

FCC TEST REPORT

REPORT NO.: RF900924R01E

MODEL NO.: F5D6050

RECEIVED: September 24, 2001

TESTED: Sep. 24 ~ Sep. 26, 2001

APPLICANT: Belkin Components

ADDRESS: 1303 Walnut Parkway, Compton, 90220,

CA, U.S.A

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei,

Taiwan, R.O.C.

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0528 ILAC MRA

Lab Code: 200102-0

Lab Code. 200 102-



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1 CERTIFICATION

PRODUCT: Wireless USB Network Adapter

BRAND NAME: Belkin

MODEL NO.: F5D6050

APPLICANT: Belkin Components

STANDARDS: 47 CFR Part 15, Subpart C (Section 15.247),

ANSI C63.4-1992, Canada RSS 210,

New Zealand RFS 29

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Sep. 24, 2001 to Sep. 26, 2001. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

TESTED BY : Steven L. DATE: Nov. 5, 200/

Steven Lu

CHECKED BY: Enily L. DATE: Nov. 5, 2001

Emily Lu

Dr. Alan Lane, Manager



2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C								
Standard Section	Test Type and Limit	Result	REMARK					
	AC Power Conducted Emission		Meet the requirement of limit					
15.107	Limit: 48dBuV	PASS	Minimum passing margin is –7.65dBuV at 2.699MHz					
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					
	Radiated Emissions		Meet the requirement of limit					
15.247(c)	Limit: Table 15.209	PASS	Minimum passing margin is –5.10dBuV at 2487.10MHz					
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit					
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit					



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless USB Network Adapter
MODEL NO.	F5D6050
POWER SUPPLY	5VDC from host equipment
MODULATION TYPE	BPSK, QPSK, CCK
RADIO TECHNOLOGY	DSSS
TRANSFER RATE	1/2/5.5/11Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	15.7dBm
ANTENNA TYPE	Dipole Antenna
DATA CABLE	1.8m (shielded)
I/O PORTS	USB Port
ASSOCIATED DEVICES	NA

NOTE:

- 1. This report is issued as a supplementary report to the original report with no.: RF900924R01.
- 2. The model: WN3501AR of original report and model: F5D6050 are identical.
- 3. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided in this EUT.

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

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

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless USB Network Adapter. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC CFR 47 Part 15, Subpart C. (15.247)
ANSI C63.4: 1992, Canada RSS 210, New Zealand RFS 29

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

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

^{2.} Above 1 GHz, the channel 1, 6, and 11 were tested individually.



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	IBM	TYPE 2635 9AH	97-84L54	FCC DoC Approved
2	PRINTER	HP	2225C+	3123S97230	DSI6XU2225
3	MODEM	ACEEX	1414	980020510	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS					
1	NA					
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic					
	frame, w/o core.					
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame,					
	w/o core.					

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



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE:

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS30	847793/022	Feb. 25, 2002
ROHDE & SCHWARZ Artificial Mains	ESH2-Z5	828075/003	July 10, 2002
Network (for EUT)	E3H2-Z3	020075/003	July 19, 2002
ROHDE & SCHWARZ	ENY41	838119/028	Dec. 12, 2001
4-wire ISN	CINT 41	030119/020	Dec. 12, 2001
ROHDE & SCHWARZ	ENY22	837497/018	Dec. 3, 2001
2-wire ISN	CINT 22	03/49//010	Dec. 3, 2001
EMCO-L.I.S.N. (for peripheral)	3825/2	90031627	July 19, 2002
Software	Cond-V2J	NA	NA
RF cable (JYEBAO)	RG-58A/U	Cable-C05.01	July 19, 2002
LYNICS Terminator (For EMCO	0900510	E1-01-305	Feb. 20, 2002
LISN)	0900510	E1-01-305	Feb. 20, 2002
LYNICS Terminator (For EMCO	0900510	E1-01-306	Feb. 20, 2002
LISN)	0900510	E1-01-300	F60. 20, 2002
Shielded Room	Site 5	ADT-C05	NA
VCCI Site Registration No.	Site 5	C-1093	NA

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

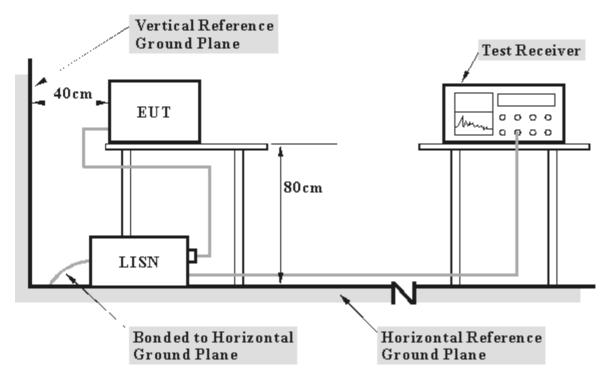
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
- 3. "*": These equipment are used for conducted telecom port test only (if tested).



4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 450 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported.

