FCC TEST REPORT

REPORT NO.: RF901008R03
MODEL NO.: WL-360F
OEM MODEL NO.: DWL-520
RECEIVED: October 8, 2001
TESTED: October 9~ October 13, 2001

APPLICANT: GEMTEK TECHNOLOGY CO., LTD.

ADDRESS: No.1, Jen Ai Road, Hsinchu Industrial Park
Hukou, Hsinchu, Taiwan, R.O.C.

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 :	Wireless PCI Card
BRAND NAME :	GemTek
MODEL NO. :	WL-360F
OEM BRAND NAME :	D-Link
OEM MODEL NO. :	DWL-520
APPLICANT :	GEMTEK TECHNOLOGY CO., 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 October 9, 2001 to October 13, 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 : Steven Lu (Steven Lu) · DATE: Oct. 17, 2001

CHECKED BY : Emily Lu (Emily Lu) · DATE: Oct. 17, 2001

APPROVED BY : Alan Lane (Dr. Alan Lane, Manager) · DATE: Oct. 17, 2001

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 –-5.67dBuV at 0.501MHz
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)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –2.9dBuV at 2483.5MHz
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	Wireless PCI Card
MODEL NO.	WL-360F
POWER SUPPLY	5VDC from host equipment
MODULATION TYPE	CCK, BPSK, QPSK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	18dBm
ANTENNA TYPE	Monopole Antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE: For a more detailed features description, please refer to the manufacturer's specifications or 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 Wireless PCI Card. 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	Personal Computer	IBM	2187-12W	1S218714ABNA000V	DoC
2	COLOR MONITOR	HP	D2842A	KR93473168	BEJCB910
3	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
4	MODEM	ACEEX	1414	980020503	IFAXDM1414
5	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110111	F4ZDA-104G
6	PS/2 MOUSE	DEXIN	A2P800A	80102109	NIYA2P800A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
3	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
6	1.5 m foil shielded wire, terminated with PS/2 connector via drain wire, w/o core.

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 5, 2002
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 equipment are used for conducted telecom port test only (if tested).

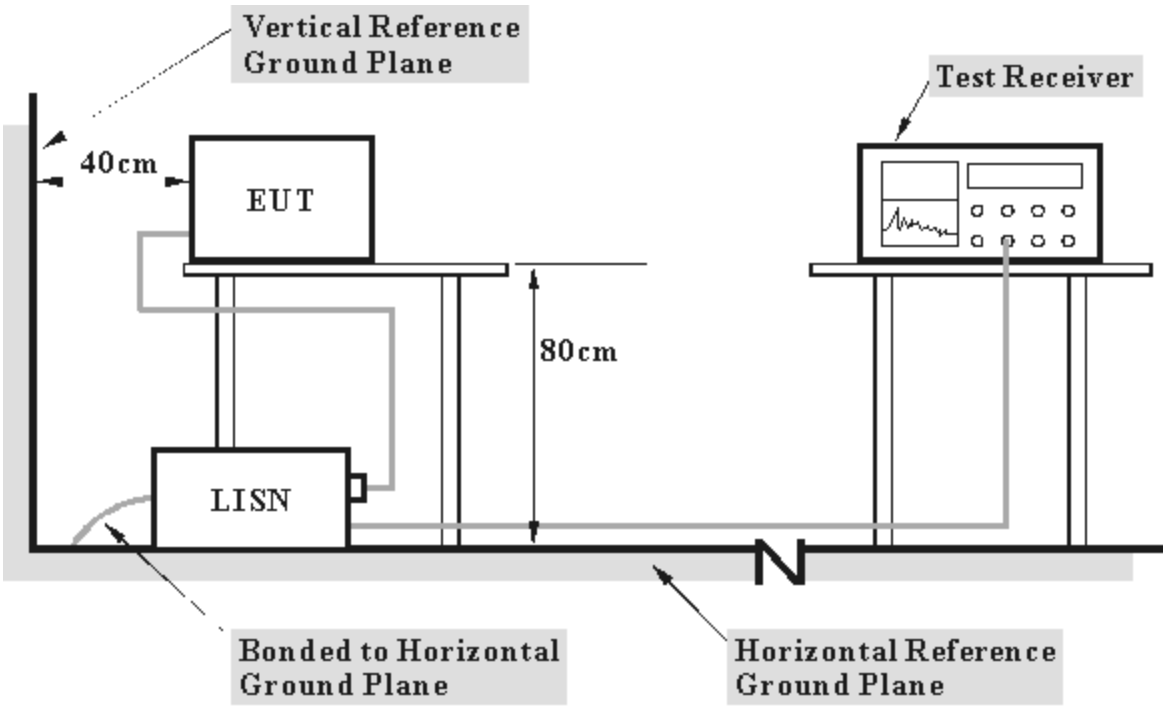
4.1.3 TEST PROCEDURES

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 450 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

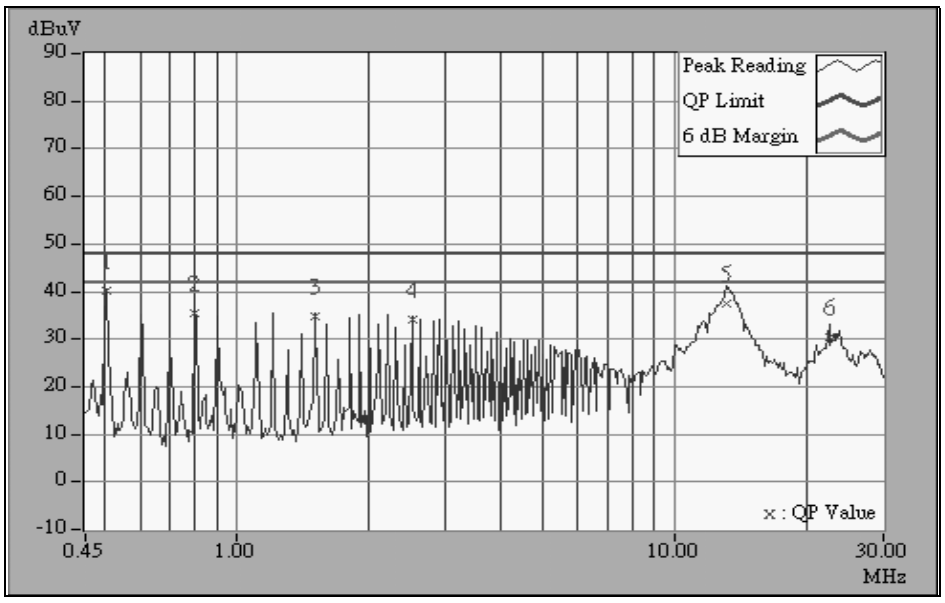
a. Connected the EUT to a computer system placed on a testing table.
b. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The computer system sent "H" messages to color monitor.
d. The computer system sent “H” messages to modem.
e. The computer system sent "H" messages to printer and the printer prints them on paper.

4.1.6 TEST RESULTS

EUT	Wireless PCI Card	**MODEL**	WL-360F
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	**TESTED BY**: Steven Lu	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.501	0.10	40.06	-	40.16	-	48.00	-	-7.84	-
2	0.802	0.10	35.42	-	35.52	-	48.00	-	-12.48	-
3	1.505	0.10	34.64	-	34.74	-	48.00	-	-13.26	-
4	2.509	0.15	33.95	-	34.10	-	48.00	-	-13.90	-
5	13.155	0.69	37.55	-	38.24	-	48.00	-	-9.76	-
6	22.571	1.05	30.44	-	31.49	-	48.00	-	-16.51	-

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

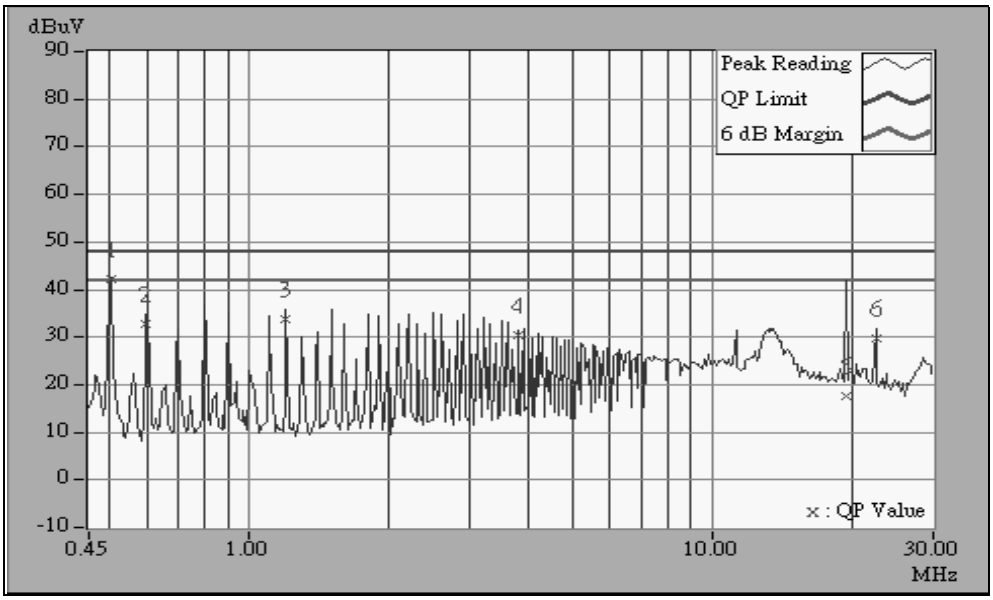


EUT	Wireless PCI Card	MODEL	WL-360F
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.501	0.10	42.23	-	42.33	-	48.00	-	-5.67	-
2	0.598	0.10	32.84	-	32.94	-	48.00	-	-15.06	-
3	1.200	0.10	33.68	-	33.78	-	48.00	-	-14.22	-
4	3.811	0.28	30.42	-	30.70	-	48.00	-	-17.30	-
5	19.450	0.78	17.48	-	18.26	-	48.00	-	-29.74	-
6	22.571	0.85	29.74	-	30.59	-	48.00	-	-17.41	-

