FCC TEST REPORT

REPORT NO.: RF900606R02
MODEL NO.: AP-830
RECEIVED: June 6, 2001
TESTED: June 11 ~ June 22, 2001

APPLICANT: yLez Technologies Pte Ltd

ADDRESS: No.1, Tannery Road, #09-03 Cencon 1, Singapore 347719

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.

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0528

Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT :	2.4GHz Wireless Access Point
BRAND NAME :	yLez
MODEL NO. :	AP-830
APPLICANT :	yLez Technologies Pte Ltd
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from June 11, 2001 to June 22, 2001. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

TESTED BY: Gary Chang , **DATE:** July 2, 2001
Gary Chang

CHECKED BY: Demi Chen , **DATE:** July 2, 2001
Demi Chen

APPROVED BY: Alan Lane , **DATE:** July 2, 2001
Dr. Alan Lane
Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.107	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is –9.92dBuV at 1.63500MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –3.9dBuV at 528.30 MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	2.4GHz Wireless Access Point
MODEL NO.	AP-830
POWER SUPPLY	5VDC from AC adapter
MODULATION TYPE	BPSK, QPSK, CCK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	13 dBm
ANTENNA TYPE	Revised F Antenna
POWER CABLE	Nonshielded 1.8m
I/O PORTS	RJ 45 Port
ASSOCIATED DEVICES	NA

NOTE: The EUT is operated with the following power adapter.

Brand Name :	Delta
Model No. :	ADP-10SB HC
Input Power :	100 - 240V, 0.4A, 50-60Hz
Output Power :	5VDC, 2A

For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

NOTE: 1. Below 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a 2.4GHz Wireless Access Point. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)
ANSI C63.4 : 1992

All tests have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	Inspiron 5000e	TW-012JXN-12961-OB9-2192	FCC DoC Approved
2	LAN CARD	3COM	3CCFE575CT-D	6ZE1316B4E	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.45 – 30	48	-

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 4, 2002
*ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 3, 2002
ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 28, 2001
ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 3, 2001
*EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 3, 2002
*Software	Cond-V2J	NA	NA
*RF cable (JYEBAO)	RG-58A/U	Cable-C02.01	July 9, 2001
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. "*" = These equipments are used for the final measurement.

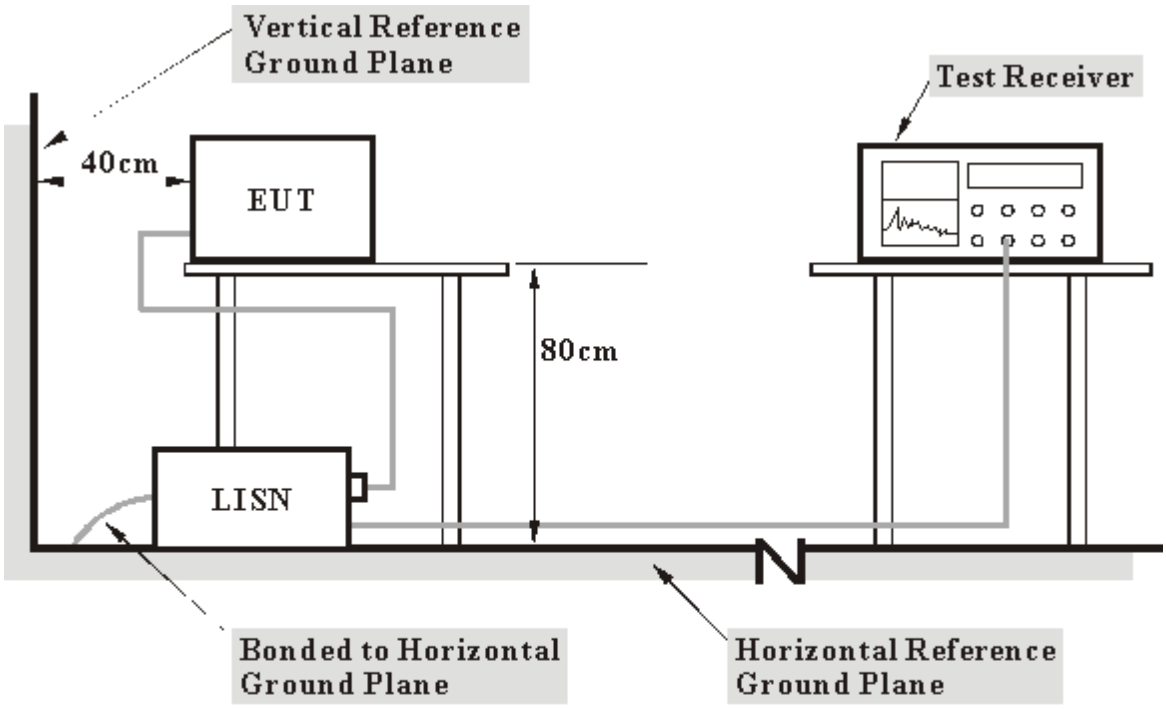
4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters 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 50 ohm/ 50uH of coupling impedance for the measuring instrument.

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

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 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.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.5 EUT OPERATING CONDITIONS

a. Placed the EUT on the testing table.

b. Prepare the computer system with LAN card and placed it outside of testing area to act as a communication partner for EUT.

c. The communication partner run a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency via an RJ 45 cable.

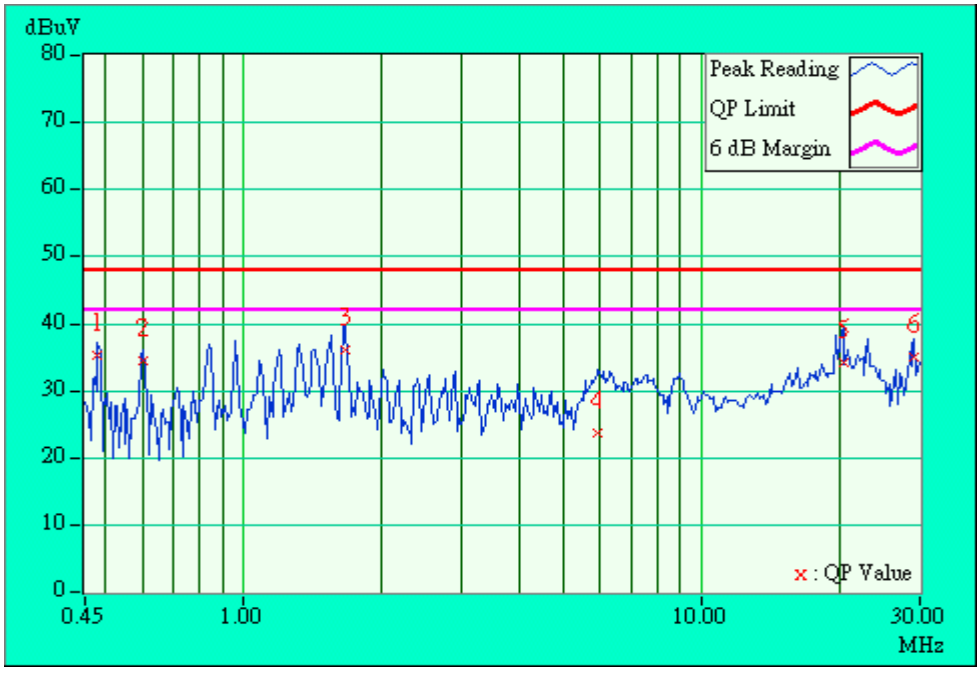
d. The communication partner sent data to EUT by command "PIN".

4.1.6 TEST RESULTS

EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.48000	0.20	35.35	-	35.55	-	48.00	-	-12.45	-
2	0.60000	0.20	34.41	-	34.61	-	48.00	-	-13.39	-
3	1.66500	0.20	36.13	-	36.33	-	48.00	-	-11.67	-
4	5.95700	0.50	23.59	-	24.09	-	48.00	-	-23.91	-
5	20.38100	1.12	34.23	-	35.35	-	48.00	-	-12.65	-
6	29.23400	1.57	35.11	-	36.68	-	48.00	-	-11.32	-

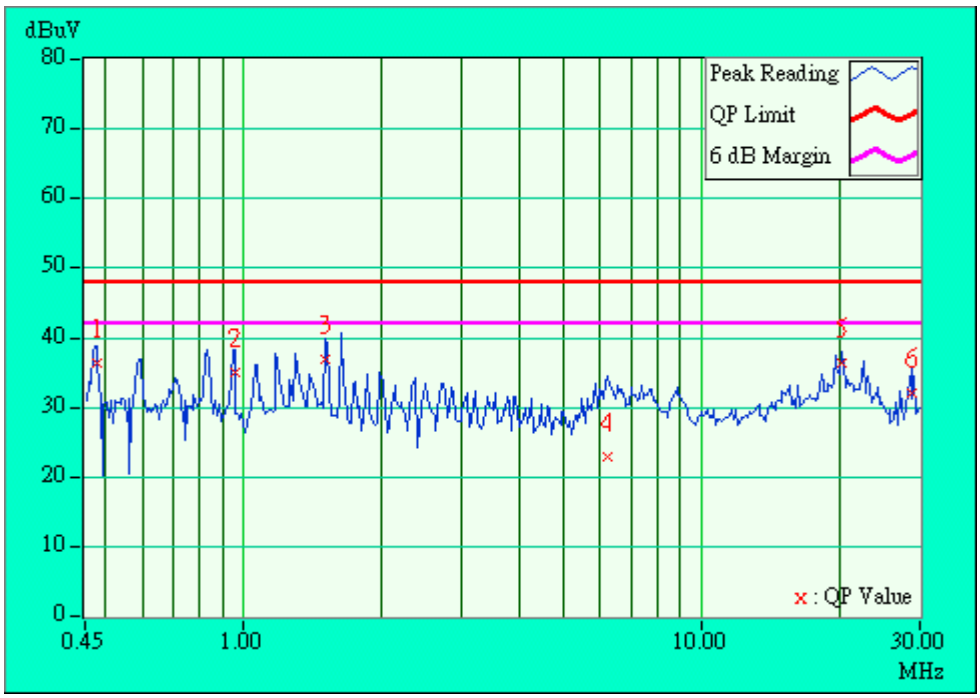
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.47700	0.20	36.49	-	36.69	-	48.00	-	-11.31	-
2	0.95400	0.20	35.00	-	35.20	-	48.00	-	-12.80	-
3	1.50000	0.20	36.77	-	36.97	-	48.00	-	-11.03	-
4	6.21500	0.47	22.95	-	23.42	-	48.00	-	-24.58	-
5	20.25800	1.02	36.35	-	37.37	-	48.00	-	-10.63	-
6	28.68500	1.37	31.95	-	33.32	-	48.00	-	-14.68	-