4.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMIN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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



4.1.5 EUT OPERATING CONDITIONS

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

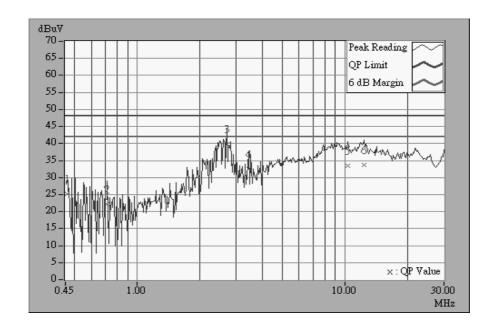


4.1.6 TEST RESULTS

EUT	Wireless USB Network Adapter	MODEL	F5D6050
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Steve	n Lu

No	Freq.	Corr. Factor	Reading		Emission [dB (Lir [dB (Mar (dl	_
	(IVITZ)	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.458	0.11	25.29	•	25.40	-	48.00	1	-22.60	-
2	0.716	0.15	22.20	ı	22.35	ı	48.00	ı	-25.65	-
3	2.695	0.27	39.88	ı	40.15	ı	48.00	ı	-7.85	-
4	3.434	0.34	32.49	-	32.83	•	48.00	-	-15.17	-
5	10.285	0.61	33.36	-	33.97	-	48.00	1	-14.03	-
6	12.359	0.65	33.76	-	34.41	-	48.00		-13.59	-

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

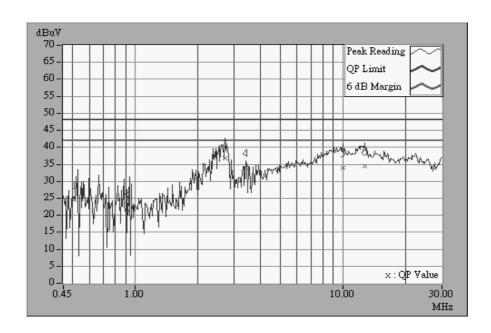




EUT	Wireless USB Network Adapter	MODEL	F5D6050
MODE	Channel 1	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 dog. 0, 7070141,	TESTED BY: Steve	n Lu
33.12.1.13NG	1005 hPa		

No	Freq.	Corr. Factor	Reading	_	Emissio		Lir [dB (Mar (dl	_
	(MHz)	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.509	0.12	24.60	-	24.72	-	48.00	-	-23.28	-
2	0.918	0.19	21.29	ı	21.48	-	48.00	ı	-26.52	-
3	2.691	0.23	36.87	ı	37.10	-	48.00	ı	-10.90	-
4	3.410	0.27	33.89	ı	34.16	-	48.00	1	-13.84	-
5	9.984	0.40	33.97	ı	34.37	-	48.00	1	-13.63	-
6	12.754	0.46	34.33	1	34.79	-	48.00	ı	-13.21	-

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

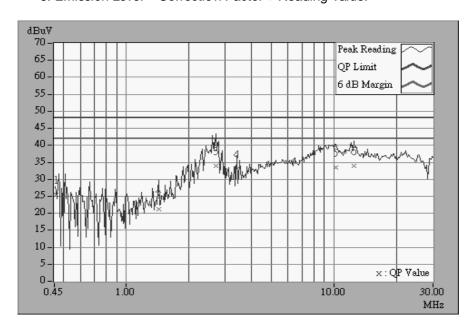




EUT	Wireless USB Network Adapter	MODEL	F5D6050
MODE	Channel 6	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Stev	ven Lu

No	Freq.	Corr. Factor	Reading	_	Emission [dB (n Level (uV)]	Lir [dB (nit (uV)]	Mar (dl	_
	(MHz)	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.459	0.11	25.45	-	25.56	-	48.00	-	-22.44	-
2	1.434	0.20	21.12	ı	21.32	-	48.00	ı	-26.68	-
3	2.707	0.27	33.87	ı	34.14	ı	48.00	ı	-13.86	-
4	3.414	0.34	33.09	ı	33.43	ı	48.00	ı	-14.57	-
5	10.188	0.60	33.45	-	34.05	-	48.00	1	-13.95	-
6	12.457	0.65	34.01	ı	34.66	ı	48.00	ı	-13.34	-

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

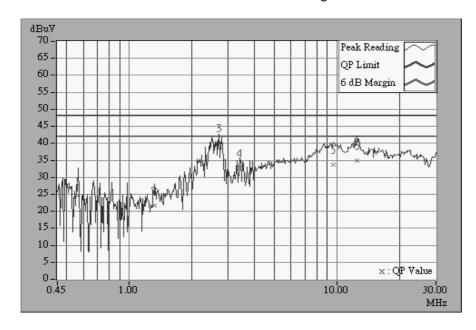




EUT	Wireless USB Network Adapter	MODEL	F5D6050	
MODE	Channel 6	6dB BANDWIDTH	10 kHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)	
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Steven Lu		

No	Freq.	Corr. Factor	Reading	_	Emissio	on Level (uV)]	Lir [dB (nit [uV)]	Mar (dl	_
	(MHz)	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.562	0.13	24.44	-	24.57	-	48.00	-	-23.43	-
2	1.328	0.20	21.65	ı	21.85	-	48.00	ı	-26.15	-
3	2.699	0.23	40.12	ı	40.35	-	48.00	•	-7.65	-
4	3.406	0.27	32.83	-	33.10	-	48.00	-	-14.90	-
5	9.586	0.39	33.76	-	34.15	-	48.00	1	-13.85	-
6	12.473	0.45	34.85	-	35.30	-	48.00	-	-12.70	-

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

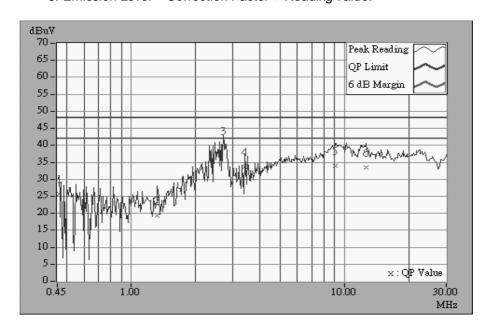




EUT	Wireless USB Network Adapter	MODEL	F5D6050	
MODE	Channel 11	6dB BANDWIDTH	10 kHz	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)	
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 1005 hPa	TESTED BY: Steven Lu		

