FCC TEST REPORT

REPORT NO.: RF921229H12
MODEL NO.: LA-5030
RECEIVED: Dec. 29, 2003
TESTED: Jan. 09 to 16, 2004

APPLICANT: SYMBOL TECHNOLOGIES, INC.

ADDRESS: HOLTSVILLE N.Y., 11742, USA

ISSUED BY: Advance Data Technology Corporation

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0536

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Lab Code: 200376-0

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1. CERTIFICATION

PRODUCT :	Symbol Wireless Networker 802.11a/g CardBus Adapter
BRAND NAME :	SYMBOL Technologies
MODEL NO. :	LA-5030
APPLICANT :	SYMBOL TECHNOLOGIES, INC.
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), Subpart E (Section 15.407), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Jan. 09 to 16, 2004. 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.

PREPARED BY: Amanda Chu , **DATE:** *Jan. 27, 2004*

(Amanda Chu)

APPROVED BY: _____ , **DATE:** *Jan. 27, 2004*

(Eric Lin, 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**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is –12.02dBuV at 0.177MHz
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 –5.4dBuV at 32.55MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

APPLIED STANDARD: 47 CFR Part 15, Subpart E			
Standard Section	**Test Type**	**Result**	**REMARK**
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is –16.32dBuV at 0.181MHz
15.407(b/1/2/3)(b)(5)	Electric Field Strength Spurious Emissions, 30 MHz – 40000 MHz	PASS	Meet the requirement of limit Minimum passing margin is –5.4dBuV at 32.55MHz
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Symbol Wireless Networker 802.11a/g CardBus Adapter
MODEL NO.	LA-5030
POWER SUPPLY	3.3VDC from host equipment
MODULATION	DSSS, OFDM
TRANSFER RATE	802.11b and draft 802.11g: 1/2/5.5/6/9/11/12/18/24/36/48/54Mbps 802.11a:6 to 54Mbps
FREQUENCY RANGE	802.11b and draft 802.11g: 2400MHz ~ 2483.5MHz 802.11a: 5.15~5.35GHz and 5.725~5.825GHz
NUMBER OF CHANNEL	802.11b and draft 802.11g: 11 802.11a: 12 for Normal mode
CHANNEL SPACING	802.11b and draft 802.11g: 5MHz 802.11a: 20MHz for Normal mode
OUTPUT POWER	802.11b: 17.09dBm / draft 802.11g: 13.01dBm 802.11a: 12.32dBm
DATA CABLE	NA
ANTENNA TYPE	Chip Antenna
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. Dual-band, the EUT communicates with Wireless-A (802.11a), Wireless-B, (802.11b), and Wireless-G (draft 802.11g) wireless networks.

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

3.2 DESCRIPTION OF TEST MODES

For 802.11b: Eleven channels are provided to 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. Transfer rate, 11Mbps with CCK technique and 6Mbps with OFDM technique, the worst case, were chosen for final test.
4. Test result A is for CCK technique and test result B is for OFDM technique which presented in Section 4.

For 802.11a: Twelve channels are provided to this EUT for Normal mode.

Channel	Frequency	Channel	Frequency
1	5180 MHz	7	5300 MHz
2	5200 MHz	8	5320 MHz
3	5220 MHz	9	5745MHz
4	5240 MHz	10	5765MHz
5	5260 MHz	11	5785MHz
6	5280 MHz	12	5805MHz

NOTE:

1. The EUT was tested in normal mode (channel bandwidth of approximately 20 MHz).
2. “Normal Mode” allows data rates of up to 54Mbps. The device was, therefore, tested in Normal mode at the data rate that produced the highest output power for normal mode (6Mbps).
3. Channel 1, 4, 5, 8, 9 and 12 are the closest frequencies to the band edge, were chosen for final test of Normal Mode.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an Symbol Wireless Networker 802.11a/g CardBus Adapter According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C. (15.247),
Subpart E (15.407). 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 47CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

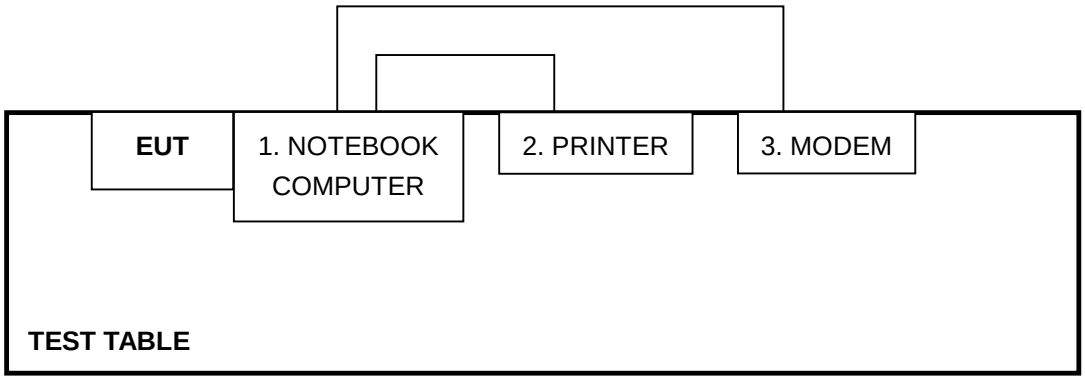
3.4 DESCRIPTION OF SUPPORT UNITS

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	PP01L	TW-09c748-12800-165-3171	DoC
2	PRINTER	HP	C2642A	MY7961C1FQ	B94C2642X
3	MODEM	ACEEX	1414	0206026772	IFAXDM1414

No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.
3	1 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

Note: 1. All power cords of the above support units are unshielded (1.8m).



NOTE: 1. Please refer to the photos of test configuration in Item 5 also.

4. TEST TYPES AND RESULTS (FOR PART 802.11b)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/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	ESCS 30	847124/029	Dec. 4, 2004
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 04, 2004
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 27, 2004
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 03, 2004
Terminator(for KYORITSU)	50	3	Apr. 11, 2004
Software	Cond-V2e	NA	NA

NOTE:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

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.

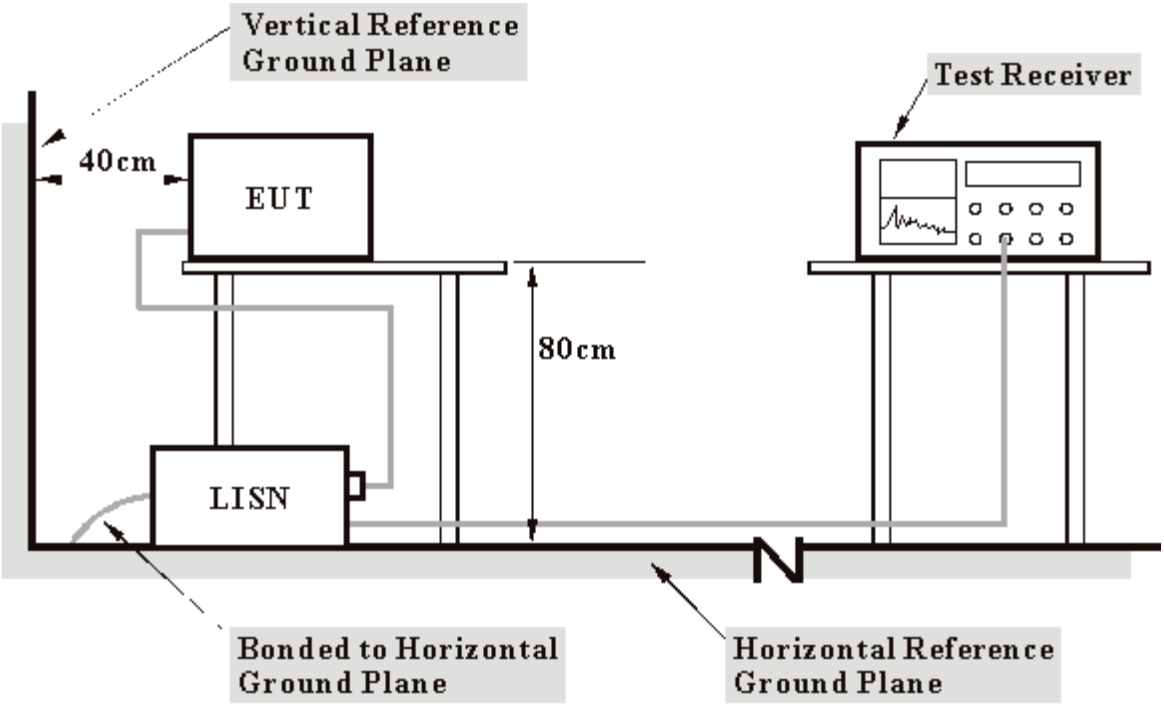
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 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.

4.1.6 EUT OPERATING CONDITIONS

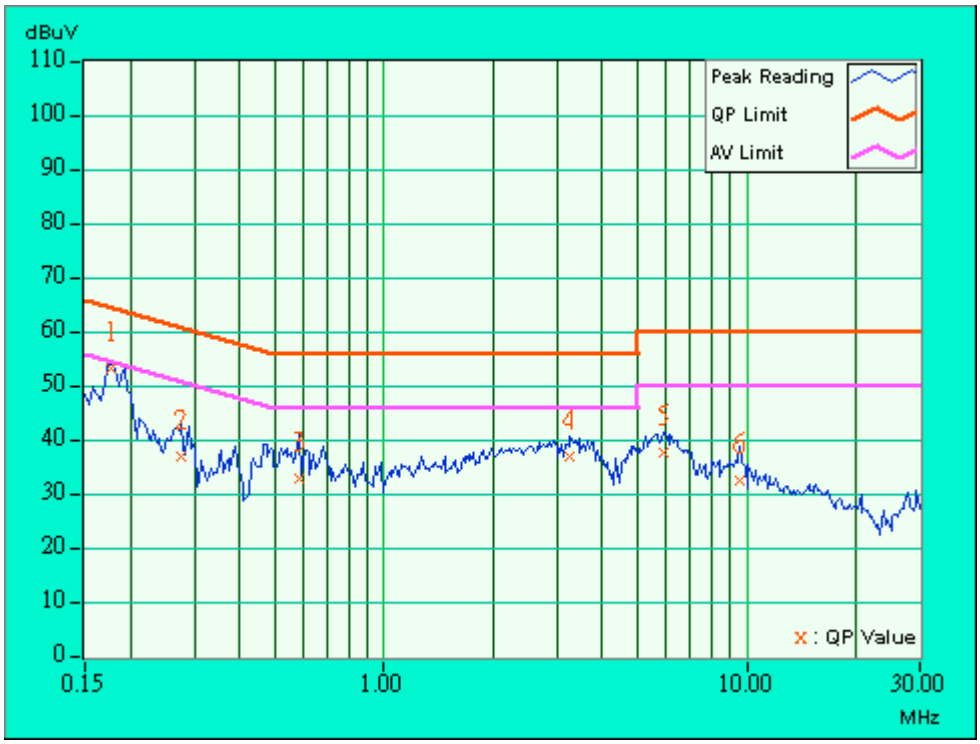
a. Placed the EUT on the testing table.
b. Prepared another computer system to act as a communication partner and placed it outside of testing area.
c. The communication partner runs a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency via wireless.

4.1.7 TEST RESULTS

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter		
MODEL	LA-5030		
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	26deg. C, 58%RH, 980 hPa	**TESTED BY**	Hank Chung

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	**0.177**	**0.20**	**52.39**	**-**	**52.59**	**-**	**64.61**	**54.61**	**-12.02**	**-**
2	0.275	0.20	36.34	-	36.54	-	60.97	50.97	-24.43	-
3	0.588	0.23	32.34	-	32.57	-	56.00	46.00	-23.43	-
4	3.250	0.36	36.37	-	36.73	-	56.00	46.00	-19.27	-
5	5.883	0.53	36.88	-	37.41	-	60.00	50.00	-22.59	-
6	9.508	0.77	31.90	-	32.67	-	60.00	50.00	-27.33	-

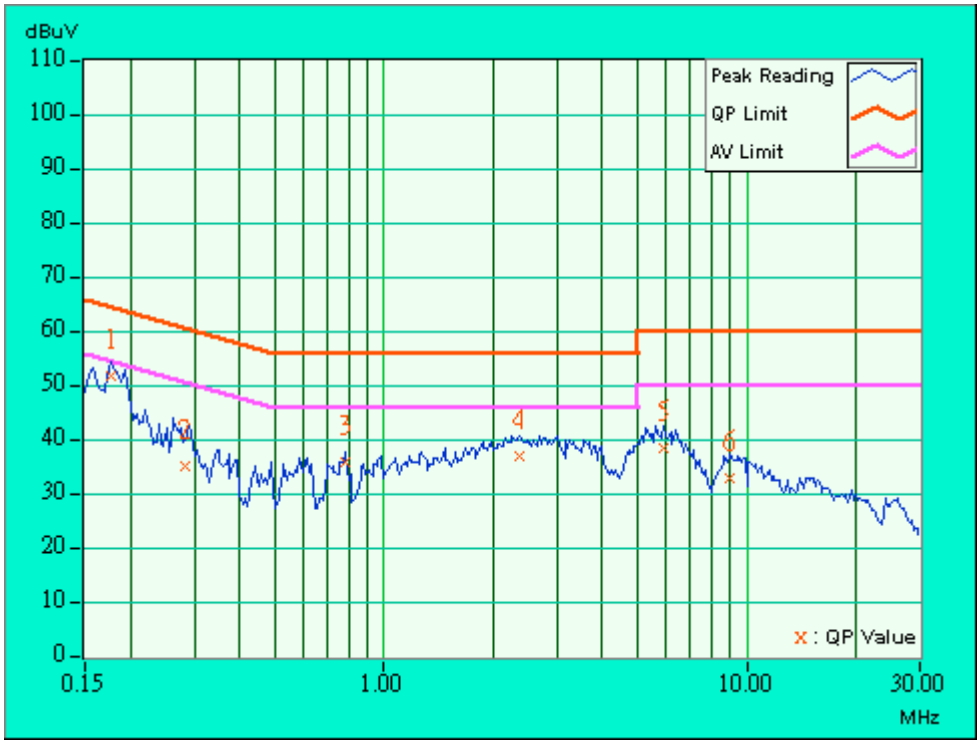
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter		
MODEL	LA-5030		
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 50%RH, 980 hPa	**TESTED BY**	Hank Chung

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	0.177	0.20	51.06	-	51.26	-	64.61	54.61	-13.35	-
2	0.284	0.20	34.63	-	34.83	-	60.70	50.70	-25.87	-
3	0.783	0.26	35.17	-	35.43	-	56.00	46.00	-20.57	-
4	2.377	0.32	36.24	-	36.56	-	56.00	46.00	-19.44	-
5	5.930	0.50	38.05	-	38.55	-	60.00	50.00	-21.45	-
6	9.012	0.65	32.42	-	33.07	-	60.00	50.00	-26.93	-

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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	3467U00646	Jun. 29, 2004
*ADVANTEST Spectrum Analyzer	R3271A	85060311	Jun. 16, 2004
CHASE RF Pre_Amplifier	CPA9232	1010	Feb. 22, 2004
*HP Pre_Amplifier	8449B	3008A01922	Oct. 13, 2004
*ROHDE & SCHWARZ Test Receiver	ESVS 30	841977/002	Sep. 17, 2004
*CHASE Broadband Antenna	CBL6112B	2798	Apr. 16, 2004
*Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 24, 2004
SCHWARZBECK Tunable Dipole Antenna	UHAP	897	Mar. 07, 2005
SCHWARZBECK Tunable Dipole Antenna	VHAP	880	Mar. 07, 2005
*RF Switches	MP59B	1-5161-28698	Jul. 31, 2004
*RF Cable(CHASE)	CH A9525	Cable_OB_01	Jul. 31, 2004
*Software	AS60P8	NA	NA
*CHANCE MOST Antenna Tower	AT-100	CM-A007	NA
*CHANCE MOST Turn Table	TC-008	CM-T007	NA
*CORCOM AC Filter	MRI2030	024/019	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. B.
5. The VCCI Site Registration No. is R-847.
6. The FCC Site Registration No. is 92753.
7. The CANADA Site Registration No. is IC 3789-B.

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.

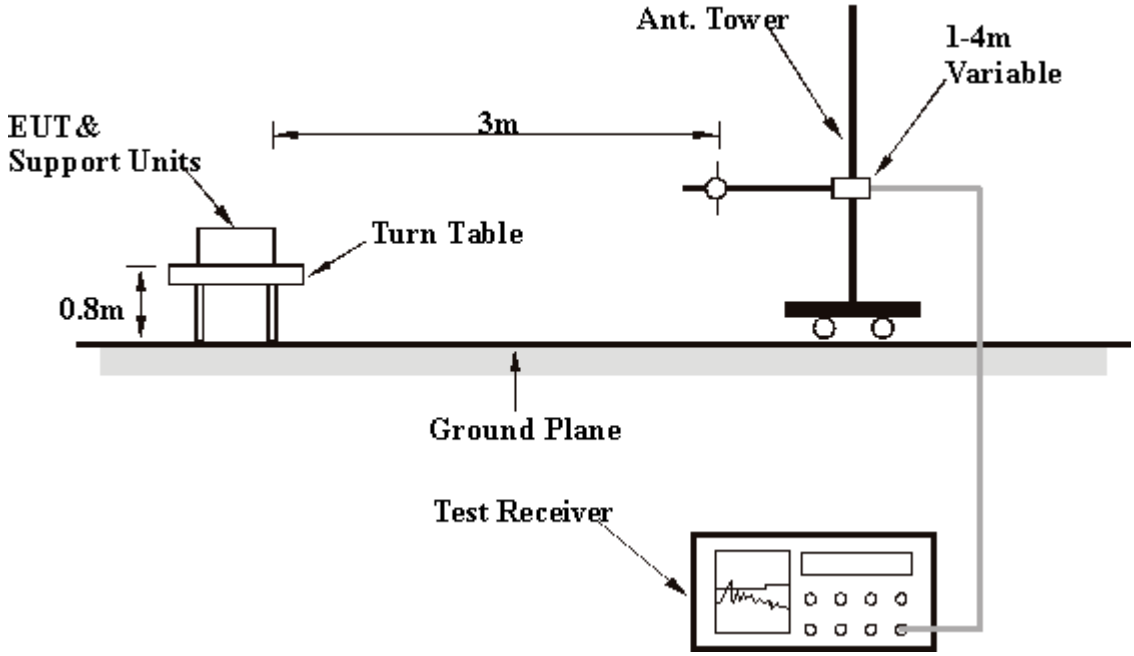
NOTE:

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 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Channel 11	**FREQUENCY RANGE**	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH, 980 hPa	**TESTED BY**	Hank Chung

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)	Correction Factor (dB/m)
1	31.12	30.80 QP	40.00	-9.20	2.32 H	89	18.00	12.70
2	66.75	19.10 QP	40.00	-20.90	2.23 H	183	7.60	11.50
3	123.95	26.80 QP	43.50	-16.70	1.75 H	174	14.80	12.00
4	162.09	32.90 QP	43.50	-10.60	1.79 H	2	18.60	14.20
5	199.77	30.20 QP	43.50	-13.30	2.15 H	268	19.00	11.20
6	240.02	28.10 QP	46.00	-17.90	2.40 H	299	15.30	12.80
7	365.76	29.00 QP	46.00	-17.00	2.12 H	359	12.00	17.00
8	400.00	33.10 QP	46.00	-12.90	2.26 H	136	15.10	18.00
9	457.00	32.60 QP	46.00	-13.40	2.23 H	124	13.30	19.30
10	528.00	29.50 QP	46.00	-16.50	1.98 H	68	8.50	21.00

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)	Correction Factor (dB/m)
1	**32.55**	**34.60 QP**	**40.00**	**-5.40**	**1.02 V**	**68**	**21.90**	**12.70**
2	86.03	21.30 QP	40.00	-18.70	1.02 V	168	10.30	11.00
3	158.03	27.90 QP	43.50	-15.60	1.02 V	349	13.60	14.30
4	200.01	25.50 QP	43.50	-18.00	1.29 V	251	14.30	11.20
5	366.16	29.20 QP	46.00	-16.80	1.32 V	356	12.20	17.00
6	456.93	34.40 QP	46.00	-11.60	1.46 V	182	15.10	19.30
7	480.00	35.70 QP	46.00	-10.30	1.27 V	106	15.80	19.80
8	528.03	25.90 QP	46.00	-20.10	1.00 V	5	4.80	21.00
9	699.25	36.40 QP	46.00	-9.60	1.08 V	160	12.00	24.40
10	752.85	29.20 QP	46.00	-16.80	1.15 V	195	3.90	25.30

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

TEST RESULTS (A)- DSSS

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Channel 1	**FREQUENCY RANGE**	1000MHz~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 58%RH, 980 hPa	**TESTED BY**	Tony Chen

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)	Correction Factor (dB/m)
1	2377.00	50.90 PK	74.00	-23.10	1.02 H	183	21.20	29.70
2	2390.00	57.00 PK	74.00	-17.00	1.24 H	247	27.20	29.80
2	2390.00	37.90 AV	54.00	-16.10	1.24 H	247	8.10	29.80
3	*2412.00	102.20 PK			1.32 H	46	72.30	29.90
3	*2412.00	94.80 AV			1.32 H	46	65.00	29.90
4	4824.00	44.20 PK	74.00	-29.80	1.40 H	33	8.00	36.20
5	7236.00	48.60 PK	74.00	-25.40	1.20 H	245	6.90	41.70
6	9648.00	52.40 PK	74.00	-21.60	1.33 H	56	7.50	44.90
6	9648.00	42.20 AV	54.00	-11.80	1.33 H	56	-2.70	44.90

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)	Correction Factor (dB/m)
1	2112.00	42.10 PK	74.00	-31.90	1.30 V	210	13.10	29.00
2	2390.00	51.40 PK	74.00	-22.60	1.24 V	269	21.60	29.80
2	2390.00	42.00 AV	54.00	-12.00	1.24 V	269	12.20	29.80
3	*2412.00	104.20 PK			1.32 V	295	74.30	29.90
3	*2412.00	98.90 AV			1.32 V	295	69.00	29.90
4	4824.00	45.40 PK	74.00	-28.60	1.48 V	336	9.20	36.20
5	7236.00	49.20 PK	74.00	-24.80	1.08 V	91	7.50	41.70
6	9648.00	53.60 PK	74.00	-20.40	1.30 V	94	8.70	44.90
6	9648.00	42.60 AV	54.00	-11.40	1.30 V	94	-2.30	44.90

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Channel 6	**FREQUENCY RANGE**	1000MHz~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 58%RH, 980 hPa	**TESTED BY**	Tony Chen

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)	Correction Factor (dB/m)
1	2366.00	42.10 PK	74.00	-31.90	1.00 H	360	12.40	29.70
2	*2437.00	101.20 PK			1.59 H	44	71.20	30.00
2	*2437.00	94.40 AV			1.59 H	44	64.40	30.00
3	2495.00	44.00 PK	74.00	-30.00	1.02 H	94	13.80	30.20
4	4874.00	44.90 PK	74.00	-29.10	1.17 H	350	8.40	36.50
5	7311.00	49.60 PK	74.00	-24.40	1.24 H	274	7.80	41.80
6	9748.00	52.30 PK	74.00	-21.70	1.27 H	314	7.70	44.60
6	9748.00	41.50 AV	54.00	-12.50	1.27 H	314	-3.10	44.60

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)	Correction Factor (dB/m)
1	2387.00	45.20 PK	74.00	-28.80	1.00 V	10	15.40	29.80
2	*2437.00	105.60 PK			1.00 V	296	75.60	30.00
2	*2437.00	98.50 AV			1.00 V	296	68.50	30.00
3	2496.00	43.80 PK	74.00	-30.20	1.05 V	304	13.60	30.20
4	4874.00	44.20 PK	74.00	-29.80	1.68 V	159	7.80	36.50
5	7311.00	49.70 PK	74.00	-24.30	1.00 V	106	7.90	41.80
6	9748.00	52.80 PK	74.00	-21.20	1.48 V	231	8.10	44.60
6	9748.00	41.50 AV	54.00	-12.50	1.48 V	231	-3.20	44.60

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Channel 11	**FREQUENCY RANGE**	1000MHz~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 58%RH, 980 hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	101.80 PK			1.23 H	220	71.70	30.10
1	*2462.00	94.50 AV			1.23 H	220	64.40	30.10
2	2483.50	46.40 PK	74.00	-27.60	1.24 H	258	16.20	30.10
3	4924.00	44.20 PK	74.00	-29.80	1.27 H	239	7.50	36.70
4	7386.00	47.00 PK	74.00	-27.00	1.36 H	201	5.20	41.80
5	9848.00	48.40 PK	74.00	-25.60	1.26 H	244	4.10	44.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.00 PK			1.00 V	298	76.00	30.10
1	*2462.00	98.40 AV			1.00 V	298	68.30	30.10
2	2483.50	52.70 PK	74.00	-21.30	1.52 V	102	22.50	30.10
2	**2483.50**	**43.70 AV**	**54.00**	**-10.30**	**1.52 V**	**102**	**13.50**	**30.10**
3	4924.00	44.60 PK	74.00	-29.40	1.24 V	120	7.90	36.70
4	7386.00	47.80 PK	74.00	-26.20	1.24 V	203	5.90	41.80
5	9848.00	50.30 PK	74.00	-23.70	1.24 V	203	6.00	44.40

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

TEST RESULTS (B)- OFDM

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Channel 1	**FREQUENCY RANGE**	1000MHz~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 57%RH, 980 hPa	**TESTED BY**	Tony Chen

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)	Correction Factor (dB/m)
1	2375.00	48.90 PK	74.00	-25.10	1.00 H	250	19.20	29.70
2	2390.00	48.70 PK	74.00	-25.30	2.01 H	200	18.90	29.80
3	*2412.00	98.40 PK			2.12 H	211	68.50	29.90
3	*2412.00	89.30 AV			2.12 H	211	59.40	29.90
4	4824.00	42.90 PK	74.00	-31.10	1.15 H	241	6.70	36.20
5	7236.00	47.10 PK	74.00	-26.90	1.03 H	216	5.40	41.70
6	9648.00	53.00 PK	74.00	-21.00	1.25 H	225	8.10	44.90
6	9648.00	43.20 AV	54.00	-10.80	1.25 H	225	-1.70	44.90

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)	Correction Factor (dB/m)
1	2375.00	46.40 PK	74.00	-27.60	1.27 V	169	16.70	29.70
2	2390.00	52.40 PK	74.00	-21.60	1.04 V	236	22.60	29.80
2	2390.00	42.80 AV	54.00	-11.20	1.04 V	236	13.00	29.80
3	*2412.00	101.90 PK			1.01 V	123	72.00	29.90
3	*2412.00	92.70 AV			1.01 V	123	62.80	29.90
4	4824.00	42.90 PK	74.00	-31.10	1.09 V	199	6.60	36.20
5	7236.00	48.50 PK	74.00	-25.50	1.33 V	180	6.80	41.70
6	9648.00	53.00 PK	74.00	-21.00	1.04 V	200	8.10	44.90
6	9648.00	42.50 AV	54.00	-11.50	1.04 V	200	-2.40	44.90

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Channel 6	**FREQUENCY RANGE**	1000MHz~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 57%RH, 980 hPa	**TESTED BY**	Tony Chen

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)	Correction Factor (dB/m)
1	2338.00	42.90 PK	74.00	-31.10	2.12 H	38	13.30	29.60
2	*2437.00	98.40 PK			1.00 H	210	68.40	30.00
2	*2437.00	89.30 AV			1.00 H	210	59.30	30.00
3	2485.00	42.20 PK	74.00	-31.80	1.84 H	77	12.00	30.10
4	4874.00	42.80 PK	74.00	-31.20	1.47 H	201	6.30	36.50
5	7311.00	48.60 PK	74.00	-25.40	1.24 H	320	6.80	41.80
6	9748.00	53.70 PK	74.00	-20.30	1.27 H	301	9.00	44.60
6	9748.00	43.60 AV	54.00	-10.40	1.27 H	301	-1.00	44.60

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)	Correction Factor (dB/m)
1	2389.00	43.80 PK	74.00	-30.20	1.36 V	121	14.00	29.80
2	*2437.00	100.20 PK			1.29 V	121	70.20	30.00
2	*2437.00	91.50 AV			1.29 V	121	61.50	30.00
3	2484.00	46.20 PK	74.00	-27.80	1.36 V	124	16.00	30.10
4	4874.00	43.60 PK	74.00	-30.40	1.27 V	235	7.10	36.50
5	7311.00	48.90 PK	74.00	-25.10	1.21 V	111	7.10	41.80
6	9748.00	52.90 PK	74.00	-21.10	1.04 V	354	8.30	44.60
6	9748.00	43.00 AV	54.00	-11.00	1.04 V	354	-1.60	44.60

