

FCC TEST REPORT

REPORT NO.: RF950510L10

MODEL NO.: WUBR-177G

RECEIVED: May 18, 2006

TESTED: May 18 ~ Jul. 04, 2006

ISSUED: Jul. 04, 2006

APPLICANT: Gemtek Technology Co., Ltd.

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1. CERTIFICATION

PRODUCT: USB Wireless 802.11b/g Adaptor
MODEL: WUBR-177G
BRAND: Gemtek
APPLICANT: Gemtek Technology Co., Ltd.
TESTED: May 18 ~ Jul. 04, 2006
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment have been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Rennie Wang , **DATE:** Jul. 04, 2006
Rennie Wang

TECHNICAL
ACCEPTANCE : Long Chen , **DATE:** Jul. 04, 2006
Responsible for RF Long Chen

APPROVED BY : Gary Chang , **DATE:** Jul. 04, 2006
Gary Chang / Supervisor

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC 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 -20.24dB at 1.051MHz
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(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -4.08dB at 174.61MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	2.55 dB
Radiated emissions (Below 1GHz test)	30MHz ~ 200MHz	3.74 dB
	200MHz ~1000MHz	3.72 dB
Radiated emissions (Above 1GHz test)	30MHz ~ 200MHz	3.62 dB
	200MHz ~1000MHz	3.64 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	USB Wireless 802.11b/g Adaptor
MODEL NO.	WUBR-177G
FCC ID	MXF-U950529G
POWER SUPPLY	5Vdc from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
RADIO TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	56.754mW
ANTENNA TYPE	Dipole antenna with 0dBi gain
DATA CABLE	NA
I/O PORTS	USB
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions of up to 54Mbps.
2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

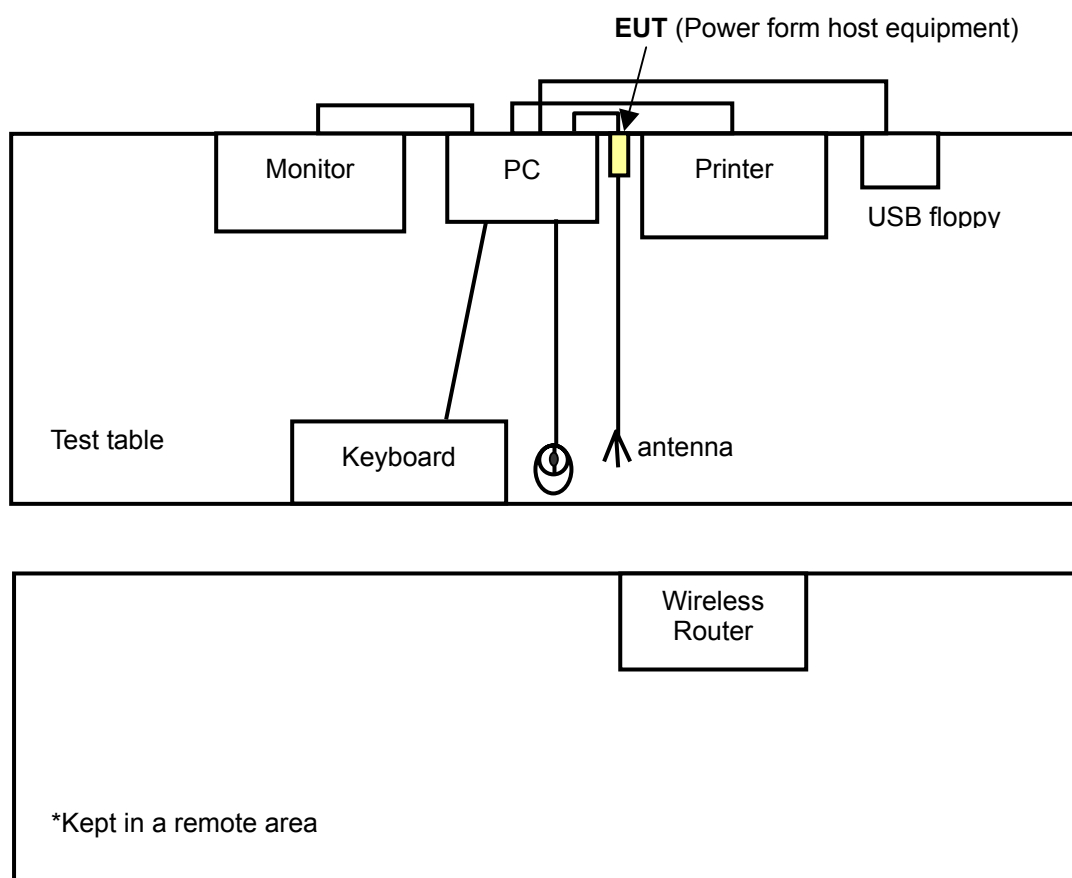
3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

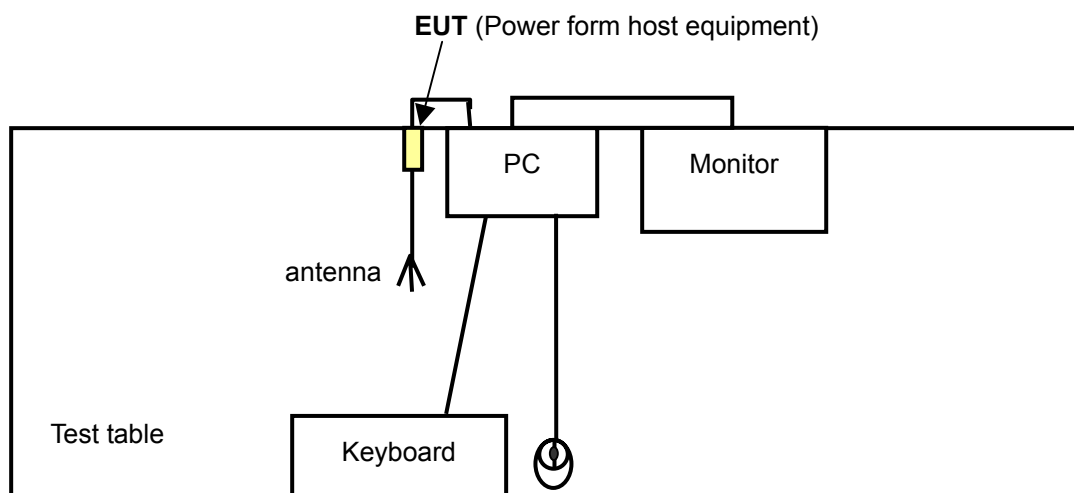
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

For conducted emission and radiated emission below 1GHz test:



For radiated emission above 1GHz test:



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	√	√	√	√	-

Where PLC: Power Line Conducted Emission

RE<1G RE: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

Radiated Emission Test (Below 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X, Y, Z axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	AXIS
802.11g	1 to 11	11	OFDM	BPSK	6	X

Radiated Emission Test (Above 1 GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X, Y, Z axis and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	AXIS
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	X
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	X

Bandedge Measurement:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 11	OFDM	BPSK	6

Antenna Port Conducted Measurement:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)

ANSI C63.4- 2003

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

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

For conducted emission and radiated emission below 1GHz test:

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PC	NA	s7400n	NA	FCC DoC Approved
2	COLOR MONITOR	ADI	CM100	026058T1020061 1 A	FCC DoC Approved
3	PRINTER	LEXMARK	Z33	03331652893	FCC DoC Approved
4	EXTERNAL USB 1.1 FLOPPY	SONY	MPF82E	50010131	FCC DoC Approved
5	PS/2 KEYBOARD	BTC	5200T	F24800239	E5XKB5122WTH01 10
6	PS/2 MOUSE	BTC	M851	M4-010377	E5XMSM860
7	WIRELESS BROADBAND ROUTER	BUFFALO	WBR-G54S	34074254622025	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core
3	2.0 m foil shielded wire , terminated with USB connector via metallic frame, w/o core.
4	0.6 m shielded cable, terminated with USB connector, with 1 core.
5	1.6 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.
6	1.5 m Non shielded wire, terminated with PS/2 connector via drain wire, w/o core.
7	NA

NOTE1: All power cords of the above support units are non shielded (1.8m).

2: Item 7 acted as a communication partner to transfer data.

For radiated emission above 1GHz test:

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PC	NA	s7400n	NA	FCC DoC Approved
2	COLOR MONITOR	HACE	CT14A	35111411001750	VERIFICATION
5	PS/2 KEYBOARD	DELL	SK-8110	MY-05N456-71619-4B5-1041	E5XKB5122WTH0110
6	PS/2 MOUSE	DELL	M071KC	504008969	E5XMSM860

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m braid shielded wire
5	1.6 m shielded cable
6	1.6 m shielded cable

NOTE1: All power cords of the above support units are non shielded (1.8m).

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	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	ESCS30	834115/016	Jan. 10, 2007
ROHDE & SCHWARZ Artificial Mains Network (For EUT)	ESH2-Z5	828075/003	Jun. 27, 2007
LISN With Adapter (for EUT)	AD10	C03Ada-001	Jun. 27, 2007
EMCO L.I.S.N. (For peripherals)	3825/2	9504-2359	Jun. 27, 2007
Software	ADT_Cond_V7.3.2	NA	NA
Software	ADT_ISN_V7.3.2	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C03.01	Mar. 15, 2007
Terminator (For EMCO LISN)	NA	E1-01-300	Jan. 16, 2007
Terminator (For EMCO LISN)	NA	E1-01-301	Jan. 16, 2007

- 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. 3.
 3. The VCCI Site Registration No. C-274.

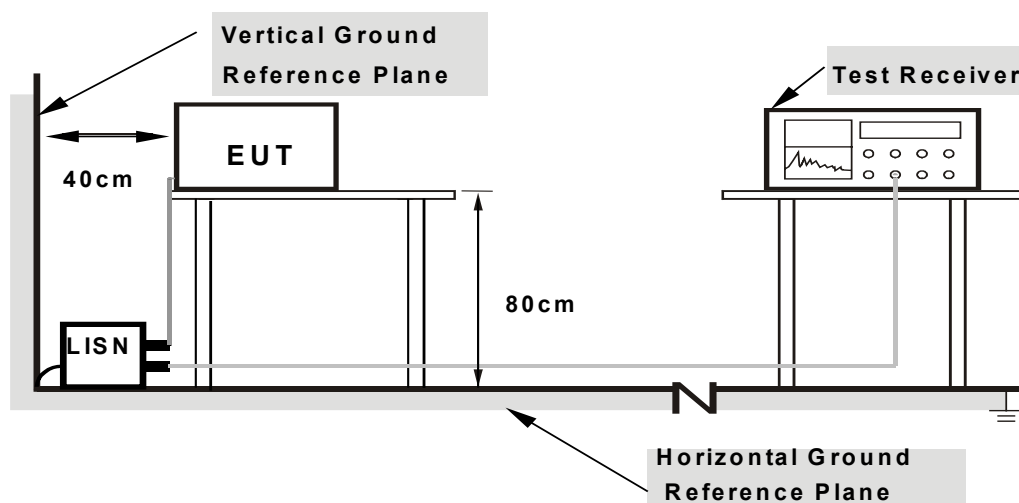
4.1.3 TEST PROCEDURES

- 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 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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) are 80 cm from EUT and at least 80 cm from other units and other metal planes

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

4.1.6 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 read/write data from the USB floppy via EUT.
- d. The computer system sent "H" messages to its screen.
- e. The computer system sent "H" messages to printer and the printer prints them on paper.
- f. Steps d ~ e were repeated.
- g. Prepared wireless router to act as a communication partner and placed it outside of testing area.
- h. The communication partner run a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- i. The communication partner sent data to EUT by command "PING".