No	Freq.	Corr. Factor	Reading	_	Emission [dB (Lir [dB (nit (uV)]	Mar (dl	_
	(MHz)	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.459	0.11	25.71	-	25.82	-	48.00	-	-22.18	-
2	1.328	0.20	19.30	ı	19.50	-	48.00	ı	-28.50	-
3	2.695	0.27	39.92	ı	40.19	ı	48.00	ı	-7.81	-
4	3.418	0.34	33.59	ı	33.93	ı	48.00	ı	-14.07	-
5	9.051	0.57	34.02	ı	34.59	-	48.00	1	-13.41	-
6	12.566	0.65	33.49	1	34.14	ı	48.00	ı	-13.86	-

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

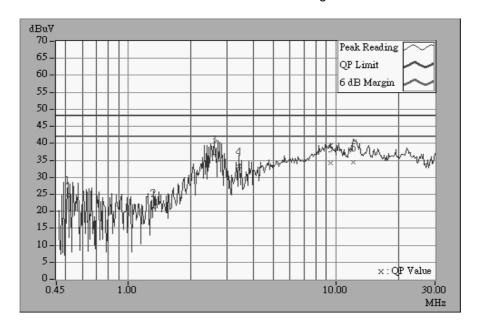




Wireless USB Network Adapter	MODEL	F5D6050
Channel 11	6dB BANDWIDTH	10 kHz
120Vac, 60 Hz	PHASE	Neutral (N)
20 dog. 0, 7070111,	TESTED BY: Steve	n Lu
1	Channel 11 20Vac, 60 Hz	Channel 11 Channe

No	Freq.	Corr. Factor	Reading	_	Emissio	on Level (uV)]	Lir [dB (nit [uV)]	Mar (dl	_
	[MHz]	(dB)	QP.	AV.	QP.	AV.	QP.	AV.	QP.	AV.
1	0.509	0.12	24.74	-	24.86	-	48.00	-	-23.14	-
2	1.328	0.20	20.96	ı	21.16	-	48.00	ı	-26.84	-
3	2.586	0.23	36.77	ı	37.00	-	48.00	•	-11.00	-
4	3.406	0.27	33.25	-	33.52	-	48.00	-	-14.48	-
5	9.379	0.39	34.06	-	34.45	-	48.00	1	-13.55	-
6	12.176	0.44	34.38	-	34.82	-	48.00	-	-13.18	-

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





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	May 7, 2002
* HP Preamplifier	8447D	2944A08485	Nov. 3, 2001
* HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
* CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2002
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
* EMCO Horn Antenna	3115	9312-4192	April 15, 2002
* EMCO Turn Table	1060	1115	NA
* SHOSHIN Tower	AP-4701	A6Y005	NA
* Software	AS61D4	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
* TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
* Antenna (Horn)	BBHA9120-D	D130	July 10, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
VCCI Site Registration No.	Site 5	R-1039	NA
0% B : (# N	FCC: 90422		
Site Registration No.	Canada IC: IC 3789 VCCI: R-1039	9	

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

- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
- 3."*" = These equipments are used for the final measurement.



4.2.3 TEST PROCEDURES

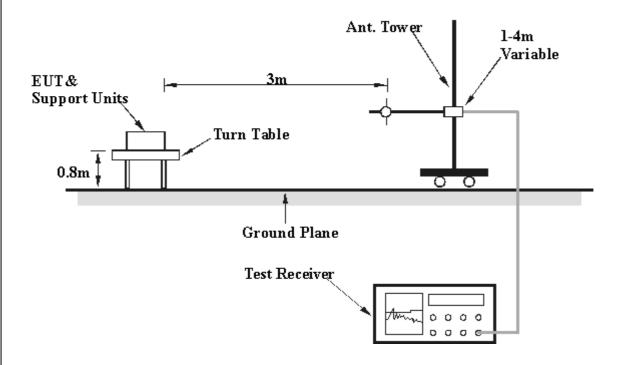
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

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



4.2.4 TEST SETUP



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

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5.



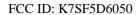
4.2.6 TEST RESULTS

EUT	Wireless USB Network Adapter	MODEL	F5D6050	
MODE	Channel 11	FREQUENCY	30-1000 MHz	
MODE	Gridinoi II	RANGE	30-1000 MHZ	
INPUT POWER	120Vac, 60 Hz	DETECTOR		
(SYSTEM)	120 vac, 60 Hz	FUNCTION	Quasi-Peak	
ENVIRONMENTAL	20 deg. C, 70%RH,	TESTED BY: Gary Chang		
CONDITIONS	1005 hPa			

