REPORT NO	:	RF89051002
PRODUCT	:	Access Point
MODEL NO	:	NWH650, NCP600
SERIAL NO	:	N/A
CLIENT	:	National Datacomm Corporation
ADDRESS	:	4F, No. 24-2, Industry East 4th Road, Science Park, Hsinchu, Taiwan R.O.C.
ISSUED BY	:	Advance Data Technology Corporation (ADT Corp.)
OFFICE ADDRESS	:	11F, No. 1, Sec. 4, Nan-King East Rd., Taipei, Taiwan, R.O.C.
LABORATORY ADDRESS	:	No. 47, 14 Ling, Chia Pau Tsuen, Lin Kou Hsian, Taipei Hsien, Taiwan, R.O.C.
TEST STANDARD	:	47CFR Part 15, Subpart C (15.247) and Subpart B
TEST DATE	:	June 4, 2000
TEST RESULT	:	Pass

Accredited Laboratory

TABLE OF CONTENTS

1 CERTIFICATION

Issue Date: July 25, 2000

PRODUCT	**:**	Access Point
MODEL NO	**:**	NWH650, NCP600
FCC ID	**:**	IOU0650S02
CLIENT	**:**	National Datacomm Corporation.
TEST STANDARD	**:**	FCC 47CFR Part 15, Subpart C(Section 15.247) and Subpart B ANSI C63.4-1992

We, ADVANCE DATA TECHNOLOGY CORPORATION**,** hereby certify that one sample of the designated sample has been tested in our facility. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate representation of the measurements of the sample's EMI characteristics and the energy emitted under the conditions herein specified.

TESTED BY: _____ **DATE:** _____
Ellis Wu

CHECKED BY: _____ **DATE:** _____
Delphine Hsu

APPROVED BY: _____ **DATE:** _____
Dr. Alan Lane, Manager

2 SUMMARY OF TEST RESULTS

47 CFR Part 15, Subpart C			
PARAGRAPH.	TEST REQUIREMENTS	COMPLIANCE (YES/NO)	TEST RESULT
15.107	**AC Power Conducted Emissions Spec.: 48 dBuV**	**Yes**	**Minimum passing margin is –7.5 dBuV At 13.658 MHz**
15.247(a)(2)	**Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Spec.: min. 500 kHz**	**Yes**	**9.77 MHz > 500 kHz**
15.247(b)	**Maximum Peak Output Power Spec.: max. 30 dBm**	**Yes**	**11.45 dBm < 30 dBm**
15.247(c)	**Transmitter Radiated Emissions Spec.: Table 15.209**	**Yes**	**Minimum passing margin is –4.6 dBuV At 4824.00 MHz**
15.247(d)	**Power Spectral Density Spec.: max. 8dBm**	**Yes**	**-9.07 dBm < 8 dBm**
15.247(e)	**Processing Gain of Direct Sequence Spread Spectrum System Spec.: min. 10 dB**	**Yes**	**11.4dB ≧10dB**

3 DECLARATION OF COMPLIANCE WITH SUBPART B

The digital circuits and receiver portion of the EUT has been tested in ADT. The test result has been verified to comply with FCC Part 15, Subpart B, Class B – Computing Devices (FCC DoC). The engineering test report can be provided upon FCC requests.

4 GENERAL INFORMATION

4.1 General Description of EUT

Product	:	**Access Point**
Model No	:	**NWH650, NCP600**
Power Supply	:	**AC adapter 100V ~ 240V**
Modulation Type	:	**BPSK(1Mbps)/QPSK(2/5.5/11Mbps)**
Transfer Rate	:	**11/5.5/2/1 Mbps**
Operating Frequency	:	**2.4 - 2.4835 GHz**
Number of Channel	:	**11**
Channel Spacing	:	**5MHz**
Rated RF output power level	:	**14 dBm**
Associated devices	:	**N/A**

Note: InstantWave High Speed is one of the first IEEE 802.11b wireless standard compliant products in the industry and was designed with a "Maximizing the Convenience of Networking" philosophy in mind.

The other detailed information, please refer to user's manual.

4.2 Description of Test mode

The EUT has 11 channels for data transmission. According to Part 15, Sec. 15.31(m), the channel 1, 6 and 11 were chose for evaluation.

4.3 Test Methodology

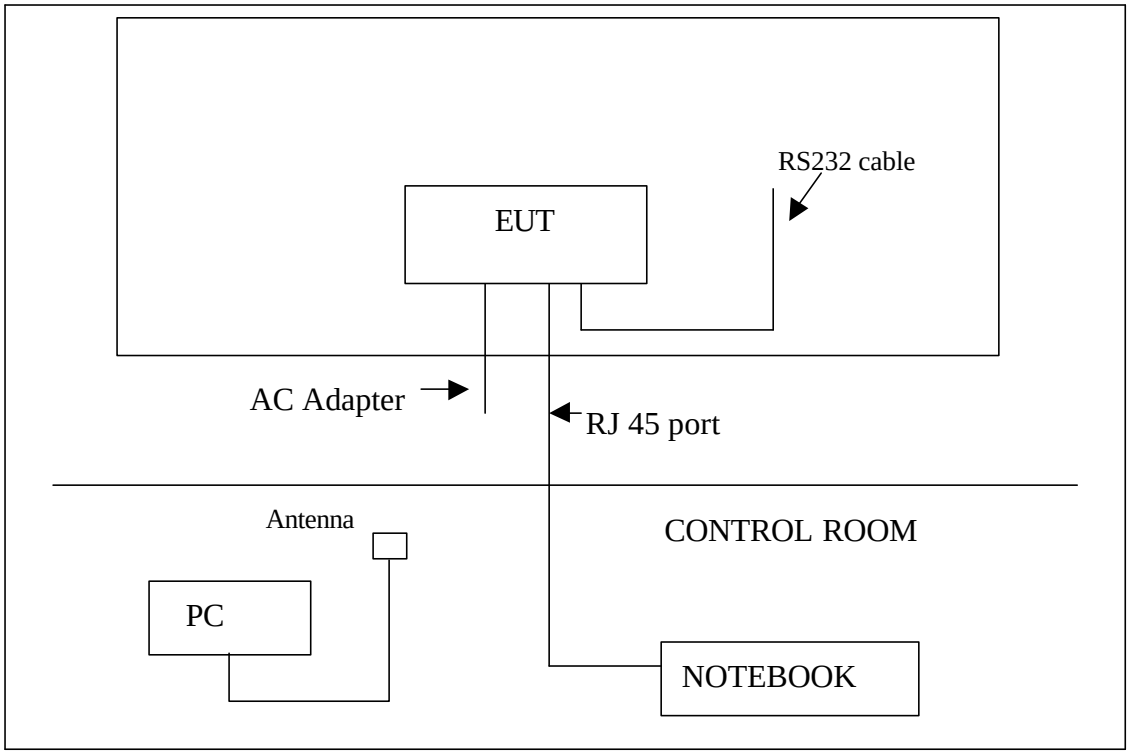
These tests were conducted on a sample of EUT for the evaluation in compliance with FCC CFR47 Part 15, Subpart C. (15.247)

Both conducted and radiated emissions measurements were carried out in accordance with ANSI C63.4:1992.

4.4 Support Units List

No	Product	Brand	Model No.	Serial No.	I/O Cable
1.	Note Book	DEKK	LS	N/A	N/A
2.	PERSONAL COMPUTER	HP	Vectra VE	SG72301070	Nonshielded (1.8m)
3.	Monitor	ADI	CM700	010042L90203864B	N/A
4.	Keyboard	BTC	5121W	N/A	Nonshielded (2.1m)
5.	Mouse	LOGITECH	M-S34	LZE01653092	N/A

4.5 Configuration of System Under Test



5 GENERAL INFORMATION OF TEST FACILITY

5.1 Test Lab.

Advance Data Technology Corporation (NVLAP accredited)
No. 47, 14 Ling, Chia Pau Tsuen, Lin Kuo Hsiang, Taipei, Taiwan, R.O.C.
Tel: +886-3-3270910
Fax: +886-3-3270892

5.2 Calibration Interval

All calibration intervals of the test sites and test instruments are 12 months. The calibrations are traceable to NML/ROC and NIST/USA.

6 TEST PROCEDURES AND TEST RESULTS

6.1 Conducted Emission Measurement

6.1.1 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 7, 2000
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 8, 2000
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 11, 2001
EMCO L.I.S.N.	3825/2	9504-2359	July 11, 2001
Shielded Room	Site 3	ADT-C03	NA

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

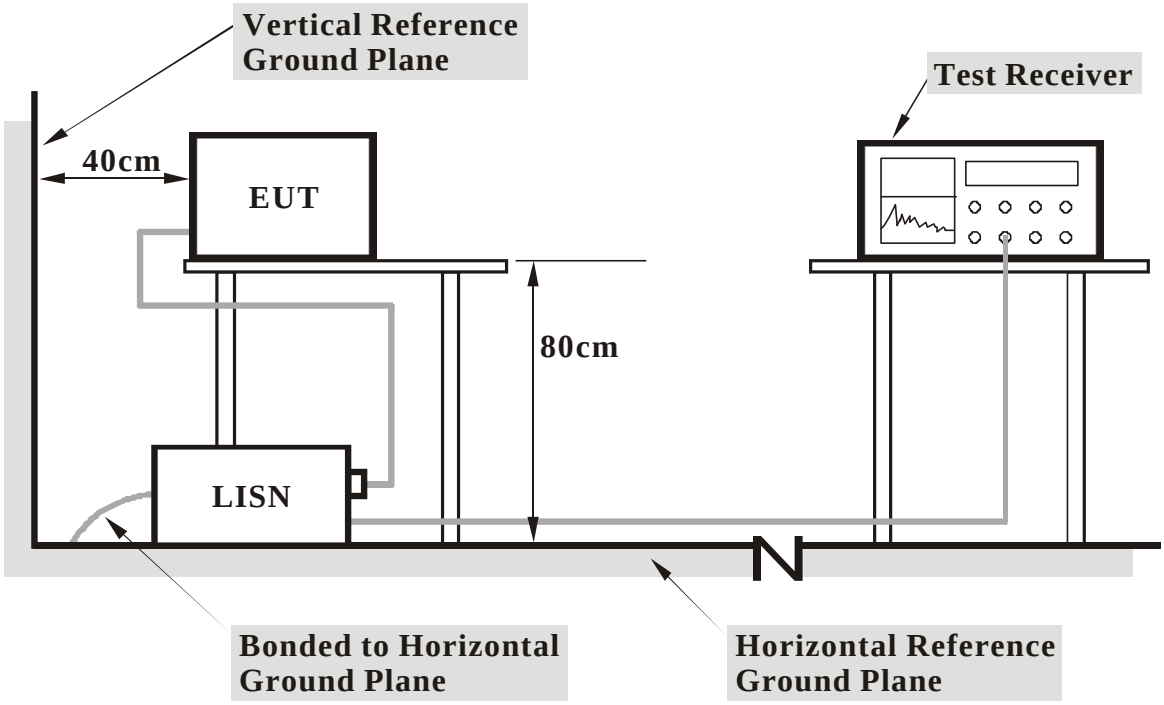
6.1.2 Test Procedure

The EUT was placed 0.4 meter from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50Ω/ 50μH coupling impedance for the measuring instrument.

Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

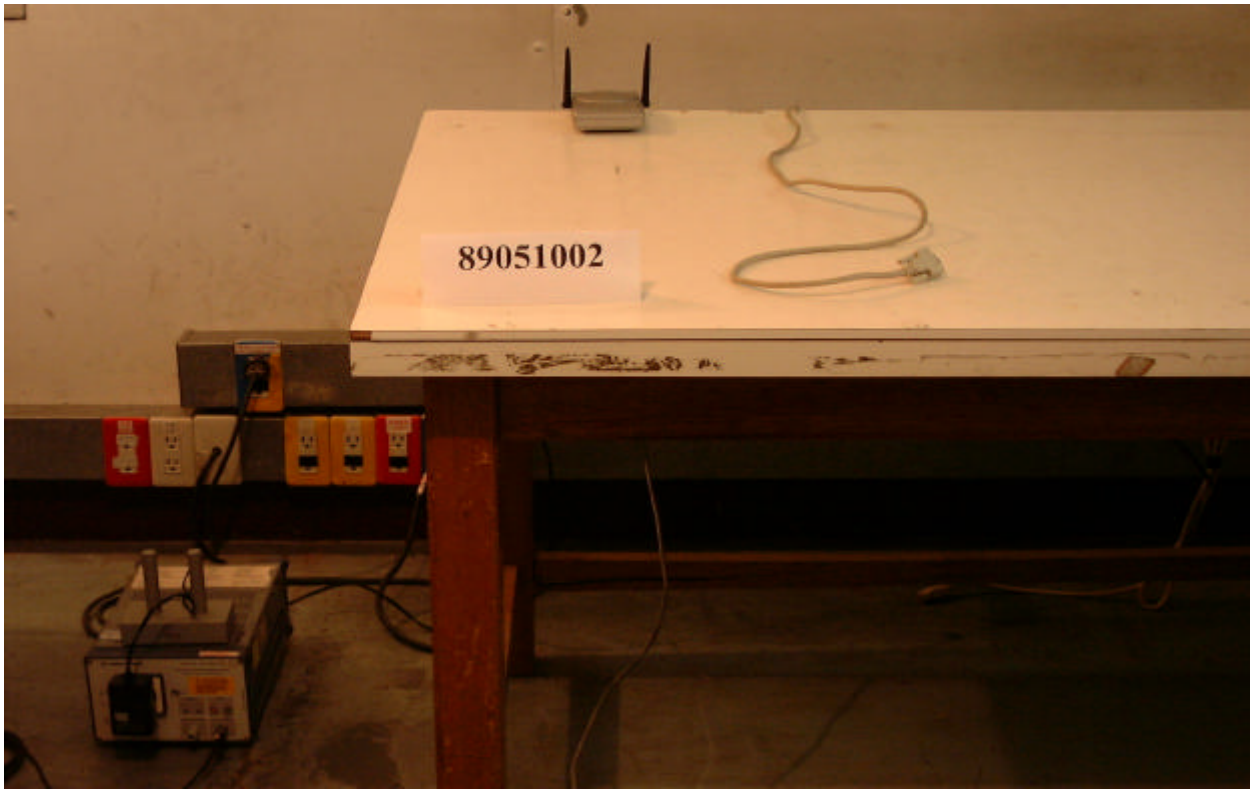
The frequency range from 450 kHz to 30 MHz was searched. The emission levels over 10dB under the prescribed limits could not be reported.

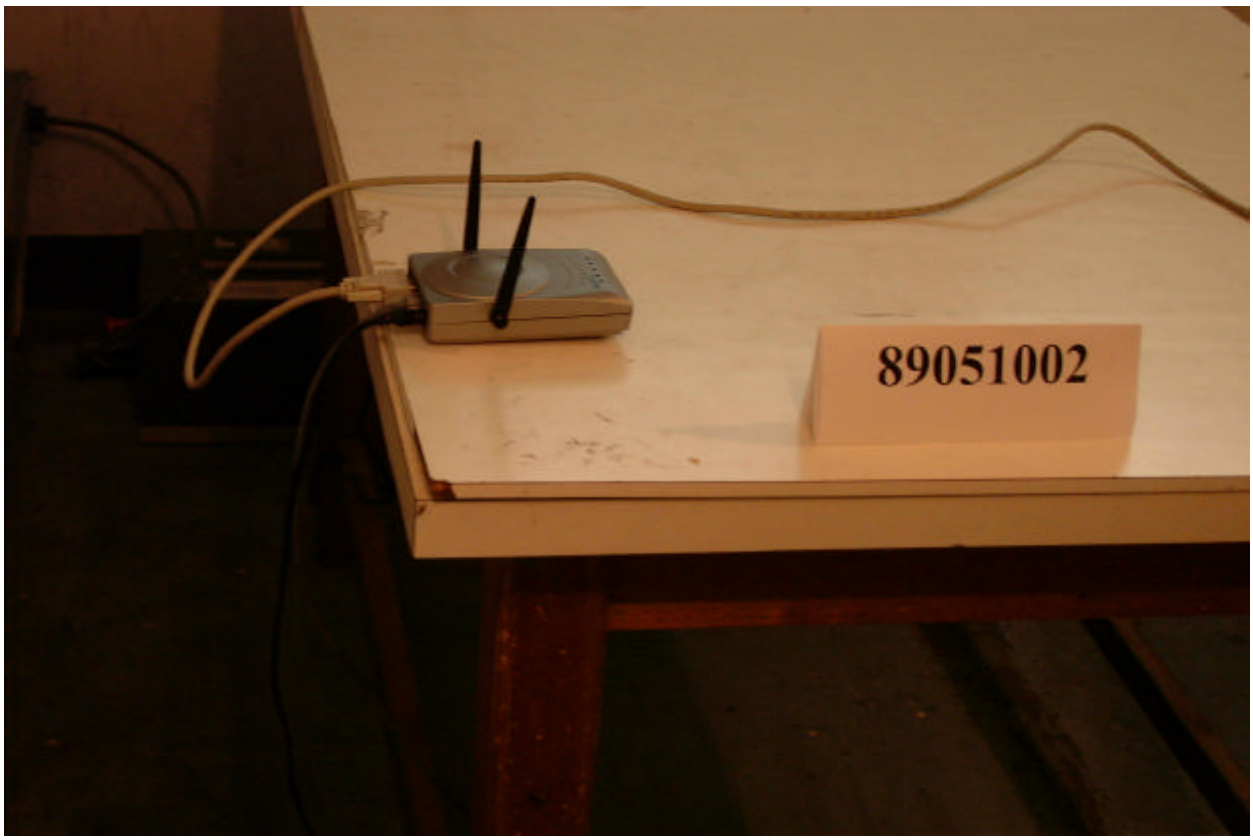
6.1.3 Test Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

6.1.4 Photograph of Test Setup





6.1.5 EUT Operating condition

1. Place the EUT on the turn table.
2. Connect antenna with antenna port.
3. Use RJ45 cable to connect PC and EUT.
4. Connect RS232 cable on RS 232 port.
5. Power on.
6. Prepare the same setup as above, but place it outside testing area.
7. Send data to EUT (on the turn table) by command "PIN".
8. The linkage between these two PC has been established when the address of the other PC is shown on the monitor.
9. Operate measurement receiver to take data.

6.1.6 Climate Condition

The temperature and related humidity is 24 degree and 80%.

6.1.7 Test Results

MODE: CH 1		6 dB Bandwidth: 10 kHz				PHASE: LINE (L)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.519	**0.2**	**35.9**	**-**	**36.1**	**-**	**48**	**-**	**-11.9**	**-**
0.819	**0.2**	**34.2**	**-**	**34.4**	**-**	**48**	**-**	**-13.6**	**-**
2.637	**0.3**	**37.9**	**-**	**38.2**	**-**	**48**	**-**	**-9.8**	**-**
6.179	**0.5**	**26.0**	**-**	**26.5**	**-**	**48**	**-**	**-21.5**	**-**
13.658	**0.9**	**38.2**	**-**	**39.1**	**-**	**48**	**-**	**-8.9**	**-**
27.011	**1.4**	**27.3**	**-**	**28.7**	**-**	**48**	**-**	**-19.3**	**-**

MODE: CH1		6 dB Bandwidth: 10 kHz				PHASE: Neutral(N)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.519	**0.2**	**36.2**	**-**	**36.4**	**-**	**48**	**-**	**-11.6**	**-**
0.819	**0.2**	**34.1**	**-**	**34.3**	**-**	**48**	**-**	**-13.7**	**-**
2.637	**0.2**	**37.2**	**-**	**37.4**	**-**	**48**	**-**	**-10.6**	**-**
6.179	**0.5**	**25.1**	**-**	**25.6**	**-**	**48**	**-**	**-22.4**	**-**
13.658	**0.7**	**39.8**	**-**	**40.5**	**-**	**48**	**-**	**-7.5**	**-**
27.011	**1.3**	**28.2**	**-**	**29.5**	**-**	**48**	**-**	**-18.5**	**-**

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.

MODE: CH 6		6 dB Bandwidth: 10 kHz				PHASE: LINE (L)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)] Q.P.	AV.	Emission Level [dB (uV)] Q.P.	AV.	Limit [dB (uV)] Q.P.	AV.	Margin (dB) Q.P.	AV.
0.519	**0.2**	**33.7**	**-**	**33.9**	**-**	**48**	**-**	**-14.1**	**-**
0.735	**0.2**	**36.1**	**-**	**36.3**	**-**	**48**	**-**	**-11.7**	**-**
2.550	**0.3**	**37.8**	**-**	**38.1**	**-**	**48**	**-**	**-9.9**	**-**
6.665	**0.5**	**24.3**	**-**	**24.8**	**-**	**48**	**-**	**-23.2**	**-**
13.373	**0.8**	**38.2**	**-**	**39.0**	**-**	**48**	**-**	**-9.0**	**-**
27.221	**1.4**	**26.1**	**-**	**27.5**	**-**	**48**	**-**	**-20.5**	**-**

MODE: CH6		6 dB Bandwidth: 10 kHz				PHASE: Neutral(N)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)] Q.P.	AV.	Emission Level [dB (uV)] Q.P.	AV.	Limit [dB (uV)] Q.P.	AV.	Margin (dB) Q.P.	AV.
0.519	**0.2**	**34.1**	**-**	**34.3**	**-**	**48**	**-**	**-13.7**	**-**
0.735	**0.2**	**35.8**	**-**	**36.0**	**-**	**48**	**-**	**-12.0**	**-**
2.550	**0.2**	**36.1**	**-**	**36.3**	**-**	**48**	**-**	**-11.7**	**-**
6.665	**0.5**	**24.9**	**-**	**25.4**	**-**	**48**	**-**	**-22.6**	**-**
13.373	**0.7**	**39.3**	**-**	**40.0**	**-**	**48**	**-**	**-8.0**	**-**
27.221	**1.3**	**31.2**	**-**	**32.5**	**-**	**48**	**-**	**-15.5**	**-**

Remarks:

1. "*": Undetectable

2. Q.P. and AV. are abbreviations of quasi-peak and average individually.

3. "-": NA

4. The emission levels of other frequencies were very low against the limit.

5. Margin value = Emission level - Limit value

6. Emission Level = Correction Factor + Reading Value.

MODE: CH 11		6 dB Bandwidth: 10 kHz				PHASE: LINE (L)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.516	**0.2**	**35.1**	**-**	**35.3**	**-**	**48**	**-**	**-12.7**	**-**
0.822	**0.2**	**34.2**	**-**	**34.4**	**-**	**48**	**-**	**-13.6**	**-**
2.556	**0.3**	**38.4**	**-**	**38.7**	**-**	**48**	**-**	**-9.3**	**-**
7.280	**0.5**	**31.2**	**-**	**31.7**	**-**	**48**	**-**	**-16.3**	**-**
13.661	**0.8**	**37.3**	**-**	**38.1**	**-**	**48**	**-**	**-9.9**	**-**
26.936	**1.4**	**30.1**	**-**	**31.5**	**-**	**48**	**-**	**-16.5**	**-**

MODE: CH11		6 dB Bandwidth: 10 kHz				PHASE: Neutral(N)			
Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.516	**0.2**	**35.2**	**-**	**35.4**	**-**	**48**	**-**	**-12.6**	**-**
0.822	**0.2**	**34.3**	**-**	**34.5**	**-**	**48**	**-**	**-13.5**	**-**
2.556	**0.2**	**38.9**	**-**	**39.2**	**-**	**48**	**-**	**-8.9**	**-**
7.280	**0.5**	**26.0**	**-**	**26.5**	**-**	**48**	**-**	**-21.5**	**-**
13.661	**0.7**	**39.6**	**-**	**40.3**	**-**	**48**	**-**	**-7.7**	**-**
26.936	**1.3**	**30.3**	**-**	**31.6**	**-**	**48**	**-**	**-16.4**	**-**