NOTE:

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

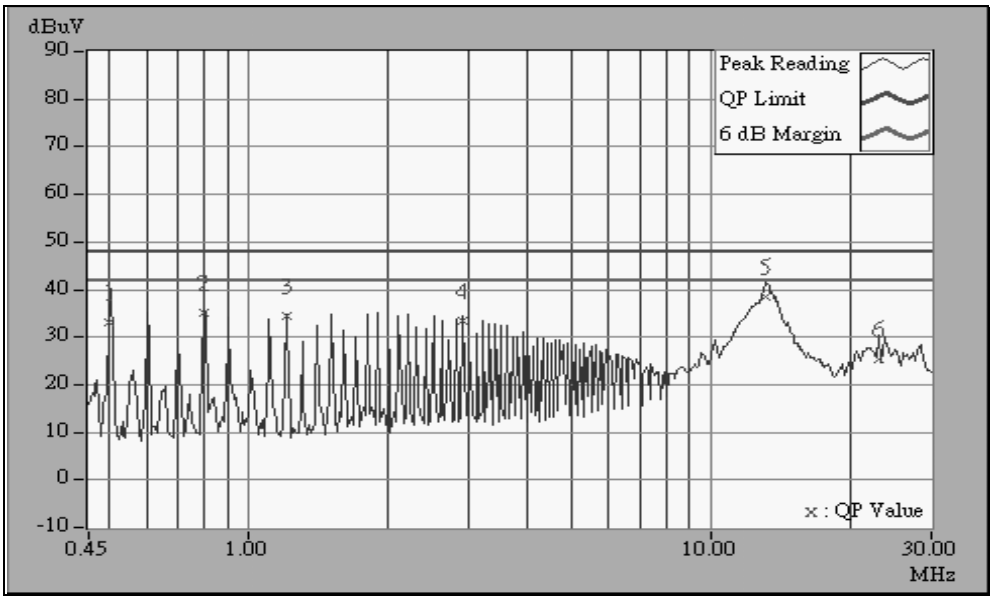


EUT	Wireless PCI Card	MODEL	WL-360F
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.497	0.10	33.07	-	33.17	-	48.00	-	-14.83	-
2	0.802	0.10	35.22	-	35.32	-	48.00	-	-12.68	-
3	1.204	0.10	34.53	-	34.63	-	48.00	-	-13.37	-
4	2.911	0.19	33.58	-	33.77	-	48.00	-	-14.23	-
5	13.157	0.69	38.56	-	39.25	-	48.00	-	-8.75	-
6	23.095	1.06	25.51	-	26.57	-	48.00	-	-21.43	-

NOTE:

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

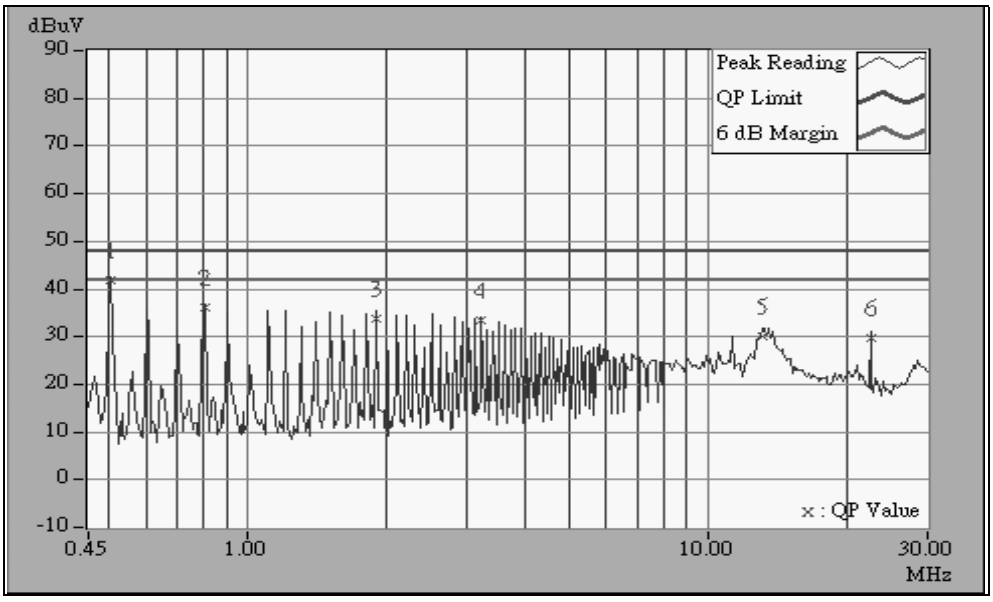


EUT	Wireless PCI Card	MODEL	WL-360F
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

No	Freq.	Corr. Factor	Reading Value [dB (Uv)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.501	0.10	41.95	-	42.05	-	48.00	-	-5.95	-
2	0.805	0.10	36.11	-	36.21	-	48.00	-	-11.79	-
3	1.907	0.10	33.79	-	33.89	-	48.00	-	-14.11	-
4	3.216	0.22	33.44	-	33.66	-	48.00	-	-14.34	-
5	13.161	0.53	29.90	-	30.43	-	48.00	-	-17.57	-
6	22.571	0.85	29.66	-	30.51	-	48.00	-	-17.49	-

NOTE:

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

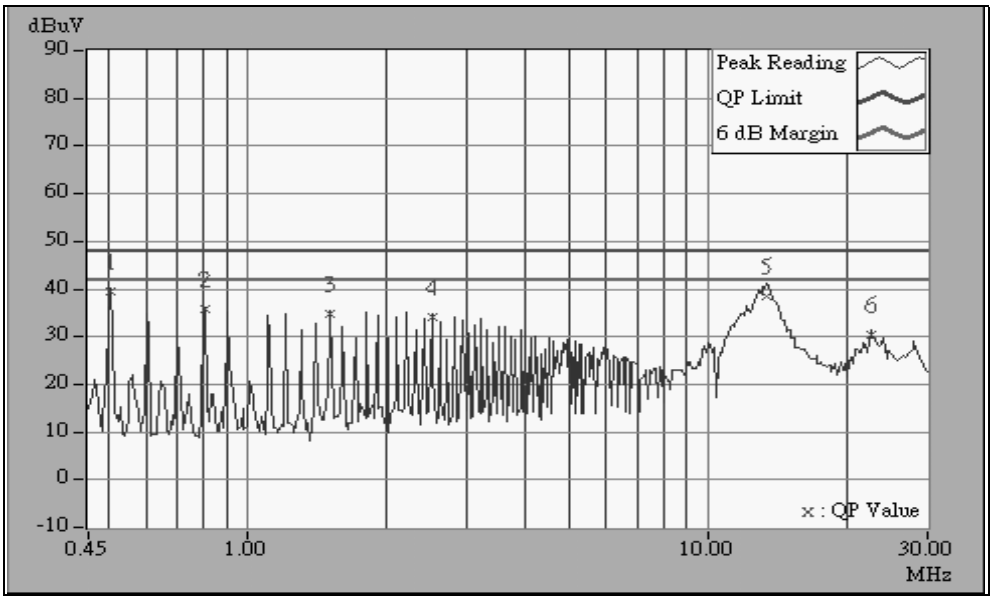


EUT	Wireless PCI Card	MODEL	WL-360F
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.501	0.10	39.64	-	39.74	-	48.00	-	-8.26	-
2	0.805	0.10	35.81	-	35.91	-	48.00	-	-12.09	-
3	1.509	0.10	34.84	-	34.94	-	48.00	-	-13.06	-
4	2.513	0.15	34.11	-	34.26	-	48.00	-	-13.74	-
5	13.372	0.70	38.53	-	39.23	-	48.00	-	-8.77	-
6	22.571	1.05	30.24	-	31.29	-	48.00	-	-16.71	-

NOTE:

