FCC TEST REPORT

REPORT NO.: RF90032807A
MODEL NO.: PA3070U-1MPC
RECEIVED: Dec. 7, 2001
TESTED: Dec. 7 ~ Dec. 10, 2001

APPLICANT: COMPAL ELECTRONICS INC.
ADDRESS: 581, Juikuang Rd., Neihu, Taipei, 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
ILAC MRA

Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT :	2.4GHz Wireless Mini PCI Card
BRAND NAME :	Toshiba
MODEL NO. :	PA3070U-1MPC
APPLICANT :	COMPAL ELECTRONICS INC.
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992, Canada RSS 210, New Zealand RFS 29

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Dec. 7, 2001 to Dec. 10, 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: James Lee , DATE: Dec. 13, 2001
James Lee

CHECKED BY: Demi Chen , DATE: Dec. 13, 2001
Demi Chen

APPROVED BY: Alan Lane , DATE: Dec. 13, 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 –7.66dBuV at 5.454MHz
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 –2.1dBuV at 733.75MHz
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 Mini PCI Card
MODEL NO.	PA3070U-1MPC
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	21dBm
ANTENNA TYPE	Inverted-F Antenna
DATA CABLE	NA
I/O PORTS	NA

NOTE:

1. The Toshiba Wireless LAN Mini PCI Card products are designed to be interoperable with any wireless LAN product that is based on Direct Sequence Spread Spectrum (DSSS) radio technology.
2. This report is prepared for FCC class II permissive change. The differences compared with the original design are base station and antenna. The newest one did some modification on the antenna placement as well as some components of the host notebook.
3. The notebook (model: Satellite1900) spec. Please refer as following list.

LCD	HannStar 14.1” XGA
SO-DIMM	Toshiba 128M
HDD	Toshiba 20G
CPU	1.6G
FDD	Mitsumi
DVD/CD-RW	Toshiba SD-R2102
BlueTooth	No
MDC Modem	Askey
Wireless device	LUCNET
Main Battery	Sony 8 Cell
K/B	US
P/N	ATR10D01003

4. The model: PA307OU-1MPC with original design has been approved by FCC under FCC ID: GKRPA307OU-1MPC.
5. 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 2.4GHz Wireless Mini 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, Canada RSS 210, New Zealand RFS 29

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	Toshiba	Satellite1900	NA	FCC DoC Approved
2	PRINTER	HP	2225C+	3123S97230	DSI6XU2225

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.

NOTE: All power cords of the above support units are nonshielded (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	ESCS30	834115/016	Feb. 21, 2002
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ESH2-Z5	892107/003	July 10, 2002
* ROHDE & SCHWARZ 4-wire ISN	ENY41	838119/028	Dec. 2, 2002
* ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/018	Dec. 2, 2002
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	July 10, 2002
Software	Cond-V2J	NA	NA
RF cable (JYEBAO)	RG-58A/U	Cable-C03.01	July 11, 2002
Terminator (For EMCO LISN)	NA	E1-01-300	Feb. 20, 2002
Terminator (For EMCO LISN)	NA	E1-01-301	Feb. 20, 2002
Shielded Room	Site 3	ADT-C03	NA
VCCI Site Registration No.	Site 3	C-274	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).

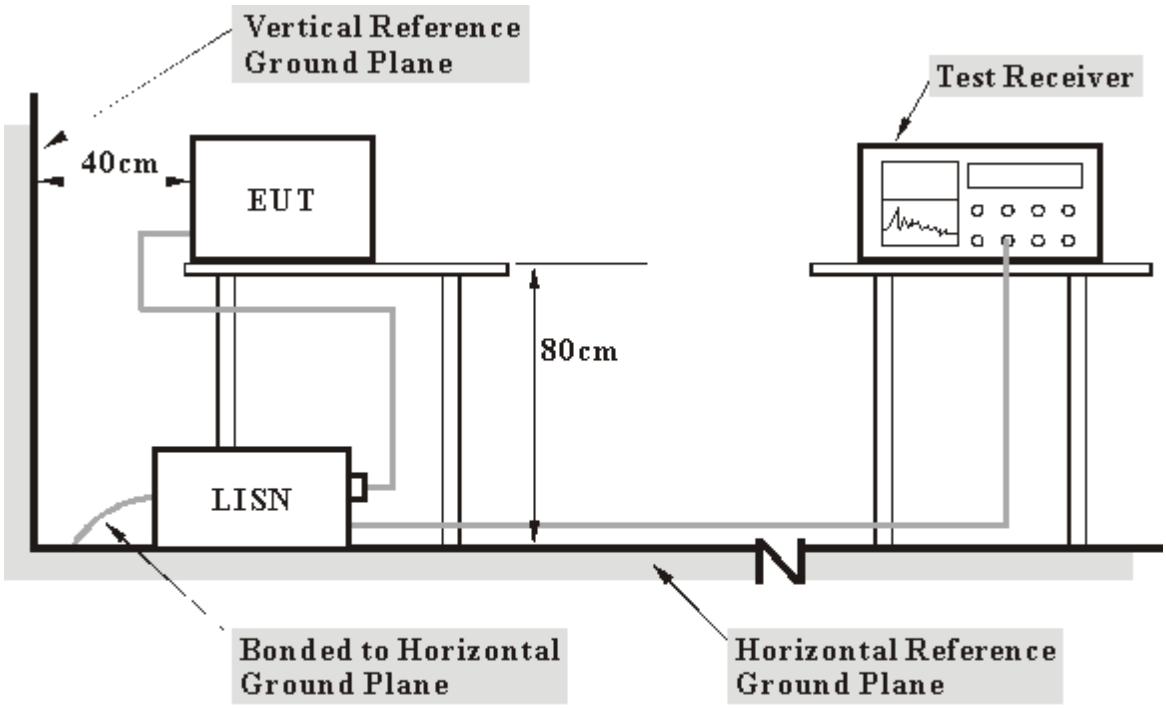
4.1.3 TEST PROCEDURES

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. The computer system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
b. The computer system sent "H" messages to its screen.
c. The computer system sent "H" messages to printer, and the printer prints them on paper.