Remarks:

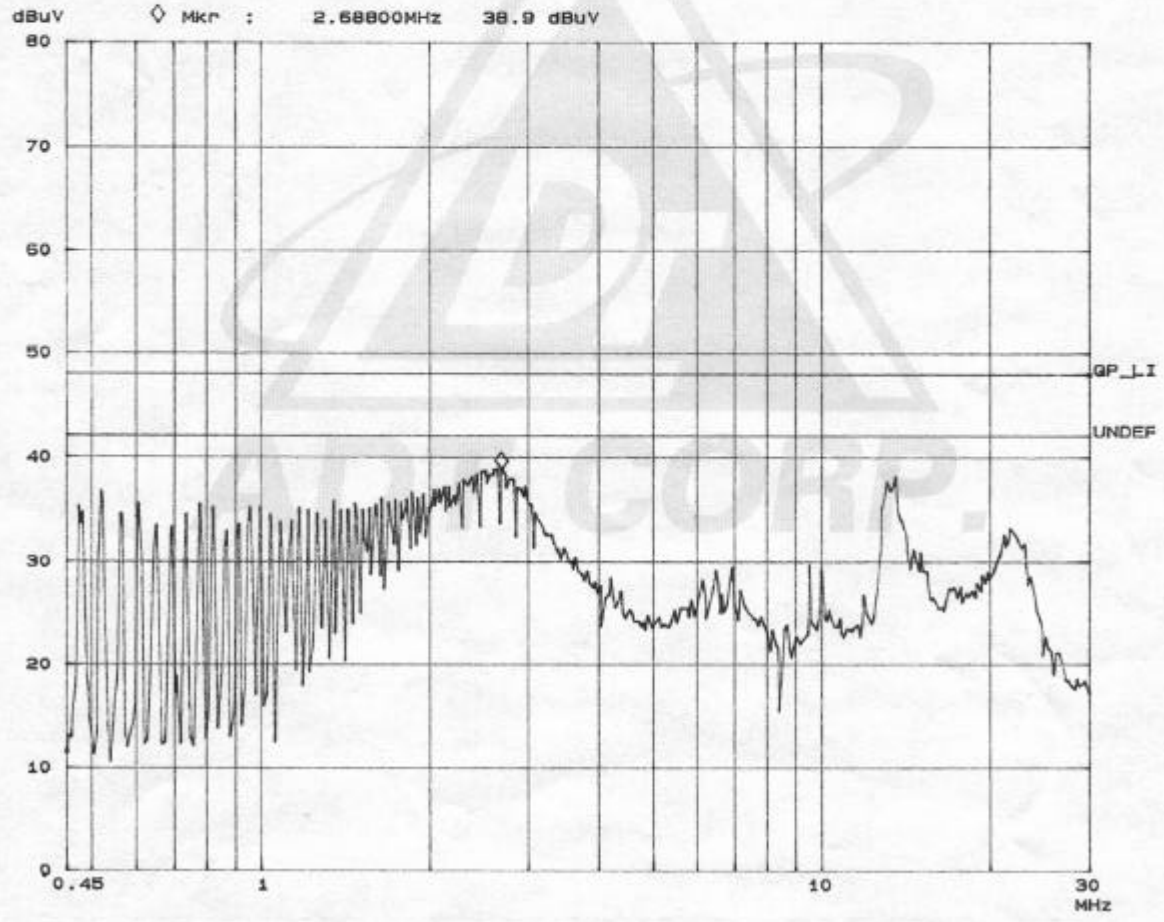
1. **"*": Undetectable**
2. **Q.P. and AV. are abbreviations of quasi-peak and average individually.**
3. **"-": NA**
4. **The emission levels of other frequencies were very low against the limit.**
5. **Margin value = Emission level - Limit value**
6. **Emission Level = Correction Factor + Reading Value.**

ADT CO. Shielded Room 2 12. Jun 00 16: 16
FCC CLASS B

EUT: NWH600
Op Cond: CH 1
Operator: ELLIS
Test Spec: LISN : L
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



ADT CO. Shielded Room 2

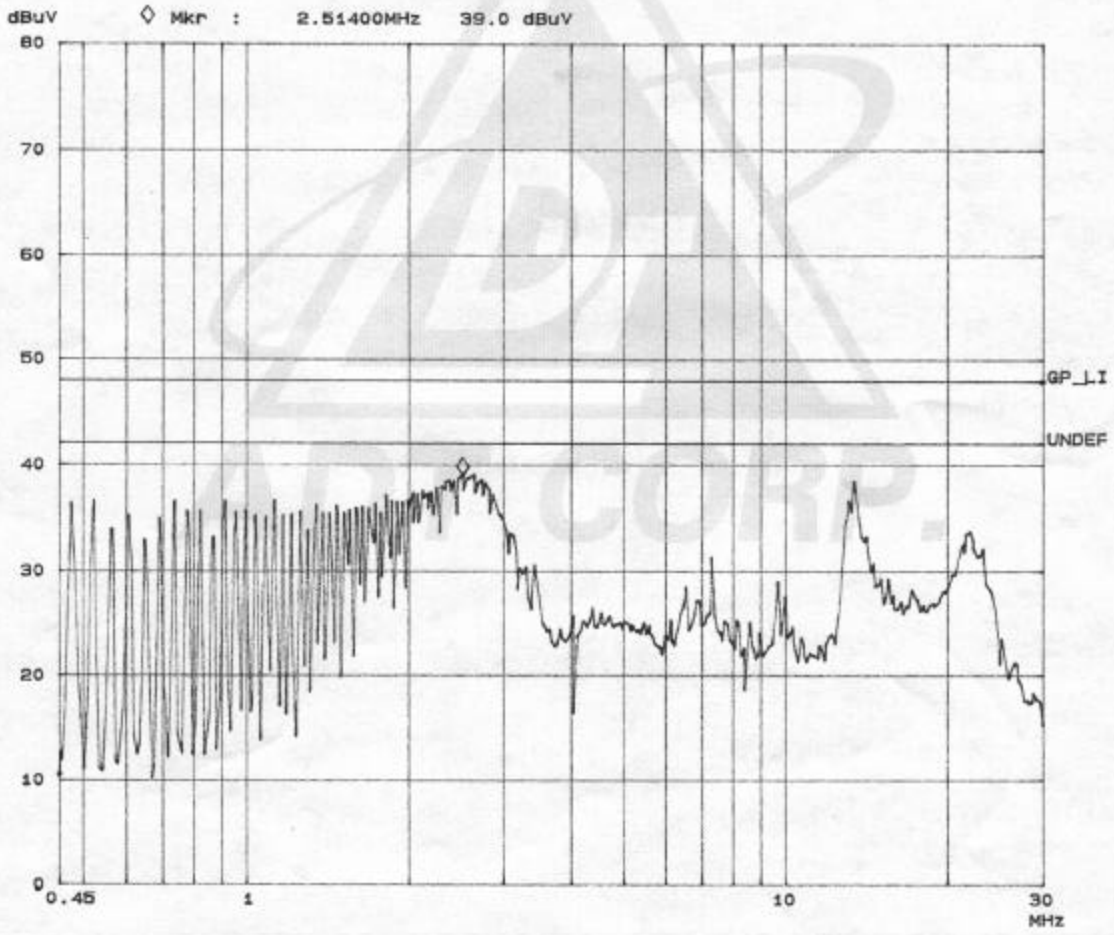
12. Jun 00 16:18

FCC CLASS B

EUT: NWH600
Op Cond: CH 1
Operator: ELLIS
Test Spec: LISN : N
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



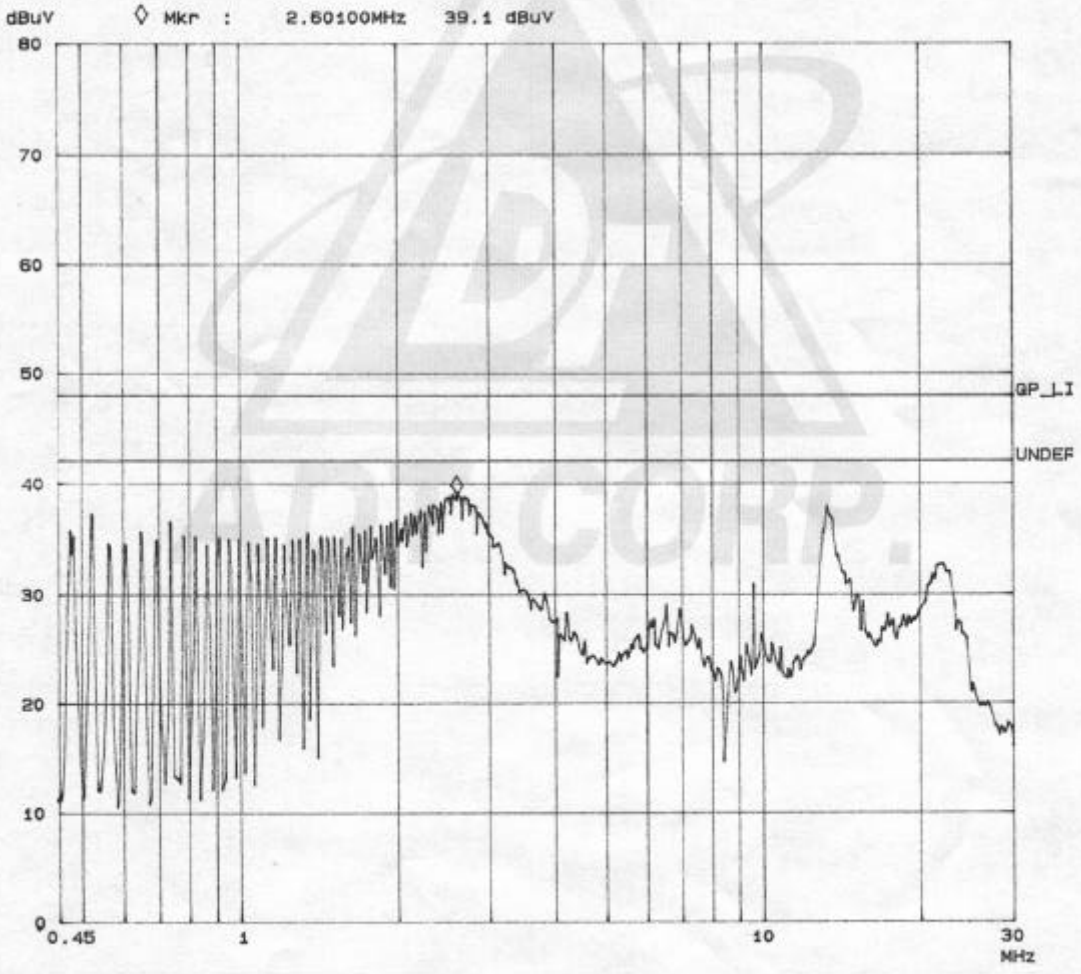
ADT CO. Shielded Room 2 12. Jun 00 16:13

FCC CLASS B

EUT: NWH600
Op Cond: CH 6
Operator: ELLIS
Test Spec: LISN : L
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



ADT CO. Shielded Room 2

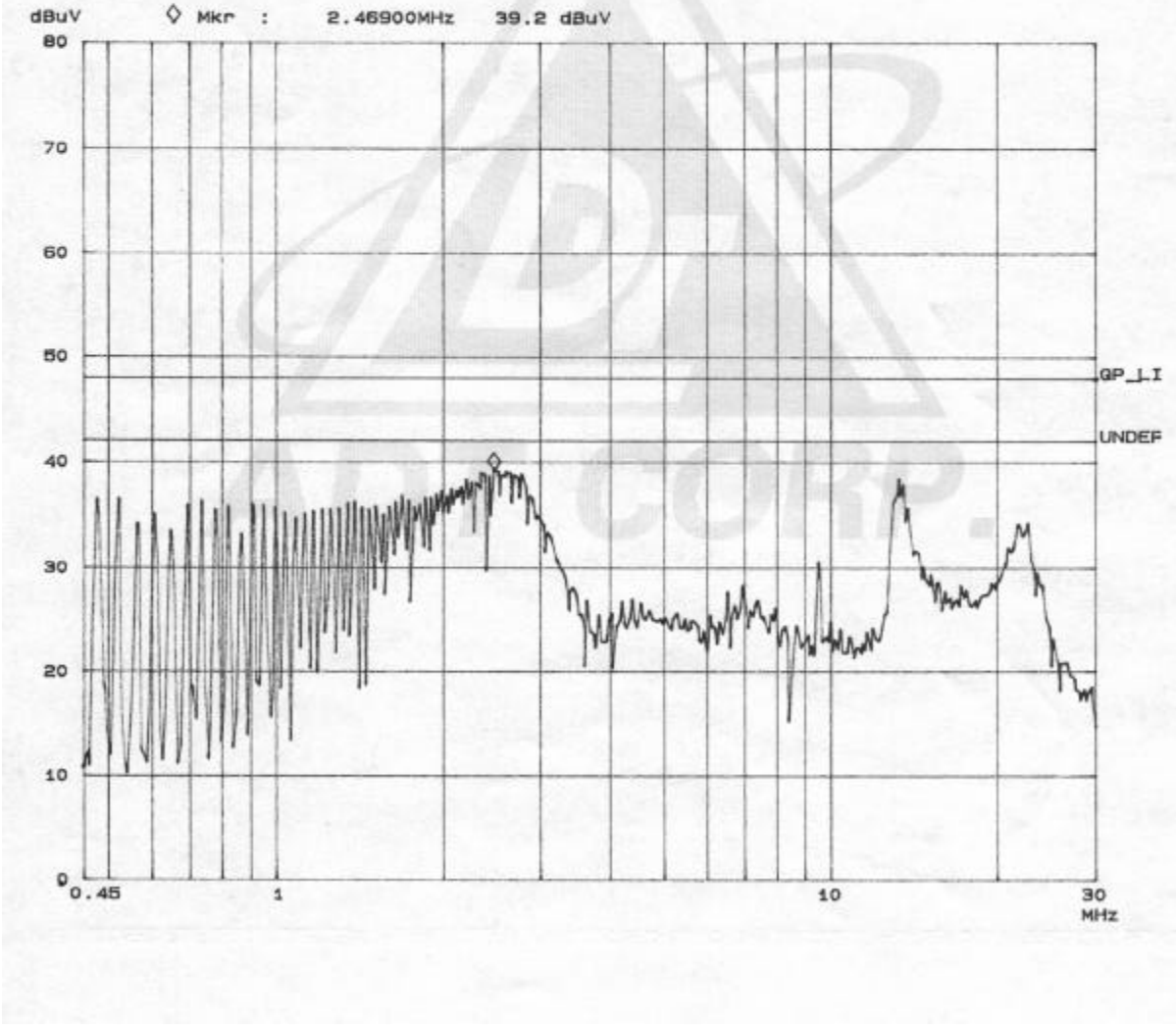
12. Jun 00 16: 11

FCC CLASS B

EUT: NWH600
Op Cond: CH 6
Operator: ELLIS
Test Spec: LISN : N
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



ADT CO. Shielded Room 2

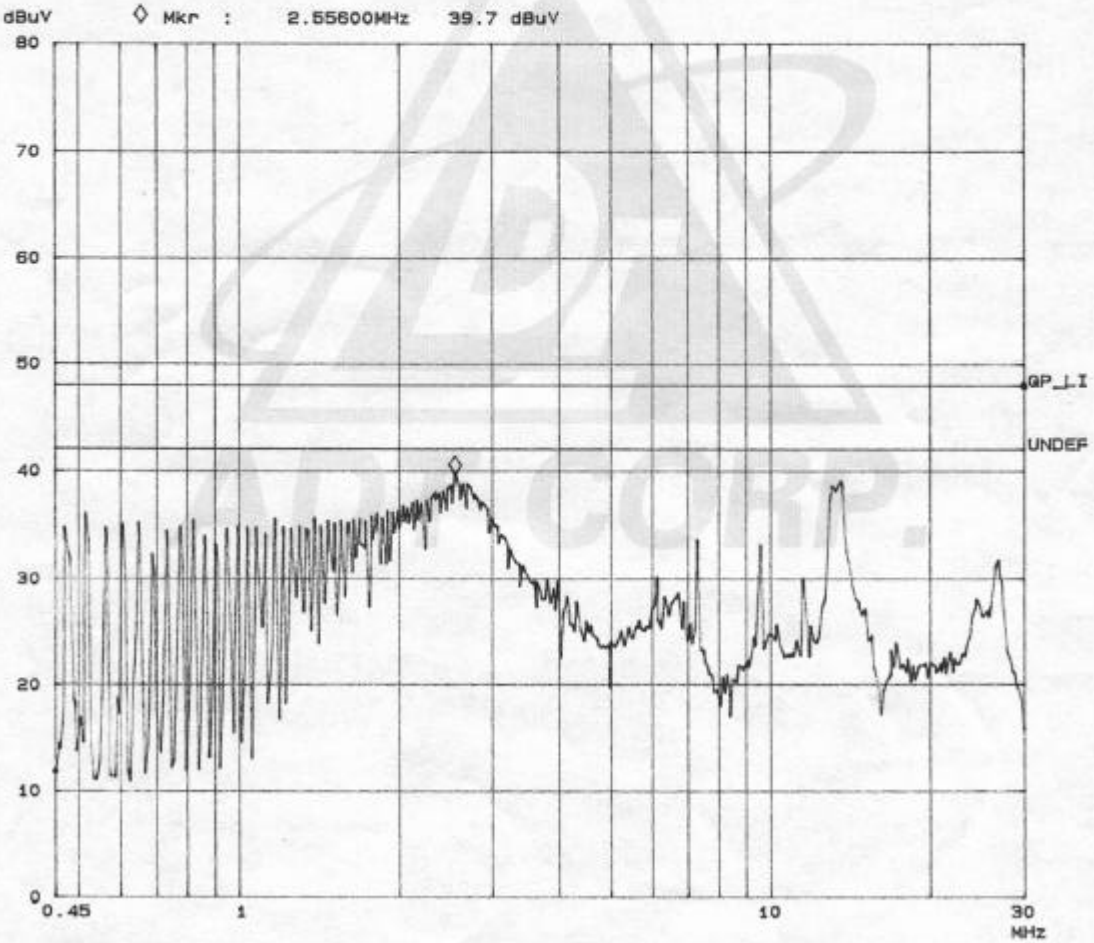
12. Jun 00 16:01

FCC CLASS B

EUT: NWH600
Op Cond: CH 11
Operator: ELLIS
Test Spec: LISN : L
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB

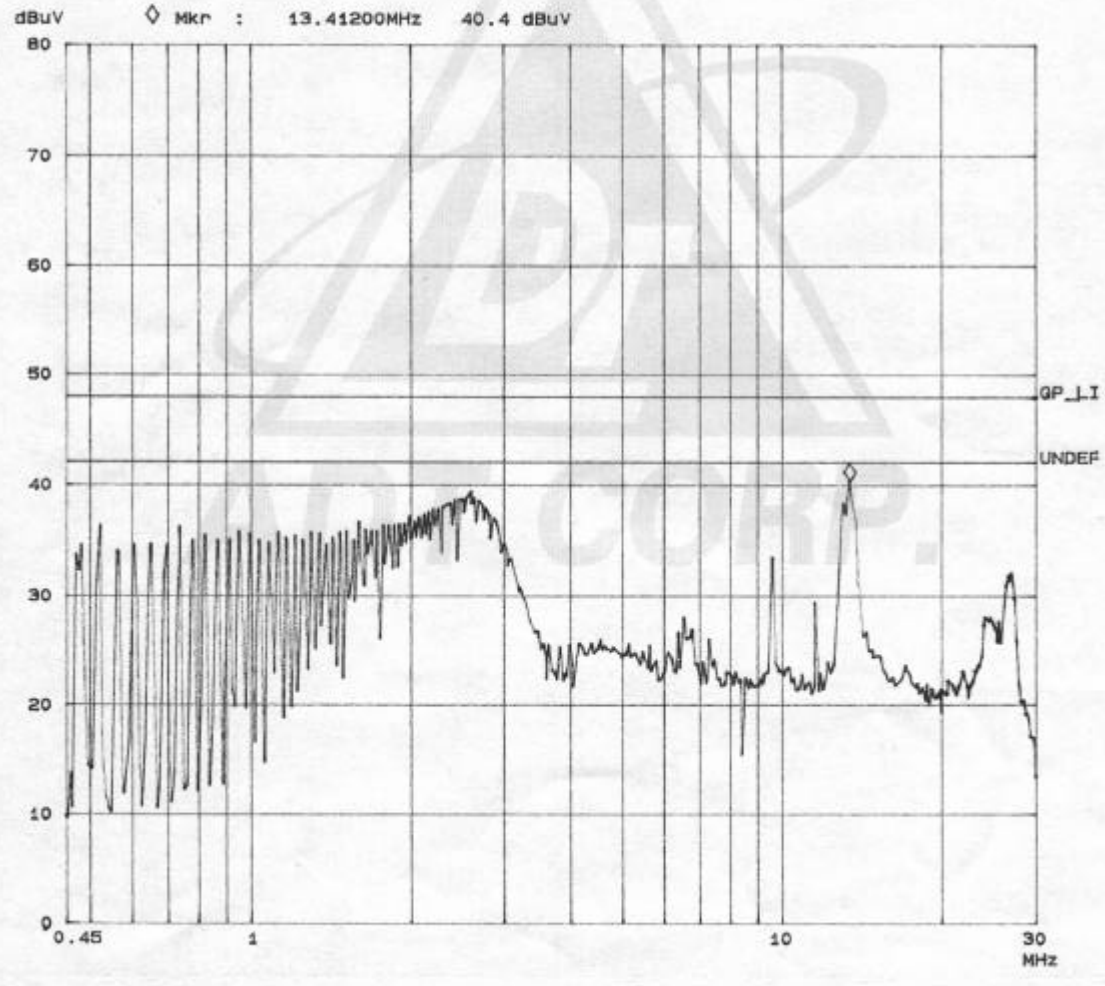


ADT CO. Shielded Room 2 12. Jun 00 16:07
FCC CLASS B

EUT: NWH600
Op Cond: CH 11
Operator: ELLIS
Test Spec: LISN : N
Comment: 120V AC / 60Hz

Fast Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB



6.2 Radiated Emission Measurement

6.2.1 Test instruments

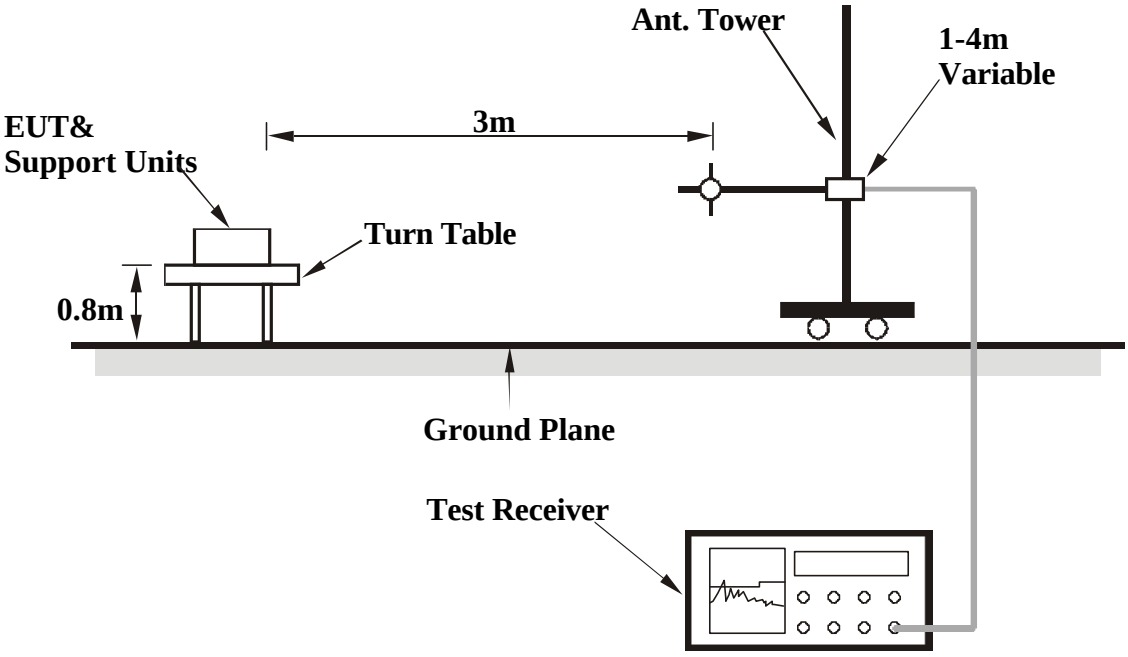
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	**8590L**	**3544A01176**	**Apr 18, 2001**
HP Preamplifier	**8447D**	**2944A08485**	**Oct. 23, 2000**
HP Preamplifier	**8347A**	**3307A01088**	**Sep. 09, 2000**
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**839013/007 839379/002**	**Aug. 27, 2000**
SCHWARZBECK Tunable Dipole Antenna	**VHA 9103 UHA 9105**	**E101051 E101055**	**Nov. 25, 2000**
CHASE BILOG Antenna	**CBL6112A**	**2221**	**Aug. 10, 2000**
SCHWARZBECK Horn Antenna	**BBHA9120-D**	**D130**	**Jul. 21, 2000**
SCHWARZBECK Horn Antenna	**BBHA9170**	**123**	**Jan. 31, 2001**
EMCO Turn Table	**1060**	**1115**	**N/A**
SHOSHIN Tower	**AP-4701**	**A6Y005**	**N/A**
Open Field Test Site	**Site 5**	**ADT-R05**	**Aug. 09, 2000**

The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.

