FCC TEST REPORT

REPORT NO.: RF950331L08
MODEL NO.: SDC-MCF10G
RECEIVED: Jun. 05, 2006
TESTED: Jun. 05 ~ 22, 2006
ISSUED: Jun. 26, 2006

APPLICANT: Summit Data Communications, Inc.

ADDRESS: 526 South Main Street Suite 411, Akron, Ohio, 44311 United States

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

0528

No.: 2177-01

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1. CERTIFICATION

PRODUCT:	802.11g Mini-Compact Flash Module with Dual U.FL Connectors
MODEL:	SDC-MCF10G
BRAND:	Summit
APPLICANT:	Summit Data Communications, Inc.
TESTED:	Jun. 05 ~ 22, 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 : Wendy Liao (Wendy Liao) , **DATE:** Jun. 26, 2006

TECHNICAL ACCEPTANCE : Long Chen (Long Chen) , **DATE:** Jun. 26, 2006
Responsible for RF

APPROVED BY : Gary Chang (Gary Chang / Supervisor) , **DATE:** Jun. 26, 2006

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 –18.61dB at 0.197MHz
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 –1.04dB at 4924.00MHz
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	2.44 dB
Radiated emissions	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	802.11g Mini-Compact Flash Module with Dual U.FL Connectors
MODEL NO.	SDC-MCF10G
FCC ID	TWG-SDMCF10G
POWER SUPPLY	3.3Vdc 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	80.168mW
ANTENNA TYPE	PCB antenna with 0dBi gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

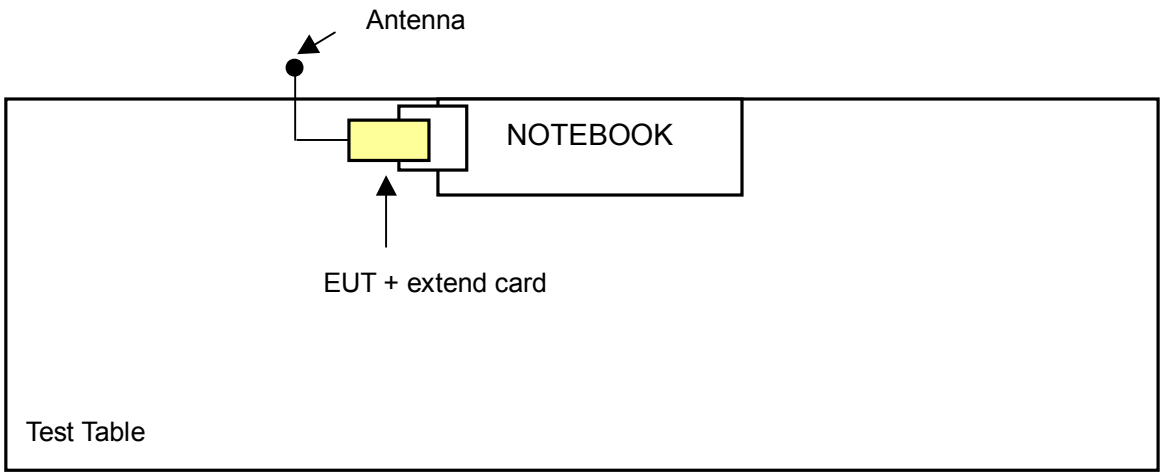
1. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions of up to 54Mbps.
2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's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



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, antenna ports (if EUT with antenna diversity architecture), and antenna direction.

☒ 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)	Antenna direction
802.11g	1 to 11	11	OFDM	BPSK	6	Z

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, antenna ports (if EUT with antenna diversity architecture), and antenna direction.

. ☒ 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)	Antenna direction
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	Z
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	Z

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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	25191592336	E2K24CLNS

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

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

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 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
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 11, 2006
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 06, 2007
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Feb. 15, 2007
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Feb. 07, 2007
Software ADT	ADT_Cond_V3	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

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.