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Channel 11	**FREQUENCY RANGE**	1000MHz~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27deg. C, 57%RH, 980 hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	98.10 PK			1.94 H	213	68.00	30.10
1	*2462.00	89.10 AV			1.94 H	213	59.00	30.10
2	2483.50	49.00 PK	74.00	-25.00	1.27 H	218	18.80	30.10
3	2498.00	44.50 PK	74.00	-29.50	1.84 H	87	14.30	30.20
4	4924.00	43.50 PK	74.00	-30.50	1.24 H	296	6.80	36.70
5	7386.00	48.70 PK	74.00	-25.30	1.23 H	222	6.90	41.80
6	9848.00	53.90 PK	74.00	-20.10	1.46 H	201	9.50	44.40
6	9848.00	43.60 AV	54.00	-10.40	1.46 H	201	-0.80	44.40

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	101.00 PK			1.00 V	120	70.90	30.10
1	*2462.00	91.70 AV			1.00 V	120	61.70	30.10
2	2483.50	52.30 PK	74.00	-21.70	1.04 V	230	22.20	30.10
2	2483.50	42.10 AV	54.00	-11.90	1.04 V	230	11.90	30.10
3	2498.00	47.20 PK	74.00	-26.80	1.12 V	65	17.00	30.20
4	4924.00	42.60 PK	74.00	-31.40	1.45 V	230	5.90	36.70
5	7386.00	48.60 PK	74.00	-25.40	1.26 V	201	6.80	41.80
6	9848.00	52.10 PK	74.00	-21.90	1.47 V	10	7.70	44.40
6	9848.00	42.00 AV	54.00	-12.00	1.47 V	10	-2.40	44.40

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ * “ : Fundamental frequency

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
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

4.3.6 EUT OPERATING CONDITIONS

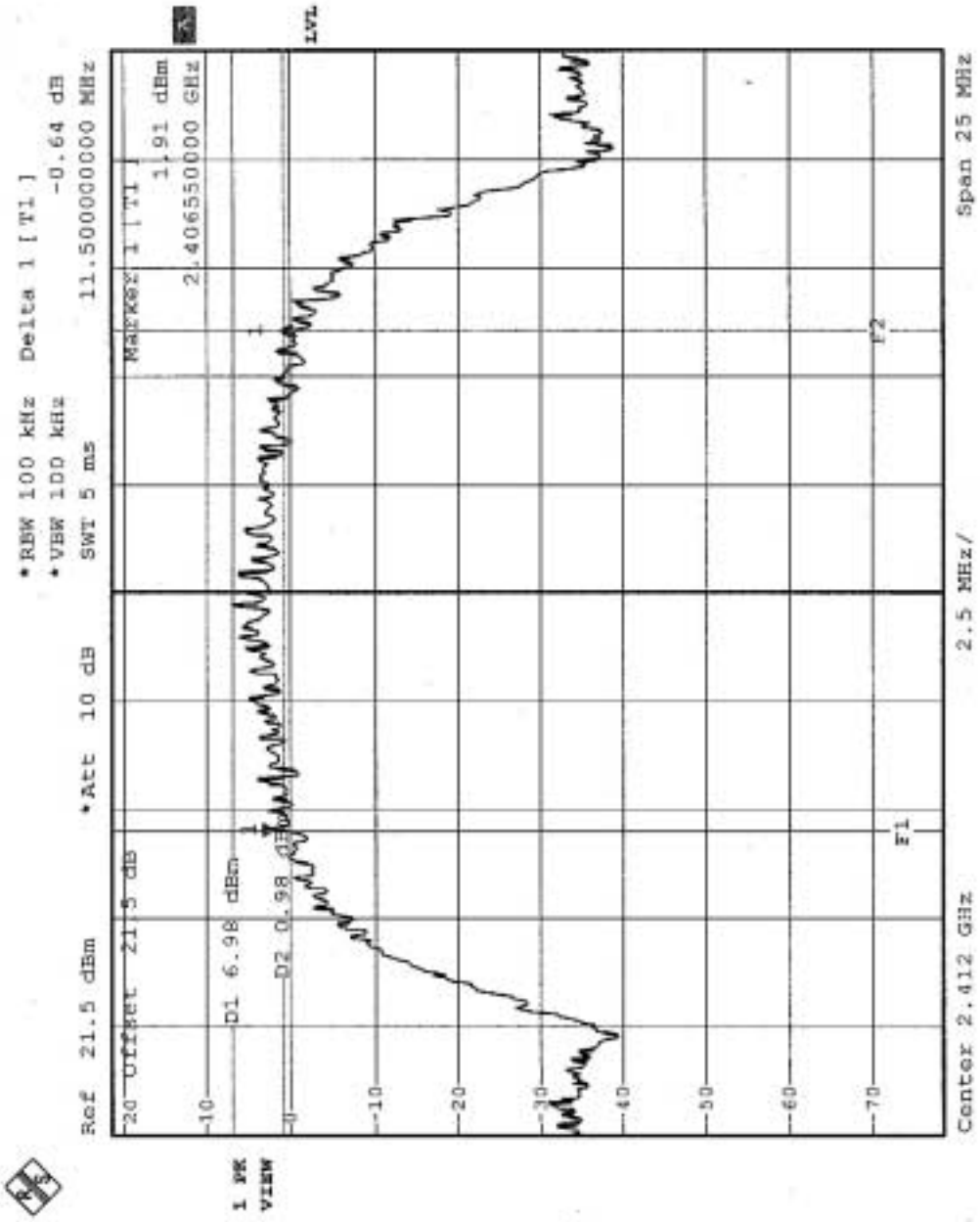
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS (A)

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	27deg. C, 58%RH 980 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.5	0.5	PASS
6	2437	11.6	0.5	PASS
11	2462	11.5	0.5	PASS

CH1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*VBW 100 kHz
SWT 5 ms
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Marker 1 [T1]
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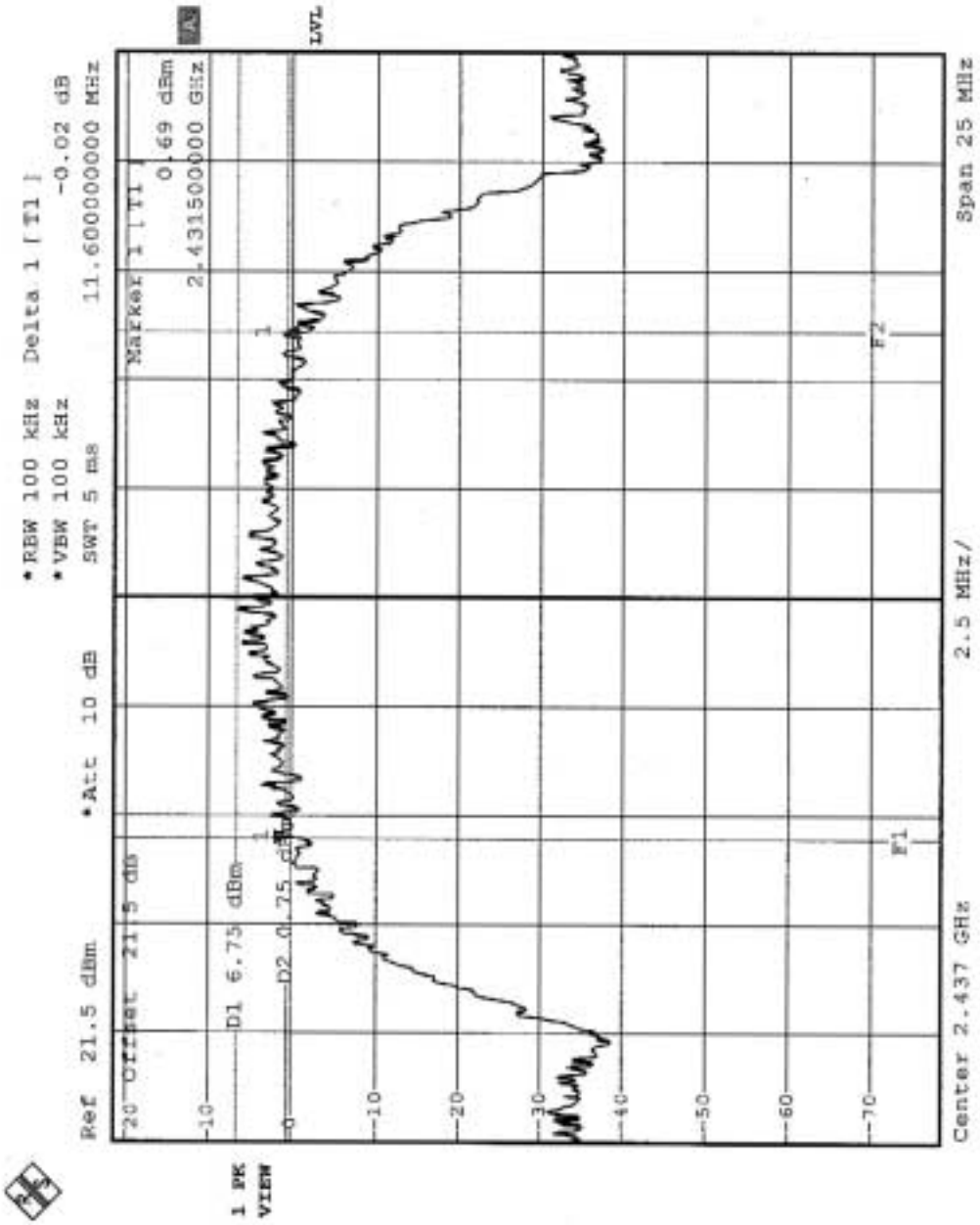
D1 6.98 dBm
D2 0.98 dB
1 AP
VIEW
Center 2.412 GHz
2.5 MHz/
Span 25 MHz

CH6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Offset 21.5 dB
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* RBW 100 kHz
* VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
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Marker 1 [T1]
0.69 dBm
2.431500000 GHz
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D2 0.75 dBm
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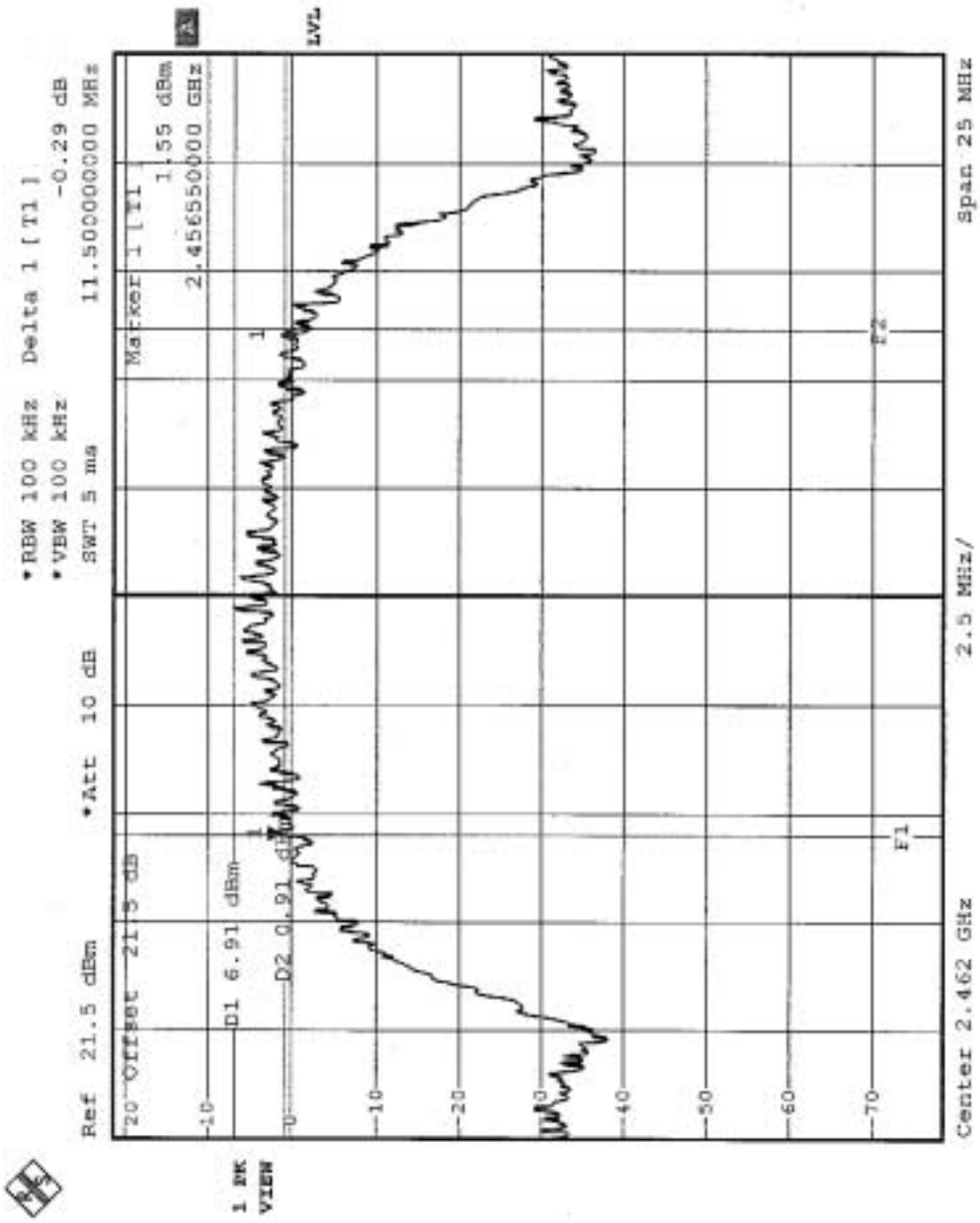
VIEW
LVL
F1
F2
Center 2.437 GHz
2.5 MHz/
Span 25 MHz

CH11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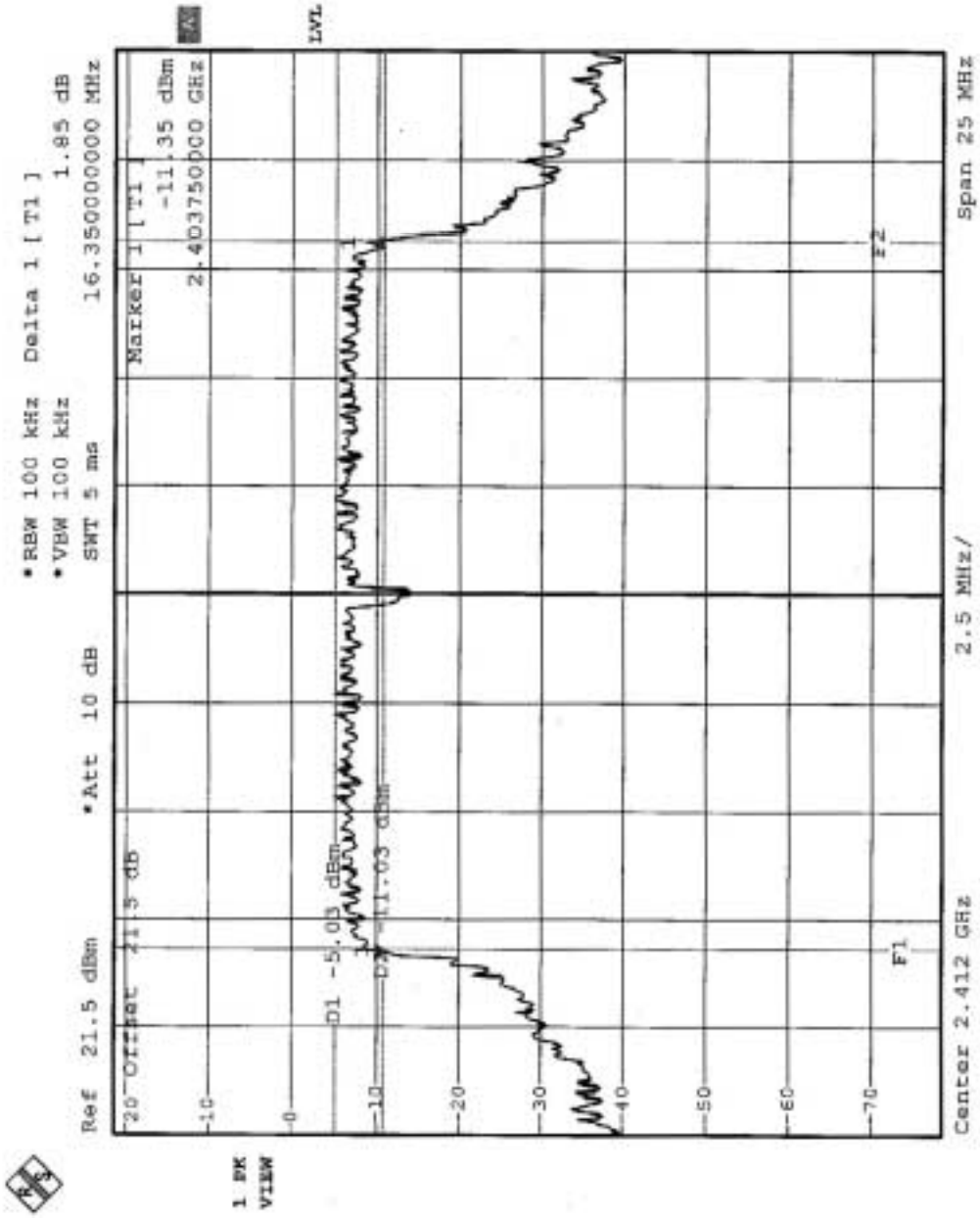
Offset 21.5 dB
*Att 10 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
-0.29 dB
11.50000000 MHz
Marker 1 [T1]
1.55 dBm
2.456550000 GHz
D1 6.91 dBm
D2 0.91 dB
1 PK
VIEW
Center 2.462 GHz
2.5 MHz/
Span 25 MHz
F1
F2

4.3.8 TEST RESULTS (B)

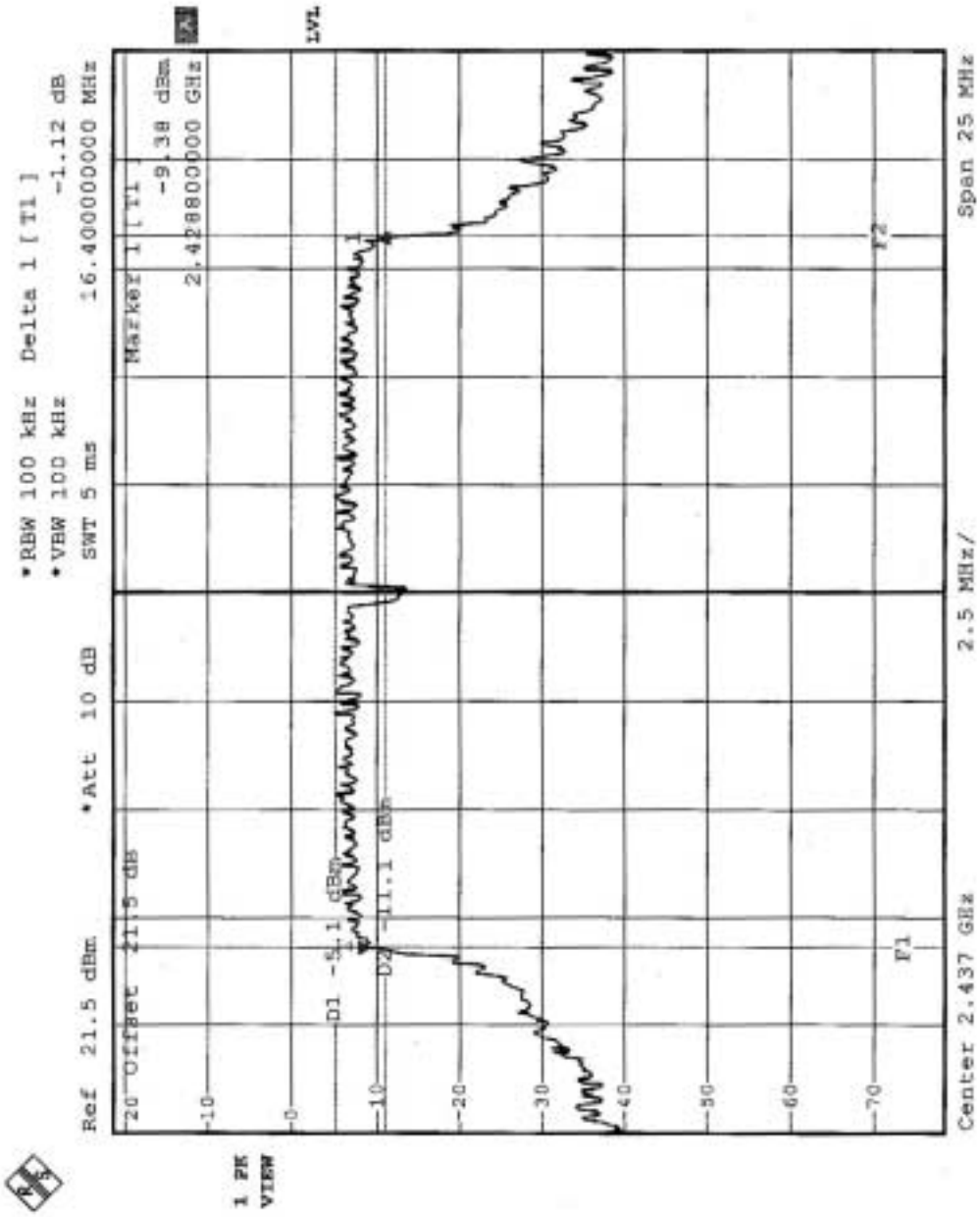
EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	27deg. C, 58%RH 980 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.35	0.5	PASS
6	2437	16.40	0.5	PASS
11	2462	16.45	0.5	PASS

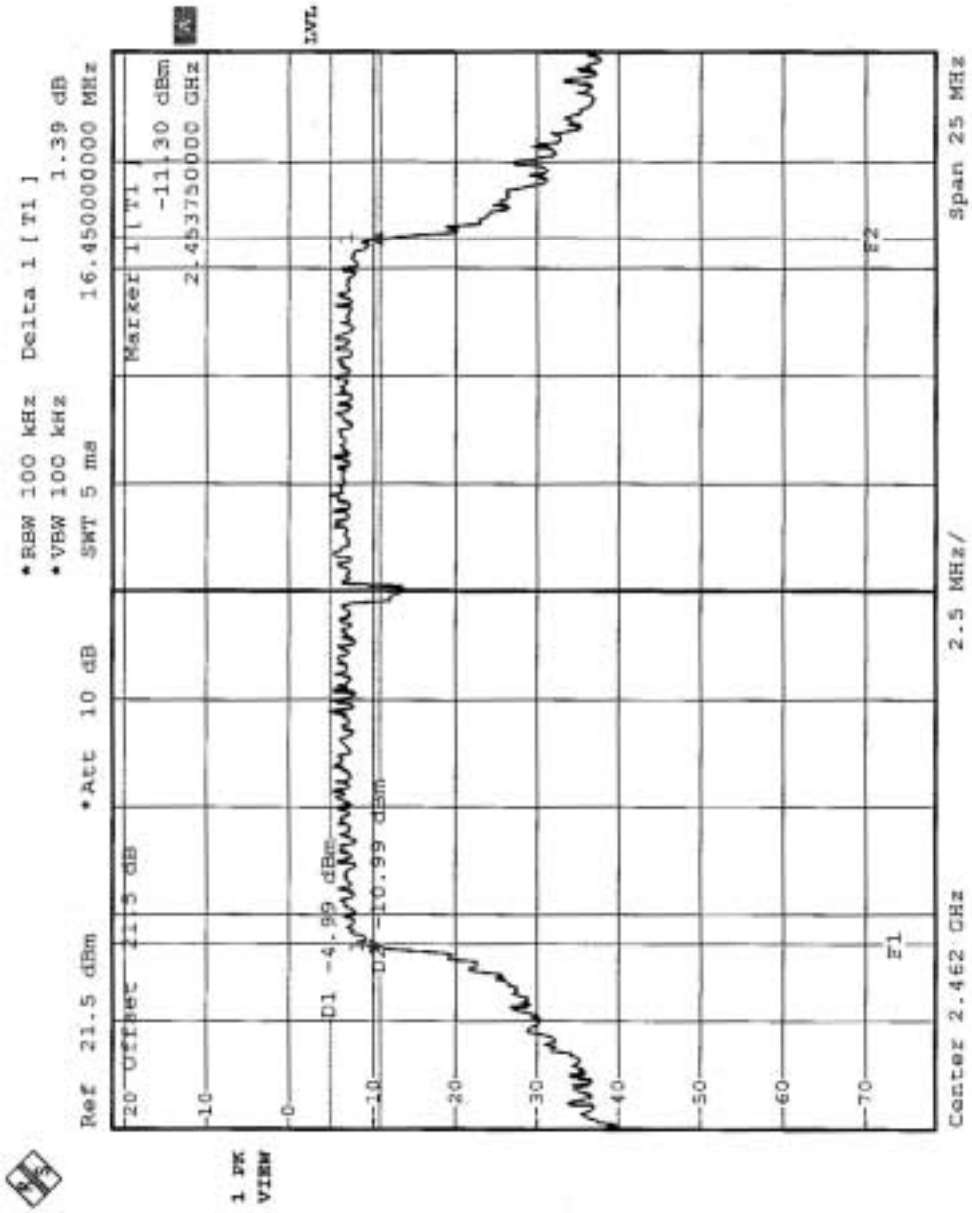
CH1


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
1.85 dB
16.35000000 MHz
Marker 1 [T1]
-11.35 dBm
2.403750000 GHz
D1 -5.03 dBm
D2 -11.03 dBm
LVL
1 PK
VIEW
Center 2.412 GHz
2.5 MHz/
Span 25 MHz

CH6


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
-1.12 dB
16.40000000 MHz
Marker 1 [T1]
-9.38 dBm
2.42800000 GHz
D1 -5.1 dBm
D2 -11.1 dBm
F1
F2
1 PK
VIEW
Center 2.437 GHz
2.5 MHz/
Span 25 MHz

CH11


Ref 21.5 dBm
Offset 21.5 dB
* Att 10 dB
* RBW 100 kHz
* VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
1.39 dB
16.45000000 MHz
Marker 1 [T1
-11.30 dBm
2.4575000 GHz
D1 -4.99 dBm
D2 -10.99 dBm
1 PK
VIEW
Center 2.462 GHz
2.5 MHz/
Span 25 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 INSTRUMENTS

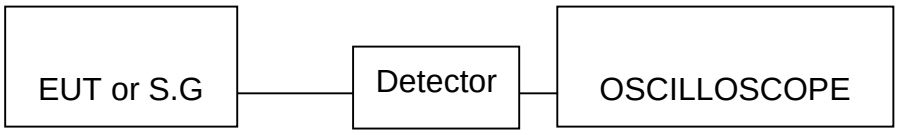
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004
R&S SIGNAL GENERATOR	SMP04	100011	May 28, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	B048470	Mar. 05, 2004
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:
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. A detector was used on the output port of the EUT. An oscilloscope was used to read the peak response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same peak reading on oscilloscope. Record the power level.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.6 TEST RESULTS (A)

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	27deg. C, 57%RH 980 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	17.01	30	PASS
6	2437	17.05	30	PASS
11	2462	17.09	30	PASS

4.4.7 TEST RESULTS (B)

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	27deg. C, 57%RH 980 hPa
TESTED BY	Tony Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	13.01	30	PASS
6	2437	12.93	30	PASS
11	2462	12.98	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
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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.