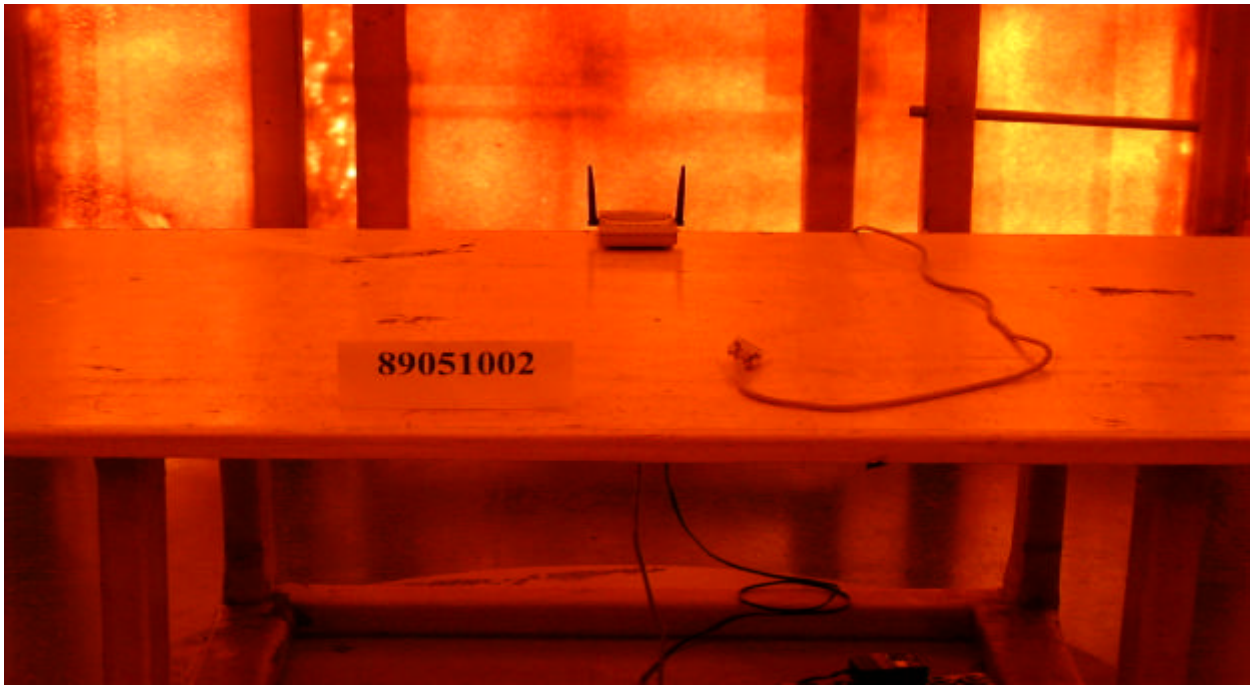
6.2.2 Test Procedure

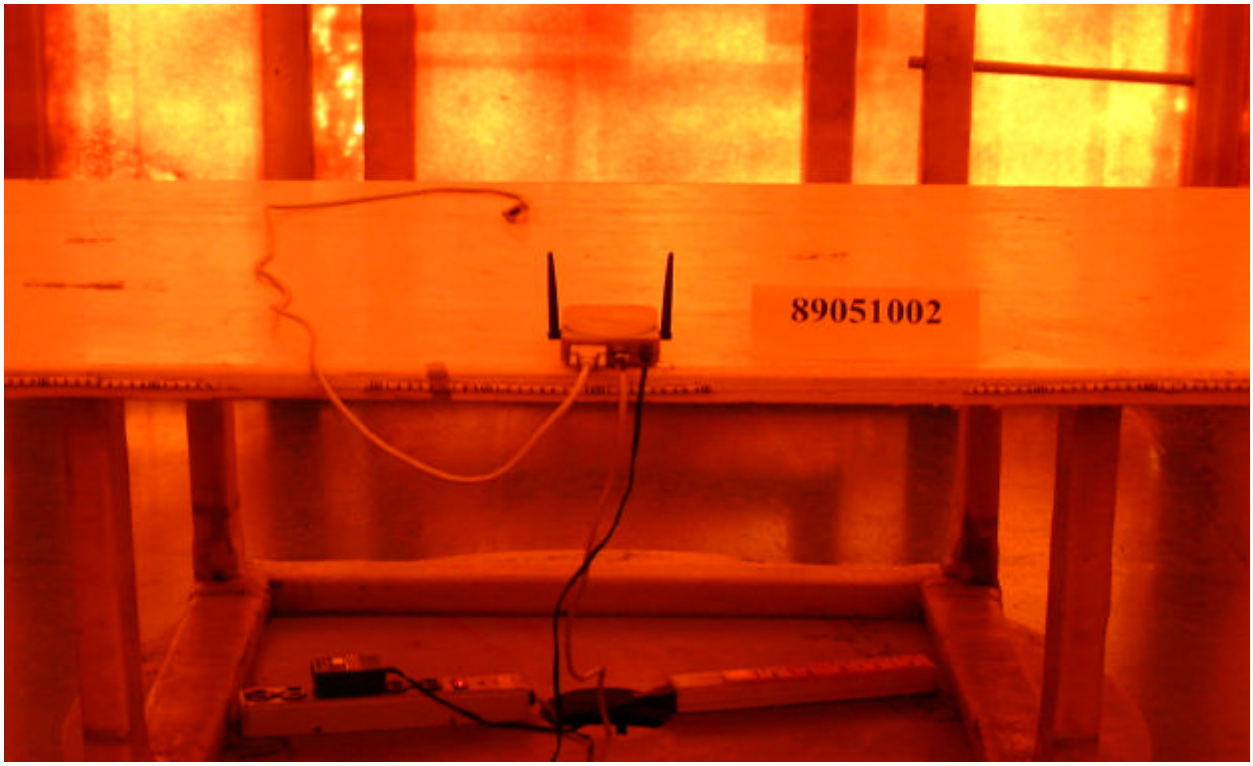
a. The EUT was placed on the turn table 0.8 meter above ground in 3 meter open area test site.
b. Set the resolution bandwidth to 120KHz in the test receiver and select Peak function to scan the frequency below 1 GHz.
c. Shift the interference-receiving antenna located in antenna tower upwards and downwards between 1 and 4 meters above ground and find out the local peak emission on frequency domain.
d. Locate the interference-receiving antenna at the position where the local peak reach the maximum emission.
e. Rotate the turn table and stop at the angle where the measurement device has maximum reading
f. Shift the interference-receiving antenna again to detect the maximum emission of the local peak
g. If the reading of the local peak under Peak function is lower than limit by 6dB, then Quasi Peak detection is not needed and this reading should be recorded. And if it is higher than Peak limit, then the test is fail. Others, switch the receiver to Quasi Peak function, set the resolution bandwidth to 100kHz and repeat the procedures C ~ F. If the reading is lower than limit, this reading should be recorded, otherwise, the test is fail.
h. Set the resolution and video bandwidth of the spectrum analyzer to 1MHz and repeat procedures C ~ F for frequency band from 1 GHz to 10 times carrier frequency.
i. If the reading for the local peak is lower than the Average limit, no further testing is needed in this local peak and this reading should be recorded. If it is higher than Average limit but lower than Peak limit, then set the resolution bandwidth to 1MHz and video bandwidth to 300Hz. Repeat procedures C ~ F. If the maximum reading is lower than Average limit, then this reading should be recorded. If it is higher, then the test is fail.

6.2.3 Test Setup



6.2.4 Photograph of Test Setup





6.2.5 EUT Operating Condition

1. Place the EUT on the turn table.
2. Connect antenna with antenna port
3. Use RJ45 cable to connect PC and EUT.
4. Use RS232 cable on RS 232 port.
5. Power on.
6. Prepare the same setup as above, but place it outside testing area.
7. Send data to EUT (on the turn table) by command "PIN".
8. The linkage of these two PC have been established when the address of the other PC is shown on the monitor.
9. Rotate the turn table and scan the antenna mast to detect the maximum emission.

6.2.6 Climate Condition

The temperature and related humidity is 24℃ and 80%.

6.2.7 Test Results

Channel:1 ANTENNA POLARITY: Vertical		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
440.01	**18.5**	**13.5**	**32.0**	**46.0**	**-14.0**	**100**	**240**
480.01	**19.3**	**8.9**	**28.2**	**46.0**	**-17.8**	**100**	**131**
560.01	**20.9**	**14.5**	**35.4**	**46.0**	**-10.6**	**100**	**268**
600.02	**20.8**	**11.6**	**32.4**	**46.0**	**-13.6**	**100**	**171**
640.01	**21.4**	**12.3**	**33.7**	**46.0**	**-12.3**	**131**	**192**
680.01	**21.6**	**9.4**	**31.0**	**46.0**	**-15.0**	**109**	**366**
720.01	**22.0**	**13.9**	**35.9**	**46.0**	**-10.1**	**118**	**176**
760.01	**22.4**	**13.1**	**35.5**	**46.0**	**-10.5**	**117**	**362**
800.01	**22.4**	**8.1**	**30.5**	**46.0**	**-15.5**	**121**	**70**
840.01	**23.1**	**14.7**	**37.8**	**46.0**	**-8.2**	**118**	**203**
880.01	**23.3**	**13.3**	**36.6**	**46.0**	**-9.4**	**100**	**17**
920.01	**23.7**	**14.3**	**38.0**	**46.0**	**-8.0**	**100**	**268**

Channel:1 ANTENNA POLARITY: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
200.00	**10.2**	**15.9**	**26.1**	**43.5**	**-17.4**	**100**	**-2**
400.00	**18.0**	**5.9**	**23.9**	**46.0**	**-22.1**	**116**	**167**
440.00	**18.5**	**12.7**	**31.2**	**46.0**	**-14.8**	**129**	**158**
480.01	**19.3**	**11.6**	**30.9**	**46.0**	**-15.1**	**165**	**206**
520.01	**20.2**	**12.2**	**32.4**	**46.0**	**-13.6**	**167**	**154**
560.01	**20.9**	**15.7**	**36.6**	**46.0**	**-9.4**	**166**	**104**
600.02	**20.8**	**14.8**	**35.6**	**46.0**	**-10.4**	**163**	**321**
640.01	**21.4**	**10.1**	**31.5**	**46.0**	**-14.5**	**139**	**260**
680.01	**21.6**	**15.3**	**36.9**	**46.0**	**-9.1**	**135**	**280**
720.02	**22.0**	**13.3**	**35.3**	**46.0**	**-10.7**	**132**	**19**
760.02	**22.4**	**15.9**	**38.3**	**46.0**	**-7.7**	**147**	**362**
800.02	**22.4**	**8.4**	**30.8**	**46.0**	**-15.2**	**100**	**30**
840.02	**23.1**	**16.8**	**39.9**	**46.0**	**-6.1**	**100**	**238**
880.02	**23.3**	**11.1**	**34.4**	**46.0**	**-11.6**	**100**	**-6**
980.02	**23.7**	**15.9**	**39.6**	**46.0**	**-6.4**	**100**	**260**

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5. The limit value is defined as per 15.247

Channel:6 ANTENNA POLARITY: Vertical		**Detector Function : Quasi-Peak**		**6dB Bandwidth : 120 kHz.**		**Distance : 3 M Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
440.01	**18.5**	**11.5**	**30.0**	**46.0**	**-16.0**	**100**	**213**
520.01	**20.2**	**8.7**	**28.9**	**43.0**	**-17.1**	**116**	**15**
560.01	**20.9**	**12.5**	**33.4**	**46.0**	**-12.6**	**117**	**264**
600.01	**20.8**	**11.9**	**32.7**	**46.0**	**-13.3**	**114**	**111**
640.01	**21.4**	**9.3**	**30.7**	**46.0**	**-15.3**	**173**	**205**
680.02	**21.6**	**9.1**	**30.7**	**46.0**	**-15.3**	**169**	**159**
720.02	**22.0**	**14.5**	**36.5**	**46.0**	**-9.5**	**100**	**187**
748.00	**22.4**	**6.8**	**29.2**	**46.0**	**-16.8**	**100**	**151**
760.01	**22.4**	**13.3**	**35.7**	**46.0**	**-10.3**	**100**	**206**
800.01	**22.4**	**6.0**	**28.4**	**46.0**	**-17.6**	**100**	**2**
840.01	**23.1**	**13.7**	**36.8**	**46.0**	**-9.2**	**100**	**209**
880.01	**23.3**	**12.2**	**35.5**	**46.0**	**-10.5**	**100**	**37**
920.01	**23.7**	**14.6**	**38.3**	**46.0**	**-7.7**	**100**	**276**

Channel:6 ANTENNA POLARITY: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
440.01	**18.5**	**10.4**	**28.9**	**46.0**	**-17.1**	**100**	**136**
480.01	**19.3**	**11.4**	**30.7**	**46.0**	**-15.3**	**108**	**356**
560.01	**20.9**	**13.9**	**34.8**	**46.0**	**-11.2**	**106**	**129**
600.01	**20.8**	**12.1**	**32.9**	**46.0**	**-13.1**	**146**	**354**
640.01	**21.4**	**5.5**	**26.9**	**46.0**	**-19.1**	**179**	**78**
680.01	**21.6**	**13.0**	**34.6**	**46.0**	**-11.4**	**129**	**325**
720.01	**22.0**	**10.0**	**32.0**	**46.0**	**-14.0**	**139**	**11**
760.02	**22.4**	**14.3**	**36.7**	**46.0**	**-9.3**	**139**	**304**
840.02	**23.1**	**14.8**	**37.9**	**46.0**	**-8.1**	**109**	**58**
880.02	**23.3**	**9.7**	**33.0**	**46.0**	**-13.0**	**109**	**336**
920.02	**23.7**	**17.2**	**40.9**	**46.0**	**-5.1**	**100**	**230**

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5. The limit value is defined as per 15.247

Channel:11 ANTENNA POLARITY: Vertical		**Detector Function : Quasi-Peak**		**6dB Bandwidth : 120 kHz.**		**Distance : 3 M Frequency Range : 30 – 1000 MHz.**	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
440.00	**18.5**	**10.8**	**29.3**	**46.0**	**-16.7**	**100**	**133**
520.00	**20.2**	**8.9**	**29.1**	**46.0**	**-16.9**	**100**	**313**
560.01	**20.9**	**14.2**	**35.1**	**46.0**	**-10.9**	**103**	**9**
600.01	**20.8**	**11.6**	**32.4**	**46.0**	**-13.6**	**109**	**221**
640.01	**21.4**	**10.3**	**31.7**	**46.0**	**-14.3**	**146**	**146**
680.01	**21.6**	**10.2**	**31.8**	**46.0**	**-14.2**	**125**	**363**
720.01	**22.0**	**13.6**	**35.9**	**46.0**	**-10.4**	**106**	**170**
760.01	**22.4**	**13.2**	**35.6**	**46.0**	**-10.4**	**113**	**340**
840.01	**23.1**	**14.5**	**37.6**	**46.0**	**-8.4**	**114**	**-6**
880.01	**23.3**	**11.7**	**35.0**	**46.0**	**-11.0**	**100**	**366**
920.01	**23.7**	**15.6**	**39.3**	**46.0**	**-6.7**	**100**	**49**

Channel:11 ANTENNA POLARITY: Horizontal		Detector Function : Quasi-Peak		6dB Bandwidth : 120 kHz.		Distance : 3 M Frequency Range : 30 – 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
440.00	**18.5**	**12.4**	**30.9**	**46.0**	**-15.1**	**155**	**162**
520.0	**20.2**	**12.3**	**32.5**	**46.0**	**-13.5**	**159**	**363**
560.01	**20.9**	**13.6**	**34.5**	**46.0**	**-11.5**	**161**	**294**
600.01	**20.8**	**12.5**	**33.3**	**46.0**	**-12.7**	**154**	**23**
640.01	**21.4**	**8.1**	**29.5**	**46.0**	**-16.5**	**144**	**355**
680.01	**21.6**	**13.7**	**35.3**	**46.0**	**-10.7**	**129**	**256**
720.01	**22.0**	**10.9**	**32.9**	**46.0**	**-13.1**	**121**	**229**
760.01	**22.4**	**14.3**	**36.7**	**46.0**	**-9.3**	**121**	**44**
840.01	**23.1**	**16.7**	**39.8**	**46.0**	**-6.2**	**118**	**363**
880.01	**23.3**	**9.9**	**33.2**	**46.0**	**-12.8**	**130**	**2**
920.01	**23.7**	**17.2**	**40.9**	**46.0**	**-5.1**	**129**	**262**

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5. The limit value is defined as per 15.247

Channel 1 ANTENNA POLARITY: Vertical		Detector Function : Peak Average				6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1159.80	28.1	18.4	-	46.5	-	74.0	54.0	-27.5	-	100	37
1319.82	29.0	17.6	-	46.6	-	74.0	54.0	-27.4	-	100	296
1400.13	29.5	19.1	-	48.6	-	74.0	54.0	-25.4	-	110	60
2038.00	33.1	14.7	-	47.8	-	74.0	54.0	-26.2	-	100	363
*2412.00	34.3	73.8	66.0	108.1	100.3	-	-	-	-	119	156
4824.00	41.3	14.7	8.1	56.0	49.4	74.0	54.0	-18.0	-4.6	100	94
7236.00	39.5	-	-	-	-	74.0	54.0	-	-	-	-

Channel 1 ANTENNA POLARITY: Horizontal		Detector Function : Peak Average				6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1159.89	28.1	13.7	-	41.8	-	74.0	54.0	-32.2	-	136	333
1319.93	29.0	17.7	-	46.7	-	74.0	54.0	-27.3	-	164	219
1399.81	29.5	18.7	-	48.2	-	74.0	54.0	-25.8	-	139	247
2038.00	33.1	12.1	-	45.2	-	74.0	54.0	-28.8	-	136	209
*2412.00	34.3	61.3	52.1	95.6	86.4	-	-	-	-	136	286
4824.00	41.3	11.3	-	52.6	-	74.0	54.0	-21.4	-	136	283
7236.00	39.5	-	-	-	-	74.0	54.0	-	-	-	-

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5. The limit value is defined as per 15.247

6. " * " : Fundamental Frequency

Channel 6 ANTENNA POLARITY: Vertical		Detector Function : Peak Average				6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1159.30	28.1	17.9	-	46.0	-	74.0	54.0	-28.0	-	100	105
1319.80	29.0	17.1	-	46.1	-	74.0	54.0	-27.9	-	106	362
1399.94	29.5	19.2	-	48.7	-	74.0	54.0	-25.3	-	100	363
2062.99	33.2	12.3	-	45.5	-	74.0	54.0	-28.5	-	113	25
*2436.40	34.4	68.8	61.5	103.0	95.9	-	-	-	-	117	138
4874.08	41.2	13.1	8.0	54.3	49.2	74.0	54.0	-19.7	-4.8	150	246
7311.00	39.7	-	-	-	-	74.0	54.0	-	-	-	-

Channel 6 ANTENNA POLARITY: Horizontal		Detector Function : Peak Average				6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1195.91	28.1	14.0	-	42.1	-	74.0	54.0	-31.9	-	113	117
1319.98	29.0	17.3	-	46.3	-	74.0	54.0	-27.7	-	107	316
1399.94	29.5	18.0	-	47.5	-	74.0	54.0	-26.5	-	108	71
2063.00	33.2	10.5	-	43.7	-	74.0	54.0	-30.3	-	115	327
*2436.44	34.4	63.8	56.7	98.2	91.1	-	-	-	-	105	223
4874.00	41.2	11.0	-	52.0	-	74.0	54.0	-21.8	-	114	2
7311.00	39.7	-	-	-	-	74.0	54.0	-	-	-	-

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5. The limit value is defined as per 15.247

6. " * " : Fundamental Frequency

Channel 11 ANTENNA POLARITY: Vertical		Detector Function : Peak Average				6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1159.10	28.1	17.5	-	45.6	-	74.0	54.0	-28.4	-	100	188
1319.82	29.0	17.3	-	46.3	-	74.0	54.0	27.7	-	100	337
1399.82	29.5	17.3	-	46.8	-	74.0	54.0	-27.2	-	100	322
2088.00	33.2	12.7	-	45.9	-	74.0	54.0	-28.1	-	100	-7
*2462.00	34.5	72.6	64.8	106.9	99.3	-	-	-	-	113	165
4924.00	41.4	11.1	-	52.5	-	74.0	54.0	-21.5	-	109	284
7386.00	39.7	-	-	-	-	74.0	54.0	-	-	-	-

Channel 11 ANTENNA POLARITY: Horizontal		Detector Function : Peak Average				6dB Bandwidth : 1 MHz.				Distance : 3 M Frequency Range : Above 1000 MHz.	
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)		Antenna Height (cm)	Table Angle (Degree)
		P.K.	A.V.	P.K.	A.V.	P.K.	A.V.	P.K.	A.V.		
1159.23	28.1	13.8	-	41.9	-	74.0	54.0	-32.1	-	134	-2
1319.84	29.0	17.9	-	46.9	-	74.0	54.0	-27.1	-	137	349
1399.84	29.5	17.5	-	47.0	-	74.0	54.0	-27.0	-	134	88
2088.15	33.2	12.1	-	45.3	-	74.0	54.0	-28.7	-	103	339
*2462.00	34.5	63.5	55.8	98.0	90.3	-	-	-	-	109	222
4924.00	41.4	9.6	-	51.0	-	74.0	54.0	-23.0	-	103	-7
7386.00	39.7	-	-	-	-	74.0	54.0	-	-	-	-

Remarks: 1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).

