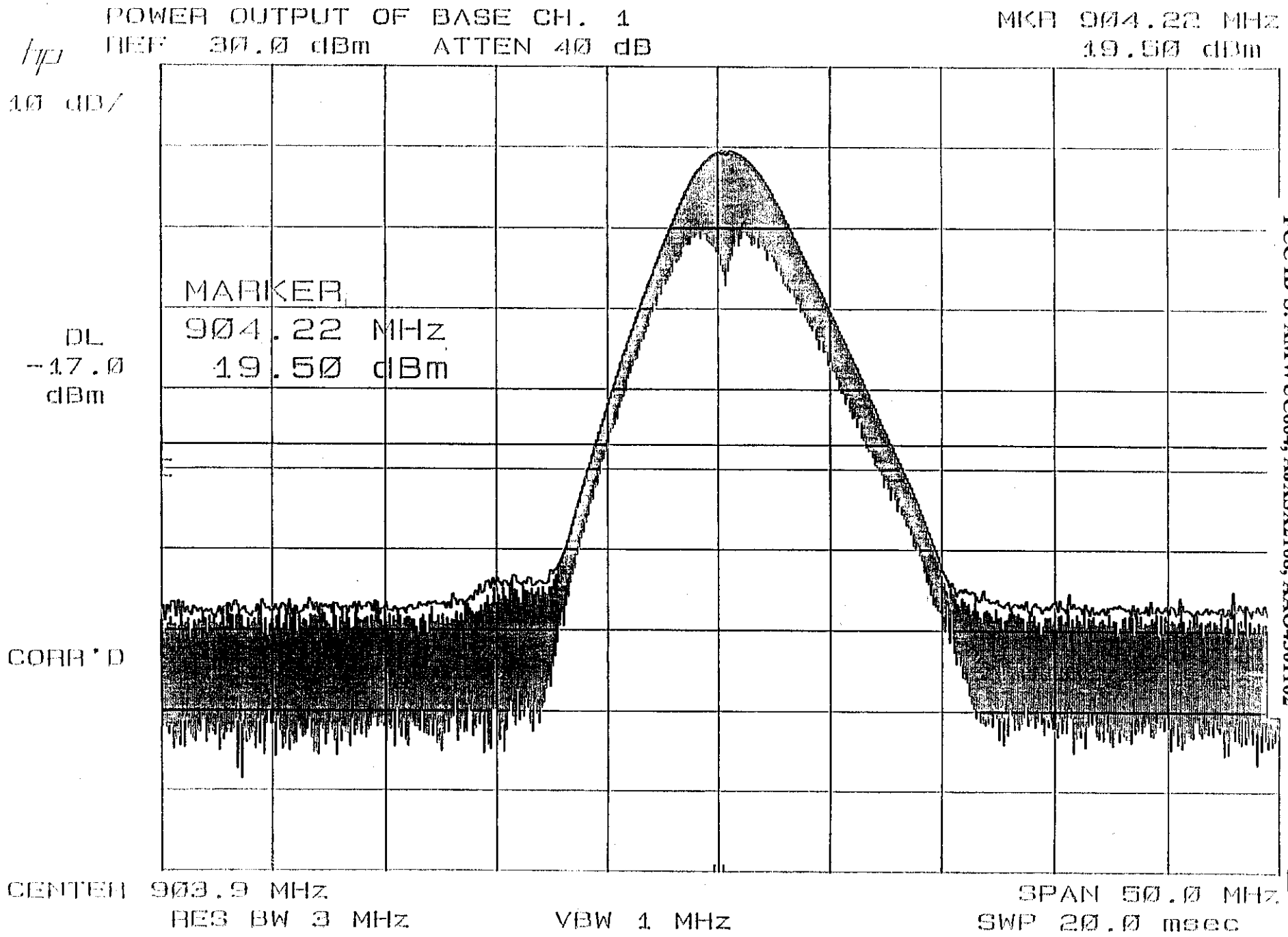
Page A40

SECTION 15.247 (b)

POWER OUTPUT OF BASE

PAGE A42 - CHANNEL 1
PAGE A43 - CHANNEL 10
PAGE A44 - CHANNEL 20

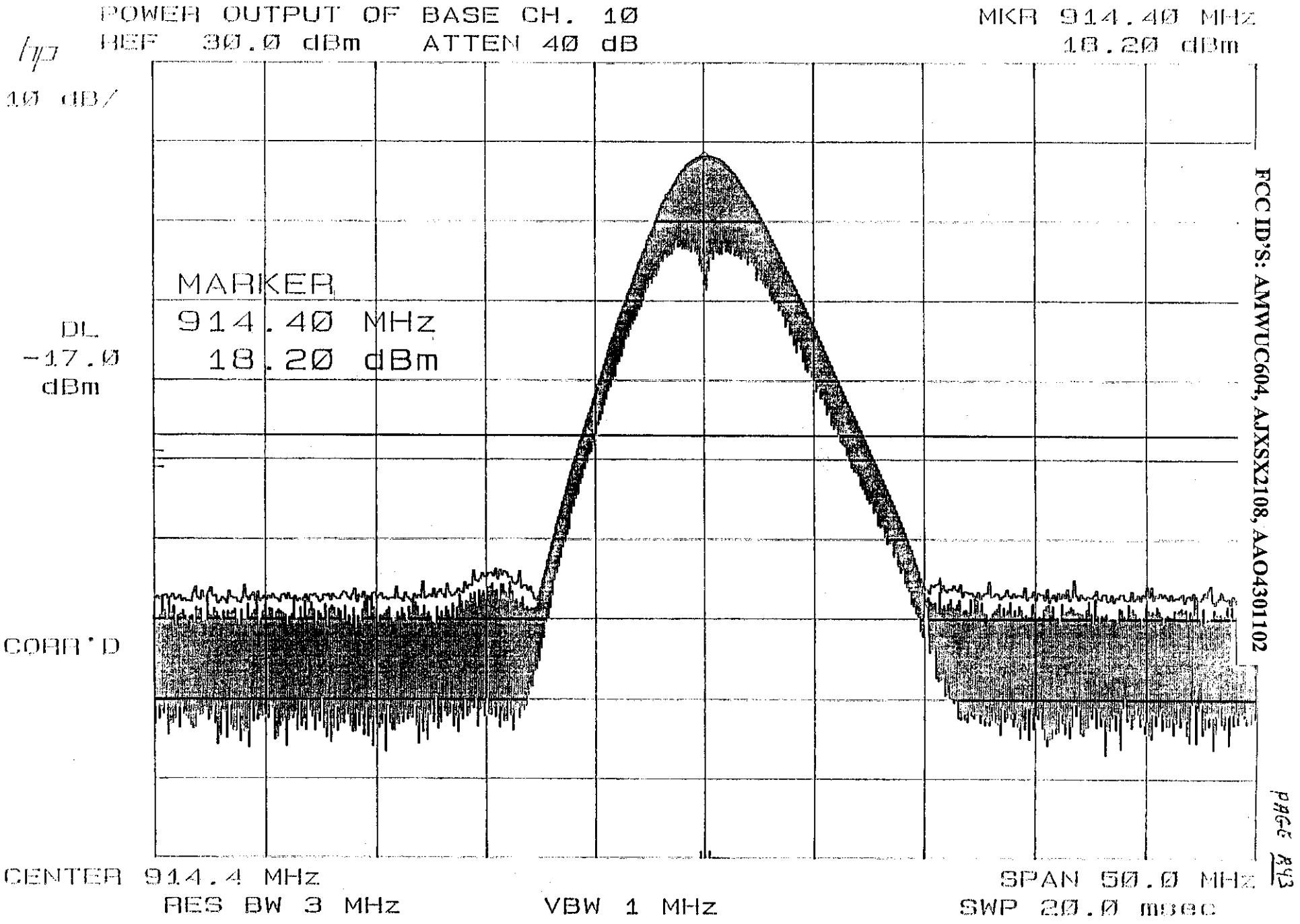
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

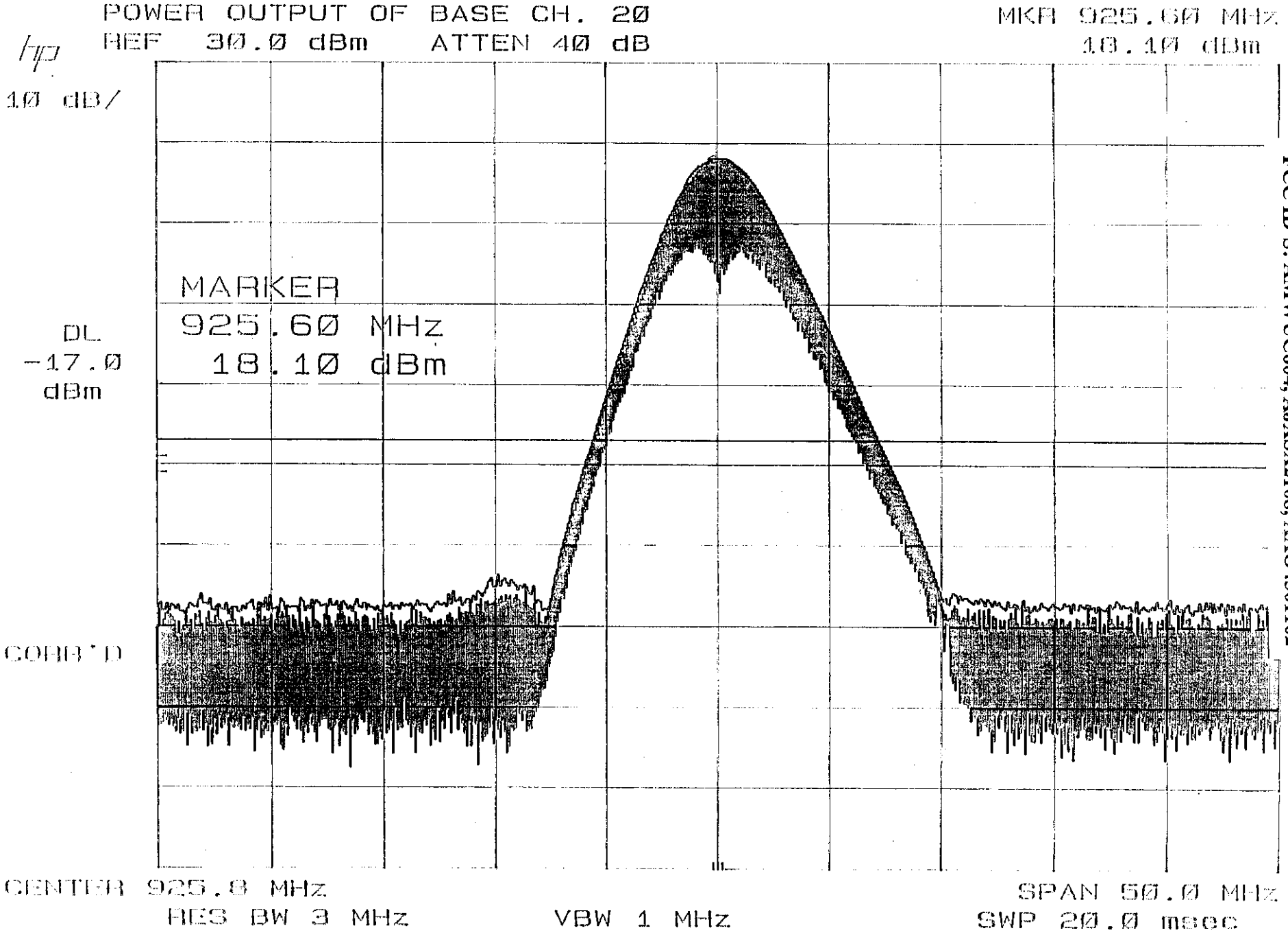
PAGE #42

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

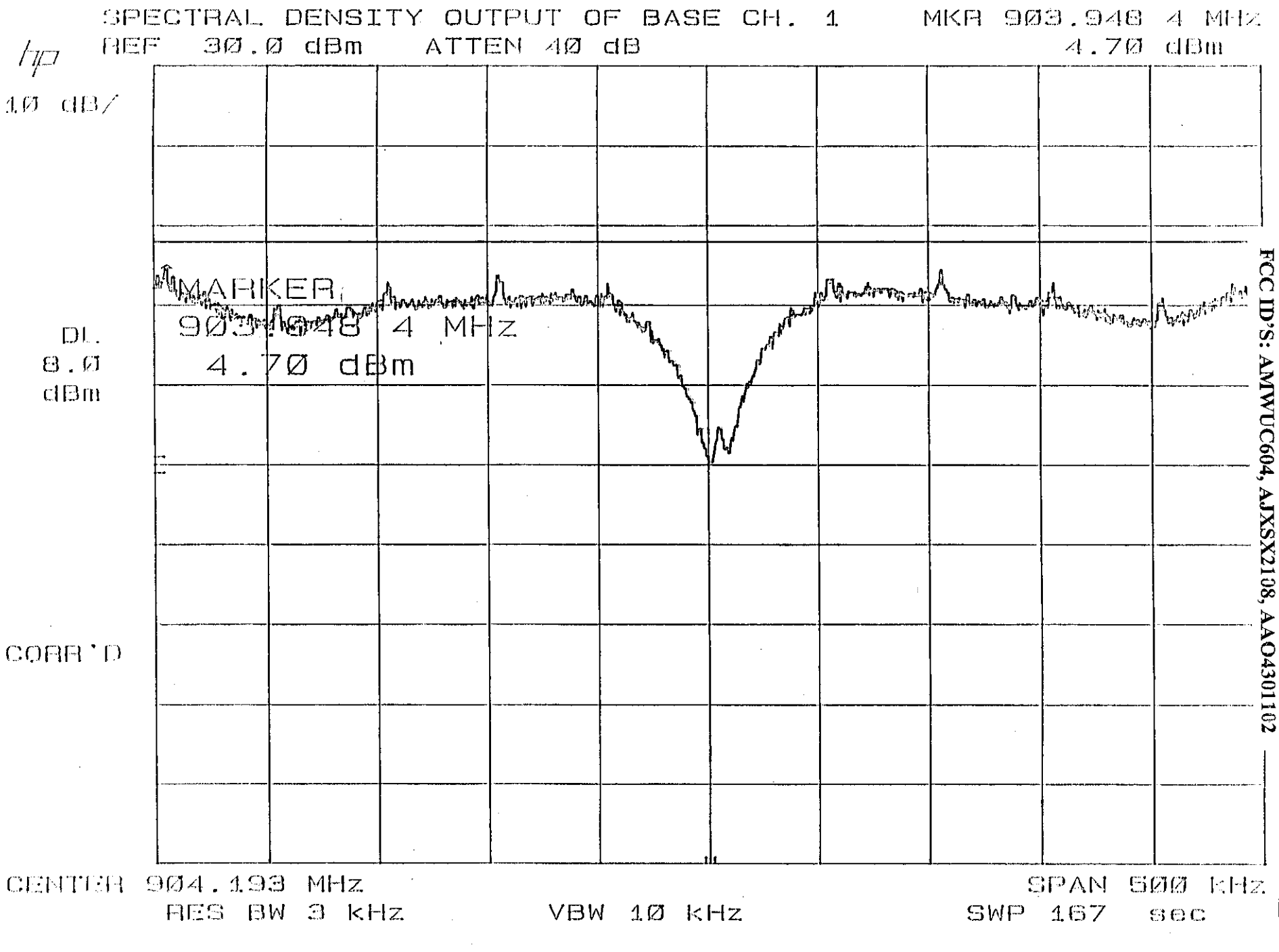
PAGE A44

SECTION 15.247 (d)