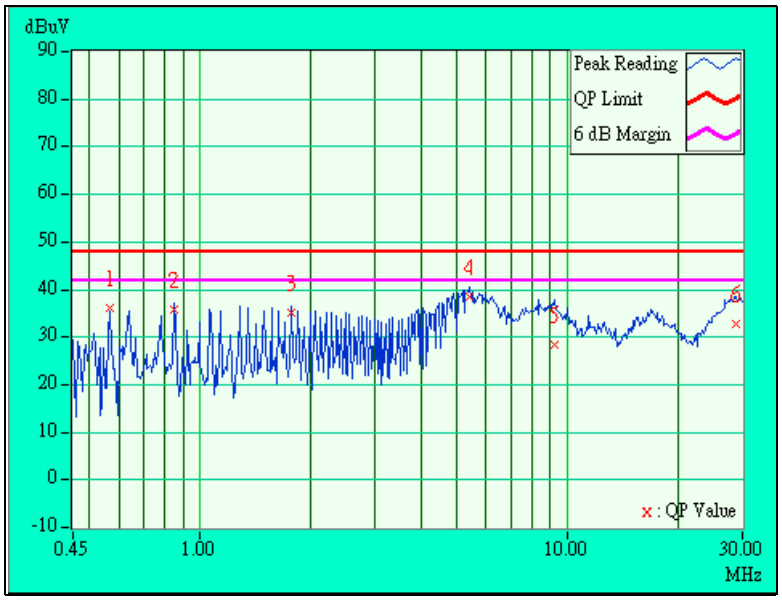
4.1.6 TEST RESULTS

EUT	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: James Lee	

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	0.568	0.13	36.07	-	36.20	-	48.00	-	-11.80	-
2	0.852	0.18	35.88	-	36.06	-	48.00	-	-11.94	-
3	1.776	0.20	35.20	-	35.40	-	48.00	-	-12.60	-
4	5.402	0.32	38.39	-	38.71	-	48.00	-	-9.29	-
5	9.227	0.39	28.29	-	28.68	-	48.00	-	-19.32	-
6	28.888	0.50	32.65	-	33.15	-	48.00	-	-14.85	-

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.

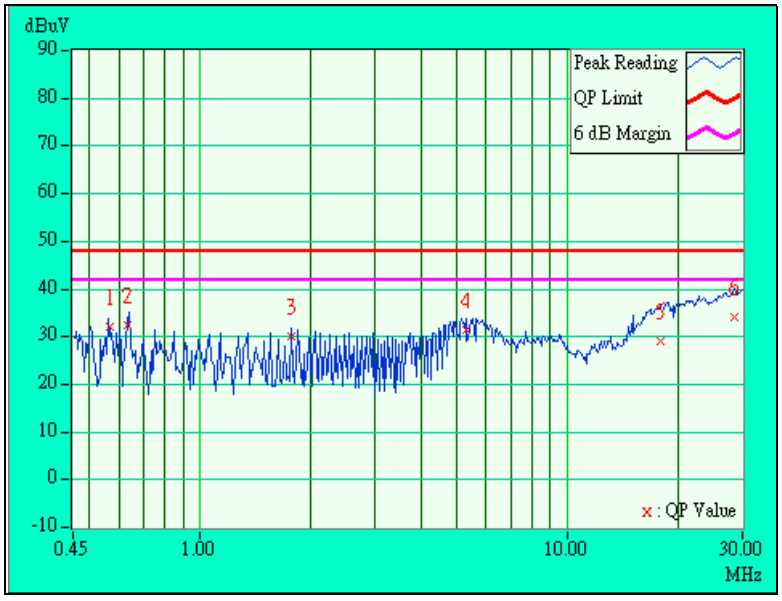


EUT	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 1	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: James Lee	

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	0.567	0.13	32.05	-	32.18	-	48.00	-	-15.82	-
2	0.636	0.14	32.43	-	32.57	-	48.00	-	-15.43	-
3	1.770	0.20	30.02	-	30.22	-	48.00	-	-17.78	-
4	5.311	0.32	31.35	-	31.67	-	48.00	-	-16.33	-
5	17.899	0.77	29.09	-	29.86	-	48.00	-	-18.14	-
6	28.552	1.28	34.15	-	35.43	-	48.00	-	-12.57	-

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.