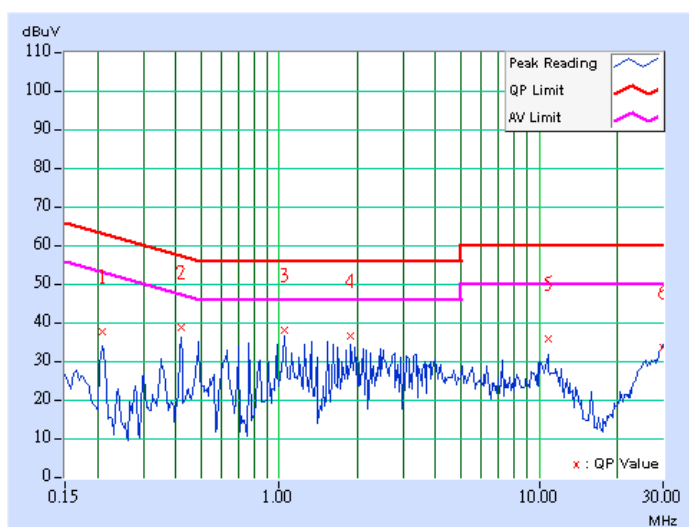
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 57%RH, 991hPa
TESTED BY	Vito Huang	INPUT POWER (SYSTEM)	120Vac, 60 Hz

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.210	0.20	34.89	-	35.09	-	63.21	53.21	-28.12	-
2	0.420	0.22	36.18	-	36.40	-	57.46	47.46	-21.05	-
3	1.051	0.32	35.44	-	35.76	-	56.00	46.00	-20.24	-
4	1.889	0.33	34.01	-	34.34	-	56.00	46.00	-21.66	-
5	10.803	0.66	33.05	-	33.71	-	60.00	50.00	-26.29	-
6	29.890	2.71	31.14	-	33.85	-	60.00	50.00	-26.15	-

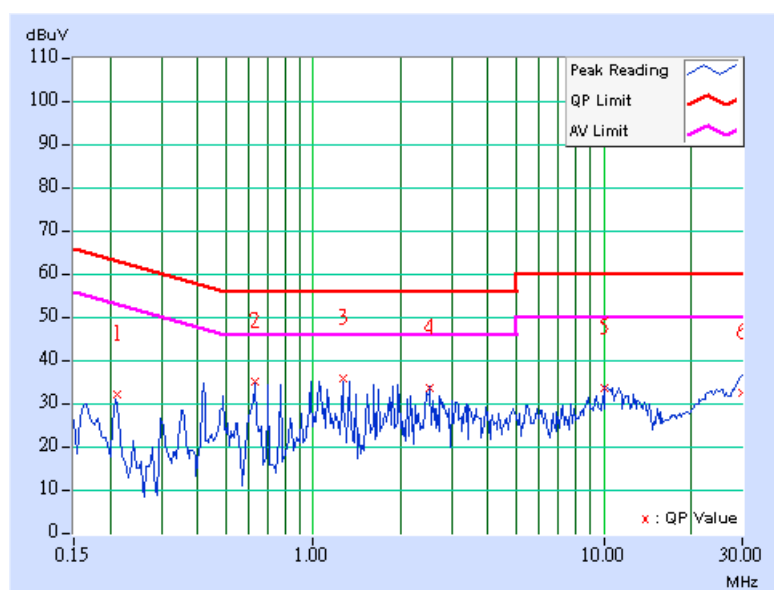
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 57%RH, 991hPa
TESTED BY	Vito Huang	INPUT POWER (SYSTEM)	120Vac, 60 Hz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.210	0.30	30.72	-	31.02	-	63.20	53.20	-32.18	-
2	0.630	0.32	33.74	-	34.06	-	56.00	46.00	-21.94	-
3	1.263	0.32	34.24	-	34.56	-	56.00	46.00	-21.44	-
4	2.524	0.36	32.20	-	32.56	-	56.00	46.00	-23.44	-
5	10.021	0.53	32.08	-	32.61	-	60.00	50.00	-27.39	-
6	30.000	1.63	30.91	-	32.54	-	60.00	50.00	-27.46	-

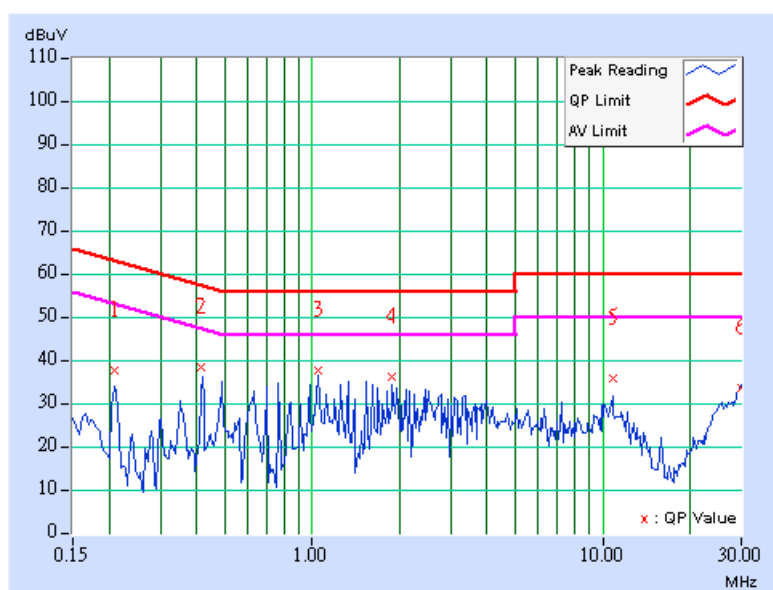
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1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 57%RH, 991hPa
TESTED BY	Vito Huang	INPUT POWER (SYSTEM)	120Vac, 60 Hz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.20	34.89	-	35.09	-	63.26	53.26	-28.17	-
2	0.415	0.22	35.62	-	35.84	-	57.55	47.55	-21.71	-
3	1.051	0.32	34.88	-	35.20	-	56.00	46.00	-20.80	-
4	1.889	0.33	33.56	-	33.89	-	56.00	46.00	-22.11	-
5	10.805	0.66	33.05	-	33.71	-	60.00	50.00	-26.29	-
6	29.893	2.71	31.14	-	33.85	-	60.00	50.00	-26.15	-

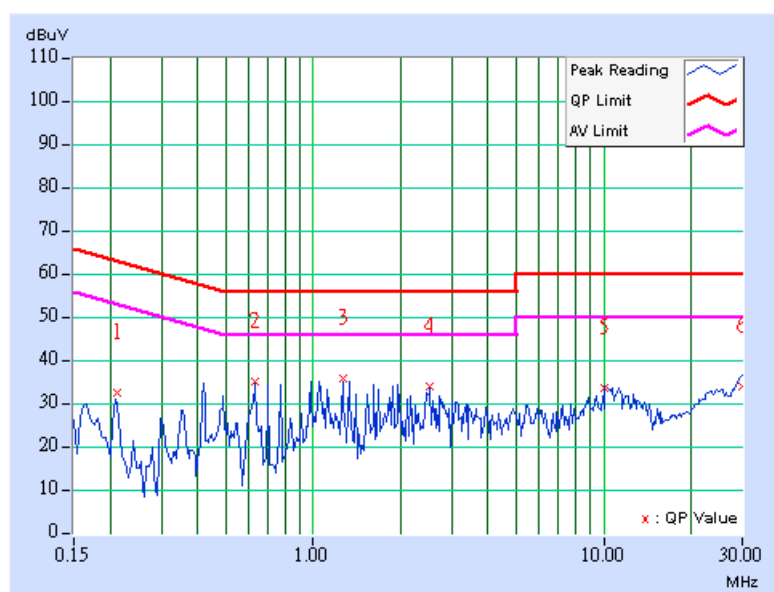
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 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 57%RH, 991hPa
TESTED BY	Vito Huang	INPUT POWER (SYSTEM)	120Vac, 60 Hz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.211	0.30	30.86	-	31.16	-	63.18	53.18	-32.02	-
2	0.631	0.32	33.69	-	34.01	-	56.00	46.00	-21.99	-
3	1.263	0.32	34.39	-	34.71	-	56.00	46.00	-21.29	-
4	2.524	0.36	32.39	-	32.75	-	56.00	46.00	-23.25	-
5	10.021	0.53	32.15	-	32.68	-	60.00	50.00	-27.32	-
6	30.000	1.63	32.51	-	34.14	-	60.00	50.00	-25.86	-

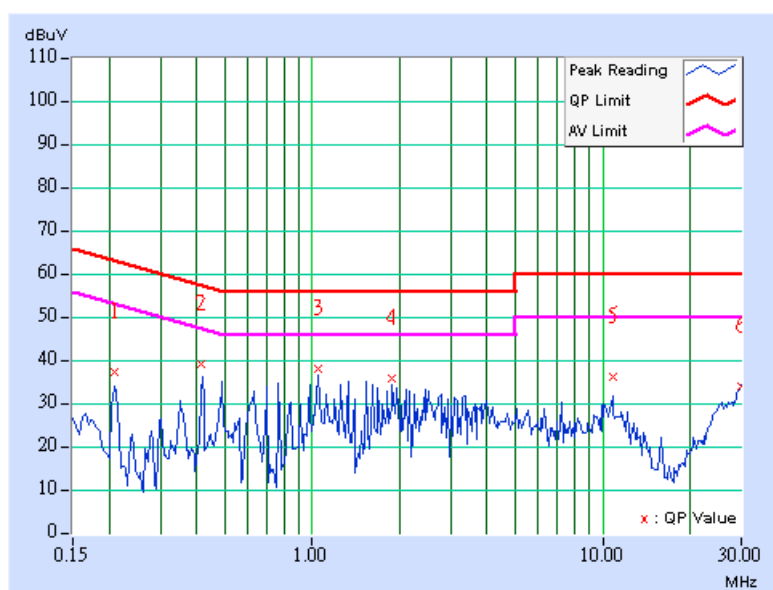
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 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 57%RH, 991hPa
TESTED BY	Vito Huang	INPUT POWER (SYSTEM)	120Vac, 60 Hz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.208	0.20	34.72	-	34.92	-	63.27	53.27	-28.35	-
2	0.413	0.22	36.69	-	36.91	-	57.59	47.59	-20.68	-
3	1.051	0.32	35.36	-	35.68	-	56.00	46.00	-20.32	-
4	1.888	0.33	33.26	-	33.59	-	56.00	46.00	-22.41	-
5	10.806	0.66	33.69	-	34.35	-	60.00	50.00	-25.65	-
6	29.899	2.72	31.22	-	33.94	-	60.00	50.00	-26.06	-

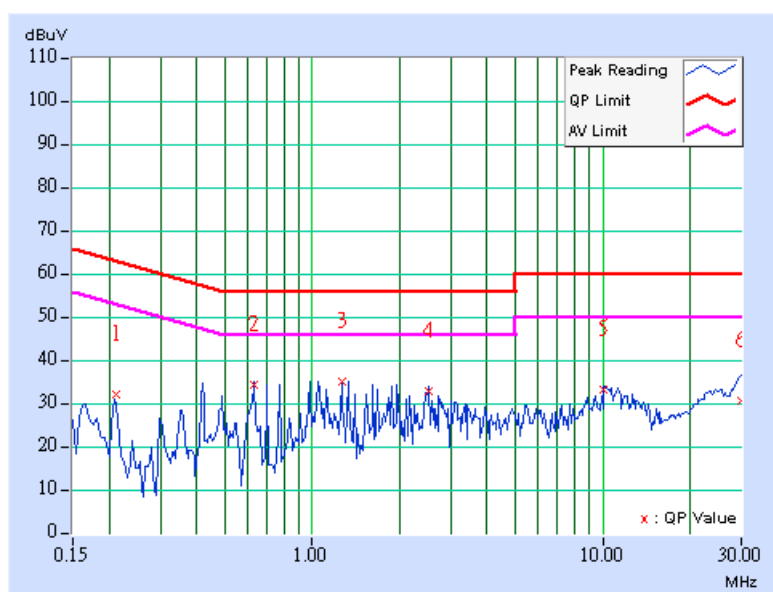
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 57%RH, 991hPa
TESTED BY	Vito Huang	INPUT POWER (SYSTEM)	120Vac, 60 Hz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.211	0.30	30.58	-	30.88	-	63.15	53.15	-32.27	-
2	0.631	0.32	32.85	-	33.17	-	56.00	46.00	-22.83	-
3	1.263	0.32	33.56	-	33.88	-	56.00	46.00	-22.12	-
4	2.524	0.36	31.29	-	31.65	-	56.00	46.00	-24.35	-
5	10.021	0.53	31.65	-	32.18	-	60.00	50.00	-27.82	-
6	30.000	1.63	29.19	-	30.82	-	60.00	50.00	-29.18	-

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

Below 1GHz rest:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Preamplifier	8449B	3008A01924	Sep. 06, 2006
HP Preamplifier	8449B	3008A01638	Sep. 21, 2006
SCHAFFNER TEST RECEIVER	SCR 3501	408	Dec. 28, 2006
CHASE BILOG Antenna	CBL6111D	21872	Aug. 07, 2006
EMCO Horn Antenna	3115	6714	Oct. 26, 2006
EMCO Horn Antenna	3115	9312-4192	Mar. 14, 2007
ADT. Turn Table	TT100	0505	NA
ADT. Tower	AT100	0505	NA
Software	ADT_Radiated _V7.5.14	NA	NA
ADT RF Switches BOX	EM-H-01-1	1002	Sep. 01, 2006
TIMES RF cable	LMR-600	CABLE-ST5-01	Sep. 01, 2006

- 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 horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 3. The test was performed in ADT Open Site No. 5.
 4. The VCCI Site Registration No. R-1039.

Above 1GHz rest:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Jan. 01, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 04, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 15, 2007
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 01, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A01960	Nov. 09, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219268/4	Dec. 20, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	230129/4	Dec. 20, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	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 HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC4924-4.

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 3 meter semi-anechoic chamber. 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.