SPECTRAL DENSITY OUTPUT OF BASE

PAGE A46 - CHANNEL 1
PAGE A47 - CHANNEL 10
PAGE A48 - CHANNEL 20

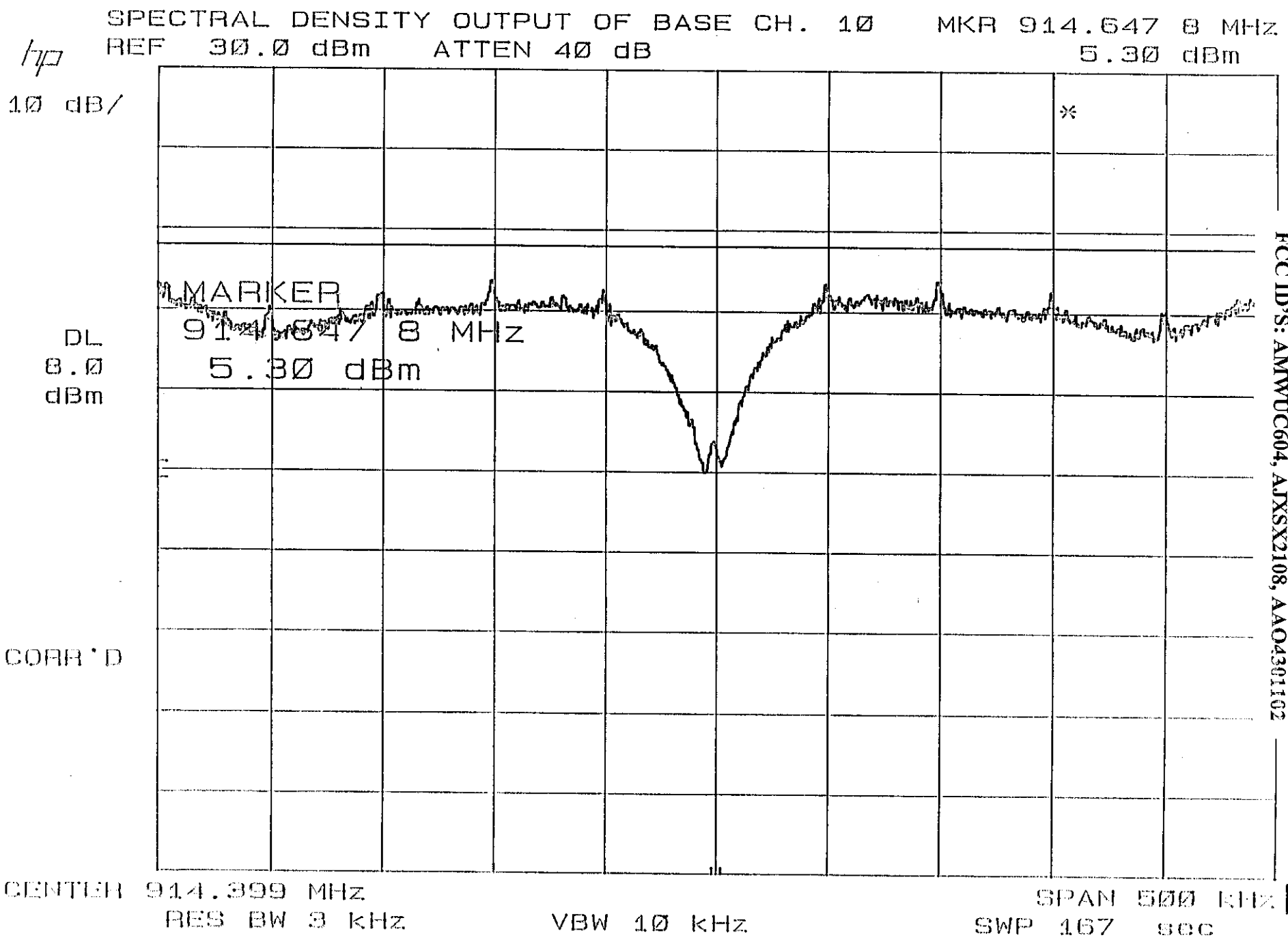
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 446

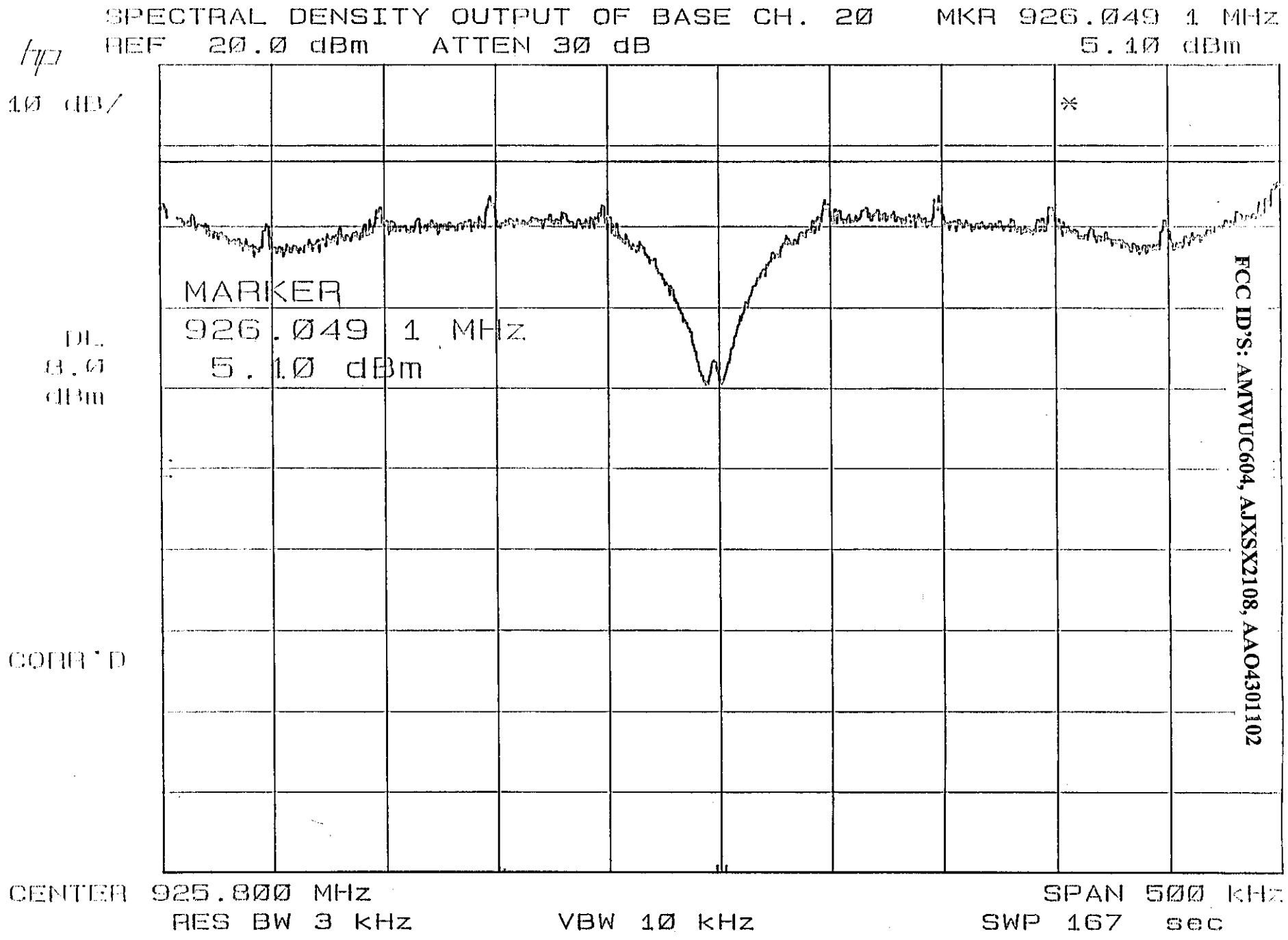
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO430102

Page 4 of 4

4-14-98



PAGE 4 of 8

SECTION 15.247 (c)