	AN	TENNA	POLAR	ITY &	TEST	DISTA	NCE:	HORIZ	ATNC	L AT 3	M
	Freq.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	(MHz)	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(IVIITZ)	(dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
1	132.10	24.1 QP	30.00	-5.90	4.00H	19	11.80	11.16	1.13	0.00	-12.29
2	216.40	22.6 QP	30.00	-7.40	4.00H	163	11.10	9.97	1.50	0.00	-11.47
3	220.00	23.4 QP	30.00	-6.60	4.00H	104	11.80	10.12	1.51	0.00	-11.63
4	264.10	26.8 QP	37.00	-10.20	4.00H	229	12.40	12.75	1.70	0.00	-14.45
5	308.47	27.1 QP	37.00	-9.90	2.12H	355	11.80	13.38	1.91	0.00	-15.30
6	336.02	27.3 QP	37.00	-9.70	2.77H	284	11.40	13.92	1.99	0.00	-15.91
7	396.00	28.6 QP	37.00	-8.40	2.07H	167	10.40	15.96	2.22	0.00	-18.18
8	432.03	29.4 QP	37.00	-7.60	2.05H	290	10.80	16.28	2.35	0.00	-18.64
9	484.10	28.8 QP	37.00	-8.20	1.99H	283	9.40	16.96	2.47	0.00	-19.43
10	528.02	28.3 QP	37.00	-8.70	2.01H	145	8.10	17.62	2.60	0.00	-20.22
11	748.00	29.2 QP	37.00	-7.80	1.18H	161	5.80	20.14	3.26	0.00	-23.40

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
	Freq.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	(MHz)	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(IVIITZ)	(dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
1	132.00	23.8 QP	30.00	-6.20	1.00V	30	11.50	11.16	1.13	0.00	-12.29
2	144.01	21.2 QP	30.00	-8.80	1.00V	209	9.40	10.58	1.18	0.00	-11.76
3	220.02	20.5 QP	30.00	-9.50	1.00V	349	8.90	10.12	1.51	0.00	-11.63
4	264.02	26.5 QP	37.00	-10.50	1.00V	36	12.10	12.75	1.70	0.00	-14.45
5	384.00	26.2 QP	37.00	-10.80	1.47V	354	8.50	15.50	2.18	0.00	-17.67
6	432.04	26.4 QP	37.00	-10.60	2.77V	145	7.80	16.28	2.35	0.00	-18.63
7	528.01	28.4 QP	37.00	-8.60	2.69V	12	8.20	17.62	2.60	0.00	-20.23
8	747.98	30.6 QP	37.00	-6.40	2.37V	292	7.20	20.14	3.26	0.00	-23.40
9	880.11	30.6 QP	37.00	-6.40	3.06V	343	6.40	20.68	3.55	0.00	-24.23

- **NOTE**: 1 Emission level = Raw Value Correction Factor
 - 2 Correction Factor = External Preamp. Gain Ant. Factor Cable loss (External Preamp. Gain = 0, when the test receiver is used for the test.)
 - 3 The other emission levels were very low against the limit.
 - 4 Margin value = Emission level Limit value





EUT	Wireless USB Network Adapter	MODEL	F5D6050
MODE	Channel 1	FREQUENCY	Above 4000 MILE
WODL	Charmer 1	RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR	Peak(PK)
(SYSTEM)	120 vac, 00 112	FUNCTION	Average (AV)
ENVIRONMENTAL	20 deg. C, 70%RH,	TESTED BY: G	ary Chang
CONDITIONS	1005 hPa		

	AN	ΓΕΝΝΑ	POLAR	ITY &	TEST	DISTA	NCE:	HORIZ	ATNC	L AT 3	M
	Freg.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	(MHz)	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(1711 12)	(dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
1	2038.00	44.9 PK	74.00	-29.10	1.81H	356	49.73	25.20	4.86	34.90	4.84
2	*2413.60	95.0 PK	-	-	1.11H	21	62.80	27.11	5.10	0.00	-32.22
3	*2413.60	88.4 AV	1	ı	1.11H	21	56.20	27.11	5.10	0.00	-32.22
4	4076.10	48.6 PK	74.00	-25.40	1.13H	133	46.20	30.13	6.78	34.52	-2.39
5	4824.20	49.0 PK	74.00	-25.00	1.85H	95	45.00	31.43	7.23	34.63	-4.03

		AN	TENNA	POL	ARITY	& TES	T DIST	ANCE:	VER	TICAL A	AT 3 M
	Freq.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	(MHz)	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(IVITIZ)	(dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
1	2037.90	46.2 PK	74.00	-27.80	1.00V	35	51.08	25.20	4.86	34.90	4.84
2	*2413.60	100.3 PK	-	-	2.13V	346	68.13	27.11	5.10	0.00	-32.21
3	*2413.60	93.4 AV	-	-	2.13V	346	61.20	27.11	5.10	0.00	-32.21
4	4075.90	49.4 PK	74.00	-24.60	1.65V	262	47.00	30.13	6.78	34.52	-2.39
5	4824.30	49.0 PK	74.00	-25.00	1.59V	8	45.00	31.43	7.23	34.63	-4.02

NOTE: 1. Emission level = Raw Value - Correction Factor

- 2. Correction Factor = External Preamp. Gain Ant. Factor Cable loss (External Preamp. Gain = 0, when the test receiver is used for the test.)
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. The limit value is defined as per 15.247
- 6. " * ": Fundamental frequency



EUT	Wireless USB Network Adapter	MODEL	F5D6050
MODE	Channel 6	FREQUENCY	Above 1000 MHz
MODE	Onarmor o	RANGE	Above 1000 MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR	Peak(PK)
(SYSTEM)	120 vac, 60 Hz	FUNCTION	Average (AV)
ENVIRONMENTAL	20 deg. C, 70%RH,	TESTED BY: G	ary Chang
CONDITIONS	1005 hPa		