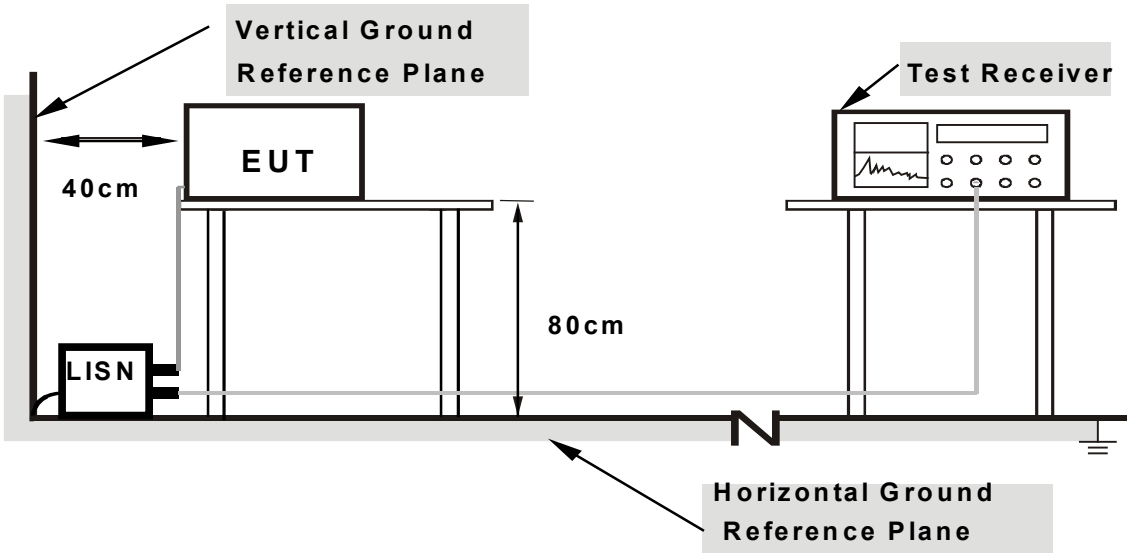
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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 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 into the notebook system and placed on a testing table.
b. The computer system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
c. The notebook system displayed “H” messages on its screen.
d. Repeated item c.

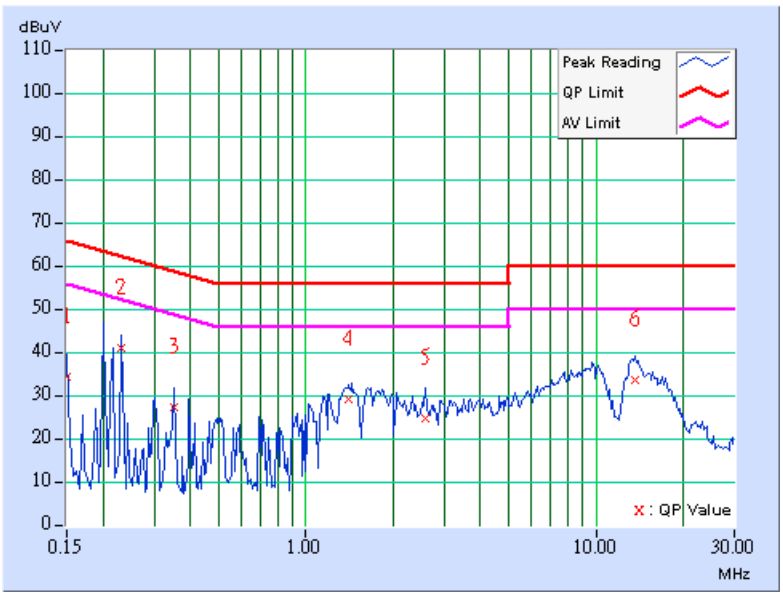
4.1.7 TEST RESULTS

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**	25deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu	**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	0.150	0.10	33.99	-	34.09	-	66.00	56.00	-31.91	-
2	0.232	0.10	40.71	-	40.81	-	62.38	52.38	-21.57	-
3	0.353	0.10	26.74	-	26.84	-	58.89	48.89	-32.05	-
4	1.406	0.20	28.74	-	28.94	-	56.00	46.00	-27.06	-
5	2.586	0.28	24.12	-	24.40	-	56.00	46.00	-31.60	-
6	13.621	0.58	33.11	-	33.69	-	60.00	50.00	-26.31	-