RF ANTENNA CONDUCTED EMISSIONS TEST FOR BASE

PAGES A50-A53 - CHANNEL 1
PAGES A54-A56 - CHANNEL 10
PAGES A57-A60 - CHANNEL 20

4-14-98

RF ANT. COND. TEST BASE 2MHZ-1GH CH. 1

hp REF 30.0 dBm ATTEN 40 dB

MKR 903 MHz
11.70 dBm

10 dB/

DISPLAY LINE
-8.3 dBm

DL
-8.3
dBm

CORR'D

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

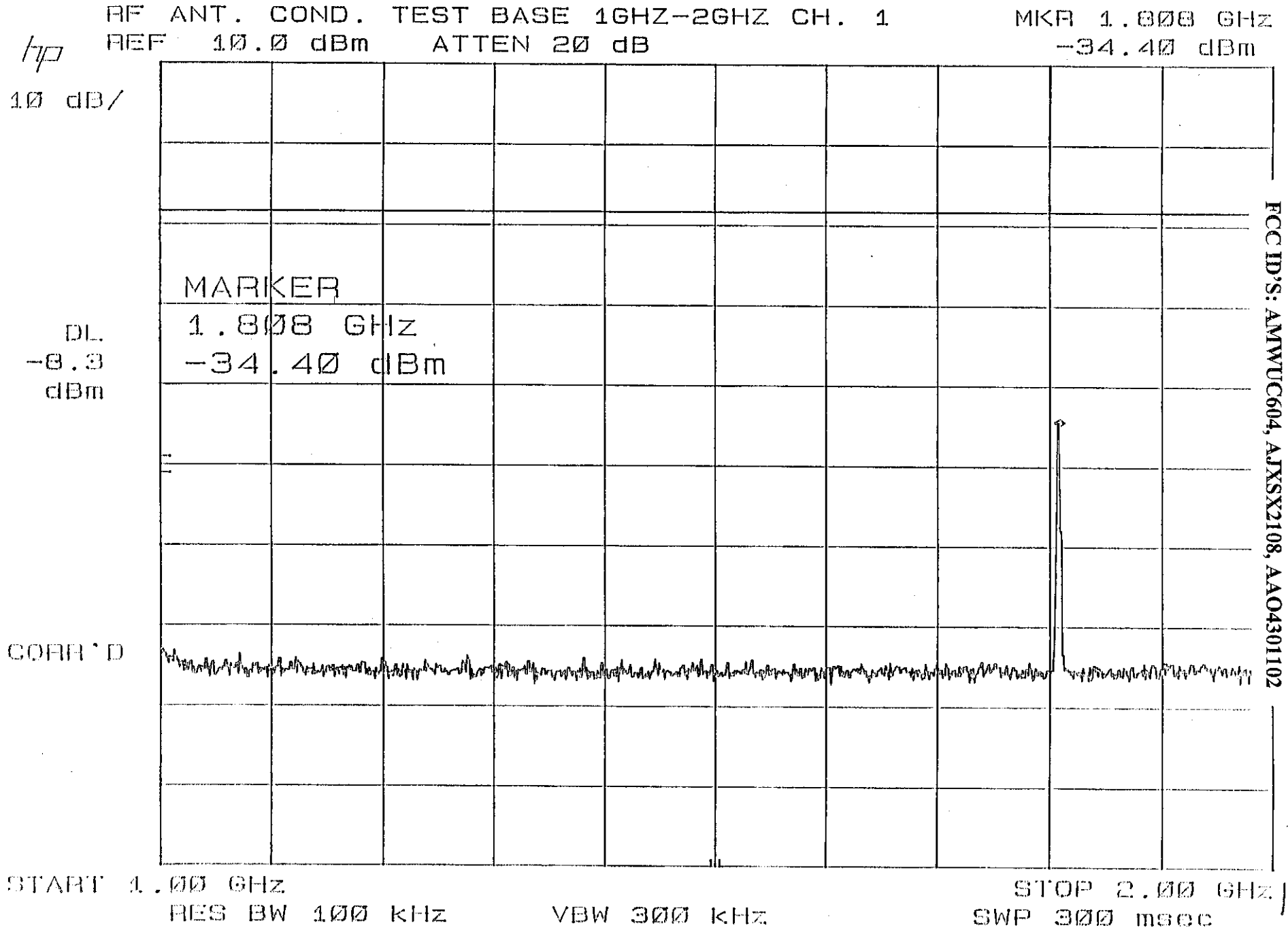
START 2 MHz

STOP 1.00 GHz

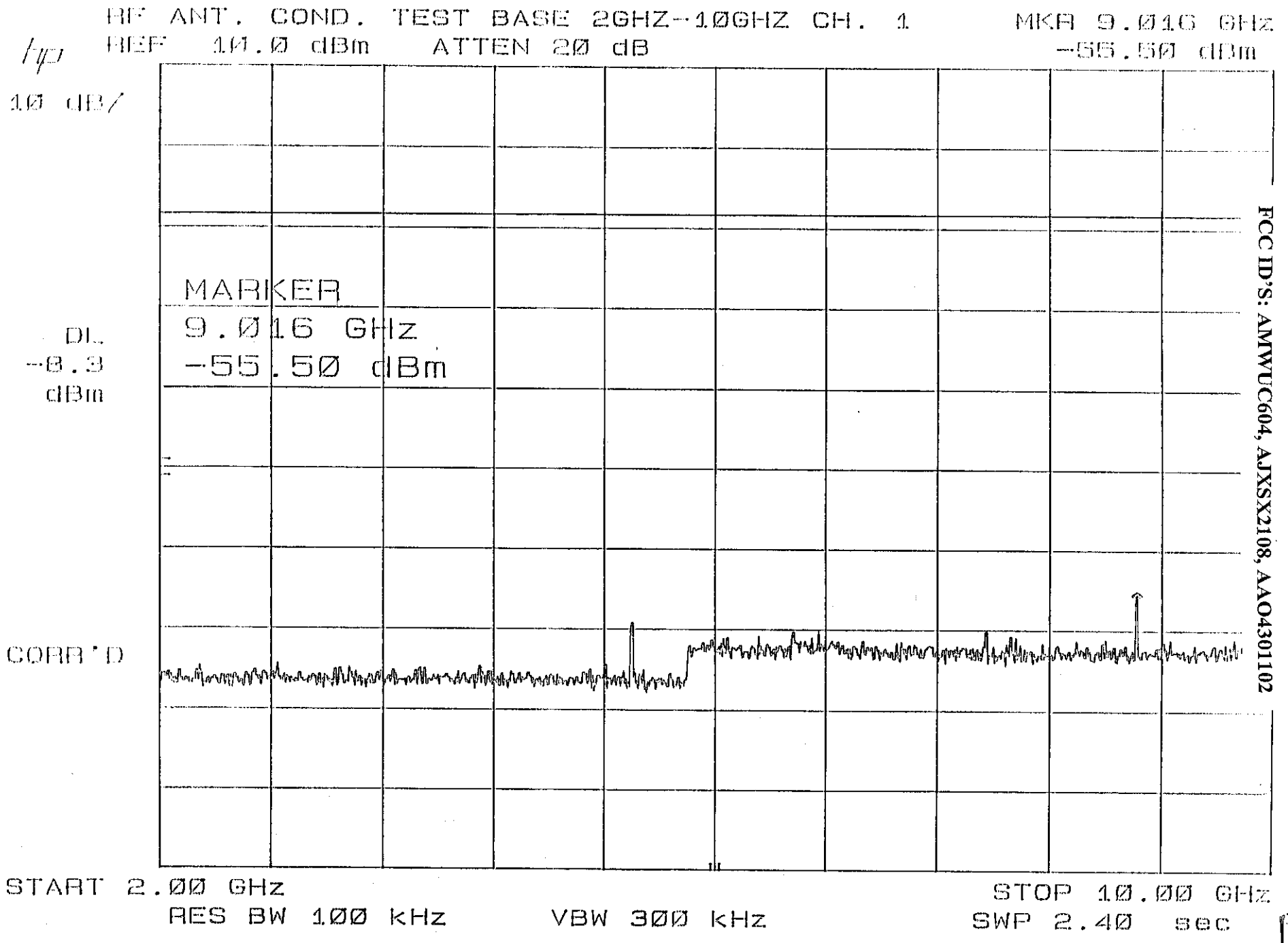
RES BW 100 kHz VBW 300 kHz SWP 299 msec

PAGE 45

4-14-98

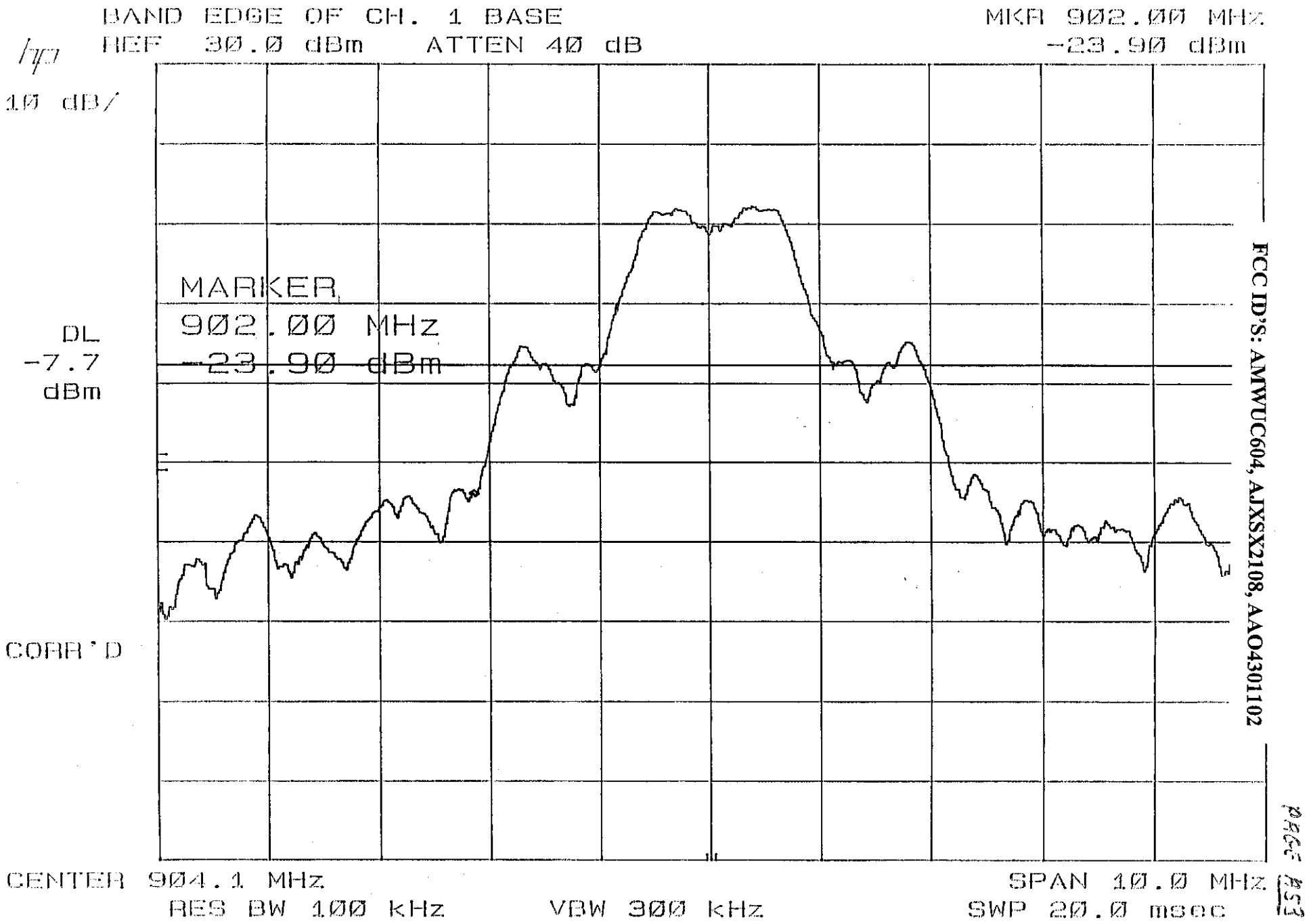


FCC ID'S: AMWUC604, AJXSX2108, AAO4301102



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

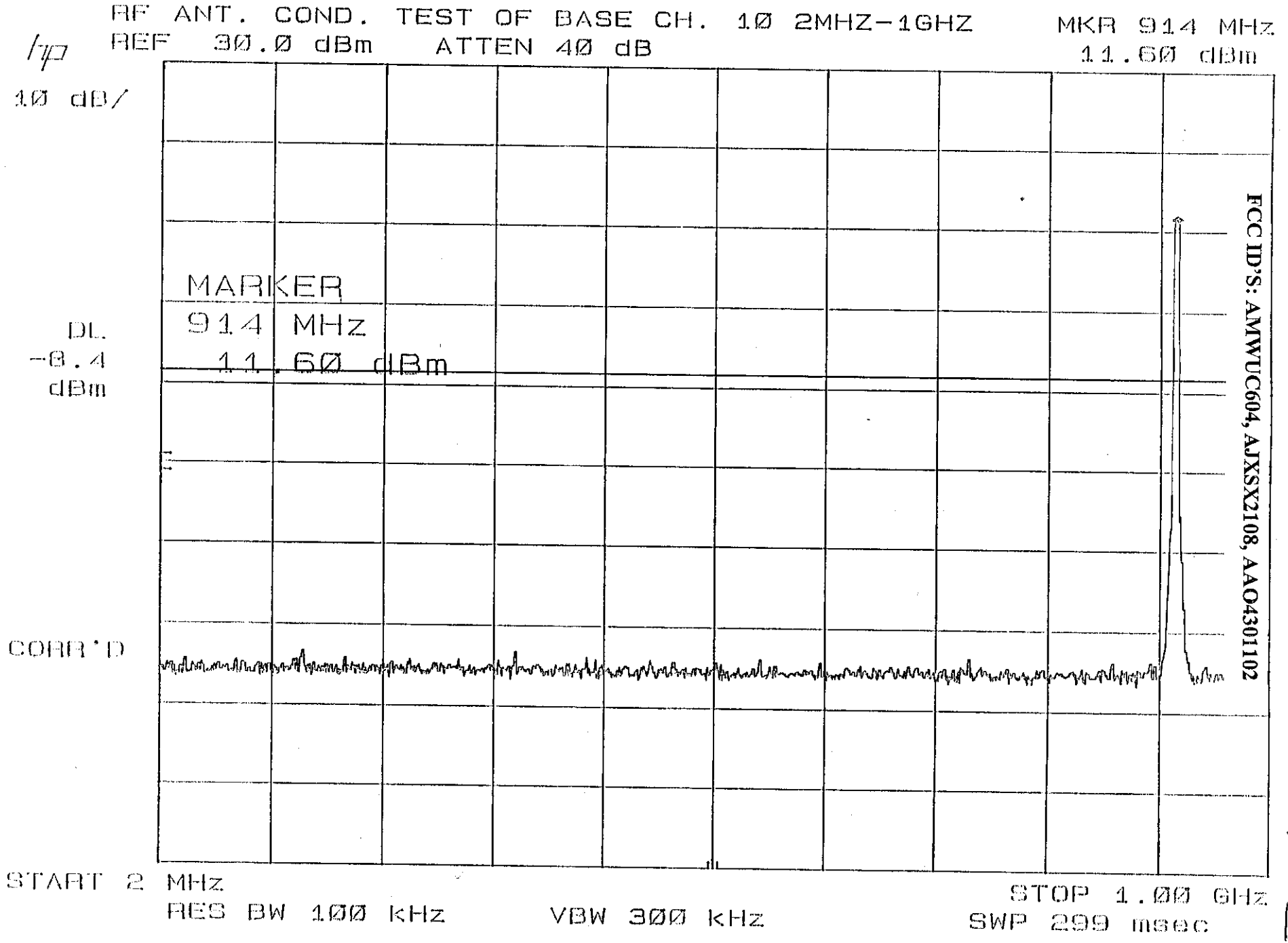
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

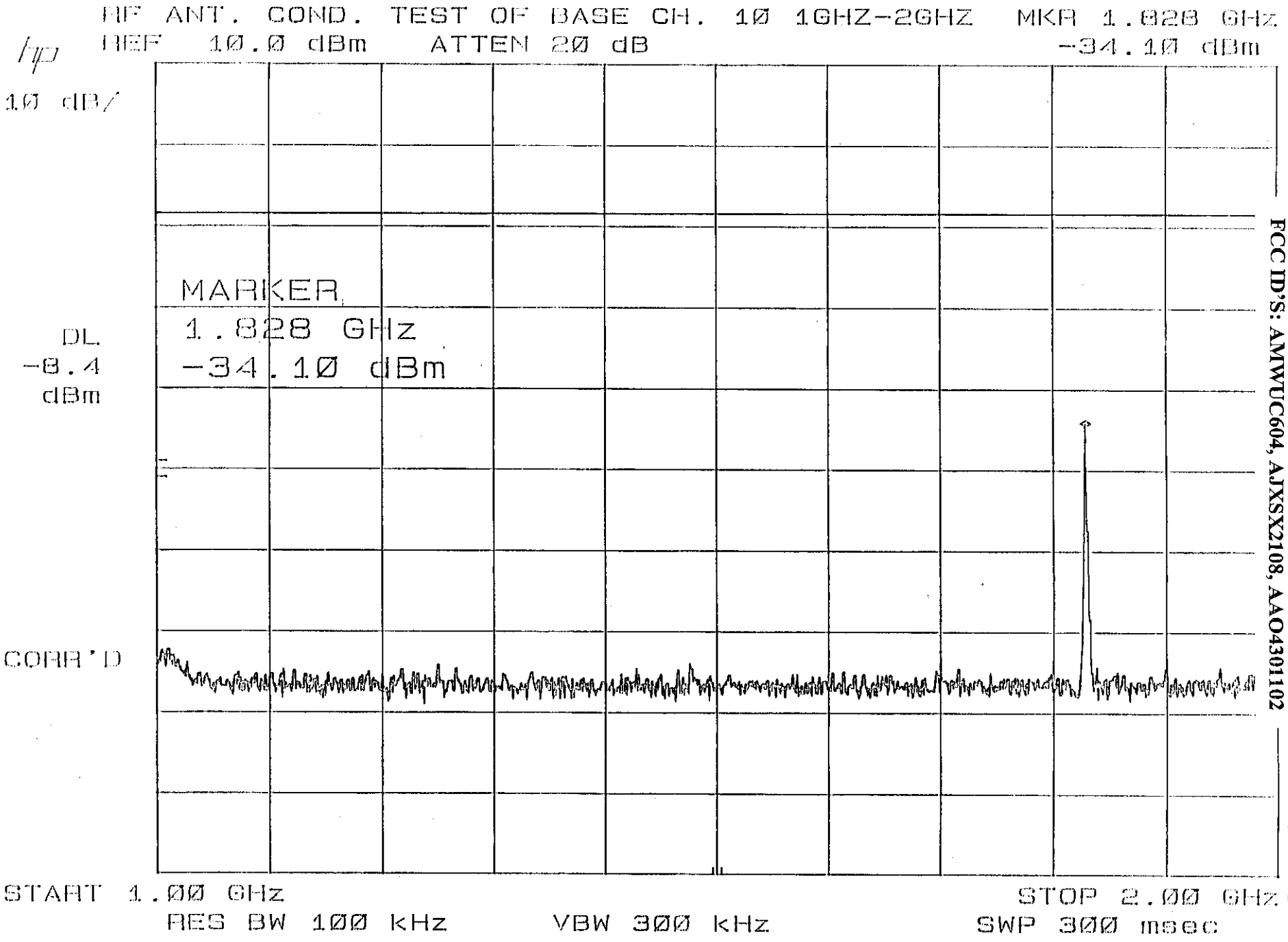
PAGE 53

4-14-98



Page 854

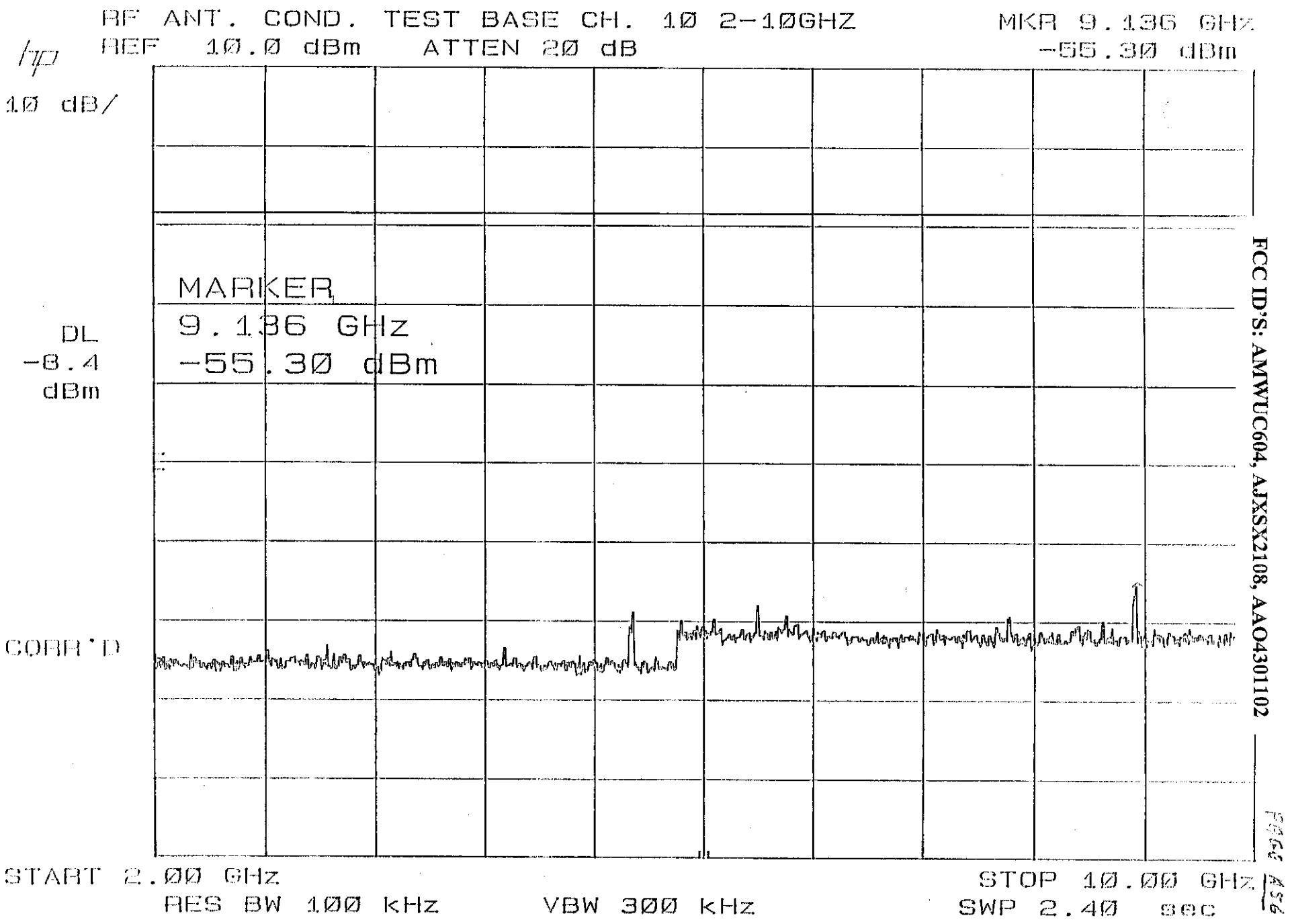
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 45