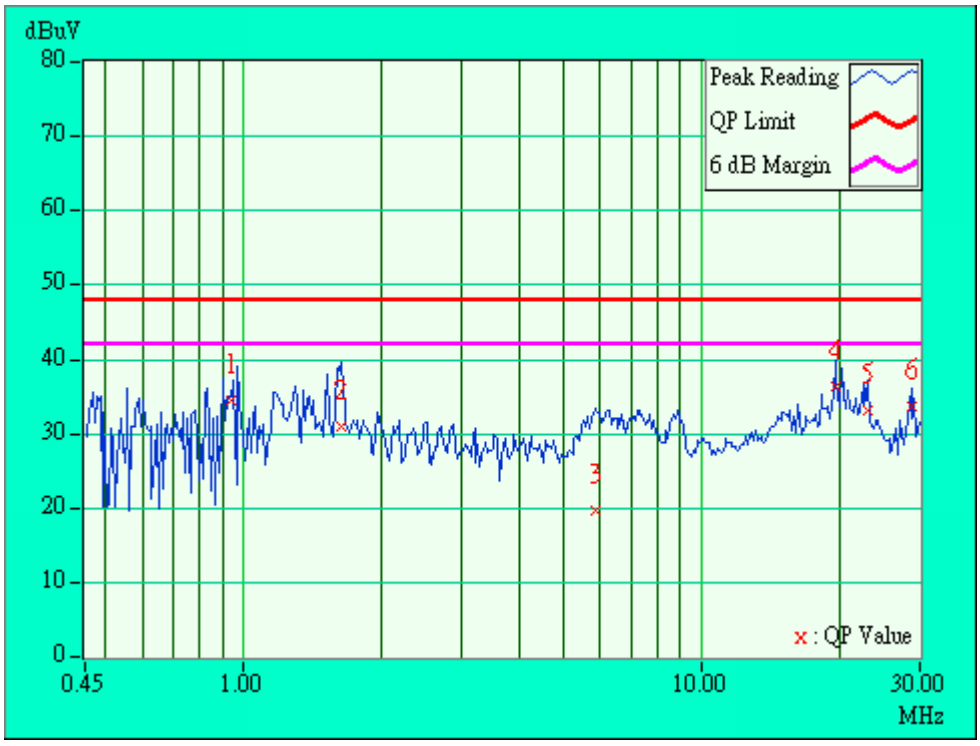
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	2.4GHz Wireless Access Point	MODEL	AP-830
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	TESTED BY: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.93896	0.20	34.54	-	34.74	-	48.00	-	-13.26	-
2	1.64137	0.20	30.85	-	31.05	-	48.00	-	-16.95	-
3	5.87000	0.49	19.75	-	20.24	-	48.00	-	-27.76	-
4	19.70900	1.09	36.39	-	37.48	-	48.00	-	-10.52	-
5	23.12600	1.29	33.05	-	34.34	-	48.00	-	-13.66	-
6	28.68500	1.55	33.59	-	35.14	-	48.00	-	-12.86	-

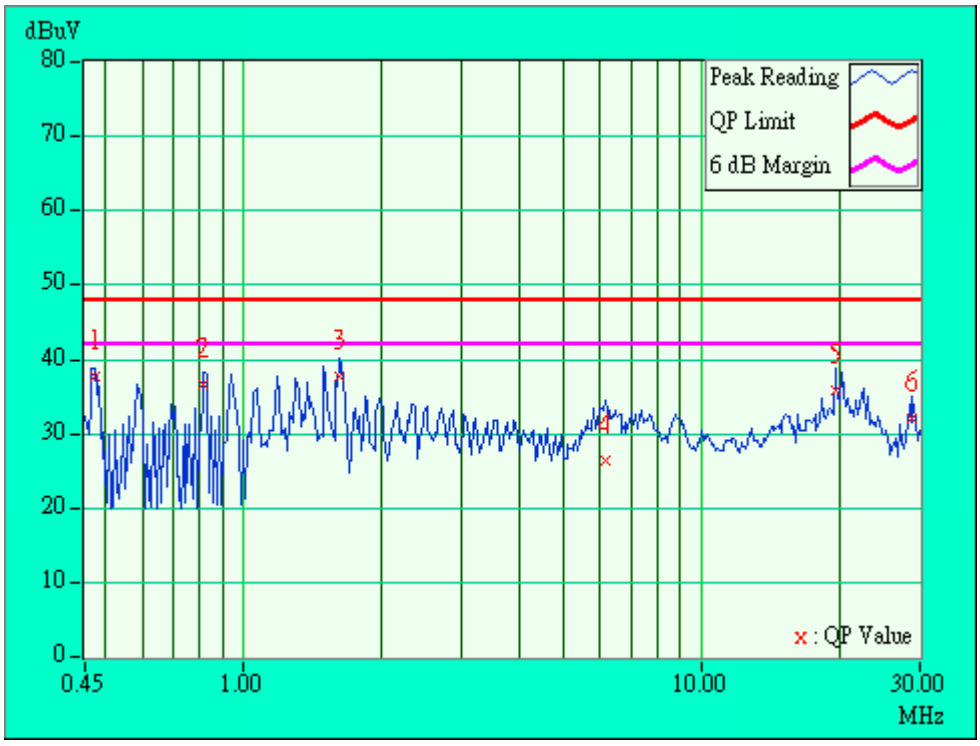
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 6	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.47100	0.20	37.81	-	38.01	-	48.00	-	-9.99	-
2	0.81900	0.20	36.74	-	36.94	-	48.00	-	-11.06	-
3	1.62300	0.20	37.72	-	37.92	-	48.00	-	-10.08	-
4	6.19100	0.47	26.51	-	26.98	-	48.00	-	-21.02	-
5	19.70900	0.99	35.79	-	36.78	-	48.00	-	-11.22	-
6	28.68500	1.37	31.97	-	33.34	-	48.00	-	-14.66	-

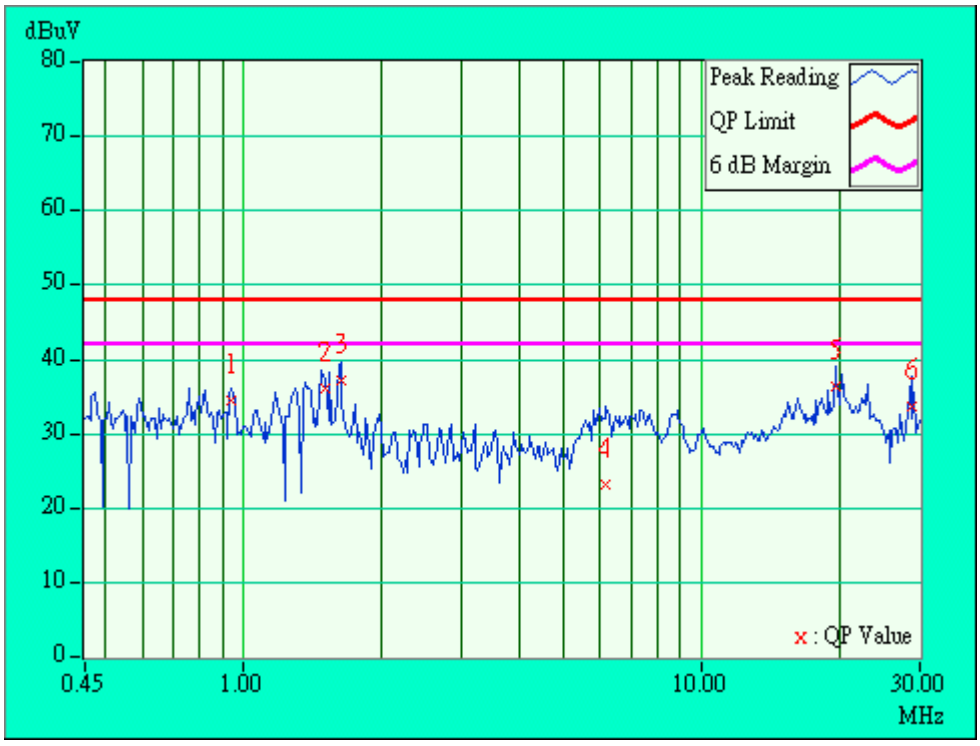
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq. (MHz)	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.94200	0.20	34.38	-	34.58	-	48.00	-	-13.42	-
2	1.50227	0.20	36.03	-	36.23	-	48.00	-	-11.77	-
3	1.62600	0.20	37.18	-	37.38	-	48.00	-	-10.62	-
4	6.17900	0.51	23.22	-	23.73	-	48.00	-	-24.27	-
5	19.70900	1.09	36.41	-	37.50	-	48.00	-	-10.50	-
6	28.68500	1.55	33.73	-	35.28	-	48.00	-	-12.72	-