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

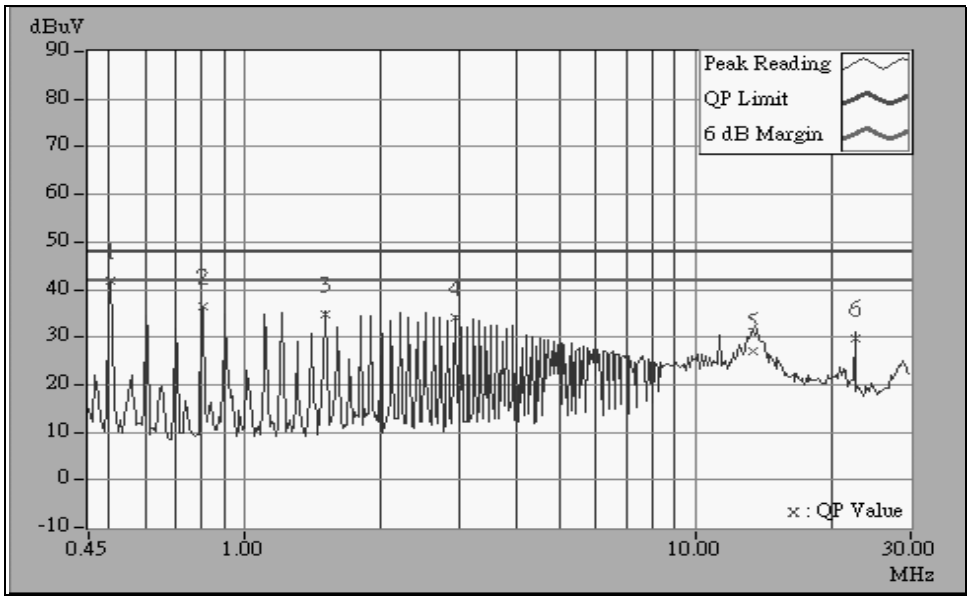


EUT	Wireless PCI Card	MODEL	WL-360F
MODE	Channel 11	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Netural (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.501	0.10	41.79	-	41.89	-	48.00	-	-6.11	-
2	0.805	0.10	36.47	-	36.57	-	48.00	-	-11.43	-
3	1.509	0.10	34.92	-	35.02	-	48.00	-	-12.98	-
4	2.915	0.19	34.04	-	34.23	-	48.00	-	-13.77	-
5	13.360	0.53	26.93	-	27.46	-	48.00	-	-20.54	-
6	22.571	0.85	29.68	-	30.53	-	48.00	-	-17.47	-

NOTE:

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



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. 3, 2001
* HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
* HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
* 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. 2, 2002
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
* EMCO Horn Antenna	3115	9312-4192	April 15, 2002
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
Site Registration No.	FCC: 90422 Canada IC: IC 3789 VCCI : R-1039		

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 equipment are used for the final measurement.

4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz.

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.

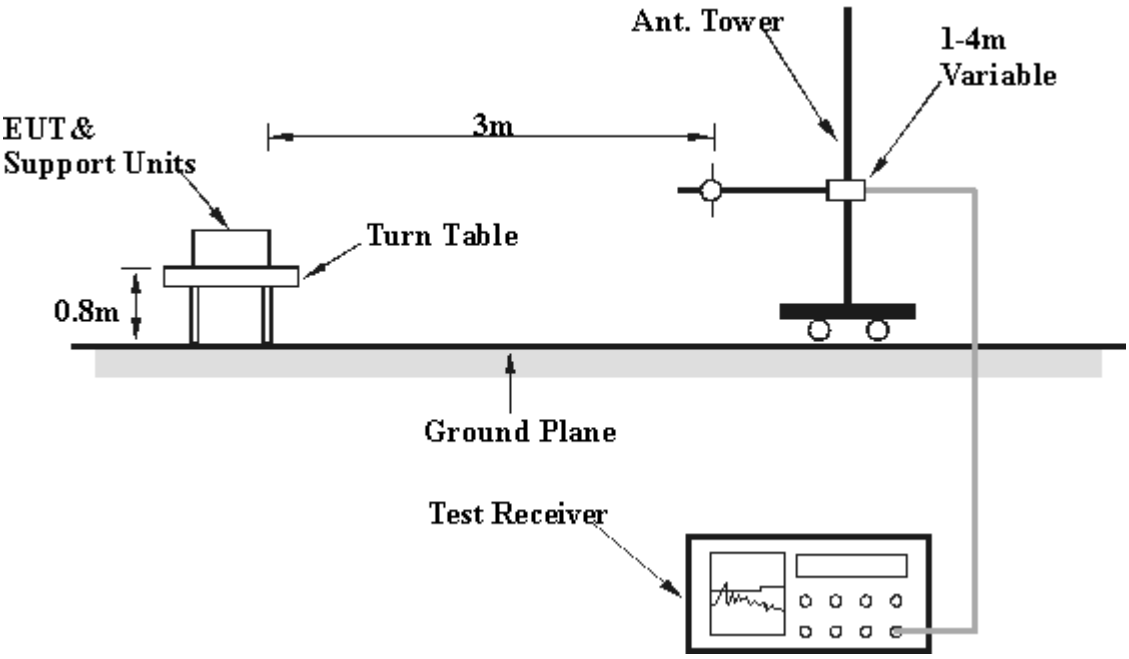
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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 peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection 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	Wireless PCI Card	**MODEL**	WL-360F
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Steven Lu	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	29.1QP	43.5	-14.4	1.70H	238	16.80	11.16	1.13	0.00	-12.29
2	176.00	24.3QP	43.5	-19.2	2.09H	6	13.90	9.08	1.33	0.00	-10.41
3	220.00	26.0QP	46.00	-20.0	1.75H	313	14.36	10.12	1.51	0.00	-11.63
4	264.00	29.4QP	46.00	-16.6	1.74H	120	14.80	12.89	1.70	0.00	-14.58
5	308.00	31.8QP	46.00	-14.2	1.51H	220	16.50	13.38	1.91	0.00	-15.29
6	396.00	34.0QP	46.00	-12.0	0.99H	28	15.80	15.96	2.22	0.00	-18.18
7	440.00	32.9QP	46.00	-13.1	1.52H	223	14.20	16.32	2.38	0.00	-18.69
8	528.00	37.0QP	46.00	-9.0	1.59H	286	16.80	17.62	2.60	0.00	-20.22
9	572.00	36.8QP	46.00	-9.2	2.16H	38	15.80	18.25	2.75	0.00	-21.00
10	616.00	35.5QP	46.00	-10.7	1.87H	134	13.60	18.82	2.89	0.00	-21.71

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Wireless PCI Card	**MODEL**	WL-360F
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Steven Lu	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	132.00	27.9	43.5	-15.6	1.04V	68	15.60	11.16	1.13	0.00	-12.29
2	176.00	25.3	43.5	-18.2	1.19V	68	14.87	9.08	1.33	0.00	-10.41
3	220.00	28.0	46.00	-18.0	0.99V	198	16.35	10.12	1.51	0.00	-11.63
4	264.00	30.4	46.00	-15.6	1.26V	242	15.80	12.89	1.70	0.00	-14.58
5	440.00	32.2	46.00	-13.8	1.38V	189	13.50	16.32	2.38	0.00	-18.69
6	528.00	35.0	46.00	-11.0	1.66V	329	14.80	17.62	2.60	0.00	-20.22
7	572.00	33.6	46.00	-12.4	1.79V	189	12.58	18.25	2.75	0.00	-21.00

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Wireless PCI Card	**MODEL**	WL-360F
MODE	Channel 1	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Steven Lu	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2037.8	42.8PK	74.0	-31.2	1.30H	45	47.60	25.20	4.86	34.90	4.84
2	2037.8	32.0AV	54.0	-22.0	1.30H	45	36.80	25.20	4.86	34.90	4.84
3	*2412.4	106.8PK	-	-	1.44H	315	74.56	27.11	5.10	0.00	-32.21
4	*2412.4	99.8AV	-	-	1.44H	315	67.54	27.11	5.10	0.00	-32.21
5	4075.5	53.8PK	74.0	-20.2	1.29H	244	51.40	30.13	6.78	34.52	-2.39
6	4075.5	44.4AV	54.0	-9.60	1.29H	244	42.00	30.13	6.78	34.52	-2.39
7	4824.2	51.9PK	74.0	-22.1	1.14H	289	47.90	31.43	7.23	34.63	-4.02

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2037.8	42.5PK	74.0	-31.5	1.12V	186	47.30	25.20	4.86	34.90	4.84
2	2037.8	31.7AV	54.0	-22.3	1.12V	186	36.50	25.20	4.86	34.90	4.84
3	*2412.4	109.0PK	-	-	1.14V	36	76.80	27.11	5.10	0.00	-32.21
4	*2412.4	102.1AV	-	-	1.14V	36	69.90	27.11	5.10	0.00	-32.21
5	4075.5	51.3PK	74.0	-22.7	1.12V	209	48.90	30.13	6.78	34.52	-2.39
6	4075.5	41.3AV	54.0	-12.7	1.12V	209	38.90	30.13	6.78	34.52	-2.39
7	4824.2	51.6PK	74.0	-22.4	1.14V	106	47.60	31.43	7.23	34.63	-4.02