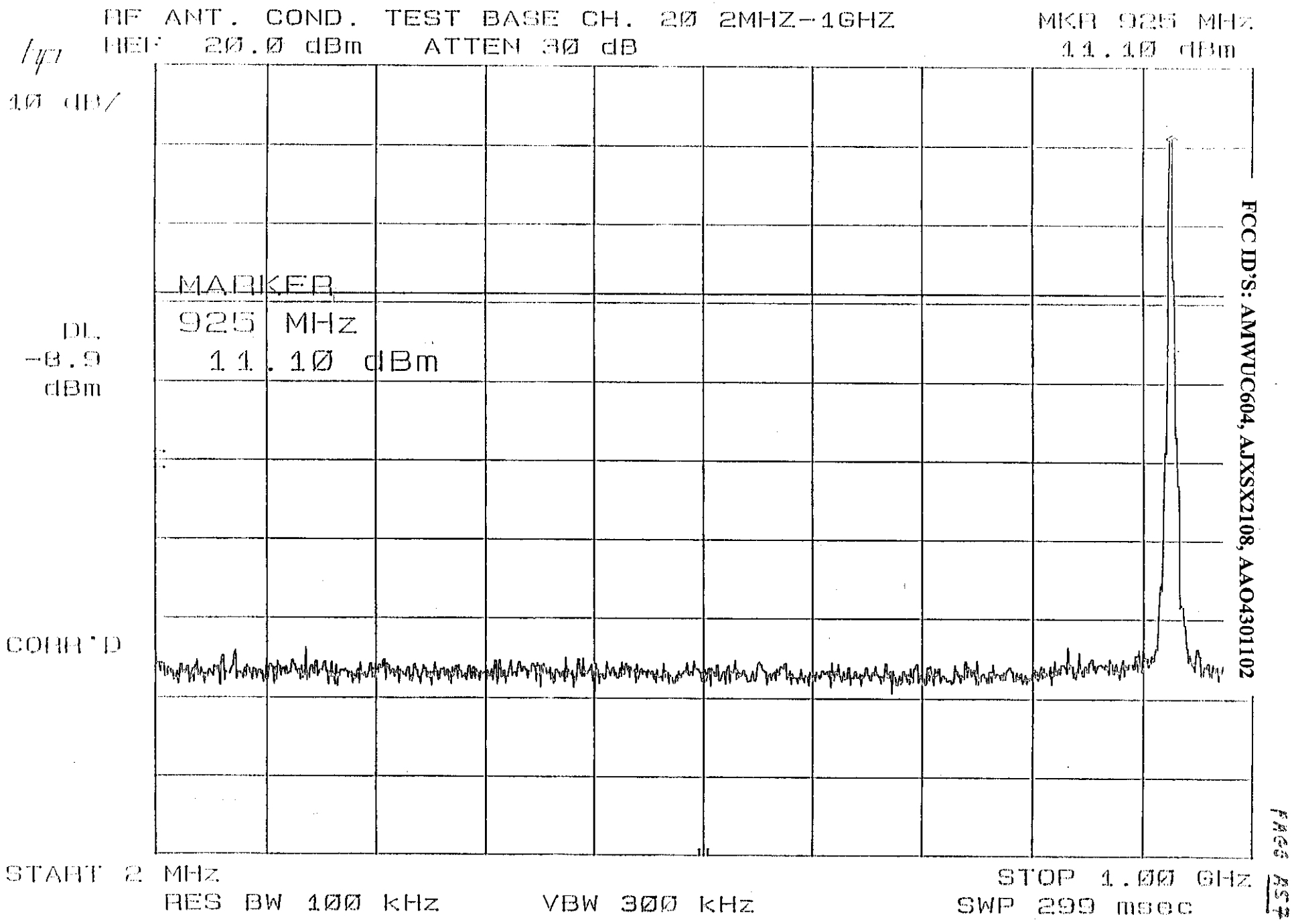
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

Page 45

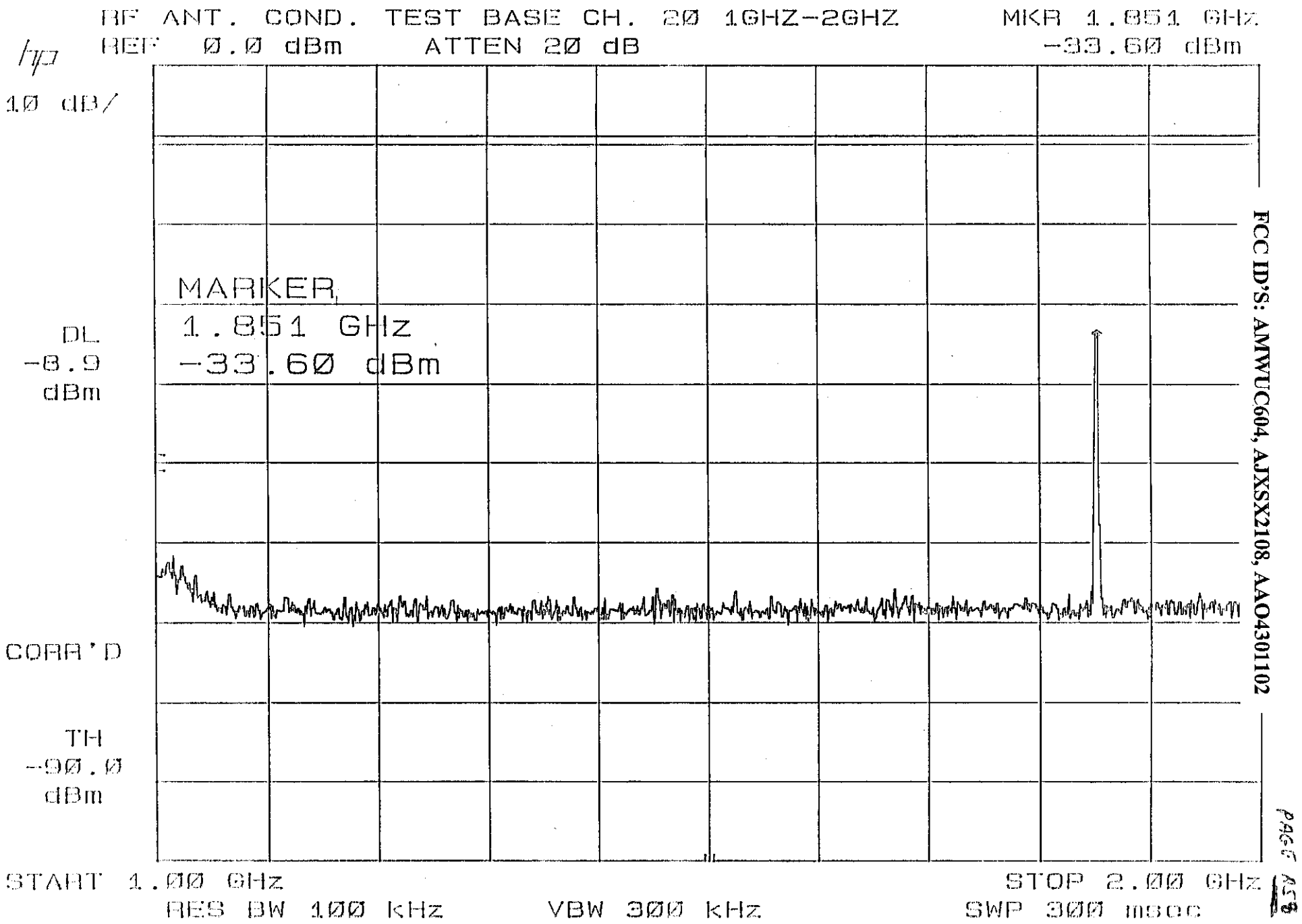
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

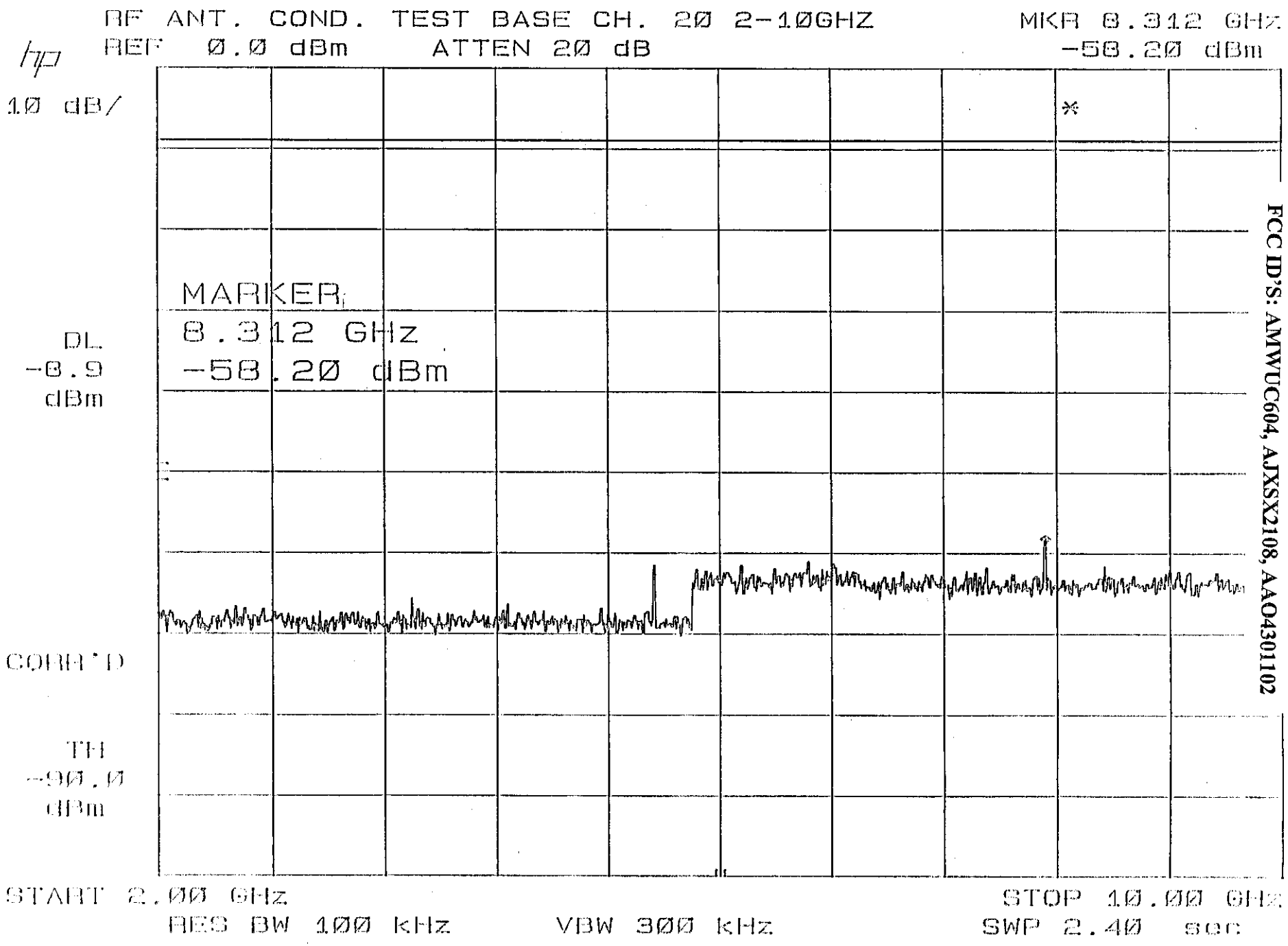
PAGE 45

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

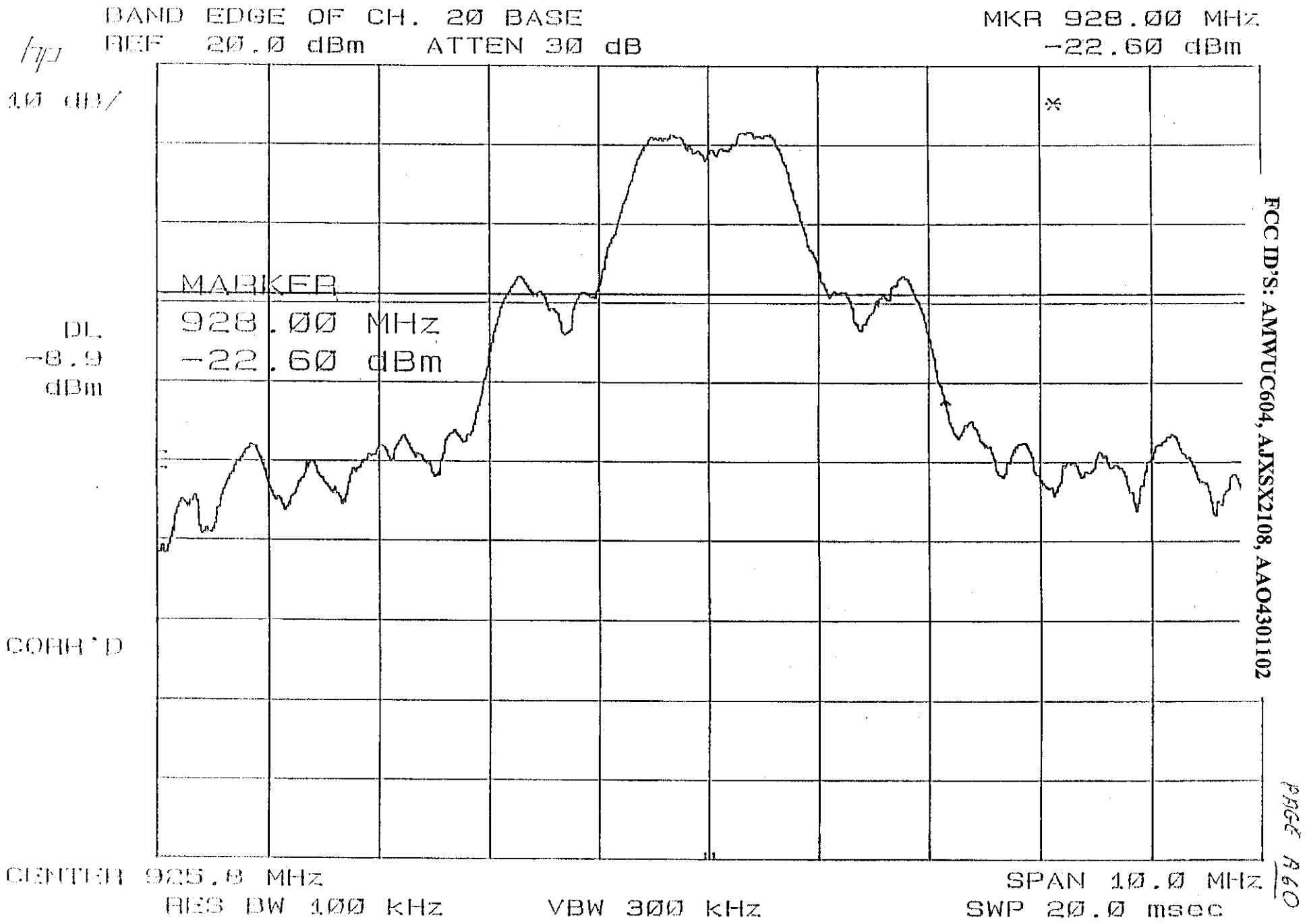
4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 157

4-14-98



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

PAGE 160

SECTION 15.247 (c)

RADIATED EMISSIONS FOR THE BASE

COMPATIBLE ELECTRONICS FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION DATE: 4-13-98

EUT: 900 MHZ SPREAD SPECTRUM CORDLESS PHONE EUT S/N: PROTOTYPE

EUT MODEL: EXS 9110 LOCATION: ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 CLASS: ____ TEST DISTANCE: 3M LAB: D

ANTENNA: ■ LOOP ☐ BICONICAL ☐ LOG ☐ HORN POLARIZATION: ☐ VERT ☐ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ☐ ENGINEER: KYLE F.