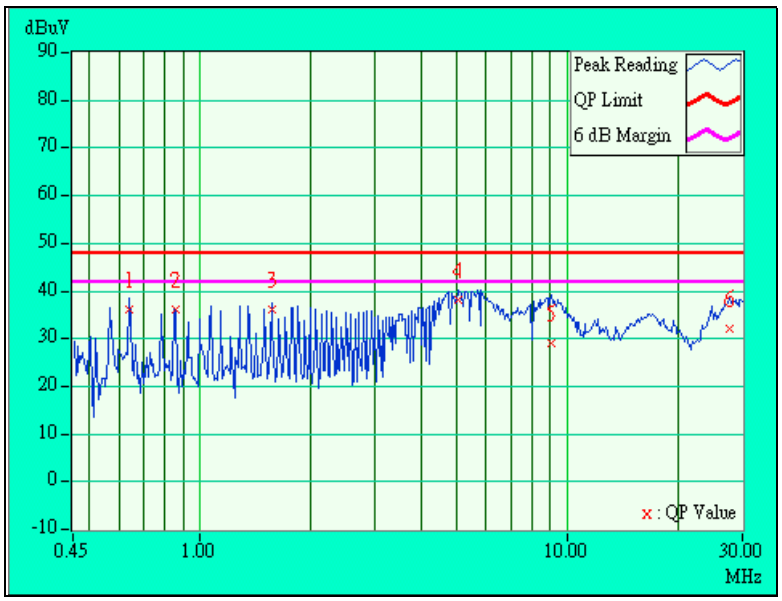


EUT	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 6	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: James Lee	

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	0.641	0.14	36.15	-	36.29	-	48.00	-	-11.71	-
2	0.856	0.18	36.10	-	36.28	-	48.00	-	-11.72	-
3	1.568	0.20	36.01	-	36.21	-	48.00	-	-11.79	-
4	5.061	0.32	38.19	-	38.51	-	48.00	-	-9.49	-
5	9.041	0.38	29.16	-	29.54	-	48.00	-	-18.46	-
6	27.614	0.50	32.25	-	32.75	-	48.00	-	-15.25	-

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.

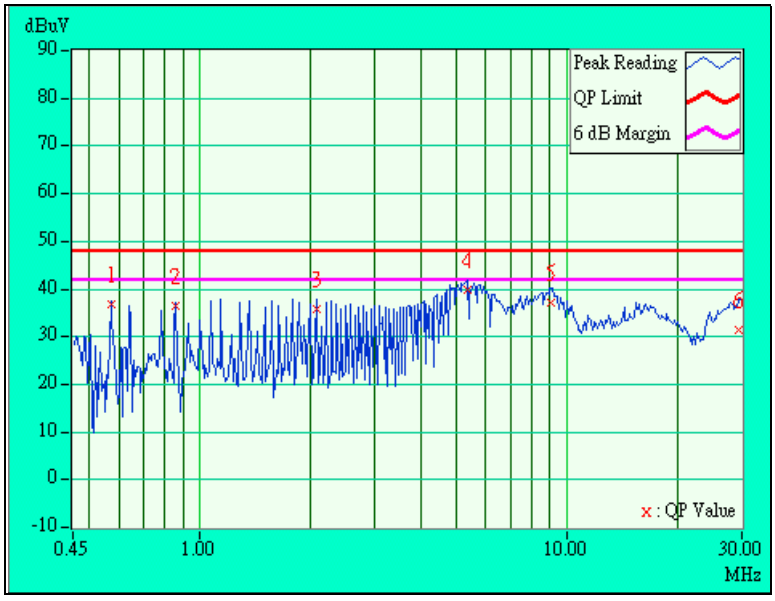


EUT	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 6	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: James Lee	

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	0.571	0.13	36.85	-	36.98	-	48.00	-	-11.02	-
2	0.858	0.18	36.51	-	36.69	-	48.00	-	-11.31	-
3	2.075	0.20	35.92	-	36.12	-	48.00	-	-11.88	-
4	5.360	0.32	39.76	-	40.08	-	48.00	-	-7.92	-
5	9.007	0.38	37.19	-	37.57	-	48.00	-	-10.43	-
6	29.526	1.36	31.43	-	32.79	-	48.00	-	-15.21	-

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.

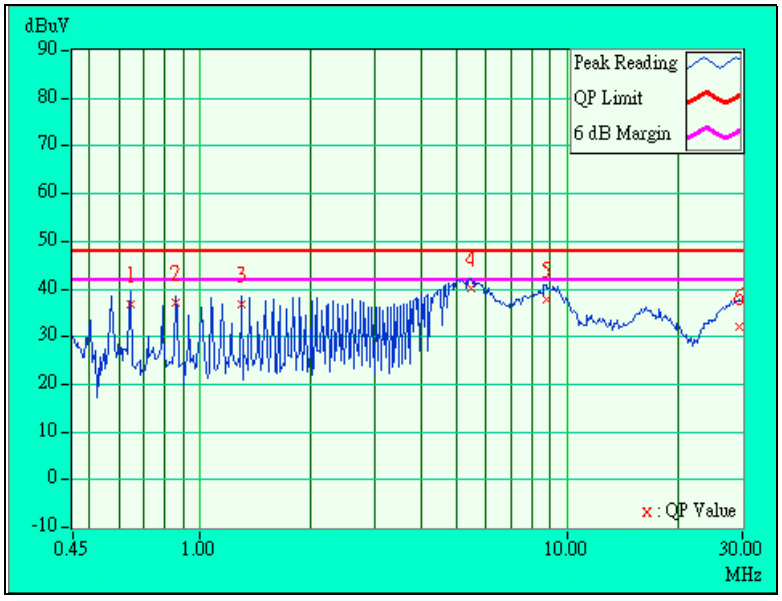


EUT	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: James Lee	

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	0.645	0.14	36.87	-	37.01	-	48.00	-	-10.99	-
2	0.861	0.18	37.28	-	37.46	-	48.00	-	-10.54	-
3	1.291	0.20	36.84	-	37.04	-	48.00	-	-10.96	-
4	5.454	0.32	40.02	-	40.34	-	48.00	-	-7.66	-
5	8.755	0.38	37.91	-	38.29	-	48.00	-	-9.71	-
6	29.360	0.50	32.02	-	32.52	-	48.00	-	-15.48	-

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.