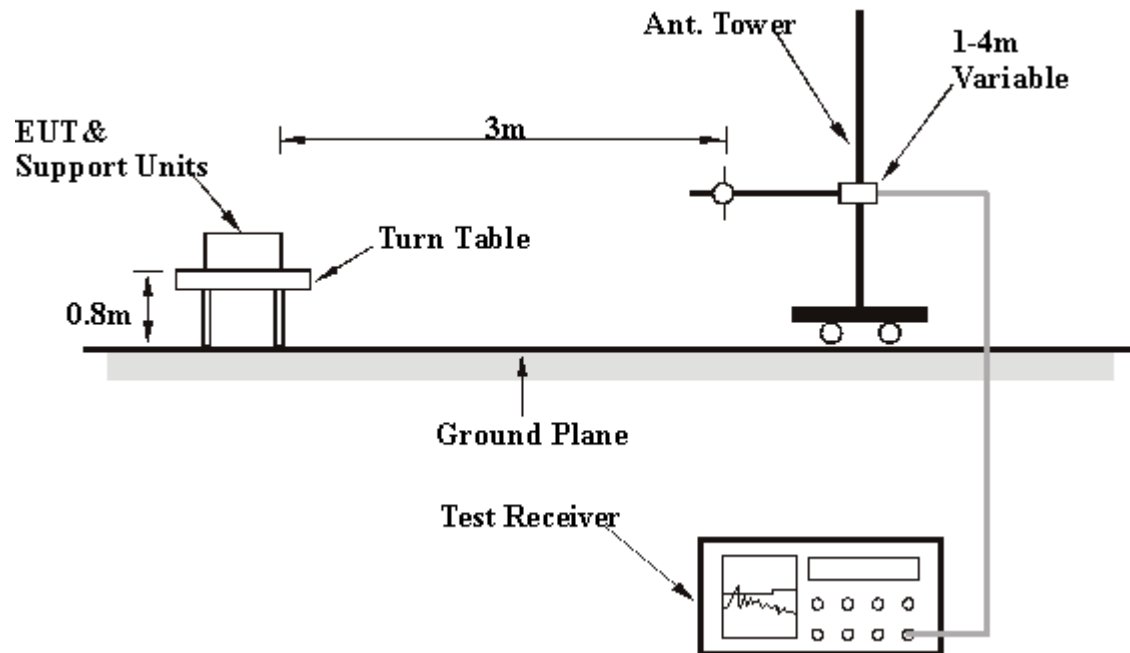
NOTE:

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 10Hz 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

RADIATED WORST-CASE DATA: BELOW 1GHz

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	30deg. C, 70%RH, 991hPa
TESTED BY	Vito Huang	INPUT POWER (SYSTEM)	120Vac, 60 Hz

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	37.65	29.55 QP	40.00	-10.45	2.79 H	200	14.70	14.85
2	125.36	33.94 QP	43.50	-9.56	1.75 H	185	21.22	12.72
3	174.61	39.42 QP	43.50	-4.08	1.79 H	277	28.77	10.65
4	215.50	39.00 QP	43.50	-4.50	1.28 H	266	28.08	10.92
5	427.15	41.71 QP	46.00	-4.29	1.00 H	304	22.60	19.11
6	564.00	37.21 QP	46.00	-8.79	1.81 H	188	13.96	23.25
7	714.80	37.48 QP	46.00	-8.52	1.34 H	80	12.42	25.06

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	41.95	28.45 QP	40.00	-11.55	1.80 V	83	15.86	12.59
2	83.40	29.05 QP	40.00	-10.95	1.31 V	153	20.44	8.61
3	185.13	32.96 QP	43.50	-10.54	1.00 V	341	22.94	10.02
4	330.00	31.66 QP	46.00	-14.34	1.26 V	236	15.43	16.23
5	429.00	41.82 QP	46.00	-4.18	1.95 V	64	22.67	19.15
6	566.00	34.41 QP	46.00	-11.59	1.41 V	336	11.18	23.23
7	722.50	33.82 QP	46.00	-12.18	2.75 V	18	8.43	25.39

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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.

802.11b DSSS modulation

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TESTED BY	Brad Wu	INPUT POWER (SYSTEM)	120Vac, 60 Hz

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	2370.00	41.37 PK	74.00	-32.63	1.21 H	244	9.34	32.03
2	2370.00	38.01 AV	54.00	-15.99	1.21 H	244	5.98	32.03
3	*2412.00	95.64 PK			1.21 H	244	63.46	32.18
4	*2412.00	92.28 AV			1.21 H	244	60.10	32.18
5	3216.00	47.18 PK	75.64	-28.46	1.03 H	340	12.80	34.38
6	3216.00	40.48 AV	72.28	-31.80	1.03 H	340	6.10	34.38
7	4824.00	48.00 PK	74.00	-26.00	1.34 H	249	9.37	38.63
8	4824.00	35.97 AV	54.00	-18.03	1.34 H	249	-2.66	38.63

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	2370.00	59.76 PK	74.00	-14.24	1.10 V	234	27.73	32.03
2	2370.00	49.38 AV	54.00	-4.62	1.10 V	234	17.35	32.03
3	*2412.00	105.71 PK			1.09 V	235	73.53	32.18
4	*2412.00	102.65 AV			1.09 V	235	70.47	32.18
5	3216.00	47.91 PK	85.71	-37.80	1.16 V	17	13.53	34.38
6	3216.00	40.43 AV	82.65	-42.22	1.16 V	17	6.05	34.38
7	4824.00	49.61 PK	74.00	-24.39	1.00 V	228	10.98	38.63
8	4824.00	41.03 AV	54.00	-12.97	1.00 V	228	2.40	38.63

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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. “ * ” : Fundamental frequency

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TESTED BY	Brad Wu	INPUT POWER (SYSTEM)	120Vac, 60 Hz

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	*2437.00	106.45 PK			1.08 V	234	74.18	32.27
2	*2437.00	103.32 AV			1.08 V	234	71.05	32.27
3	2483.50	59.71 PK	74.00	-14.29	1.08 V	234	27.27	32.44
4	2483.50	48.86 AV	54.00	-5.14	1.08 V	234	16.42	32.44
5	3248.00	48.13 PK	86.45	-38.32	1.05 V	67	13.72	34.41
6	3248.00	40.65 AV	83.32	-42.67	1.05 V	67	6.24	34.41
7	4874.00	49.87 PK	74.00	-24.13	1.05 V	326	11.10	38.77
8	4874.00	41.32 AV	54.00	-12.68	1.05 V	326	2.55	38.77

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	*2437.00	106.45 PK			1.08 V	234	74.18	32.27
2	*2437.00	103.32 AV			1.08 V	234	71.05	32.27
3	2483.50	59.71 PK	74.00	-14.29	1.08 V	234	27.27	32.44
4	2483.50	48.86 AV	54.00	-5.14	1.08 V	234	16.42	32.44
5	3248.00	48.13 PK	86.45	-38.32	1.05 V	67	13.72	34.41
6	3248.00	40.65 AV	83.32	-42.67	1.05 V	67	6.24	34.41
7	4874.00	49.87 PK	74.00	-24.13	1.05 V	326	11.10	38.77
8	4874.00	41.32 AV	54.00	-12.68	1.05 V	326	2.55	38.77

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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. “ * ” : Fundamental frequency

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TESTED BY	Brad Wu	INPUT POWER (SYSTEM)	120Vac, 60 Hz

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	*2462.00	95.41 PK			1.20 H	243	63.05	32.36
2	*2462.00	92.03 AV			1.20 H	243	59.67	32.36
3	2500.00	42.07 PK	74.00	-31.93	1.20 H	243	9.57	32.50
4	2500.00	38.69 AV	54.00	-15.31	1.20 H	243	6.19	32.50
5	3282.00	47.03 PK	75.41	-28.38	1.14 H	23	12.59	34.44
6	3282.00	40.35 AV	72.03	-31.68	1.14 H	23	5.91	34.44
7	4924.00	48.24 PK	74.00	-25.76	1.09 H	67	9.34	38.90
8	4924.00	36.11 AV	54.00	-17.89	1.09 H	67	-2.79	38.90

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	*2462.00	106.30 PK			1.07 V	232	73.94	32.36
2	*2462.00	103.19 AV			1.07 V	232	70.83	32.36
3	2500.00	60.77 PK	74.00	-13.23	1.28 V	233	28.27	32.50
4	2500.00	49.85 AV	54.00	-4.15	1.28 V	233	17.35	32.50
5	3282.00	47.85 PK	86.30	-38.45	1.08 V	29	13.41	34.44
6	3282.00	40.31 AV	83.19	-42.88	1.08 V	29	5.87	34.44
7	4924.00	49.45 PK	74.00	-24.55	1.03 V	177	10.55	38.90
8	4924.00	40.87 AV	54.00	-13.13	1.03 V	177	1.97	38.90

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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. “ * ” : Fundamental frequency

802.11g OFDM modulation

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TESTED BY	Brad Wu	INPUT POWER (SYSTEM)	120Vac, 60 Hz

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	2386.00	47.52 PK	74.00	-26.48	1.20 H	206	15.43	32.09
2	2386.00	38.71 AV	54.00	-15.29	1.20 H	206	6.62	32.09
3	*2412.00	95.62 PK			1.20 H	206	63.44	32.18
4	*2412.00	86.81 AV			1.20 H	206	54.63	32.18
5	3216.00	44.75 PK	75.62	-30.87	1.09 H	15	10.37	34.38
6	3216.00	37.32 AV	66.81	-29.49	1.09 H	15	2.94	34.38
7	4824.00	47.95 PK	74.00	-26.05	1.30 H	251	9.32	38.63
8	4824.00	35.82 AV	54.00	-18.18	1.30 H	251	-2.81	38.63

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	2368.00	59.79 PK	74.00	-14.21	1.14 V	57	27.77	32.02
2	2368.00	48.99 AV	54.00	-5.01	1.14 V	57	16.97	32.02
3	*2412.00	105.81 PK			1.14 V	57	73.63	32.18
4	*2412.00	97.09 AV			1.14 V	57	64.91	32.18
5	3216.00	45.95 PK	85.81	-39.86	1.12 V	24	11.57	34.38
6	3216.00	38.47 AV	77.09	-38.62	1.12 V	24	4.09	34.38
7	4824.00	45.45 PK	74.00	-28.55	1.02 V	236	6.82	38.63
8	4824.00	36.85 AV	54.00	-17.15	1.02 V	236	-1.78	38.63

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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. “ * ” : Fundamental frequency

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TESTED BY	Brad Wu	INPUT POWER (SYSTEM)	120Vac, 60 Hz

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	*2437.00	95.42 PK			1.15 H	214	63.15	32.27
2	*2437.00	86.60 AV			1.15 H	214	54.33	32.27
3	3248.00	44.62 PK	75.42	-30.80	1.13 H	27	10.21	34.41
4	3248.00	37.24 AV	66.60	-29.36	1.13 H	27	2.83	34.41
5	4874.00	48.09 PK	74.00	-25.91	1.24 H	26	9.32	38.77
6	4874.00	35.91 AV	54.00	-18.09	1.24 H	26	-2.86	38.77

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	*2437.00	105.68 PK			1.15 V	60	73.41	32.27
2	*2437.00	96.95 AV			1.15 V	60	64.68	32.27
3	3248.00	46.12 PK	85.68	-39.56	1.09 V	47	11.71	34.41
4	3248.00	38.63 AV	76.95	-38.32	1.09 V	47	4.22	34.41
5	4874.00	45.69 PK	74.00	-28.31	1.13 V	39	6.92	38.77
6	4874.00	37.07 AV	54.00	-16.93	1.13 V	39	-1.70	38.77

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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. “ * ” : Fundamental frequency

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 64%RH, 991hPa
TESTED BY	Brad Wu	INPUT POWER (SYSTEM)	120Vac, 60 Hz

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	*2462.00	95.57 PK			1.19 H	204	63.21	32.36
2	*2462.00	86.72 AV			1.19 H	204	54.36	32.36
3	2483.50	47.69 PK	74.00	-26.31	1.19 H	204	15.25	32.44
4	2483.50	38.85 AV	54.00	-15.15	1.19 H	204	6.41	32.44
5	3282.00	44.62 PK	75.57	-30.95	1.06 H	84	10.18	34.44
6	3282.00	37.25 AV	66.72	-29.47	1.06 H	84	2.81	34.44
7	4924.00	47.84 PK	74.00	-26.16	1.11 H	43	8.94	38.90
8	4924.00	35.76 AV	54.00	-18.24	1.11 H	43	-3.14	38.90

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	*2462.00	105.45 PK			1.12 V	55	73.09	32.36
2	*2462.00	96.77 AV			1.12 V	55	64.41	32.36
3	2483.50	60.15 PK	74.00	-13.85	1.12 V	55	27.71	32.44
4	2483.50	49.27 AV	54.00	-4.73	1.12 V	55	16.83	32.44
5	3282.00	46.12 PK	85.45	-39.33	1.07 V	45	11.68	34.44
6	3282.00	38.61 AV	76.77	-38.16	1.07 V	45	4.17	34.44
7	4924.00	45.36 PK	74.00	-28.64	1.09 V	58	6.46	38.90
8	4924.00	36.71 AV	54.00	-17.29	1.09 V	58	-2.19	38.90

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
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. “ * ” : 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
SPECTRUM ANALYZER	FSEK 30	100049	Aug. 14, 2006

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

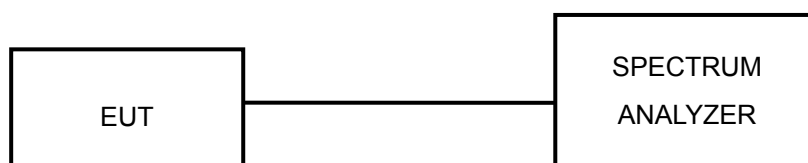
4.3.3 TEST PROCEDURE

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 6dB.

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.