NOTES: BASE UNIT

Frequency (kHz)	Peak Reading (dBuV)	Avg. ☐ Q.P. ☐ (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
			NO EMISSIONS FOUND						
			BETWEEN 10KHZ AND 30MHZ						
			FOR THE BASE.						

* CORRECTED READING = METER READING - DISTANCE FACTOR - ANTENNA GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

Test location: Compatible Electronics
Customer : UNIDEN CORPORATION Date : 4/13/1998
Manufacturer : UNIDEN CORPORATION Time : 9.55
EUT name : 900 MHZ SPREAD SPECTRUM CORDLESS PHONE Model: EXS9110
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
BASE UNIT - SPURIOUS EMISSIONS
TEMPERATURE 51 DEGREES F.
RELATIVE HUMIDITY 88%

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	38.44	59.10	0.50	11.77	38.98	32.38	40.00	-7.62
2V	60.04	55.70	0.70	10.70	38.90	28.20	40.00	-11.80
3V	82.39	52.70	0.72	8.75	38.32	23.85	40.00	-16.15
4V	85.10	53.50	0.75	8.70	38.35	24.60	40.00	-15.40
5V	111.95	47.70	0.95	10.42	38.74	20.33	43.50	-23.17
6V	115.24	54.40	0.96	10.61	38.80	27.17	43.50	-16.33
7V	120.04	54.80	0.98	10.90	38.90	27.78	43.50	-15.72
8V	172.81	40.10	1.38	14.53	38.60	17.41	43.50	-26.09
9V	182.45	53.70	1.40	14.96	38.72	31.34	43.50	-12.16
10V	192.03	50.00	1.40	15.42	38.87	27.95	43.50	-15.55
11V	201.64	60.10	1.40	15.84	38.98	38.36	43.50	-5.14
12V	220.84	59.60	1.40	16.30	38.75	38.55	46.00	-7.45
13V	224.85	42.40	1.40	16.40	38.70	21.49	46.00	-24.51
14V	278.44	44.00	1.71	19.57	38.69	26.60	46.00	-19.40
15V	307.25	46.50	1.81	14.03	38.64	23.70	46.00	-22.30
16V	316.83	46.60	1.83	14.07	38.70	23.80	46.00	-22.20
17V	336.09	48.30	1.87	14.14	38.82	25.50	46.00	-20.50
18V	345.68	49.20	1.89	14.18	38.87	26.40	46.00	-19.60
19V	355.24	54.10	1.91	14.80	38.84	31.97	46.00	-14.03
20V	360.05	49.90	1.92	15.35	38.78	28.39	46.00	-17.61
21V	364.82	57.20	1.93	15.89	38.72	36.30	46.00	-9.70
22V	374.44	56.70	1.95	16.99	38.61	37.03	46.00	-8.97
23V	384.04	59.90	1.97	18.08	38.56	41.38	46.00	-4.62
24V	393.64	52.00	1.99	19.18	38.53	34.64	46.00	-11.36
25V	403.24	55.80	2.01	19.61	38.48	38.94	46.00	-7.06
26V	412.83	54.30	2.05	18.75	38.42	36.67	46.00	-9.33
27V	422.44	51.00	2.09	17.88	38.37	32.60	46.00	-13.40
28V	441.63	53.50	2.17	16.15	38.25	33.57	46.00	-12.43
29V	451.26	56.10	2.21	15.43	38.21	35.53	46.00	-10.47
30V	460.84	52.40	2.27	15.66	38.31	32.02	46.00	-13.98

Test location: Compatible Electronics
Customer : UNIDEN CORPORATION Date : 4/13/1998
Manufacturer : UNIDEN CORPORATION Time : 9.55
EUT name : 900 MHZ SPREAD SPCTRUM CORDLESS PHONE Model: EXS9110
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
BASE UNIT - SPURIOUS EMISSIONS
TEMPERATURE 51 DEGREES F.
RELATIVE HUMIDITY 88%

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
31V	480.05	51.40	2.38	16.12	38.50	31.40	46.00	-14.60
32V	499.24	53.60	2.50	16.58	38.69	33.98	46.00	-12.02
33V	508.83	50.70	2.57	16.49	38.59	31.17	46.00	-14.83
34V	518.43	52.30	2.65	16.38	38.48	32.85	46.00	-13.15
35V	537.64	51.30	2.80	16.15	38.25	32.00	46.00	-14.00
36V	547.23	50.50	2.88	16.03	38.13	31.28	46.00	-14.72
37V	556.83	50.00	2.91	16.37	38.15	31.13	46.00	-14.87
38V	576.05	45.10	2.95	17.41	38.31	27.15	46.00	-18.85
39V	585.64	49.40	2.97	17.92	38.39	31.91	46.00	-14.09
40V	604.84	51.00	3.04	18.78	38.51	34.31	46.00	-11.69
41V	624.04	46.90	3.19	19.08	38.55	30.63	46.00	-15.37
42V	681.64	45.60	3.46	20.51	38.22	31.36	46.00	-14.64
43V	748.83	42.60	3.79	23.54	38.20	31.74	46.00	-14.26
44V	787.24	46.60	4.10	22.11	37.83	34.98	46.00	-11.02
45V	844.85	44.50	4.20	22.95	38.06	33.59	46.00	-12.41
46V	921.63	50.20	4.19	23.17	37.28	40.27	46.00	-5.73
47V	940.84	48.00	4.26	23.05	37.09	38.23	46.00	-7.77

FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

Test location: Compatible Electronics
Customer : UNIDEN CORPORATION Date : 4/13/1998
Manufacturer : UNIDEN CORPORATION Time : 10.49
EUT name : 900 MHZ SPREAD SPECTRUM CORDLESS PHONE Model: EXS9110
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
BASE UNIT - SPURIOUS EMISSIONS
TEMPERATURE 51 DEGREES F.
RELATIVE HUMIDITY 88%

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1H	48.02	55.00	0.58	11.50	39.00	28.08	40.00	-11.92
2H	72.83	54.10	0.70	9.52	38.52	25.80	40.00	-14.20
3H	158.73	50.90	1.27	14.08	38.60	27.65	43.50	-15.85
4H	182.46	49.40	1.40	14.96	38.72	27.04	43.50	-16.46
5H	192.04	48.70	1.40	15.42	38.87	26.65	43.50	-16.85
6H	201.63	58.30	1.40	15.84	38.98	36.56	43.50	-6.94
7H	220.84	62.20	1.40	16.30	38.75	41.15	46.00	-4.85
8H	230.44	52.50	1.44	16.55	38.68	31.82	46.00	-14.18
9H	278.43	48.00	1.71	19.57	38.69	30.60	46.00	-15.40
10H	297.65	45.70	1.79	21.11	38.61	29.99	46.00	-16.01
11H	311.23	49.10	1.82	14.04	38.67	26.30	46.00	-19.70
12H	336.04	57.10	1.87	14.14	38.82	34.30	46.00	-11.70
13H	345.64	53.90	1.89	14.18	38.87	31.10	46.00	-14.90
14H	355.23	56.70	1.91	14.80	38.84	34.57	46.00	-11.43
15H	364.85	61.10	1.93	15.89	38.72	40.20	46.00	-5.80
16H	374.43	57.60	1.95	16.98	38.61	37.93	46.00	-8.07
17H	384.03	56.80	1.97	18.08	38.56	38.28	46.00	-7.72
18H	403.24	51.00	2.01	19.61	38.48	34.14	46.00	-11.86
19H	412.84	55.90	2.05	18.74	38.42	38.27	46.00	-7.73
20H	432.09	51.90	2.13	17.01	38.31	32.73	46.00	-13.27
21H	441.64	54.80	2.17	16.15	38.25	34.87	46.00	-11.13
22H	451.24	47.10	2.21	15.43	38.21	26.52	46.00	-19.48
23H	460.85	51.50	2.27	15.66	38.31	31.12	46.00	-14.88
24H	480.03	48.80	2.38	16.12	38.50	28.80	46.00	-17.20
25H	508.85	49.20	2.57	16.49	38.59	29.67	46.00	-16.33
26H	528.03	50.70	2.72	16.26	38.36	31.32	46.00	-14.68
27H	604.84	44.90	3.04	18.78	38.51	28.21	46.00	-17.79
28H	614.47	41.20	3.12	18.93	38.53	24.72	46.00	-21.28
29H	672.07	40.70	3.44	20.21	38.34	26.02	46.00	-19.98
30H	796.82	38.70	4.17	21.73	37.73	26.87	46.00	-19.13

Test location: Compatible Electronics
Customer : UNIDEN CORPORATION Date : 4/13/1998
Manufacturer : UNIDEN CORPORATION Time : 10.49
EUT name : 900 MHZ SPREAD SPECTRUM CORDLESS PHONE Model: EXS9110
Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor(20*log(test/spec)) : 0.00
Test Mode :
BASE UNIT - SPURIOUS EMISSIONS
TEMPERATURE 51 DEGREES F.
RELATIVE HUMIDITY 88%

Pol	Freq	Rdng	Cable loss	Ant factor	Amp gain	Cor'd rdg = R	limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV	dBuV/m	dB
31H	921.67	45.10	4.19	23.17	37.28	35.17	46.00	-10.83
32H	950.49	39.40	4.30	22.99	37.01	29.69	46.00	-16.31

COR ELECTRONICS FCC ID'S: AMWUC604, AJXSX2108, AAO4301102 PAGE 7 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION DATE: 4-17-98

EUT: 900 MHZ SPREAD SPECTRUM PHONE EUT S/N: PROTOTYPE

EUT MODEL: EXS9110 LOCATION: ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 CLASS: ____ TEST DISTANCE: 3M LAB: D

ANTENNA: ☐ LOOP ☐ BICONICAL ■ LOG ■ HORN POLARIZATION: ■ VERT ☐ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.

NOTES: BASE - CH. 1

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.904	111.6	105.6	2.0	0	23.3	-	33.3	95.6	—	—
1.808	62.2	56.2	2.0	180	24.5	5.9	29.0	57.6	-18.0	75.6
2.712	46.8	40.8	2.0	180	28.2	5.5	26.8	47.7	-6.3	54.0
3.616	42.6	36.6	1.5	180	29.6	6.9	23.9	49.2	-4.8	54.0
4.521	35.1	29.1	1.0	180	30.9	8.6	22.1	46.5	-7.5	54.0
5.425	37.6	31.6	1.0	180	32.4	9.2	32.0	41.2	-12.8	54.0
6.329	41.1	35.1	1.0	180	34.3	10.3	32.0	47.7	-27.9	75.6
7.234	39.6	33.6	1.5	90	36.8	11.4	32.0	49.8	-4.2	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

COMPLIANCE ELECTRONICS **FCC ID'S: AMWUC604, AJXSX2108, AAO4301102** iE 8 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHz SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXS9110 **LOCATION:** ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ■ LOG ■ HORN **POLARIZATION:** ☐ VERT ■ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: BASE - CH. 1

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.904	109.2	103.2	1.0	0	23.2	-	33.2	93.2	—	-
1.808	55.7	49.7	1.0	90	24.5	5.9	29.0	51.1	-24.5	75.6
2.713	44.0	38.0	1.0	90	28.2	5.5	26.8	44.9	-9.1	54.0
3.616	44.0	38.0	1.0	180	29.6	6.9	23.9	50.6	-3.4	54.0
4.520	37.1	31.1	1.0	180	30.9	8.6	22.1	48.5	-5.5	54.0
5.425	36.1	30.1	1.0	180	32.9	9.2	32.0	39.7	-14.3	54.0
6.329	41.7	35.7	2.0	180	34.3	10.3	32.0	48.3	-27.3	75.6
7.234	39.2	33.2	1.5	90	36.8	11.4	32.0	49.4	-4.6	54.0

* **CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** **DELTA** = CORRECTED READING - SPECIFICATION LIMIT

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHZ SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXS9110 **LOCATION:** ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN **POLARIZATION:** ☒ VERT ☐ HORIZ

☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: BASE CH. 10

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.914	111.5	105.5	2.0	0	23.2	–	33.2	95.2	–	–
1.828	65.7	59.7	3.0	0	24.5	5.9	29.0	61.1	-14.1	75.2
2.712	47.4	41.4	1.0	0	28.2	5.5	26.8	48.3	-5.7	54.0
3.658	44.9	38.9	1.0	0	29.6	6.9	23.9	51.5	-2.5	54.0
4.571	37.8	31.8	1.0	0	30.9	8.6	22.1	49.2	-4.8	54.0
5.486	38.1	32.1	1.0	0	32.4	9.2	32.0	41.7	-12.3	54.0
6.400	46.9	40.9	1.0	0	34.3	10.3	32.0	53.5	-21.7	75.2
7.315	39.5	33.5	3.0	0	36.8	11.4	32.0	49.7	-4.3	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

RADIATED EMISSIONS

COMPANY NAME: Uniden Corporation **DATE:** 4-17-98

EUT: 900 MHz Spread Spectrum Phone **EUT S/N:** Prototype

EUT MODEL: EXS9110 **LOCATION:** ■ BREA □ SILVERADO □ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: □ LOOP □ BICONICAL ■ LOG ■ HORN **POLARIZATION:** □ VERT ■ HORIZ

■ QUALIFICATION □ ENGINEERING □ MFG. AUDIT **ENGINEER:** Kyle R.

NOTES: Base - Ch. 10

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.914	110.2	104.2	1.0	0	23.2	–	33.2	94.2	–	–
1.829	55.2	49.2	1.0	90	24.5	5.9	29.0	50.6	-24.6	75.2
2.743	46.8	40.8	1.0	180	28.2	5.5	26.8	47.7	-6.3	54.0
3.658	42.3	36.3	1.0	180	29.6	6.9	23.9	48.9	-5.1	54.0
4.572	36.1	30.1	1.0	180	30.9	8.6	22.1	47.5	-6.5	54.0
5.486	37.7	31.7	1.0	0	32.4	9.2	32.0	41.3	-12.7	54.0
6.400	42.9	36.9	1.0	180	34.3	10.3	32.0	49.5	-25.7	75.2
7.315	48.8	34.8	1.0	180	36.8	11.4	32.0	51.0	-3.0	54.0

* **CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** **DELTA** = CORRECTED READING - SPECIFICATION LIMIT

COM ELECTRONICS FCC ID'S: AMWUC604, AJXSX2108, AAO4301102 GE 11 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION **DATE:** 4-17-98

EUT: 900 MHZ SPREAD SPECTRUM PHONE **EUT S/N:** PROTOTYPE

EUT MODEL: EXS9110 **LOCATION:** ■ BREA □ SILVERADO □ AGOURA

SPECIFICATION: FCC 15.247 **CLASS:** _____ **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: □ LOOP □ BICONICAL ■ LOG ■ HORN **POLARIZATION:** ■ VERT □ HORIZ

■ QUALIFICATION □ ENGINEERING □ MFG. AUDIT **ENGINEER:** KYLE F.

NOTES: BASE - CH. 20

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.926	111.3	105.3	1.0	0	23.2	-	33.1	95.4	-	-
1.862	63.0	57.0	3.0	180	24.5	5.7	29.1	58.1	-17.3	75.4
2.777	47.3	41.3	1.5	180	29.7	6.4	28.2	49.2	-4.8	54.0
3.703	44.9	38.9	1.5	180	29.6	6.9	23.9	51.5	-2.5	54.0
4.629	35.7	29.7	1.0	180	30.9	8.6	22.1	47.1	-6.9	54.0
5.554	38.5	32.5	2.0	180	32.4	9.2	32.0	42.1	-11.9	54.0
6.481	42.9	36.9	2.0	90	34.3	10.3	32.0	49.5	-25.9	75.4
7.406	39.4	33.4	3.0	0	36.8	11.4	32.0	49.6	-4.4	54.0
8.332	35.6	29.6	2.0	0	37.1	12.5	30.5	48.7	-5.3	54.0

* **CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** **DELTA** = CORRECTED READING - SPECIFICATION LIMIT

COM. ELECTRONICS FCC ID'S: AMWUC604, AJXSX2108, AAO4301102 PAGE 12 of 12

RADIATED EMISSIONS

COMPANY NAME: UNIDEN CORPORATION DATE: 4-17-98

EUT: 900 MHz Spread Spectrum Phone EUT S/N: PROTOTYPE

EUT MODEL: EXS9110 LOCATION: ■ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC15.247 CLASS: ____ TEST DISTANCE: 3M LAB: D

ANTENNA: ☐ LOOP ☐ BICONICAL ■ LOG ■ HORN POLARIZATION: ☐ VERT ■ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: Kyle F.