2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)

3. The other emission levels were very low against the limit.

4. Margin value = Emission level - Limit value

5. The limit value is defined as per 15.247

6. " * " : Fundamental Frequency

6.3 6dB Bandwidth Measurement

6.3.1 Test Instruments

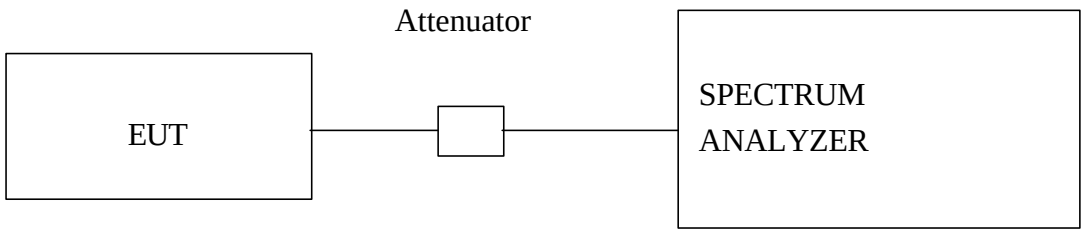
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**846839/018 848926/005**	**Dec. 03, 2000**
HP ATTENUATOR	**8496B**	**3247A18505**	**Cal. on use**
HP PLOTTER	**7475A**	**2641V27755**	**N/A**

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

6.3.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum whose power is larger than peak power mines 6 dB.

6.3.3 Test Setup



6.3.4 EUT Operating Condition

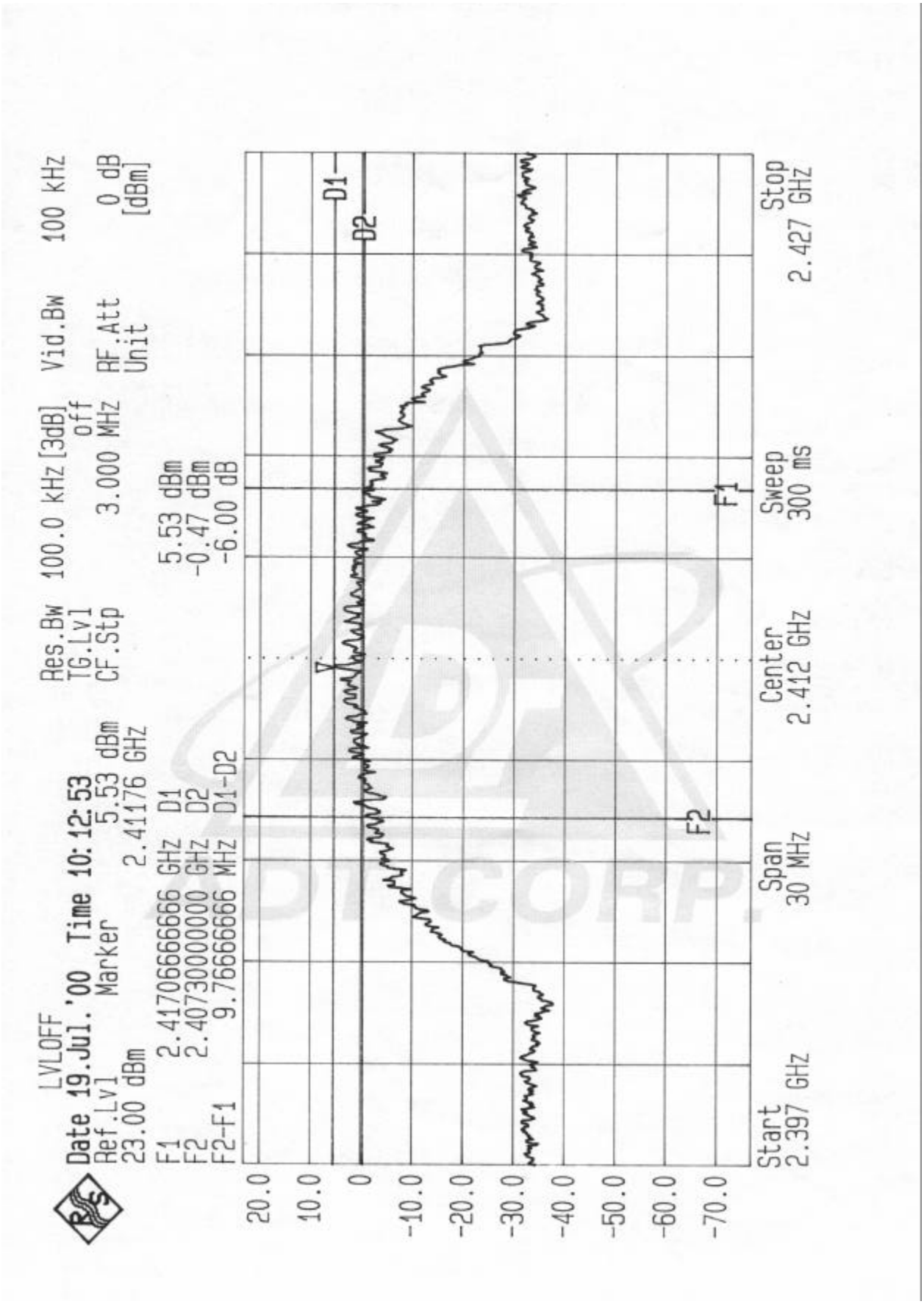
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

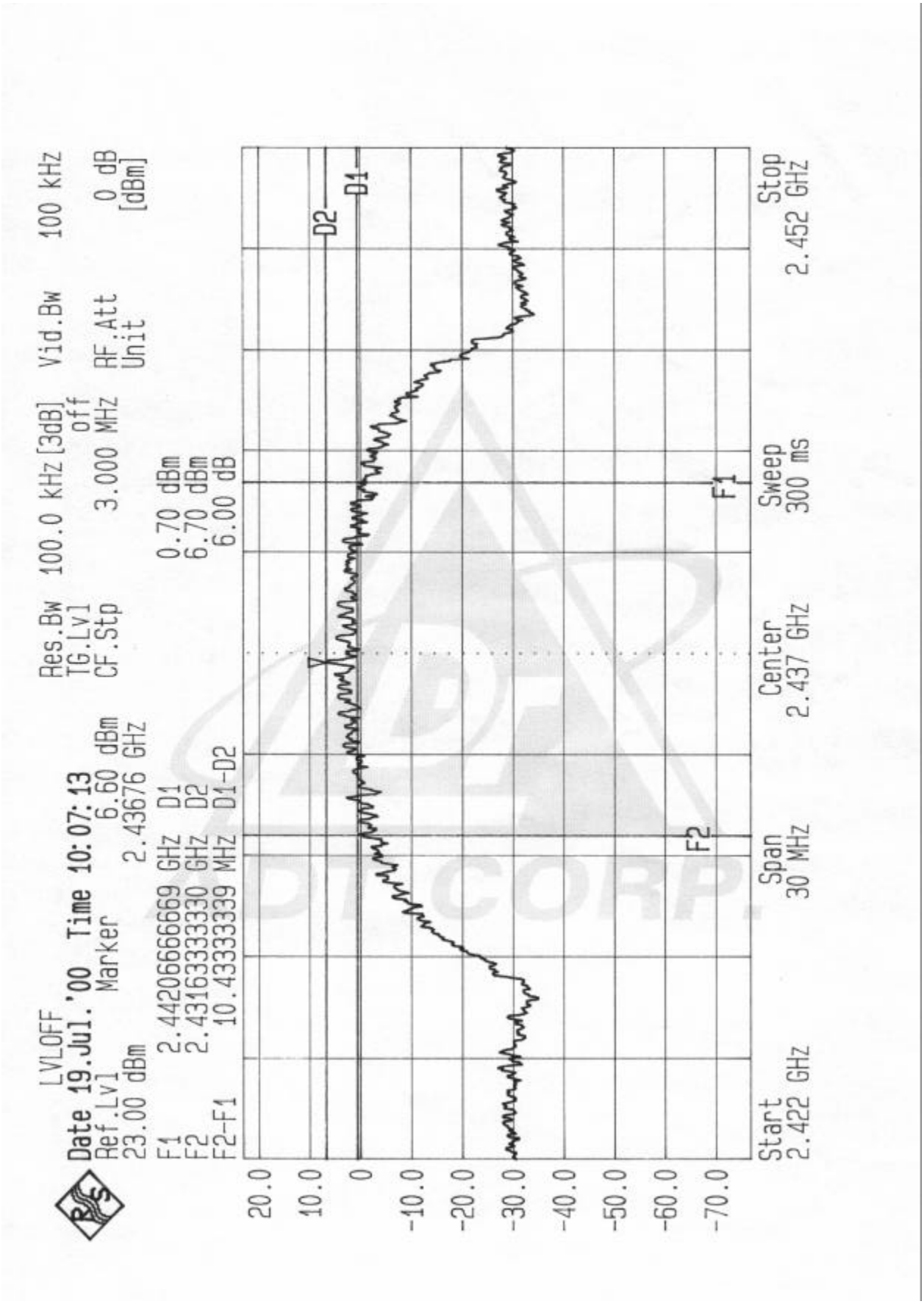
6.3.5 Climate Condition

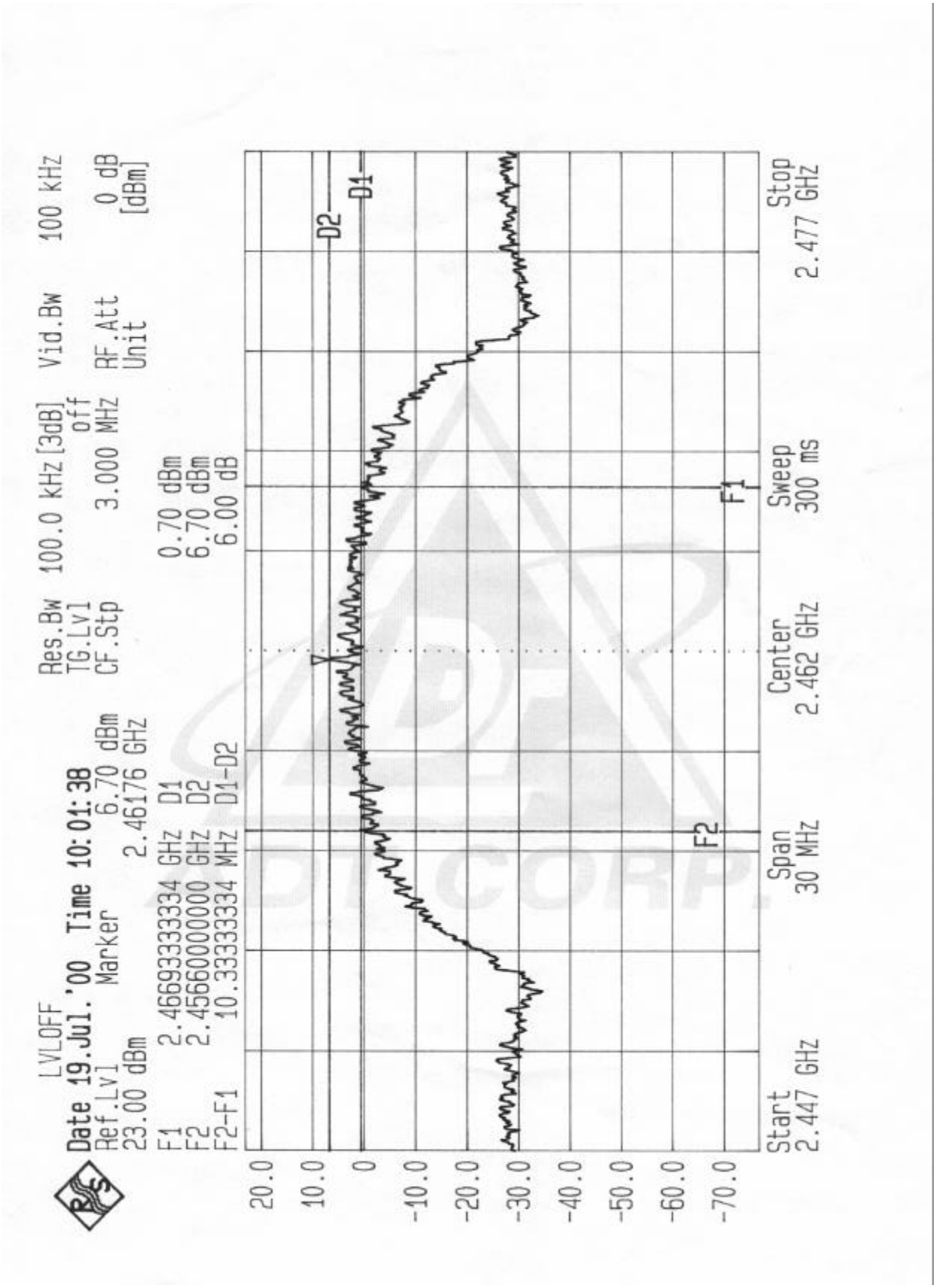
The temperature and related humidity is 18℃ and 78%.

6.3.6 Test Results

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	9.77	0.5	PASS
6	2437	10.43	0.5	PASS
11	2462	10.33	0.5	PASS


LVLOFF
Date 19.Jul.'00 Time 10:12:53
Ref.Lvl
23.00 dBm
Marker
5.53 dBm
2.41176 GHz
F1 2.417066666666 GHz D1 5.53 dBm
F2 2.407300000000 GHz D2 -0.47 dBm
F2-F1 9.766666666 MHz D1-D2 -6.00 dB
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 3.000 MHz
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
Start 2.397 GHz
Span 30 MHz
Center 2.412 GHz
Sweep 300 ms
Stop 2.427 GHz
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0


LVLOFF
Date 19.Jul.'00 Time 10:07:13
Ref.Lvl
23.00 dBm
Marker
6.60 dBm
2.43676 GHz
F1 2.44206666669 GHz D1 0.70 dBm
F2 2.43163333330 GHz D2 6.70 dBm
F2-F1 10.43333339 MHz D1-D2 6.00 dB
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 3.000 MHz
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.422 GHz
Span 30 MHz
Center 2.437 GHz
Sweep 300 ms
Stop 2.452 GHz


LVLOFF
Date 19.Jul.'00 Time 10:01:38
Ref.Lvl
23.00 dBm
Marker
6.70 dBm
2.46176 GHz
F1 2.46693333334 GHz D1 0.70 dBm
F2 2.45660000000 GHz D2 6.70 dBm
F2-F1 10.33333334 MHz D1-D2 6.00 dB
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 3.000 MHz
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D2
D1
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.447 GHz
Span 30 MHz
Center 2.462 GHz
Sweep 300 ms
Stop 2.477 GHz

6.4 Maximum Peak Output Power and RF Exposure Measurement

6.4.1 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**846839/018 848926/005**	**Dec. 03, 2000**
HP ATTENUATOR	**8496B**	**3247A18505**	**Cal. on use**
HP PLOTTER	**7475A**	**2641V27755**	**N/A**

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

6.4.2 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
3. The span of the spectrum analyzer should be larger than 6dB BandWidth plus 10MHz.
4. Use Peak Search to read the peak power after Maximum Hold function is activated.
5. Shift the marker to +/- 3MHz and +/-6MHz, and record the reading.
6. The Maximum Peak Output Power is the linear summation of the 5 readings in (4) and (5).

6.4.3 RF exposure limit

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
(A)Limits For Occupational / Control Exposures				
300-1500	…	…	F/300	6
1500-100,000	…	…	5	6
(B)Limits For General Population / Uncontrolled Exposure				
300-1500	…	…	F/1500	6
1500-100,000	…	…	1.0	30

F = Frequency in MHz

The 20cm separation requirement listed in section 2.1091 is met because the output power and the antenna gain is very low. Please see the calculation below.

Friis transmission formula : $Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

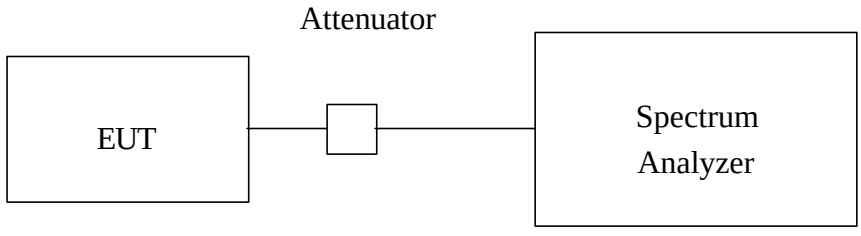
Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Through the calculation, we know the distance r where the MPE limit is reached.

Ref. : David K. Cheng, *Field and Wave Electromagnetics*, Second Edition, Page 640, Eq. (11-133).

6.4.4 Test Setup



6.4.5 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.
The product is connected with PC through cable. People is easy to place it outside 20cm distance to the user. So this product is classified as **Mobile Device**.

6.4.6 Climate Condition

The temperature and related humidity is 18℃ and 78%.

6.4.7 Test Result

6.4.7.1 Peak Power

The maximum antenna Gain measured is 1.4dBi or 1.38 (numeric)

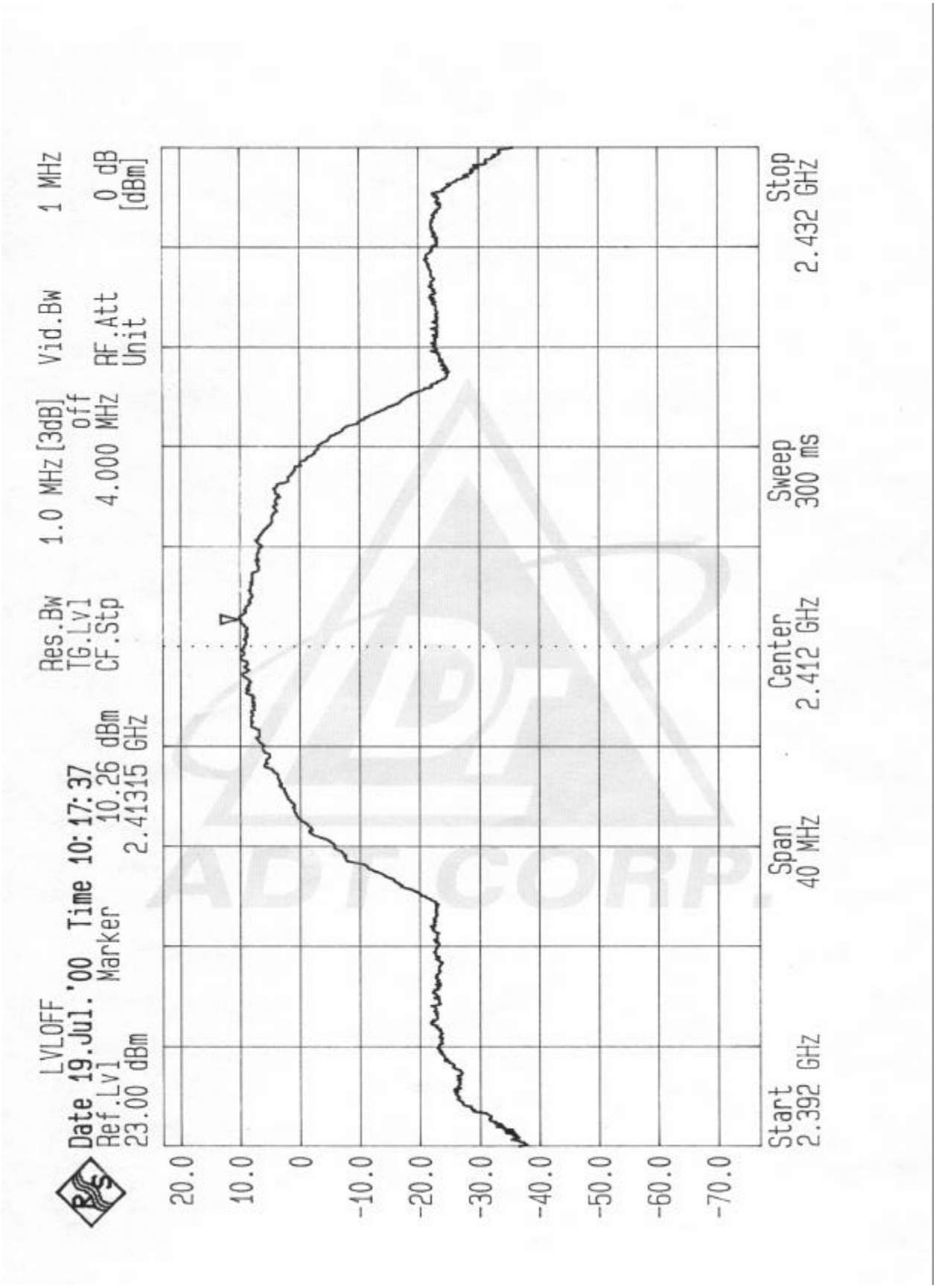
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2.414	14.3	30	PASS
6	2.437	15.1	30	PASS
11	2.464	15.5	30	PASS

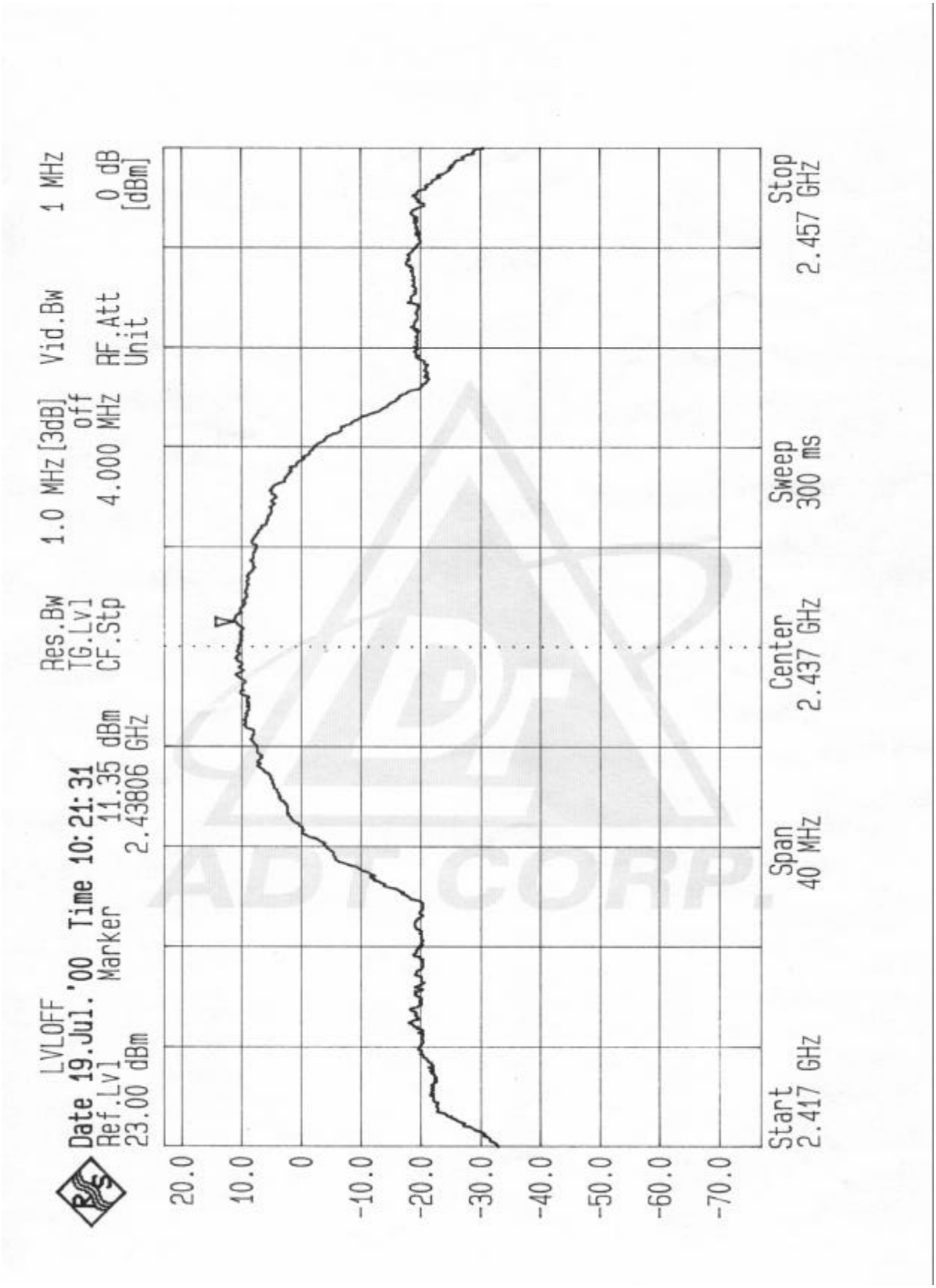
The spectrum plots are attached as below.