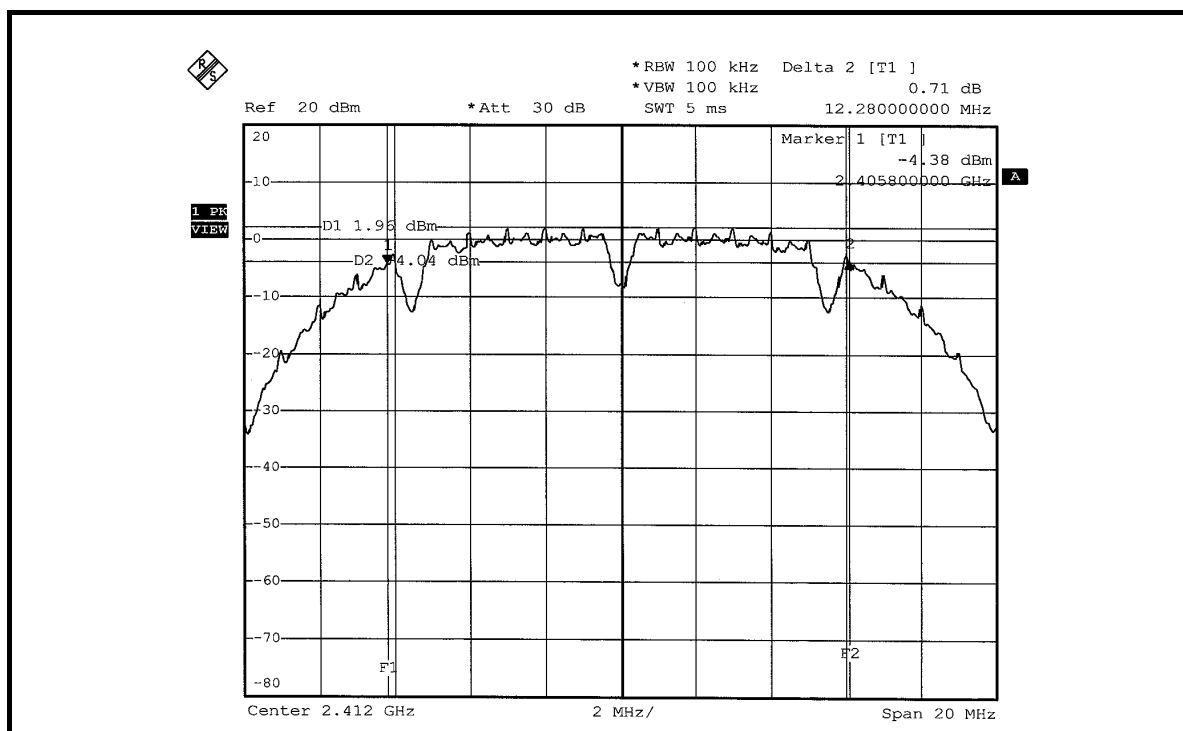
4.3.7 TEST RESULTS

802.11b DSSS modulation

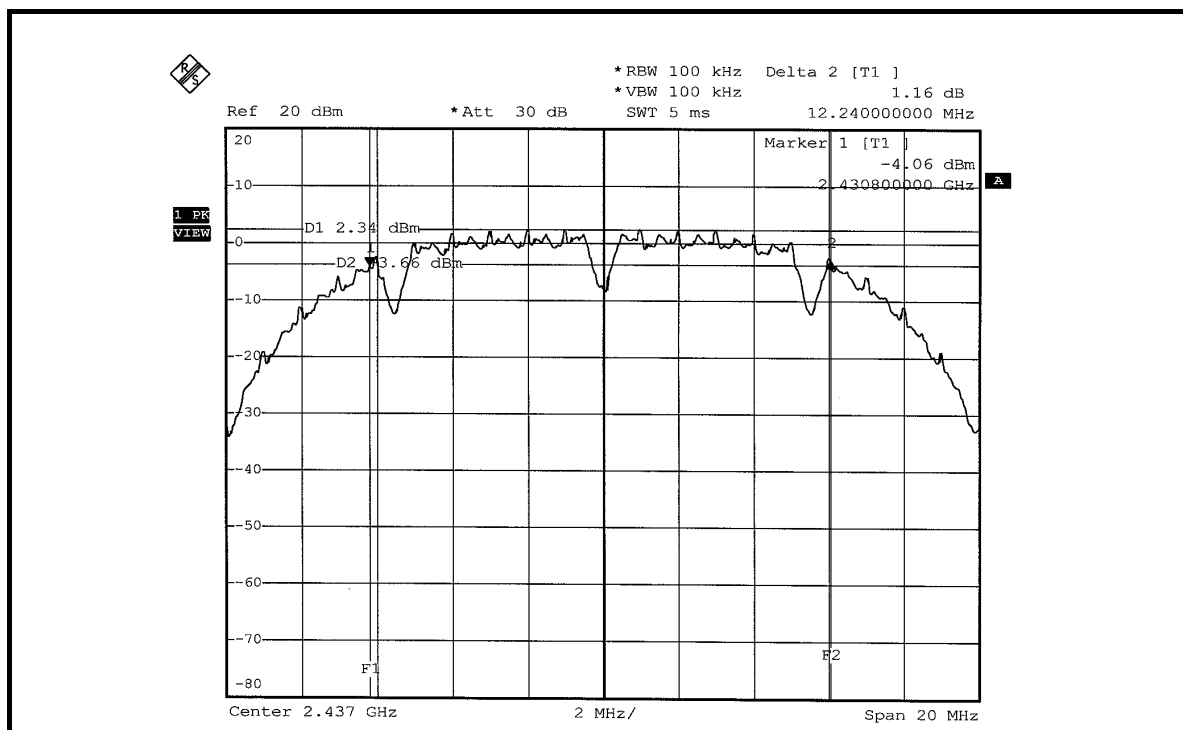
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	12.28	0.5	PASS
6	2437	12.24	0.5	PASS
11	2462	12.12	0.5	PASS

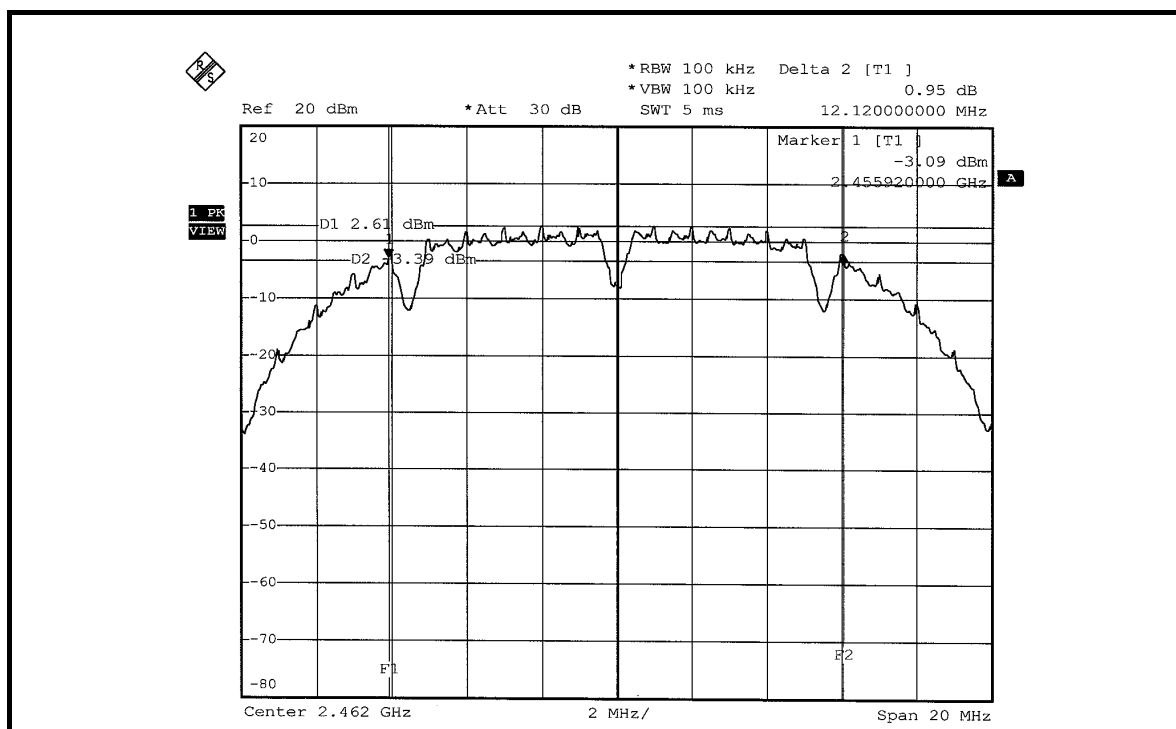
CH1



CH6



CH11

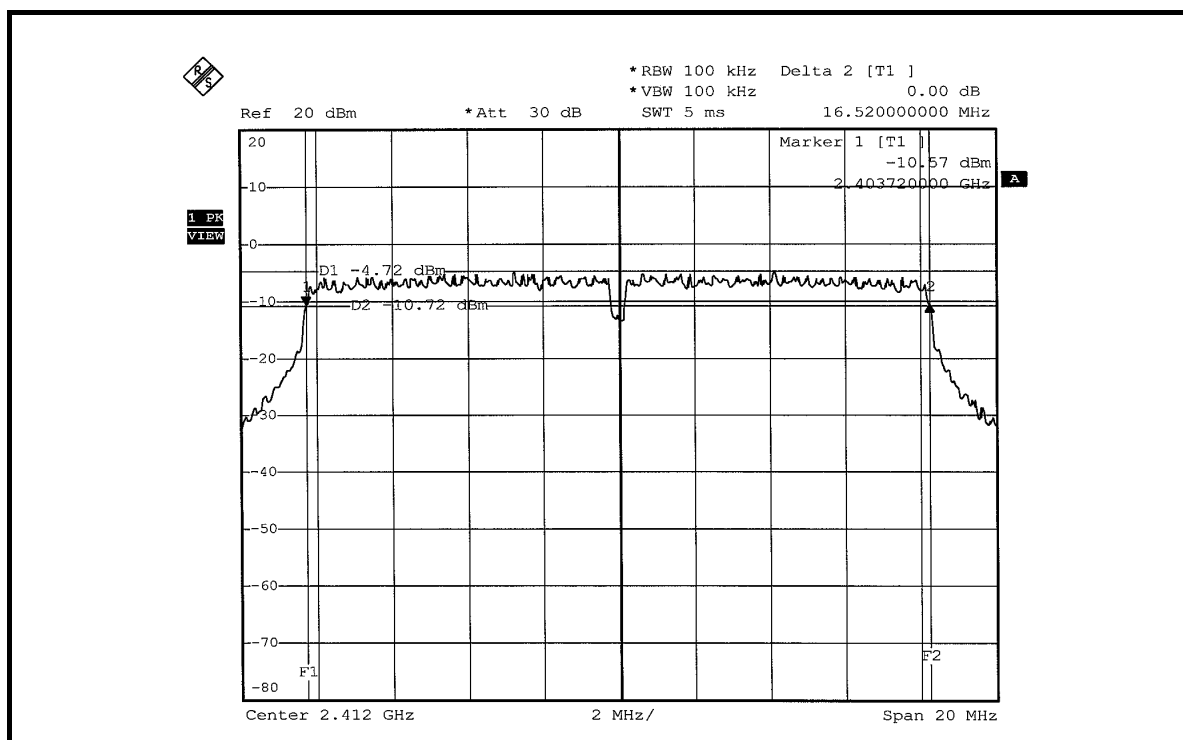


802.11g OFDM modulation

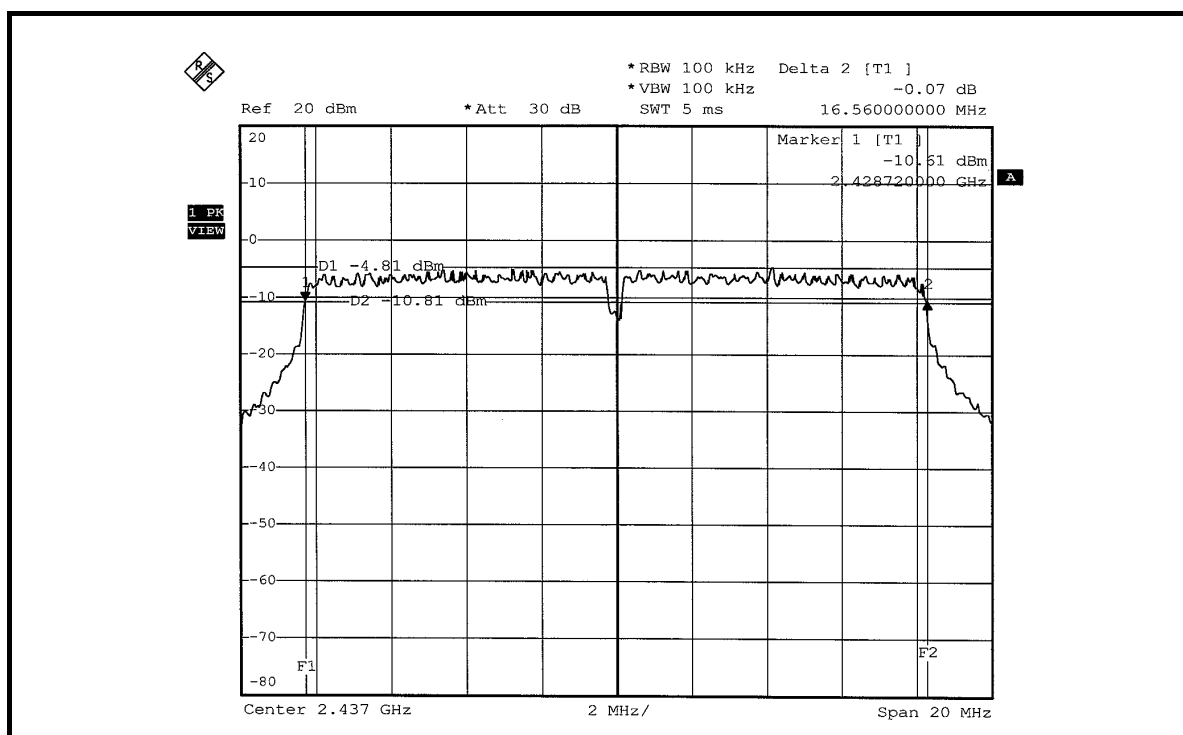
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.52	0.5	PASS
6	2437	16.56	0.5	PASS
11	2462	16.56	0.5	PASS