NOTES: BASE - CH. 20

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.926	108.3	102.3	1.0	0	23.2	-	33.1	92.4	—	—
1.851	53.0	47.0	1.0	90	24.5	5.7	29.1	53.0	-22.4	75.4
2.777	45.8	39.8	1.0	180	29.7	6.4	28.2	47.7	-6.3	54.0
3.703	44.2	38.2	1.0	180	29.6	6.9	23.9	50.8	-3.2	54.0
4.629	38.4	32.4	1.0	180	30.9	8.6	22.1	49.8	-4.2	54.0
5.552	35.7	29.7	1.5	180	32.4	9.2	32.0	39.3	-14.7	54.0
6.480	41.2	35.2	2.0	90	34.3	10.3	32.0	47.8	-27.6	75.4
7.407	39.3	33.3	1.0	180	36.8	11.4	32.0	49.5	-4.5	54.0
8.332	37.3	31.3	1.0	0	37.1	12.5	30.5	50.4	-3.6	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

SECTION 15.207

CONDUCTED EMISSIONS FOR BASE ON AC POWER LINE

MEASUREMENT NOTES: **FCC ID'S: AMWUC604, AJXSX2108, AAO4301102**

UNIDEN CORPORATION
900 MHZ SPREAD SPECTRUM CORDLESS PHONE
MODEL: EXS9110
FCC C - BLACK LEAD - 13 APR 1998 14:41:34

12 highest Peaks above -50 dB of Limit Line #2
peak criteria = .1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.4732	41.1	-6.9
2	.5812	41.1	-6.9
3	.5682	40.6	-7.4
4	.5367	40.3	-7.7
5	.4576	40.2	-7.8
6	.5082	40.2	-7.8
7	.5278	40.2	-7.8
8	.5125	40.1	-7.9
9	.4673	40	-8.0
10	.5234	40	-8.0
11	.4853	39.9	-8.1
12	.4812	39.8	-8.2

MEASUREMENT NOTES:

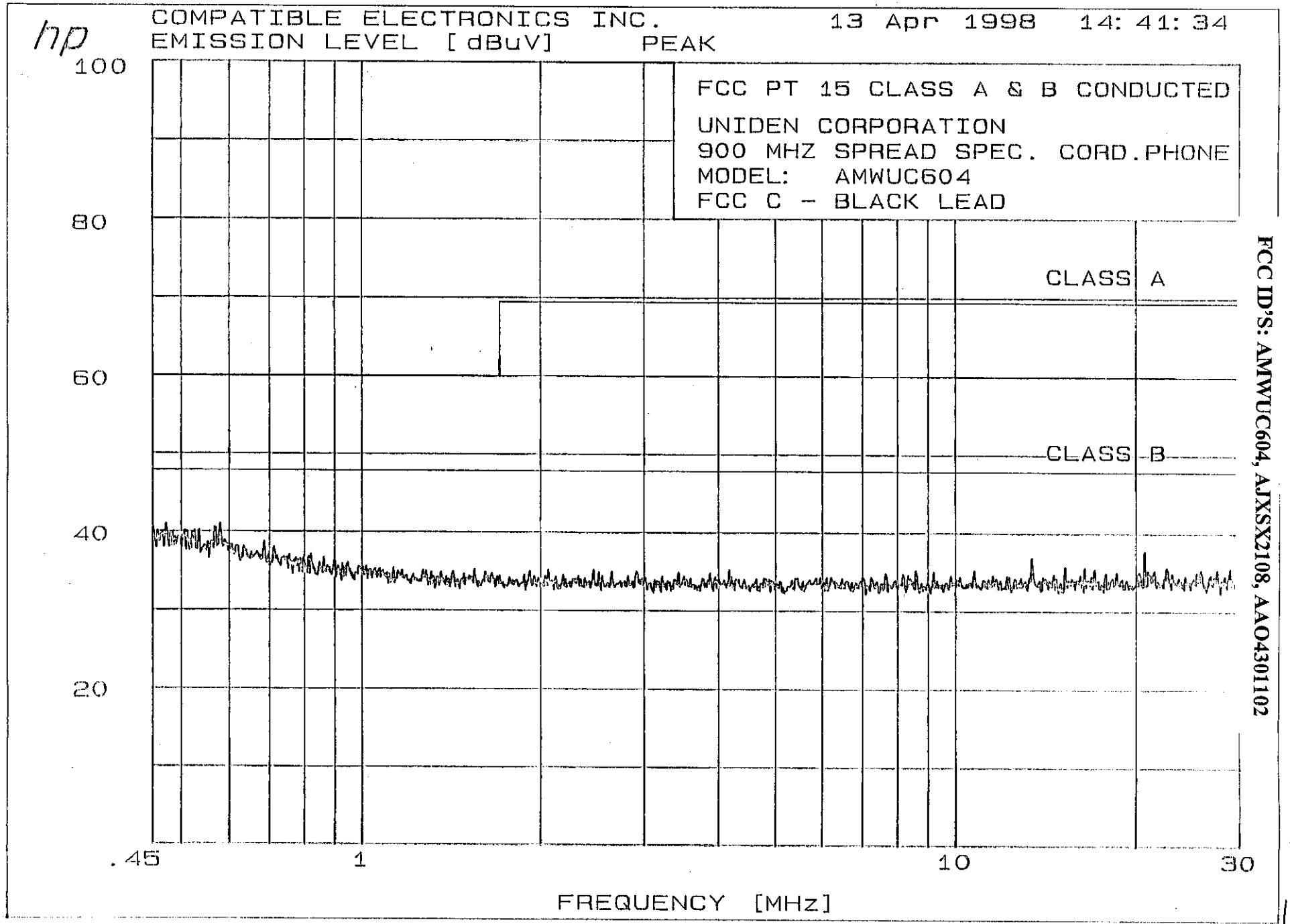
UNIDEN CORPORATION
900 MHZ SPREAD SPECTRUM CORDLESS PHONE
MODEL: EXS9110
FCC C - WHITE LEAD - 13 APR 1998 14:51:23

12 highest Peaks above -50 dB of Limit Line #2
peak criteria = .1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	13.41	36.6	-11.4
2	.6428	36.1	-11.9
3	15.2	35.8	-12.2
4	3.274	35.6	-12.4
5	20.65	35.6	-12.4
6	10.12	35.5	-12.5
7	21.63	35.4	-12.6
8	.5716	35.3	-12.7
9	.7803	35.2	-12.8
10	22.65	35.1	-12.9
11	17.03	35	-13.0
12	.4713	34.9	-13.1

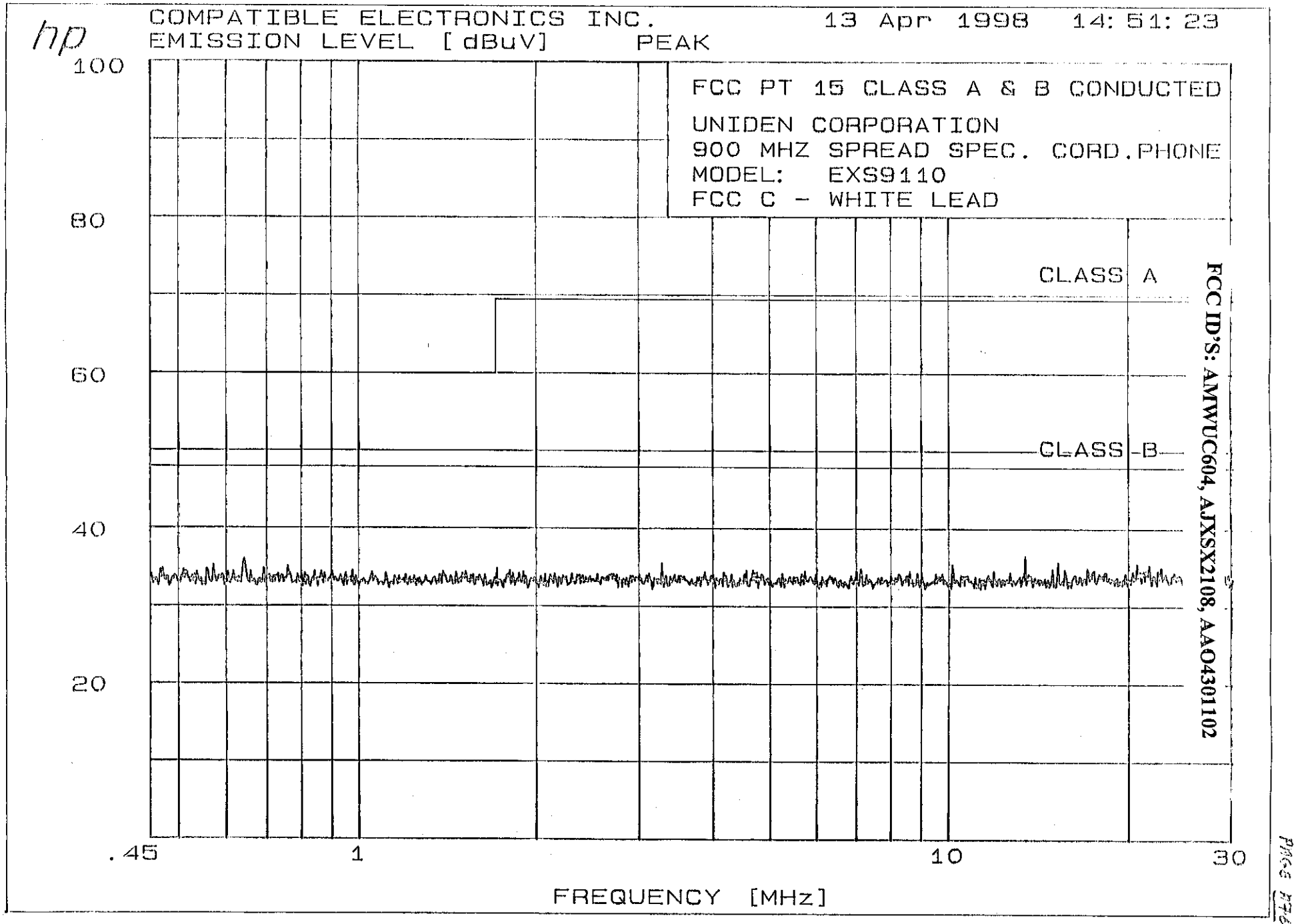
MEASUREMENT NOTES:

TEST ENGINEER: Kyle Fujimoto
KYLE FUJIMOTO



FCC ID'S: AMWUC604, AJXSX2108, AAO4301102

Page 175


hp
COMPATIBLE ELECTRONICS INC.
EMISSION LEVEL [dBuV]
PEAK
13 Apr 1998 14:51:23
FCC PT 15 CLASS A & B CONDUCTED
UNIDEN CORPORATION
900 MHZ SPREAD SPEC. CORD.PHONE
MODEL: EXS9110
FCC C - WHITE LEAD
CLASS A
CLASS B
FCC ID'S: AMWUC604, AJXSX2108, AAO4301102
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

SECTION 15.247 (e)

PROCESSING GAIN FOR BASE AND HANDSET

PROCESSING GAIN WORKSHEET FCC ID: AMWUC604

PROCESSING GAIN TEST

CHANNEL 10 (914.40 MHz) - Handset output to base station input

Jammer Freq. (MHz)	Transmitter Output (dBm)	Signal Level (dBm)	CW Noise (dBm)	Mj J/S ratio (dB)	Processing Gain (dBm)
914.40	0.10	-48.40	-26.20	18.90	28.90
914.45	0.10	-48.40	-38.50	6.60	16.60
914.50	0.10	-48.40	-38.50	6.60	16.60
914.55	0.10	-48.40	-37.20	7.90	17.90
914.60	0.10	-48.40	-35.20	9.90	19.90
914.65	0.10	-48.40	-39.10	6.00	16.00
914.70	0.10	-48.40	-39.10	6.00	16.00
914.75	0.10	-48.40	-39.00	6.10	16.10
914.80	0.10	-48.40	-37.80	7.30	17.30
914.85	0.10	-48.40	-32.20	12.90	22.90
914.90	0.10	-48.40	-38.10	7.00	17.00
914.95	0.10	-48.40	-38.20	6.90	16.90
915.00	0.10	-48.40	-36.80	8.30	18.30
915.05	0.10	-48.40	-35.70	9.40	19.40
915.10	0.10	-48.40	-34.60	10.50	20.50

LOSSES

Attenuation	43.3
Combiner Loss	3
Cable Loss	2.2
System Loss	2
S/N ratio	8
Sig. Gen. Cal Factor	0.3

Signal Level = TX Ouput - Attenuation - Combiner Loss - Cable Loss

Mj J/S radio = CW Noise - Sig. Level - Combiner Loss - Sig. Gen. Cal Factor.

Processing Gain = Mj J/S ratio + System Loss + S/N ratio.

CHANNEL 10 (914.40 MHz) - Handset output to base station input

Jammer Freq. (MHz)	Transmitter Output (dBm)	Signal Level (dBm)	CW Noise (dBm)	Mj J/S ratio (dB)	Processing Gain (dBm)
914.35	0.10	-48.40	-37.50	7.60	17.60
914.30	0.10	-48.40	-37.70	7.40	17.40
914.25	0.10	-48.40	-37.10	8.00	18.00
914.20	0.10	-48.40	-34.90	10.20	20.20
914.15	0.10	-48.40	-38.40	6.70	16.70
914.10	0.10	-48.40	-38.40	6.70	16.70
914.05	0.10	-48.40	-38.60	6.50	16.50
914.00	0.10	-48.40	-37.00	8.10	18.10
913.95	0.10	-48.40	-32.60	12.50	22.50
913.90	0.10	-48.40	-38.70	6.40	16.40
913.85	0.10	-48.40	-37.90	7.20	17.20
913.80	0.10	-48.40	-36.50	8.60	18.60
913.75	0.10	-48.40	-36.00	9.10	19.10
913.70	0.10	-48.40	-34.50	10.60	20.60

PROCESSING GAIN WORKSHEET FCC ID: AMWUC604

CHANNEL 10 (914.4 MHz) - Base station output to handset input

Jammer Freq. (MHz)	Transmitter Output (dBm)	Signal Level (dBm)	CW Noise (dBm)	Mj J/S ratio (dB)	Processing Gain (dBm)
914.40	1.50	-47.00	-19.40	24.30	34.30
914.45	1.50	-47.00	-39.80	3.90	13.90
914.50	1.50	-47.00	-39.80	3.90	13.90
914.55	1.50	-47.00	-38.70	5.00	15.00
914.60	1.50	-47.00	-37.10	6.60	16.60
914.65	1.50	-47.00	-41.30	2.40	12.40
914.70	1.50	-47.00	-41.30	2.40	12.40
914.75	1.50	-47.00	-41.50	2.20	12.20
914.80	1.50	-47.00	-39.50	4.20	14.20
914.85	1.50	-47.00	-35.50	8.20	18.20
914.90	1.50	-47.00	-40.90	2.80	12.80
914.95	1.50	-47.00	-40.10	3.60	13.60
915.00	1.50	-47.00	-39.10	4.60	14.60
915.05	1.50	-47.00	-38.60	5.10	15.10
915.10	1.50	-47.00	-36.60	7.10	17.10

LOSSES

Attenuation	**43.3**
Combiner Loss	**3**
Cable Loss	**2.2**
System Loss	**2**
S/N ratio	**8**
Sig. Gen. Cal Factor	**0.3**

Signal Level = TX Ouput - Attenuation - Combiner Loss - Cable Loss

Mj J/S radio = CW Noise - Sig. Level - Combiner Loss - Sig. Gen. Cal Factor.