	AN	ΓΕΝΝΑ	POLAR	ITY &	TEST	DISTA	NCE:	HORIZ	ATNC	L AT 3	M
	Freg.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	(MHz)	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(IVITIZ)	(dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
1	2063.00	49.6 PK	74.00	-24.40	1.52H	183	54.15	25.41	4.96	34.90	4.53
2	*2438.70	90.2 PK	-	-	1.10H	116	57.75	27.33	5.08	0.00	-32.40
3	*2438.70	86.9 AV	1	ı	1.10H	116	54.50	27.33	5.08	0.00	-32.40
4	4125.70	49.2 PK	74.00	-24.80	1.28H	55	46.70	30.32	6.70	34.56	-2.46
5	4874.10	49.9 PK	74.00	-24.10	1.91H	319	45.80	31.47	7.21	34.63	-4.05

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
	Freq.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	(MHz)	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(IVITZ)	(dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
1	2063.00	47.4 PK	74.00	-26.60	1.22V	328	51.90	25.41	4.96	34.90	4.53
2	*2438.80	99.6 PK	-	-	2.25V	68	67.23	27.33	5.08	0.00	-32.41
3	*2438.80	93.8 AV	1	-	2.25V	68	61.40	27.33	5.08	0.00	-32.41
4	4126.10	48.7 PK	74.00	-25.30	1.70V	254	46.20	30.32	6.70	34.56	-2.46
5	4874.00	49.2 PK	74.00	-24.80	1.47V	47	45.10	31.47	7.21	34.63	-4.06

NOTE: 1. Emission level = Raw Value - Correction Factor

- 2. Correction Factor = External Preamp. Gain Ant. Factor Cable loss (External Preamp. Gain = 0, when the test receiver is used for the test.)
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. The limit value is defined as per 15.247
- 6. " * ": Fundamental frequency



EUT	Wireless USB Network Adapter	MODEL	F5D6050	
MODE	Channel 11	FREQUENCY	Above 1000 MHz	
MODE	Onarmer 11	RANGE	Above 1000 MHz	
INPUT POWER	120Vac, 60 Hz	DETECTOR	Peak(PK)	
(SYSTEM)	120 vac, 00 112	FUNCTION	Average (AV)	
ENVIRONMENTAL	20 deg. C, 70%RH,	TESTED BY: Gary Chang		
CONDITIONS	1005 hPa			

	AN ⁻	ΓΕΝΝΑ	POLAR	ITY &	TEST	DISTA	NCE:	HORIZ	ATNC	L AT 3	M
	Freg.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	(MHz)	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(IVITIZ)	(dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)
1	2088.00	51.3 PK	74.00	-22.70	1.15H	182	55.54	25.62	5.02	34.90	4.26
2	*2462.80	88.9 PK	-	-	1.80H	189	56.50	27.33	5.08	0.00	-32.41
3	*2462.80	86.5 AV	-	1	1.80H	189	54.05	27.33	5.08	0.00	-32.41
4	2491.70	44.5 PK	74.00	-29.50	1.50H	9	46.80	27.54	5.06	34.90	2.31
5	4175.90	48.2 PK	74.00	-25.80	1.65H	337	45.70	30.41	6.68	34.58	-2.51
6	4923.60	50.1 PK	74.00	-23.90	1.35H	156	46.00	31.51	7.21	34.62	-4.10

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
	Freq.	Emission	Limit	Margin	Antenna	Table	Raw	Antenna	Cable	Pre-Amp.	Correction
No.	'	Level	(dBuV/m)	(dB)	Height	Angle	Value	Factor	Factor	Factor	Factor
	(MHz) (dBuV/m)	(ubuv/III)	(ub)	(m)	(Degree)	(dBuV)	(dB/m)	(dB)	(dB)	(dB/m)	
1	2088.00	45.7 PK	74.00	-28.30	2.57V	68	50.00	25.62	5.02	34.90	4.26
2	*2460.20	98.8 PK	1	1	1.68V	319	66.38	27.33	5.08	0.00	-32.40
3	*2460.20	92.6 AV	1	1	1.68V	319	60.20	27.33	5.08	0.00	-32.40
4	2487.10	56.3 PK	74.00	-17.70	1.17V	186	58.62	27.54	5.06	34.90	2.31.
5	2487.10	48.9 AV	54.00	-5.10	1.17V	186	51.20	27.54	5.06	34.90	2.31
6	4176.00	48.5 PK	74.00	-25.50	1.21V	199	46.00	30.41	6.68	34.58	-2.51
	4924.20	50.9 PK	74.00	-23.10	1.24V	358	46.80	31.51	7.21	34.62	-4.10

NOTE: 1. Emission level= Raw Value - Correction Factor

- 2. Correction Factor = External Preamp. Gain Ant. Factor Cable loss (External Preamp. Gain = 0, when the test receiver is used for the test.)
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Emission level Limit value
- 5. The limit value is defined as per 15.247
- 6. " * ": Fundamental frequency



4.3 6DB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

Notes:

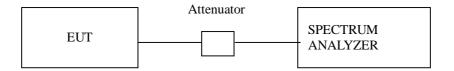
- 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.