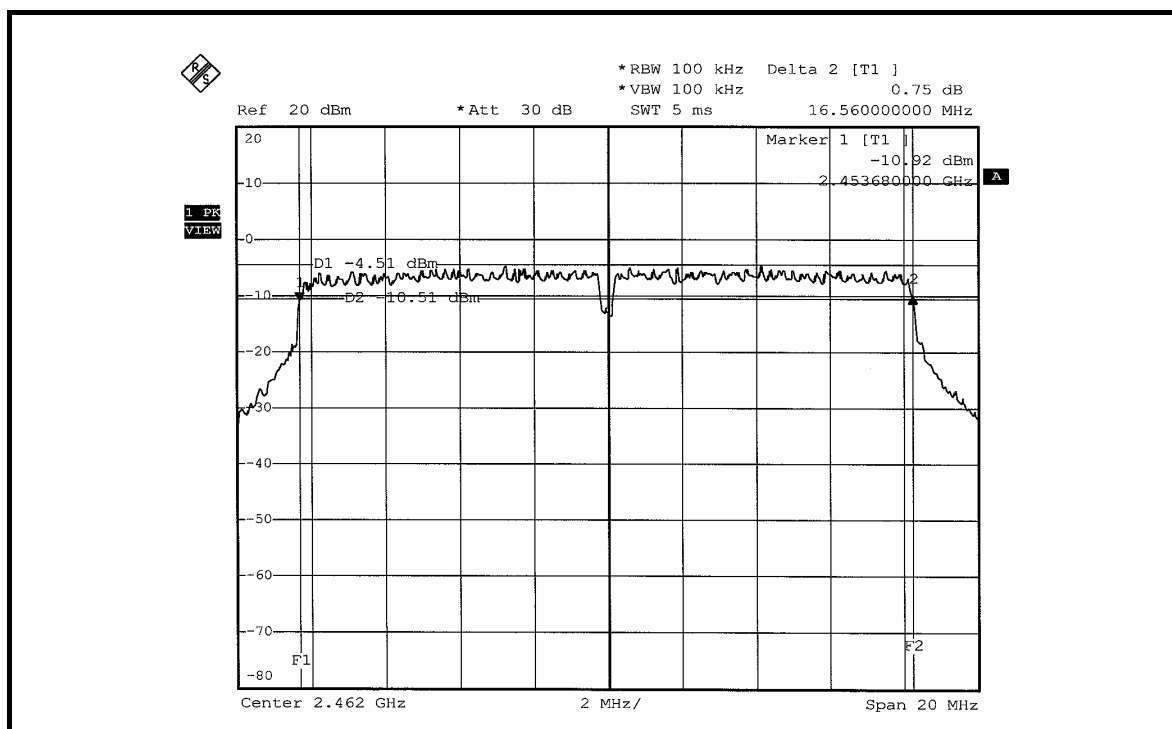
CH1



CH6



CH11



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	Aug. 14, 2006
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 07, 2006
TEKTRONIX OSCILLOSCOPE	TDS1012	C037299	Nov. 28, 2006
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.

4.4.1 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the 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 reading on oscilloscope. Record the power level.

4.4.2 DEVIATION FROM TEST STANDARD

No deviation

4.4.3 TEST SETUP



4.4.4 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.3 TEST RESULTS

802.11b DSSS modulation

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	56.494	17.52	30	PASS
6	2437	56.364	17.51	30	PASS
11	2462	56.754	17.54	30	PASS

802.11g OFDM modulation

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	35.810	15.54	30	PASS
6	2437	35.481	15.50	30	PASS
11	2462	35.727	15.53	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	Aug. 14, 2006

NOTE:

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

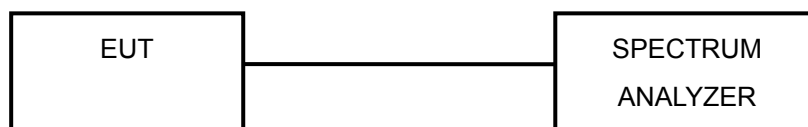
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

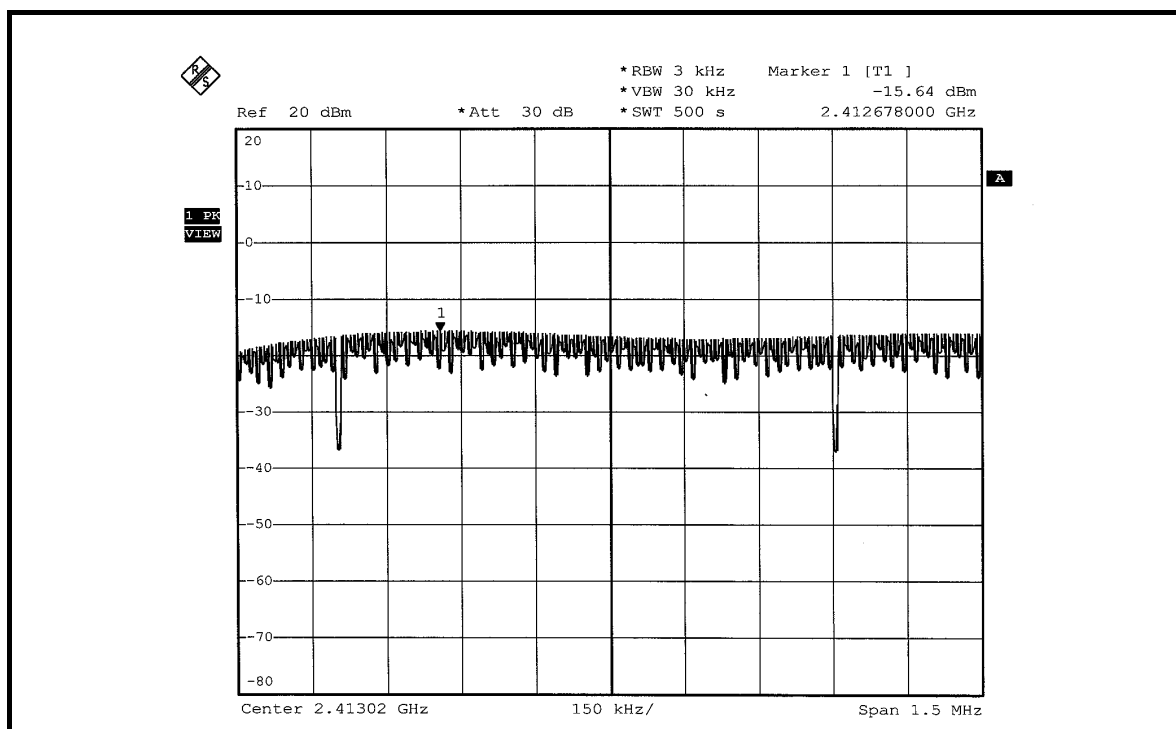
4.5.7 TEST RESULTS

802.11b DSSS modulation

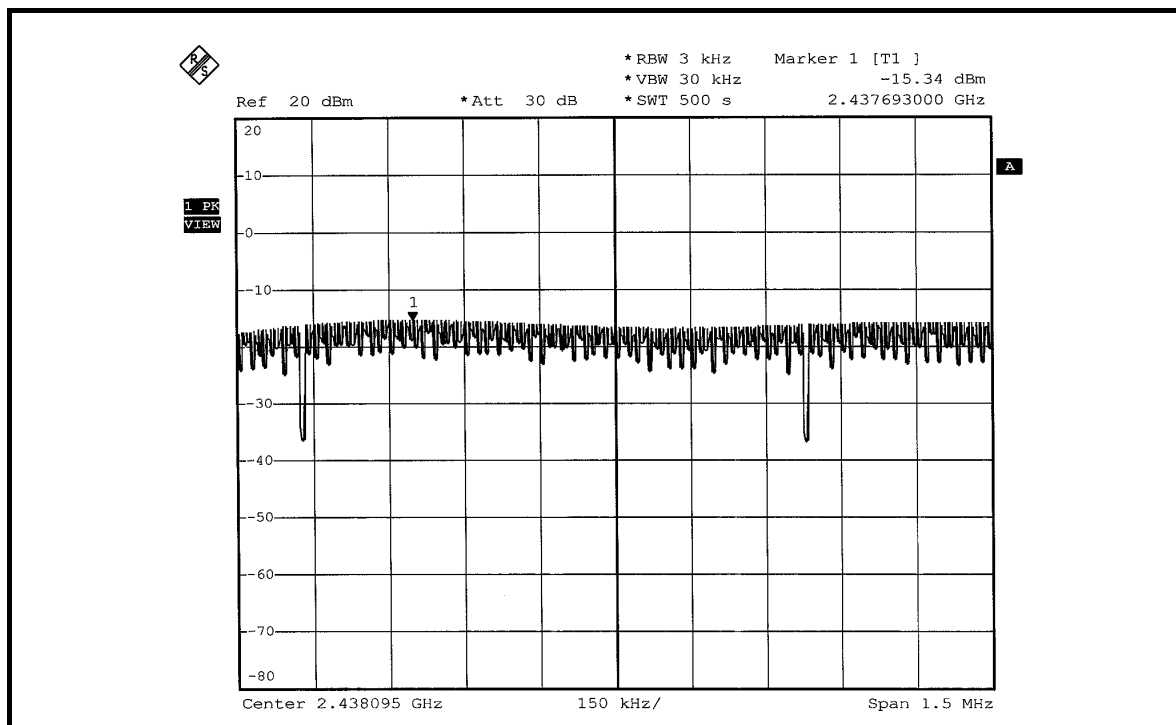
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-15.64	8	PASS
6	2437	-15.34	8	PASS
11	2462	-15.38	8	PASS