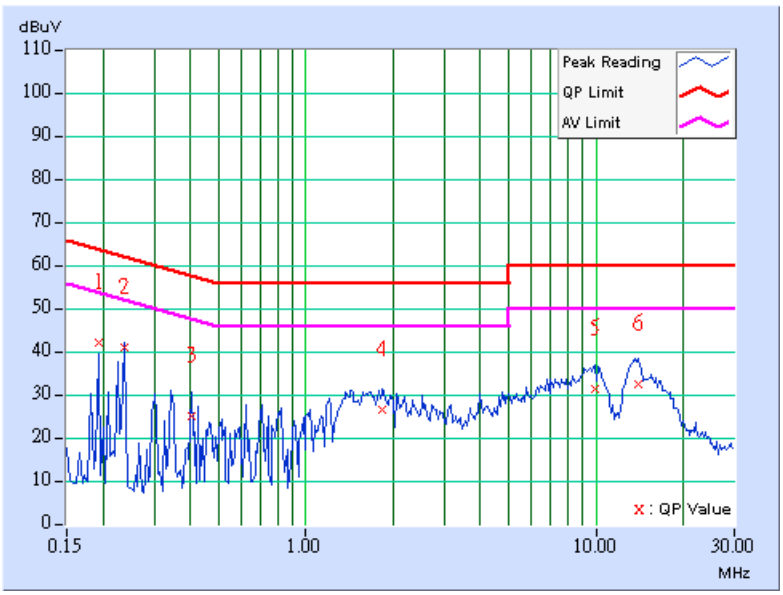
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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	25deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu	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	0.193	0.10	41.73	-	41.83	-	63.91	53.91	-22.08	-
2	0.236	0.10	40.45	-	40.55	-	62.24	52.24	-21.69	-
3	0.404	0.10	24.59	-	24.69	-	57.77	47.77	-33.08	-
4	1.844	0.18	26.13	-	26.31	-	56.00	46.00	-29.69	-
5	9.961	0.46	30.89	-	31.35	-	60.00	50.00	-28.65	-
6	13.984	0.52	32.17	-	32.69	-	60.00	50.00	-27.31	-

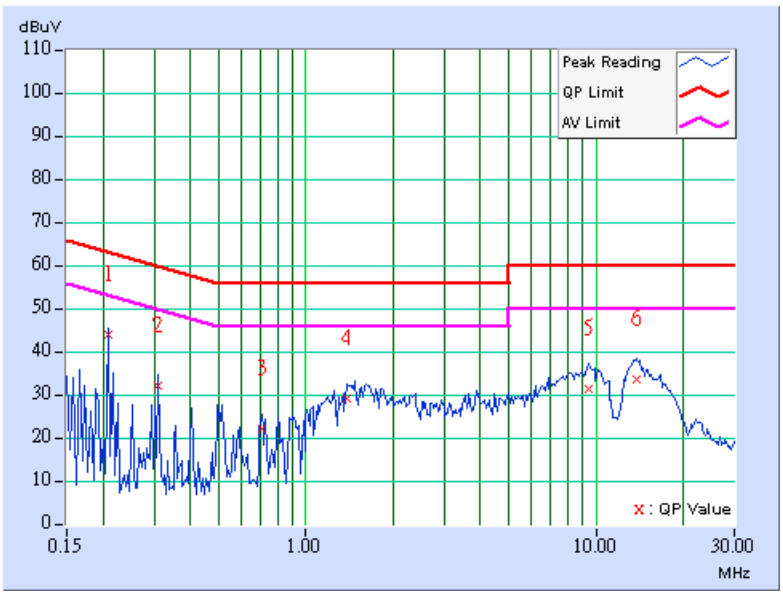
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu	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	0.10	43.53	-	43.63	-	63.26	53.26	-19.63	-
2	0.310	0.10	31.45	-	31.55	-	59.97	49.97	-28.42	-
3	0.705	0.15	21.66	-	21.81	-	56.00	46.00	-34.19	-
4	1.379	0.20	28.60	-	28.80	-	56.00	46.00	-27.20	-
5	9.488	0.46	30.94	-	31.40	-	60.00	50.00	-28.60	-
6	13.762	0.59	33.20	-	33.79	-	60.00	50.00	-26.21	-