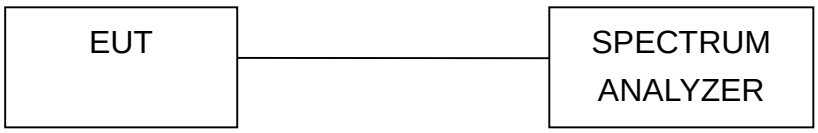
4.5.3 TEST PROCEDURE

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 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

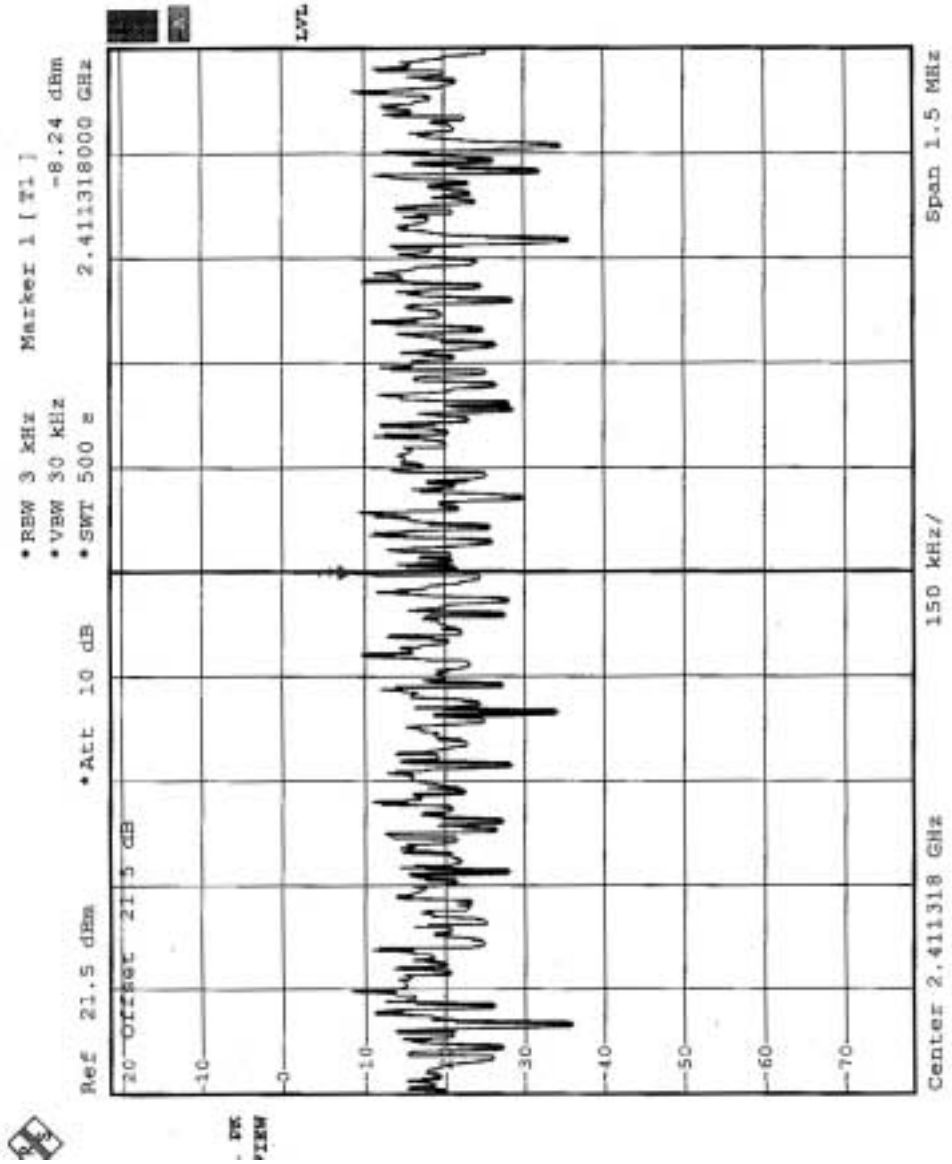
Same as Item 4.3.6

4.5.7 TEST RESULTS(A)

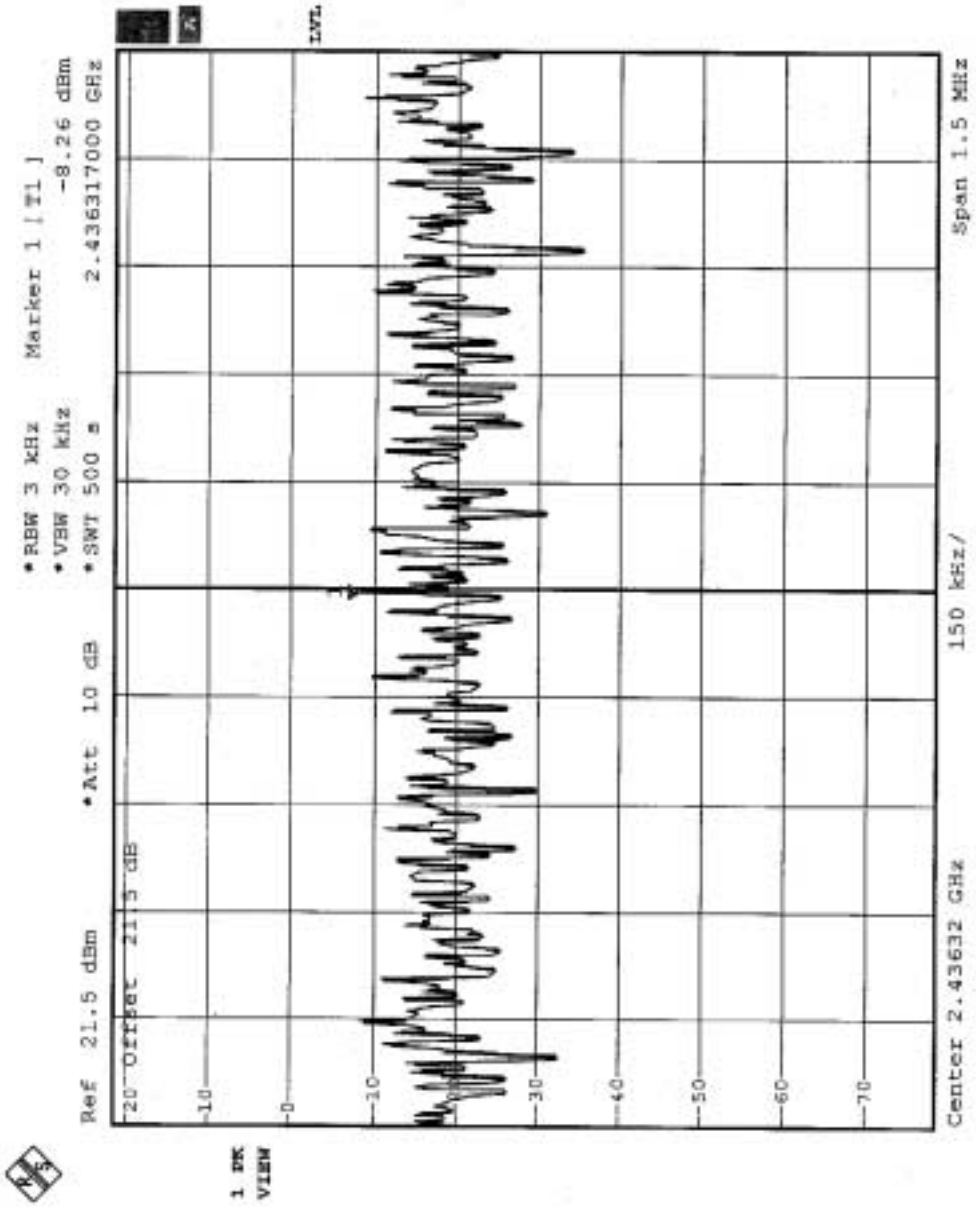
EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	27deg. C, 58RH, 980 hPa
TESTED BY	Tony Chen		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-8.24	8	PASS
6	2437	-8.26	8	PASS
11	2462	-8.01	8	PASS

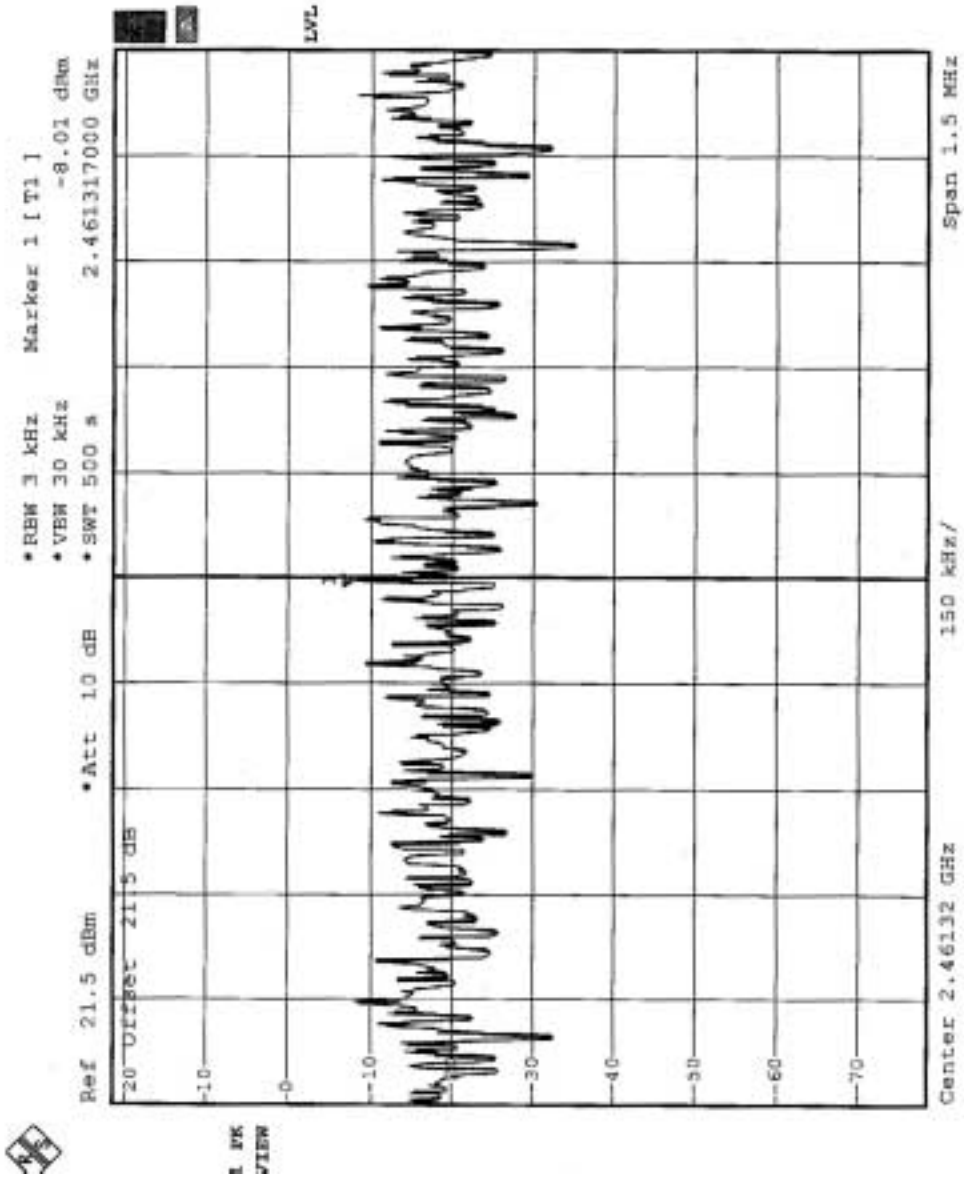
CH1


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.24 dBm
2.411318000 GHz
Center 2.411318 GHz
150 kHz/
Span 1.5 MHz

CH6


Ref 21.5 dBm
Offset 21.5 dB
* Att 10 dB
* RBW 3 kHz
* VBW 30 kHz
* SWT 500 s
Marker 1 [T1]
-8.26 dBm
2.436317000 GHz
1 PK
VIEW
Center 2.43632 GHz
150 kHz/
Span 1.5 MHz

CH11

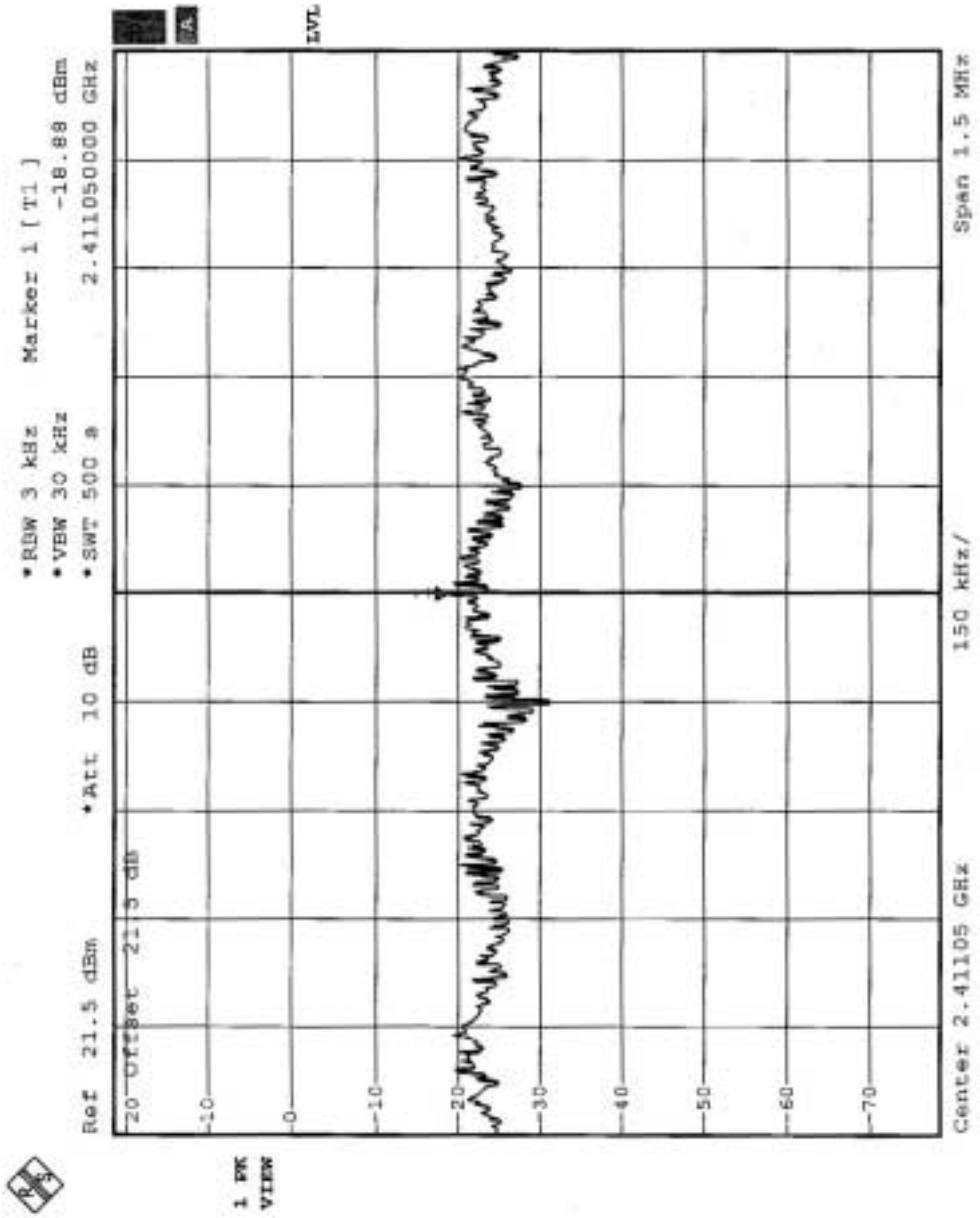

Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.01 dBm
2.461317000 GHz
LVL
Center 2.46132 GHz
150 kHz/
Span 1.5 MHz

4.5.8 TEST RESULTS(B)

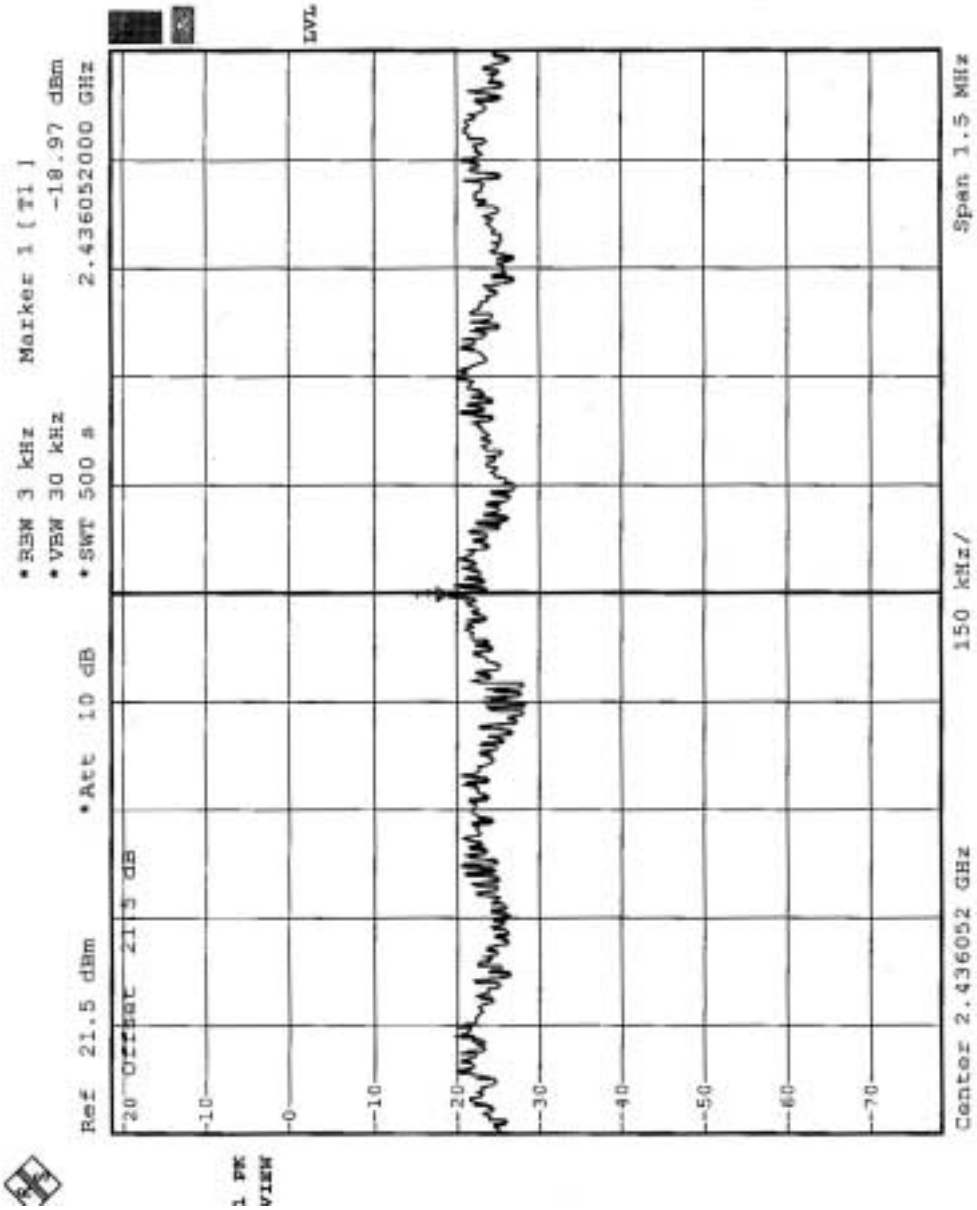
EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	27deg. C, 58RH, 980 hPa
TESTED BY	Tony Chen		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-18.88	8	PASS
6	2437	-18.97	8	PASS
11	2462	-18.99	8	PASS

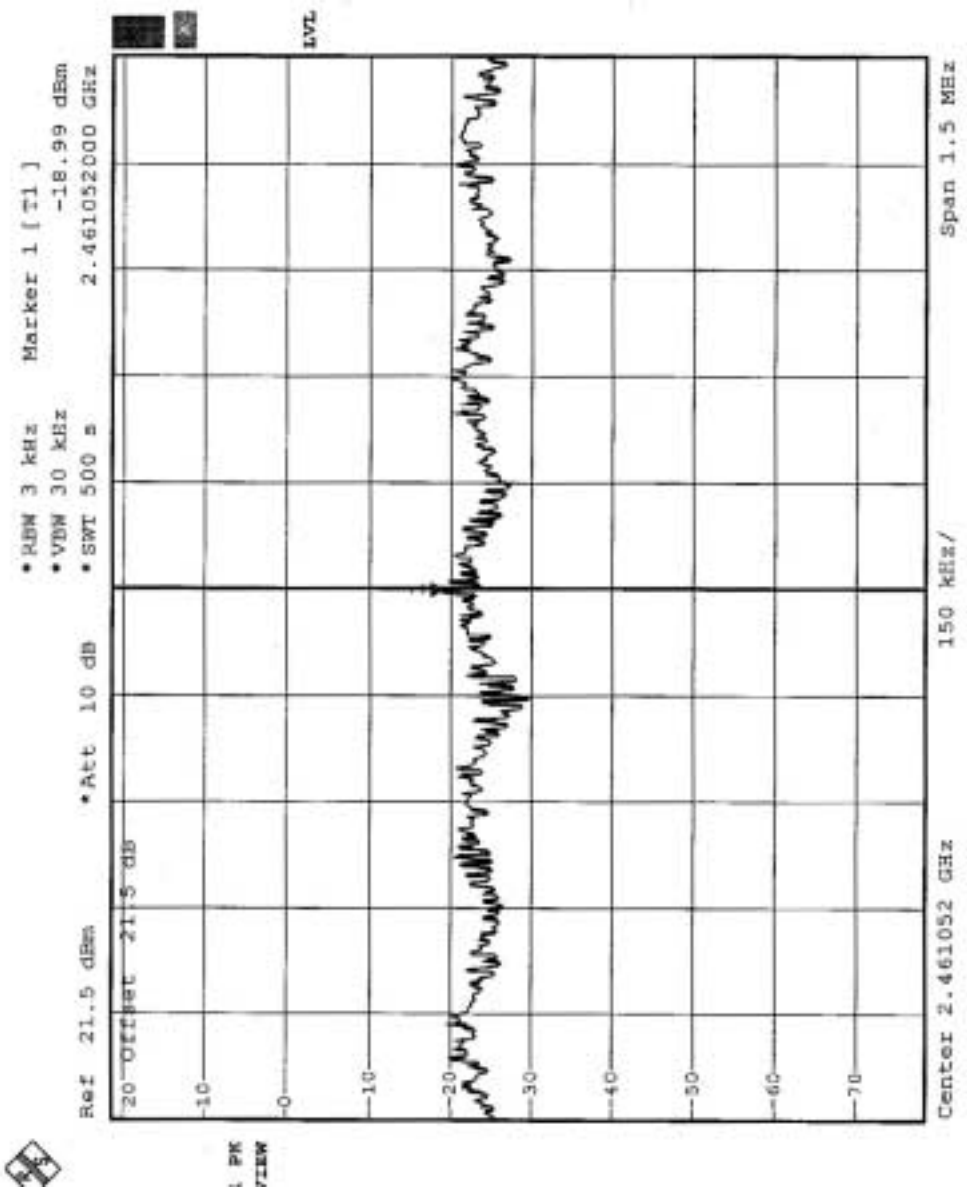
CH1


Ref 21.5 dBm
Offset 21.5 dB
Att 10 dB
RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-18.88 dBm
2.411050000 GHz
1 PK
VIEW
LVL
Center 2.41105 GHz
150 kHz/
Span 1.5 MHz

CH6


Ref 21.5 dBm
Offset 21.5 dB
• Att 10 dB
• RBW 3 kHz
• VBW 30 kHz
• SWT 500 s
Marker 1 [T1]
-18.97 dBm
2.436052000 GHz
1 PK
VIEW
Center 2.436052 GHz
150 kHz/
Span 1.5 MHz

CH11


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-18.99 dBm
2.461052000 GHz
LVL
Center 2.461052 GHz
150 kHz/
Span 1.5 MHz

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
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

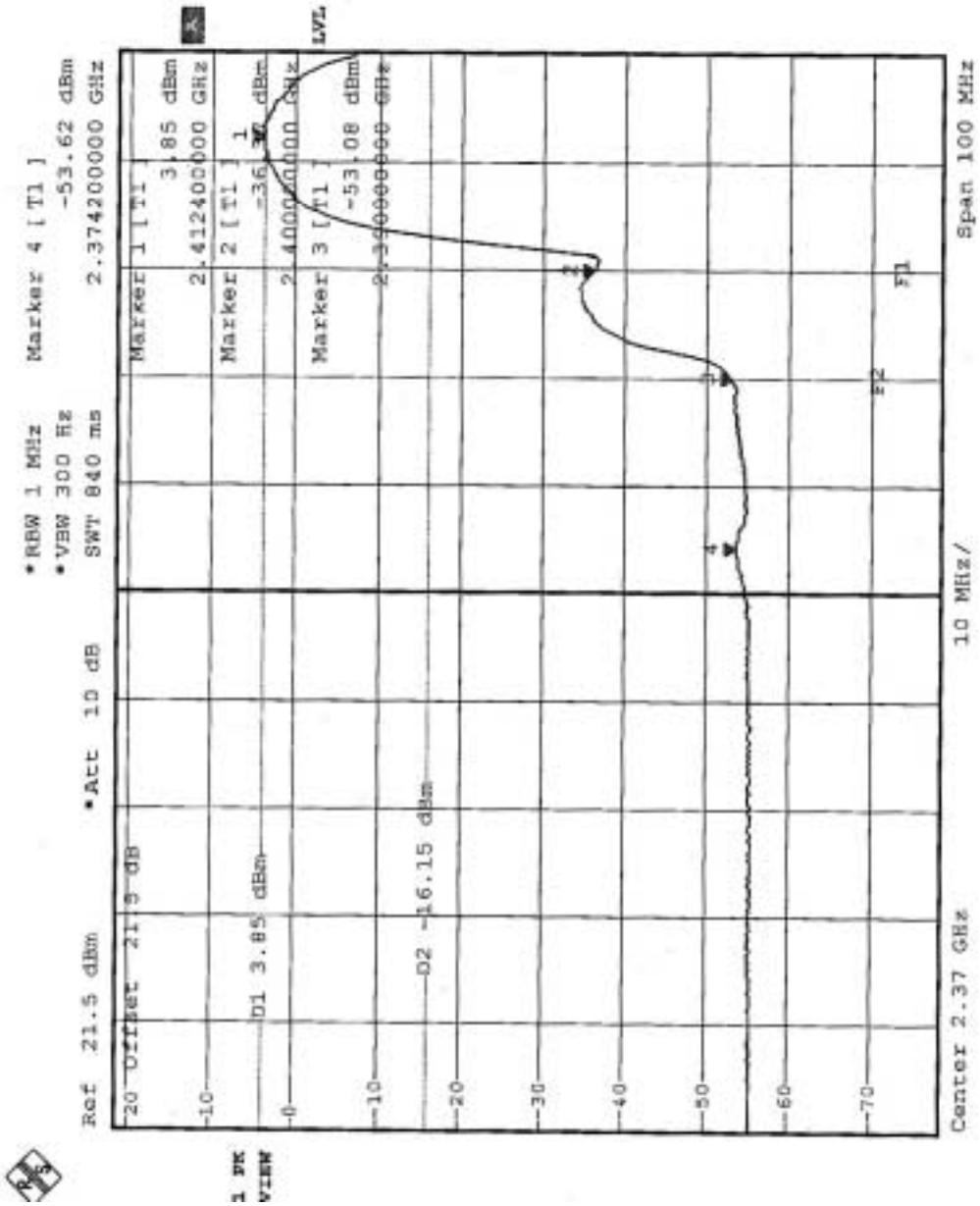
Same as Item 4.3.6

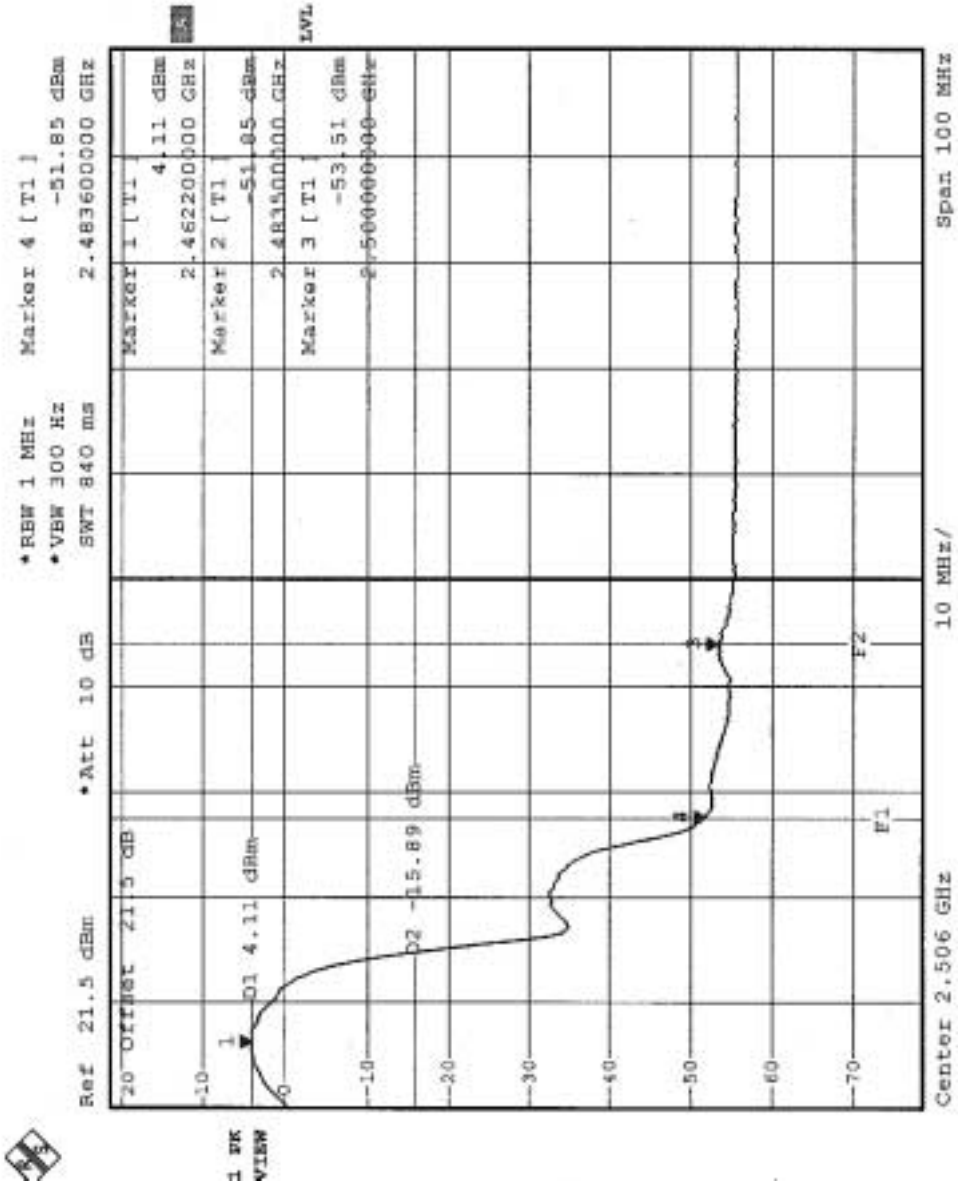
4.6.6 TEST RESULTS (A)

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

NOTE (1): The band edge emission plot on the following first page shows 56.93dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 98.9dBuV/m, so the maximum field strength in restrict band is 98.9-56.93=41.97dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 55.96 dB delta between carrier maximum power and local maximum emission in restrict band (2.4836GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 98.4dBuV/m, so the maximum field strength in restrict band is 98.4-55.96=42.44dBuV/m which is under 54 dBuV/m limit.