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless PCI Card	**MODEL**	WL-360F
MODE	Channel 6	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 1050 hPa	**TESTED BY**: Steven Lu	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2063.2	44.0PK	74.0	-30.0	1.14H	90	48.50	25.41	4.96	34.90	4.53
2	2063.2	32.5AV	54.0	-21.5	1.14H	90	37.00	25.41	4.96	34.90	4.53
3	*2437.5	108.0PK	-	-	1.31H	33	75.60	27.33	5.08	0.00	-32.40
4	*2437.5	101.3AV	-	-	1.31H	33	68.90	27.33	5.08	0.00	-32.40
5	4125.5	55.1PK	74.0	-18.9	1.25H	313	52.60	30.32	6.70	34.56	2.46
6	4125.5	44.0AV	54.0	-10.0	1.25H	313	41.56	30.32	6.70	34.56	-2.46
7	4874.2	51.6PK	74.0	-22.4	1.30H	213	47.50	31.47	7.21	34.63	-4.05

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2063.2	43.3PK	74.0	-30.7	1.27V	338	47.80	25.41	4.96	34.90	4.53
2	2063.2	32.3AV	54.0	-21.7	1.27V	338	36.80	25.41	4.96	34.90	4.53
3	*2437.5	110.1PK	-	-	1.16V	43	77.70	27.33	5.08	0.00	-32.40
4	*2437.5	102.6AV	-	-	1.16V	43	70.20	27.33	5.08	0.00	-32.40
5	4125.5	54.2PK	74.0	-19.8	1.27V	6	51.70	30.32	6.70	34.56	-2.46
6	4125.5	42.7AV	54.0	-11.3	1.27V	6	40.20	30.32	6.70	34.56	-2.46
7	4874.2	50.5PK	74.0	-23.5	1.24V	28	46.40	31.47	7.21	34.63	-4.05

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Wireless PCI Card	MODEL	WL-360F
MODE	Channel 11	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 60 % RH, 1050 hPa	TESTED BY: Steven Lu	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2088.0	44.6PK	74.0	-29.4	1.12H	30	48.90	25.62	5.02	34.90	4.26
2	2088.0	34.2AV	54.0	-19.8	1.12H	30	38.50	25.62	5.02	34.90	4.26
3	*2462.5	106.2PK	-	-	1.41H	316	73.80	27.33	5.08	0.00	-32.40
4	*2462.5	99.9AV	-	-	1.41H	316	67.50	27.33	5.08	0.00	-32.40
5	2483.5	55.1PK	74.0	-18.9	1.35H	321	57.40	27.54	5.06	34.90	2.31
6	2483.5	44.5AV	54.0	-9.5	1.35H	321	46.80	27.54	5.06	34.90	2.31
7	4175.5	51.7PK	74.0	-22.3	1.23H	293	49.20	30.41	6.68	34.58	-2.51
8	4175.5	40.9AV	54.0	-13.1	1.23H	293	38.40	30.41	6.68	34.58	-2.51
9	4924.3	52.3PK	74.0	-21.7	1.12H	216	48.20	31.51	7.21	34.62	-4.10

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2088.0	42.2PK	74.0	-31.8	1.32V	-2	46.50	25.62	5.02	34.90	4.26
2	2088.0	31.1AV	54.0	-22.9	1.32V	-2	35.40	25.62	5.02	34.90	4.26
3	*2462.5	107.6PK	-	-	1.23V	349	75.20	27.33	5.08	0.00	-32.40
4	*2462.5	102.0AV	-	-	1.23V	349	69.58	27.33	5.08	0.00	-32.40
5	2483.5	62.2PK	74.0	-11.8	1.02V	337	64.50	27.54	5.06	34.90	2.31
6	2483.5	51.1AV	54.0	-2.9	1.02V	337	53.40	27.54	5.06	34.90	2.31
7	4175.5	51.7PK	74.0	-22.3	1.26V	17	49.20	30.41	6.68	34.58	-2.51
8	4175.5	42.3AV	54.0	-11.7	1.26V	17	39.74	30.41	6.68	34.58	-2.51
9	4924.3	51.6PK	74.0	-22.4	1.10V	230	47.50	31.51	7.21	34.62	-4.10

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
   (Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

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
SPECTRUM ANALYZER	FSEK30	100049	July17, 2002

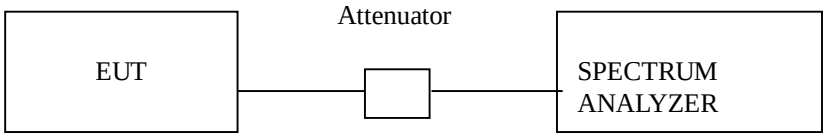
NOTE:

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.

4.3.3 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



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

4.3.5 EUT OPERATING CONDITIONS

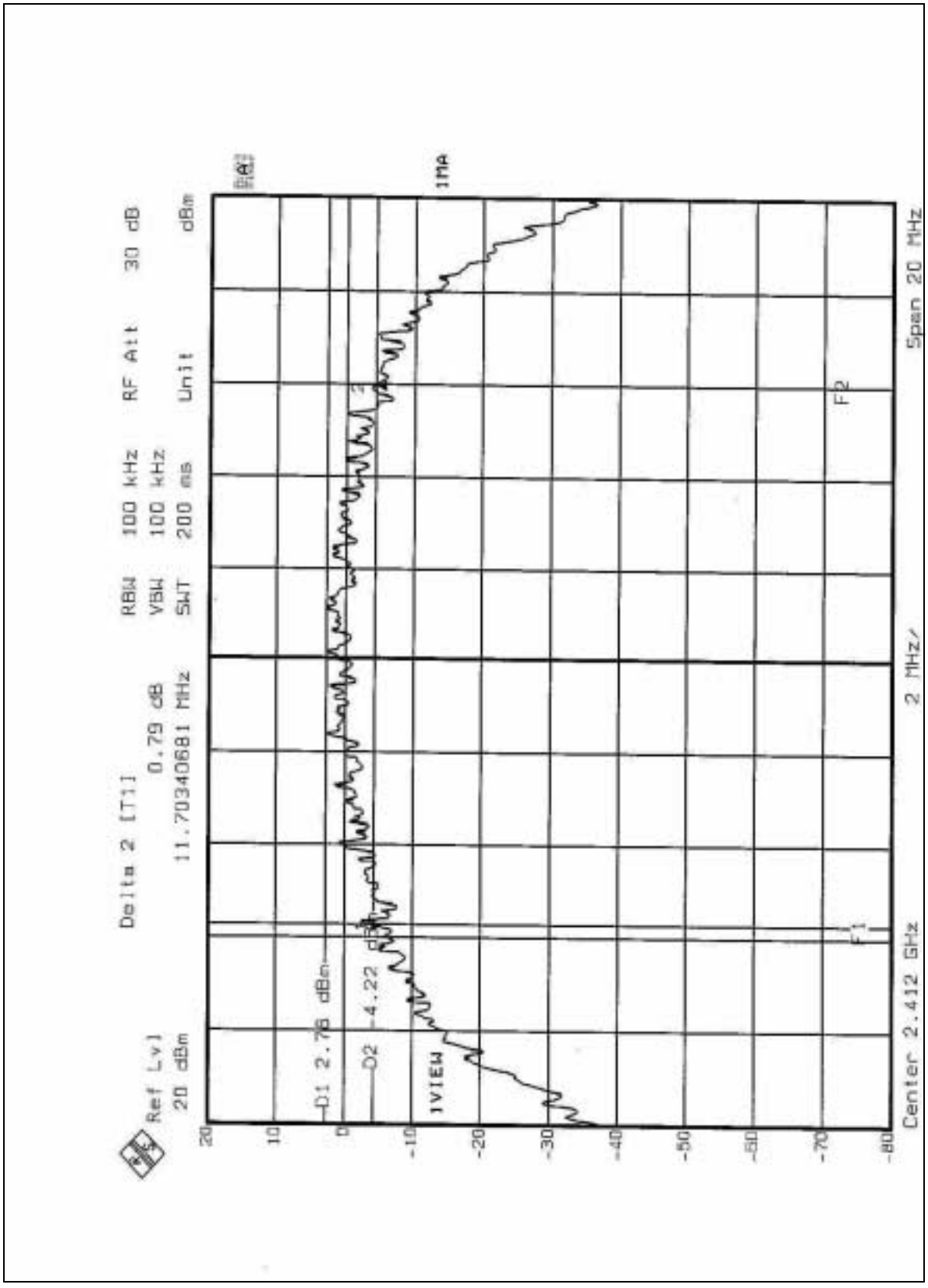
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