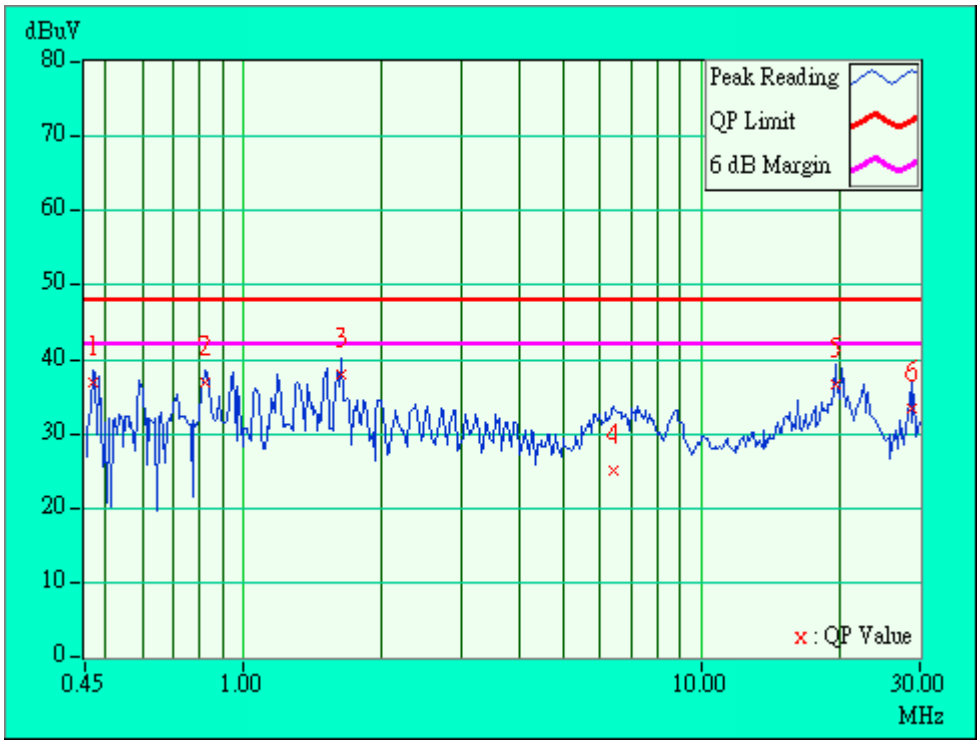
Remarks:
1. "*": Undetectable
2. QP. and AV. are abbreviations of quasi-peak and average individually.
3. "-": NA
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.



EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.46800	0.20	36.81	-	37.01	-	48.00	-	-10.99	-
2	0.82200	0.20	36.96	-	37.16	-	48.00	-	-10.84	-
3	1.63500	0.20	37.88	-	38.08	-	48.00	-	-9.92	-
4	6.41900	0.48	25.06	-	25.54	-	48.00	-	-22.46	-
5	19.70900	0.99	36.75	-	37.74	-	48.00	-	-10.26	-
6	28.68500	1.37	33.45	-	34.82	-	48.00	-	-13.18	-

Remarks:
1. "*": Undetectable
2. QP. 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.



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*HP Spectrum Analyzer	8590L	3544A01176	May 7, 2002
*HP Preamplifier	8447D	2944A08485	Nov. 4, 2001
* HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 4, 2001
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 4, 2001
* Antenna (Horn)	BBHA9120-D	D130	July 10, 2001
Open Field Test Site	Site 5	ADT-R05	July 28, 2001
Site Registration No.	FCC: 90422 VCCI : R-1039 Canada IC: IC 3789-5		

NOTE: 1.The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.

2.The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

3.“*” = These equipments are used for the final measurement.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

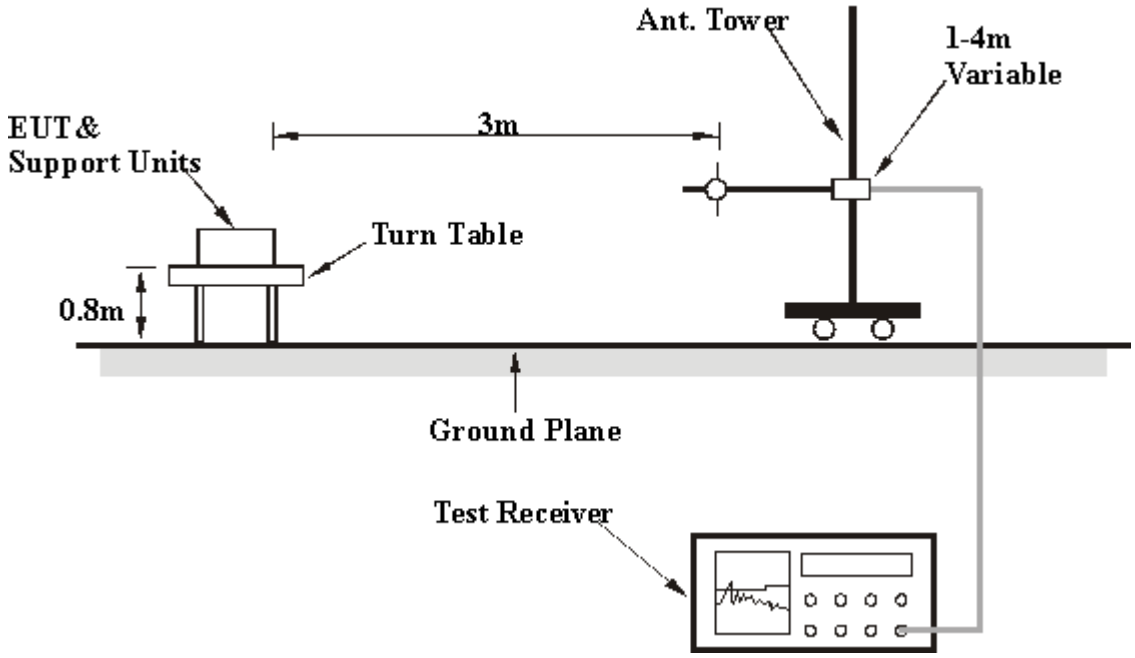
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 300 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.

4.2.6 TEST RESULTS

EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 1	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	220.14	36.1 QP	46.00	-9.90	2.04H	258	23.70	9.58	2.82	0.00	-12.41
2	264.31	38.4 QP	46.00	-7.60	1.00H	35	23.40	12.00	2.96	0.00	-14.96
3	352.40	39.1 QP	46.00	-6.90	1.13H	84	21.80	13.88	3.38	0.00	-17.25
4	440.12	34.0 QP	46.00	-12.00	1.41H	116	14.80	15.93	3.27	0.00	-19.20
5	528.30	42.1 QP	46.00	-3.90	1.61H	160	21.40	17.03	3.67	0.00	-20.71
6	616.50	36.1 QP	46.00	-9.90	1.75H	211	14.80	17.68	3.61	0.00	-21.29
7	704.12	37.3 QP	46.00	-8.70	1.96H	235	14.80	18.43	4.09	0.00	-22.53
8	880.12	35.6 QP	46.00	-10.40	1.84H	188	11.40	19.63	4.54	0.00	-24.17

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	176.00	36.5 QP	43.50	-7.00	1.00V	70	25.10	8.73	2.65	0.00	-11.38
2	219.93	36.7 QP	46.00	-9.30	1.00V	15	24.30	9.58	2.82	0.00	-12.41
3	264.56	36.7 QP	46.00	-9.30	1.00V	200	21.70	12.00	2.96	0.00	-14.96
4	352.12	35.5 QP	46.00	-10.50	1.08V	68	18.20	13.88	3.38	0.00	-17.25
5	440.15	34.6 QP	46.00	-11.40	1.15V	323	15.40	15.93	3.27	0.00	-19.20
6	528.31	38.9 QP	46.00	-7.10	2.00V	9	18.20	17.03	3.67	0.00	-20.71.
7	616.23	36.7 QP	46.00	-9.30	1.85V	277	15.40	17.68	3.61	0.00	-21.29
8	704.12	37.9 QP	46.00	-8.10	1.86V	272	15.40	18.43	4.09	0.00	-22.53
9	880.12	37.0 QP	46.00	-9.00	1.86V	56	12.80	19.63	4.54	0.00	-24.17

NOTE: 1 Emission level = Raw Value - Correction Factor

2 Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)

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

4 Margin value = Emission level - Limit value

EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2038.0	49.3 PK	74.00	-24.70	1.17H	333	19.75	26.31	3.29	0.00	-29.60
2	*2412.8	98.0 PK	NA	NA	1.11H	93	66.89	27.45	3.62	0.00	-31.07.
3	*2412.8	92.6 AV	NA	NA	1.11H	93	61.53	27.45	3.62	0.00	-31.07.
4	4075.9	50.3 PK	74.00	-23.70	1.76H	165	15.48	30.03	4.77	0.00	-34.80
5	4823.8	50.8 PK	74.00	-23.20	1.50H	148	14.24	31.35	5.21	0.00	-36.56

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2038.1	46.9 PK	74.00	-27.10	1.80V	211	17.34	26.31	3.29	0.00	-29.60
3	*2410.3	103.5 PK	NA	NA	1.08V	192	72.40	27.45	3.62	0.00	-31.08
2	*2410.3	98.9 AV	NA	NA	1.08V	192	67.80	27.45	3.62	0.00	-31.08
4	4076.2	50.2 PK	74.00	-23.80	1.46V	268	15.38	30.03	4.77	0.00	-34.80
5	4824.4	52.3 PK	74.00	-21.70	1.08V	235	15.76	31.35	5.21	0.00	-36.56

NOTE: 1. Emission level = Raw Value - Correction Factor
2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
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

EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2063.10	48.1 PK	74.00	-25.90	2.10H	195	18.38	26.37	3.31	0.00	-29.68
2	*2438.3	95.2 PK	NA	NA	1.53H	180	64.06	27.52	3.64	0.00	-31.17
3	*2438.3	89.2 AV	NA	NA	1.53H	180	58.04	27.52	3.64	0.00	-31.17
4	4125.80	50.3 PK	74.00	-23.70	1.56H	63	15.38	30.10	4.79	0.00	-34.90
5	4874.20	51.4 PK	74.00	-22.60	1.56H	187	14.70	31.44	5.25	0.00	-36.69

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2063.2	47.7 PK	74.00	-26.30	1.27V	338	18.02	26.37	3.31	0.00	-29.68
2	*2435.5	104.6 PK	NA	NA	1.10V	336	73.40	27.52	3.64	0.00	-31.17
3	*2435.5	99.7 AV	NA	NA	1.10V	336	68.50	27.52	3.64	0.00	-31.17
4	4125.9	50.7 PK	74.00	-23.30	1.09V	342	15.81	30.10	4.79	0.00	-34.89
5	4874.0	51.7 PK	74.00	-22.30	2.05V	162	15.06	31.44	5.25	0.00	-36.69

NOTE: 1. Emission level = Raw Value - Correction Factor
2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
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

EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
MODE	Channel 11	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Gary Chang	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2088.5	48.2 PK	74.00	-25.80	1.00H	93	18.48	26.44	3.33	0.00	-29.77
2	*2463.3	98.5 PK	NA	NA	1.04H	289	67.24	27.59	3.66	0.00	-31.26
3	*2463.3	92.0 AV	NA	NA	1.04H	289	60.79	27.59	3.66	0.00	-31.26
4	2487.3	51.7 PK	74.00	-22.30	1.67H	289	20.36	27.66	3.68	0.00	-31.33
5	4176.8	50.2 PK	74.00	-23.80	1.00H	219	15.18	30.18	4.81	0.00	-34.98
6	4924.3	51.0 PK	74.00	-23.00	1.00H	256	14.20	31.53	5.28	0.00	-36.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	2087.8	50.7 PK	74.00	-3.30	1.12V	97	20.97	26.44	3.33	0.00	-29.77
2	*2462.8	102.6 PK	NA	NA	1.11V	19	71.33	27.59	3.66	0.00	-31.26
3	*2462.8	99.5 AV	NA	NA	1.11V	19	68.23	27.59	3.66	0.00	-31.26
4	2484.1	55.9 PK	74.00	-18.10	1.11V	252	24.60	27.66	3.68	0.00	-31.34
5	2484.1	45.9 AV	54.00	-8.10	1.11V	252	14.54	27.66	3.68	0.00	-31.33
6	4176.6	49.0 PK	74.00	-25.00	1.27V	283	14.00	30.18	4.81	0.00	-34.98
7	4923.2	53.0 PK	74.00	-21.00	1.83V	165	16.20	31.53	5.28	0.00	-36.81

NOTE: 1. Emission level= Raw Value - Correction Factor
2. Correction Factor = External Preamp. Gain - Ant. Factor - Cable loss
(External Preamp. Gain = 0, when the test receiver is used for the test.)
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

4.3 6DB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

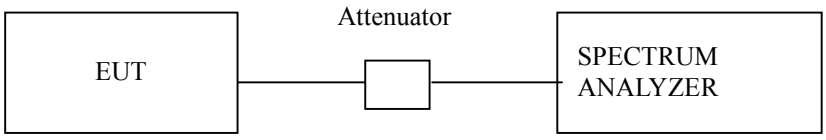
Notes:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST PROCEDURE

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

4.3.4 TEST SETUP



4.3.5 EUT OPERATING CONDITIONS

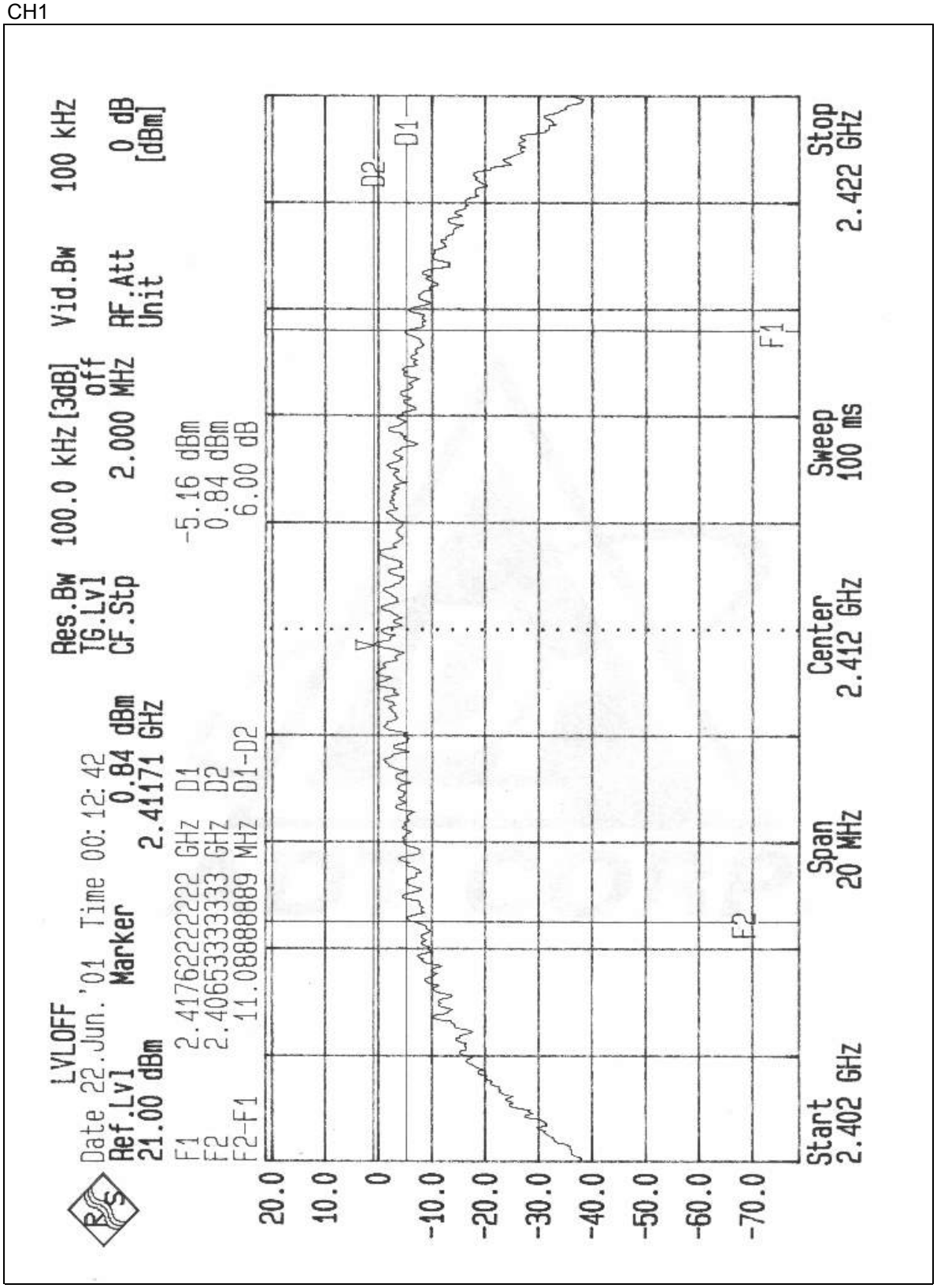
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

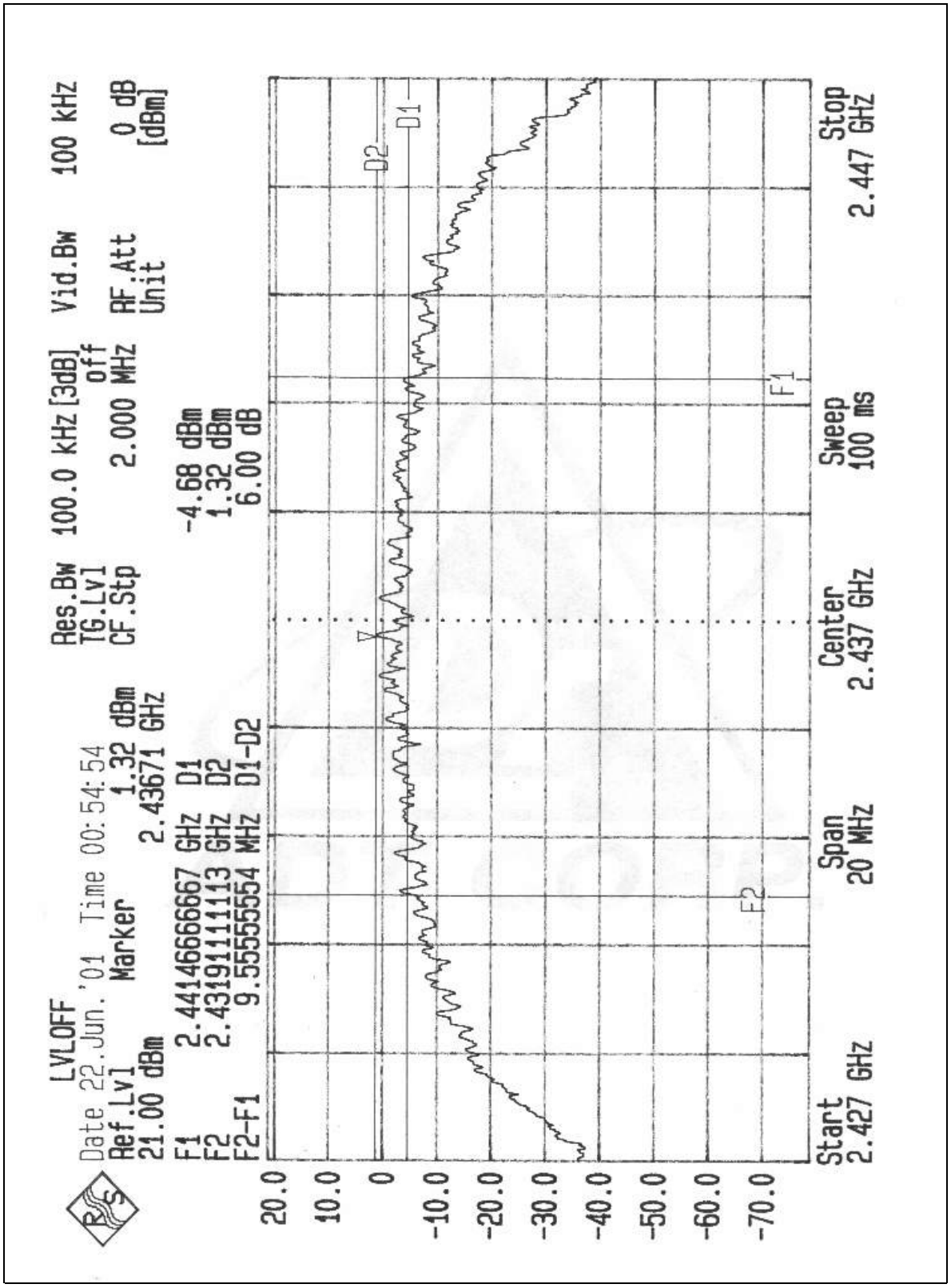
EUT	2.4GHz Wireless Access Point	MODEL	AP-830
INPUT POWER (SYSTEM)	230Vac, 50 Hz	ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.09	0.5	PASS
6	2437	9.56	0.5	PASS
11	2462	9.51	0.5	PASS