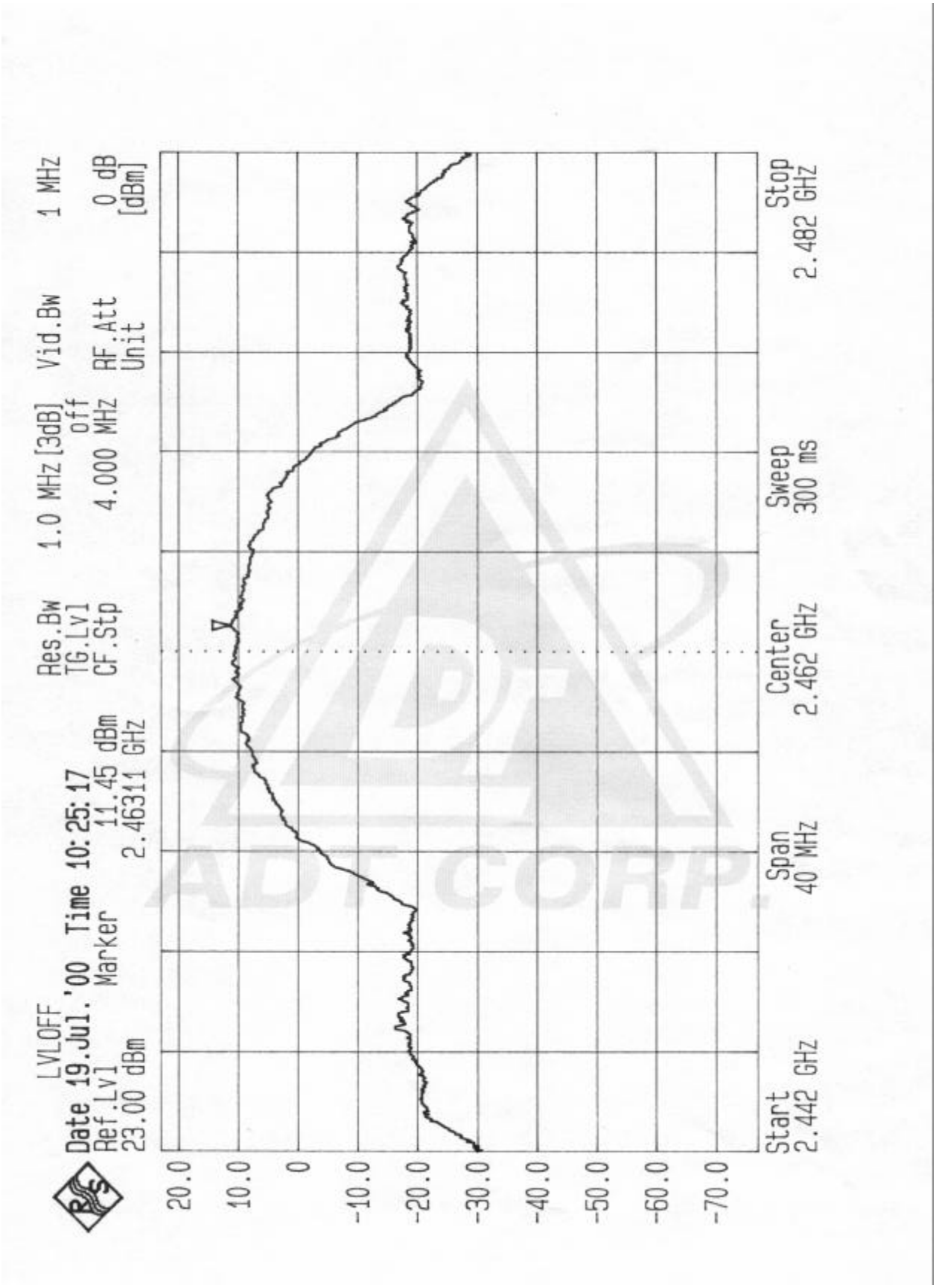
6.4.7.2 RF Exposure Distance Limits :

CHANNEL	CHANNEL FREQUENCY (MHz)	OUTPUT POWER TO ANTENNA (mW)	MINIMUM ALLOWABLE DISTANCE (r) FROM SKIN (Centi-Meter)
1	2412	26.9	1.72
6	2437	32.3	1.88
11	2462	35.5	1.97

The distance r (4th column) calculated from the Friis transmission formula is far more shorter than 20 cm separation requirement.


LVLOFF
Date 19.Jul.'00 Time 10:17:37
Ref.Lvl
23.00 dBm
Marker
10.26 dBm
2.41315 GHz
Res.Bw 1.0 MHz [3dB]
TG.Lvl off
CF.Stp 4.000 MHz
Vid.Bw 1 MHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.392 GHz
Span 40 MHz
Center 2.412 GHz
Sweep 300 ms
Stop 2.432 GHz


LVLOFF
Date 19.Jul.'00 Time 10:21:31
Ref.Lvl
23.00 dBm
Marker
11.35 dBm
2.43806 GHz
Res.Bw 1.0 MHz [3dB]
TG.Lvl off
CF.Stp 4.000 MHz
Vid.Bw 1 MHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.417 GHz
Span 40 MHz
Center 2.437 GHz
Sweep 300 ms
Stop 2.457 GHz


LVLOFF
Date 19.Jul.'00 Time 10:25:17
Ref.Lvl
23.00 dBm
Marker
11.45 dBm
2.46311 GHz
Res.Bw 1.0 MHz [3dB]
TG.Lvl off
CF.Stp 4.000 MHz
Vid.Bw 1 MHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.442 GHz
Span 40 MHz
Center 2.462 GHz
Sweep 300 ms
Stop 2.482 GHz

6.5 Power Spectral Density Measurement

6.5.1 Test Instruments

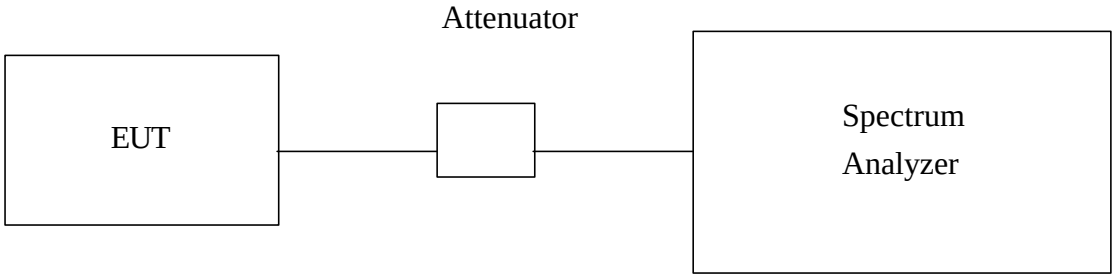
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	**ESMI**	**846839/018 848926/005**	**Dec. 03, 2000**
HP ATTENUATOR	**8496B**	**3247A18505**	**Cal. on use**
HP PLOTTER	**7475A**	**2641V27755**	**N/A**

The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

6.5.2 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time=span/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

6.5.3 Test Setup



6.5.4 EUT Operating Condition

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

6.5.5 Climate Condition

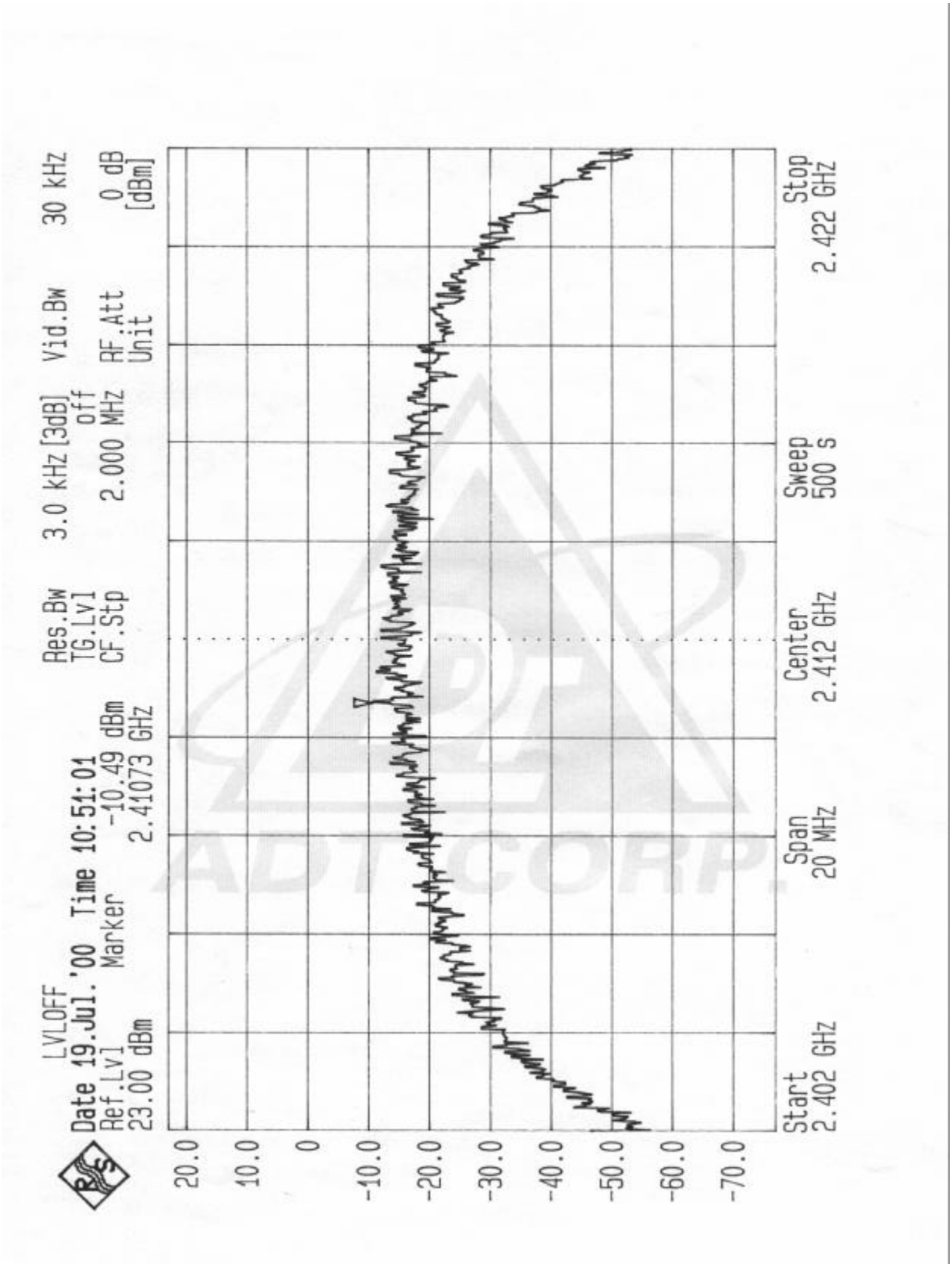
The temperature and related humidity is 18℃ and 78%.

6.5.6 Test Result

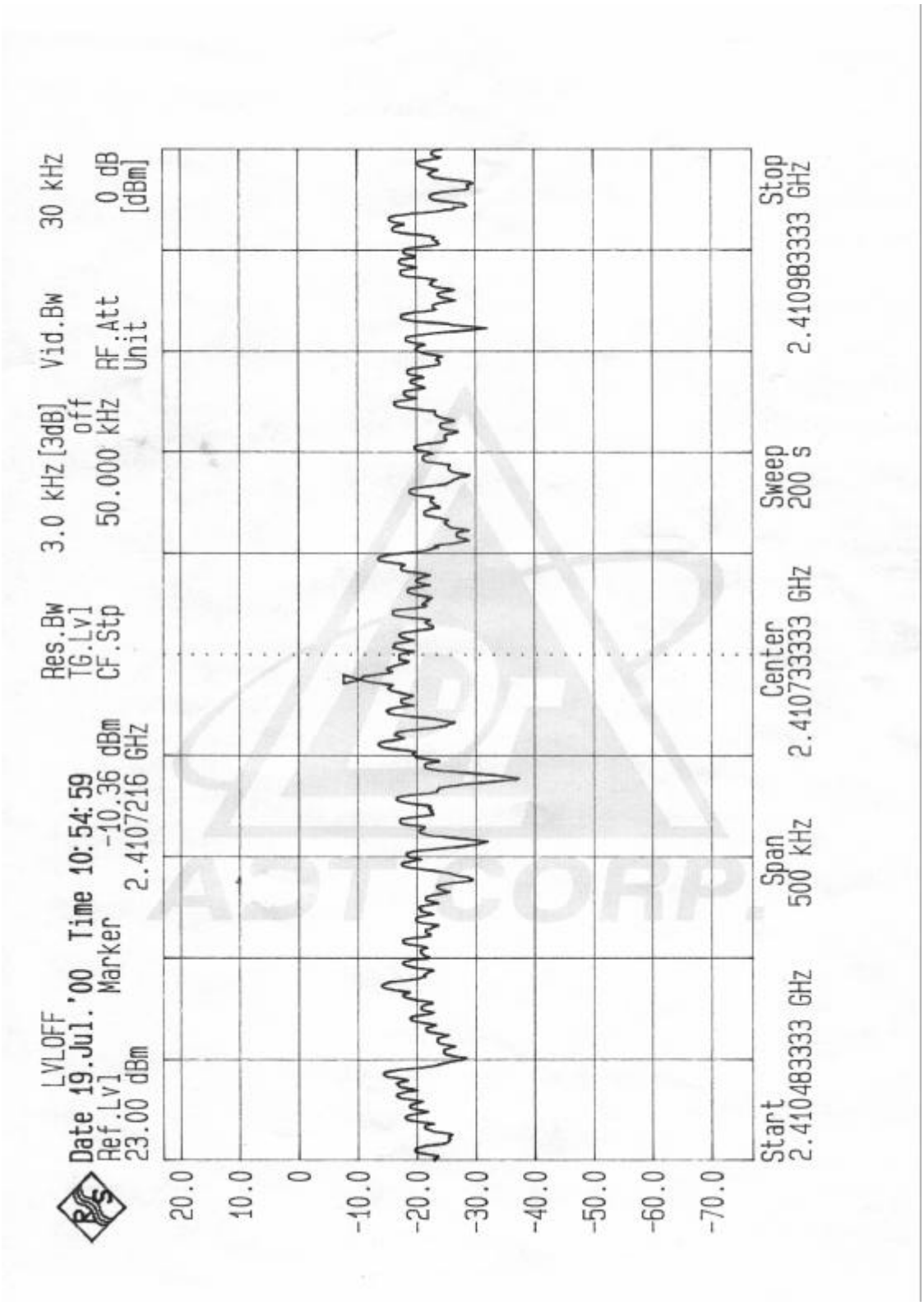
CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW	MAXIMUM LIMIT (MHz)	PASS/FAIL
1	2412	-10.36dBm	8dBm	PASS
6	2437	-9.19dBm	8dBm	PASS
11	2462	-9.07dBm	8dBm	PASS

The spectrum plots of test result are attached as below.

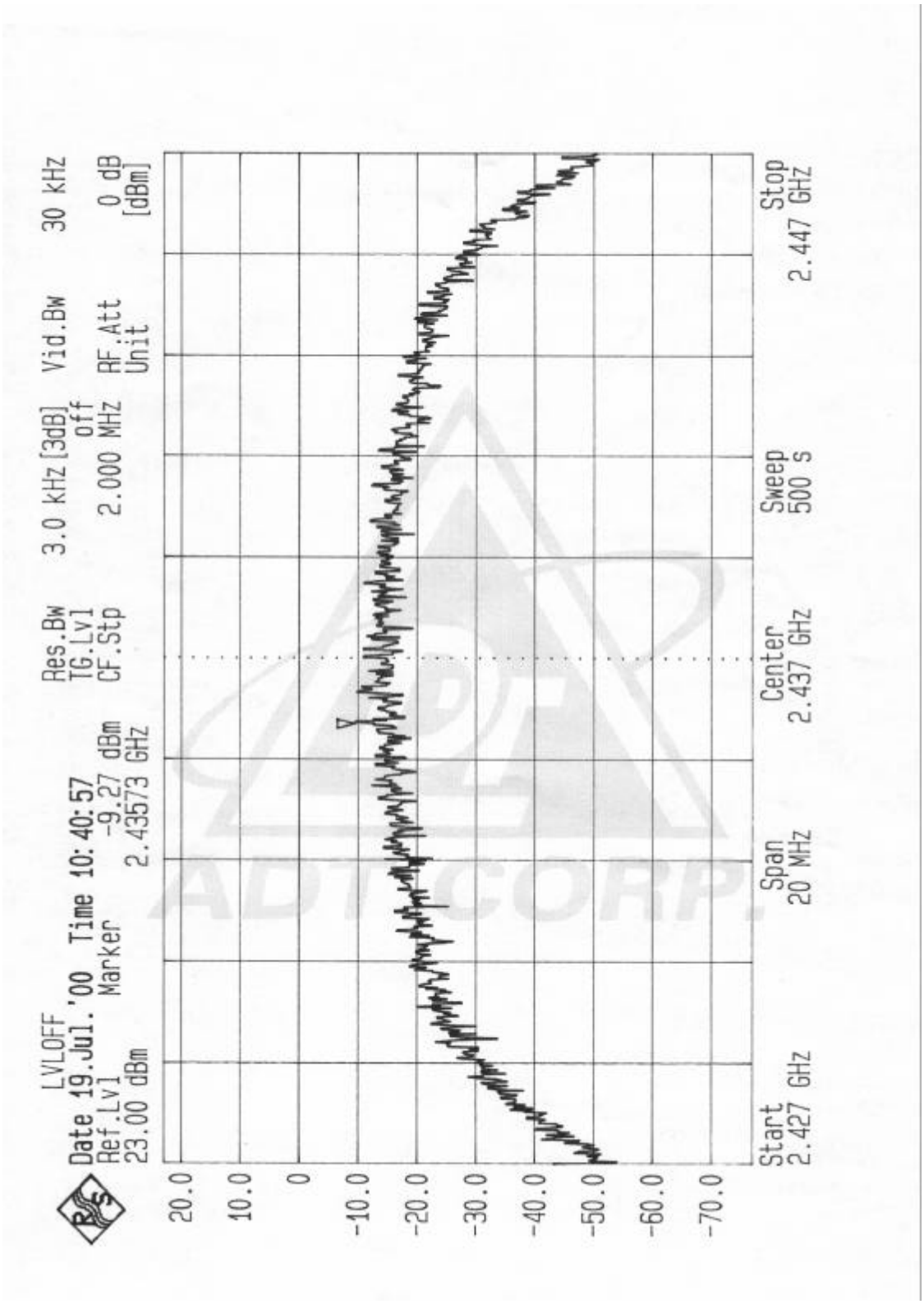
CH 1


LVLOFF
Date 19.Jul.'00 Time 10:51:01
Ref.Lvl
23.00 dBm
Marker
-10.49 dBm
2.41073 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.402 GHz
Span 20 MHz
Center 2.412 GHz
Sweep 500 s
Stop 2.422 GHz

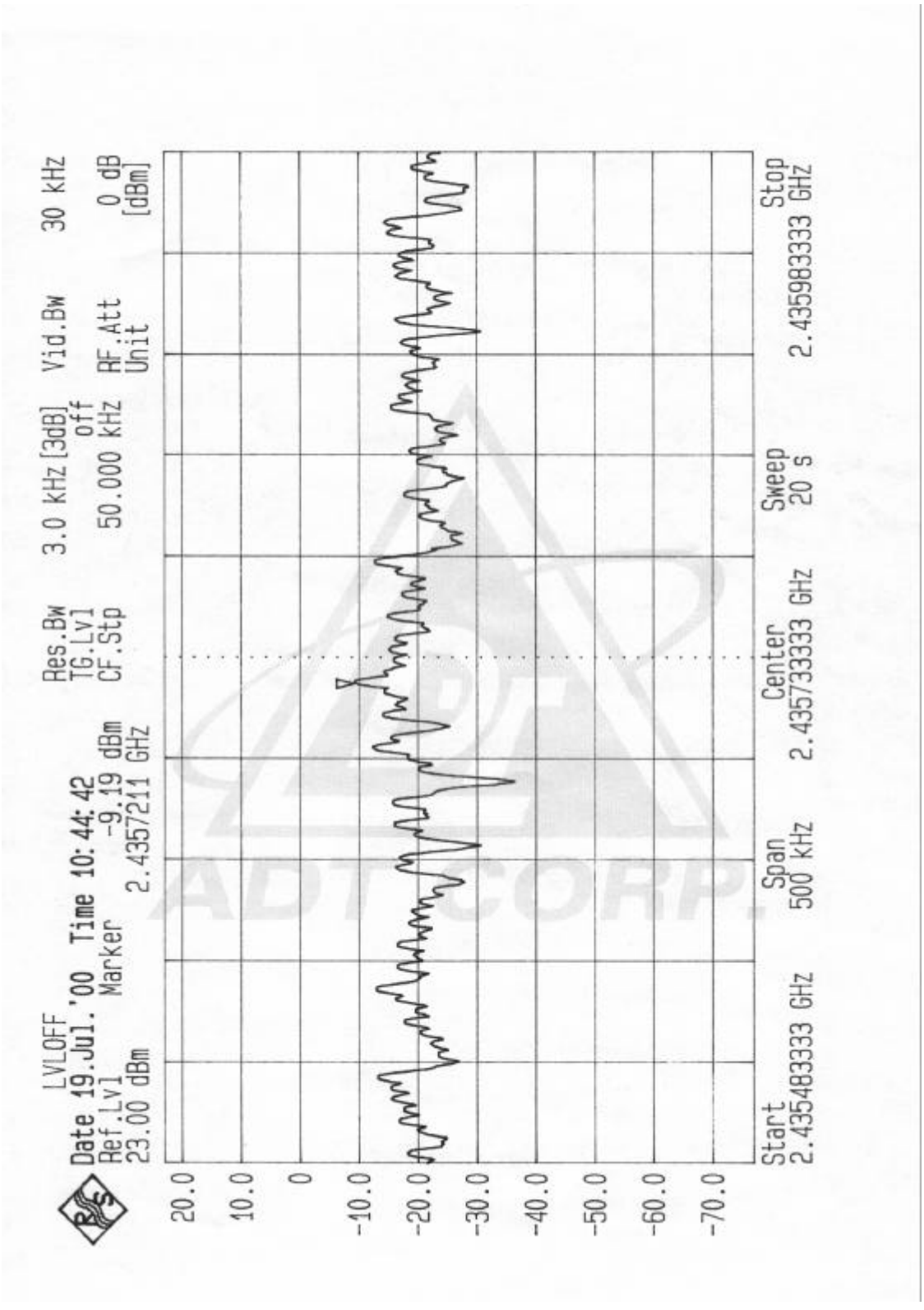
CH 1


LVLOFF
Date 19.Jul.'00 Time 10:54:59
Ref.Lvl
23.00 dBm
Marker
-10.36 dBm
2.4107216 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 50.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.410483333 GHz
Span 500 kHz
Center 2.410733333 GHz
Sweep 200 s
Stop 2.410983333 GHz