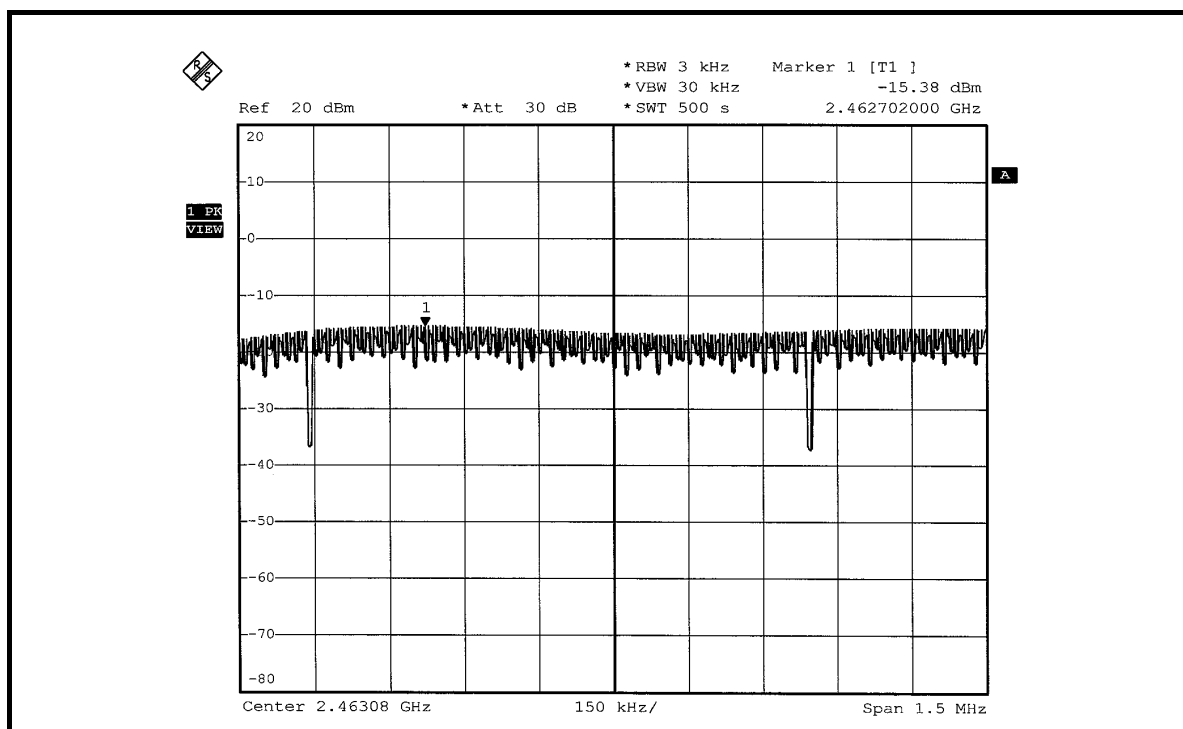
CH1



CH6



CH11

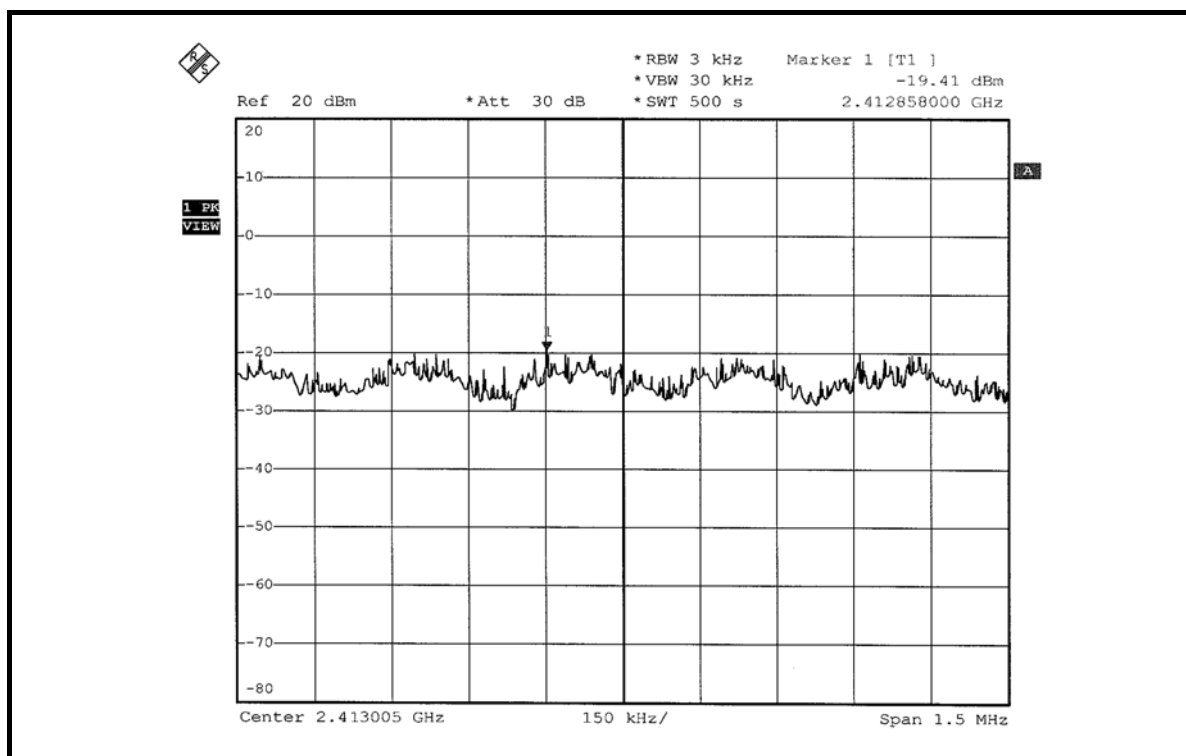


802.11g OFDM modulation

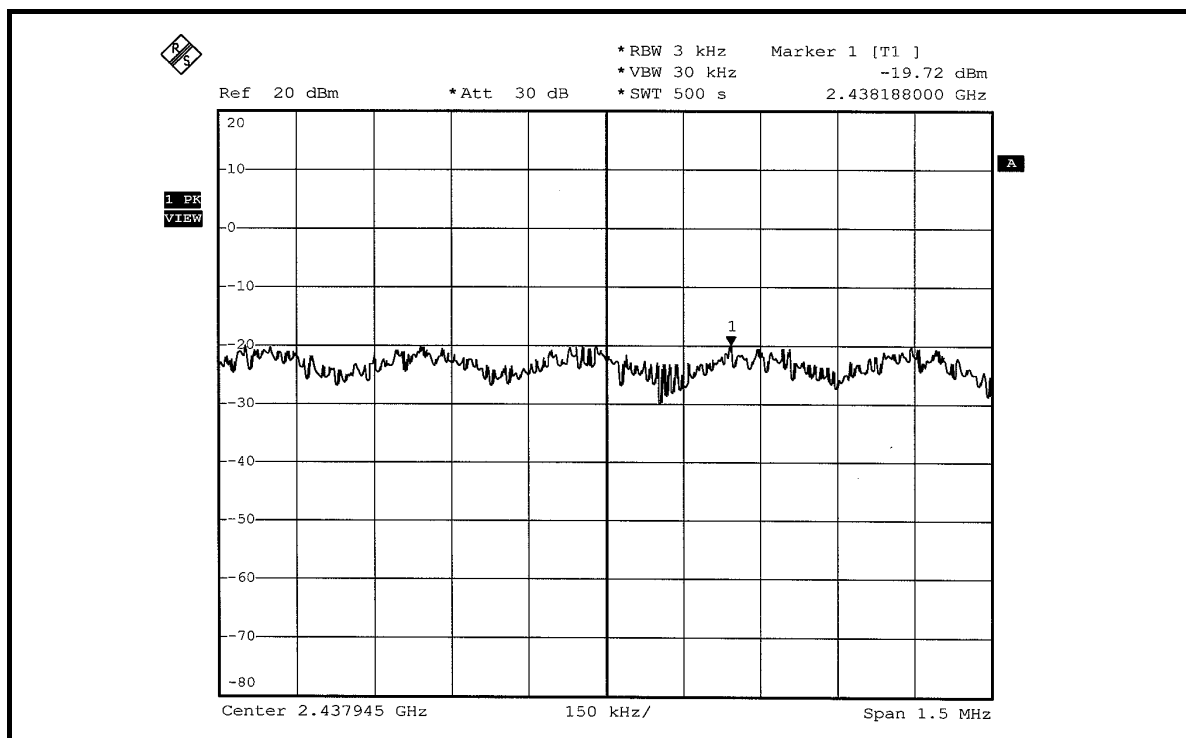
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-19.41	8	PASS
6	2437	-19.72	8	PASS
11	2462	-19.10	8	PASS

CH1



CH6



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	Aug. 14, 2006

NOTE: 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 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW=VBW=100kHz ; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

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

The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

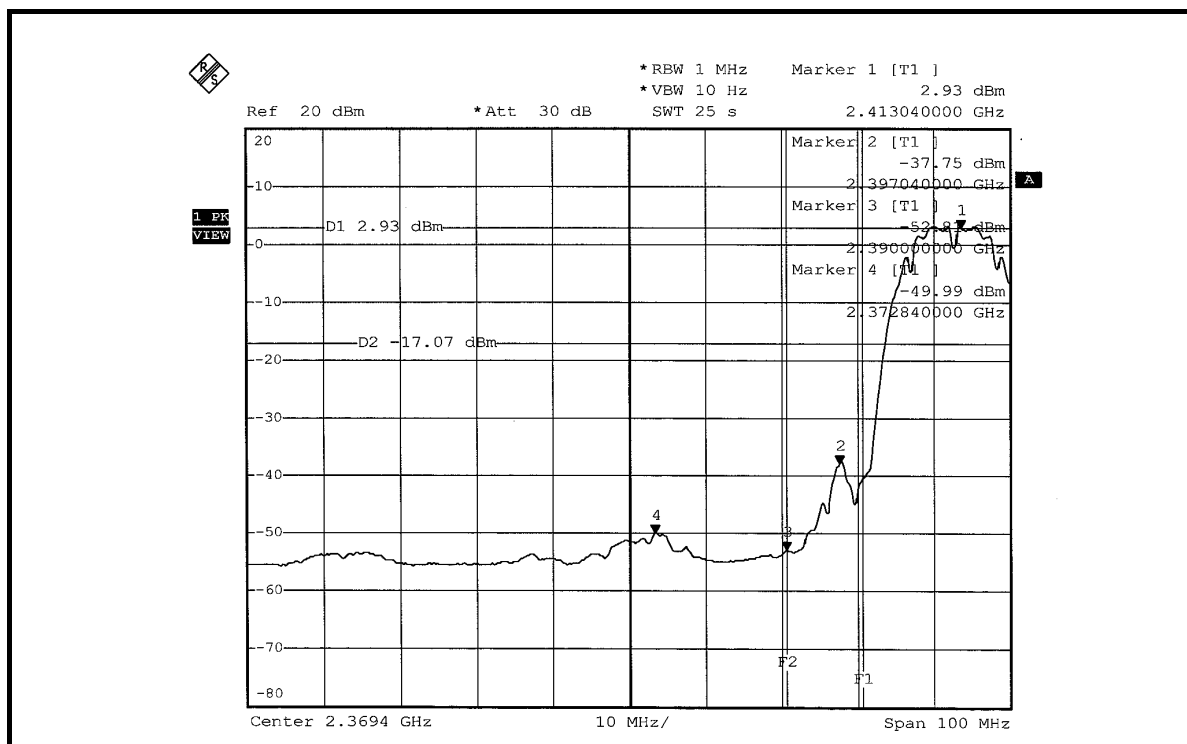
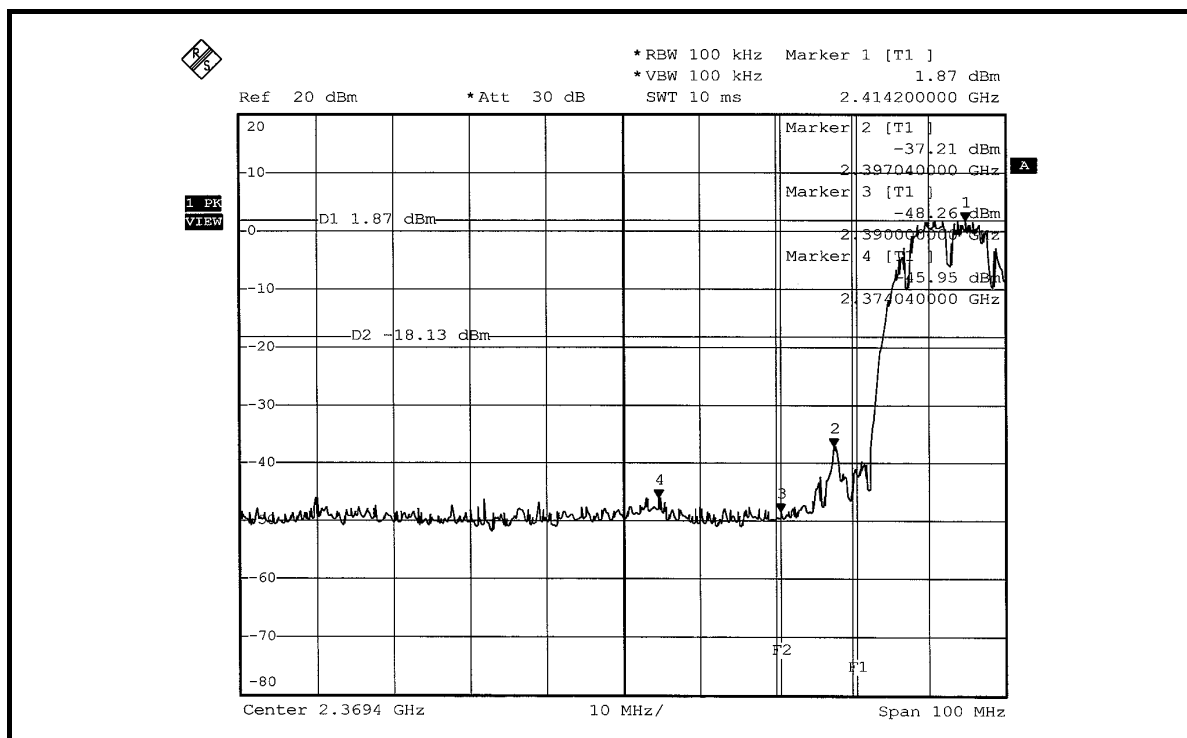
802.11b DSSS modulation

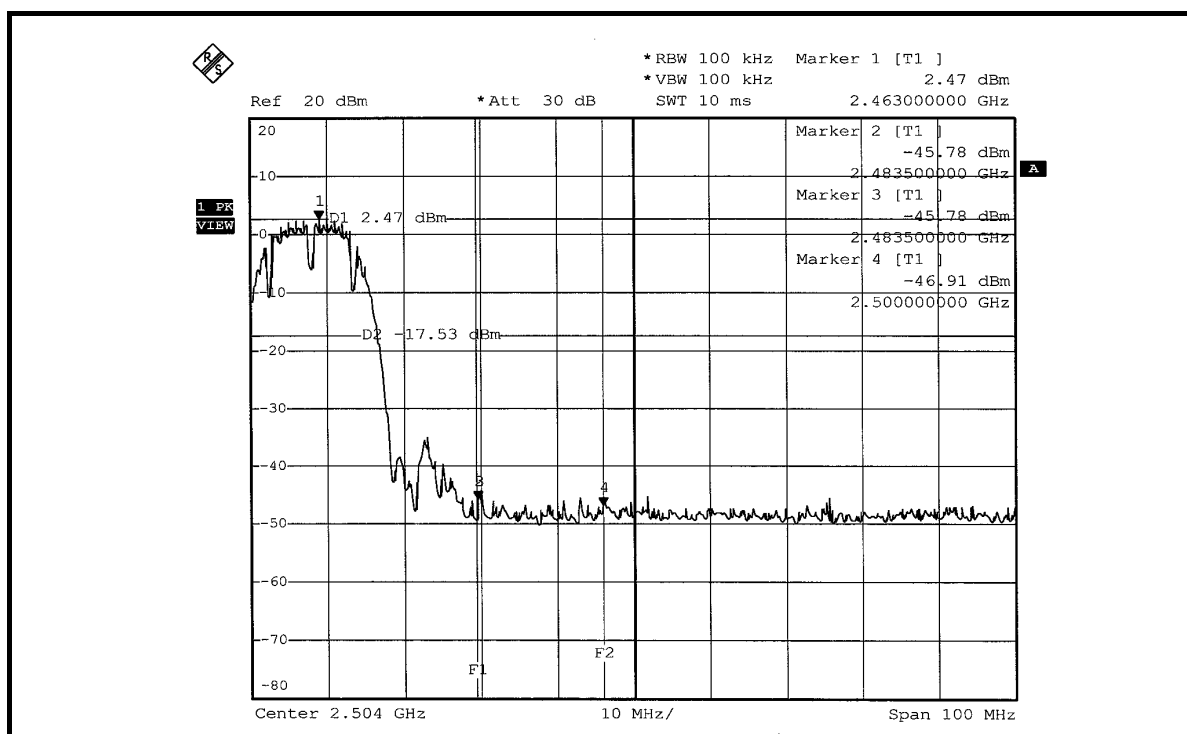
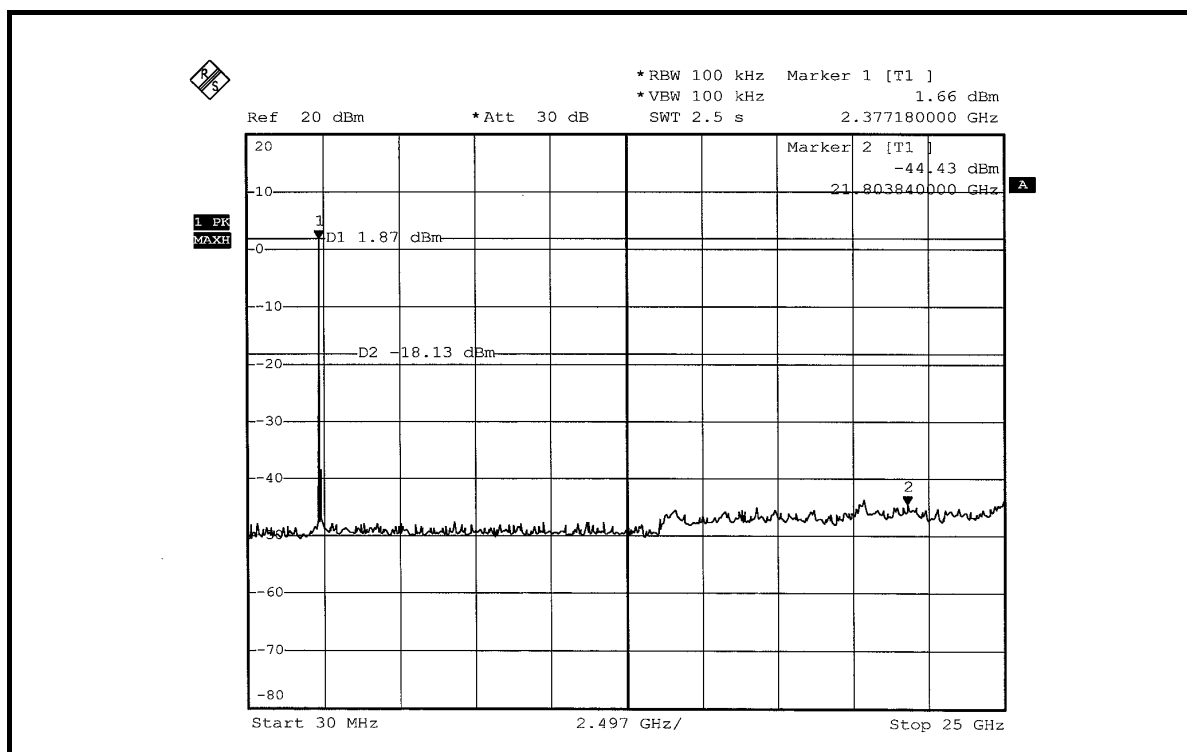
NOTE 1: The band edge emission plot on following first page shows 47.82dBc delta between carrier maximum power and local maximum emission in restrict band (2.37404GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 105.71dBuV/m (Peak), so the maximum field strength in restrict band is $105.71 - 47.82 = 57.89$ dBuV/m which is under 74dBuV/m limit.