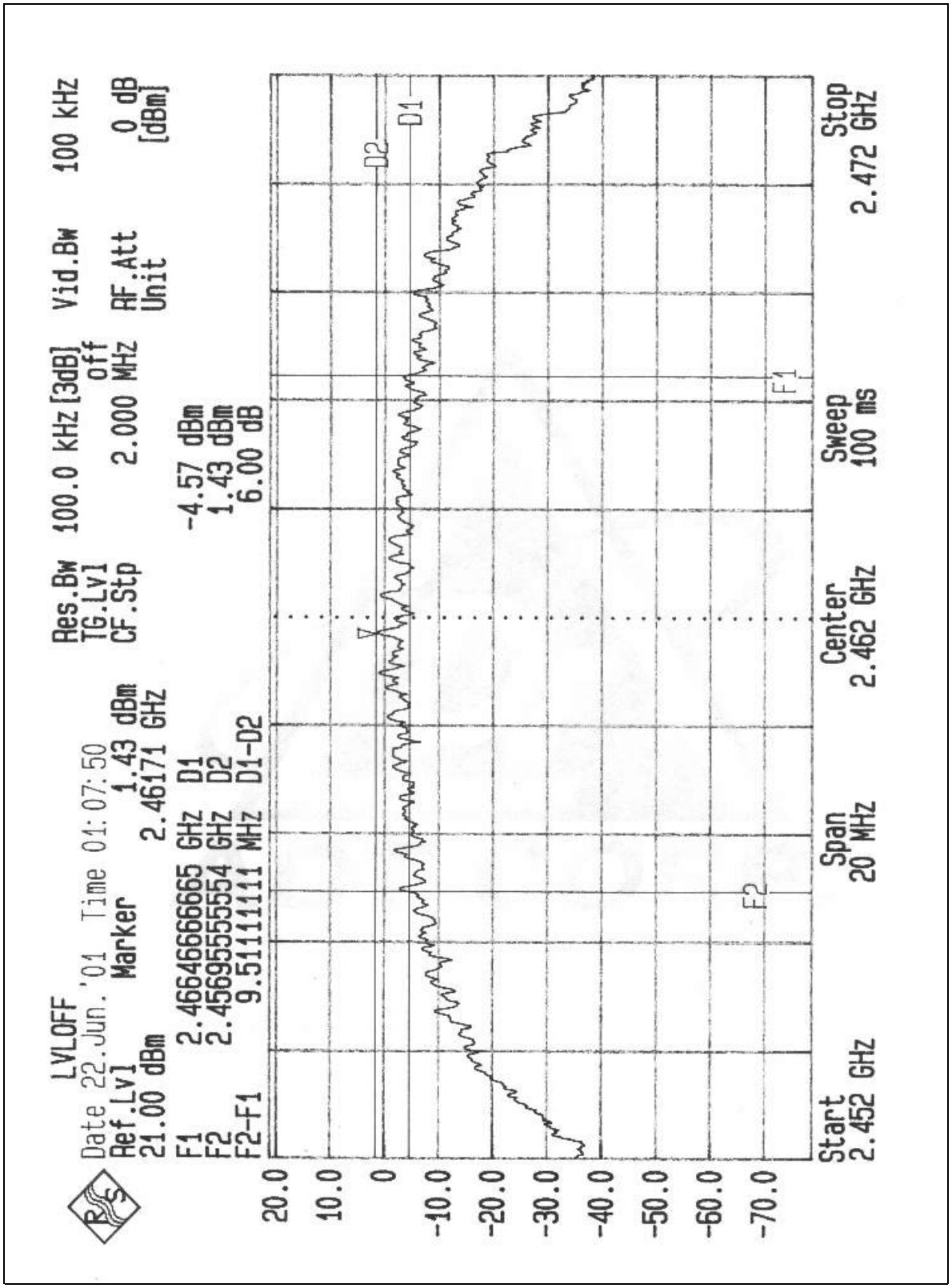
CH1


LVLOFF
Date 22.Jun.'01 Time 00:12:42
Ref.Lvl
21.00 dBm
Marker
0.84 dBm
2.41171 GHz
F1 2.41762222222 GHz D1
F2 2.40653333333 GHz D2
F2-F1 11.08888889 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-5.16 dBm
0.84 dBm
6.00 dB
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 2.402 GHz
Span 20 MHz
Center 2.412 GHz
Sweep 100 ms
Stop 2.422 GHz

CH6


LVLOFF
Date 22.Jun.'01 Time 00:54:54
Ref.Lvl
21.00 dBm
Marker
1.32 dBm
2.43671 GHz
F1 2.441466666667 GHz D1 -4.68 dBm
F2 2.431911111113 GHz D2 1.32 dBm
F2-F1 9.55555554 MHz D1-D2 6.00 dB
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 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 2.427 GHz
Span 20 MHz
Center 2.437 GHz
Sweep 100 ms
Stop 2.447 GHz

CH11


LVLOFF
Date 22.Jun.'01 Time 01:07:50
Ref.Lvl
21.00 dBm
Marker
1.43 dBm
2.46171 GHz
F1 2.46466666665 GHz D1
F2 2.45695555554 GHz D2
F2-F1 9.51111111 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
-4.57 dBm
1.43 dBm
6.00 dB
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 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 100 ms
Stop 2.472 GHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

NOTE:1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

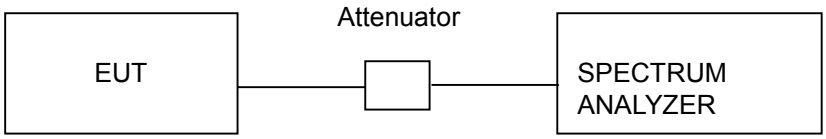
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

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

NOTE: This measurement is the total power of 12MHz bandwidth which is far more wider than 6dB bandwidth.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 3.4.5

4.4.6 TEST RESULTS

EUT	2.4GHz Wireless Access Point	**MODEL**	AP-830
INPUT POWER (SYSTEM)	230Vac, 50 Hz	**ENVIRONMENTAL CONDITIONS**	30 deg. C, 60%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.69	30	PASS
6	2437	17.46	30	PASS
11	2462	17.44	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

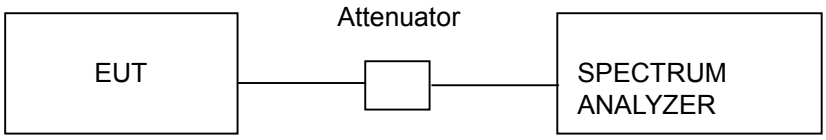
NOTE:1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.

2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 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/3 kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITION