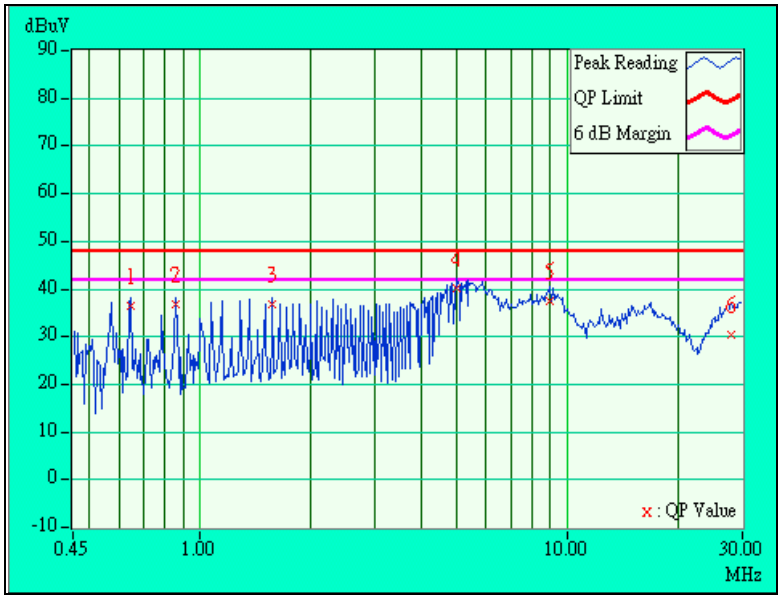


EUT	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 11	**6dB BANDWIDTH**	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Netural (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa	**TESTED BY**: James Lee	

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	0.646	0.14	36.32	-	36.46	-	48.00	-	-11.54	-
2	0.859	0.18	36.79	-	36.97	-	48.00	-	-11.03	-
3	1.576	0.20	36.85	-	37.05	-	48.00	-	-10.95	-
4	5.014	0.32	40.01	-	40.33	-	48.00	-	-7.67	-
5	8.950	0.38	37.48	-	37.86	-	48.00	-	-10.14	-
6	27.938	1.24	30.56	-	31.80	-	48.00	-	-16.20	-

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	May 7, 2002
* HP Preamplifier	8449B	3008A01201	Dec. 6, 2002
* 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, 2002
* 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
* Antenna (Horn)	BBHA9120-D	D130	July 10, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
VCCI Site Registration No.	Site 5	R-1039	NA
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.

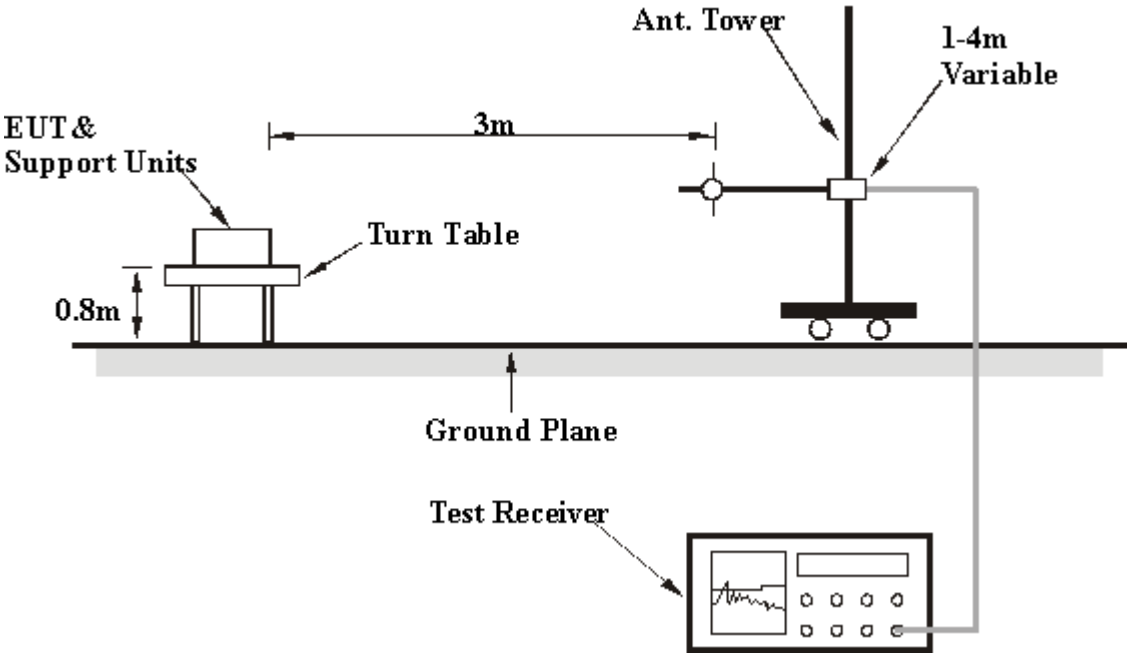
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1050 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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	195.00	29.4 QP	43.50	-14.10	1.54H	98	19.00	8.96	1.40	0.00	-10.36
2	262.00	31.6 QP	46.00	-14.40	1.03H	355	17.00	12.89	1.70	0.00	-14.58
3	299.40	33.1 QP	46.00	-12.90	1.36H	109	18.00	13.18	1.88	0.00	-15.06
4	333.52	40.9 QP	46.00	-5.10	1.41H	7	25.00	13.87	1.99	0.00	-15.86.
5	364.00	38.9 QP	46.00	-7.10	1.21H	338	22.00	14.76	2.10	0.00	-16.87
6	393.98	37.1 QP	46.00	-8.90	1.16H	289	19.00	15.86	2.21	0.00	-18.09
7	396.00	35.2 QP	46.00	-10.80	1.02H	351	17.00	15.96	2.22	0.00	-18.18
8	399.95	38.3 QP	46.00	-7.70	1.01H	52	20.00	16.11	2.24	0.00	-18.35
9	454.00	36.9 QP	46.00	-9.10	1.06H	72	18.00	16.45	2.42	0.00	-18.86
10	466.00	38.1 QP	46.00	-7.90	1.02H	341	19.00	16.66	2.44	0.00	-19.11
11	484.00	35.4 QP	46.00	-10.60	1.02H	42	16.00	16.96	2.47	0.00	-19.44
12	530.02	41.3 QP	46.00	-4.70	1.02H	72	21.00	17.66	2.61	0.00	-20.26
13	563.13	38.8 QP	46.00	-7.20	2.66H	347	18.00	18.12	2.72	0.00	-20.85
14	662.50	40.5 QP	46.00	-5.50	1.79H	45	18.20	19.25	3.05	0.00	-22.30
15	733.75	43.9 QP	46.00	-2.10	1.58H	313	20.75	19.89	3.22	0.00	-23.12
16	797.00	39.0 QP	46.00	-7.00	2.56H	12	15.00	20.65	3.32	0.00	-23.97
17	844.00	38.0 QP	46.00	-8.00	1.51H	103	14.00	20.50	3.48	0.00	-23.99
18	867.15	40.9 QP	46.00	-5.10	1.27H	137	16.80	20.59	3.53	0.00	-24.12
19	940.00	36.9 QP	46.00	-9.10	2.24H	39	12.00	21.12	3.75	0.00	-24.87