4.3.3 TEST PROCEDURE

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

4.3.4 TEST SETUP



4.3.5 EUT OPERATING CONDITIONS

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

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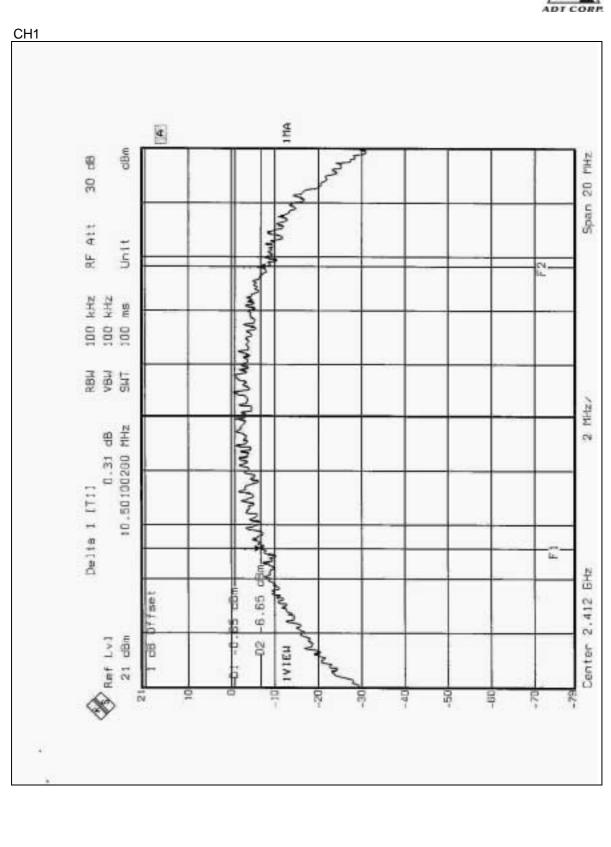
4.3.6 TEST RESULTS

EUT	Wireless USB Network Adapter	MODEL	F5D6050
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa

TESTED BY: Bruce Shiau

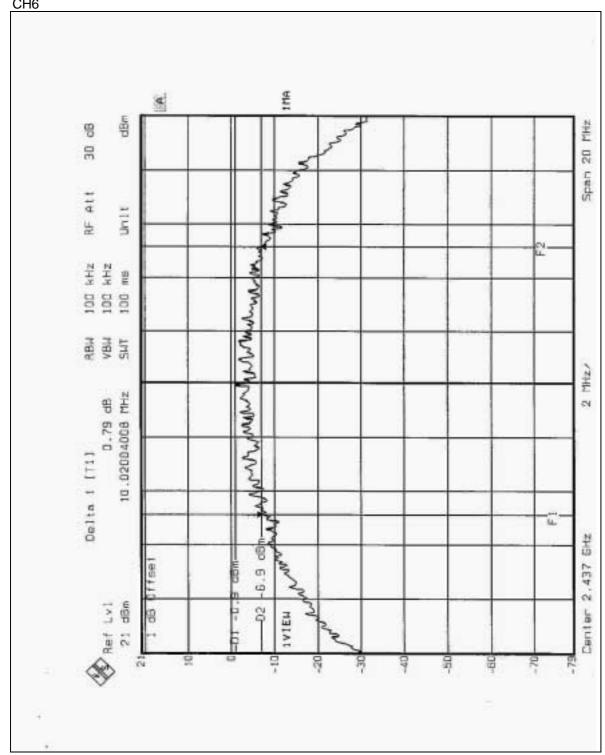
CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.50	0.5	PASS
6	2437	10.02	0.5	PASS
11	2462	10.54	0.5	PASS





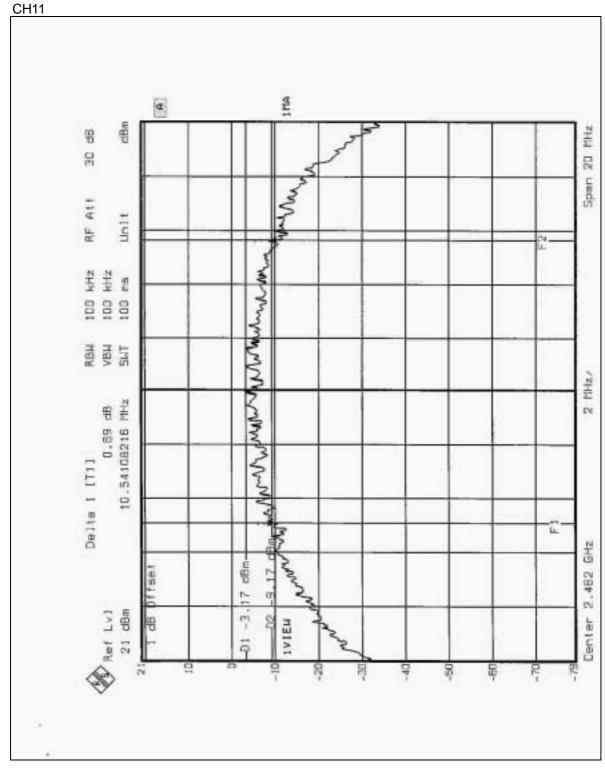














4.4 MAXIMUM PEAK OUTPUT POWER

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	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

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

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

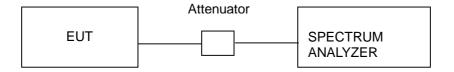


4.4.3 TEST PROCEDURES

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

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

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 3.4.5



4.4.6 TEST RESULTS

EUT	Wireless USB Network Adapter	MODEL	F5D6050
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa

TESTED BY: Bruce Shiau

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.65	30	PASS
6	2437	15.44	30	PASS
11	2462	13.81	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	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