Ref 21.5 dBm
Offset 21.5 dB
D1 3.85 dBm
D2 -16.15 dBm
*Att 10 dB
*RBW 1 MHz
*VBW 300 Hz
SWT 840 ms
Marker 4 [T1]
-53.62 dBm
2.374200000 GHz
Marker 1 [T1]
3.85 dBm
2.412400000 GHz
Marker 2 [T1]
-36.[illegible] dBm
2.400000000 GHz
Marker 3 [T1]
-53.08 dBm
2.390000000 GHz
LVL
Center 2.37 GHz
10 MHz/
Span 100 MHz

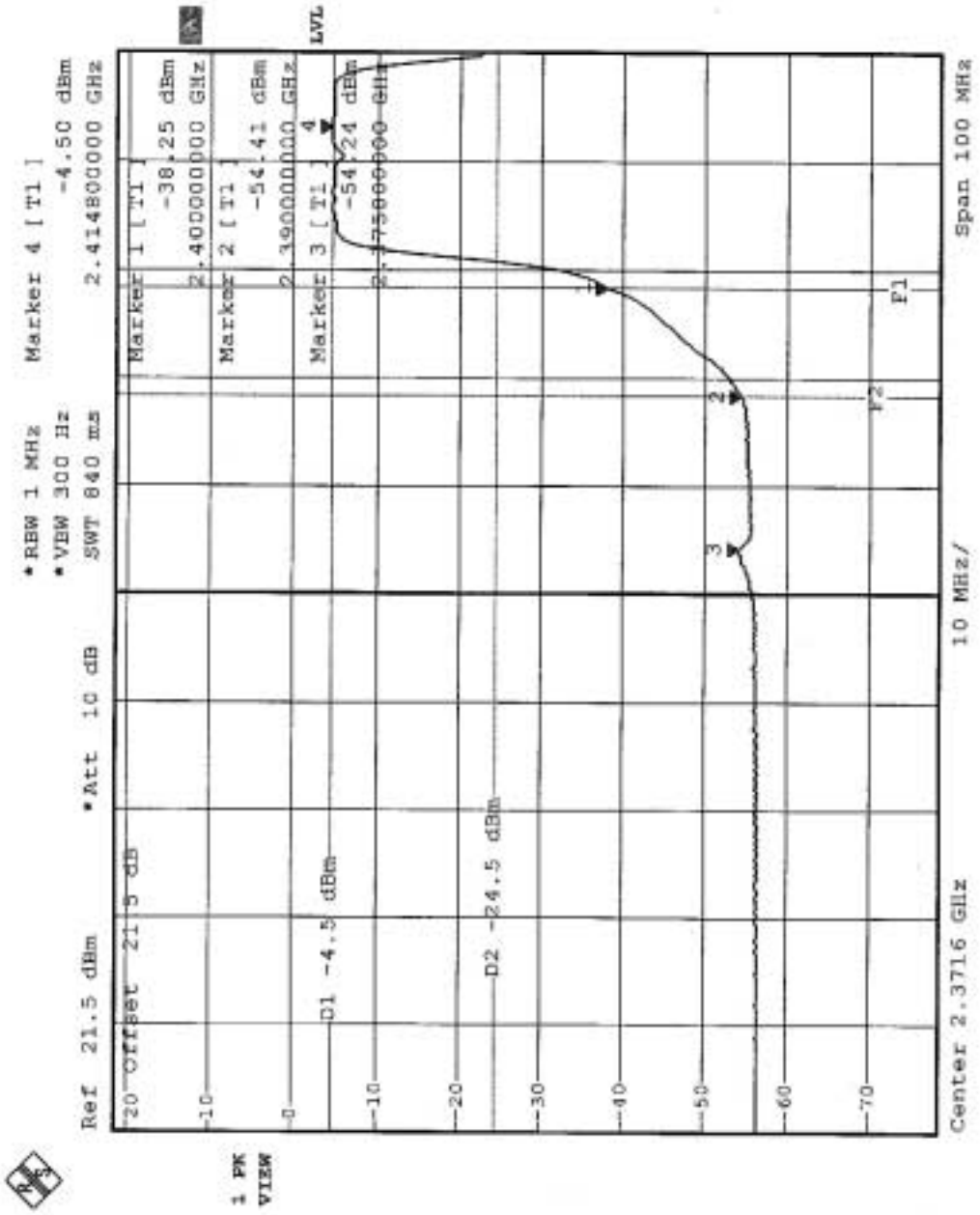

Ref 21.5 dBm
Offset 21.5 dB
D1 4.11 dBm
D2 -15.89 dBm
*Att 10 dB
*RBW 1 MHz
*VBW 300 Hz
SWT 840 ms
Marker 4 [T1]
-51.85 dBm
2.48360000 GHz
Marker 1 [T1]
4.11 dBm
2.46220000 GHz
Marker 2 [T1]
-51.85 dBm
2.48350000 GHz
Marker 3 [T1]
-53.51 dBm
2.50000000 GHz
LVL
1 PK VIEW
Center 2.506 GHz
10 MHz/
Span 100 MHz

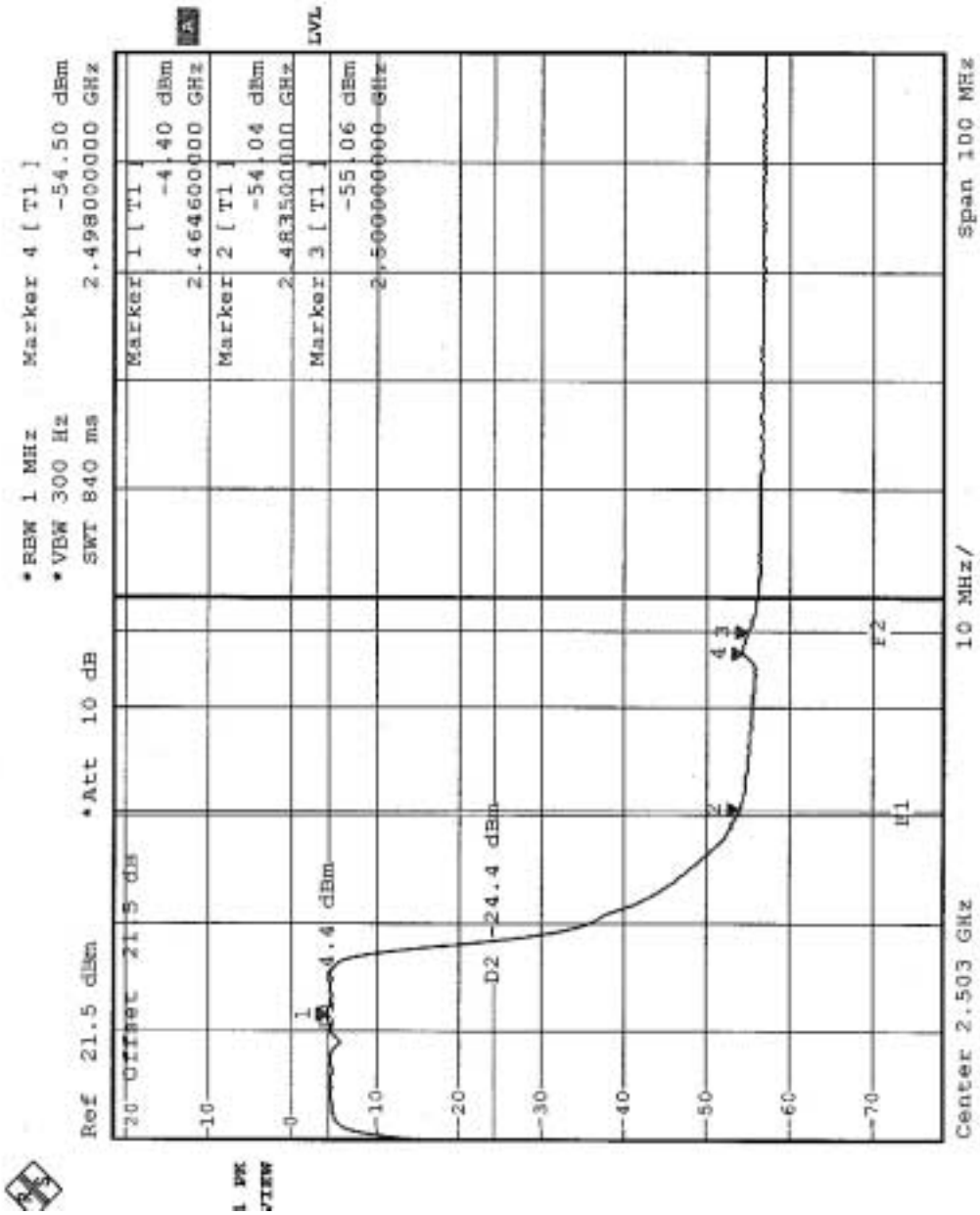
4.6.7 TEST RESULTS (B)

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

NOTE (1): The band edge emission plot on the following first page shows 49.74dB delta between carrier maximum power and local maximum emission in restrict band (2.3758GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 92.7dBuV/m, so the maximum field strength in restrict band is 92.7-49.74=42.96dBuV/m which is under 54 dBuV/m limit.

NOTE (2): The band edge emission plot on the following second page shows 49.64 dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 91.7dBuV/m, so the maximum field strength in restrict band is 91.7-49.64=42.06 dBuV/m which is under 54 dBuV/m limit.


Ref 21.5 dBm
Offset 21.5 dB
D1 -4.5 dBm
D2 -24.5 dBm
*Att 10 dB
*RBW 1 MHz
*VBW 300 Hz
SWT 840 ms
Marker 4 [T1]
-4.50 dBm
2.414800000 GHz
Marker 1 [T1]
-38.25 dBm
2.400000000 GHz
Marker 2 [T1]
-54.41 dBm
2.390000000 GHz
Marker 3 [T1]
-54.24 dBm
2.375000000 GHz
LVL
1 PK
VIEW
Center 2.3716 GHz
10 MHz/
Span 100 MHz
F1
F2


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 Hz
SWT 840 ms
Marker 4 [T1]
-54.50 dBm
2.49800000 GHz
Marker 1 [T1]
-4.40 dBm
2.46460000 GHz
Marker 2 [T1]
-54.04 dBm
2.48350000 GHz
Marker 3 [T1]
-55.06 dBm
2.50000000 GHz
LVL
-4.4 dBm
D2 -24.4 dBm
Center 2.503 GHz
10 MHz/
Span 100 MHz

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 Chip Antenna without connector. The maximum Gain of the antenna is 0.5dBi.

5. TEST TYPES AND RESULTS (FOR PART 802.11a)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Dec. 4, 2004
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 04, 2004
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 27, 2004
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 03, 2004
Terminator(for KYORITSU)	50	3	Apr. 11, 2004
Software	Cond-V2e	NA	NA

NOTE:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

5.1.3 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.

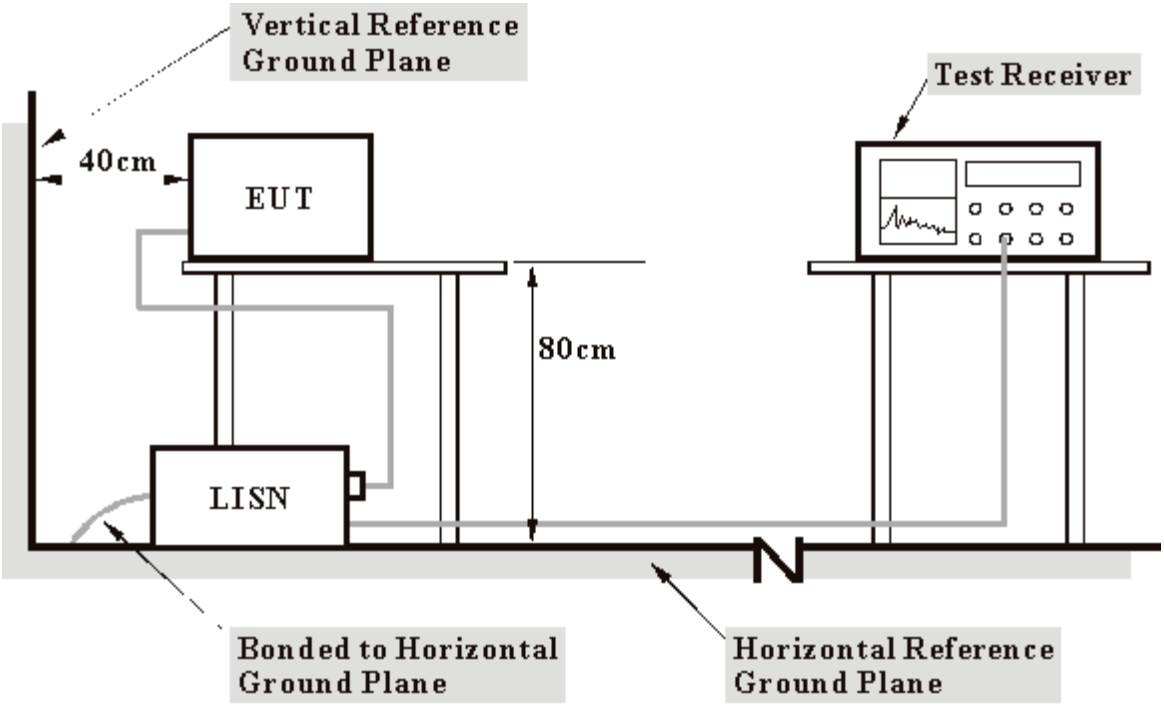
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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.

5.1.6 EUT OPERATING CONDITIONS

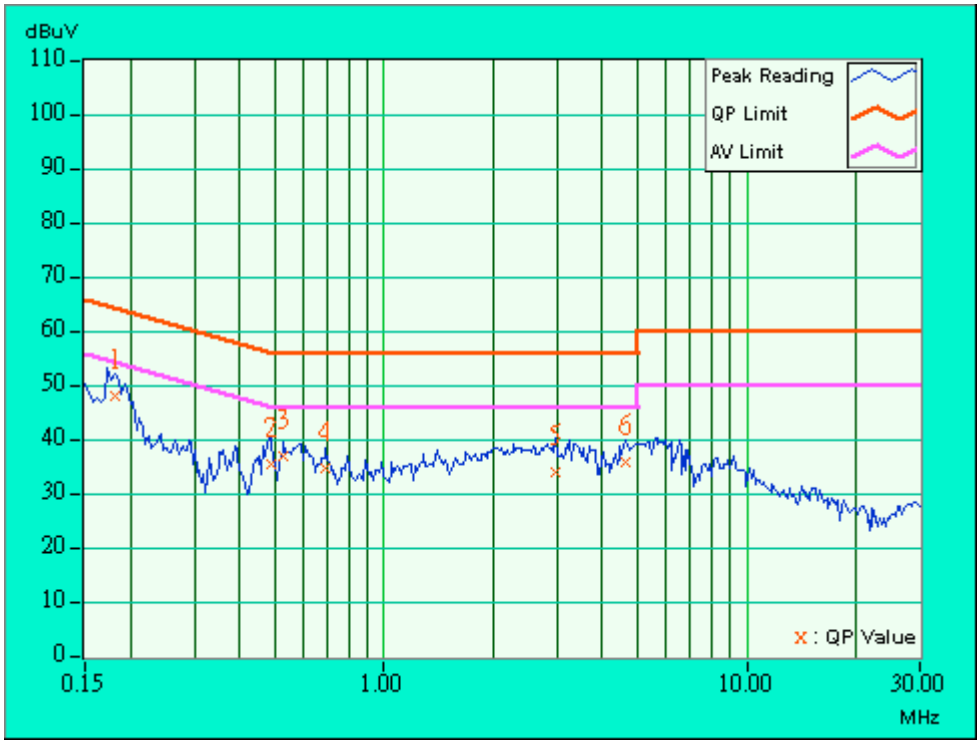
Same as 4.1.6.

5.1.7 TEST RESULTS

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter		
MODEL	LA-5030	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	25deg. C, 50%RH 980 hPa	**TESTED BY**	Hank Chung

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.182	0.20	47.55	-	47.75	-	64.38	54.38	-16.63	-
2	0.486	0.21	35.28	-	35.49	-	56.24	46.24	-20.74	-
3	0.529	0.22	36.63	-	36.85	-	56.00	46.00	-19.15	-
4	0.689	0.25	34.36	-	34.61	-	56.00	46.00	-21.39	-
5	2.974	0.35	33.52	-	33.87	-	56.00	46.00	-22.13	-
6	4.660	0.44	35.58	-	36.02	-	56.00	46.00	-19.98	-

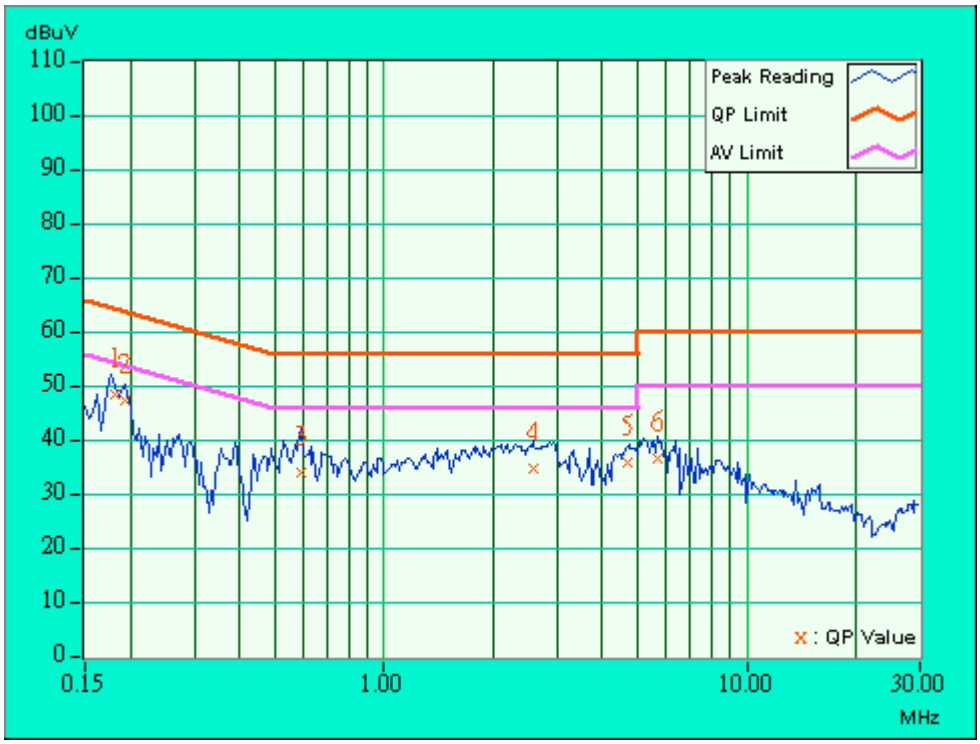
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter		
MODEL	LA-5030	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	25deg. C, 50%RH 980 hPa	**TESTED BY**	Hank Chung

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	**0.181**	**0.20**	**47.91**	**-**	**48.11**	**-**	**64.43**	**54.43**	**-16.32**	**-**
2	0.193	0.20	46.88	-	47.08	-	63.91	53.91	-16.83	-
3	0.591	0.23	33.71	-	33.94	-	56.00	46.00	-22.06	-
4	2.588	0.33	34.22	-	34.55	-	56.00	46.00	-21.45	-
5	4.695	0.43	35.52	-	35.95	-	56.00	46.00	-20.05	-
6	5.691	0.48	36.31	-	36.79	-	60.00	50.00	-23.21	-

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit value



5.2 RADIATED EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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.

5.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	**EIRP Limit (dBm)**	**Equivalent Field Strength at 3m (dBμV/m)** *note 3
5150~5250	-27	68.3
5250~5350	-27	68.3
5725~5825	-27 *note 1	68.3
	-17 *note 2	78.3

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E=\frac{1000000\sqrt{30P}}{3} \quad \mu V/m, \quad \text{where P is the eirp (Watts)}$$

5.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Spectrum Analyzer	8590L	3467U00646	Jun. 29, 2004
*ADVANTEST Spectrum Analyzer	R3271A	85060311	Jun. 16, 2004
CHASE RF Pre_Amplifier	CPA9232	1010	Feb. 22, 2004
*HP Pre_Amplifier	8449B	3008A01922	Oct. 13, 2004
*ROHDE & SCHWARZ Test Receiver	ESVS 30	841977/002	Sep. 17, 2004
*CHASE Broadband Antenna	CBL6112B	2798	Apr. 16, 2004
*Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 24, 2004
SCHWARZBECK Tunable Dipole Antenna	UHAP	897	Mar. 07, 2005
SCHWARZBECK Tunable Dipole Antenna	VHAP	880	Mar. 07, 2005
*RF Switches	MP59B	1-5161-28698	Jul. 31, 2004
*RF Cable(CHASE)	CH A9525	Cable_OB_01	Jul. 31, 2004
*Software	AS60P8	NA	NA
*CHANCE MOST Antenna Tower	AT-100	CM-A007	NA
*CHANCE MOST Turn Table	TC-008	CM-T007	NA
*CORCOM AC Filter	MRI2030	024/019	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Tunable Dipole Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. B.
5. The VCCI Site Registration No. is R-847.
6. The FCC Site Registration No. is 92753.
7. The CANADA Site Registration No. is IC 3789-B.

5.2.4 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 10dB 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

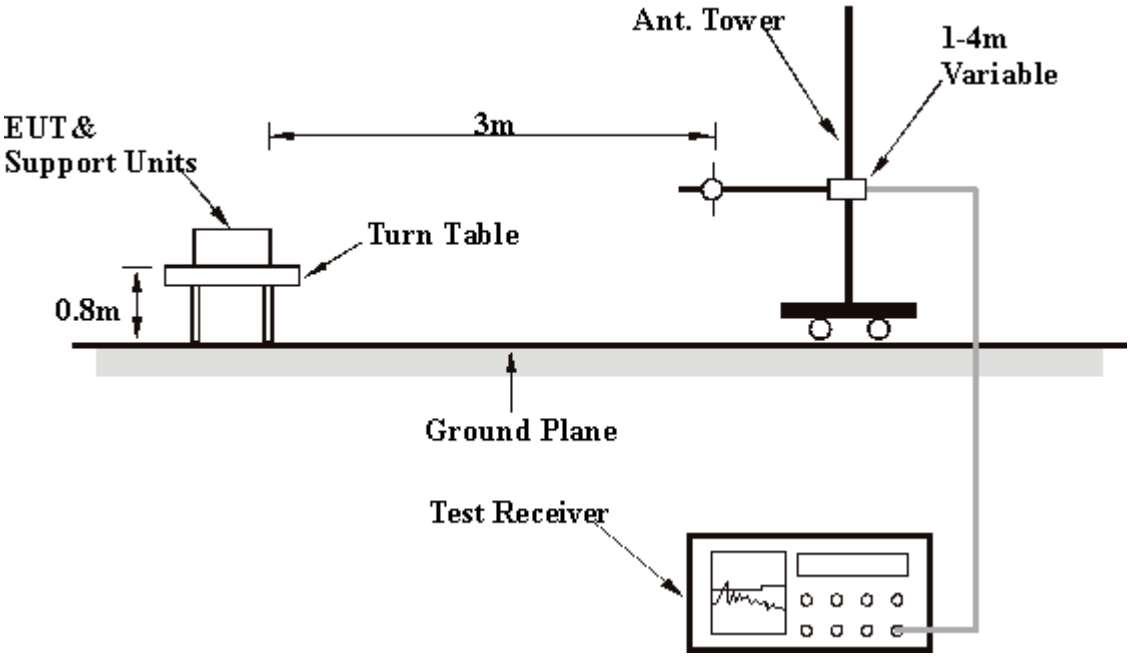
NOTE:

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.

5.2.5 DEVIATION FROM TEST STANDARD

No deviation

5.2.6 TEST SETUP



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

5.2.7 EUT OPERATING CONDITIONS

Same as 4.1.6.