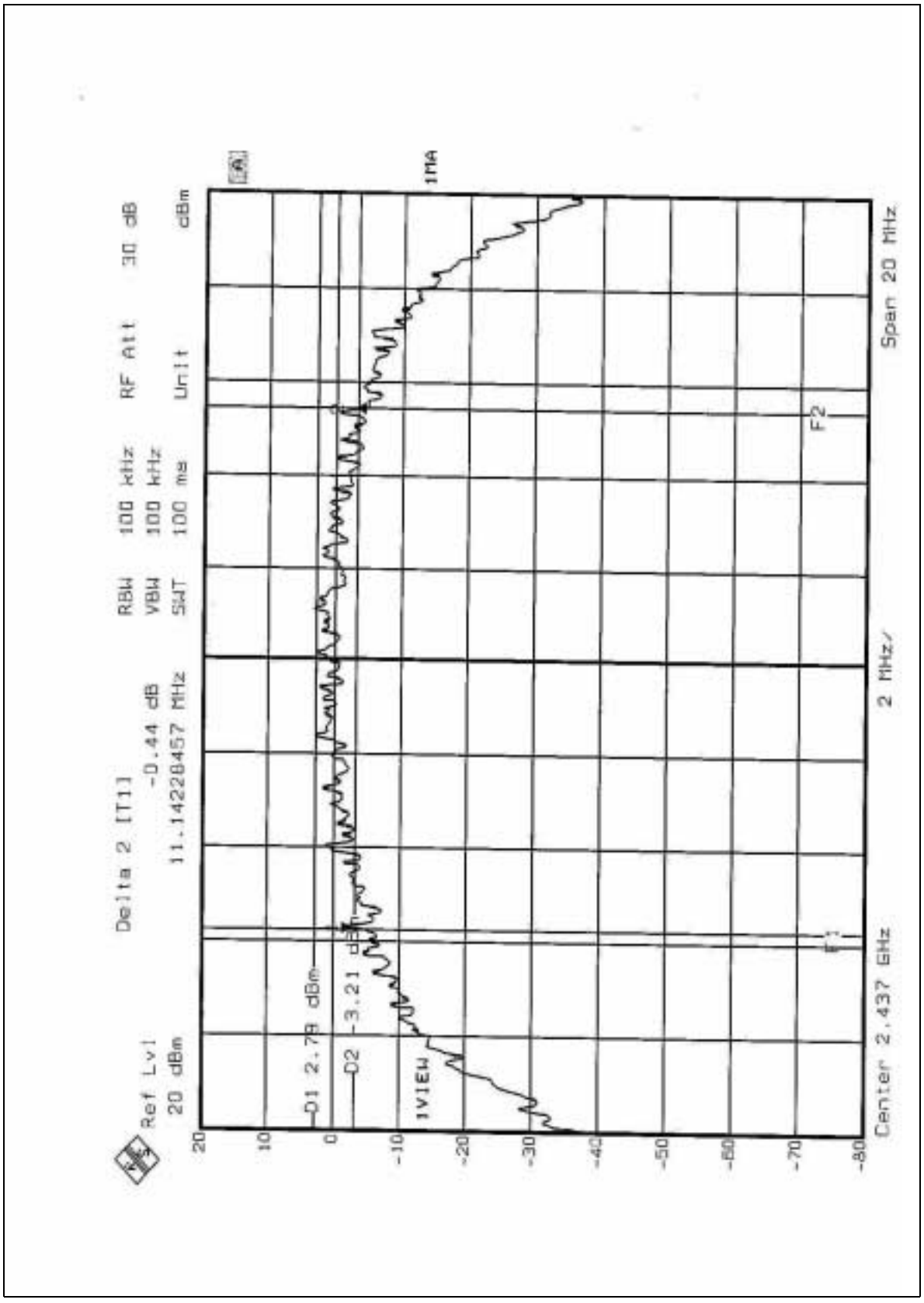
EUT	Wireless PCI Card	**MODEL**	WL-360F
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 70%RH, 1005 hPa
TESTED BY: James Lee			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.70	0.5	PASS
6	2437	11.14	0.5	PASS
11	2462	11.18	0.5	PASS

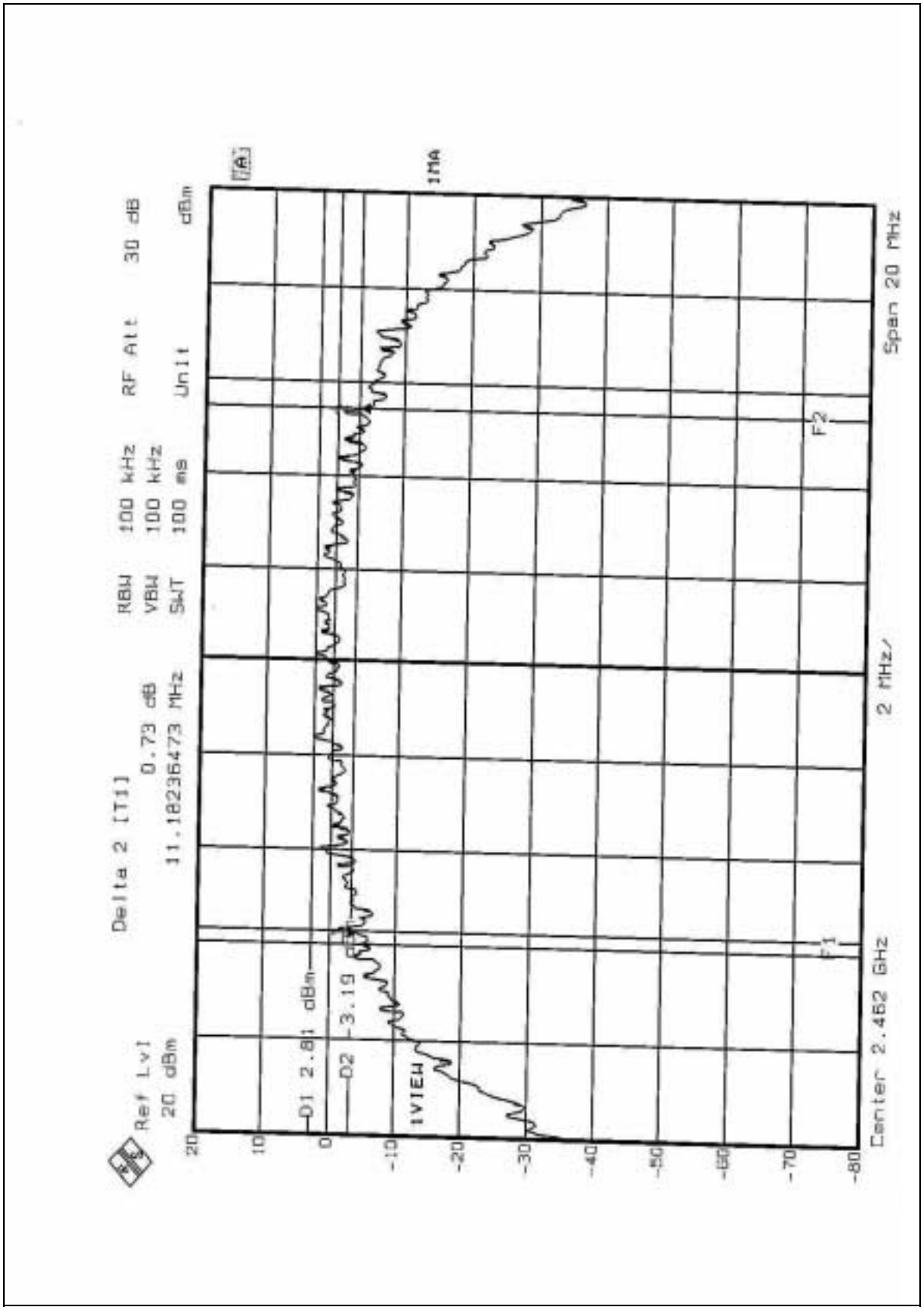
CH1


Ref Lvl
20 dBm
Delta 2 [T1]
0.79 dB
11.70340681 MHz
RBW 100 kHz
VBW 100 kHz
SWT 200 ms
RF Att 30 dB
Unit dBm
D1 2.76 dBm
D2 -4.22 dB
1VIEW
1MA
F2
F1
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH6


Delta 2 [T1]
-0.44 dB
11.14228457 MHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20 dBm
D1 2.78 dBm
D2 -3.21 dB
1VIEW
1MA
F2
Span 20 MHz
2 MHz/
Center 2.437 GHz

CH11


Ref Lvl
20 dBm
Delta 2 [T1]
0.73 dB
11.18236473 MHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
D1 2.81 dBm
D2 -3.19
1VIEW
1MA
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

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 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July17, 2002

NOTE:

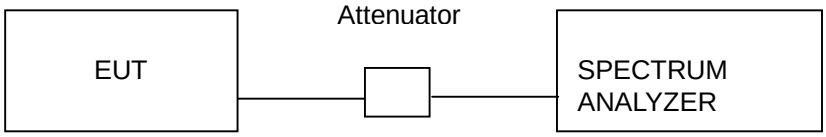
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST PROCEDURES

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

NOTE: This measurement is the total power of 15MHz bandwidth which is far more wider than 6dB bandwidth.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

4.4.6 TEST RESULTS

EUT	Wireless PCI Card	**MODEL**	WL-360F
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 70%RH, 1005 hPa
TESTED BY: James Lee			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	18.02	30	PASS
6	2437	18.06	30	PASS
11	2462	17.98	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
SPECTRUM ANALYZER	FSEK30	100049	July17, 2002

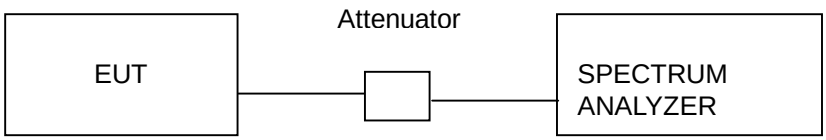
NOTE:

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/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.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

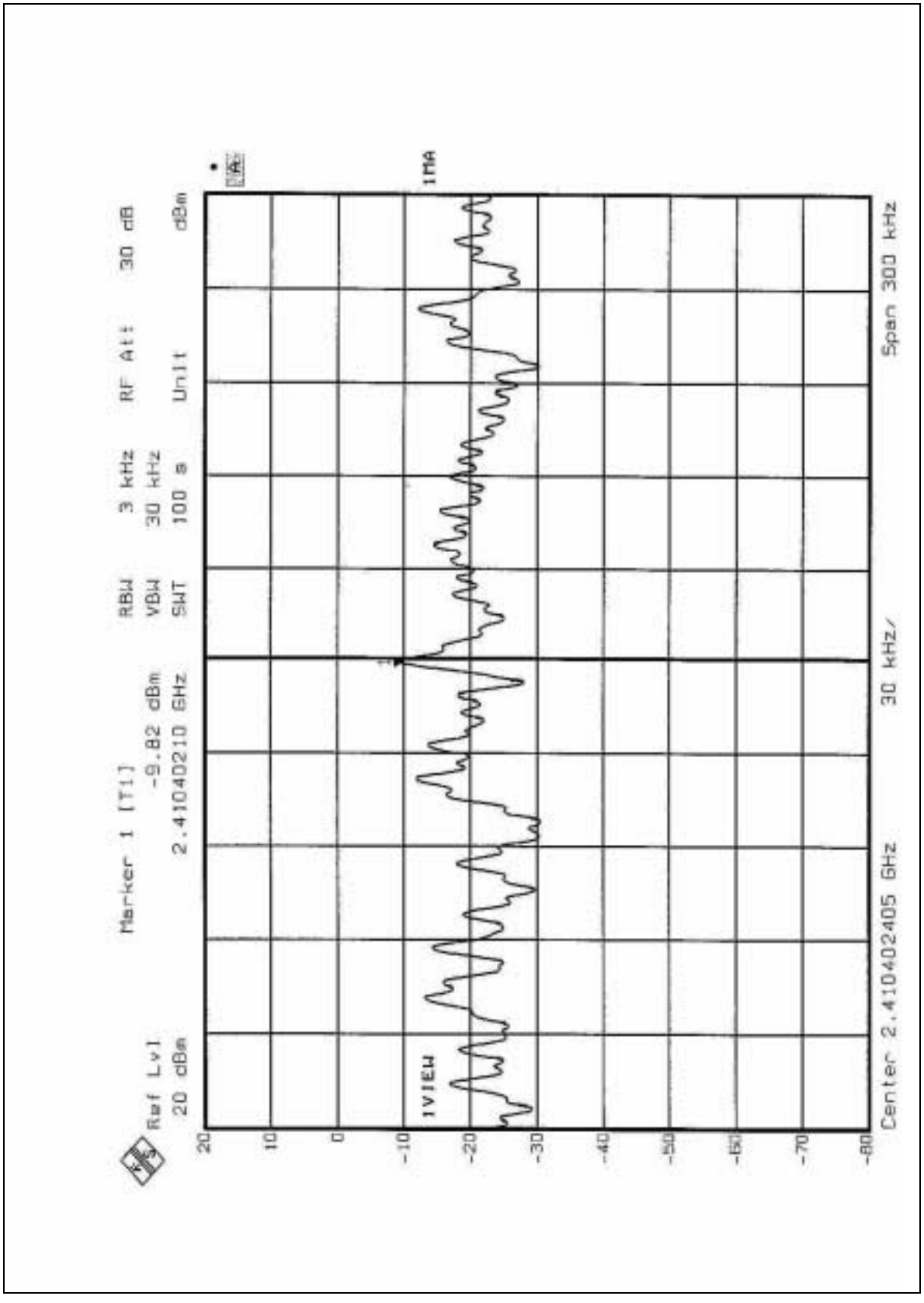
Same as 4.3.5

4.5.6 TEST RESULTS

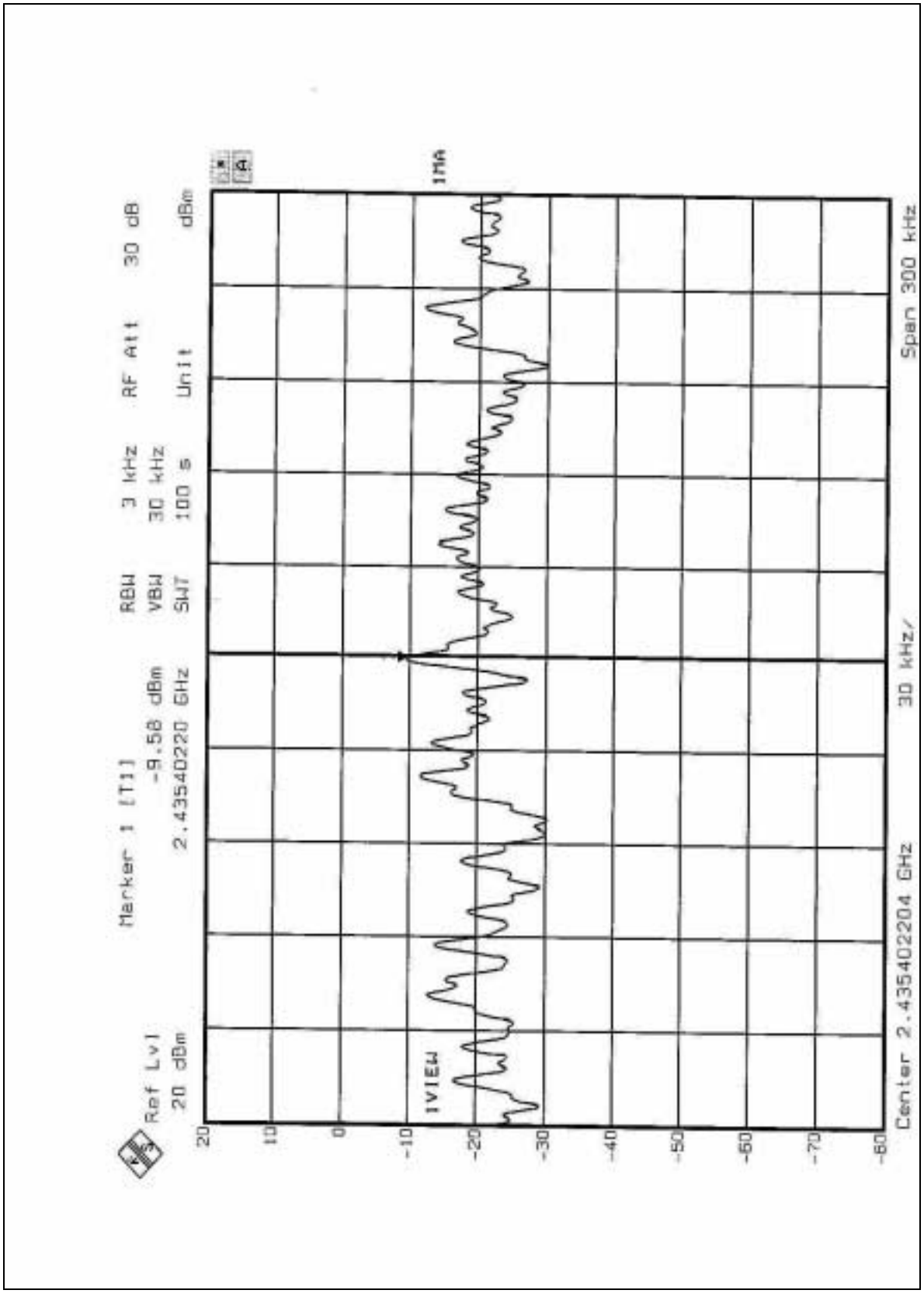
EUT	Wireless PCI Card	**MODEL**	WL-360F
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 70%RH, 1005 hPa
TESTED BY: James Lee			

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-9.82	8	PASS
6	2437	-9.58	8	PASS
11	2462	-9.54	8	PASS