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

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

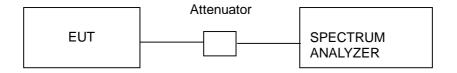


4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITION

Same as Item 3.4.5



4.5.6 TEST RESULTS

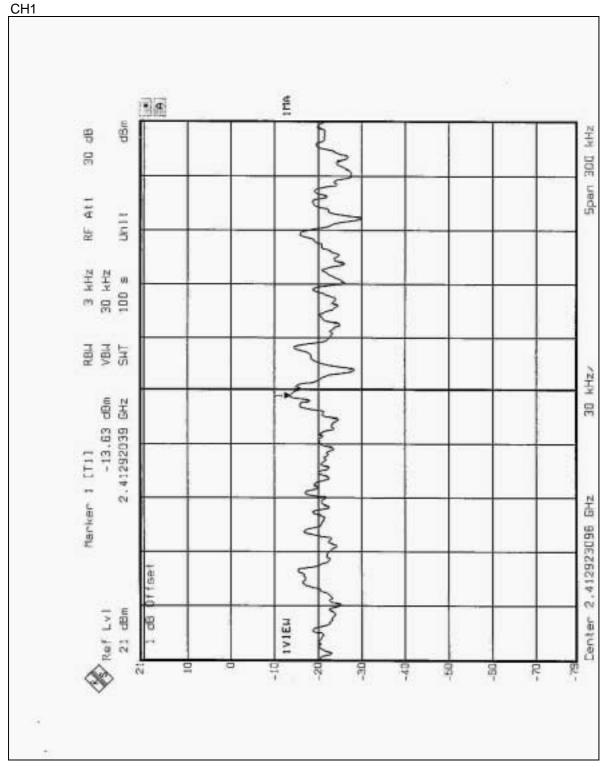
EUT	Wireless USB Network Adapter	MODEL	F5D6050
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25 deg. C, 70%RH, 1005 hPa

TESTED BY: Bruce Shiau

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-13.63	8	PASS
6	2437	-13.34	8	PASS
11	2462	-15.08	8	PASS

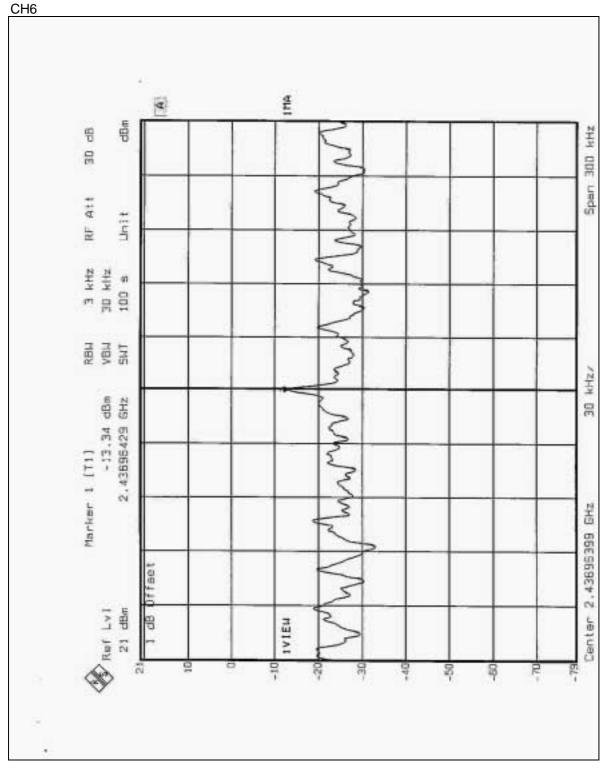






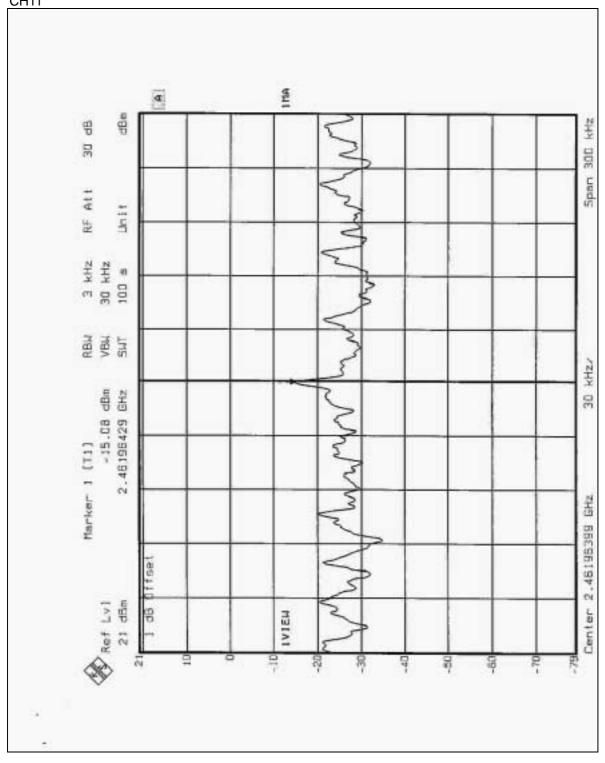














4.6 BAND EDGES MEASUREMENT

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	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

NOTE:

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

4.6.3 TEST PROCEDURE

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



4.6.4 EUT OPERATING CONDITION

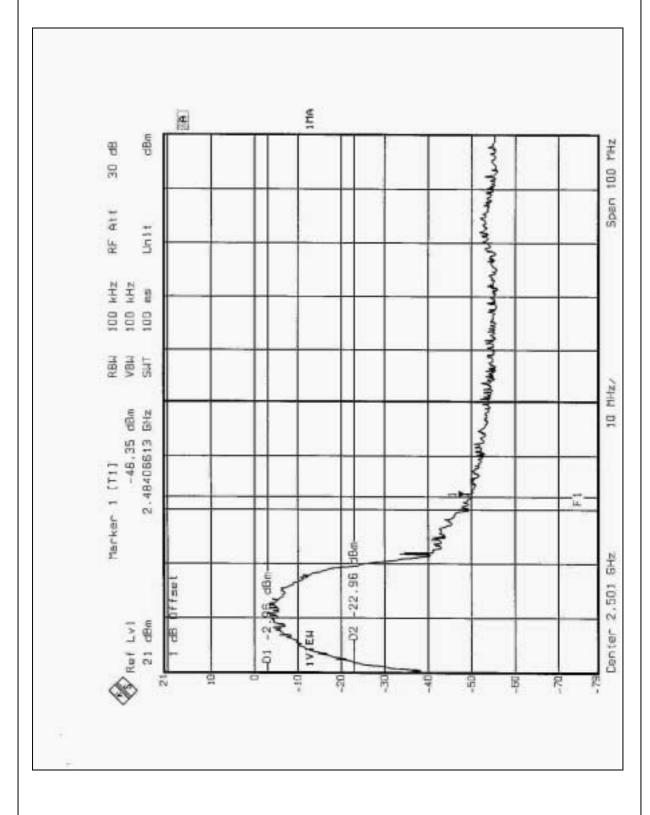
Same as Item 3.4.5

4.6.5 TEST RESULTS

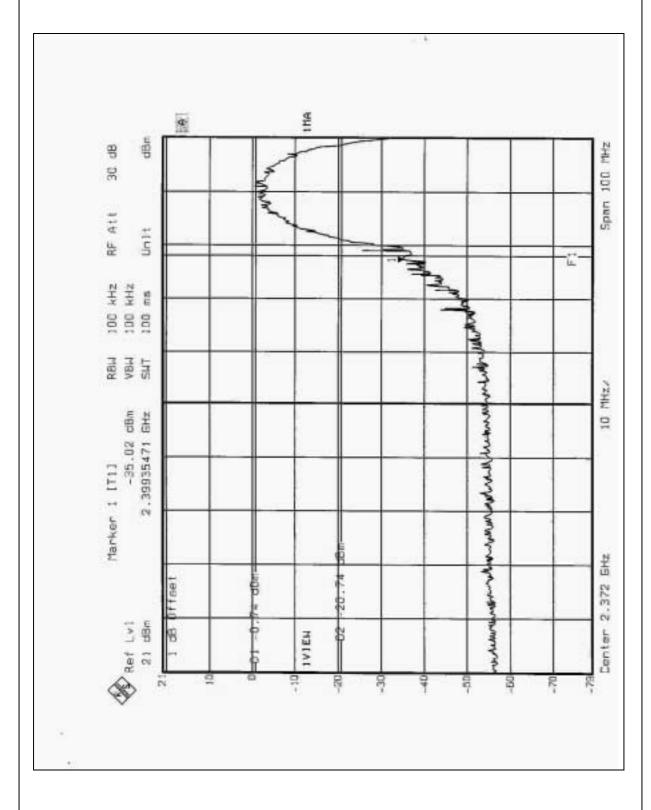
The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

NOTE: The band edge emission plot on the following 2 pages shows 45.39dB delta between carrier maximum power and local maximum emission in restrict band (2.4852GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.6 (Page 25) is 92.6dBuV/m, so the maximum field strength in restrict band is 92.6-45.39=47.21dBuV/m which is under 54 dBuV/m limit.











4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

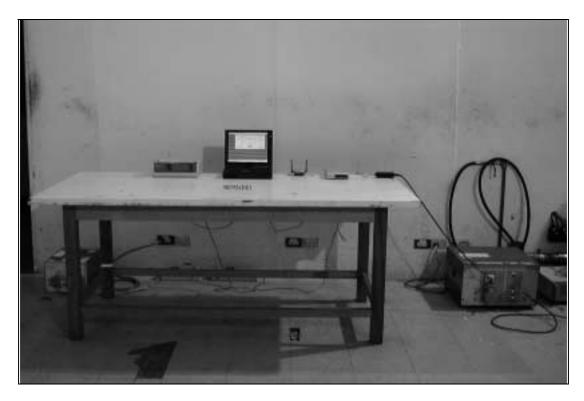
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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 dipole antenna. There is no antenna connector. The maximum Gain of the antenna is 1dBi only.



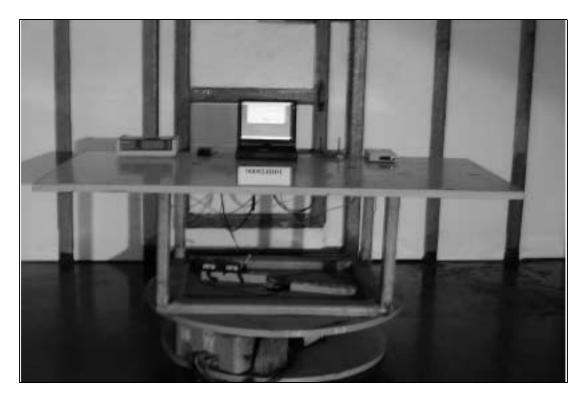
5 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST







RADIATED EMISSION TEST







6 INFORMATION ON THE TESTING LABORATORIES

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

USA FCC, NVLAP, UL 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.