5.2.8 TEST RESULTS

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
FREQUENCY RANGE	Below 1000MHz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 66%RH, 980 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TESTED BY	Tony Chen		

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)	Correction Factor (dB/m)
1	31.12	30.80 QP	40.00	-9.20	2.32 H	89	18.00	12.70
2	66.75	19.10 QP	40.00	-20.90	2.23 H	183	7.60	11.50
3	123.95	26.80 QP	43.50	-16.70	1.75 H	174	14.80	12.00
4	162.09	32.90 QP	43.50	-10.60	1.79 H	2	18.60	14.20
5	199.77	30.20 QP	43.50	-13.30	2.15 H	268	19.00	11.20
6	240.02	28.10 QP	46.00	-17.90	2.40 H	299	15.30	12.80
7	365.76	29.00 QP	46.00	-17.00	2.12 H	359	12.00	17.00
8	400.00	33.10 QP	46.00	-12.90	2.26 H	136	15.10	18.00
9	457.00	32.60 QP	46.00	-13.40	2.23 H	124	13.30	19.30
10	528.00	29.50 QP	46.00	-16.50	1.98 H	68	8.50	21.00

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)	Correction Factor (dB/m)
1	**32.55**	**34.60 QP**	**40.00**	**-5.40**	**1.02 V**	**68**	**21.90**	**12.70**
2	86.03	21.30 QP	40.00	-18.70	1.02 V	168	10.30	11.00
3	158.03	27.90 QP	43.50	-15.60	1.02 V	349	13.60	14.30
4	200.01	25.50 QP	43.50	-18.00	1.29 V	251	14.30	11.20
5	366.16	29.20 QP	46.00	-16.80	1.32 V	356	12.20	17.00
6	456.93	34.40 QP	46.00	-11.60	1.46 V	182	15.10	19.30
7	480.00	35.70 QP	46.00	-10.30	1.27 V	106	15.80	19.80
8	528.03	25.90 QP	46.00	-20.10	1.00 V	5	4.80	21.00
9	699.25	36.40 QP	46.00	-9.60	1.08 V	160	12.00	24.40
10	752.85	29.20 QP	46.00	-16.80	1.15 V	195	3.90	25.30

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

5.2.9 TEST RESULTS

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal Mode	**CHANNEL**	1
FREQUENCY RANGE	1000MHz~40000MHz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 57%RH, 980 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TESTED BY	Tony Chen		

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)	Correction Factor (dB/m)
1	#4945.00	50.10 PK	74.00	-23.90	1.38 H	1	13.30	36.80
2	#5150.00	56.40 PK	74.00	-17.60	1.63 H	325	19.30	37.00
2	#5150.00	47.10 AV	54.00	-6.90	1.63 H	325	10.00	37.00
3	*5180.00	103.70 PK			1.93 H	334	66.70	37.00
3	*5180.00	94.70 AV			1.93 H	334	57.70	37.00
4	10360.00	52.00 PK	68.30	-16.30	1.52 H	262	7.30	44.70
5	#15540.00	57.30 PK	74.00	-16.70	1.48 H	314	8.70	48.60
5	#15540.00	46.50 AV	54.00	-7.50	1.48 H	314	-2.10	48.60

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)	Correction Factor (dB/m)
1	#1006.00	38.40 PK	74.00	-35.60	1.01 V	313	12.50	25.90
2	#5150.00	52.70 PK	74.00	-21.30	1.93 V	358	15.60	37.00
2	#5150.00	43.60 AV	54.00	-10.40	1.93 V	358	6.50	37.00
3	*5180.00	99.70 PK			1.78 V	348	62.70	37.00
3	*5180.00	91.20 AV			1.78 V	348	54.20	37.00
4	10360.00	51.80 PK	68.30	-16.50	1.67 V	350	7.10	44.70
5	#15540.00	58.00 PK	74.00	-16.00	1.55 V	344	9.40	48.60
5	#15540.00	46.60 AV	54.00	-7.40	1.55 V	344	-2.00	48.60

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal Mode	**CHANNEL**	4
FREQUENCY RANGE	1000MHz~40000MHz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 57%RH, 980 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TESTED BY	Tony Chen		

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)	Correction Factor (dB/m)
1	#5026.00	50.70 PK	74.00	-23.30	1.77 H	1	13.60	37.00
2	*5240.00	102.70 PK			1.79 H	1	65.70	37.00
2	*5240.00	94.90 AV			1.79 H	1	57.80	37.00
3	10480.00	52.30 PK	68.30	-16.00	1.57 H	360	7.30	45.00
4	#15720.00	56.80 PK	74.00	-17.20	1.63 H	255	8.80	48.00
4	#15720.00	46.00 AV	54.00	-8.00	1.63 H	255	-2.00	48.00

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)	Correction Factor (dB/m)
1	#5025.00	50.50 PK	74.00	-23.50	1.58 V	0	13.50	37.00
2	*5240.00	99.40 PK			1.32 V	343	62.30	37.00
2	*5240.00	90.20 AV			1.32 V	343	53.10	37.00
3	10480.00	52.30 PK	68.30	-16.00	1.27 V	258	7.30	45.00
4	#15720.00	58.70 PK	74.00	-15.30	1.56 V	58	10.70	48.00
4	#15720.00	46.90 AV	54.00	-7.10	1.56 V	58	-1.10	48.00

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal Mode	**CHANNEL**	5
FREQUENCY RANGE	1000MHz~40000MHz	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 57%RH, 980 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TESTED BY	Tony Chen		

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)	Correction Factor (dB/m)
1	#4995.00	48.50 PK	74.00	-25.50	1.00 H	12	11.50	37.00
2	*5260.00	103.70 PK			1.80 H	337	66.70	37.00
2	*5260.00	94.70 AV			1.80 H	337	57.70	37.00
3	10520.00	52.80 PK	68.30	-15.50	1.27 H	349	7.60	45.20
4	#15780.00	58.60 PK	74.00	-15.40	1.28 H	226	10.70	47.90
4	#15780.00	47.20 AV	54.00	-6.80	1.28 H	226	-0.70	47.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5017.00	53.20 PK	74.00	-20.80	1.59 V	117	16.20	37.00
1	#5017.00	42.80 AV	54.00	-11.20	1.59 V	117	5.80	37.00
2	*5260.00	99.40 PK			1.79 V	344	62.30	37.00
2	*5260.00	90.50 AV			1.79 V	344	53.50	37.00
3	10520.00	52.70 PK	68.30	-15.60	1.27 V	360	7.50	45.20
4	#15780.00	57.80 PK	74.00	-16.20	1.47 V	317	9.90	47.90
4	#15780.00	47.00 AV	54.00	-7.00	1.47 V	317	-0.90	47.90

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal Mode	**CHANNEL**	8
FREQUENCY RANGE	1000MHz~40000MHz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 57%RH, 980 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TESTED BY	Tony Chen		

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)	Correction Factor (dB/m)
1	#5032.00	52.00 PK	74.00	-22.00	1.40 H	334	14.90	37.00
1	#5032.00	41.60 AV	54.00	-12.40	1.40 H	334	4.60	37.00
2	*5320.00	102.90 PK			2.26 H	330	65.80	37.00
2	*5320.00	93.90 AV			2.26 H	330	56.80	37.00
3	#5350.00	54.90 PK	74.00	-19.10	2.21 H	210	17.80	37.00
3	#5350.00	45.90 AV	54.00	-8.10	2.21 H	210	8.90	37.00
4	#10640.00	53.70 PK	74.00	-20.30	1.07 H	236	7.40	46.30
4	#10640.00	42.30 AV	54.00	-11.70	1.07 H	236	-4.00	46.30
5	#15960.00	57.30 PK	74.00	-16.70	1.42 H	201	10.00	47.30
5	#15960.00	46.30 AV	54.00	-7.70	1.42 H	201	-1.00	47.30

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)	Correction Factor (dB/m)
1	#5086.00	50.80 PK	74.00	-23.20	1.23 V	342	13.80	37.00
2	*5320.00	100.00 PK			1.29 V	343	63.00	37.00
2	*5320.00	91.40 AV			1.29 V	343	54.30	37.00
3	#5350.00	52.40 PK	74.00	-21.60	1.27 V	224	15.30	37.00
3	#5350.00	43.90 AV	54.00	-10.10	1.27 V	224	6.90	37.00
4	#10640.00	52.80 PK	74.00	-21.20	1.24 V	256	6.50	46.30
4	#10640.00	42.60 AV	54.00	-11.40	1.24 V	256	-3.70	46.30
5	#15960.00	58.60 PK	74.00	-15.40	1.28 V	223	11.30	47.30
5	#15960.00	47.10 AV	54.00	-6.90	1.28 V	223	-0.20	47.30

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal Mode	**CHANNEL**	9
FREQUENCY RANGE	1000MHz~40000MHz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 57%RH, 980 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TESTED BY	Tony Chen		

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)	Correction Factor (dB/m)
1	5715.00	52.30 PK	68.3	-16.00	1.82 H	317	14.80	37.50
2	5725.00	60.00 PK	78.3	-18.30	1.83 H	316	22.50	37.50
3	*5745.00	103.20 PK			1.88 H	327	65.70	37.60
3	*5745.00	94.40 AV			1.88 H	327	56.80	37.60
4	#11490.00	51.70 PK	74.00	-22.30	1.56 H	360	0.40	51.30
4	#11490.00	40.60 AV	54.00	-13.40	1.56 H	360	-10.70	51.30
5	17235.00	57.20 PK	68.30	-11.10	1.52 H	114	5.50	51.70

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)	Correction Factor (dB/m)
1	5715.00	48.20 PK	68.3	-20.10	1.47 V	111	10.70	37.50
2	5725.00	54.90 PK	78.3	23.40	1.46 V	116	17.30	37.50
3	*5745.00	97.90 PK			1.47 V	118	60.30	37.60
3	*5745.00	89.10 AV			1.47 V	118	51.50	37.60
4	#11490.00	53.80 PK	74.00	-20.20	1.28 V	254	2.50	51.30
4	#11490.00	43.10 AV	54.00	-10.90	1.28 V	254	-8.20	51.30
5	17235.00	57.60 PK	68.30	-10.70	1.29 V	222	5.90	51.70

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal Mode	**CHANNEL**	12
FREQUENCY RANGE	1000MHz~40000MHz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	27 deg. C, 57%RH, 980 hPa	**INPUT POWER (SYSTEM)**	120Vac, 60Hz
TESTED BY	Tony Chen		

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)	Correction Factor (dB/m)
1	*5805.00	101.40 PK			1.87 H	334	63.70	37.70
1	*5805.00	93.40 AV			1.87 H	334	55.70	37.70
2	5825.00	57.20 PK	78.30	-21.10	1.85 H	320	19.50	37.70
3	5835.00	51.40 PK	68.30	-16.90	1.86 H	320	13.70	37.70
4	#11610.00	52.70 PK	74.00	-21.30	1.57 H	354	1.70	51.00
4	#11610.00	41.80 AV	54.00	-12.20	1.57 H	354	-9.20	51.00
5	17415.00	58.20 PK	68.30	-10.10	1.50 H	230	4.60	53.60

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)	Correction Factor (dB/m)
1	*5805.00	98.40 PK			1.33 V	123	60.70	37.70
1	*5805.00	89.70 AV			1.33 V	123	52.00	37.70
2	5825.00	50.10 PK	78.30	-28.20	1.33 V	121	12.30	37.70
3	5835.00	45.70 PK	68.30	-22.60	1.32 V	120	8.00	37.70
4	#11610.00	52.80 PK	74.00	-21.20	1.29 V	258	1.80	51.00
4	#11610.00	42.50 AV	54.00	-11.50	1.29 V	258	-8.50	51.00
5	17415.00	58.70 PK	68.30	-9.60	1.54 V	236	5.10	53.60

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “*” : Fundamental frequency
6. “# “ : The radiated frequency falling in the restricted band.

5.3 PEAK TRANSMIT POWER MEASUREMENT

5.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35 GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825 GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

Note: Where B is the 26dB emission bandwidth in MHz.

5.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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

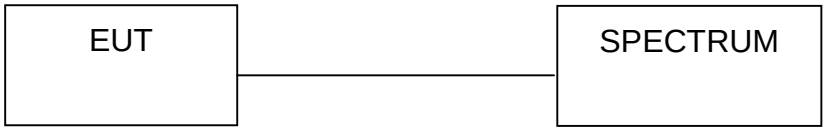
5.3.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth of the signal.
3. Set RBW to 1MHz, VBW to 30kHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

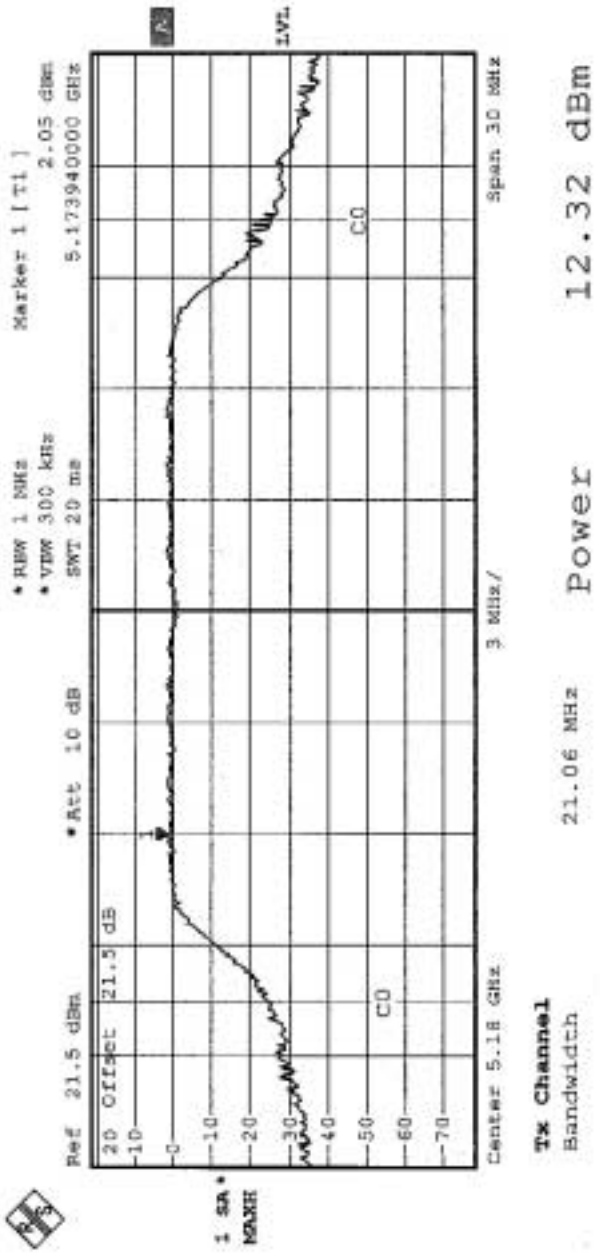
5.3.7 TEST RESULTS

EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	28eg. C, 56RH, 980 hPa	**TESTED BY**	Tony Chen

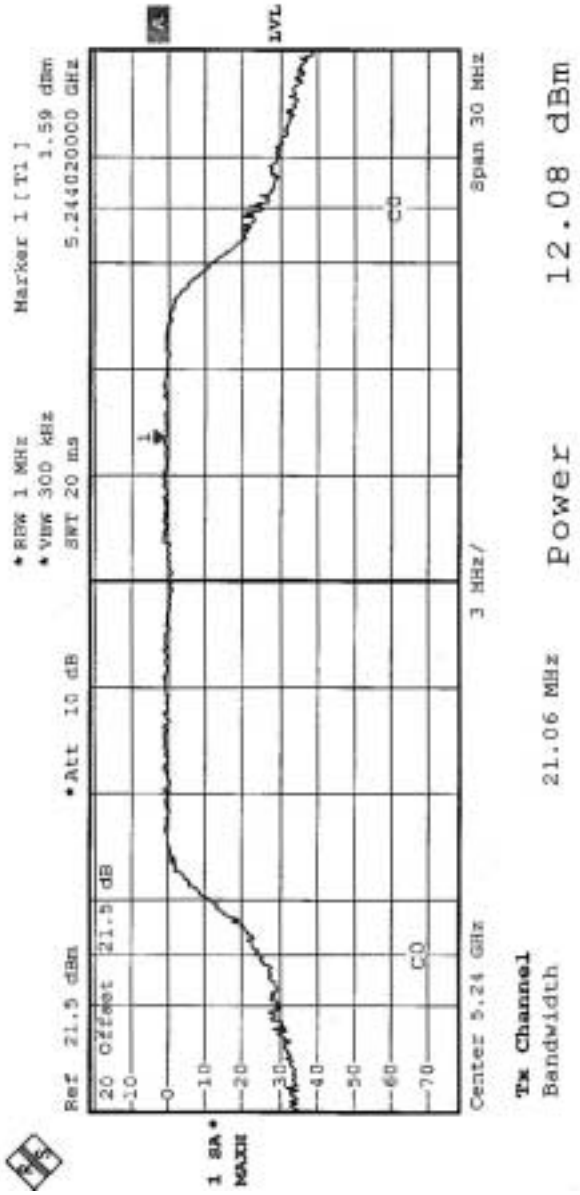
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	12.32	17.00	21.06	PASS
4	5240	12.08	17.00	21.06	PASS
5	5260	12.13	24.00	20.94	PASS
8	5320	12.07	24.00	21.00	PASS
9	5745	12.09	30.00	20.94	PASS
12	5805	12.11	30.00	20.94	PASS

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

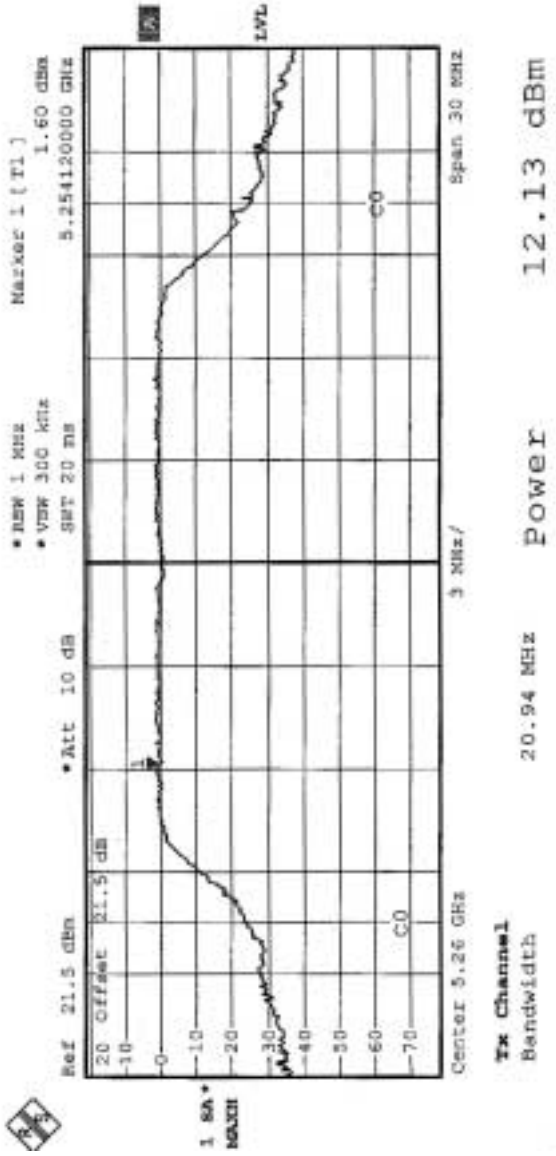
CHANNEL 1


Ref 21.5 dBm
20 Offset 21.5 dB
10
0
-10
-20
-30
-40
-50
-60
-70
1 SA
MAXH
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1]
2.05 dBm
5.173940000 GHz
Center 5.18 GHz
3 MHz/
Span 30 MHz
CO
CO
Tx Channel
Bandwidth
21.06 MHz
Power
12.32 dBm

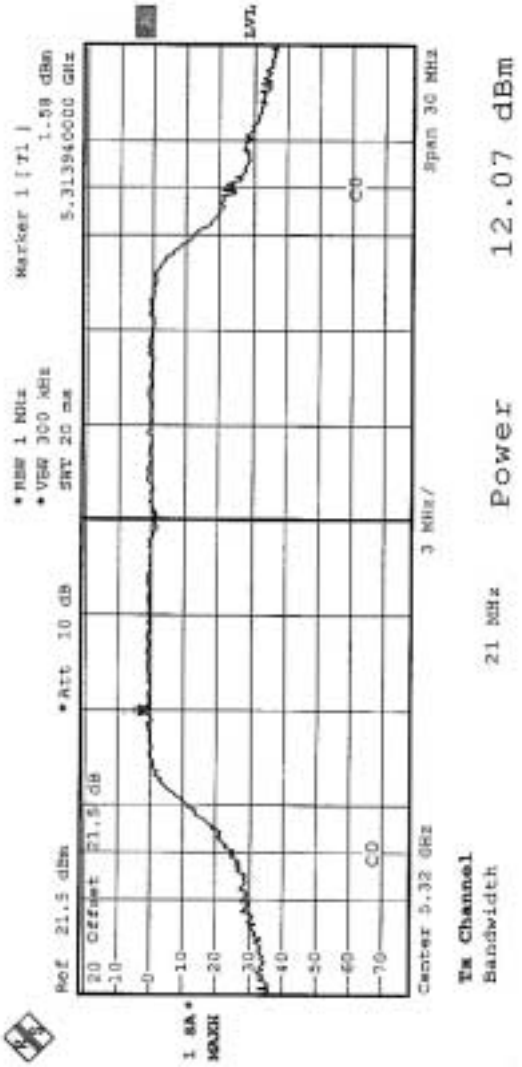
CHANNEL 4


Ref 21.5 dBm
Offset 21.5 dB
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1]
1.59 dBm
5.24402000 GHz
1 SA
MAXH
LVL
Center 5.24 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
21.06 MHz
Power
12.08 dBm

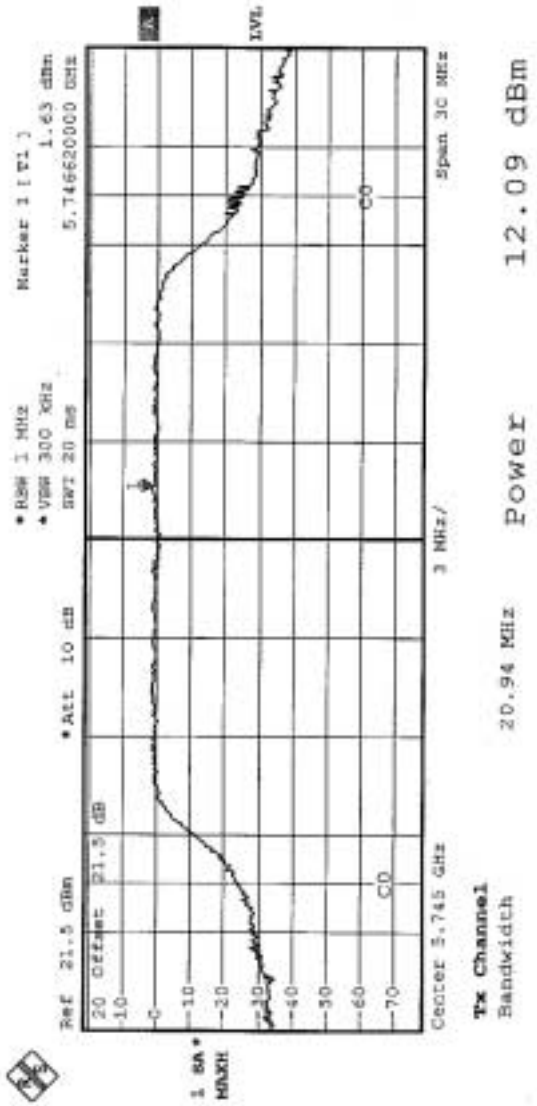
CHANNEL 5


Ref 21.5 dBm
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1]
1.60 dBm
5.254120000 GHz
Center 5.26 GHz
Span 30 MHz
Tx Channel
Bandwidth
20.94 MHz
Power
12.13 dBm

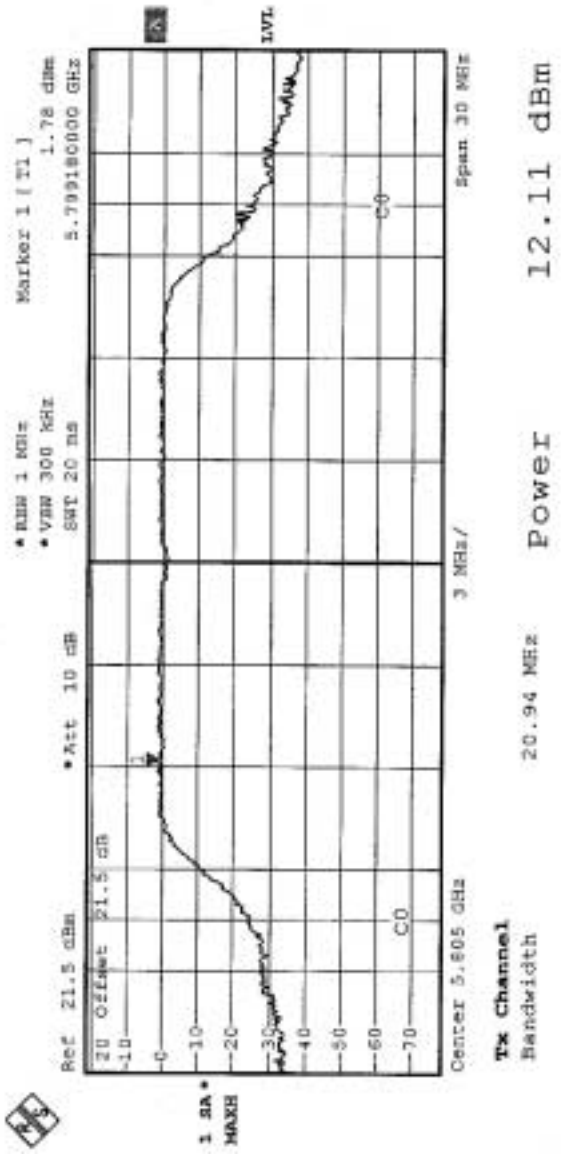
CHANNEL 8


Ref 21.5 dBm
Offset 21.5 dB
* Att 10 dB
* RBW 1 MHz
* VBW 300 kHz
SWT 20 ms
Marker 1 [T1]
1.58 dBm
5.313940000 GHz
Center 5.32 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
21 MHz
Power
12.07 dBm

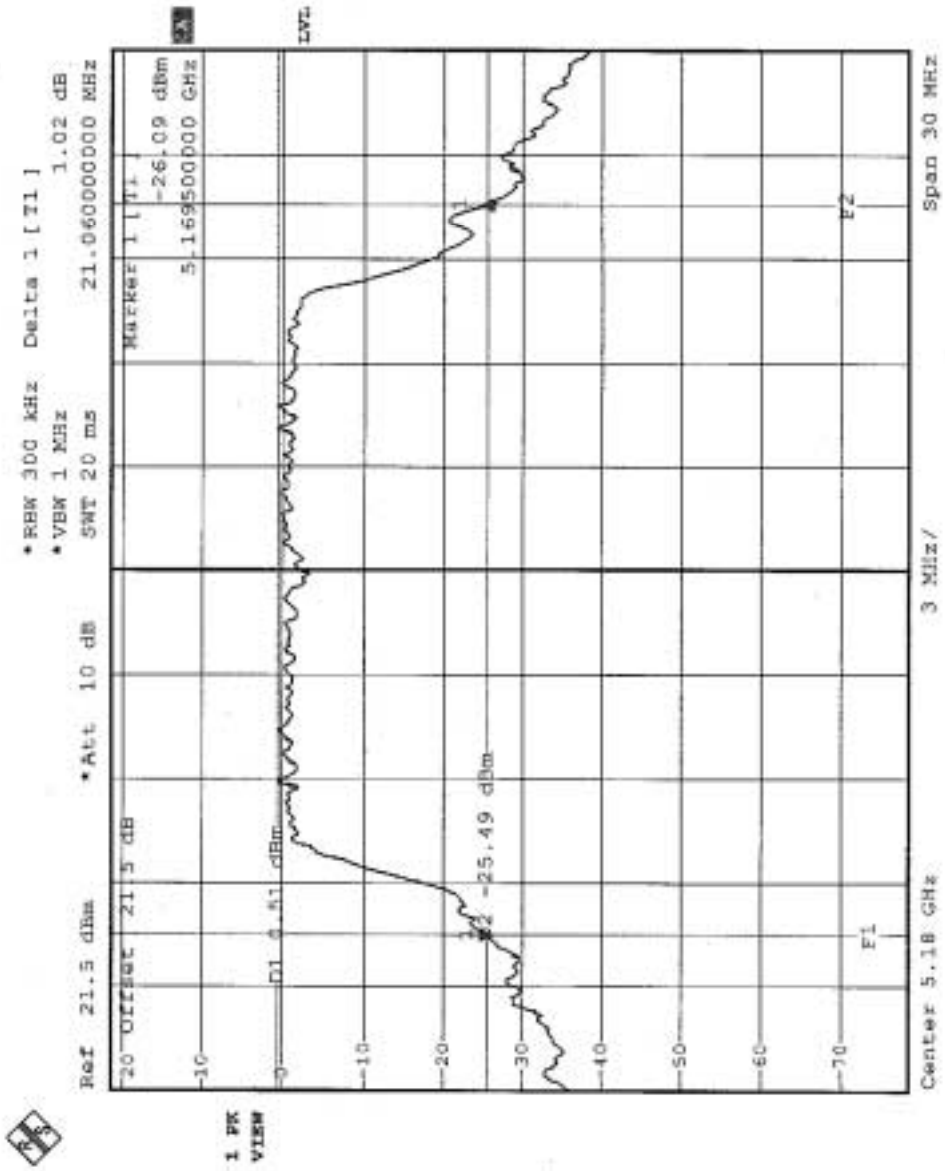
CHANNEL 9


Ref 21.5 dBm
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1]
1.63 dBm
5.746620000 GHz
Center 5.745 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
20.94 MHz
Power
12.09 dBm