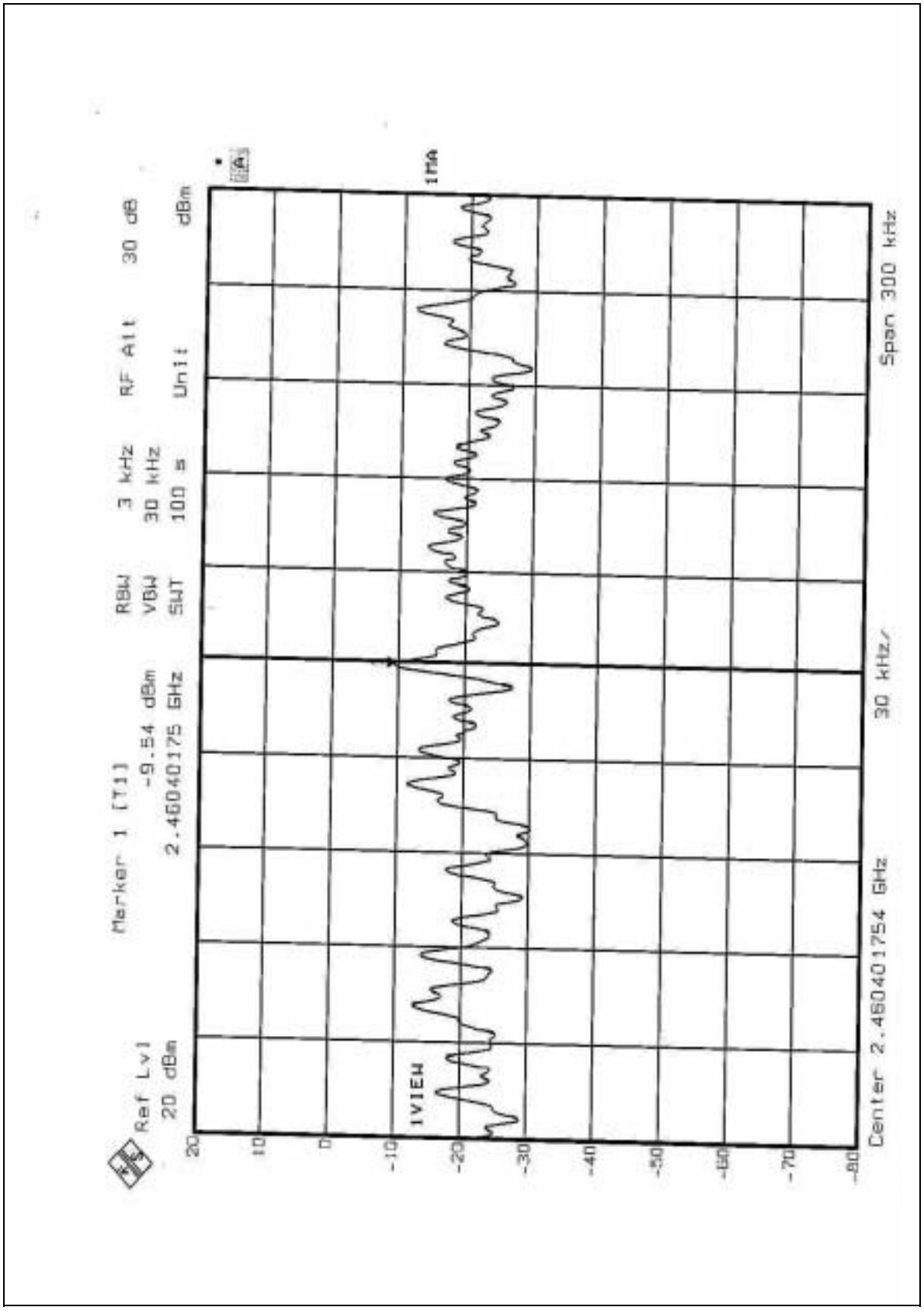
CH1


Ref Lvl
20 dBm
Marker 1 [T1]
-9.82 dBm
2.41040210 GHz
RBW 3 kHz
VBW 30 kHz
SWT 100 s
RF Att 30 dB
Unit dBm
1MA
1VIEW
Center 2.41040405 GHz
30 kHz/
Span 300 kHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80

CH6


Ref Lvl
20 dBm
Marker 1 [T1]
-9.58 dBm
2.43540220 GHz
RBW 3 kHz
VBW 30 kHz
SWT 100 s
RF Att 30 dB
Unit dBm
1MA
1VIEW
Center 2.435402204 GHz
30 kHz/
Span 300 kHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80

CH11


Marker 1 [T1]
-9.54 dBm
2.46040175 GHz
RBW 3 kHz
VBW 30 kHz
SWT 100 s
RF Att 30 dB
Unit dBm
Ref Lvl
20 dBm
1VIEW
1MA
Center 2.46040175 GHz
30 kHz/
Span 300 kHz

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
SPECTRUM ANALYZER	FSEK30	100049	July17, 2002

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.