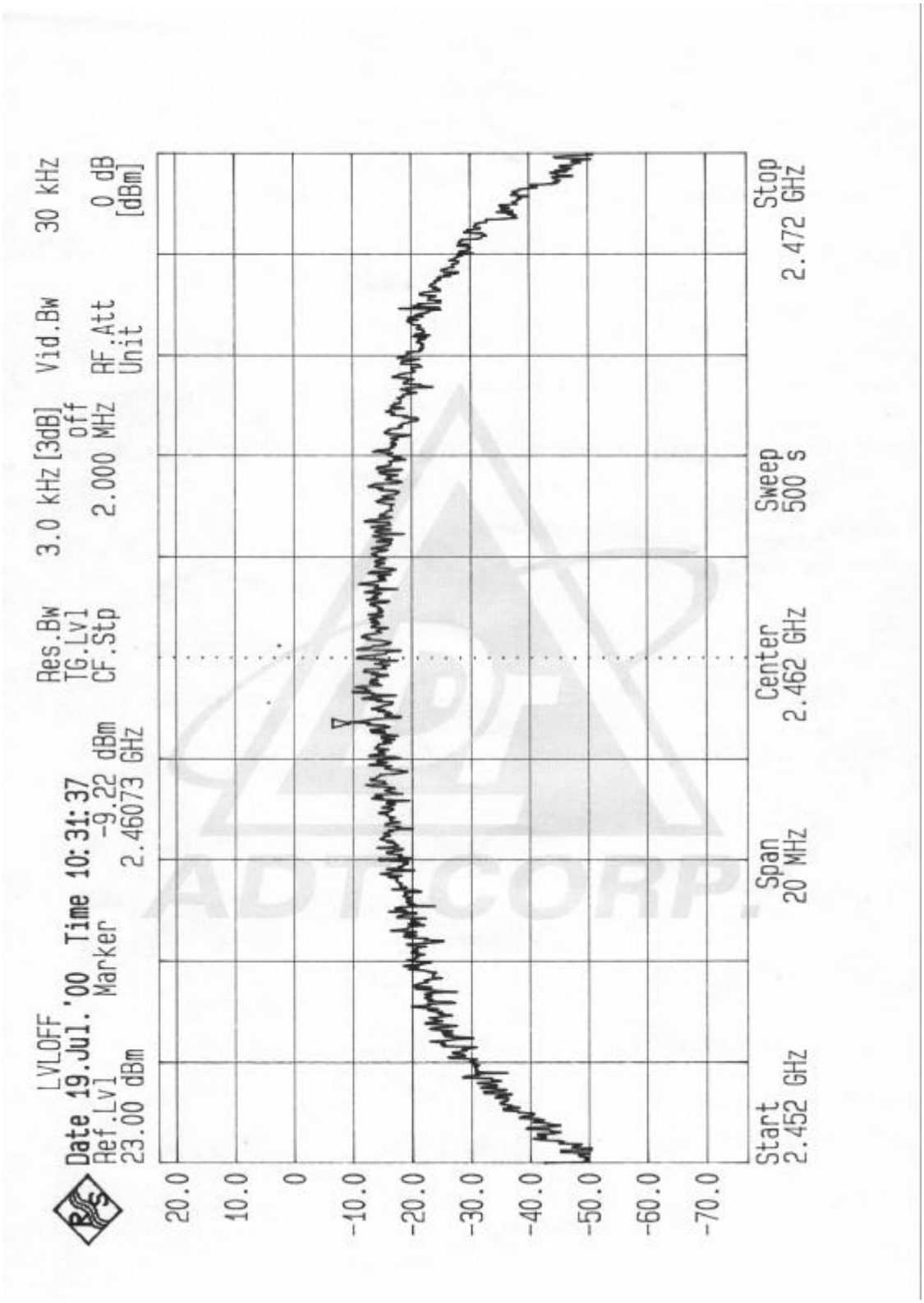
CH6


LVLOFF
Date 19.Jul.'00 Time 10:40:57
Ref.Lvl
23.00 dBm
Marker
-9.27 dBm
2.43573 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 500 s
Stop 2.447 GHz

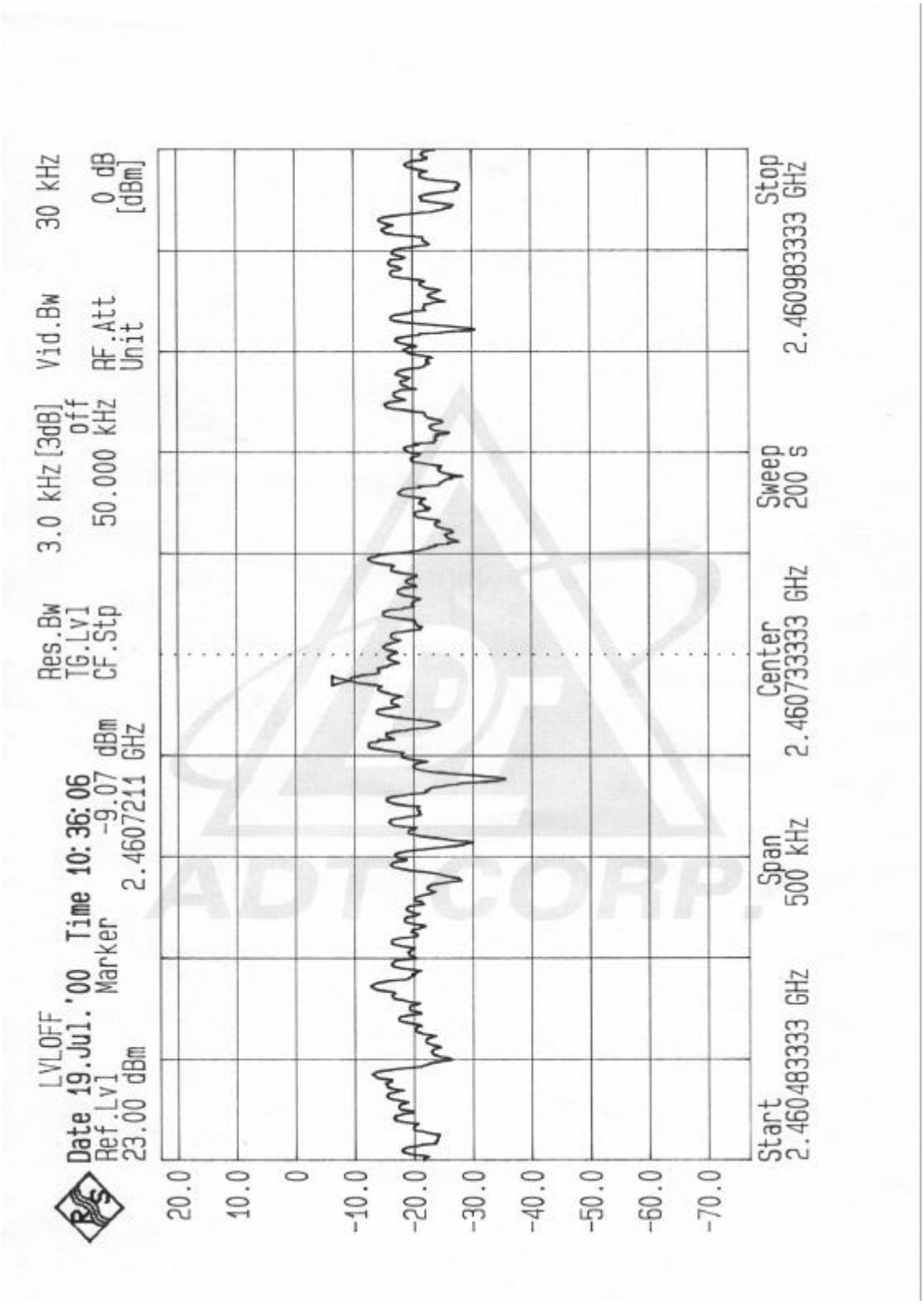
CH 6


LVLOFF
Date 19.Jul.'00 Time 10:44:42
Ref.Lvl
23.00 dBm
Marker
-9.19 dBm
2.4357211 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 50.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.435483333 GHz
Span
500 kHz
Center
2.435733333 GHz
Sweep
20 s
Stop
2.435983333 GHz

CH11


LVLOFF
Date 19.Jul.'00 Time 10:31:37
Ref.Lvl
23.00 dBm
Marker
-9.22 dBm
2.46073 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
Start 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 500 s
Stop 2.472 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0

CH 11


LVLOFF
Date 19.Jul.'00 Time 10:36:06
Ref.Lvl
23.00 dBm
Marker
-9.07 dBm
2.4607211 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 50.000 kHz
Vid.Bw 30 kHz
RF.Att 0 dB
Unit [dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.460483333 GHz
Span
500 kHz
Center
2.460733333 GHz
Sweep
200 s
Stop
2.460983333 GHz

6.6 Processing Gain of a Direct Sequence Spread Spectrum Measurement

6.6.1 Test Instruments and Support Units

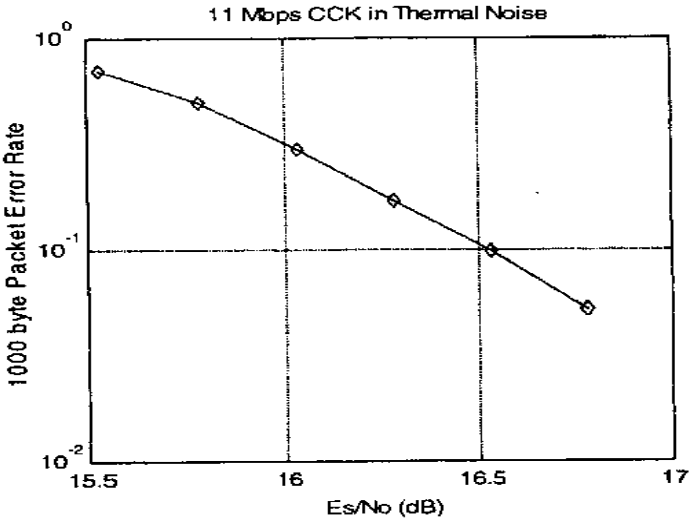
Description & Manufacturer	Model No.	Serial No.
Hewlett Packard Spectrum Analyzer, 9kHz to 22GHz	**HP8593E**	**S942848**
Marconi Signal Generator, 10kHz to 2.7GHz	**2031**	**953426**
Hewlett Packard Power Meter,	**HP438A**	**S952633**
Hewlett Packard Power Sensor, -20 to –70dBm	**HP8481D**	**SCD15369**
Hewlett Packard Attenuator, 6dB to 10 dB	**HP8493A**	**NA**
Hewlett Packard Step Attenuator, 1dB steps	**HP8494A**	**NA**
Hewlett Packard Step Attenuator, 10dB steps	**HP8495D**	**NA**
Hewlett Packard Power Splitter,	**HP11667B**	**04390**
Campaq Laptop Computer (Qty 2),	**Armada 1700**	**NA**

6.6.2 Method of Measurement

The processing gain may be measured using the CW jamming margin method. Figure 1 shows the test configuration. The test consists of stepping a signal generator in 50 kHz increments across the passband of the system. At each point, the generator level required to produce the recommended Bit Error Rate (BER) is recorded. This level is jammer level. The output power of the transmitting 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 points. The lowest remaining J/S ratio is used when calculating the Process Gain.

The reference PER is specified as 8%. The corresponding Es/No (signal to noise ratio per symbol) is 16.4 dB. The curve is attached as below.

1.1 1000 byte PER vs. Es/No



This value and the measured J/S ratio are used in the following equation to calculate the Process Gain (Gp) of the system.

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

Where:

$(S/N)_o$: Signal to noise ratio for the chosen BER.

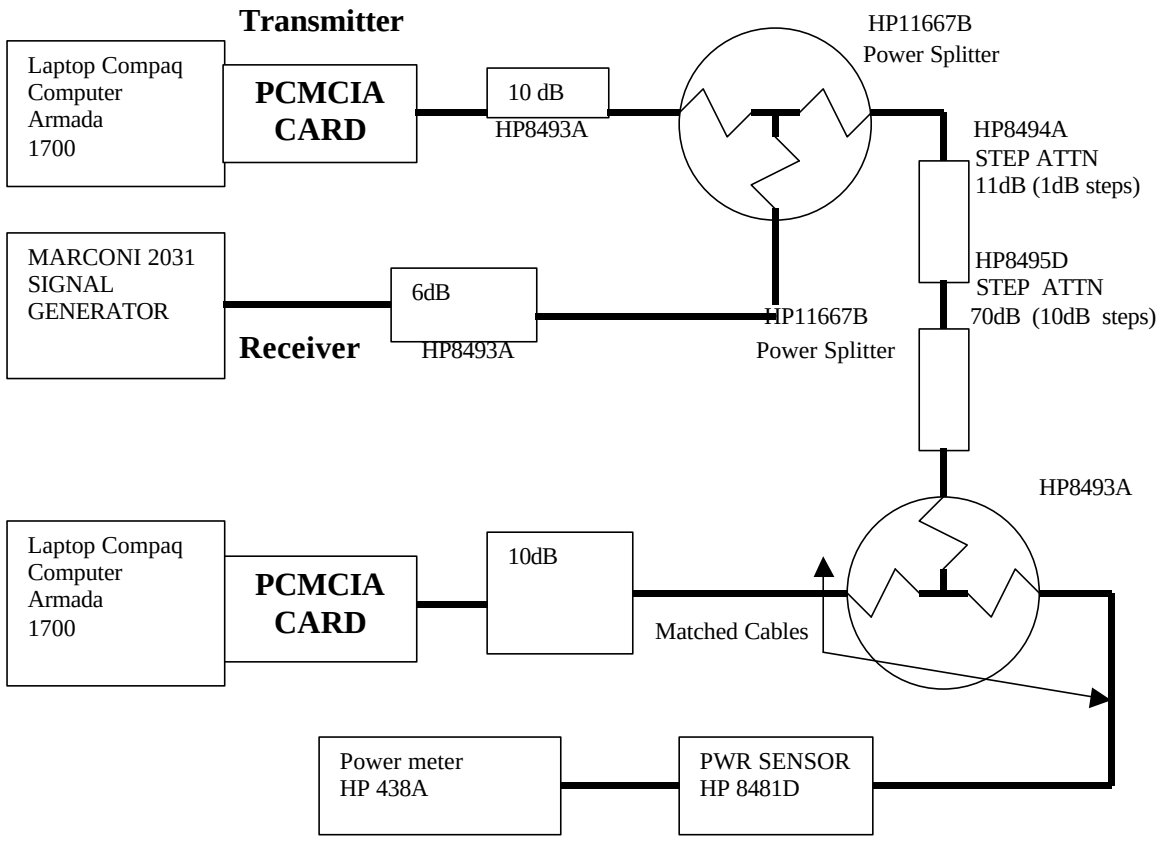
Mj : Maximum jammer to Signal Ratio recorded at the detected BER.

Lsys : System losses . For the purpose of this processing gain calculation, we assume Lsys at its minimum value of 2 dB.

Applicable Reference Documents.

1. "HFA3861A Direct Sequence Spread Spectrum Baseband Processor" Harris Corporation Semiconductor Sector Preliminary Data Sheet, Melbourne FL, July 1999.
2. "M-ary Orthogonal Keying BER Curve".

6.6.3 Test Setup



6.6.4 Test Procedure

Obtain the simplex link shown. Perform all independent instrumentation calibrations prior to this procedure. Set operating power levels using fixed and variable attenuators in system to meet the following objectives:

1. Signal Power at receiver approximately –60dBm (above thermal sensitivity such that thermal noise does not cause bit errors.

2. Signal Power at power meter between –20 and –30dBm for optimal linearity.

3. Use spectrum analyzer to monitor test.

4. Ensure that CW Jammer generator RF output is disabled and measure the power at the power meter port using the power meter. This is the relative signal power, Sr.

5. Disable Transmitter, and set CW Jammer generator RF output frequency equal to the carrier frequency and enable generator output. Set reference CW Jammer power level at power meter port 8.4dB below Sr (minimum J/S, or 10dB processing gain reference level). Note the power level setting on the generator, this is the reference CW Jammer power setting, Jr.

6. Disable CW Jammer, re-establish link. PER test should be operating essentially error -free.

7. Enable CW Jammer at the reference power level and verify that the PER test indicates a PER of less than 8%.

8. Alternatively, adjust the CW Jammer level to that which causes 8% PER and verify that the S/J is less than 8.4dB.

9. Repeat step 7 for uniform steps in frequency increments of 50 kHz across the receiver passband with the CW Jammer. In this case the receiver passband is +/- 8.5 MHz.

The numerical data associated with the following radio channel is tabulated and presented for :

Channel 1	:2412 MHZ
Channel 6	:2437 MHz
Channel 11	:2462 MHz

6.6.5 EUT Operating condition

The software provided by client to set the EUT to transmit at lowest, middle and highest channel.

6.6.6 Climate Condition

The temperature and related humidity: 25°C and 50%RH

6.6.7 Test Results

Although the theoretical processing gain is lower than 10 dB, but the CCK coding provides an extra coding gain of 2.2dB.

11Mbps CHANNEL 1 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	Gp	(S/N)。	Mj = J/S	Lsys	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4095	11.3	16.4	-7.1	2	-47.1	-0.7
2.40955	11.4	16.4	-7	2	-47	-0.6
2.4096	11.4	16.4	-7	2	-47	-0.6
2.40965	11.4	16.4	-7	2	-47	-0.6
2.4097	11.3	16.4	-7.1	2	-47.1	-0.7
2.40975	11.3	16.4	-7.1	2	-47.1	-0.7
2.4098	11.1	16.4	-7.3	2	-47.3	-0.9
2.40985	11.1	16.4	-7.3	2	-47.3	0.9
2.4099	11	16.4	-7.4	2	-47.4	-1
2.40995	11	16.4	-7.4	2	-47.4	-1
2.41	10.9	16.4	-7.5	2	-47.5	-1.1
2.41005	11	16.4	-7.4	2	-47.4	-1
2.4101	11	16.4	-7.4	2	-47.4	-1
2.41015	11.1	16.4	-7.3	2	-47.3	-0.9
2.4102	11.2	16.4	-7.2	2	-47.2	-0.8
2.41025	11.3	16.4	-7.1	2	-47.1	-0.7
2.4103	11.3	16.4	-7.1	2	-47.1	-0.7
2.41035	11.4	16.4	-7	2	-47	-0.6
2.4104	11.3	16.4	-7.1	2	-47.1	-0.7
2.41045	11.3	16.4	-7.1	2	-47.1	-0.7
2.4105	11.3	16.4	-7.1	2	-47.1	-0.7
2.41055	11.2	16.4	-7.2	2	-47.2	-0.8
2.4106	11.2	16.4	-7.2	2	-47.2	-0.8
2.41065	11.3	16.4	-7.1	2	-47.1	-0.7
2.4107	11.3	16.4	-7.1	2	-47.1	-0.7
2.41075	11.3	16.4	-7.1	2	-47.1	-0.7
2.4108	11.4	16.4	-7	2	-47	-0.6
2.41085	11.5	16.4	-6.9	2	-46.9	-0.5
2.4109	11.6	16.4	-6.8	2	-46.8	-0.4
2.41095	11.6	16.4	-6.8	2	-46.8	-0.4
2.411	11.6	16.4	-6.8	2	-46.8	-0.4
2.41105	11.4	16.4	-7	2	-47	-0.6
2.4111	11.5	16.4	-6.9	2	-46.9	-0.5
2.41115	11.6	16.4	-6.8	2	-46.8	-0.4

11Mbps CHANNEL 1 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	Gp	(S/N)。	Mj = J/S	Lsys	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4112	11.5	16.4	-6.9	2	-46.9	-0.5
2.41125	11.5	16.4	-6.9	2	-46.9	-0.5
2.4113	11.5	16.4	-6.9	2	-46.9	-0.5
2.41135	11.4	16.4	-7	2	-47	-0.6
2.4114	11.4	16.4	-7	2	-47	-0.6
2.41145	11.4	16.4	-7	2	-47	-0.6
2.4115	11.4	16.4	-7	2	-47	-0.6
2.41155	11.4	16.4	-7	2	-47	-0.6
2.4116	11.6	16.4	-6.8	2	-46.8	-0.4
2.41165	11.6	16.4	-6.8	2	-46.8	-0.4
2.4117	11.5	16.4	-6.9	2	-46.9	-0.5
2.41175	11.4	16.4	-7	2	-47	-0.6
2.4118	11.2	16.4	-7.2	2	-47.2	-0.8
2.41185	11.1	16.4	-7.3	2	-47.3	-0.9
2.4119	11	16.4	-7.4	2	-47.4	-1
2.41195	10.8	16.4	-7.6	2	-47.6	-1.2
2.412	10.9	16.4	-7.5	2	-47.5	-1.1
2.41205	10.9	16.4	-7.5	2	-47.5	-1.1
2.4121	11.1	16.4	-7.3	2	-47.3	-0.9
2.41215	11.4	16.4	-7	2	-47	-0.6
2.4122	11.5	16.4	-6.9	2	-46.9	-0.5
2.41225	11.6	16.4	-6.8	2	-46.8	-0.4
2.4123	11.7	16.4	-6.7	2	-46.7	-0.3
2.41235	11.7	16.4	-6.7	2	-46.7	-0.3
2.4124	11.7	16.4	-6.7	2	-46.7	-0.3
2.41245	11.6	16.4	-6.8	2	-46.8	-0.4
2.4125	11.6	16.4	-6.8	2	-46.8	-0.4
2.41255	11.6	16.4	-6.8	2	-46.8	-0.4
2.4126	11.6	16.4	-6.8	2	-46.8	-0.4
2.41265	11.6	16.4	-6.8	2	-46.8	-0.4
2.4127	11.7	16.4	-6.7	2	-46.7	-0.3
2.41275	11.6	16.4	-6.8	2	-46.8	-0.4
2.4128	11.8	16.4	-6.6	2	-46.6	-0.2
2.41285	11.8	16.4	-6.6	2	-46.6	-0.2