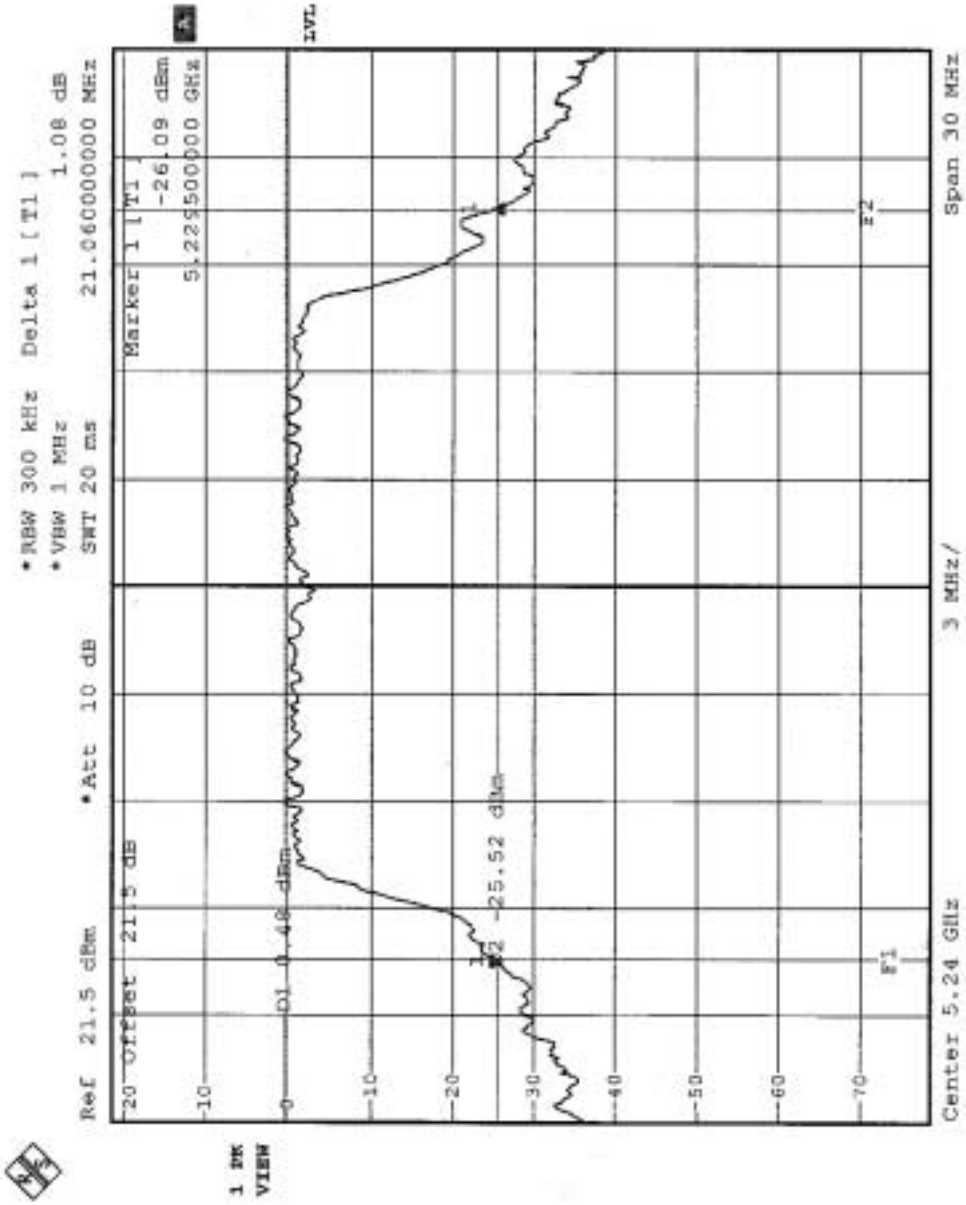
CHANNEL 12


Ref 21.5 dBm
Att 10 dB
RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Marker 1 [T1]
1.78 dBm
5.79980000 GHz
Center 5.805 GHz
3 MHz/
Span 30 MHz
Tx Channel
Bandwidth
20.94 MHz
Power
12.11 dBm

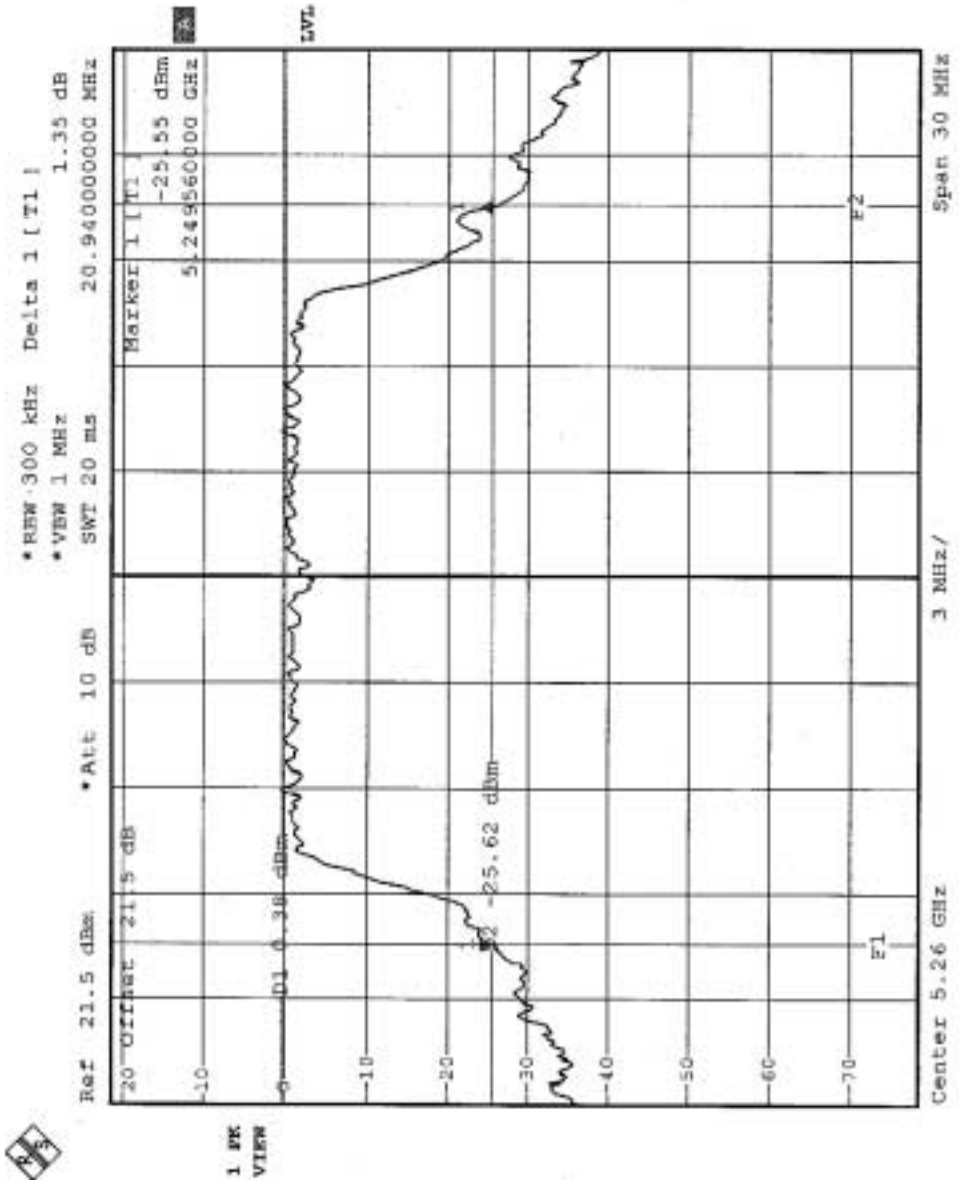
CHANNEL 1


Ref 21.5 dBm
Offset 21.5 dB
D1 0.51 dBm
*Att 10 dB
*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
1.02 dB
21.06000000 MHz
Marker 1 [T1]
-26.09 dBm
5.169500000 GHz
-25.49 dBm
1 PK
VIEW
Center 5.18 GHz
3 MHz/
Span 30 MHz

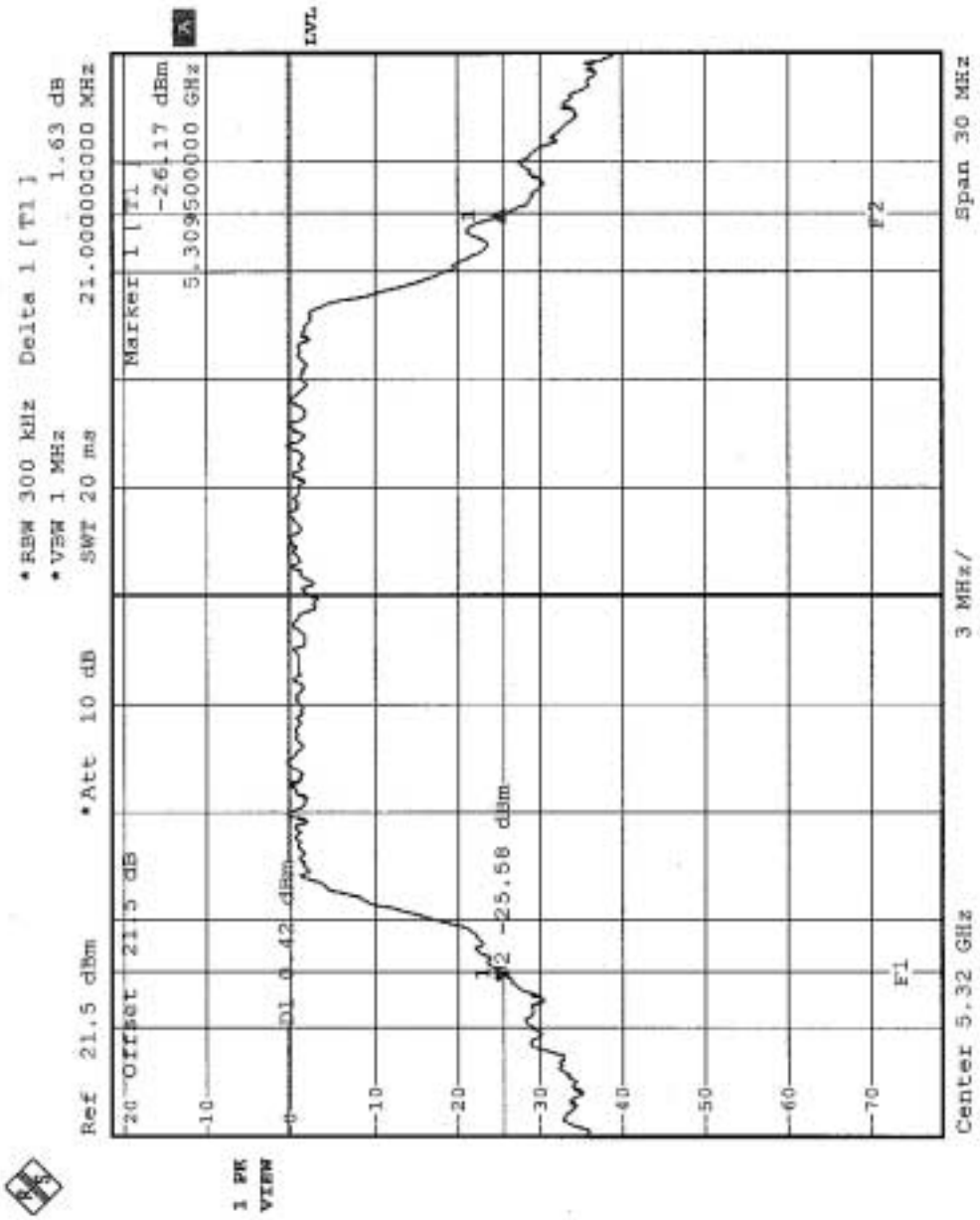
CHANNEL 4


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
1.08 dB
21.060000000 MHz
Marker 1 [T1]
-26.09 dBm
5.229500000 GHz
D1 0.48 dBm
-25.52 dBm
1 PK
VIEW
Center 5.24 GHz
3 MHz/
Span 30 MHz

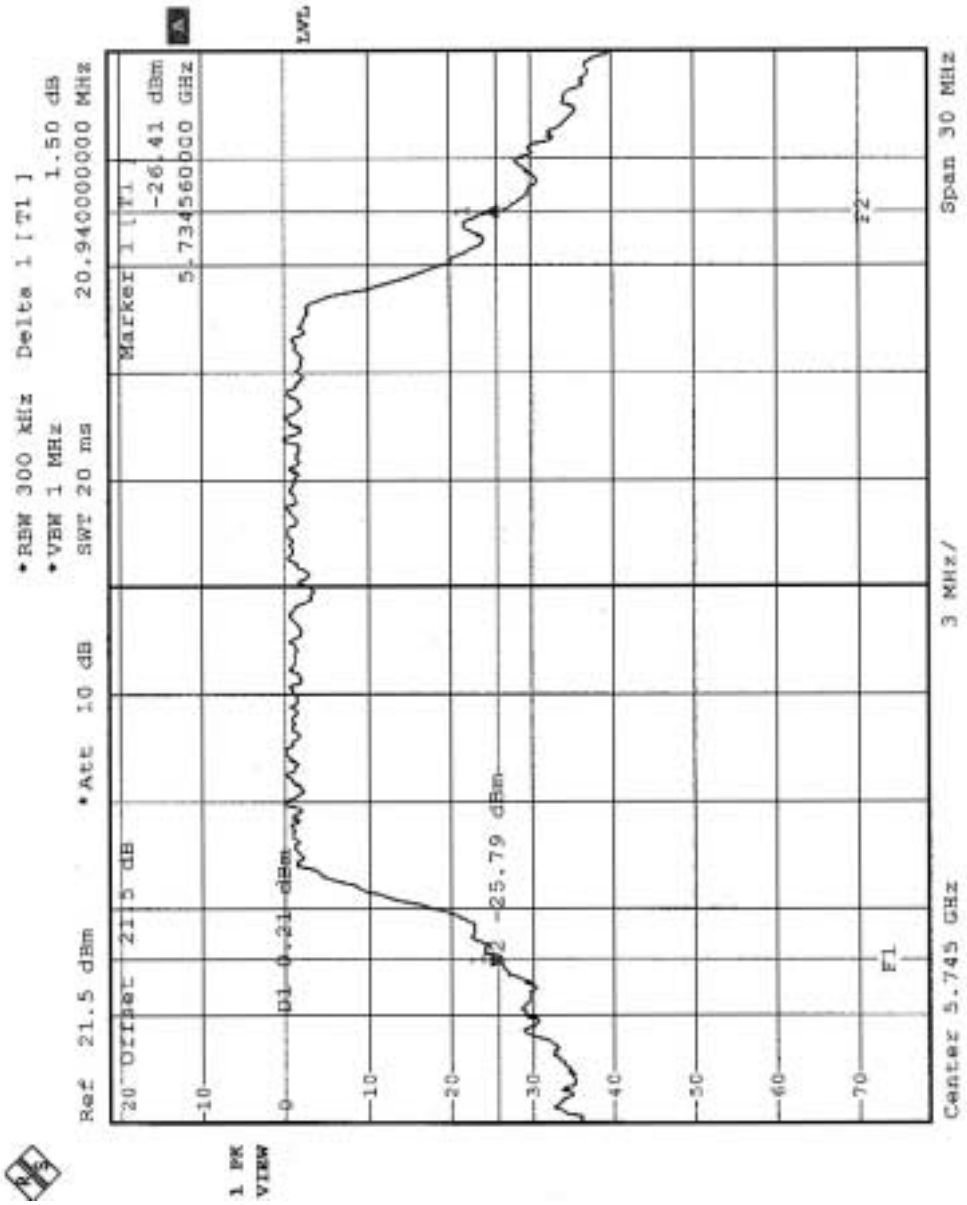
CHANNEL 5


Ref 21.5 dBm
Offset 21.5 dB
D1 0.38 dBm
* Att 10 dB
* RBW 300 kHz
* VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
1.35 dB
20.94000000 MHz
Marker 1 [T1]
-25.55 dBm
5.24956000 GHz
-25.62 dBm
1 PK
VIEW
Center 5.26 GHz
3 MHz/
Span 30 MHz

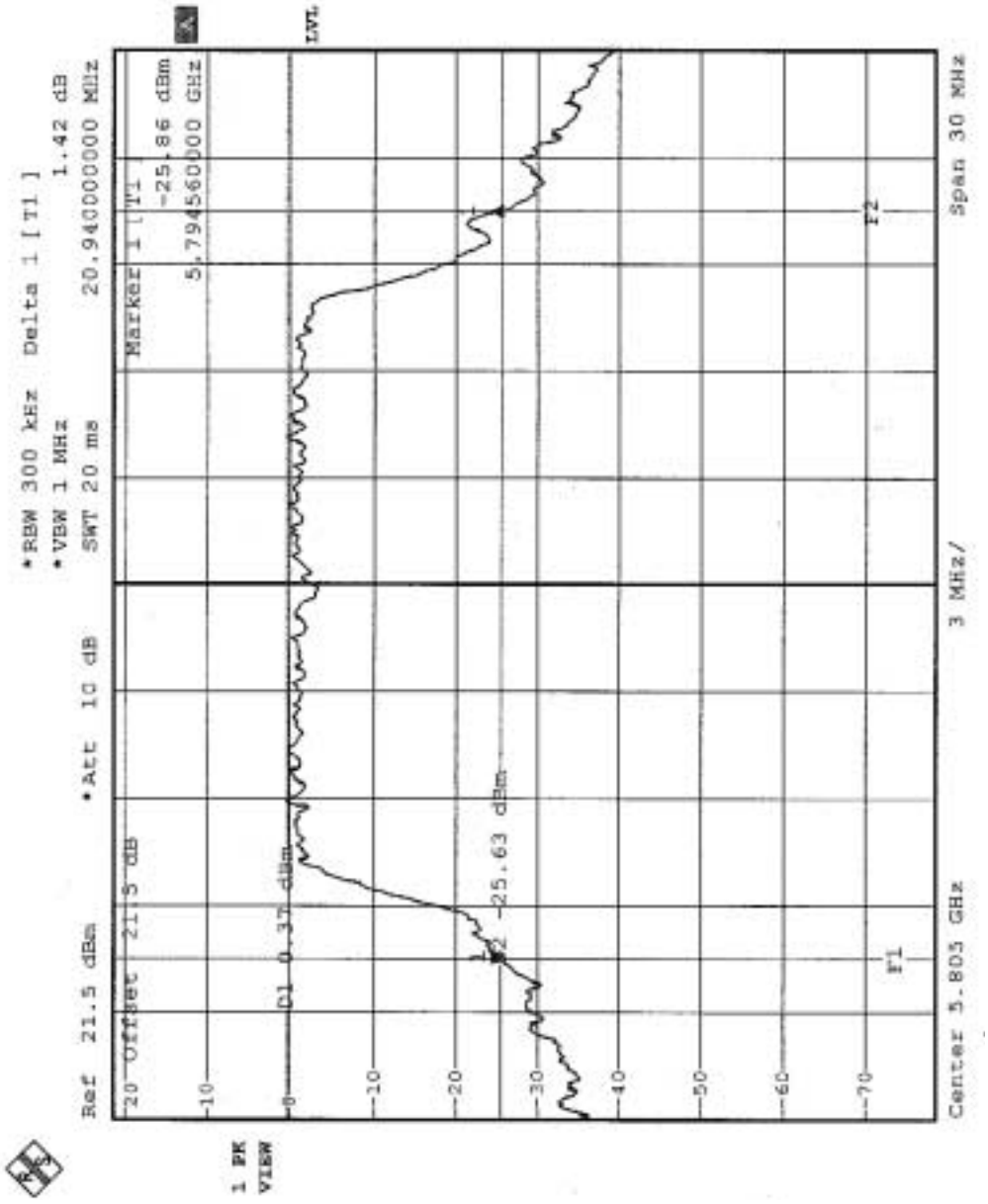
CHANNEL 8


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
1.63 dB
21.00000000 MHz
Marker 1 [T1]
-26.17 dBm
5.309500000 GHz
D1 0.42 dBm
-25.58 dBm
LVL
1 PK
VIEW
Center 5.32 GHz
3 MHz/
Span 30 MHz

CHANNEL9


Ref 21.5 dBm
Offset 21.5 dB
Att 10 dB
RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
1.50 dB
20.94000000 MHz
Marker 1 [T1]
-26.41 dBm
5.734560000 GHz
D1 0.21 dBm
D2 -25.79 dBm
LVL
Center 5.745 GHz
3 MHz/
Span 30 MHz
1 PK
VIEW

CHANNEL 12


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
1.42 dB
20.940000000 MHz
Marker 1 [T1]
-25.86 dBm
5.794560000 GHz
D1 0.37 dBm
-25.63 dBm
F1
F2
Center 5.805 GHz
3 MHz/
Span 30 MHz
1 PK
VIEW
LVL

5.4 PEAK POWER EXCURSION MEASUREMENT

5.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	13dB
5.25 – 5.35 GHz	13dB
5.725 – 5.825 GHz	13dB

5.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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

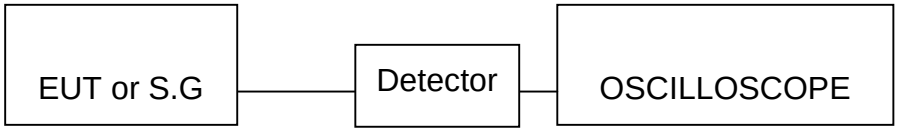
5.4.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set the spectrum bandwidth span to view the entire spectrum.
3. Using peak detector and Max-hold function for Trace 1 (RB=1MHz, VB=3MHz) and 2 (RB=1MHz, VB=30KHz).
4. The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

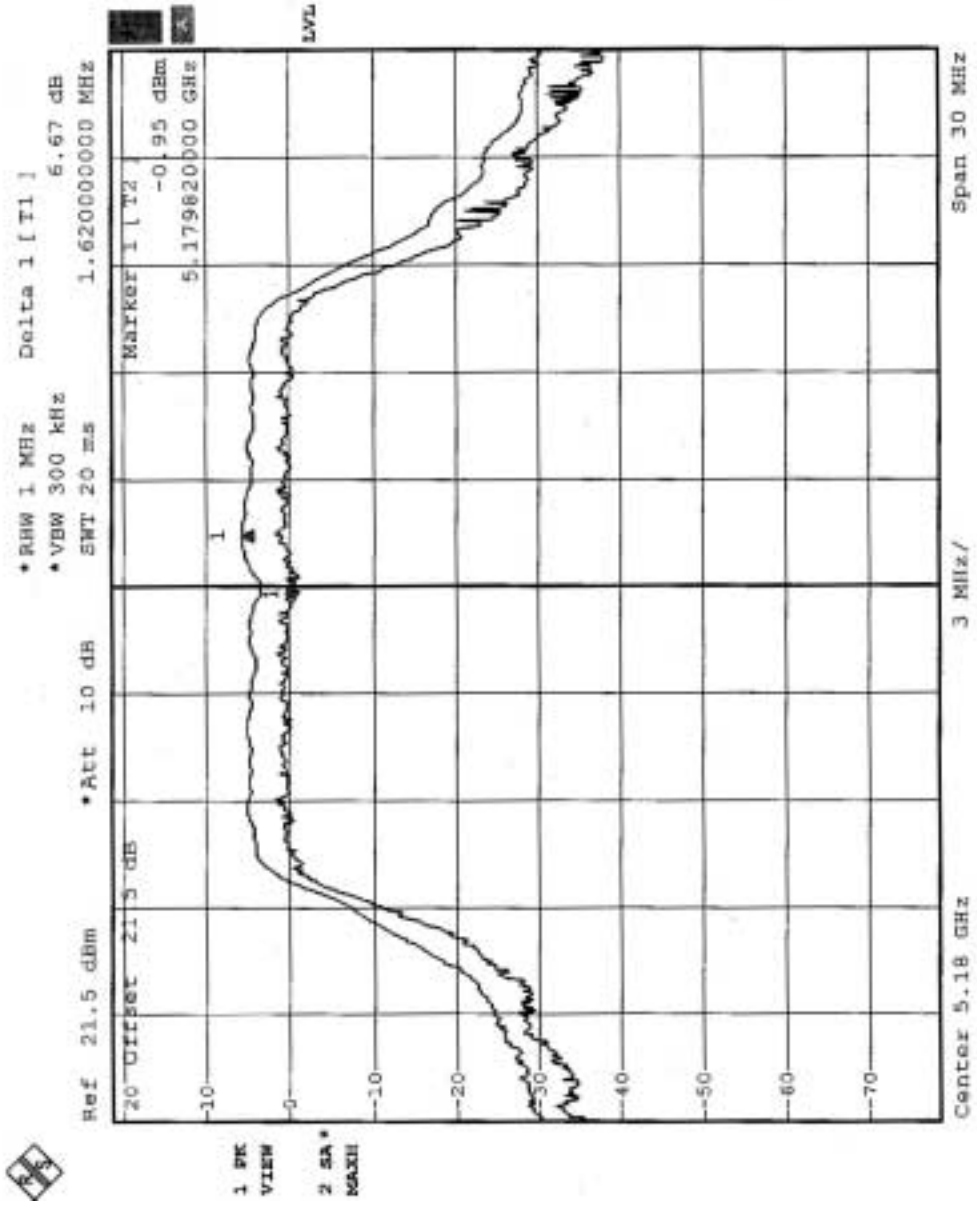
The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

5.4.7 TEST RESULTS

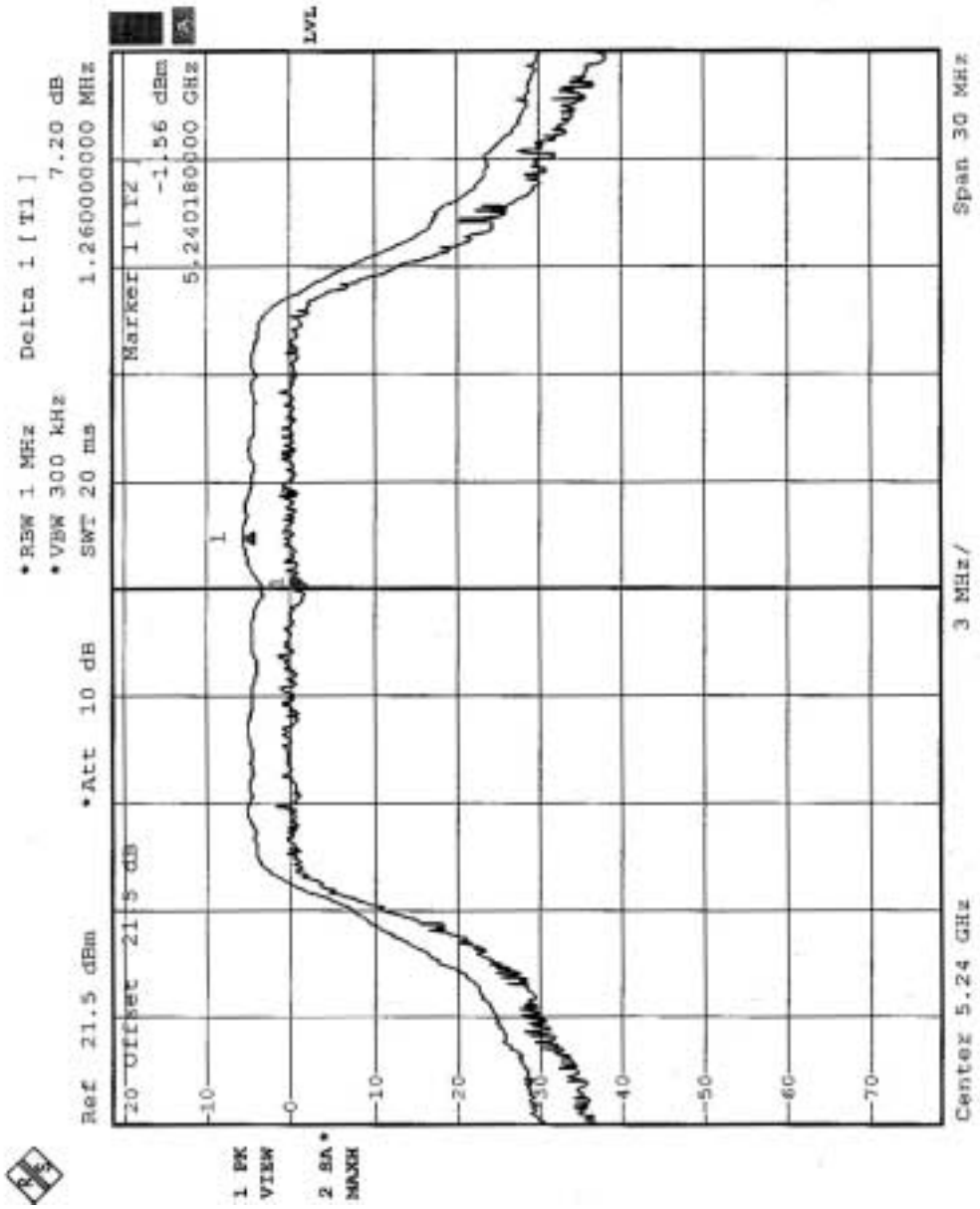
EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	27eg. C, 58RH, 980 hPa	**TESTED BY**	Tony Chen