Processing Gain = Mj J/S ratio + System Loss + S/N ratio.

CHANNEL 10 (914.4 MHz) - Base station output to handset input

Jammer Freq. (MHz)	Transmitter Output (dBm)	Signal Level (dBm)	CW Noise (dBm)	Mj J/S ratio (dB)	Processing Gain (dBm)
914.35	1.50	-47.00	-41.40	2.30	12.30
914.30	1.50	-47.00	-41.90	1.80	11.80
914.25	1.50	-47.00	-41.30	2.40	12.40
914.20	1.50	-47.00	-39.20	4.50	14.50
914.15	1.50	-47.00	-42.60	1.10	11.10
914.10	1.50	-47.00	-43.00	0.70	10.70
914.05	1.50	-47.00	-42.70	1.00	11.00
914.00	1.50	-47.00	-41.80	1.90	11.90
913.95	1.50	-47.00	-36.80	6.90	16.90
913.90	1.50	-47.00	-43.20	0.50	10.50
913.85	1.50	-47.00	-42.70	1.00	11.00
913.80	1.50	-47.00	-41.30	2.40	12.40
913.75	1.50	-47.00	-40.80	2.90	12.90
913.70	1.50	-47.00	-39.30	4.40	14.40

APPENDIX B

EUT CONFIGURATION AND CABLE INFORMATION

EUT AND ACCESSORY LIST

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
900 MHz Spread Spectrum Cordless Phone (BASE)	UNIDEN AMERICA CORPORATION	EXS9110	N/A	AMWUC604
CLASS 2 TRANSFORMER	N/A	N/A	DATE CODE: 9733	N/A
LINE SIMULATOR	TELTONE	TLS-3	N/A	N/A
PHONE	COMDIAL	N/A	N/A	REG (#) A5493N-70140-TE-T
900 MHz Spread Spectrum Cordless Phone (HANDSET)	UNIDEN AMERICA CORPORATION	EXS9110	N/A	AJXEXS9110

DESCRIPTION OF EUT CONFIGURATION AND CABLE INFORMATION 900 MHz Spread Spectrum Cordless Phone MODEL: EXS9110

EUT CONFIGURATION

Handset being tested: The 900 MHz Spread Spectrum Cordless Phone- Handset Model: EXS9110 (EUT) was placed on the wooden table and tested in three orthogonal axis. The low (channel 1), medium (channel 10), and high (channel 20) channels were tested. The handset was transmitting to and receiving from the 900 Spread Spectrum Telephone base. The EUT was investigated for emissions while off hook. The radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in this Appendix.

Base being tested: The 900 MHz Spread Spectrum Cordless Phone - Base Model: EXS9110 (EUT) was placed on the wooden table. The low (channel 1), medium (channel 10), and high (channel 20) channels were tested. The base was connected to a line simulator and AC adapter via its RJ-11 and power ports, respectively. The line simulator was connected to the Comdial telephone. The base was transmitting and receiving from the 900 MHz Spread Spectrum Cordless Phone handset. The 900 MHz Spread Spectrum Cordless Phone handset was also used to dial out a number on the simulator that caused the Comdial telephone to ring. The conducted as well as radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in this Appendix.

CABLE CONSTRUCTION AND TERMINATION

HANDSET BEING TESTED

Cable 1

This is a 6 foot unshielded cable connecting the headphones to the handset. It has a 1/8 inch stereo connector at the headphones end and is hard wired into the handset.

BASE BEING TESTED

Cable 1

This is a 6 foot unshielded cable connecting the base to the line simulator. It has an RJ-11 connector at the line simulator end and is hard wired into the base. The cable was bundled to a length of 1 meter.

Cable 2

This is a 6 foot unshielded cable connecting the telephone to the line simulator. It has an RJ-11 connector at the line simulator end and is hard wired into the telephone. The cable was bundled to a length of 1 meter.

Cable 3

This is a 6 foot unshielded round cable connecting the base to the AC adapter. It has a 1/8" power jack at the base end and is hard wired into the AC adapter.

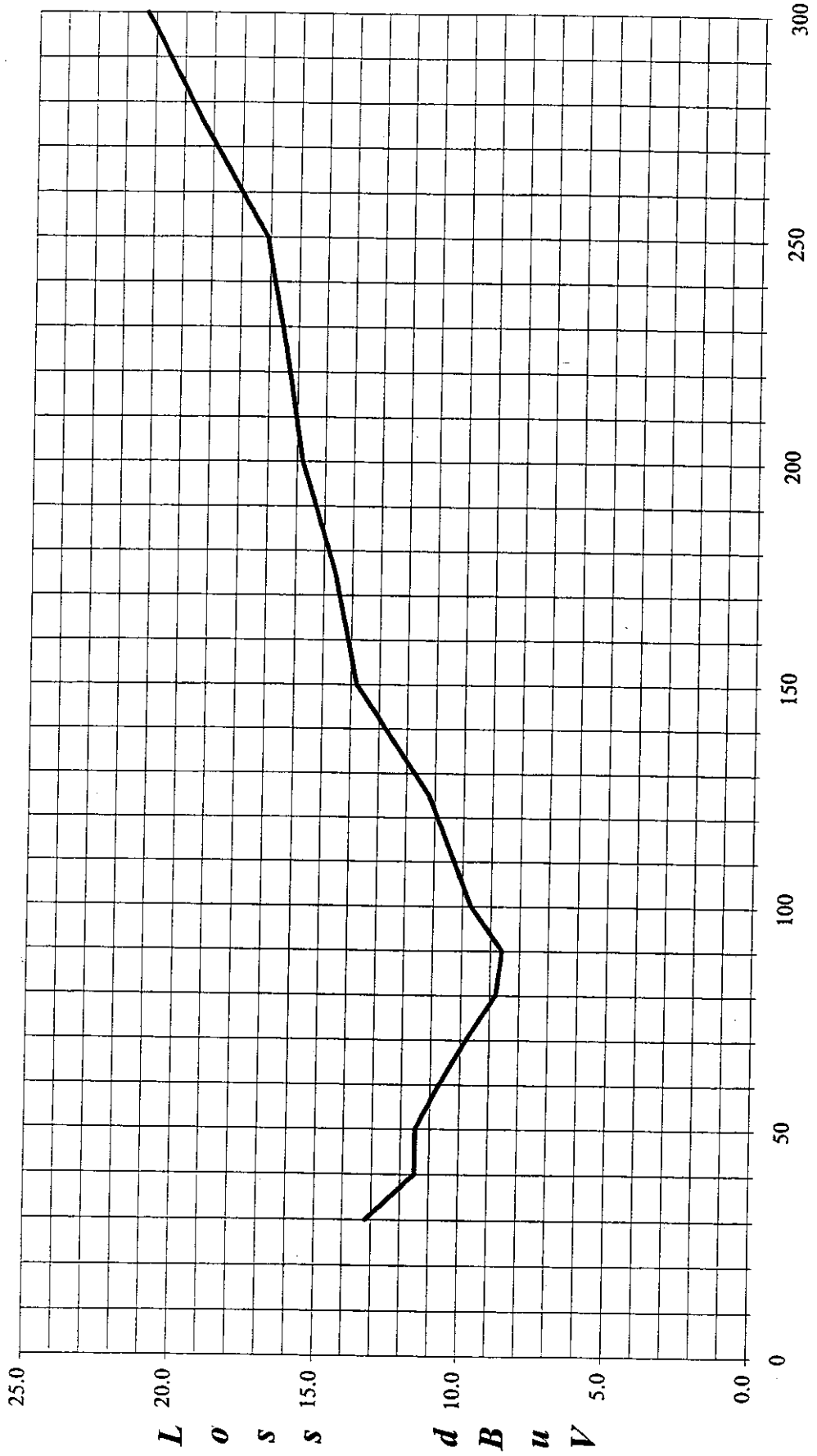
APPENDIX C

ANTENNA, AMPLIFIER FACTORS & EFFECTIVE GAIN CHARTS

COMPATIBLE ELECTRONICS

LAB "D" BICONICAL ANTENNA AB-100 S/N 01548

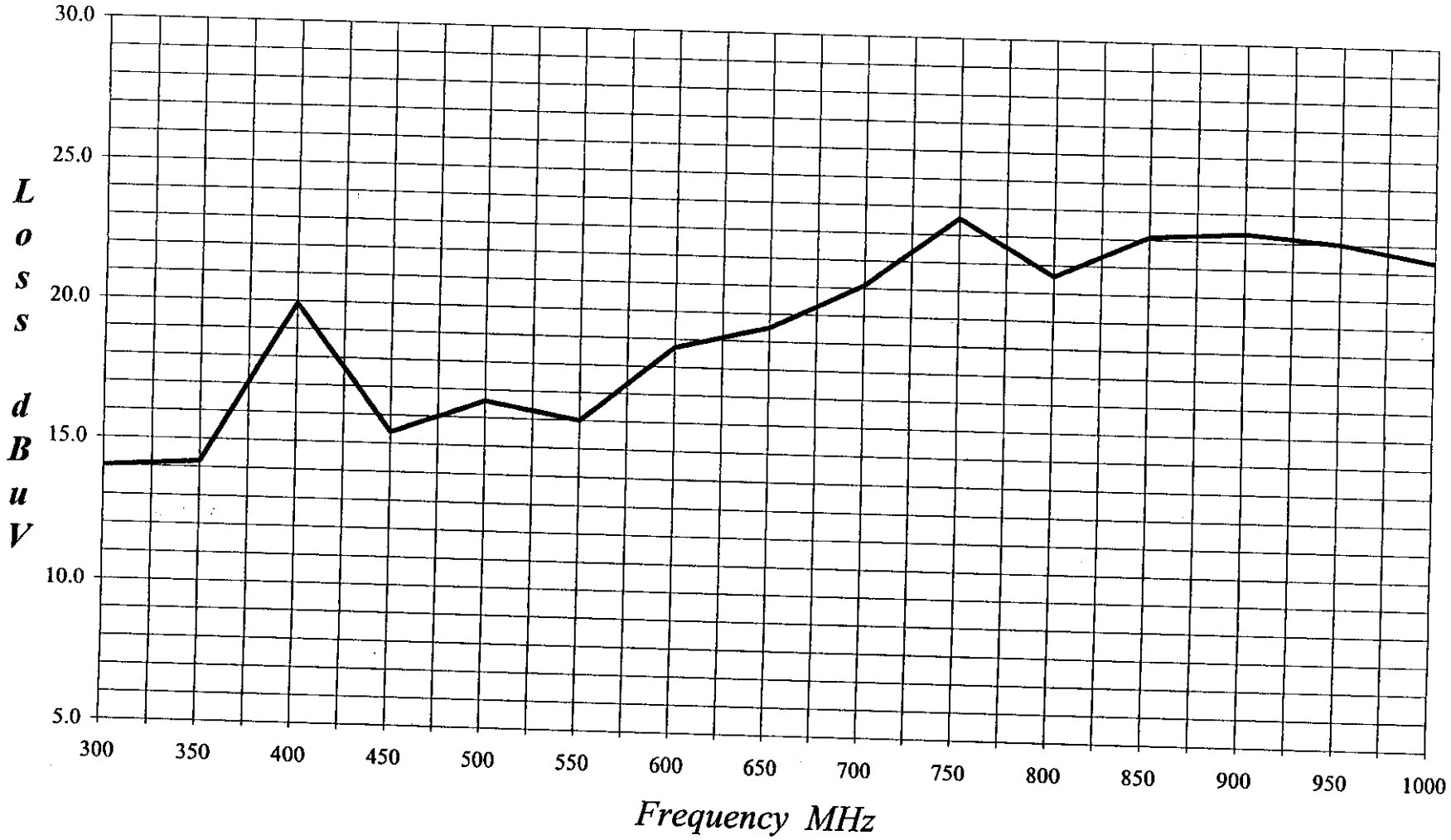
Cal: 3/24/98



Cal: 2/13/98

RP-1

LAB "D" LOG PERIODIC ANTENNA AL-100 S/N 01012



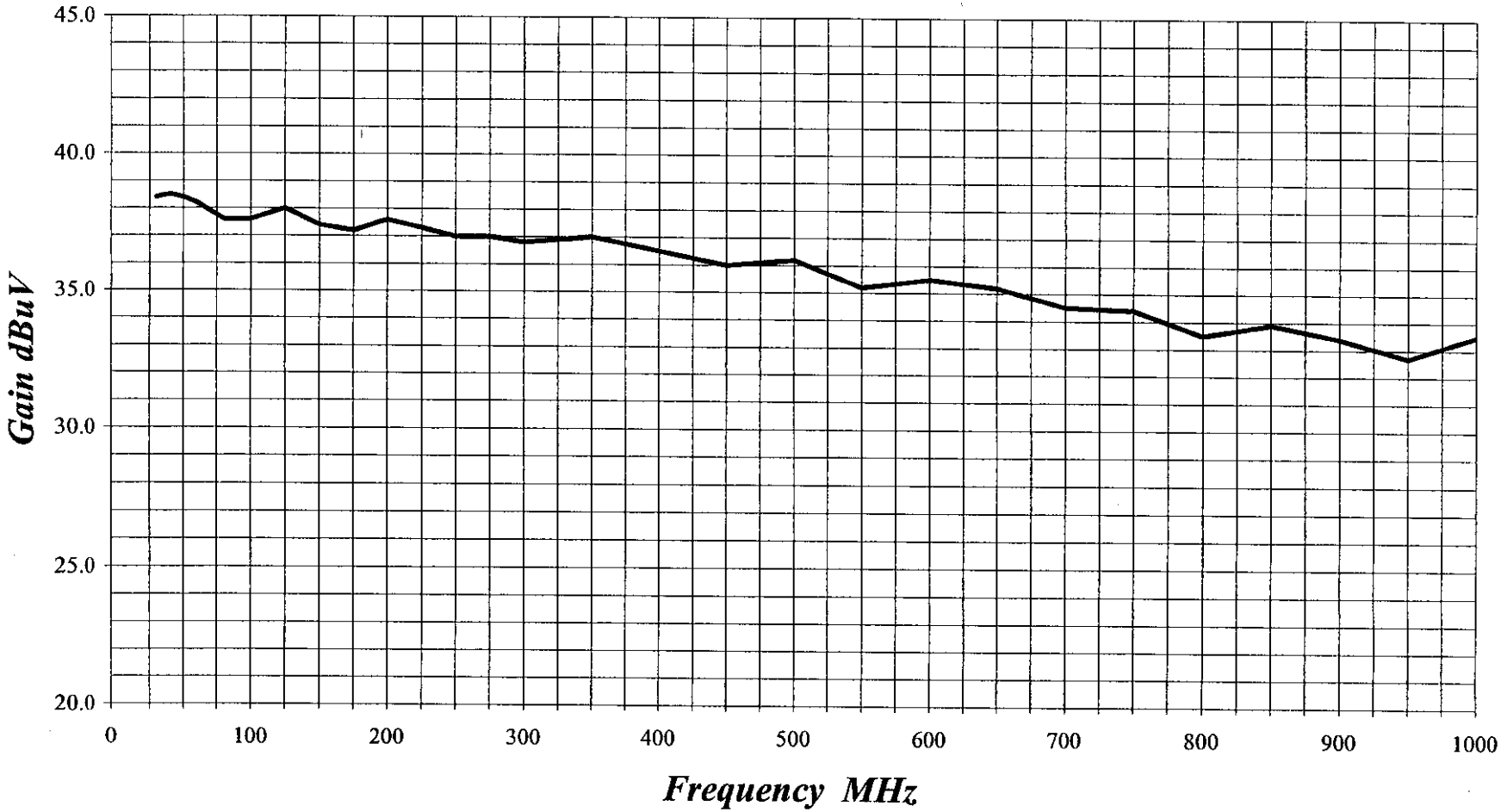
COMPATIBLE ELECTRONICS

Page 23

Lab "D" Effective: 2/16/98 *Effective Gain = Preamplifier Gain - Cable Loss*

RP-1

PREAMPLIFIER EFFECTIVE GAIN AT 3 METERS PA-102 S/N: 1017



COMPATIBLE ELECTRONICS

Page 19

ANTENNA RESEARCH ASSOCIATES, INC.
11317 Frederick Avenue, Beltsville, MD 20705

E-FIELD ANTENNA FACTOR CALIBRATION

E(dB V/m) = Vo(dB V) + AFE(dB/m)