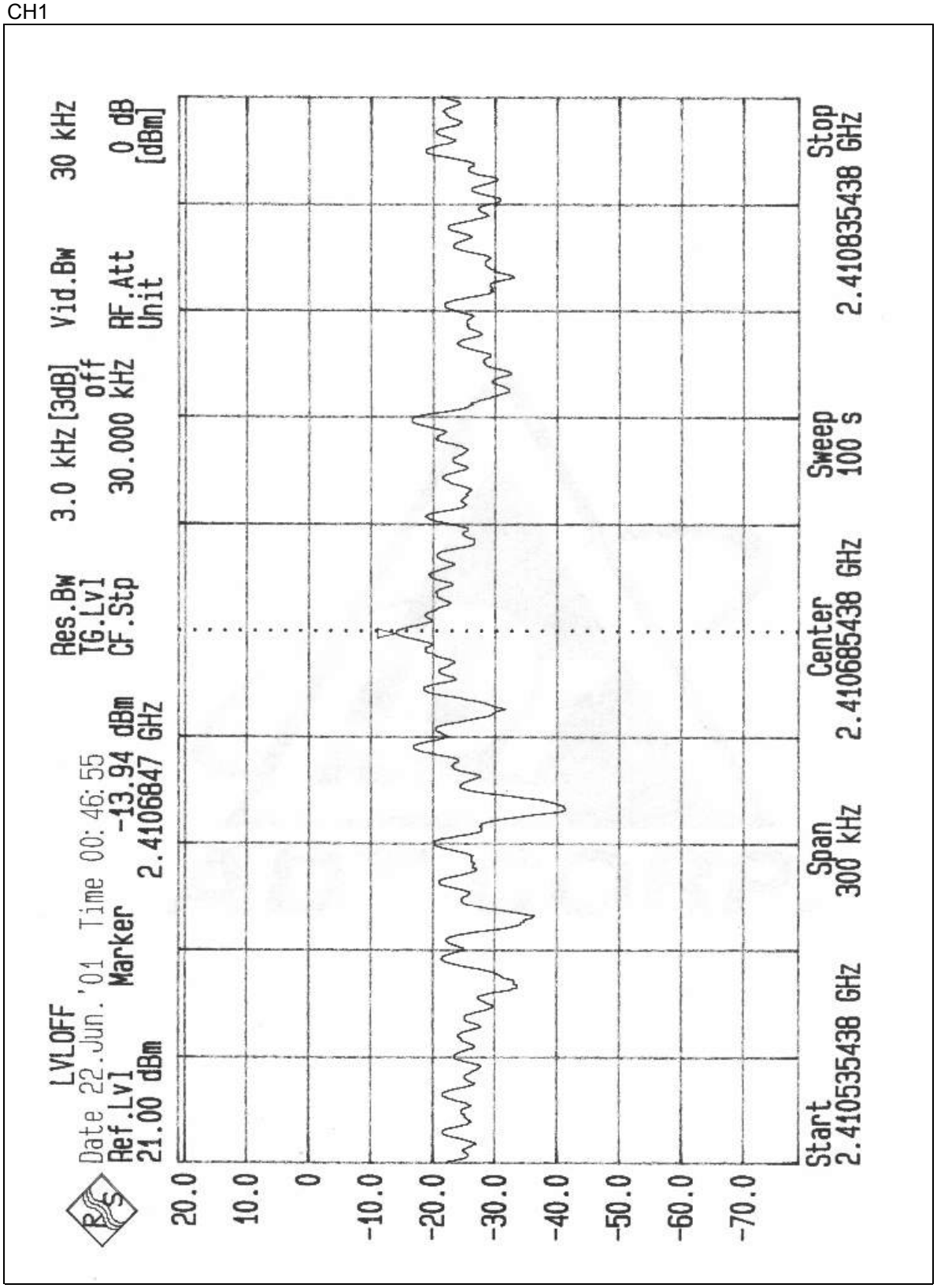
Same as Item 3.4.5

4.5.6 TEST RESULTS

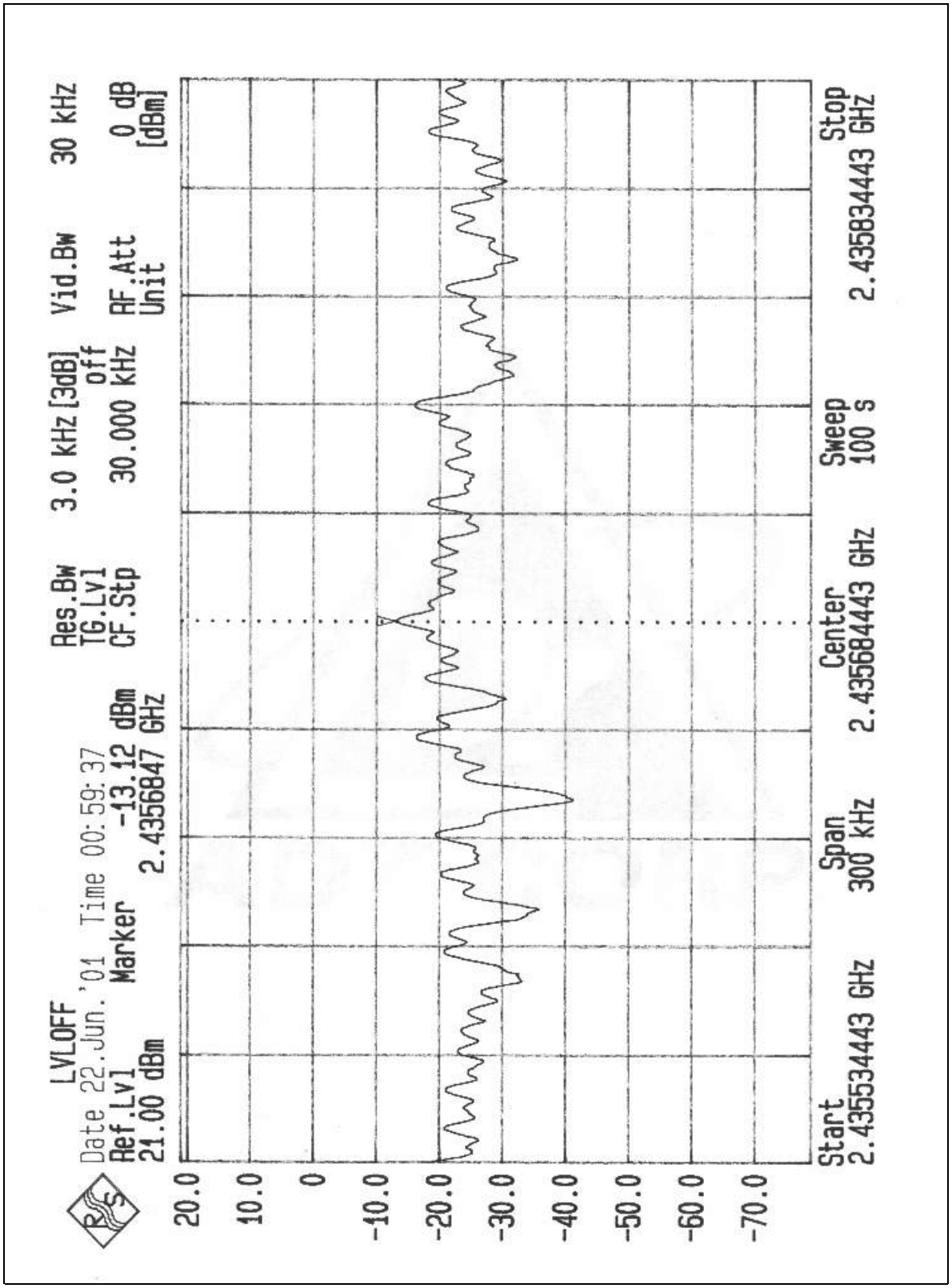
EUT	2.4GHz Wireless Access Point	MODEL	AP-830
INPUT POWER (SYSTEM)	230Vac, 50 Hz	ENVIRONMENTAL CONDITIONS	30 deg. C, 60%RH, 1005 hPa
TESTED BY: Gary Chang			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-13.94	8	PASS
6	2437	-13.12	8	PASS
11	2462	-13.07	8	PASS

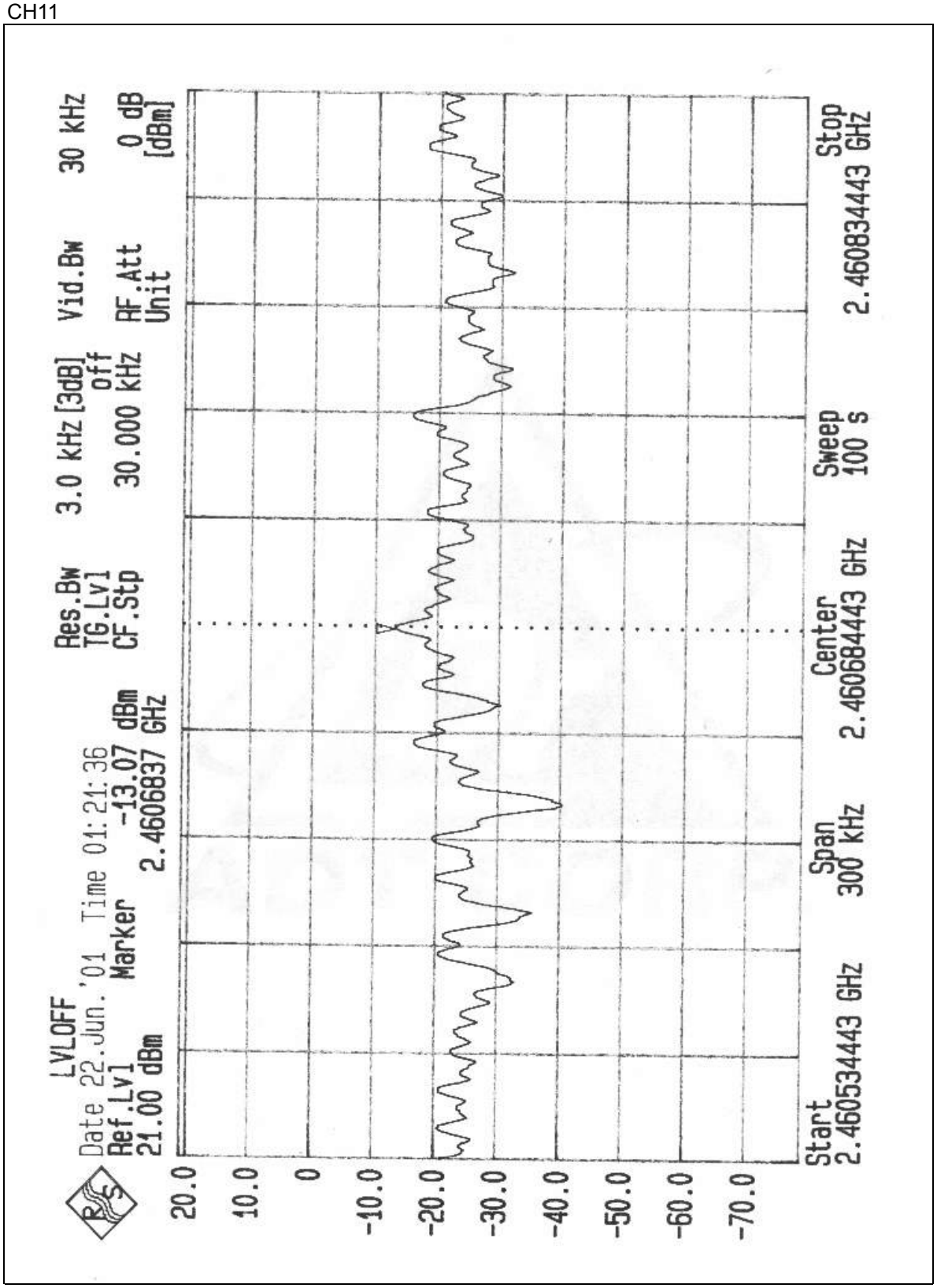
CH1


LVLOFF
Date 22.Jun.'01 Time 00:46:55
Ref.Lvl
21.00 dBm
Marker
-13.94 dBm
2.4106847 GHz
Res.Bw
3.0 kHz [3dB]
TG.Lvl
off
CF.Stp
30.000 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
2.41053543B GHz
Span
300 kHz
Center
2.410685438 GHz
Sweep
100 s
Stop
2.410835438 GHz