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	6.67	13	PASS
4	5240	7.20	13	PASS
5	5260	7.71	13	PASS
8	5320	7.89	13	PASS
9	5745	7.35	13	PASS
12	5805	6.99	13	PASS

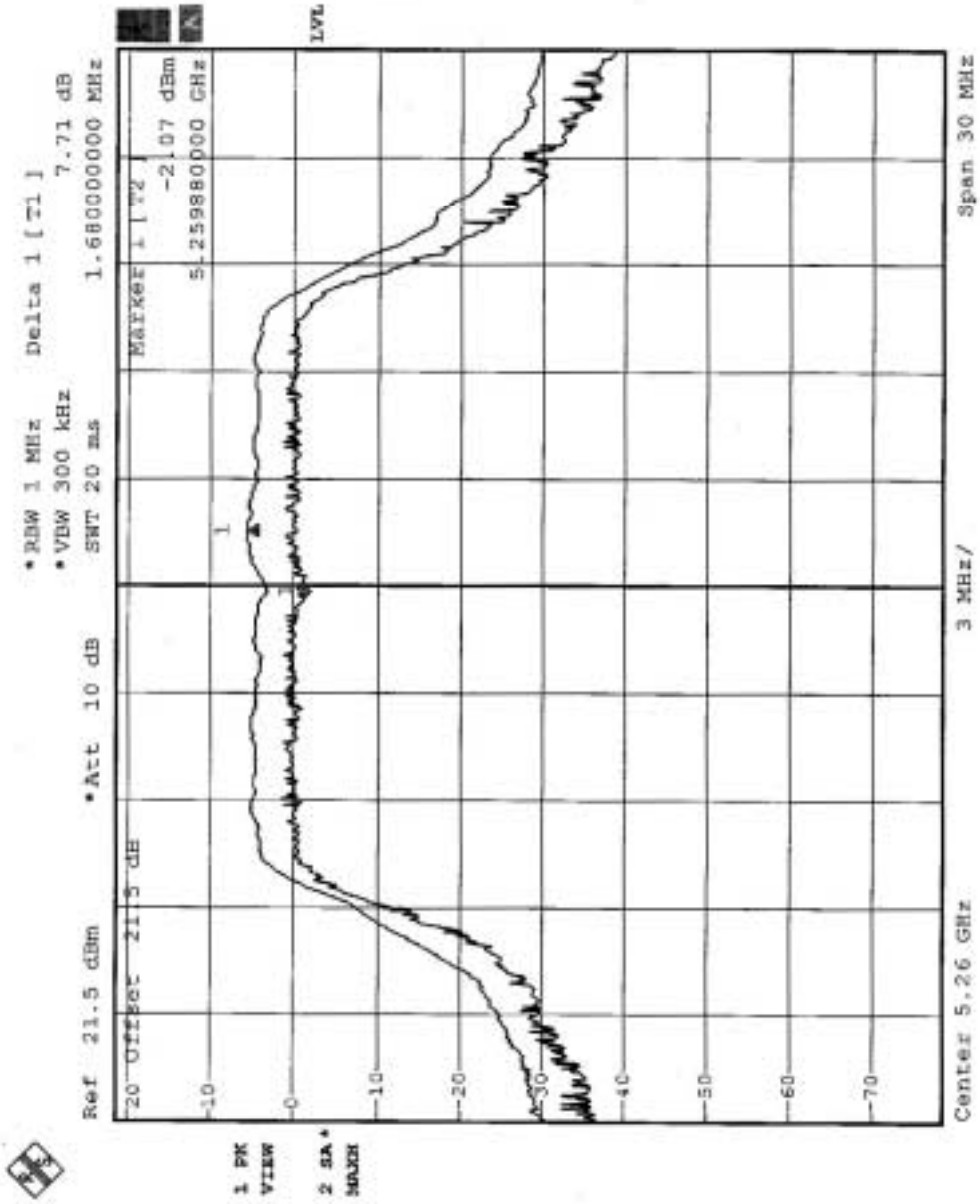
CHANNEL 1


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
6.67 dB
1.620000000 MHz
Marker 1 [T2]
-0.95 dBm
5.179820000 GHz
LVL
1 PK VIEW
2 SA * MAXH
Center 5.18 GHz
3 MHz/
Span 30 MHz

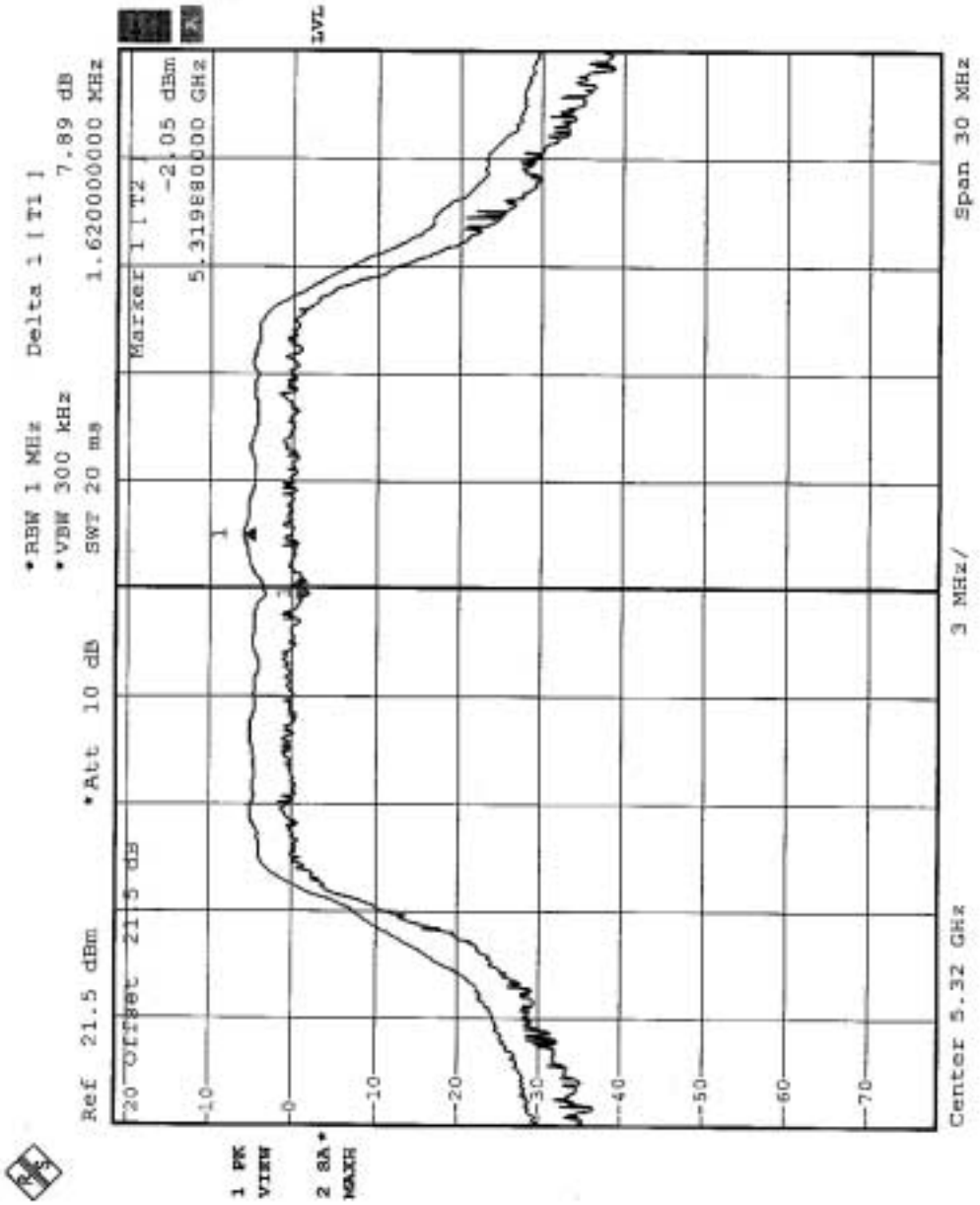
CHANNEL 4


Ref 21.5 dBm
Offset 21.5 dB
•Att 10 dB
•RBW 1 MHz
•VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
7.20 dB
1.260000000 MHz
Marker 1 [T2]
-1.56 dBm
5.240180000 GHz
LVL
1 PK VIEW
2 SA* MAXH
Center 5.24 GHz
3 MHz/
Span 30 MHz

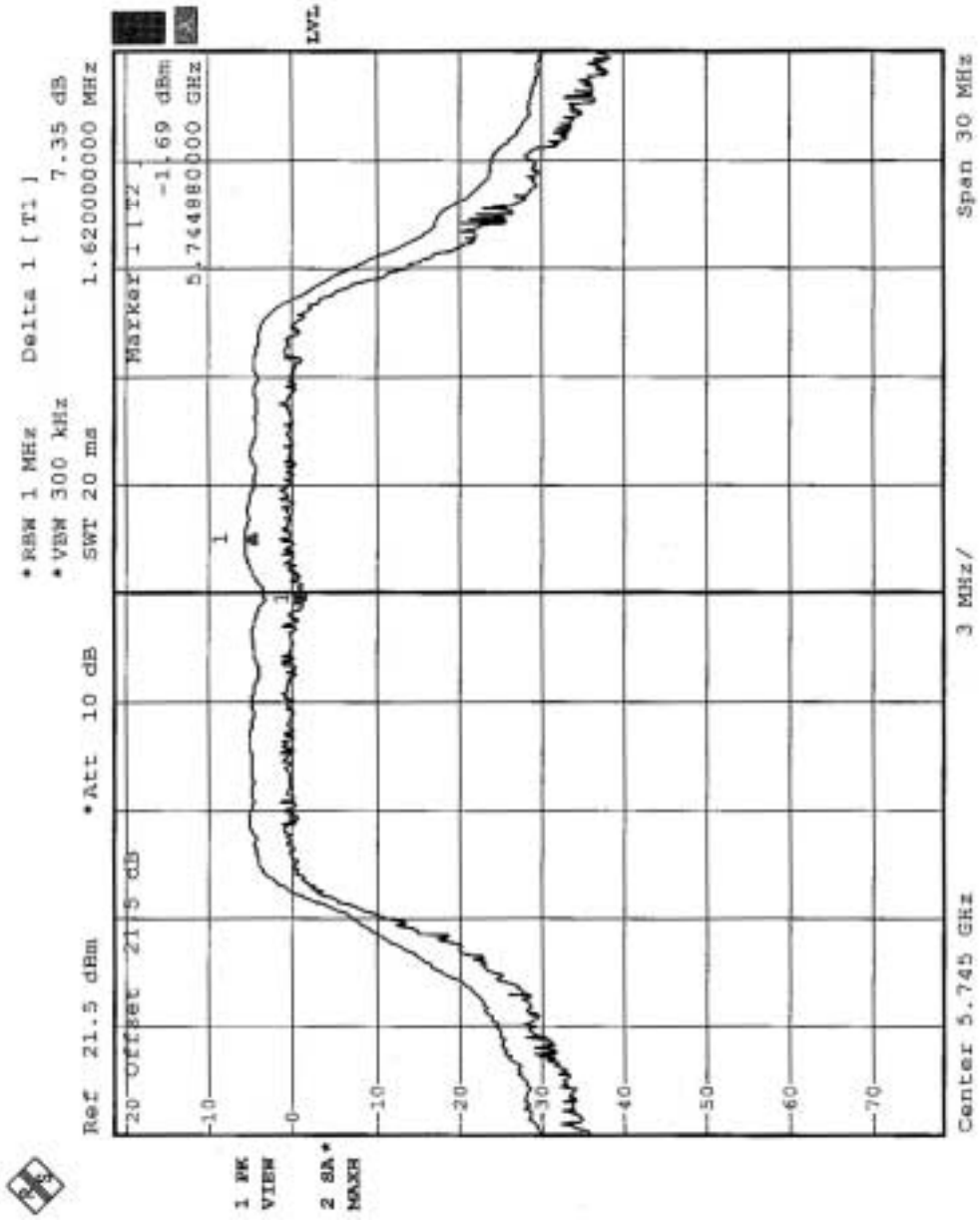
CHANNEL 5


Ref 21.5 dBm
Offset 21.5 dB
•Att 10 dB
•RBW 1 MHz
•VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
7.71 dB
1.68000000 MHz
Marker 1 [T2]
-2.07 dBm
5.259880000 GHz
1 PK VIEW
2 SA* MAXH
LVL
Center 5.26 GHz
3 MHz/
Span 30 MHz

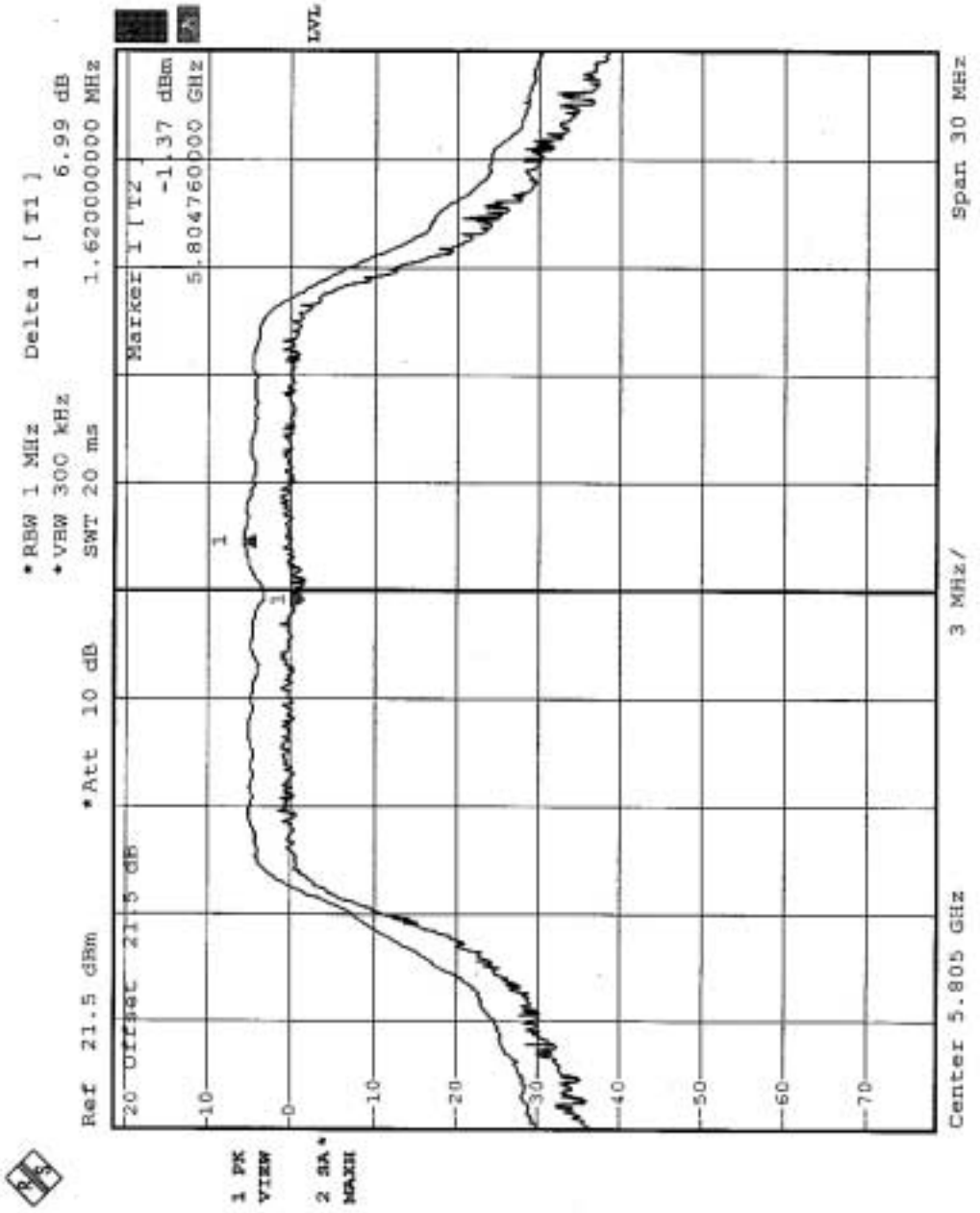
CHANNEL 8


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
7.89 dB
1.620000000 MHz
Marker 1 [T2]
-2.05 dBm
5.319880000 GHz
1 PK VIEW
2 SA* MAXH
Center 5.32 GHz
3 MHz/
Span 30 MHz

CHANNEL 9


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
7.35 dB
1.62000000 MHz
Marker 1 [T2]
-1.69 dBm
5.74480000 GHz
1 PK VIEW
2 SA* MAXH
Center 5.745 GHz
3 MHz/
Span 30 MHz

CHANNEL 12


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
6.99 dB
1.62000000 MHz
Marker 1 [T2]
-1.37 dBm
5.80476000 GHz
1 PK VIEW
2 SA* MAXH
LVL
Center 5.805 GHz
3 MHz/
Span 30 MHz

5.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	4dBm
5.25 – 5.35 GHz	11dBm
5.725 – 5.825 GHz	17dBm

5.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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

5.5.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer.
2. Set RBW=1MHz, VBW=3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP

5.5.6 EUT OPERATING CONDITIONS

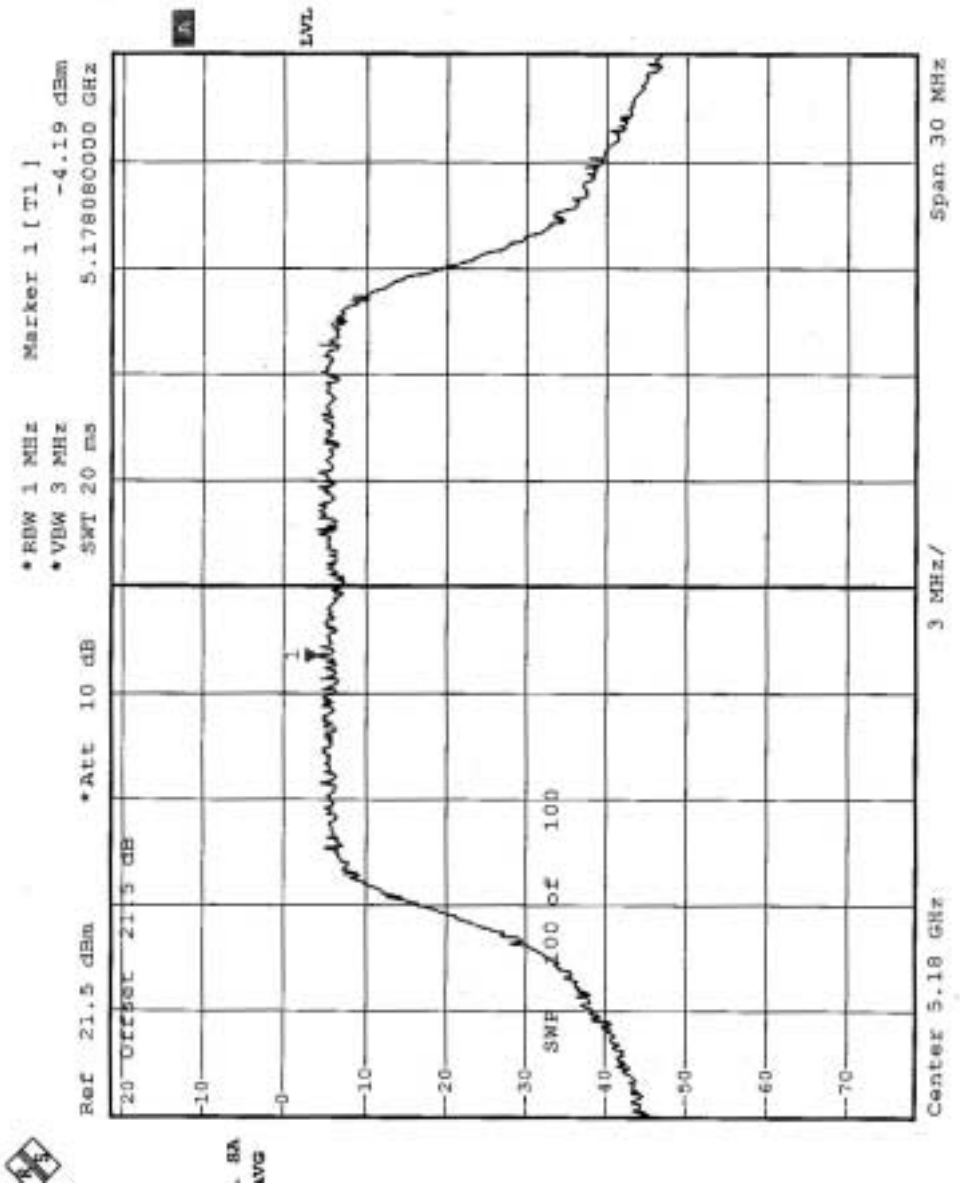
Same as 5.3.6

5.5.7 TEST RESULTS

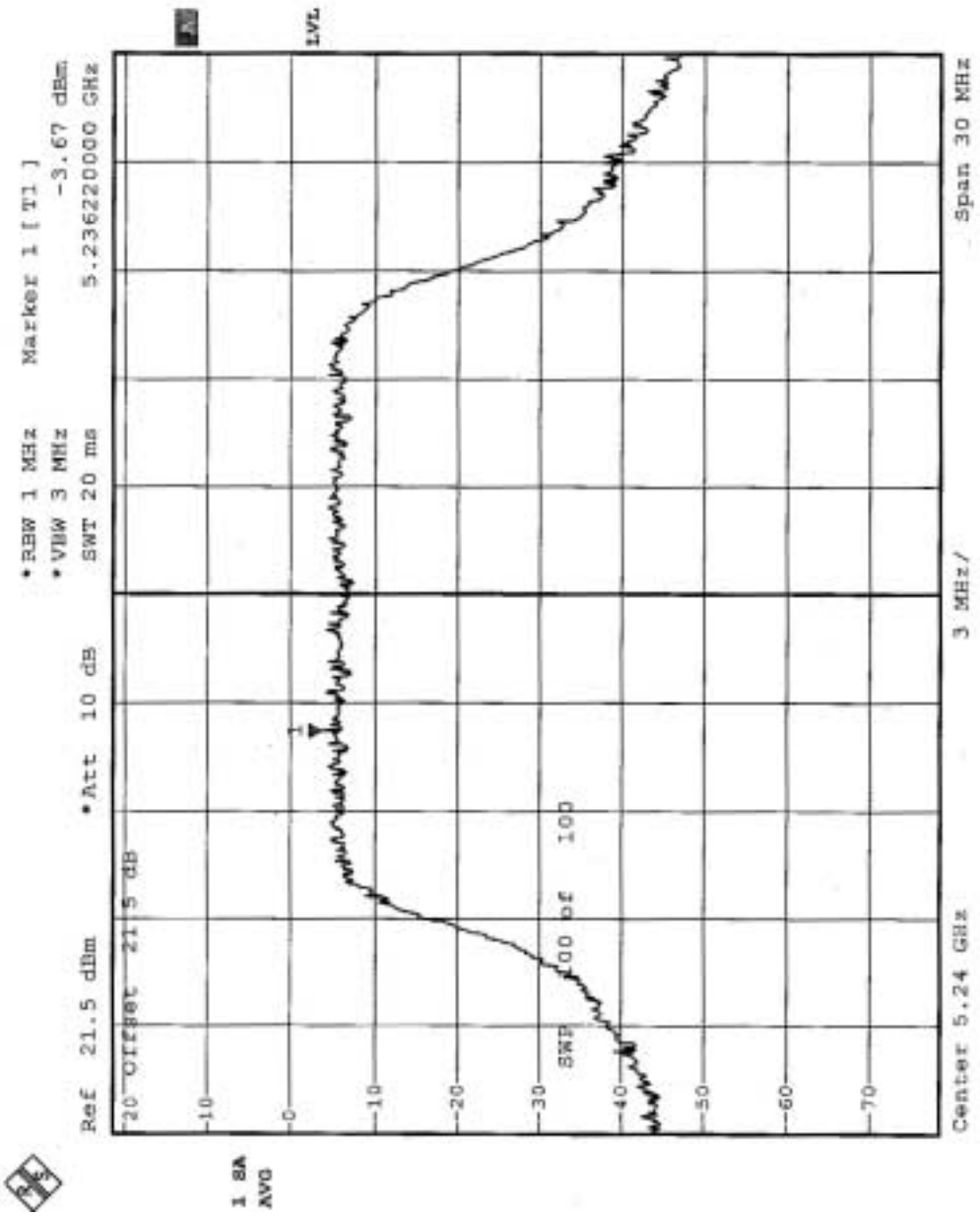
EUT	Symbol Wireless Networker 802.11a/g CardBus Adapter	**MODEL**	LA-5030
MODE	Normal	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	28eg. C, 56RH, 980 hPa	**TESTED BY**	Tony Chen

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1 MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-4.19	4	PASS
4	5240	-3.67	4	PASS
5	5260	-5.47	11	PASS
8	5320	-4.65	11	PASS
9	5745	-3.74	17	PASS
12	5805	-4.05	17	PASS

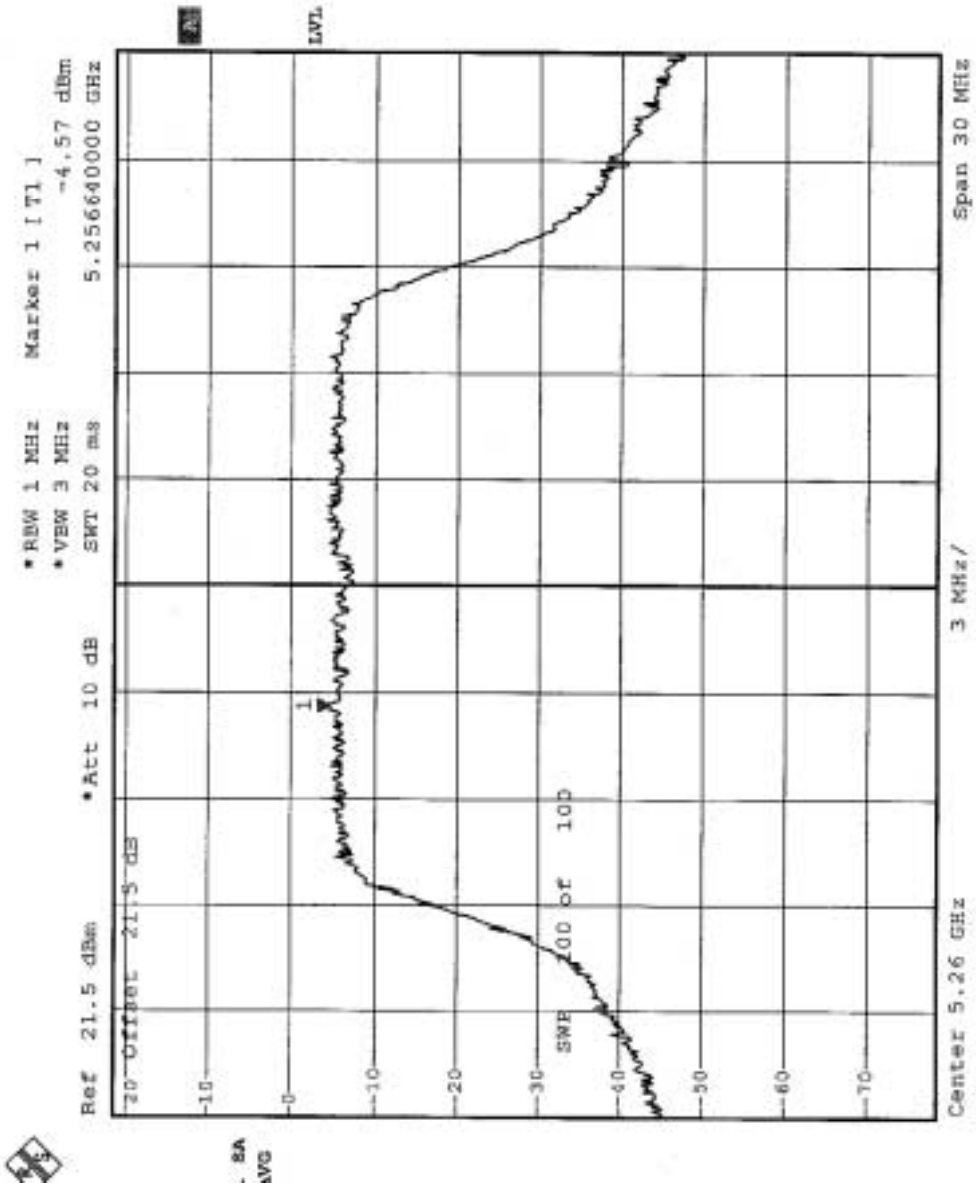
CHANNEL 1


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-4.19 dBm
5.17808000 GHz
LVL
SWP 100 of 100
Center 5.18 GHz
3 MHz/
Span 30 MHz