11Mbps CHANNEL 1 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	**Gp**	**(S/N)。**	**Mj = J/S**	**Lsys**	**Jammer**	**LVL**
(GHz)	**(dB)**	**(dB)**	**(dB)**	**(dB)**	**(dBm)**	**(dBm)**
2.4129	11.8	16.4	-6.6	2	-46.6	-0.2
2.41295	11.9	16.4	-6.5	2	-46.5	-0.1
2.413	11.8	16.4	-6.6	2	-46.6	-0.2
2.41305	11.8	16.4	-6.6	2	-46.6	-0.2
2.4131	11.8	16.4	-6.6	2	-46.6	-0.2
2.41315	11.7	16.4	-6.7	2	-46.7	-0.3
2.4132	11.6	16.4	-6.8	2	-46.8	-0.4
2.41325	11.7	16.4	-6.7	2	-46.7	-0.3
2.4133	11.6	16.4	-6.8	2	-46.8	-0.4
2.41335	11.6	16.4	-6.8	2	46.8	-0.4
2.4134	11.6	16.4	-6.8	2	-46.8	-0.4
2.41345	11.6	16.4	-6.8	2	-46.8	-0.4
2.4135	11.6	16.4	-6.8	2	-46.8	-0.4
2.41355	11.7	16.4	-6.8	2	-46.8	-0.4
2.4136	11.6	16.4	-6.7	2	-46.7	-0.3
2.41365	11.7	16.4	-6.7	2	-46.7	-0.3
2.4137	11.7	16.4	-6.7	2	-46.7	-0.3
2.41375	11.7	16.4	-6.7	2	-46.7	-0.3
2.4138	11.6	16.4	-6.8	2	-46.8	-0.4
2.41385	11.5	16.4	-6.9	2	-46.9	-0.5
2.4139	11.4	16.4	-7	2	-47	-0.6
2.41395	11.3	16.4	-7.1	2	-47.1	-0.7
2.414	11.2	16.4	-7.2	2	-47.2	-0.8
2.41405	11.2	16.4	-7.2	2	-47.2	-0.8
2.4141	11.2	16.4	-7.2	2	-47.2	-0.8
2.41415	11.2	16.4	-7.2	2	-47.2	-0.8
2.4142	11.3	16.4	-7.1	2	-47.1	-0.7
2.41425	11.4	16.4	-7	2	-47	-0.6
2.4143	11.5	16.4	-6.9	2	-46.9	-0.5
2.41435	11.5	16.4	-6.9	2	-46.9	-0.5
2.4144	11.5	16.4	-6.9	2	-46.9	-0.5
2.41445	11.5	16.4	-6.9	2	-46.9	-0.5
2.4145	11.4	16.4	-7	2	-47	-0.6
Processing Gain : 11.5 dB						

11Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	Gp	(S/N)。	Mj = J/S	Lsys	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4345	11.2	16.4	-7.2	2	-47.2	-3.1
2.43455	11.2	16.4	-7.2	2	-47.2	-3.1
2.4346	11.2	16.4	-7.2	2	-47.2	-3.1
2.43465	11.3	16.4	-7.1	2	-47.1	-3
2.4347	11.3	16.4	-7.1	2	-47.1	-3
2.43475	11.2	16.4	-7.2	2	-47.2	-3.1
2.4348	11.1	16.4	-7.3	2	-47.3	-3.2
2.43485	11.1	16.4	-7.3	2	-47.3	-3.2
2.4349	11	16.4	-7.4	2	-47.4	-3.3
2.43495	11	16.4	-7.4	2	-47.4	-3.3
2.435	11	16.4	-7.4	2	-47.4	-3.3
2.43505	11.1	16.4	-7.3	2	-47.3	-3.2
2.4351	11.1	16.4	-7.3	2	-47.3	-3.2
2.43515	11.2	16.4	-7.2	2	-47.2	-3.1
2.4352	11.3	16.4	-7.1	2	-47.1	-3
2.43525	11.3	16.4	-7.1	2	-47.1	-3
2.4353	11.4	16.4	-7	2	-47	-2.9
2.43535	11.4	16.4	-7	2	-47	-2.9
2.4354	11.3	16.4	-7.1	2	-47.1	-3
2.43545	11.3	16.4	-7.1	2	-47.1	-3
2.4355	11.2	16.4	-7.2	2	-47.2	-3.1
2.43555	11.2	16.4	-7.2	2	-47.2	-3.1
2.4356	11.2	16.4	-7.2	2	-47.2	-3.1
2.43565	11.2	16.4	-7.2	2	-47.2	-3.1
2.4357	11.2	16.4	-7.2	2	-47.2	-3.1
2.43575	11.3	16.4	-7.1	2	-47.1	-3
2.4358	11.4	16.4	-7	2	-47	-2.9
2.43585	11.5	16.4	-6.9	2	-46.9	-2.8
2.4359	11.5	16.4	-6.9	2	-46.9	-2.8
2.43595	11.5	16.4	-6.9	2	-476.9	-2.8
2.436	11.5	16.4	-6.9	2	-46.9	-2.8
2.43605	11.4	16.4	-7	2	-47	-2.9
2.4361	11.5	16.4	-6.9	2	-46.9	-2.8
2.43615	11.5	16.4	-6.9	2	-46.9	-2.8

11Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	**Gp**	**(S/N)。**	**Mj = J/S**	**Lsys**	**Jammer**	**LVL**
(GHz)	**(dB)**	**(dB)**	**(dB)**	**(dB)**	**(dBm)**	**(dBm)**
2.4362	11.5	16.4	-6.9	2	-46.9	-2.8
2.43625	11.5	16.4	-6.9	2	-46.9	-2.8
2.4363	11.5	16.4	-6.9	2	-46.9	-2.8
2.43635	11.4	16.4	-7	2	-47	-2.9
2.4364	11.4	16.4	-7	2	-47	-2.9
2.43645	11.4	16.4	-7	2	-47	-2.9
2.4365	11.4	16.4	-7	2	-47	-2.9
2.43655	11.4	16.4	-7	2	-47	-2.9
2.4366	11.4	16.4	-7	2	-47	-2.9
2.43665	11.5	16.4	-6.9	2	-46.9	-2.8
2.4367	11.5	16.4	-6.9	2	-46.9	-2.8
2.43675	11.4	16.4	-7	2	-47	-2.9
2.4368	11.3	16.4	-7.1	2	-47.1	-3
2.43685	11.1	16.4	-7.3	2	-47.3	-3.2
2.4369	11	16.4	-7.4	2	-47.4	-3.3
2.43695	10.9	16.4	-7.5	2	-47.5	-3.4
2.437	10.9	16.4	-7.5	2	-47.5	-3.4
2.43705	11	16.4	-7.4	2	-47.4	-3.3
2.4371	11.1	16.4	-7.3	2	-47.3	-3.2
2.43715	11.2	16.4	-7.2	2	-47.2	-3.1
2.4372	11.3	16.4	-7.1	2	-47.1	-3
2.43725	11.5	16.4	-6.9	2	-46.9	-2.8
2.4373	11.6	16.4	-6.8	2	-46.8	-2.7
2.43735	11.6	16.4	-6.8	2	-46.8	-2.7
2.4374	11.5	16.4	-6.9	2	-46.9	-2.8
2.43745	11.4	16.4	-7	2	-47	-2.9
2.4375	11.4	16.4	-7	2	-47	-2.9
2.43755	11.5	16.4	-6.9	2	-46.9	-2.8
2.4376	11.5	16.4	-6.9	2	-46.9	-2.8
2.43765	11.5	16.4	-6.9	2	-46.9	-2.8
2.4377	11.5	16.4	-6.9	2	-46.9	-2.8
2.43775	11.5	16.4	-6.9	2	-46.9	-2.8
2.4378	11.6	16.4	-6.8	2	-46.8	-2.7
2.43785	11.7	16.4	-6.7	2	-46.7	-2.6

11Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	**Gp**	**(S/N)。**	**Mj = J/S**	**Lsys**	**Jammer**	**LVL**
(GHz)	**(dB)**	**(dB)**	**(dB)**	**(dB)**	**(dBm)**	**(dBm)**
2.4379	11.8	16.4	-6.6	2	-46.6	-2.5
2.43795	11.7	16.4	-6.7	2	-46.7	-2.6
2.438	11.7	16.4	-6.7	2	-46.7	-2.6
2.43805	11.6	16.4	-6.8	2	-46.8	-2.7
2.4381	11.6	16.4	-6.8	2	-46.8	-2.7
2.43815	11.5	16.4	-6.9	2	-46.9	-2.8
2.4382	11.5	16.4	-6.9	2	-46.9	-2.8
2.43825	11.4	16.4	-7	2	-47	-2.9
2.4383	11.4	16.4	-7	2	-47	-2.9
2.43835	11.3	16.4	-7.1	2	-47.1	-3
2.4384	11.3	16.4	-7.1	2	-47.1	-3
2.43845	11.3	16.4	-7.1	2	-47.1	-3
2.4385	11.3	16.4	-7.1	2	-47.1	-3
2.43855	11.4	16.4	-7	2	-47	-2.9
2.4386	11.4	16.4	-7	2	-47	-2.9
2.43865	11.4	16.4	-7	2	-47	-2.9
2.4387	11.4	16.4	-7	2	-47	-2.9
2.43875	11.4	16.4	-7	2	-47	-2.9
2.4388	11.3	16.4	-7.1	2	-47.1	-3
2.43885	11.3	16.4	-7.1	2	-47.1	-3
2.4389	11.2	16.4	-7.2	2	-47.2	-3.1
2.4895	11.1	16.4	-7.3	2	-47.3	-3.2
2.439	11.1	16.4	-7.3	2	-47.3	-3.2
2.43905	11	16.4	-7.4	2	-47.4	-3.3
2.4391	11	16.4	-7.4	2	-47.4	-3.3
2.43915	11	16.4	-7.4	2	-47.4	-3.3
2.4392	11	16.4	-7.4	2	-47.4	-3.3
2.43925	11.1	16.4	-7.3	2	-47.3	-3.2
2.4393	11.2	16.4	-7.2	2	-47.2	-3.1
2.43935	11.2	16.4	-7.2	2	-47.2	-3.1
2.4394	11.4	16.4	-7	2	-47	-2.9
2.43945	11.4	16.4	-7	2	-47	-2.9
2.4395	11.2	16.4	-7.2	2	-47.2	-3.1
Processing Gain : 11.4 dB						

11Mbps CHANNEL 11 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	Gp	(S/N)。	Mj = J/S	Lsys	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4595	11.7	16.4	-6.7	2	-46.7	-4.9
2.45955	11.8	16.4	-6.6	2	-46.6	-4.8
5.4596	11.8	16.4	-6.6	2	-46.6	-4.8
2.45965	11.7	16.4	-6.7	2	-46.7	-4.9
2.4597	11.7	16.4	-6.7	2	-46.7	-4.9
2.45975	11.6	16.4	-6.8	2	-46.8	-5
2.4598	11.5	16.4	-6.9	2	-46.9	-5.1
2.45985	11.4	16.4	-7	2	-47	-5.2
2.4599	11.4	16.4	-7	2	-47	-5.2
2.45995	11.3	16.4	-7.1	2	-47.1	-5.3
2.46	11.3	16.4	-7.1	2	-47.1	-5.3
2.46005	11.3	16.4	-7.1	2	-47.1	-5.3
2.4601	11.4	16.4	-7	2	-47	-5.2
2.46015	11.5	16.4	-6.9	2	-46.9	-5.1
2.4602	11.5	16.4	-6.9	2	-46.9	-5.1
2.46025	11.6	16.4	-6.8	2	-46.8	-5
2.4603	11.6	16.4	-6.8	2	-46.8	-5
2.46035	11.6	16.4	-6.8	2	-46.8	-5
2.4604	11.6	16.4	-6.8	2	-46.8	-5
2.46045	11.5	16.4	-6.9	2	-46.9	-5.1
2.4605	11.5	16.4	-6.9	2	-46.9	-5.1
2.46055	11.4	16.4	-7	2	-47	-5.2
2.4606	11.4	16.4	-7	2	-47	-5.2
2.46065	11.5	16.4	-6.9	2	-46.9	-5.1
2.4607	11.5	16.4	-6.9	2	-46.9	-5.1
2.46075	11.6	16.4	-6.8	2	-46.8	-5
2.4608	11.6	16.4	-6.8	2	-46.8	-5
2.46085	11.8	16.4	-6.6	2	-46.6	-4.8
2.4609	11.9	16.4	-6.5	2	-46.5	-4.7
2.46095	12	16.4	-6.4	2	-46.4	-4.6
2.461	12	16.4	-6.4	2	-46.4	-4.6
2.46105	11.9	16.4	-6.5	2	-46.5	-4.7
2.4611	12	16.4	-6.4	2	-46.4	-4.6
2.46115	12.1	16.4	-6.3	2	-46.3	-4.5

11Mbps CHANNEL 11 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	Gp	(S/N)。	Mj = J/S	Lsys	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4612	12.1	16.4	-6.3	2	-46.3	-4.5
2.46125	12.1	16.4	-6.3	2	-46.3	-4.5
2.4613	12.1	16.4	-6.3	2	-46.3	-4.5
2.46135	12.1	16.4	-6.3	2	-46.3	-4.5
2.4614	12.1	16.4	-6.3	2	-46.3	-4.5
2.46145	12.1	16.4	-6.3	2	-46.3	-4.5
2.4615	12.2	16.4	-6.2	2	-46.2	-4.4
2.46155	12.2	16.4	-6.2	2	-46.2	-4.4
2.4616	12.3	16.4	-6.1	2	-46.1	-4.3
2.46165	12.3	16.4	-6.1	2	-46.1	-4.3
2.4617	12.4	16.4	-6	2	-46	-4.2
2.46175	12.3	16.4	-6.1	2	-46.1	-4.3
2.4618	12.2	16.4	-6.2	2	-46.2	-4.4
2.46185	12.1	16.4	-6.3	2	-46.3	-4.5
2.4619	12	16.4	-6.4	2	-46.4	-4.6
2.46195	12	16.4	-6.4	2	-46.4	-4.6
2.462	11.9	16.4	-6.5	2	-46.5	-4.7
2.46205	12	16.4	-6.4	2	-46.4	-4.6
2.4621	12.1	16.4	-6.3	2	-46.3	-4.5
2.46215	12.2	16.4	-6.2	2	-46.2	-4.4
2.4622	12.3	16.4	-6.1	2	-46.1	-4.3
2.46225	12.4	16.4	-6	2	-46	-4.2
2.4623	12.5	16.4	-5.9	2	-45.9	-4.1
2.46235	12.4	16.4	-6	2	-46	-4.2
2.4624	12.4	16.4	-6	2	-46	-4.2
2.46245	12.3	16.4	-6.1	2	-46.1	-4.3
2.4625	12.3	16.4	-6.1	2	-46.1	-4.3
2.46255	12.3	16.4	-6.1	2	-46.1	-4.3
2.4626	12.3	16.4	-6.1	2	-46.1	-4.3
2.46265	12.3	16.4	-6.1	2	-46.1	-4.3
2.4627	12.2	16.4	-6.2	2	-46.2	-4.4
2.46275	12.3	16.4	-6.1	2	-46.1	-4.3
2.4628	12.3	16.4	-6.1	2	-46.1	-4.3
2.46285	12.3	16.4	-6.1	2	-46.1	-4.3

11Mbps CHANNEL 11 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	**Gp**	**(S/N)。**	**Mj = J/S**	**Lsys**	**Jammer**	**LVL**
(GHz)	**(dB)**	**(dB)**	**(dB)**	**(dB)**	**(dBm)**	**(dBm)**
2.4629	12.2	16.4	-6.2	2	-46.2	-4.4
2.46295	12.2	16.4	-6.2	2	-46.2	-4.4
2.463	12.2	16.4	-6.2	2	-46.2	-4.4
2.46305	12.1	16.4	-6.3	2	-46.3	-4.5
2.4631	12	16.4	-6.4	2	-46.4	-4.6
2.46315	11.9	16.4	-6.5	2	-46.5	-4.7
2.4632	11.9	16.4	-6.5	2	-46.5	-4.7
2.46325	11.8	16.4	-6.6	2	-46.6	-4.8
2.4633	11.8	16.4	-6.6	2	-46.6	-4.8
2.46335	11.7	16.4	-6.7	2	-46.7	-4.9
2.4634	11.8	16.4	-6.6	2	-46.6	-4.8
2.46345	11.8	16.4	-6.6	2	-46.6	-4.8
2.4635	11.9	16.4	-6.5	2	-46.5	-4.7
2.46355	11.9	16.4	-6.5	2	-46.5	-4.7
2.4636	12	16.4	-6.4	2	-46.4	-4.6
2.46365	12	16.4	-6.4	2	-46.4	-4.6
2.4637	12.1	16.4	-6.3	2	-46.3	-4.5
2.46375	12.1	16.4	-6.3	2	-46.3	-4.5
2.4638	12	16.4	-6.4	2	-46.4	-4.6
2.46385	12	16.4	-6.4	2	-46.4	-4.6
2.4639	11.9	16.4	-6.5	2	-46.5	-4.7
2.46395	11.8	16.4	-6.6	2	-46.6	-4.8
2.464	11.8	16.4	-6.6	2	-46.6	-4.8
2.46405	11.8	16.4	-6.6	2	-46.6	-4.8
2.4641	11.8	16.4	-6.6	2	-46.6	-4.8
2.46415	11.8	16.4	-6.6	2	-46.6	-4.8
2.4642	11.9	16.4	-6.5	2	-46.5	-4.7
2.46425	12	16.4	-6.4	2	-46.4	-4.6
2.4643	12.1	16.4	-6.3	2	-46.3	-4.5
2.46435	12.2	16.4	-6.2	2	-46.2	-4.4
4.4644	12.2	16.4	-6.2	2	-46.2	-4.4
2.46445	12.2	16.4	-6.2	2	-46.2	-4.4
2.4645	12.2	16.4	-6.2	2	-46.2	-4.4
Processing Gain : 12 dB						

2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	Gp	(S/N)。	Mj = J/S	Lsys	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4345	12.1	13.3	-3.2	2	-43.2	0.5
2.43455	12.7	13.3	-2.6	2	-42.6	1.1
2.4346	12.9	13.3	-2.4	2	-42.4	1.3
2.43465	13	13.3	-2.3	2	-42.3	1.4
2.4347	13	13.3	-2.3	2	-42.3	1.4
2.43475	12.9	13.3	-2.4	2	-42.4	1.3
2.4348	13.1	13.3	-2.2	2	-42.2	1.5
2.43485	12.4	13.3	-2.9	2	-42.9	0.8
2.4349	12.1	13.3	-3.2	2	-43.2	0.5
2.43495	12.6	13.3	-2.7	2	-42.7	1
2.435	12.6	13.3	-2.7	2	-42.7	1
2.43505	12.5	13.3	-2.8	2	-42.8	0.9
2.4351	12.4	13.3	-2.9	2	-42.9	0.8
2.43515	12.4	13.3	-2.9	2	-42.9	0.8
2.4352	12.2	13.3	-3.1	2	-43.1	0.6
2.43525	12.2	13.3	-3.1	2	-43.7	0.6
2.4353	12.3	13.3	-3	2	-43	0.7
2.43535	11.9	13.3	-3.4	2	-43.4	0.3
2.4354	11.5	13.3	-3.8	2	-43.8	-0.1
2.43545	12.1	13.3	-3.2	2	-43.2	0.5
2.4355	11.5	13.3	-3.8	2	-43.8	-0.1
2.43555	12.4	13.3	-2.9	2	-42.9	0.8
2.4356	12.7	13.3	-2.6	2	-42.6	1.1
2.43565	12.9	13.3	-2.4	2	-42.4	1.3
2.4357	12.8	13.3	-2.5	2	-42.5	1.2
5.43575	12.8	13.3	-2.5	2	-42.5	1.2
2.4358	12.9	13.3	-2.4	2	-42.4	1.3
2.43585	12.1	13.3	-3.2	2	-43.2	0.5
2.4359	11.7	13.3	-3.6	2	-43.6	0.1
2.43595	12.4	13.3	-2.9	2	-42.9	0.8
2.436	12.5	13.3	-2.8	2	-42.8	0.9
2.43605	12.5	13.3	-2.8	2	-42.8	0.9
2.4361	12.4	13.3	-2.9	2	-42.9	0.8
2.43615	12.4	13.3	-2.9	2	-42.9	0.8

2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	Gp	(S/N)。	Mj = J/S	Lsys	Jammer	LVL
(GHz)	(dB)	(dB)	(dB)	(dB)	(dBm)	(dBm)
2.4362	12.1	13.3	-3.2	2	-43.2	0.5
2.43625	12.1	13.3	-3.2	2	-43.2	0.5
2.4363	12.1	13.3	-3.2	2	-43.2	0.5
2.43635	11.5	13.3	-3.8	2	-43.8	-0.1
2.4364	11.1	13.3	-4.2	2	-44.2	-0.5
2.43645	11.7	13.3	-3.6	2	-43.6	0.1
2.4365	11.2	13.3	-4.1	2	-44.1	-0.4
2.43655	12.6	13.3	-2.7	2	-42.7	1
2.4366	13.1	13.3	-2.2	2	-42.2	1.5
2.43665	13.7	13.3	-1.6	2	-41.6	2.1
2.4367	14.1	13.3	-1.2	2	-41.2	2.5
2.43675	15.1	13.3	-0.2	2	-40.2	3.5
2.4368	15.7	13.3	0.4	2	-39.6	4.1
2.43685	16.2	13.3	0.9	2	-39.1	4.6
2.4369	16.1	13.3	0.8	2	-39.2	4.5
2.43695	16.3	13.3	1	2	-39	4.7
2.437	16.6	13.3	1.3	2	-38.7	5
2.43705	16.3	13.3	1	2	-39	4.7
2.4371	16.3	13.3	1	2	-39	4.7
2.43715	16	13.3	0.7	2	-39.3	4.4
2.4372	15.5	13.3	0.2	2	-39.8	3.9
2.43725	14.8	13.3	-0.5	2	-40.5	3.2
2.4373	14	13.3	-1.3	2	-41.3	2.4
2.43735	13.5	13.3	-1.8	2	-41.8	1.9
2.4374	12.7	13.3	-2.6	2	-42.6	1.1
2.43745	12.6	13.3	-2.7	2	-42.7	1
2.4375	11.6	13.3	-3.7	2	-43.7	0
2.43755	12.1	13.3	-3.2	2	-43.2	0.5
2.4376	12.1	13.3	-3.2	2	-43.2	0.5
2.43765	12.1	13.3	-3.2	2	-43.2	0.5
2.4377	12	13.3	-3.3	2	-43.3	0.4
2.43775	11.7	13.3	-3.6	2	-43.6	0.1
2.4378	12	13.3	-3.3	2	43.3	0.4
2.43785	11.1	13.3	-4.2	2	-44.2	-0.5

2Mbps CHANNEL 6 Processing Gain						
Gp = (S/N)。+ Mj + Lsys						
Freq.	**Gp**	**(S/N)。**	**Mj = J/S**	**Lsys**	**Jammer**	**LVL**
(GHz)	**(dB)**	**(dB)**	**(dB)**	**(dB)**	**(dBm)**	**(dBm)**
2.4379	11.2	13.3	-4.1	2	-44.1	-0.4
2.43795	12.1	13.3	-3.2	2	-43.2	0.5
2.438	12.5	13.3	-2.8	2	-42.8	0.9
2.43805	12.7	13.3	-2.6	2	-42.6	1.1
2.4381	12.8	13.3	-2.5	2	-42.5	1.2
2.43815	12.9	13.3	-2.4	2	-42.4	1.3
2.4382	12.9	13.3	-2.4	2	-42.4	1.3
2.43825	12.9	13.3	-2.4	2	-42.4	1.3
2.4383	12.8	13.3	-2.5	2	-42.5	1.2
2.43835	12.6	13.3	-2.7	2	-42.7	1
2.4384	12	13.3	-3.3	2	-43.3	0.4
2.43845	12.4	13.3	-2.9	2	-42.9	0.8
2.4385	11.7	13.3	-3.6	2	-43.6	0.1
2.43855	12.3	13.3	-3	2	-43	0.7
2.4386	12.3	13.3	-3	2	-43	0.7
2.43865	12.3	13.3	-3	2	-43	0.7
2.4387	12.2	13.3	-3.1	2	-43.1	0.6
2.43875	12	13.3	-3.3	2	-43.3	0.4
2.4388	12.3	13.3	-3	2	-43	0.7
2.43885	11.6	13.3	-3.7	2	-43.7	0
2.4389	11.6	13.3	-3.7	2	-43.7	0
2.43895	12.4	13.3	-2.9	2	-42.9	0.8
2.439	12.7	13.3	-2.6	2	-42.6	1.1
2.43905	12.7	13.3	-2.6	2	-42.6	1.1
2.4391	12.8	13.3	-2.5	2	-42.5	1.2
2.43915	12.9	13.3	-2.4	2	-42.4	1.3
2.4392	12.8	13.3	-2.5	2	-42.5	1.2
2.43925	12.9	13.3	-2.4	2	-42.4	1.3
2.4393	12.8	13.3	-2.5	2	-42.5	1.2
2.43935	12.6	13.3	-2.7	2	-42.7	1
2.4394	12.3	13.3	-3	2	-43	0.7
2.43945	12.5	13.3	-2.8	2	-42.8	0.9
2.4395	12	13.3	-3.3	2	-43.3	0.4
Processing Gain : 12.5 dB						

6.7 ANTENNA REQUIREMENT

6.7.1 Standard Applicable

For intentional device, according to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (b), 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.