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	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
MODE	Channel 11	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1050 hPa	**TESTED BY**: Gary Chang	

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	65.00	29.5 QP	40.00	-10.50	1.09V	239	23.00	5.74	0.80	0.00	-6.54
2	176.00	33.4 QP	43.50	-10.10	1.10V	6	23.00	9.08	1.33	0.00	-10.41
3	196.00	27.4 QP	43.50	-16.10	1.16V	143	17.00	8.96	1.40	0.00	-10.36
4	257.00	32.5 QP	46.00	-13.50	1.00V	243	18.00	12.82	1.68	0.00	-14.51
5	393.00	35.9 QP	46.00	-10.10	1.12V	96	17.80	15.86	2.21	0.00	-18.08
6	396.00	36.9 QP	46.00	-9.10	1.72V	280	18.70	15.96	2.22	0.00	-18.18
7	454.00	36.9 QP	46.00	-9.10	1.12V	10	18.00	16.45	2.42	0.00	-18.87
8	465.00	36.1 QP	46.00	-9.90	1.50V	171	17.00	16.62	2.44	0.00	-19.05
9	499.74	40.8 QP	46.00	-5.20	1.44V	246	21.00	17.26	2.50	0.00	-19.76
10	528.00	34.2 QP	46.00	-11.80	1.04V	153	14.00	17.62	2.60	0.00	-20.22
11	531.00	39.3 QP	46.00	-6.70	2.19V	4	19.00	17.69	2.62	0.00	-20.31.
12	584.78	37.2 QP	46.00	-8.80	2.22V	355	16.00	18.41	2.79	0.00	-21.20
13	624.00	37.2 QP	46.00	-8.80	2.24V	286	15.40	18.91	2.92	0.00	-21.83
14	662.00	43.7 QP	46.00	-2.30	1.01V	13	21.40	19.25	3.05	0.00	-22.30
15	733.70	37.1 QP	46.00	-8.90	1.88V	37	14.00	19.89	3.22	0.00	-23.11
16	748.00	35.4 QP	46.00	-10.60	1.07V	198	12.00	20.14	3.26	0.00	-23.40
17	797.85	39.0 QP	46.00	-7.00	1.04V	356	15.00	20.68	3.32	0.00	-24.00
18	867.70	40.1 QP	46.00	-5.90	1.10V	108	16.00	20.59	3.53	0.00	-24.11
19	933.40	38.8 QP	46.00	-7.20	1.41V	346	14.00	21.08	3.73	0.00	-24.81