CH6


LVLOFF
Date 22.Jun.'01 Time 00:59:37
Ref.Lvl
21.00 dBm
Marker
-13.12 dBm
2.4356847 GHz
Res.Bw
TG.Lvl
CF.Stp
3.0 kHz [3dB]
off
30.000 kHz
Vid.Bw
RF.Att
Unit
30 kHz
0 dB
[dBm]
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start
2.43534443 GHz
Span
300 kHz
Center
2.43568443 GHz
Sweep
100 s
Stop
2.43584443 GHz

CH11


LVLOFF
Date 22.Jun.'01 Time 01:21:36
Ref.Lvl
21.00 dBm
Marker
-13.07 dBm
2.4606837 GHz
Res.Bw 3.0 kHz [3dB]
TG.Lvl off
CF.Stp 30.000 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
2.460534443 GHz
Span
300 kHz
Center
2.460684443 GHz
Sweep
100 s
Stop
2.460834443 GHz

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ TEST RECEIVER	ESMI	848926/005 846839/018	Dec 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

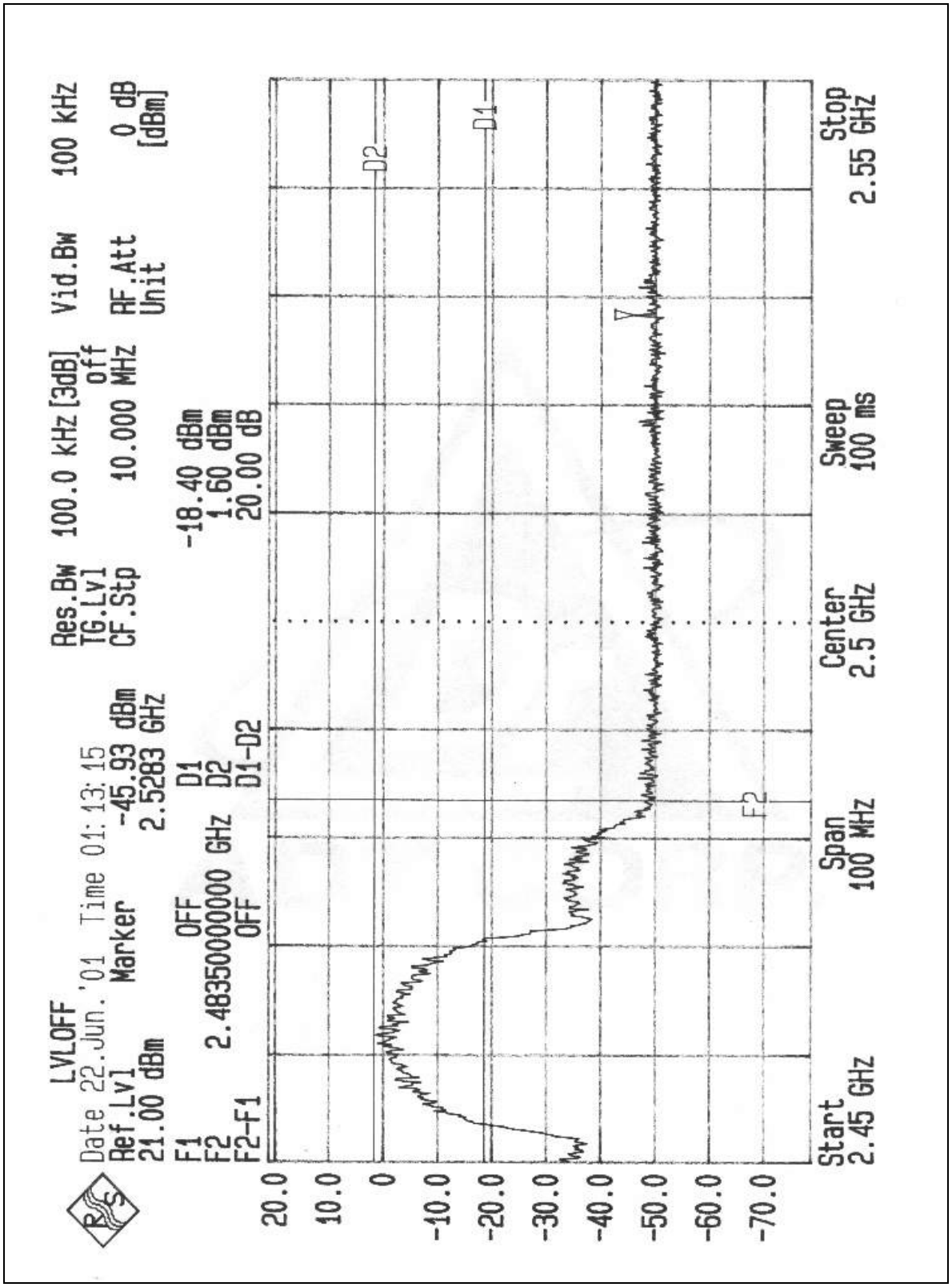
4.6.4 EUT OPERATING CONDITION

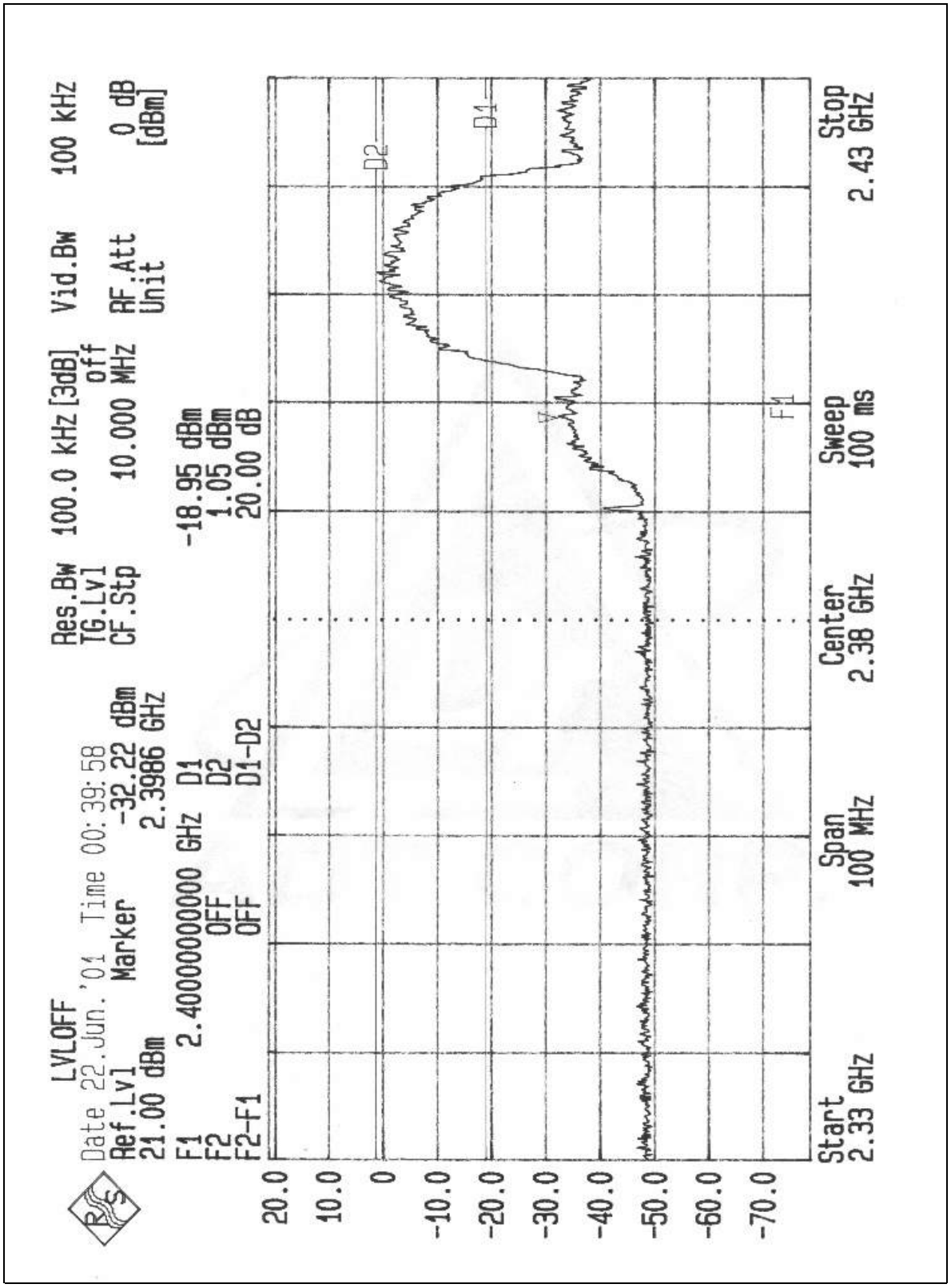
Same as Item 3.4.5

4.6.5 TEST RESULTS

The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

NOTE: The band edge emission plot on the following 2 pages shows 47.53dB delta between carrier maximum power and local maximum emission in restrict band (2528.3GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.6 (Page 25) is 99.5dBuV/m, so the maximum field strength in restrict band is 99.50-47.53=51.97 dBuV/m which is under 54 dBuV/m limit.