Model number : DRG-118/A

Frequency GHz	AFE dB/m	Gain dBi
1	22.3	8.0
2	26.7	9.5
3	29.7	10.1
4	29.5	12.8
5	32.3	12.0
6	32.4	13.4
7	36.1	11.0
8	37.4	10.9
9	36.8	12.5
10	39.5	10.7
11	39.6	11.5
12	39.8	12.0
13	39.7	12.8
14	41.8	11.3
15	41.9	11.9
16	38.1	16.3
17	41.0	13.9
18	46.5	8.9

Serial number : 1053
Job number : 96-092
Remarks : 3 meter calibration
Standards : LPD-118/A, TE-1000

Temperature : 72° F
Humidity : 56 %
Traceability : A01887
Date : December 08, 1995

Calibrated By

Com-Power Corporation

(714) 587-9800

Antenna Calibration

Antenna Type:	Loop Antenna
Model:	AL-130
Serial Number:	25309
Calibration Date:	2/5/98

Frequency MHz	Magnetic (dB/m)	Electric dB/m
0.01	-40.5	11.0
0.02	-41.6	9.9
0.03	-40.0	11.5
0.04	-40.3	11.2
0.05	-41.6	9.9
0.06	-41.1	10.4
0.07	-41.3	10.2
0.08	-41.6	9.9
0.09	-41.7	9.8
0.1	-41.8	9.7
0.2	-44.0	7.5
0.3	-41.6	9.9
0.4	-41.7	9.8
0.5	-41.7	9.8
0.6	-41.5	10.0
0.7	-41.5	10.0
0.8	-41.6	9.9
0.9	-41.6	9.9
1	-41.1	10.4
2	-40.7	10.8
3	-40.7	10.8
4	-40.9	10.6
5	-40.1	11.4
6	-40.0	11.5
7	-40.3	11.2
8	-39.8	11.7
9	-38.8	12.7
10	-40.8	10.7
12	-41.4	10.1
14	-41.4	10.1
15	-40.9	10.6
16	-40.8	10.7
18	-41.5	10.0
20	-41.5	10.0
25	-41.2	10.3
30	-41.4	10.1

Trans. Antenna Height	2 meter
Receiving Antenna Height	2 meter

HEWLETT PACKARD 8349B

MICROWAVE PREAMPLIFIER

S/N: 2548A00432

CALIBRATION DATE: FEBRUARY 18, 1998

FREQUENCY (GHz)	GAIN (dB)	FREQUENCY (GHz)	GAIN (dB)
1.0	10.4	1.9	29.1
1.1	18.6	2.0	28.8
1.2	22.9	2.5	26.8
1.3	25.7	3.0	28.2
1.4	27.2	3.5	23.9
1.5	28.5	4.0	25.8
1.6	28.7	4.5	22.1
1.7	28.8	5.0	23.3
1.8	29.0		

COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 001

CALIBRATION DATE: MARCH 31, 1998

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
5.5	32.0	8.0	31.4
6.0	31.6	8.5	30.5
6.5	32.0	9.0	31.4
7.0	31.4	9.5	32.6
7.5	32.0	10.0	33.1

APPENDIX D

MODIFICATIONS TO THE EUT

TEST DATA FOR FCC CERTIFICATION APPLICATION
==========

TABLE OF CONTENTS

EXHIBIT NO. TITLE

1	GENERAL INFORMATION
2	DRAFT COPY OF THE INSTRUCTION MANUAL....Omitted
3	CIRCUIT DESCRIPTION & DIGITAL SECURITY CODE INFORMATION
4	SCHEMATIC DIAGRAMS AND BLOCK DIAGRAMS
5	MEASUREMENT PROCEDURE AND TEST RESULTS... ~~Omitted~~ Supplied if needed GRH 5/5/98
6	PHOTOGRAPHS
7	EQUIPMENT IDENTIFICATION

EXHIBIT - 1

GENERAL INFORMATION

General Information in accordance with the Federal Communications Commission Rules and Regulations, Volume II, Part 2.

Section 2.1033(b)(1) Applicant:

Toshiba America Consumer Products, Inc.
1420 Toshiba Drive
Lebanon, TN 37087

Section 2.1033(b)(2) FCC Identifier:

FCC ID: AJXSX2108
MODEL : SX-2108(XX)

Section 2.1033(b)(3) Instruction Manual:

Omitted in accordance with Section 2.933.

Section 2.1033(b)(4) Circuit Description:

Refer to EXHIBIT-3

Section 2.1033(b)(5) Circuit & Block Diagrams:

Refer to EXHIBIT-4

Section 2.1033(b)(6) Measurement Data:

Omitted in accordance with Section 2.933.

Section 2.1033(b)(7) Photographs & Equipment Identification:

Refer to EXHIBIT-6 and EXHIBIT-7.

Section 2.1033(b)(8) Peripheral or Accessory Device:

Not used

Section 2.1033(b)(9) Transition provisions in section 15.37 Rules:

This equipment complies with the new Part 15 of FCC Rules and is not affected by Section 15.37.

Section 2.1033(b)(10) Decoding the Emergency Broadcast System Attention Signal:

Not Applicable

Section 2.1033(b)(11) Direct Sequence Spread Spectrum Transmitter:

Refer to EXHIBIT-3

Section 15.214(d)(3) Digital Security Code Information:

Refer to EXHIBIT-3

§ 2.933 INFORMATION FOR CHANGE IN THE IDENTIFICATION OF EQUIPMENT

	Question	Comments
(1)	The original identification used on the equipment prior to the change in identification.	AMWUC604 (Applicant: Uniden America Corporation)
(2)	The date of the original grant of the equipment authorization.	Application is in the process of being filed under the FCC ID listed above.
(3)	The original type approval number assigned by the Commissions, if one was assigned.	Not applicable
(4)	How the equipment bearing the modified identification differs from the original equipment.	No change in circuitry except for model name designation.
(5)	Whether the data previously filed with the Commission (or measured by the Commission in the case of type approved equipment or measured by the applicant in the case of notified equipment) continues to be representative of and applicable to the equipment bearing the changed identification.	The same as above.
(6)	In the case of type accepted equipment, the photographs required by section 2.983(f).	Not applicable
(7)	In the case of certified equipment, the photographs required by section 2.1033(c).	Refer to EXHIBIT-6 and EXHIBIT-7.

EXHIBIT - 2

DRAFT COPY OF THE INSTRUCTION MANUAL

To whom it may concern,

As an original model of Uniden EXS9110, the 900MHz ISM band Spread Spectrum cordless telephone is in the process of being filed under the FCC ID of AMWUC604.

Simultaneously, we, Uniden Corporation is offering to Toshiba America for marketing the product with their own model name of SX-2108(XX) (FCC ID: AJXSX2108) as OEM business basis.

Toshiba SX-2108(XX)(FCC ID: AJXSX2108) is electrically and mechanically identical to the original models of Uniden EXS9110 (FCC ID: AMWUC604), therefore, we omitted the operation manual in accordance with section 2.933 of FCC rule and regulation.

Date: April 17, 1998

Signature

Keizo Fujiwara
Engineering Manager
Uniden Corporation

EXHIBIT - 3

CIRCUIT DESCRIPTION AND
DIGITAL SECURITY CODE INFORMATION

CIRCUIT DESCRIPTION

1. OVER VIEW

The SX-2108 is a digital spread spectrum cordless telephone which meets with FCC Part 15 requirements. It provides the following features:

Direct Sequence Spread Spectrum Modulation
20 Radio frequency Channels in 902 - 928MHz ISM band
100mW maximum output power
Time Division Duplex operation
32kbps or 40kbps ADPCM voice CODEC
65536 security codes
Auto Channel codes
Auto Interference Avoidance
Auto least power control

2. Configurations

2.1 Transmission

The voice signal is converted into 32kbps or 40kbps digital data by ADPCM CODEC. The digital data is fed to scrambler, differential encoder, spreader which is responsible for the Spread Spectrum modulation. The SS Chip sends out digital data which is made by the spread spectrum sequence. This digital data having a 1.2Mbps data rate is filtered and upper converted to RF by DBPSK (Differential Binary Phase Shift Keying) modulator. Then, filtered by LPF (Low Pass Filter) to suppress the out-of-band spurious of the antenna transmission signal.

2.2 Reception

The receiver is direct conversion type. The incoming signal is passes through the RF BPF (Band Pass Filter). Down-conversion to quadrature base band signal is done using a matched pair of mixers and a 90° phase splatter for the LO (Local). The SS Chip calculates the correlation from the spreading code and the outputs the detected voice data to ADPCM CODEC. Finally, the ADPCM CODEC outputs received analog signal.

2.3 Duplexing

The SX-2108 can communicate by using Time Division Duplexing. It uses same frequency in both transmission and reception. It has 2 msec time frame of one transmission and reception cycle. This frame signal is generated by SS Chip and is provided to all other circuits.

2.4 Control

The CPU controls the RF frequency channels, RF power, ADPCM CODEC and audio signal switching. It also set up the spreading code other data of the SS Chip. Before established the communication link, EXS9110 searches vacant RF channel and then transmits RF signal at the vacant channel. Initially, it output the minimum RF power to maintain communication in order to minimize the interference to other cordless telephones. The CPU generates a random security code out of 65536 codes, which can protects customers privacy.

3. Specification

Item	Specification
Frequency	902 - 928MHz
Channel	20
Channel Separation	ch.1-2, ch-19, 20; 0.6MHz ch.2-19; 1.2MHz
Spread Spectrum method	Direct Sequence (DBPSK modulation)
Chip rate	1.2Mbps

RF Output Power	100mW (Max.)
Output Power Control	3 steps, 100mW to 10mW, and 1mW (10dB step)
Duplexing	Time Division Duplex
Burst Frame	2 msec
Voice Coding	ADPCM
Power Supply	3.6VDC Battery (Handset)
120VAC Adapter (Base unit)	
Operating temperature	0 to 50 deg C
Humidity	Up to 90%

Digital Security Code Information

65536 Digital Security Code

This cordless telephone system provides the random digital security code.

Equipment Description

The model SX-2108 is a telephone terminal device that is designed for voice operation in a similar fashion to an ordinary residential or business telephone without the inconvenience and restrain of a handset cord.

This device consists of a base unit and a handset. The base unit is intended to connect to standard telephone modular jacks and is supplied electric power from a standard AC power line by using with the AC Adapter. The handset is powered from an internal battery pack.

The SX-2108 Cordless Telephone operates by means of a full duplex radio frequency TX/RX system in 902 - 928 MHz band with Spread Spectrum Technology. Theses radio frequency systems operate in accordance with Part 15 of the FCC Rules.

The SX-2108 has been specifically designed to comply with the requirements set forth in Part 68 of the FCC Rules as well as the Part15 requirements. The specifications are below:

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart C Section 15.247 (c) specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

Modifications:

1) Change R227 on the base from 1800 ohms to 2200 ohms.

2) Change R627 on the handset from 1800 ohms to 2200 ohms

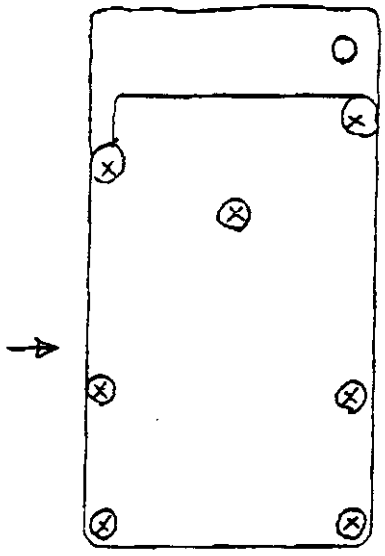
3) Affix copper adhesive tape to the side of the RF module for both the base and handset. The size of the copper adhesive will be 10 mm X 20 mm. (See diagram on next page)

RF MODULE

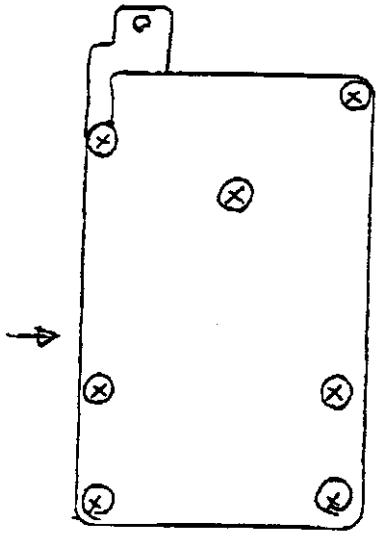
GIND-404

3/4

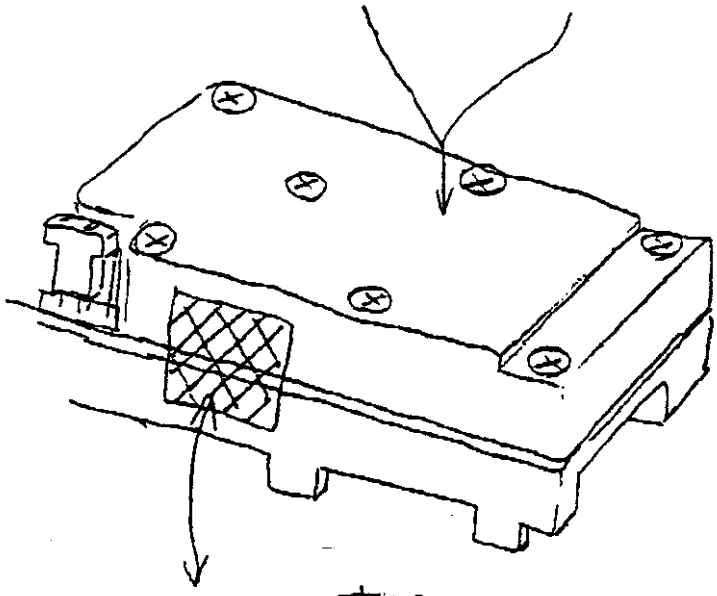
TOP VIEW ⊗ = SCREW



Base : RF UNIT



HANDSET : RF UNIT



Cupper Tape.

(SIZE: 10 mm X 20 mm)

APPENDIX E

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

900 MHz Spread Spectrum Cordless Phone
Brand: Uniden
Model: EXS9110
S/N: Prototype
FCC-ID: AMWUC604

Note: The chassis for the Uniden model is 100% plastic.

ALSO APPROVED UNDER THIS REPORT:

1. Brand: Toshiba
   Model: SX-2108
   FCC-ID: AJXSX2108

2. Brand: Radio Shack
   Model: 43-1104
   FCC-ID: AAO4301102

Both the Toshiba and Radio Shack Models are exactly the same electrically and will have 100% plastic chassis for both the base and handset.

EXHIBIT - 6

PHOTOGRAPHS