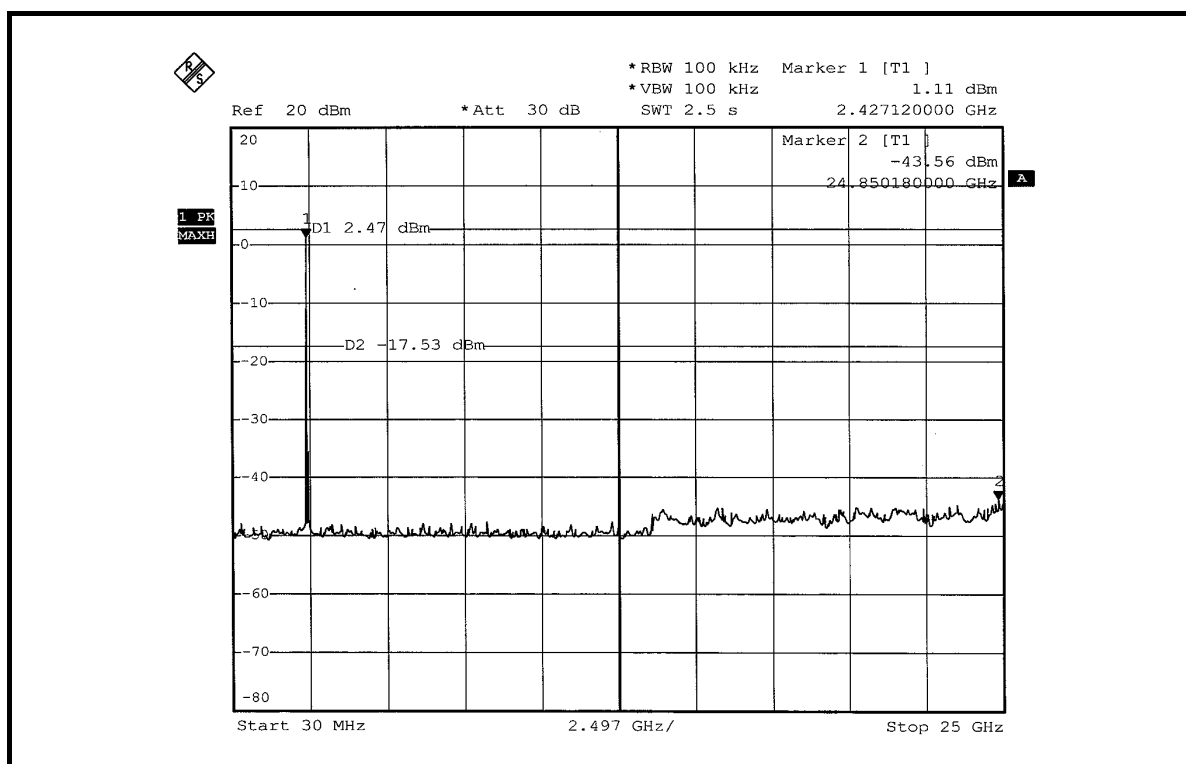
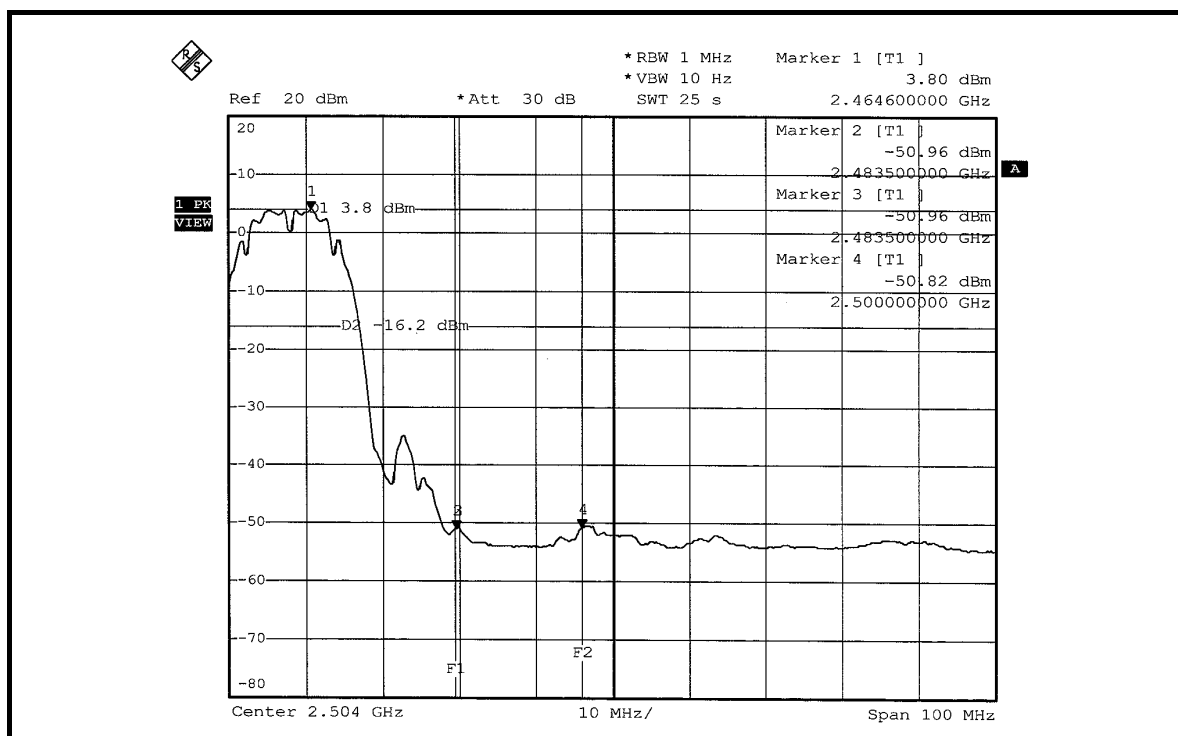
The band edge emission plot on following first page shows 52.92dBc delta between carrier maximum power and local maximum emission in restrict band (2.37284GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 102.65dBuV/m (Average), so the maximum field strength in restrict band is $102.65 - 52.92 = 49.73$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on following second page shows 48.25dBc delta between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 106.30dBuV/m (Peak), so the maximum field strength in restrict band is $106.30 - 48.25 = 58.05$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on following third page shows 54.62dBc delta between carrier maximum power and local maximum emission in restrict band (2.5000GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 103.19dBuV/m (Average), so the maximum field strength in restrict band is $103.19 - 54.62 = 48.57$ dBuV/m which is under 54dBuV/m limit.







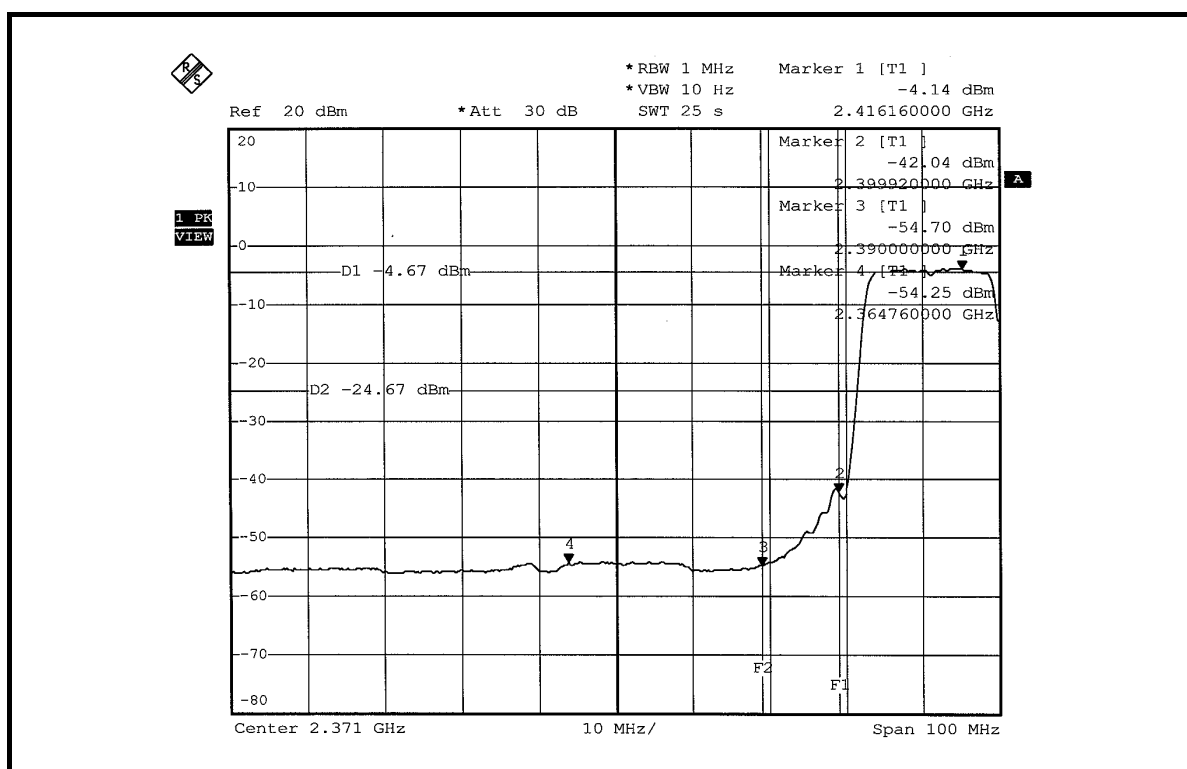
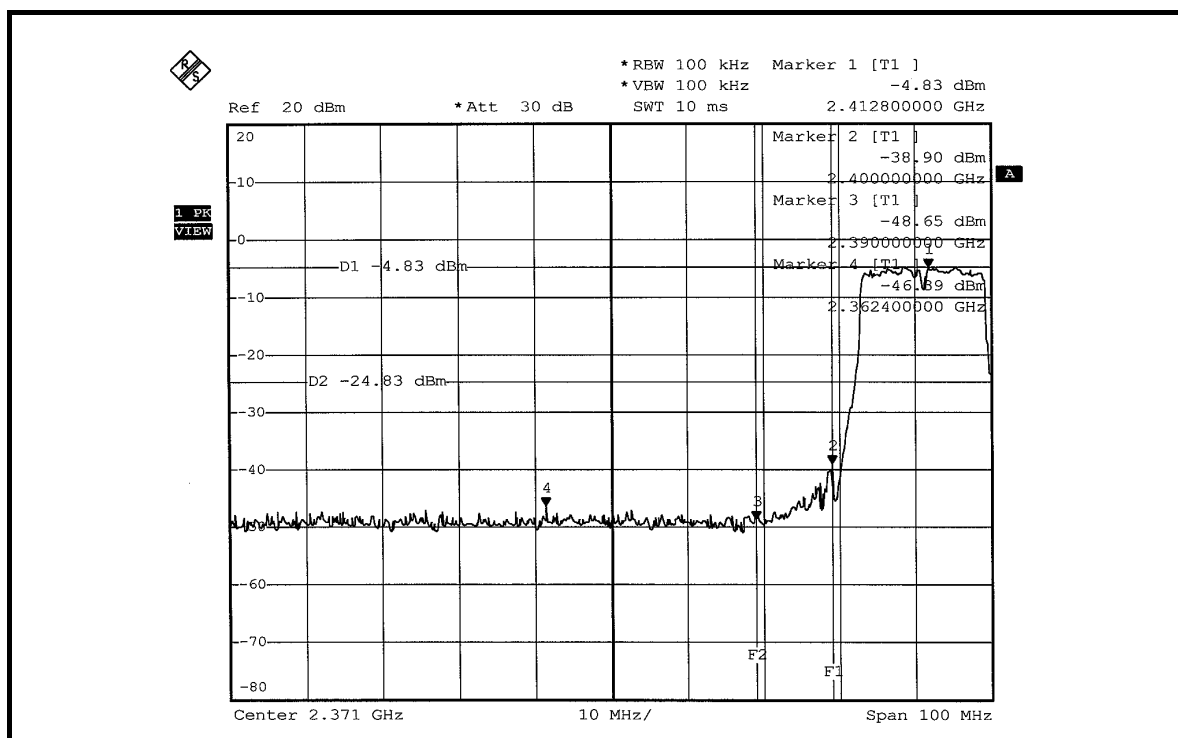
802.11g OFDM modulation