LVLOFF
Date 22.Jun.'01 Time 01:13:15
Ref.Lvl
21.00 dBm
Marker
-45.93 dBm
2.5283 GHz
F1
F2
F2-F1
OFF
2.4835000000 GHz
OFF
D1
D2
D1-D2
-18.40 dBm
1.60 dBm
20.00 dB
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 10.000 MHz
Vid.Bw 100 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
D1
D2
F2
Start 2.45 GHz
Span 100 MHz
Center 2.5 GHz
Sweep 100 ms
Stop 2.55 GHz


LVLOFF
Date 22.Jun.'01 Time 00:39:58
Ref.Lvl
21.00 dBm
Marker
F1 2.400000000 GHz
F2 OFF
F2-F1 OFF
-32.22 dBm
2.3986 GHz
D1
D2
D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 10.000 MHz
-18.95 dBm
1.05 dBm
20.00 dB
Vid.Bw 100 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
D2
D1
F1
Start 2.33 GHz
Span 100 MHz
Center 2.38 GHz
Sweep 100 ms
Stop 2.43 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 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 FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

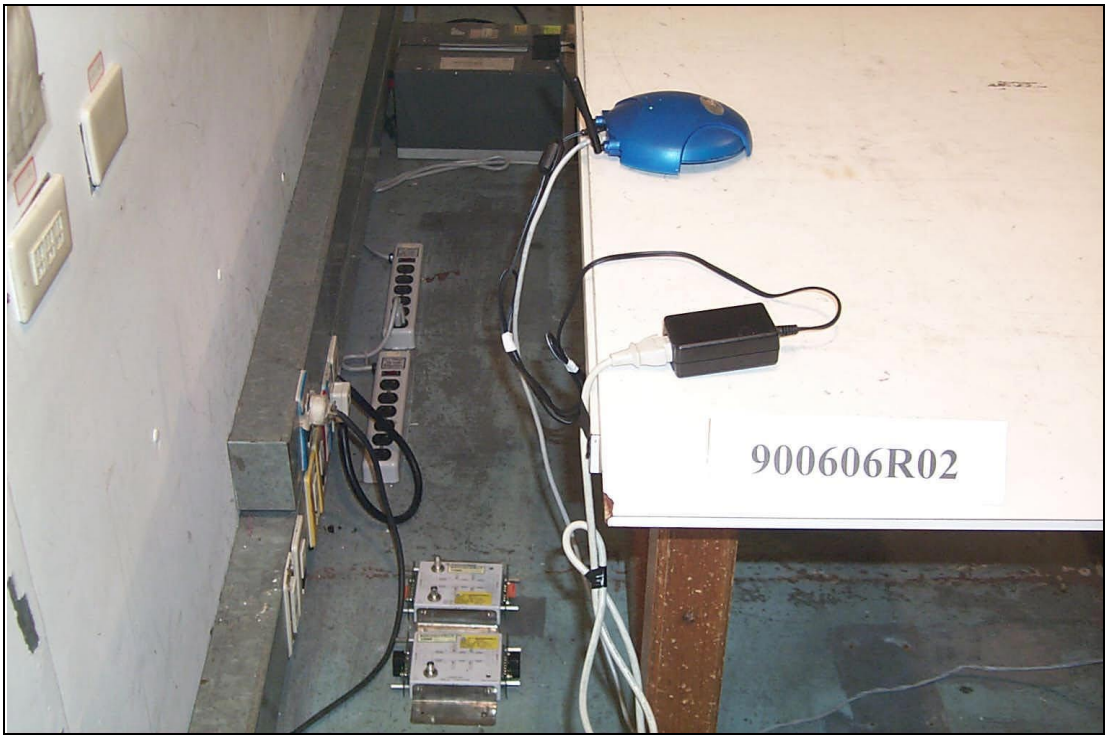
4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Inverted-F antenna and no antenna connector.

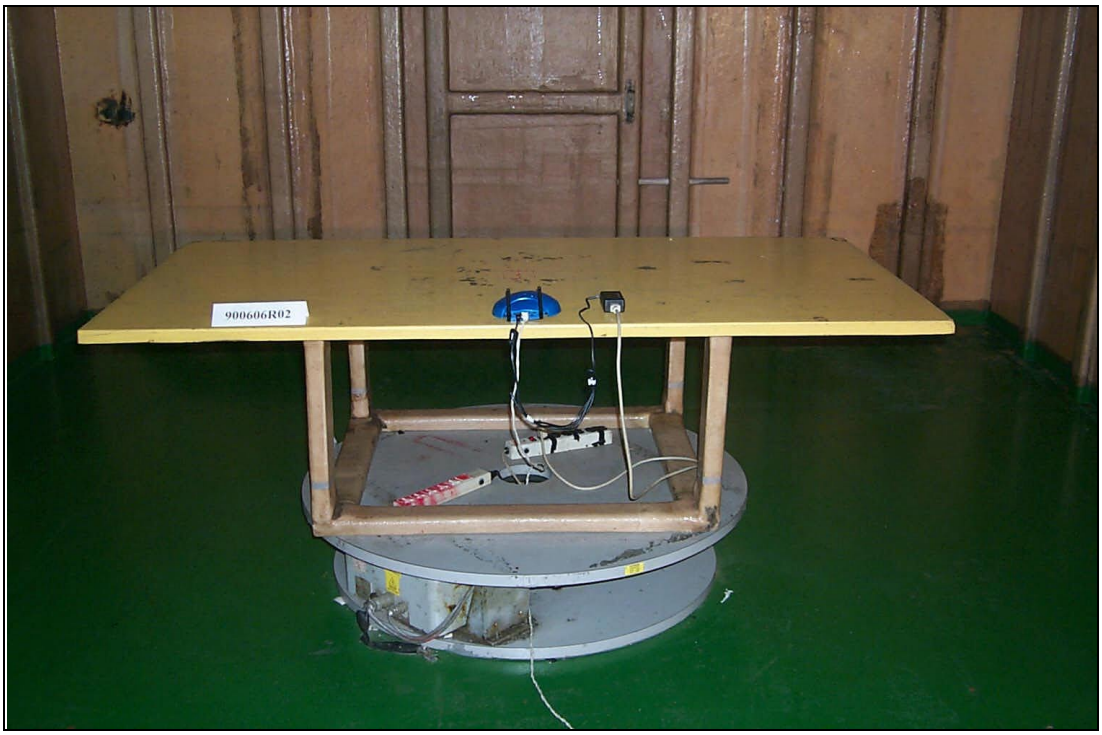
The maximum Gain of the antenna is -1dBi only.

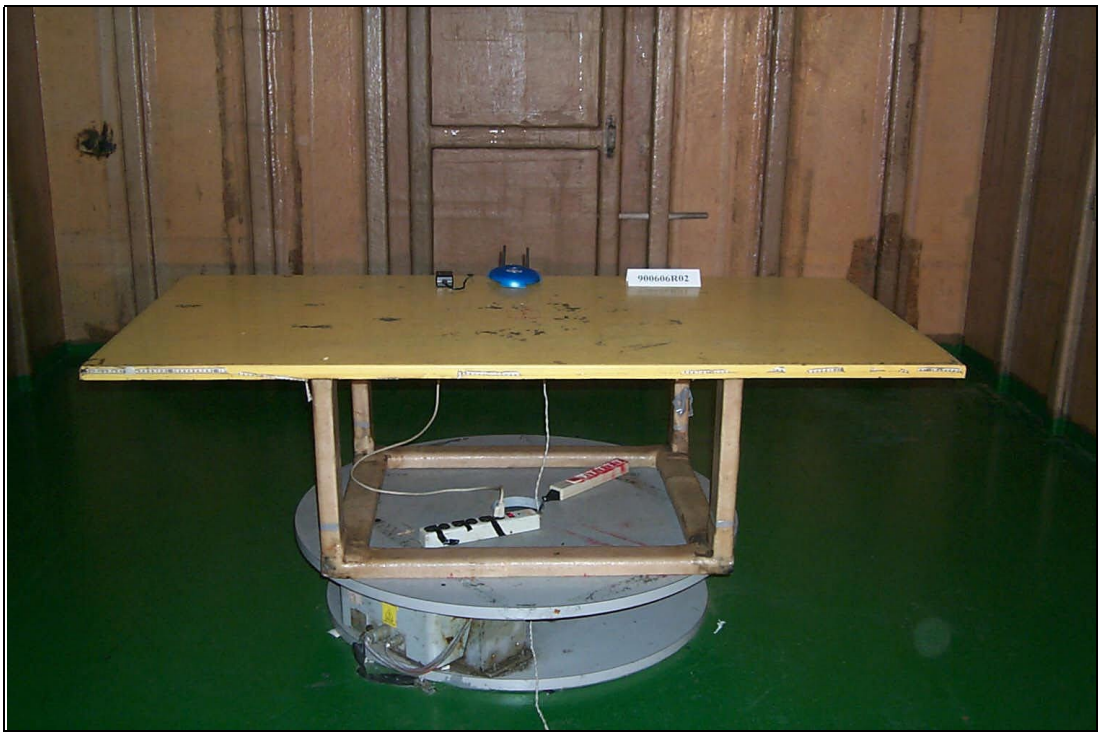
5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST





6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP, UL
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
R.O.C.	BSMI, DGT, CNLA

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:
www.adt.com.tw/index.5/phtml.

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The address and road map of all our labs can be found in our web site also.