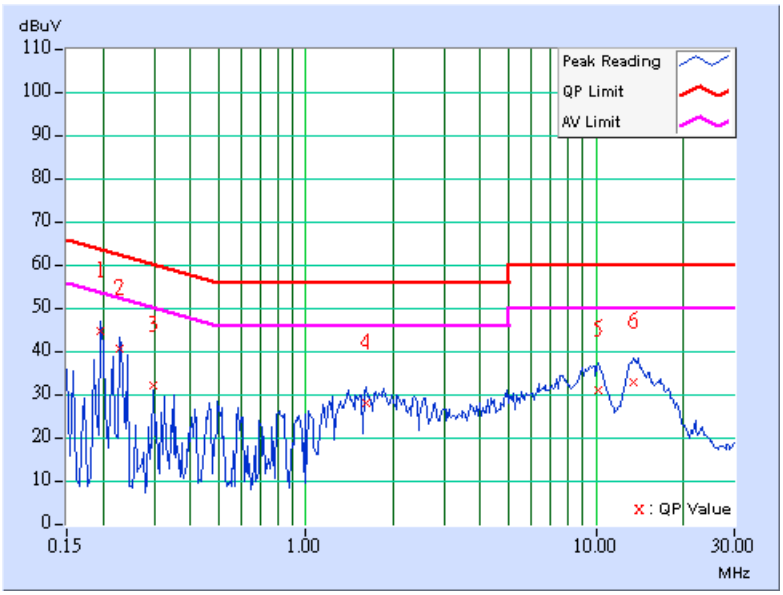
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu	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	0.197	0.10	44.14	-	44.24	-	63.74	53.74	-19.50	-
2	0.228	0.10	40.21	-	40.31	-	62.52	52.52	-22.21	-
3	0.298	0.10	31.56	-	31.66	-	60.29	50.29	-28.63	-
4	1.613	0.16	27.47	-	27.63	-	56.00	46.00	-28.37	-
5	10.219	0.46	30.59	-	31.05	-	60.00	50.00	-28.95	-
6	13.523	0.51	32.63	-	33.14	-	60.00	50.00	-26.86	-

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 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu	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	0.205	0.10	43.55	-	43.65	-	63.42	53.42	-19.77	-
2	0.236	0.10	39.04	-	39.14	-	62.24	52.24	-23.10	-
3	0.338	0.10	23.05	-	23.15	-	59.26	49.26	-36.11	-
4	1.395	0.20	29.14	-	29.34	-	56.00	46.00	-26.66	-
5	9.477	0.46	31.02	-	31.48	-	60.00	50.00	-28.52	-
6	13.898	0.59	33.08	-	33.67	-	60.00	50.00	-26.33	-

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.
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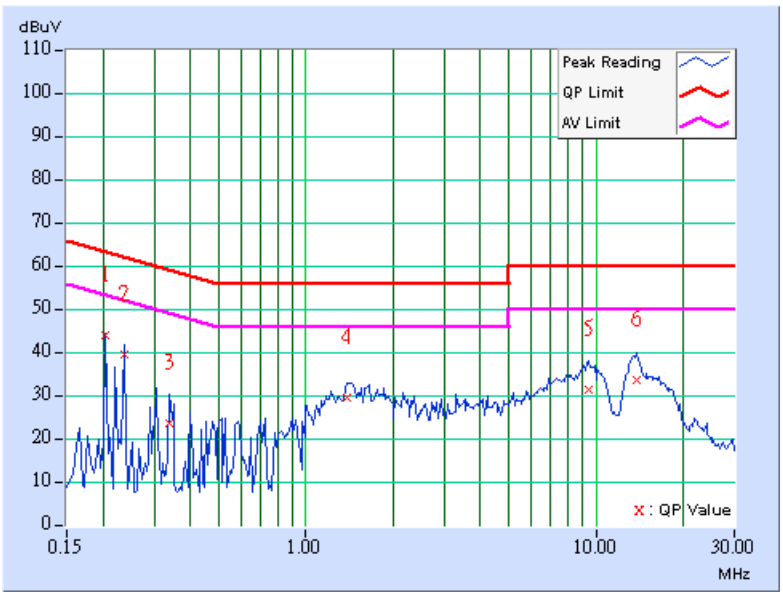
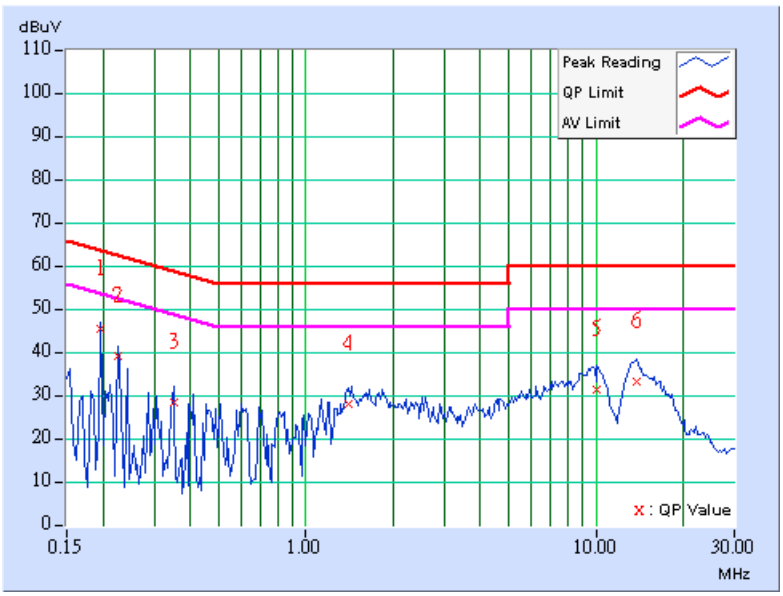
6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
TESTED BY	Brad Wu	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	**0.197**	**0.10**	**45.03**	**-**	**45.13**	**-**	**63.74**	**53.74**	**-18.61**	**-**
2	0.224	0.10	38.57	-	38.67	-	62.66	52.66	-23.99	-
3	0.349	0.10	27.83	-	27.93	-	58.98	48.98	-31.05	-
4	1.406	0.14	27.69	-	27.83	-	56.00	46.00	-28.17	-
5	10.055	0.46	31.01	-	31.47	-	60.00	50.00	-28.53	-
6	13.746	0.51	32.81	-	33.32	-	60.00	50.00	-26.68	-