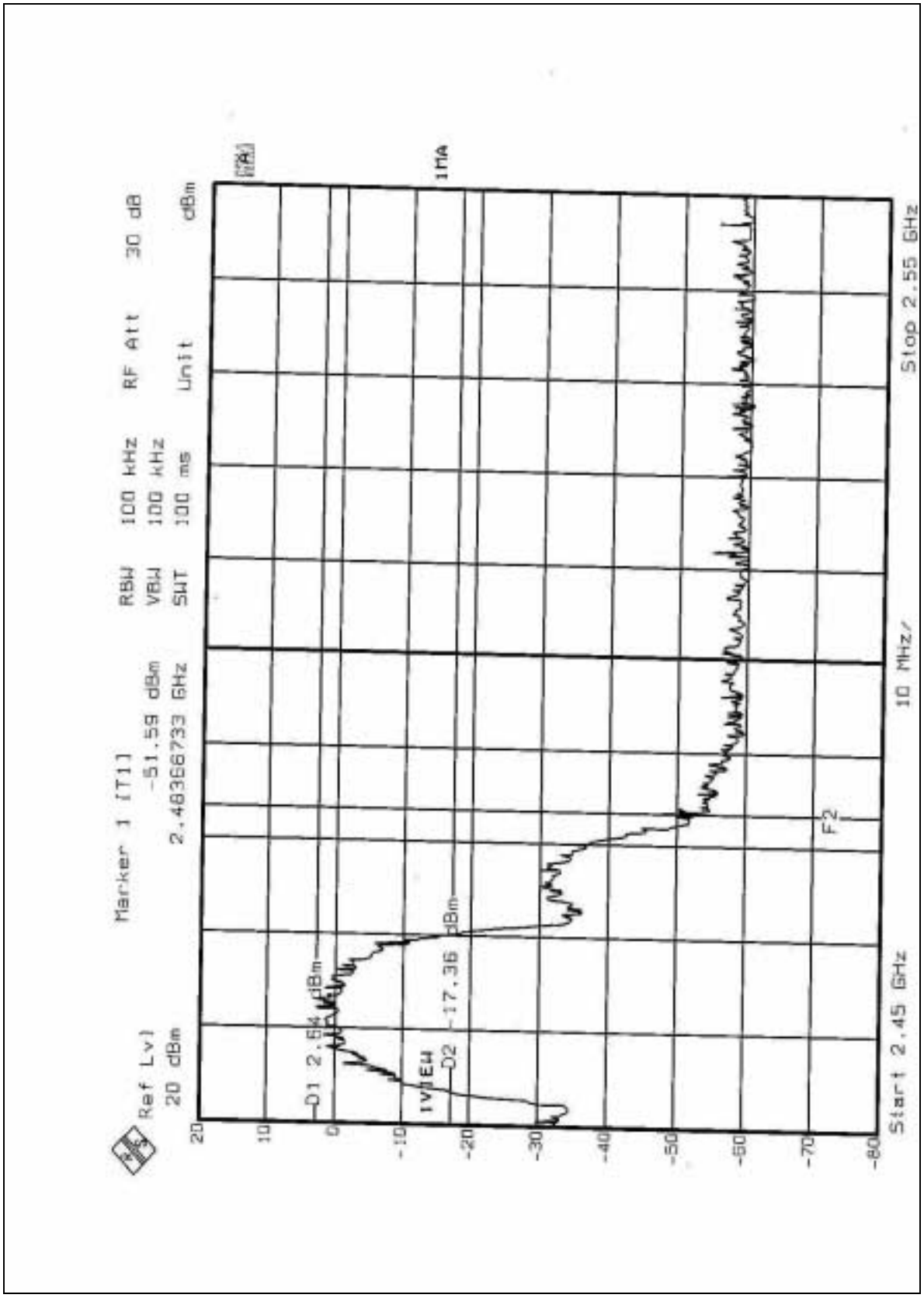
4.6.4 EUT OPERATING CONDITION

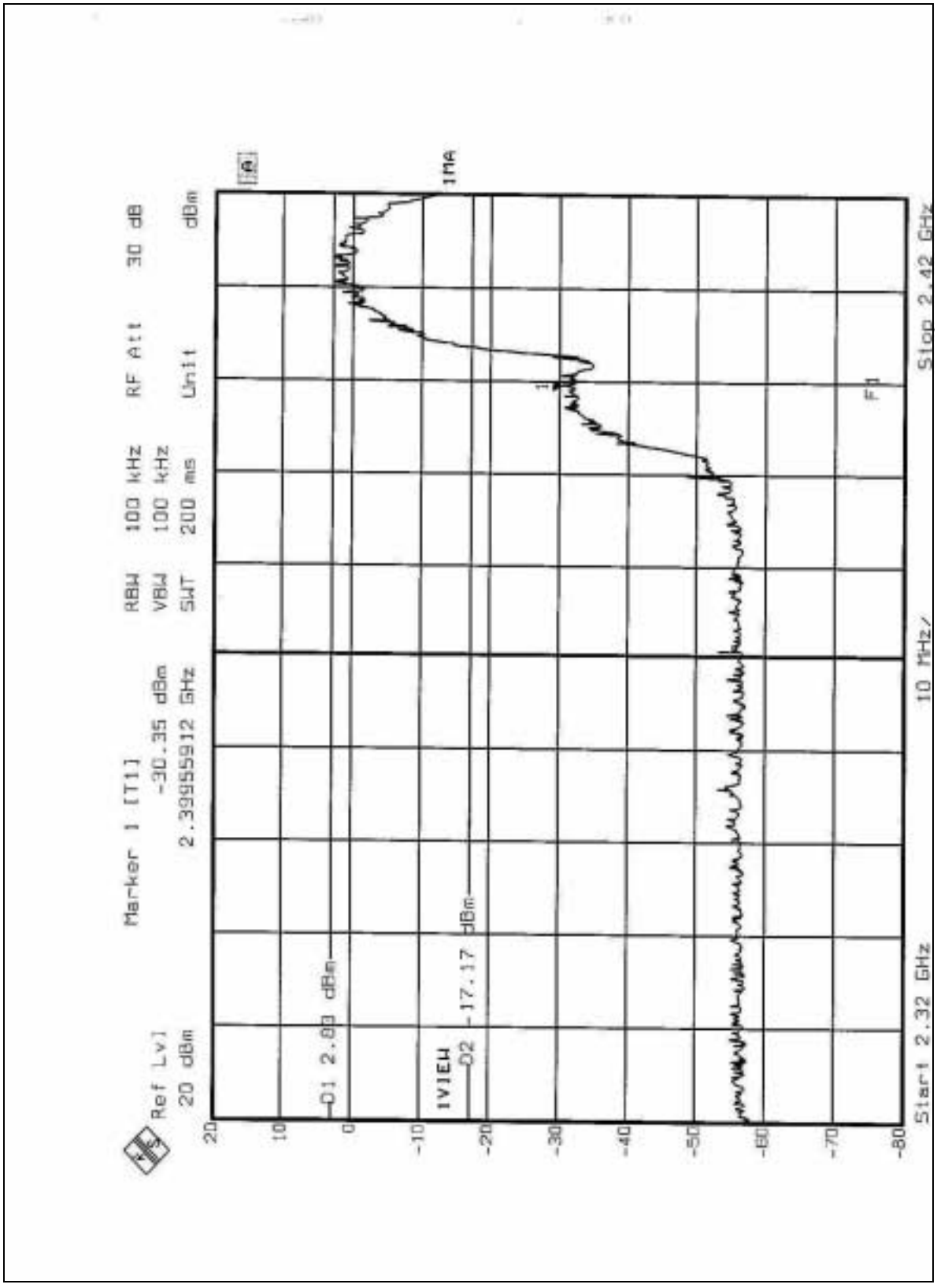
Same as Item 4.3.5

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 54.23dB delta between carrier maximum power and local maximum emission in restrict band (2.4837GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.6 (Page 26) is 102.0dBuV/m, so the maximum field strength in restrict band is 102.0-54.23=47.77 dBuV/m which is under 54 dBuV/m limit.


Marker 1 [T1]
-51.59 dBm
2.48366733 GHz
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20 dBm
1MA
D1 2.54 dBm
D2 -17.36 dBm
VIEW
F2
Start 2.45 GHz
10 MHz/
Stop 2.55 GHz


Ref Lvl
20 dBm
Marker 1 [T1]
-30.35 dBm
2.39955912 GHz
RBW 100 kHz
VBW 100 kHz
SWT 200 ms
RF Att 30 dB
Unit dBm
D1 2.80 dBm
D2 -17.17 dBm
1VIEW
1MA
Start 2.32 GHz
10 MHz/
Stop 2.42 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

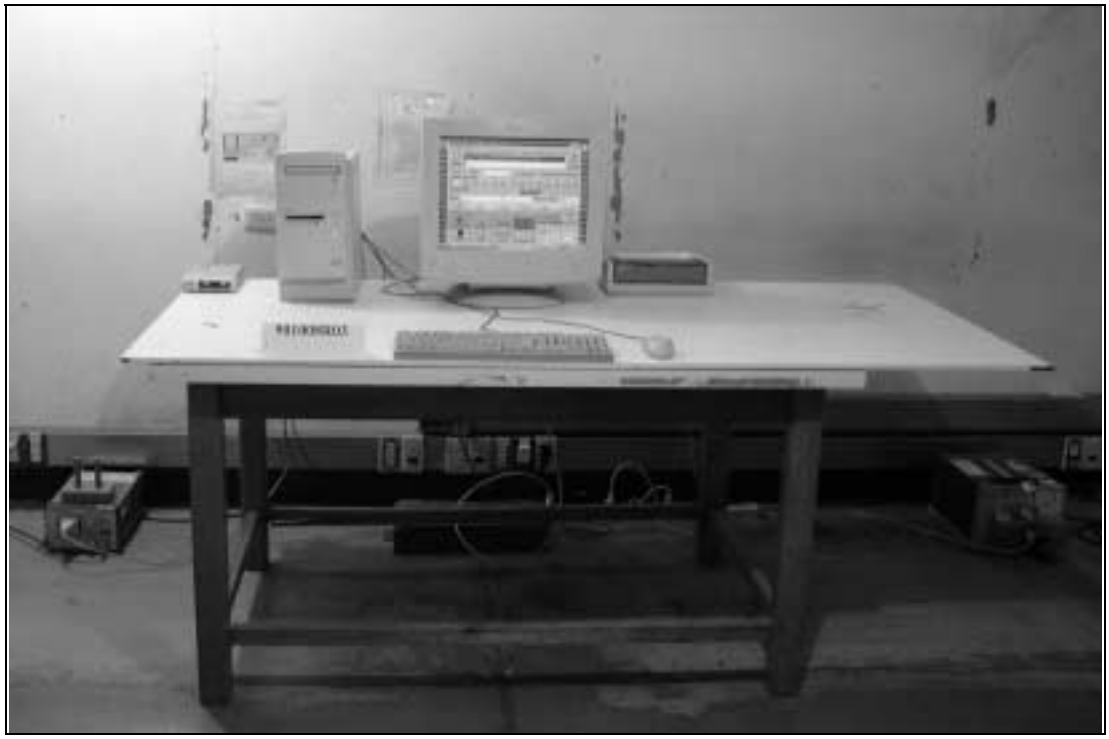
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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

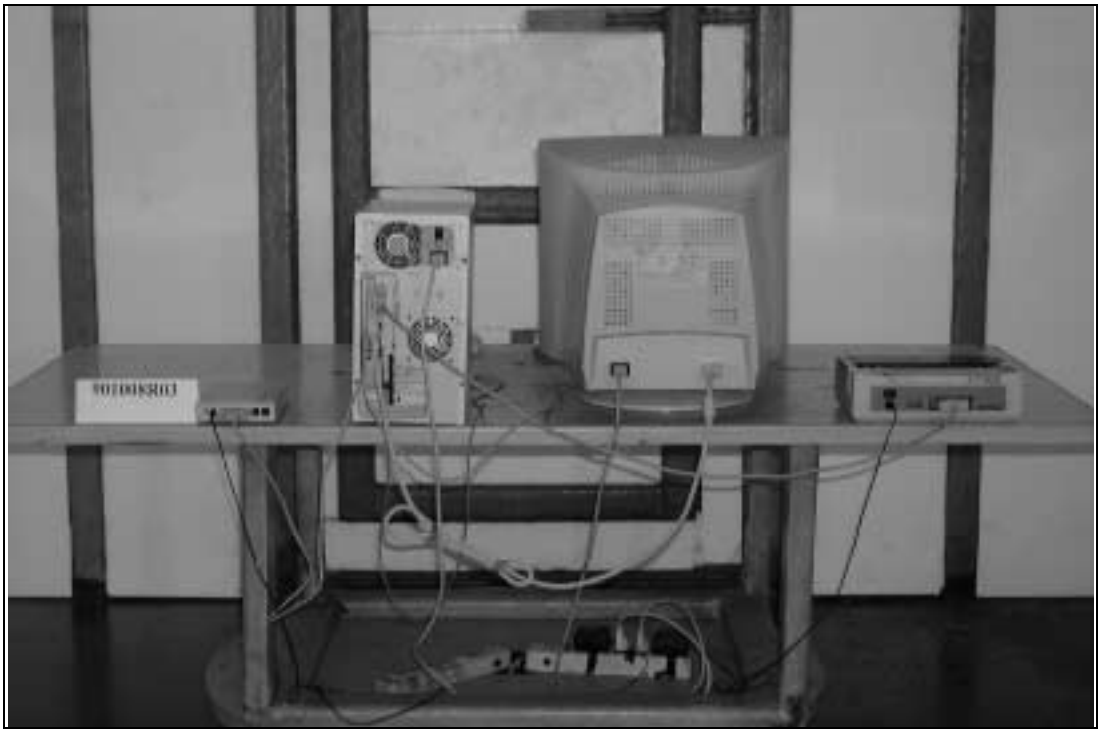
The antenna used in this product is Monopole antenna. The antenna connector is Reversed SMA. And the maximum Gain of this antenna is only 1dBi.

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
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.