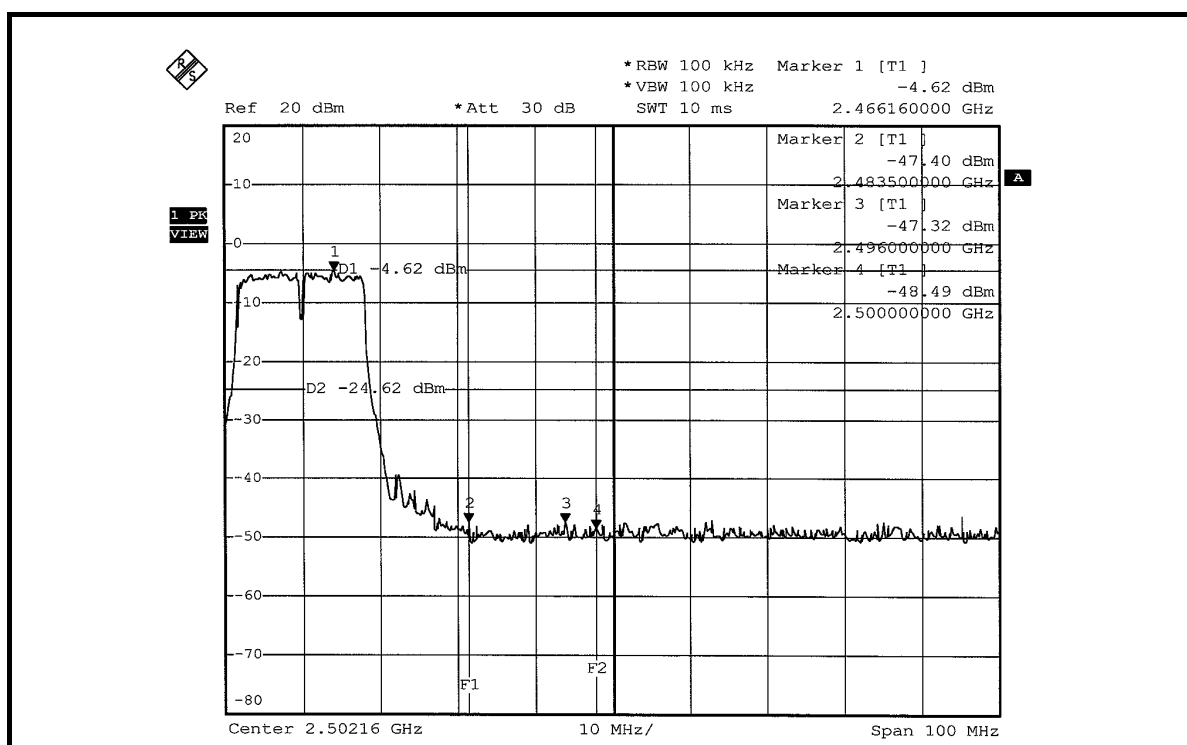
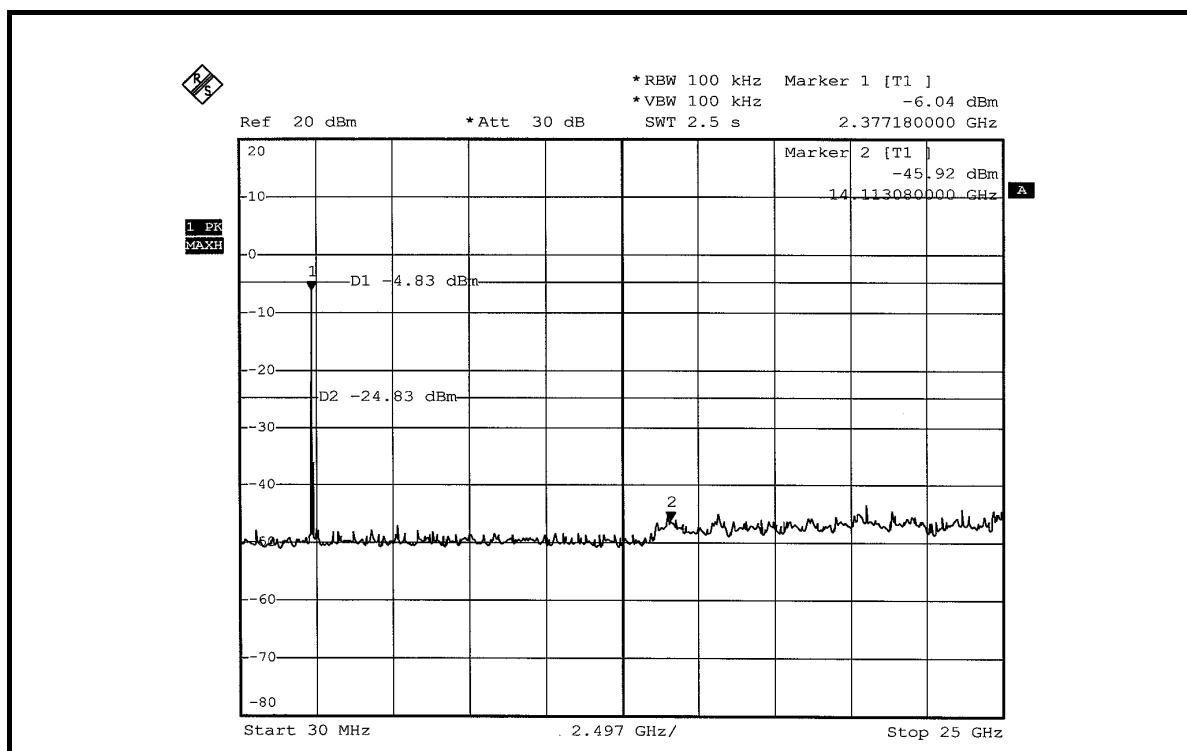
NOTE 1: The band edge emission plot on following first page shows 41.56dBc delta between carrier maximum power and local maximum emission in restrict band (2.36240GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 105.81dBuV/m (Peak), so the maximum field strength in restrict band is $105.81 - 41.56 = 64.25$ dBuV/m which is under 74dBuV/m limit.

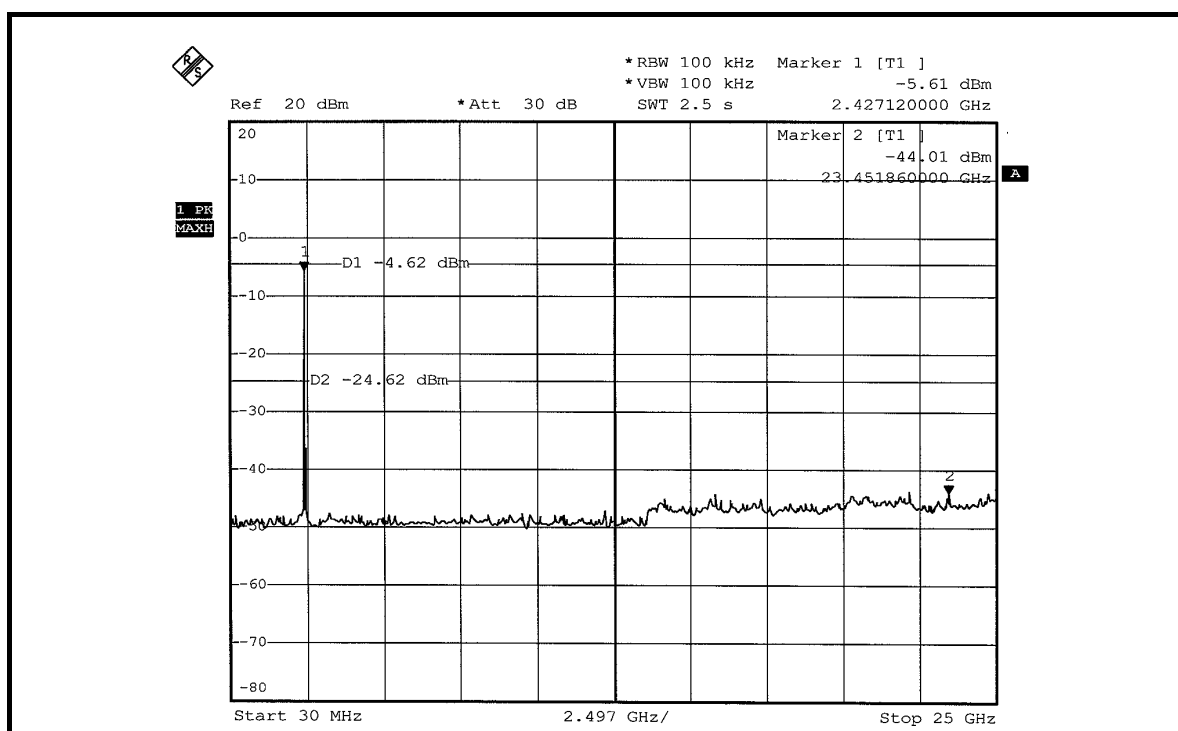
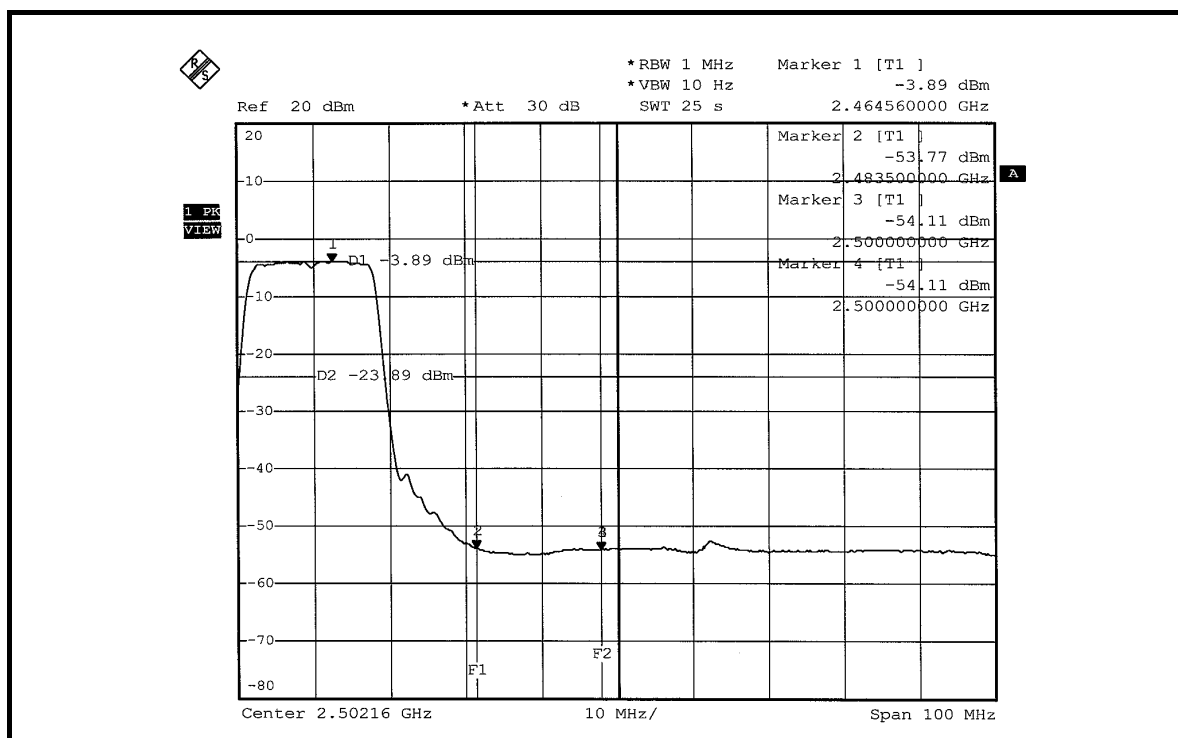
The band edge emission plot on following first page shows 50.11dBc delta between carrier maximum power and local maximum emission in restrict band (2.36476GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 97.09dBuV/m (Average), so the maximum field strength in restrict band is $97.09 - 50.11 = 46.98$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on following second page shows 42.70dBc delta between carrier maximum power and local maximum emission in restrict band (2.49600GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 105.45dBuV/m (Peak), so the maximum field strength in restrict band is $105.45 - 42.70 = 62.75$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on following third page shows show 49.88dBc delta between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 96.77dBuV/m (Average), so the maximum field strength in restrict band is $96.77 - 49.88 = 46.89$ dBuV/m which is under 54dBuV/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 antennas used in this product are Dipole antenna with UFL antenna connector. The maximum Gain of the antenna is 0dBi.

5. INFORMATION ON THE TESTING LABORATORIES

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

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, DGT
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

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. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Web Site: www.adt.com.tw

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

APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.