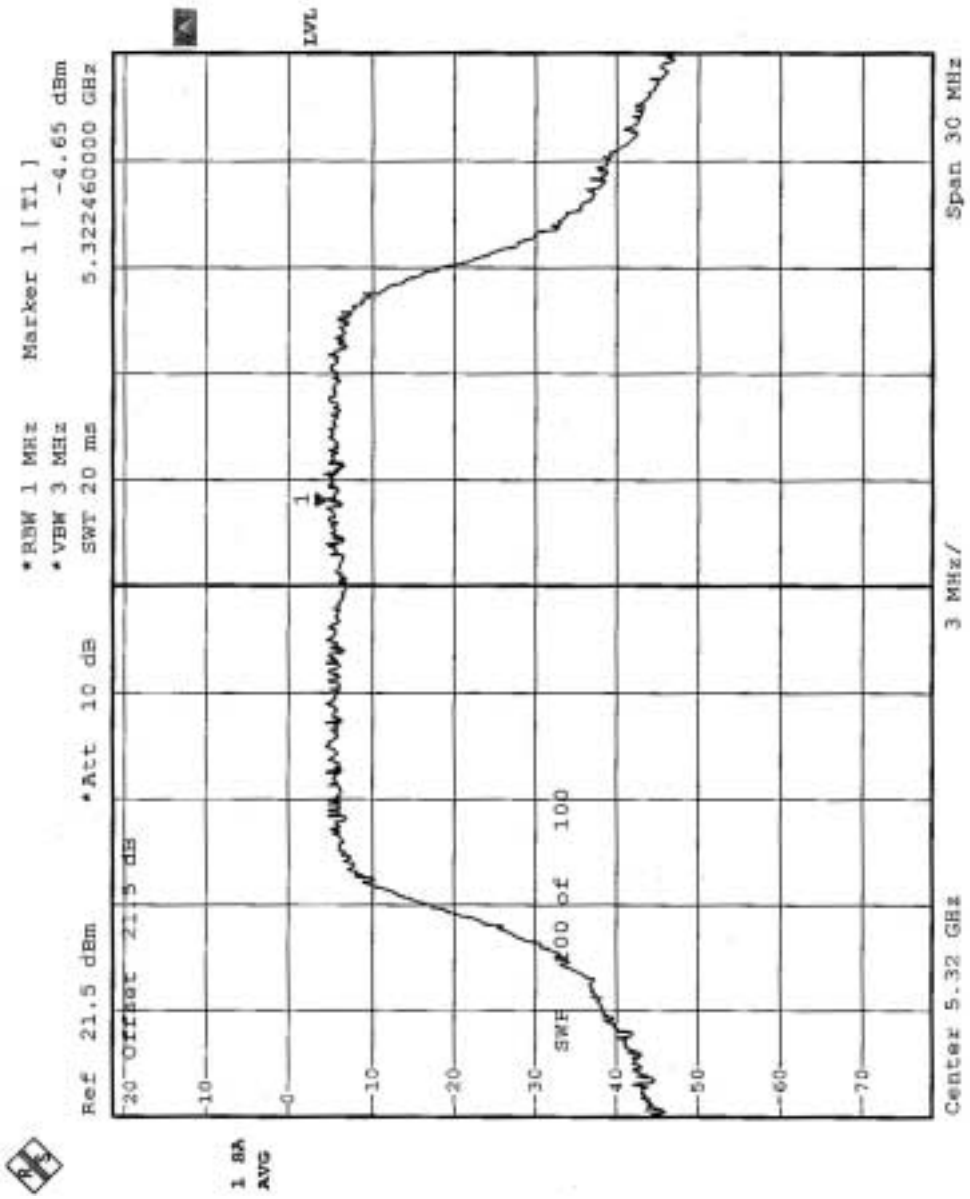
CHANNEL 4


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-3.67 dBm
5.23622000 GHz
1 SA
AVG
LVL
SWP 100 of 100
Center 5.24 GHz
3 MHz/
Span 30 MHz

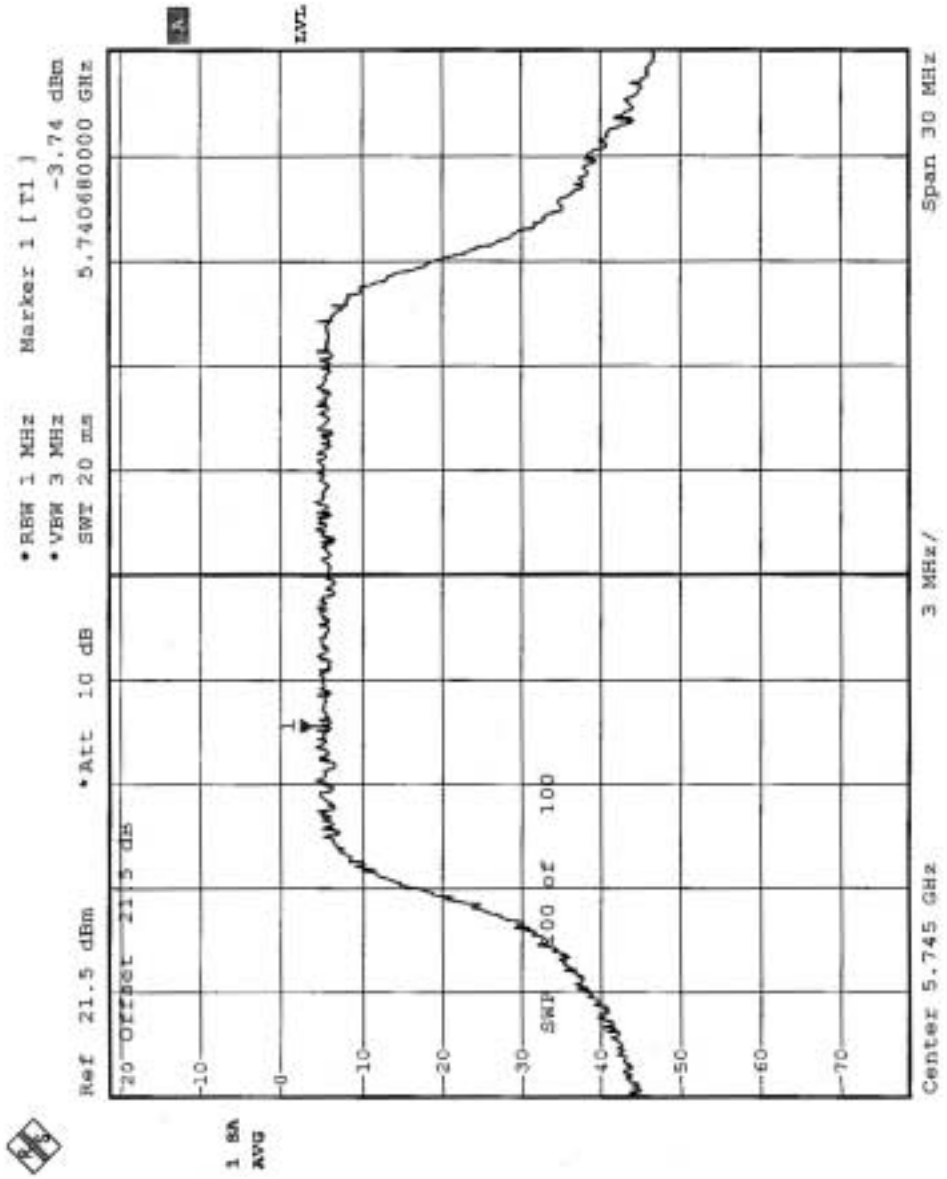
CHANNEL 5


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-4.57 dBm
5.25640000 GHz
LVL
SWP 100 of 100
Center 5.26 GHz
3 MHz/
Span 30 MHz

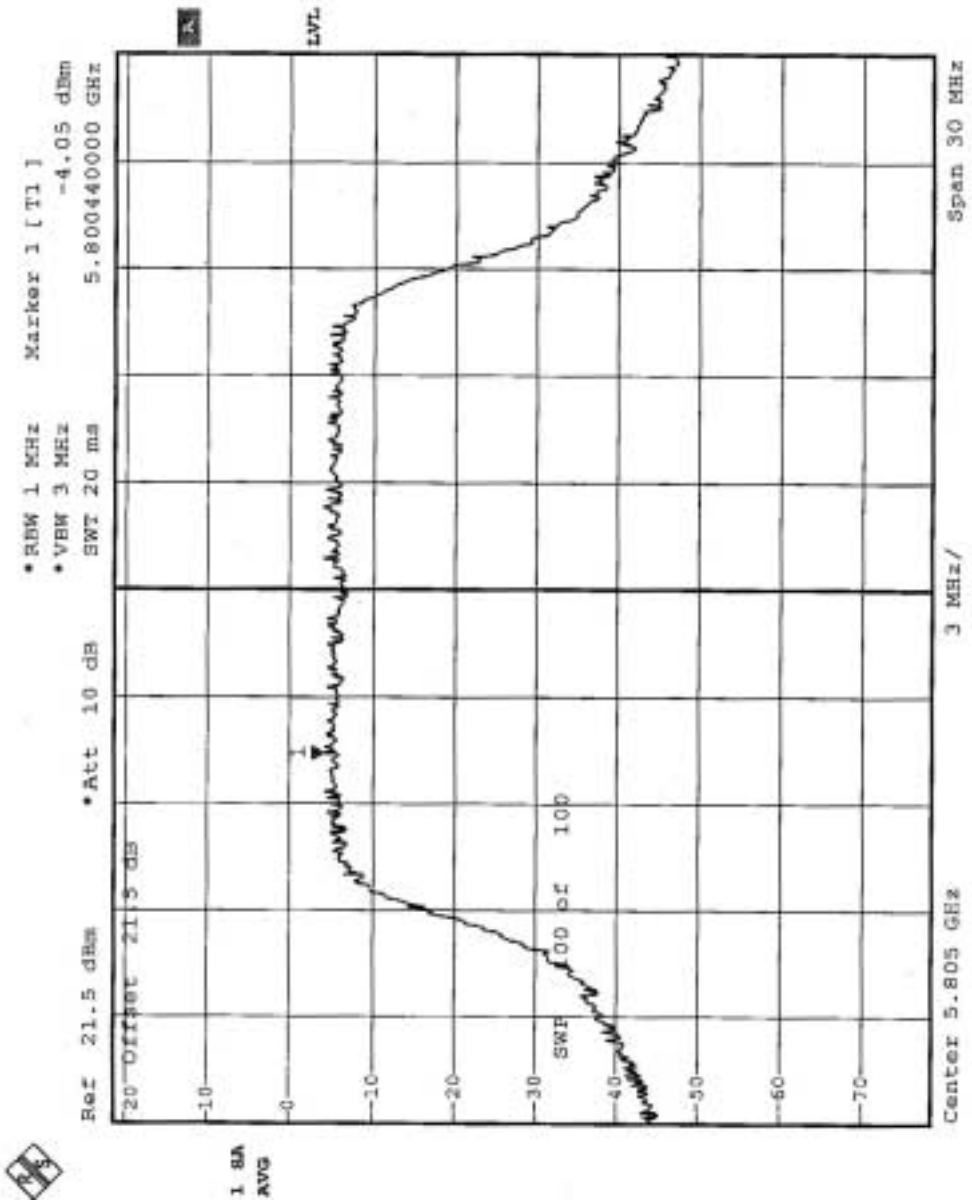
CHANNEL 8


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-4.65 dBm
5.322460000 GHz
SWP 100 of 100
Center 5.32 GHz
3 MHz/
Span 30 MHz
1 SA
AVG
LVL

CHANNEL 9


Ref 21.5 dBm
Offset 21.5 dB
Att 10 dB
RBW 1 MHz
VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-3.74 dBm
5.740680000 GHz
1 SA
AVG
Center 5.745 GHz
3 MHz/
Span 30 MHz

CHANNEL 12


Ref 21.5 dBm
Offset 21.5 dB
*Att 10 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-4.05 dBm
5.800440000 GHz
1 SA
AVG
Center 5.805 GHz
3 MHz/
Span 30 MHz

5.6 FREQUENCY STABILITY

5.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.02% of the operating frequency over a temperature variation of –30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

5.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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

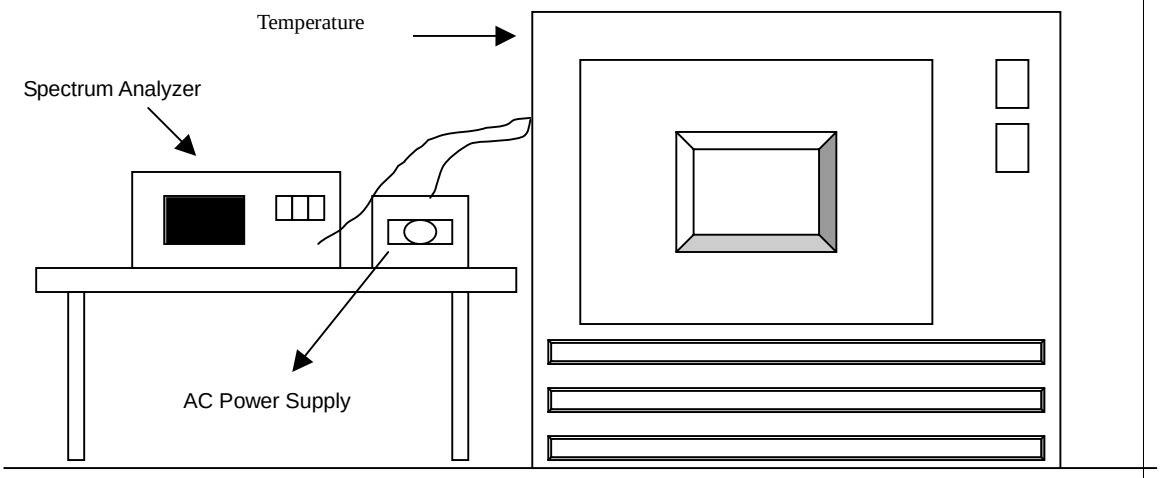
5.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6

5.6.7 TEST RESULTS

Operating frequency: 5320MHz						Limit : ± 0.02%	
Temp. (℃)	Power supply (VAC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5319.9782	-0.000410%	5319.9782	-0.000410%	5319.9776	-0.000421%
	110	5319.9773	-0.000427%	5319.9743	-0.000483%	5319.9764	-0.000444%
	93.5	5319.9756	-0.000459%	5319.9728	-0.000511%	5319.9738	-0.000492%
40	126.5	5319.9976	-0.000045%	5319.9979	-0.000039%	5319.9978	-0.000041%
	110	5319.9957	-0.000081%	5319.9977	-0.000043%	5319.9979	-0.000039%
	93.5	5319.9933	-0.000126%	5319.9978	-0.000041%	5319.9978	-0.000041%
30	126.5	5319.9763	-0.000445%	5319.9777	-0.000419%	5319.9782	-0.000410%
	110	5319.9763	-0.000445%	5319.9765	-0.000442%	5319.9749	-0.000472%
	93.5	5319.9741	-0.000487%	5319.974	-0.000489%	5319.9737	-0.000494%
20	126.5	5319.9867	-0.000250%	5319.9846	-0.000289%	5319.9876	-0.000233%
	110	5319.985	-0.000282%	5319.9834	-0.000312%	5319.9856	-0.000271%
	93.5	5319.9841	-0.000299%	5319.9814	-0.000350%	5319.9832	-0.000316%
10	126.5	5319.9966	-0.000064%	5319.9963	-0.000070%	5319.9938	-0.000117%
	110	5319.9953	-0.000088%	5319.9935	-0.000122%	5319.9938	-0.000117%
	93.5	5319.9921	-0.000148%	5319.9935	-0.000122%	5319.9937	-0.000118%
0	126.5	5320.065	0.001222%	5320.0690	0.001297%	5320.0760	0.001429%
	110	5320.044	0.000827%	5320.0540	0.001015%	5320.0560	0.001053%
	93.5	5320.026	0.000489%	5320.0320	0.000602%	5320.0360	0.000677%
-10	126.5	5320.087	0.001635%	5320.0980	0.001842%	5320.0124	0.000233%
	110	5320.07	0.001316%	5320.0750	0.001410%	5320.0870	0.001635%
	93.5	5320.054	0.001015%	5320.0620	0.001165%	5320.0752	0.001414%
-20	126.5	5320.0104	0.000195%	5320.0112	0.000211%	5320.0132	0.000248%
	110	5320.0097	0.000182%	5320.0870	0.001635%	5320.0853	0.001603%
	93.5	5320.0038	0.000071%	5320.0640	0.001203%	5320.0642	0.001207%
-30	126.5	5319.9987	-0.000024%	5320.0085	0.000160%	5320.0840	0.001579%
	110	5319.9957	-0.000081%	5320.0054	0.000102%	5320.0732	0.001376%
	93.5	5319.9921	-0.000148%	5320.0043	0.000081%	5320.0625	0.001175%

5.7 BAND EDGES MEASUREMENT

5.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	May. 06, 2004

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.

5.7.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set RBW of spectrum analyzer to 1MHz and VBW of spectrum analyzer to 300Hz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

5.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

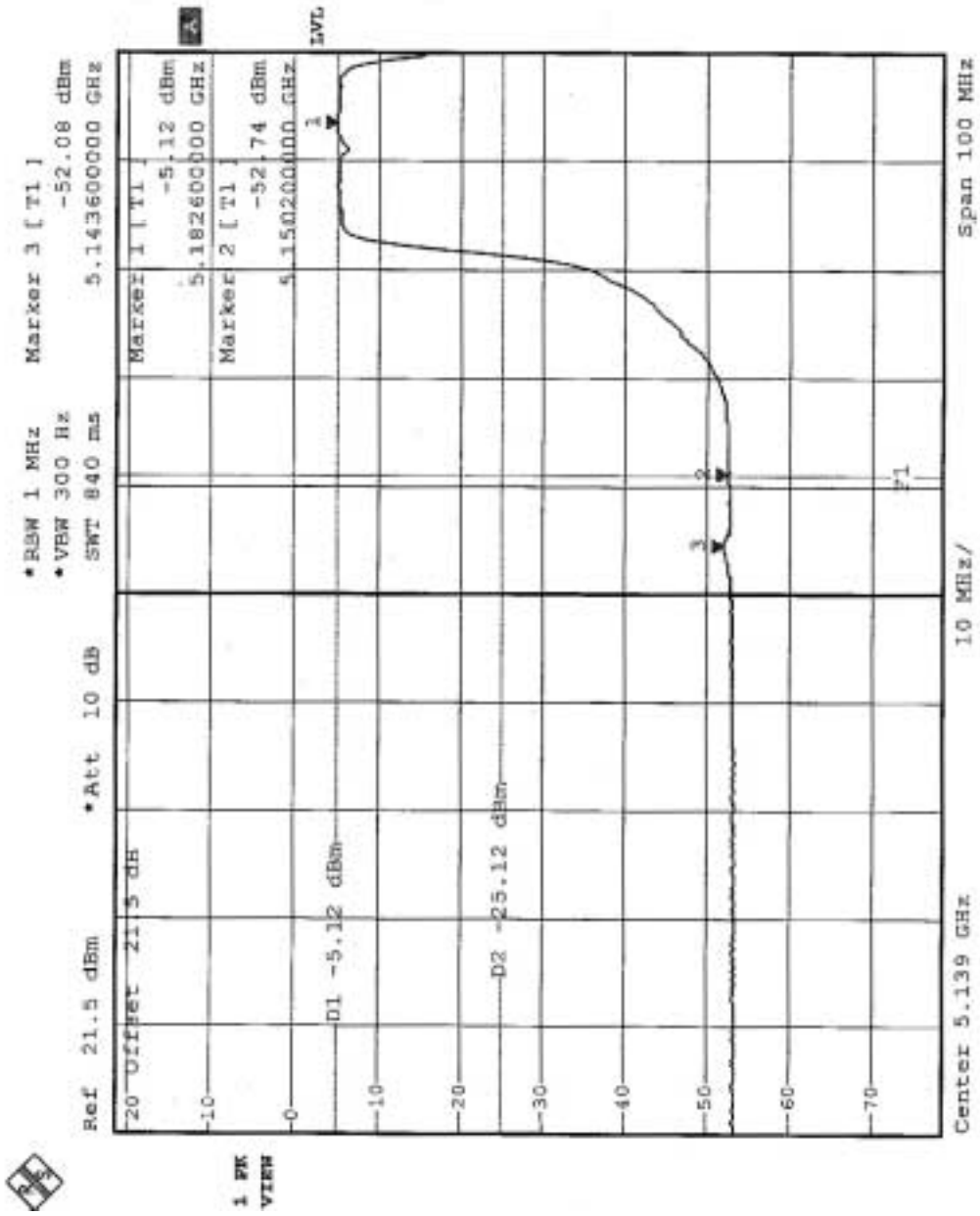
5.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.35 GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak filed strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

The spectrum plots (Average RBW=1MHz, VBW=300Hz) are attached on the following 2 pages.

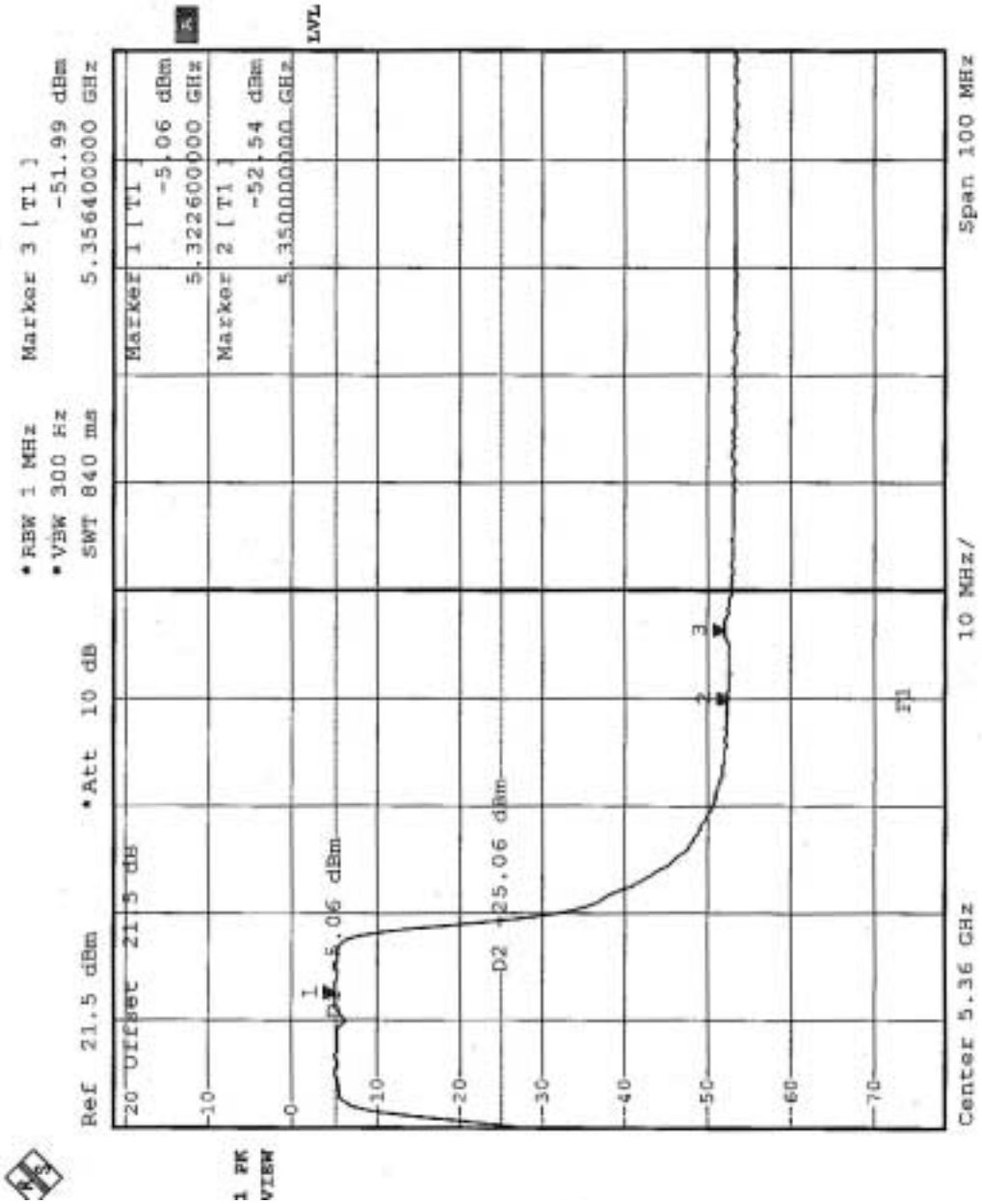
Normal Mode: Channel 1 (5180 MHz)

The band edge emission plot on the following page shows 57.2dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 (normal mode) is 94.7dBuV/m, so the maximum field strength in restrict band is 94.7-57.2=37.5dBuV/m which is under 54dBuV/m limit.



Normal Mode: Channel 8 (5320 MHz)

The band edge emission plot on the following page shows 57.05dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 (normal mode) is 93.9dBuV/m, so the maximum field strength in restrict band is 93.9-57.05=36.85dBuV/m which is under 54dBuV/m limit.



5.8 ANTENNA REQUIREMENT

5.8.1 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 15.407(a), 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.

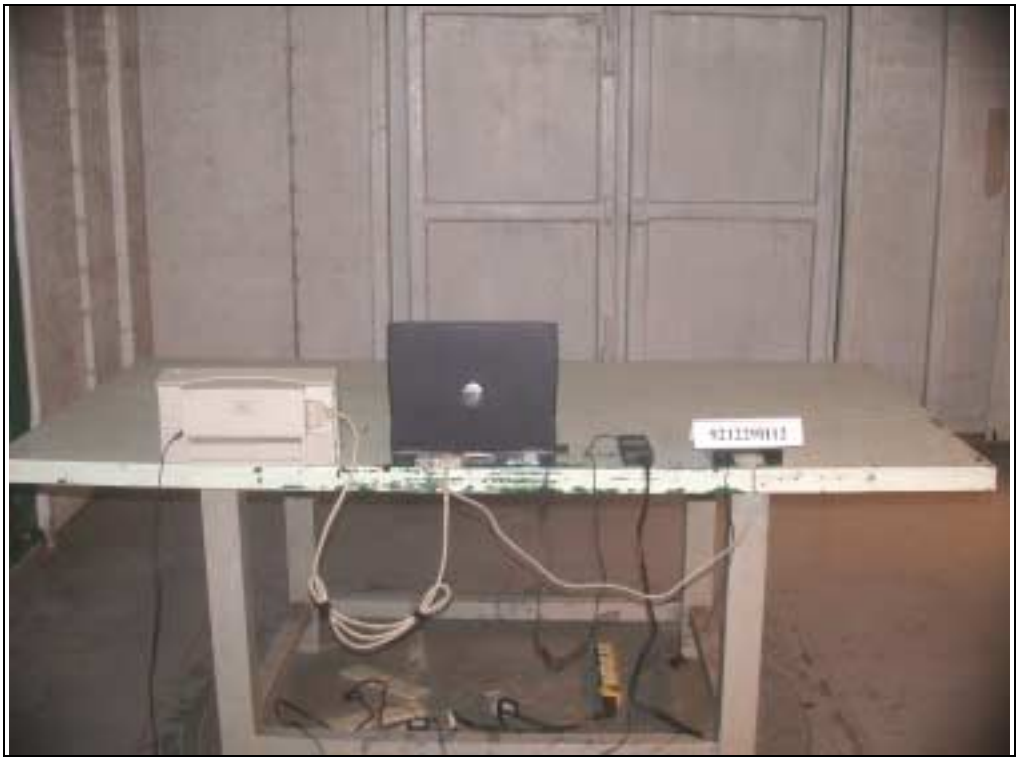
5.8.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Chip Antenna without connector. The maximum Gain of the antenna is 0.5dBi.

6. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



7. 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.