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	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
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, 70%RH, 1050 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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2060.00	42.9 PK	74.00	-31.10	1.57H	357	47.40	25.41	4.96	34.90	4.53
2	*2411.70	107.2 PK	-	-	1.24H	12	75.00	27.11	5.10	0.00	-32.21.
3	*2411.70	100.2 AV	-	-	1.24H	12	68.00	27.11	5.10	0.00	-32.21.
4	4120.00	49.2 PK	74.00	-24.80	1.19H	32	46.80	30.23	6.72	34.54	-2.40
5	4824.00	51.2 PK	74.00	-22.80	1.24H	130	47.20	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	2060.00	44.2 PK	74.00	-29.80	1.96V	3	48.70	25.41	4.96	34.90	4.53
2	*2411.70	105.2 PK	-	-	1.00V	294	73.00	27.11	5.10	0.00	-32.21
3	*2411.70	100.2 AV	-	-	1.00V	294	68.00	27.11	5.10	0.00	-32.21
4	4120.00	49.4 PK	74.00	-24.60	1.21V	266	47.00	30.23	6.72	34.54	-2.40
5	4824.00	50.9 PK	74.00	-23.10	1.20V	220	46.90	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	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
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, 70%RH, 1050 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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2085.00	44.7 PK	74.00	-29.30	1.35H	354	49.00	25.62	5.02	34.90	4.26
2	*2437.00	106.4 PK	-	-	2.18H	5	74.00	27.33	5.08	0.00	-32.40.
3	*2437.00	99.4 AV	-	-	2.18H	5	67.00	27.33	5.08	0.00	-32.40.
4	4170.00	48.5 PK	74.00	-25.50	1.44H	312	46.00	30.41	6.68	34.58	-2.51
5	4874.00	51.1 PK	74.00	-22.90	1.44H	4	47.00	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	2085.00	45.7 PK	74.00	-28.30	1.46V	5	50.00	25.62	5.02	34.90	4.26
2	*2437.00	105.4 PK	-	-	1.07V	356	73.00	27.33	5.08	0.00	-32.40
3	*2437.00	97.4 AV	-	-	1.07V	356	65.00	27.33	5.08	0.00	-32.40
4	4170.00	49.3 PK	74.00	-24.70	1.39V	10	46.80	30.41	6.68	34.58	-2.51
5	4874.00	50.1 PK	74.00	-23.90	1.37V	75	46.00	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	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
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, 70%RH, 1050 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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	2110.00	47.9 PK	74.00	-26.10	1.00H	354	52.11	25.62	5.02	34.90	4.26
2	*2464.40	105.4 PK	-	-	2.17H	18	73.00	27.33	5.08	0.00	-32.40
3	*2464.40	97.8 AV	-	-	2.17H	18	65.40	27.33	5.08	0.00	-32.40
4	2485.40	47.8 PK	74.00	-26.20	1.31H	52	50.10	27.54	5.06	34.90	2.32
5	4220.00	49.3 PK	74.00	-24.70	1.40H	7	46.70	30.51	6.70	34.59	-2.63
6	4924.00	51.1 PK	74.00	-22.90	1.43H	75	47.00	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	2110.00	47.1 PK	74.00	-26.90	1.09V	355	51.40	25.62	5.02	34.90	4.26
2	*2464.40	105.3 PK	-	-	1.00V	353	72.90	27.33	5.08	0.00	-32.41
3	*2464.40	99.4 AV	-	-	1.00V	353	67.00	27.33	5.08	0.00	-32.41
4	2486.50	48.1 PK	74.00	-25.90	1.17V	27	50.40	27.54	5.06	34.90	2.32
5	4220.00	47.6 PK	74.00	-26.40	1.67V	220	45.00	30.51	6.70	34.59	-2.62
6	4924.00	50.1 PK	74.00	-23.90	1.31V	5	46.00	31.51	7.21	34.62	-4.11

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
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839379/002	Dec. 28, 2001
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

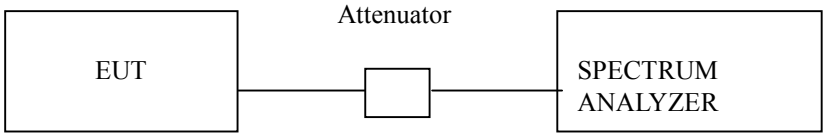
NOTE:

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.

4.3.3 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

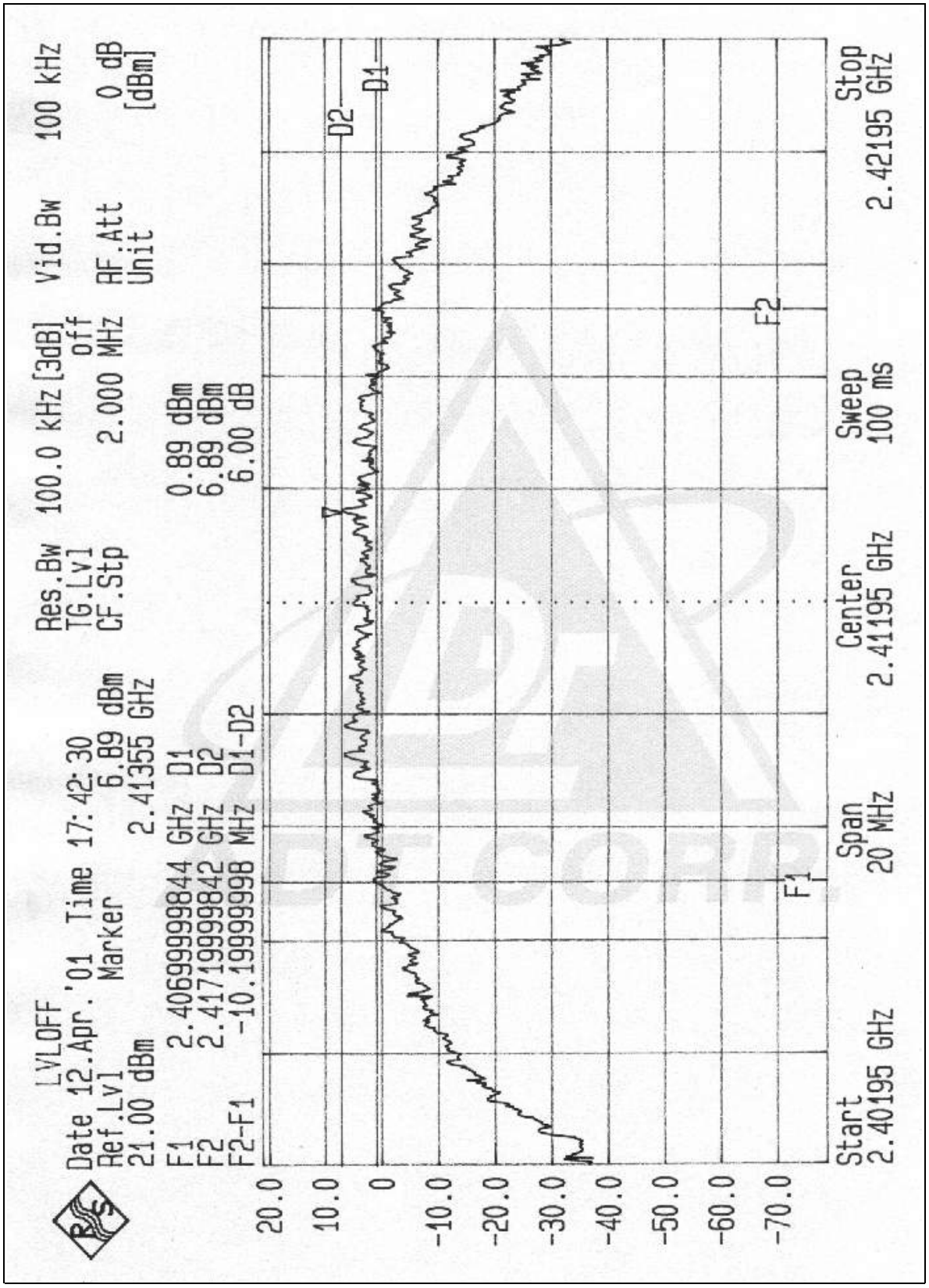
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.6 TEST RESULTS