6.7.2 Antenna Connected Construction

The original design of antenna connector here in this product is MMCX type. The manufacture had changed dimension to meet the FCC connector related requirement (right now it's not a standard type connector). And they will also produce in this design in the future.

6. The Modification include the following

1. Added four gaskets on the top of RF module .(see photo 4)
2. Added a gasket on the top side of main board.(see photo 7)
3. Added a gasket on the inside of lower enclosure.(see photo 3)
4. Added two gaskets on the inside of upper enclosure.(see photo 3)
5. Added a copper foil on the inside of lower enclosure.(see photo 3)
6. Added a copper foil on the inside of upper enclosure.(see photo 3)

EUT PHOTOS

Photo 1

Photo 2

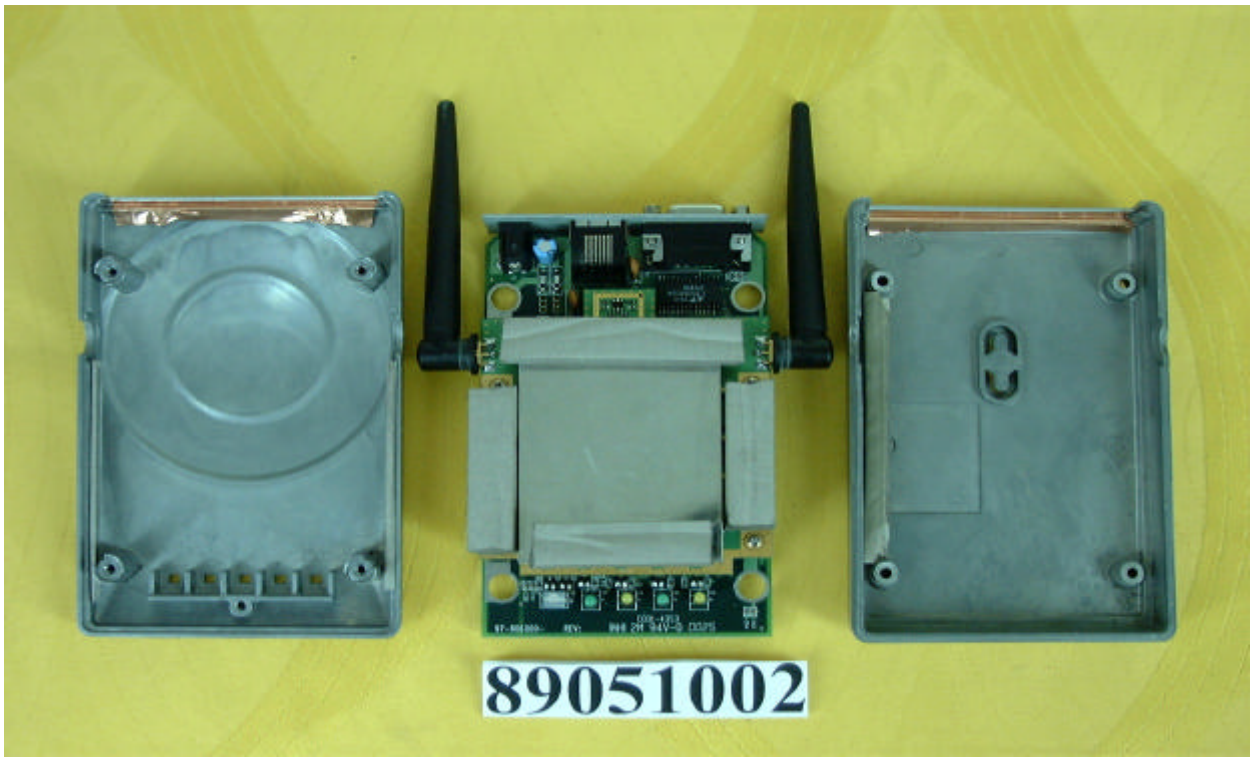


Photo 3

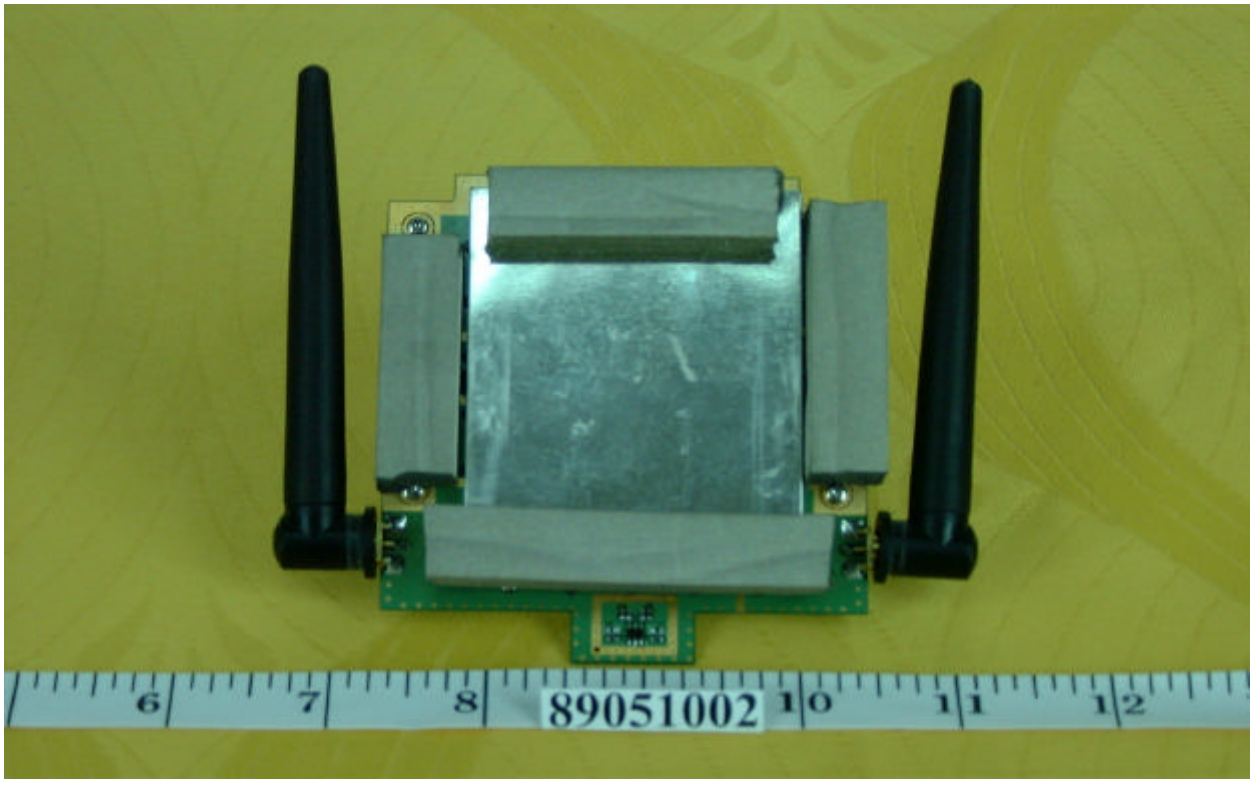


Photo 4

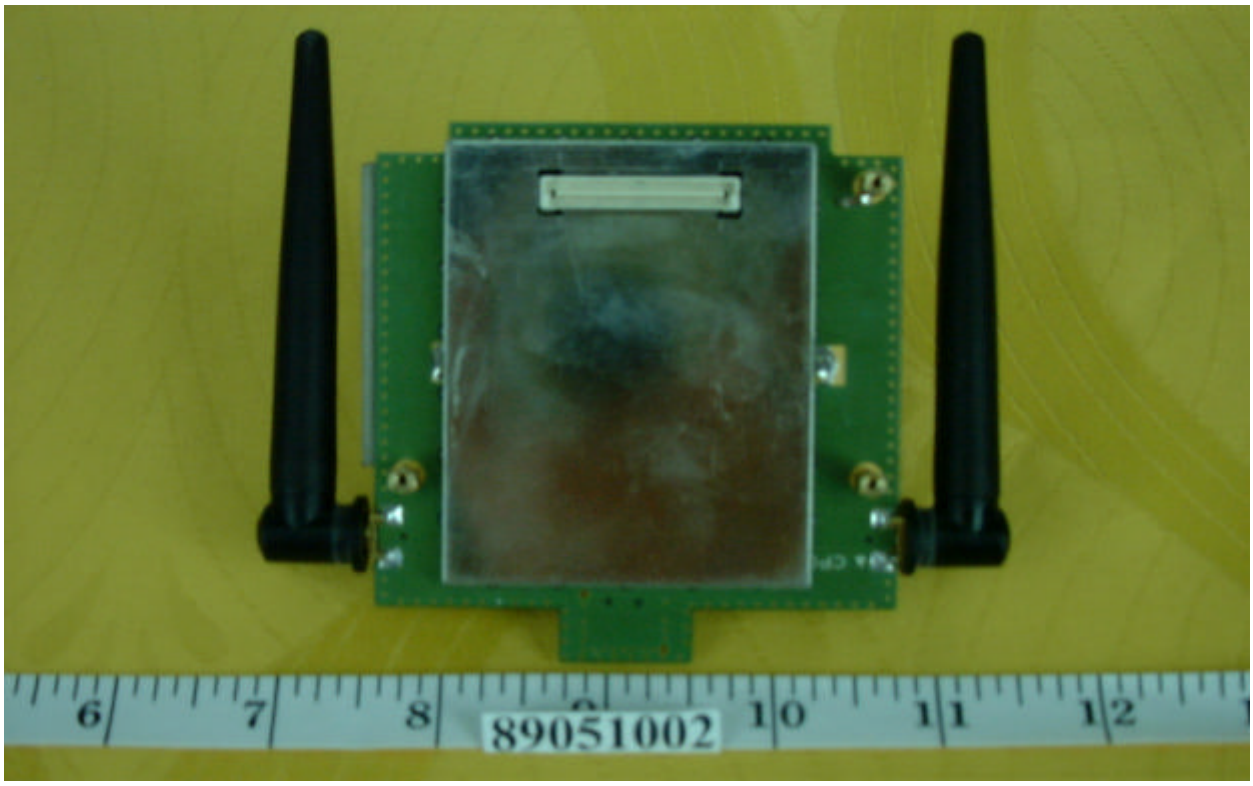


Photo 5

Photo 6

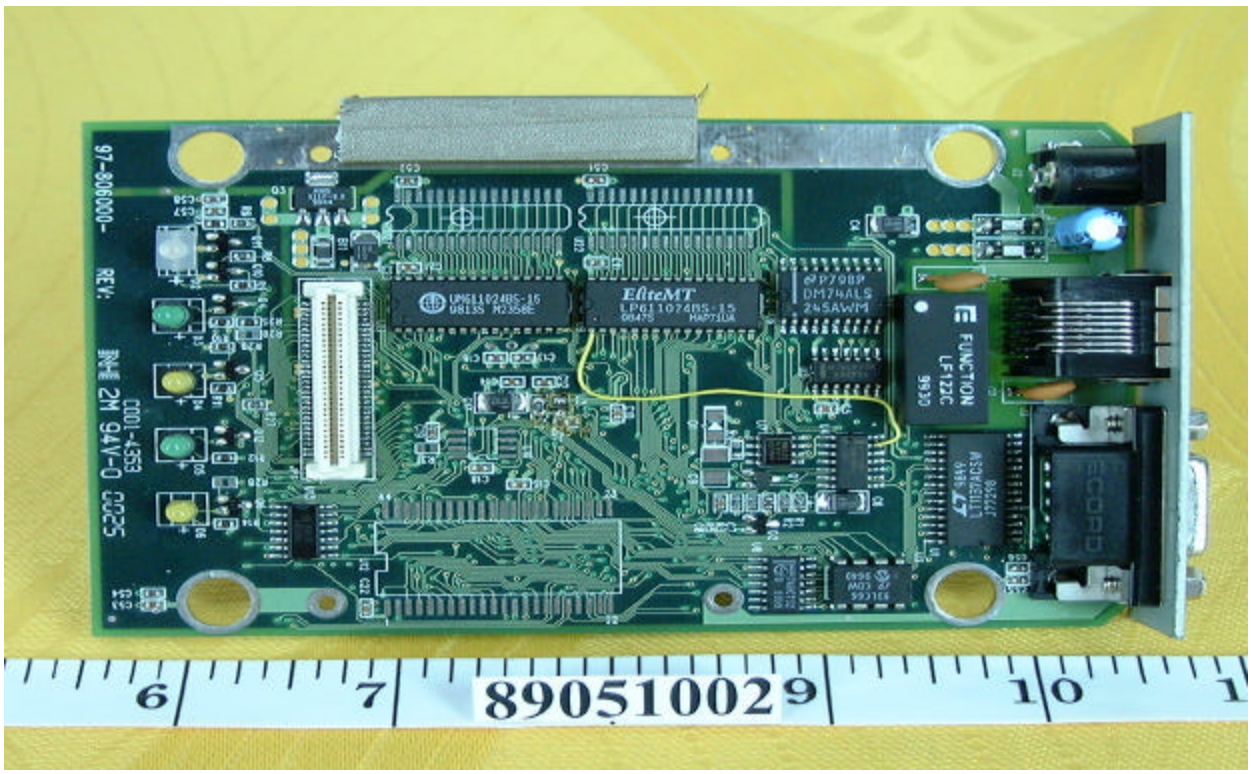


Photo 7

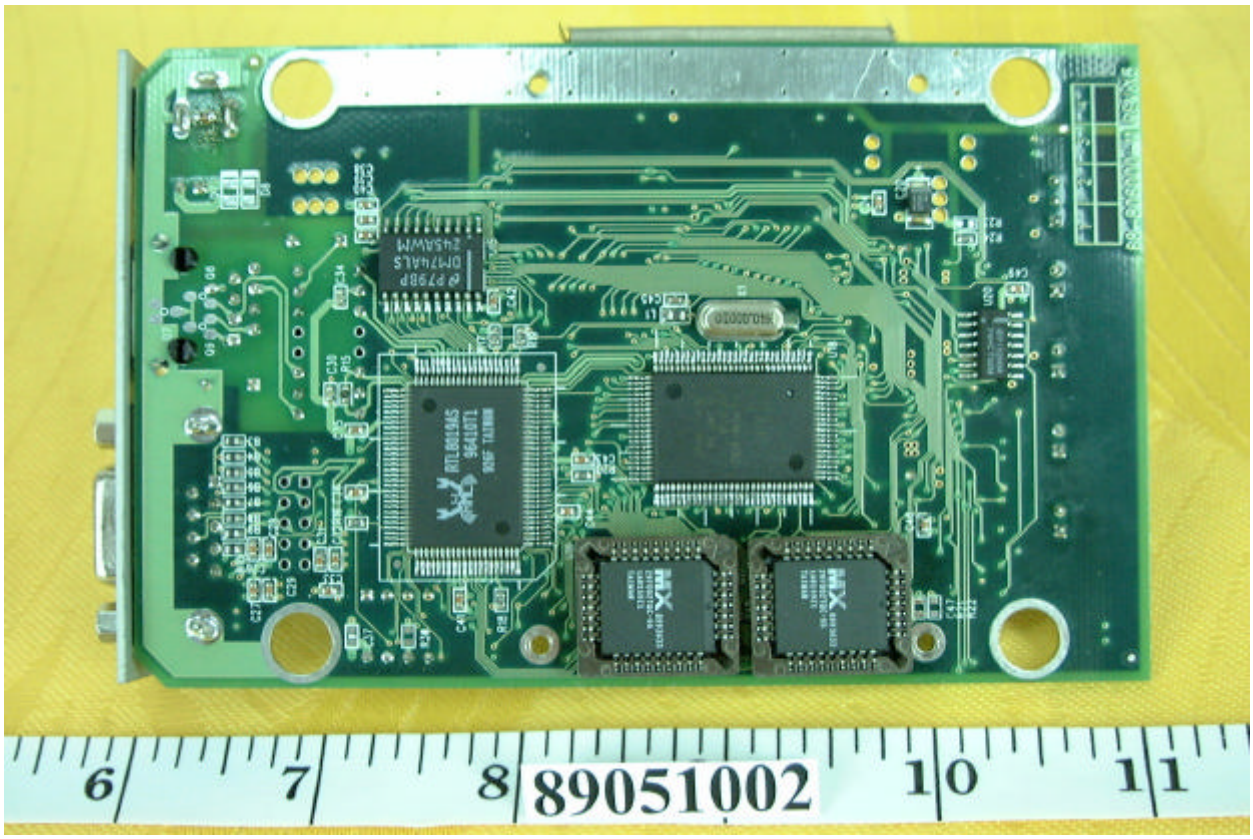


Photo 8

Photo 9

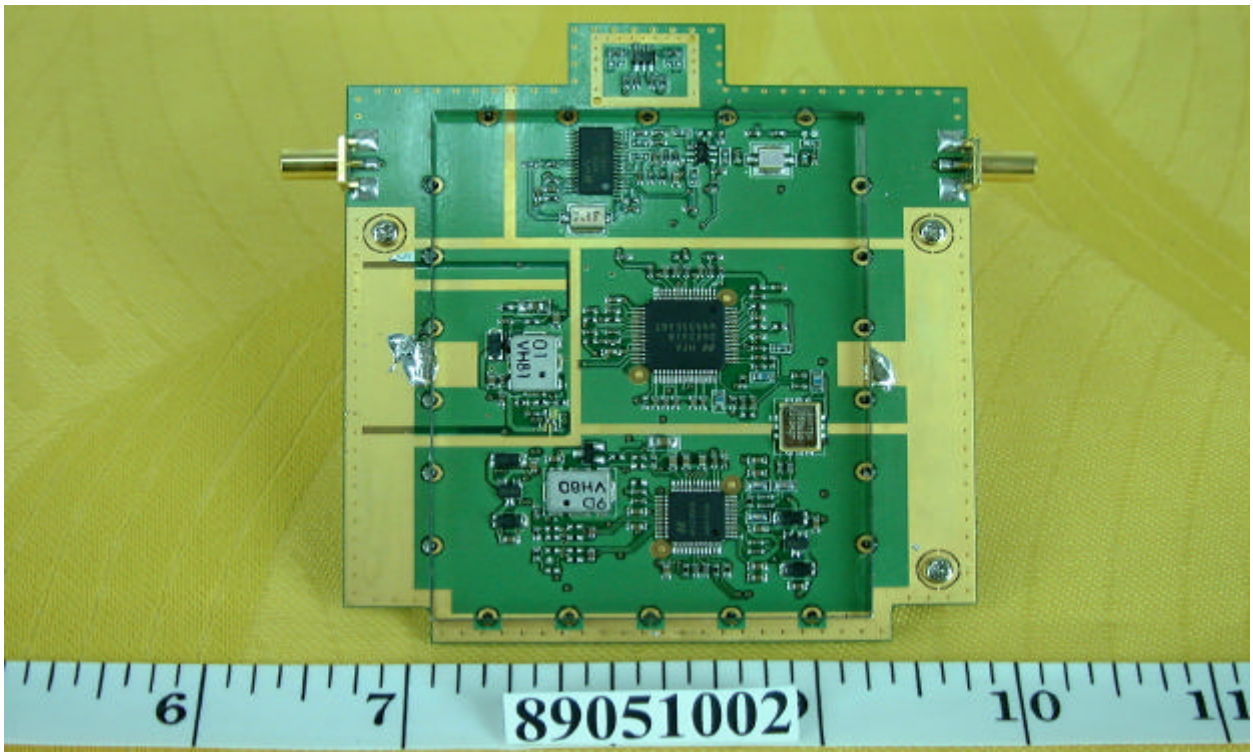


Photo 10

Photo 11

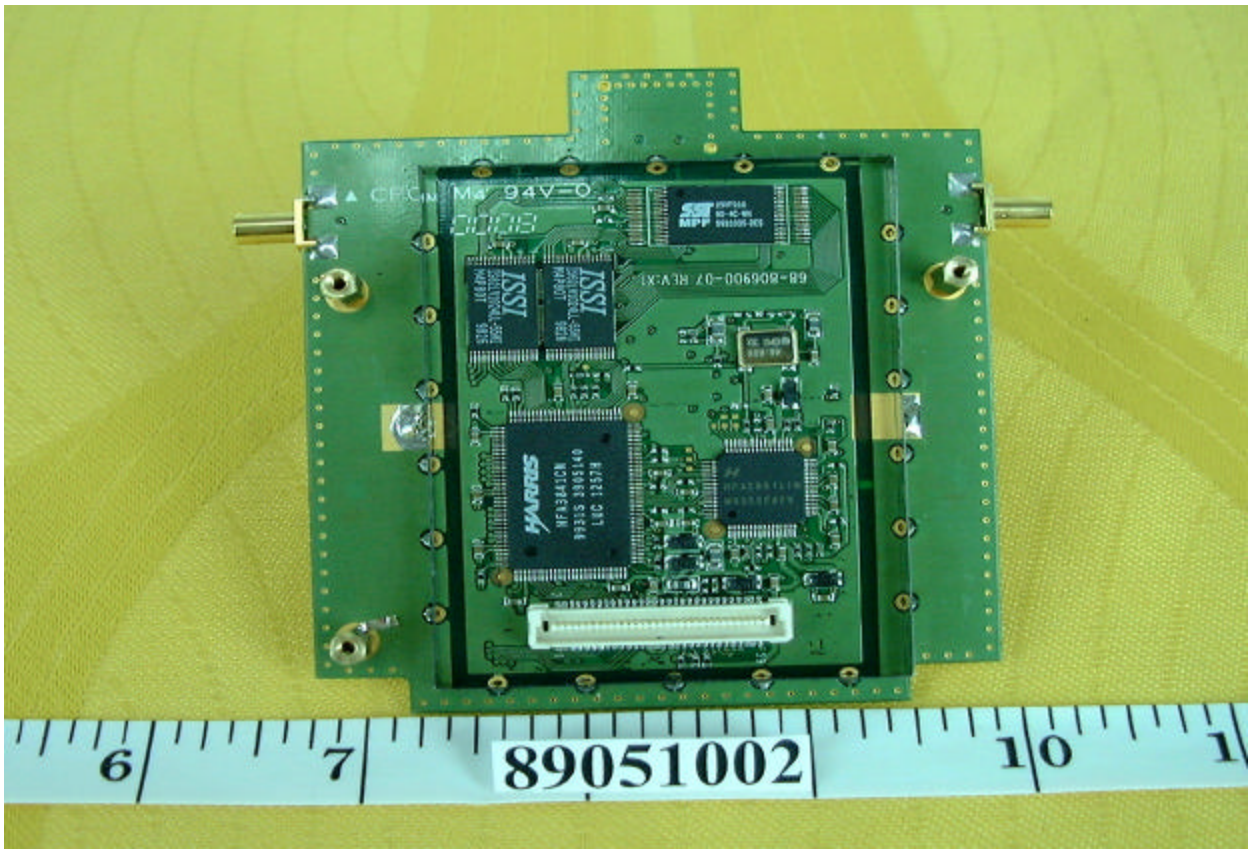


Photo 12

Photo 13

Photo 14