EUT	2.4GHz Wireless Mini PCI Card	**MODEL**	PA3070U-1MPC
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	20 deg. C, 70%RH, 1005 hPa
TESTED BY: Steven Lu			

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.20	0.5	PASS
6	2437	10.24	0.5	PASS
11	2462	10.18	0.5	PASS

CH1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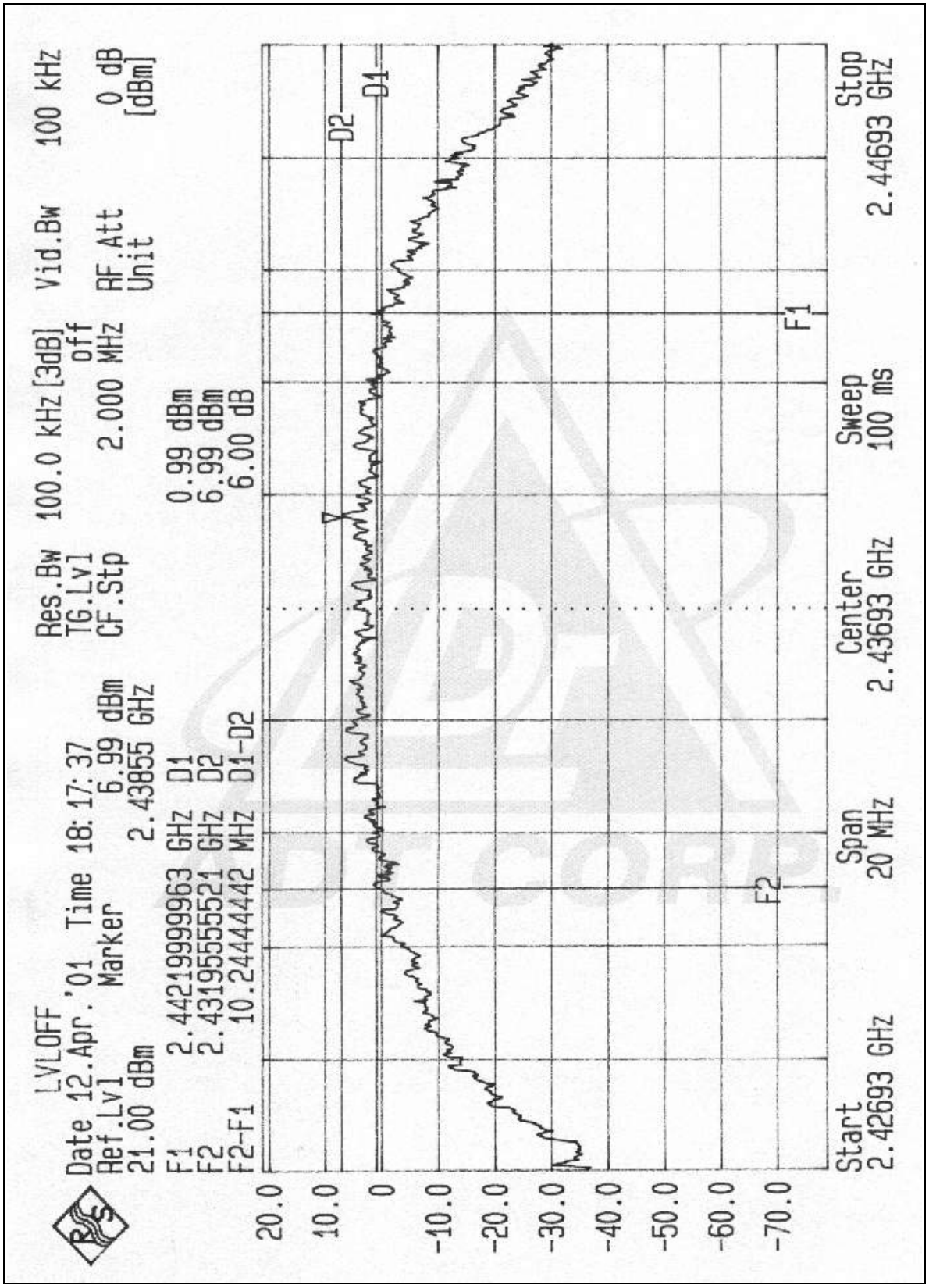
Date 12.Apr.'01 Time 17:42:30
Ref.Lvl
21.00 dBm
Marker
F1 2.40699999844 GHz D1 0.89 dBm
F2 2.41719999842 GHz D2 6.89 dBm
F2-F1 -10.19999998 MHz D1-D2 6.00 dB
6.89 dBm
2.41355 GHz
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.40195 GHz
Span 20 MHz
Center 2.41195 GHz
Sweep 100 ms
Stop 2.42195 GHz

CH6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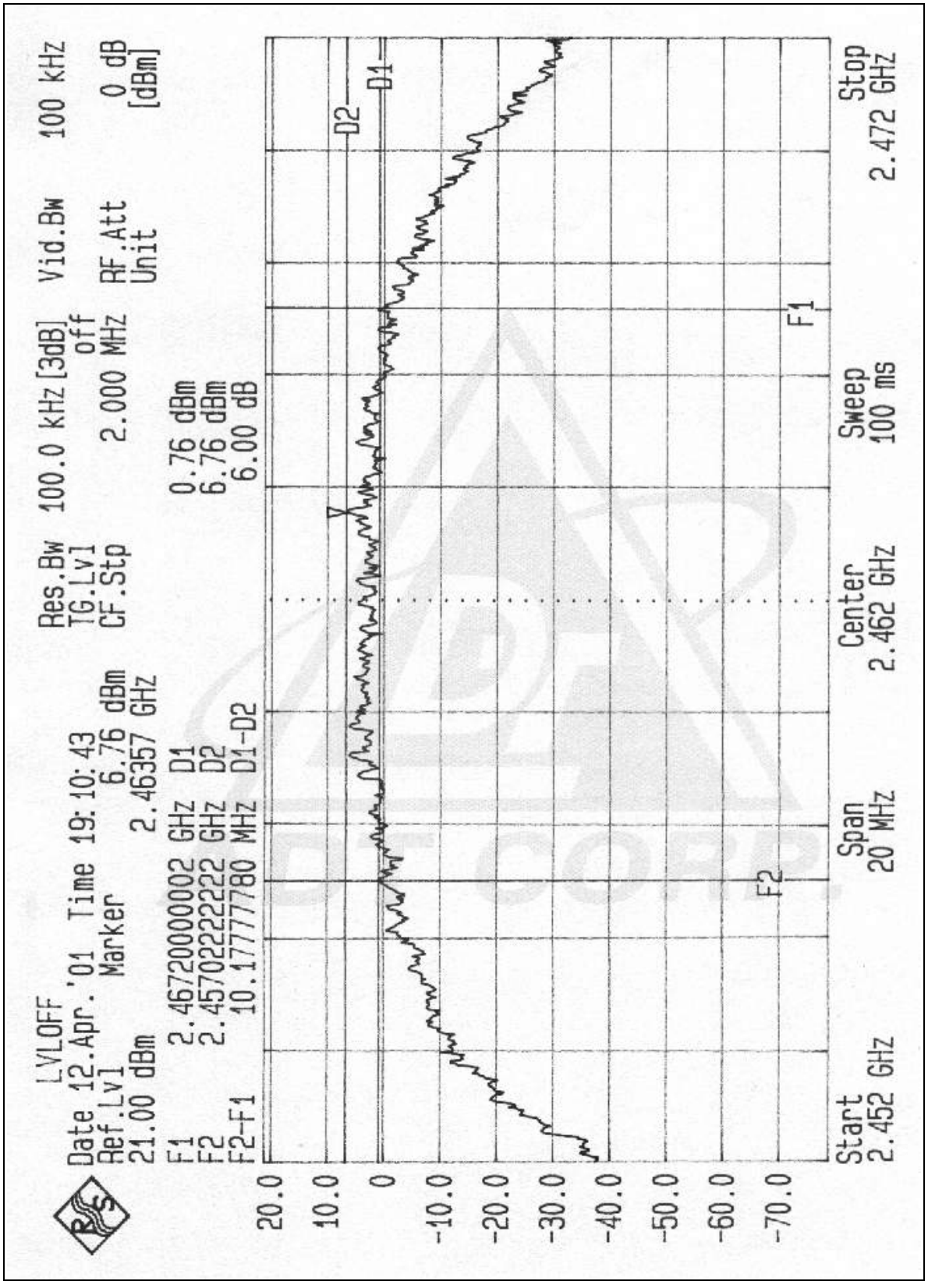
Date 12.Apr.'01 Time 18:17:37
Ref.Lvl
21.00 dBm
Marker
6.99 dBm
2.43855 GHz
F1 2.44219999963 GHz D1
F2 2.43195555521 GHz D2
F2-F1 10.24444442 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
0.99 dBm
6.99 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D1
D2
F1
F2
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
Start 2.42693 GHz
Span 20 MHz
Center 2.43693 GHz
Sweep 100 ms
Stop 2.44693 GHz

CH11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Date 12.Apr.'01 Time 19:10:43
Ref.Lvl 6.76 dBm
21.00 dBm 2.46357 GHz
F1 2.467200000 2 GHz D1
F2 2.457022222 22 GHz D2
F2-F1 10.17777780 MHz D1-D2
Res.Bw 100.0 kHz [3dB]
TG.Lvl off
CF.Stp 2.000 MHz
0.76 dBm
6.76 dBm
6.00 dB
Vid.Bw 100 kHz
RF.Att 0 dB
Unit [dBm]
D1
D2
F1
F2
Start 2.452 GHz
Span 20 MHz
Center 2.462 GHz
Sweep 100 ms
Stop 2.472 GHz
20.0
10.0
0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0