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	100033	May. 22, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Dec. 05, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2007
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 08, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 19, 2007
Preamplifier Agilent	8447D	2944A10633	Nov. 04, 2006
Preamplifier Agilent	8449B	3008A01964	Oct. 30, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214377/4	Dec. 13, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219272/4	Dec. 13, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 2.

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

4. The VCCI Site Registration No. is R-237.

5. The IC Site Registration No. is IC4924-3.

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.

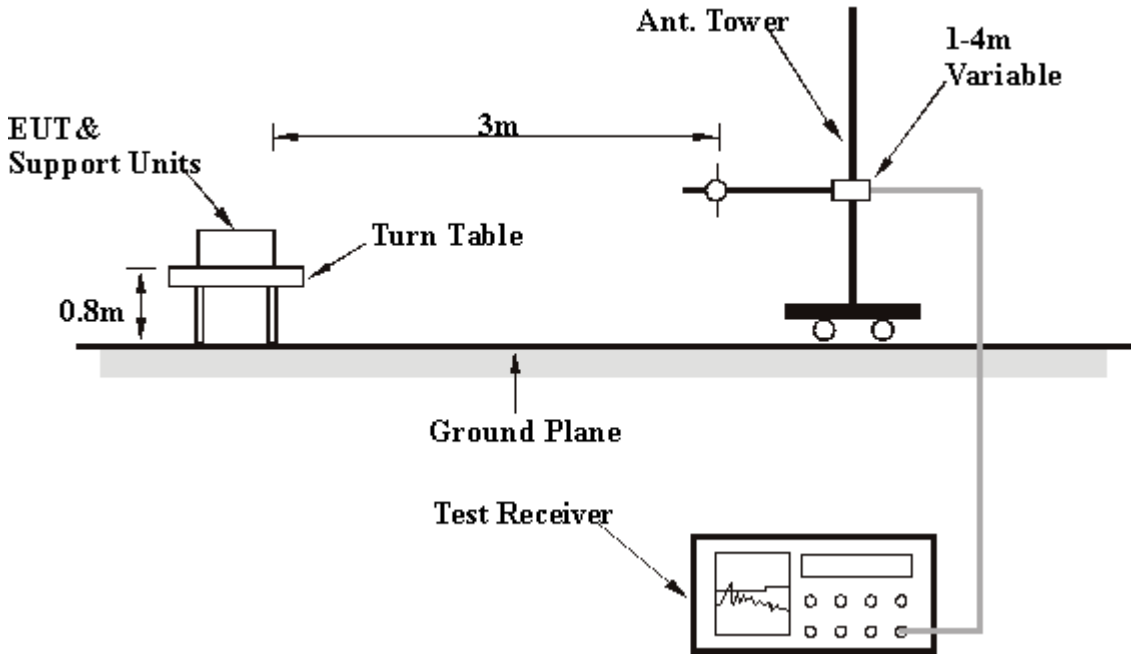
NOTE:

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 1kHz 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**	25deg. C, 68%RH, 991hPa
TESTED BY	Morgan Chen	**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	199.12	33.20 QP	43.50	-10.30	1.00 H	148	21.87	11.34
2	259.38	32.32 QP	46.00	-13.68	1.00 H	337	18.76	13.56
3	271.04	31.29 QP	46.00	-14.71	1.25 H	181	16.83	14.46
4	309.92	31.04 QP	46.00	-14.96	1.50 H	64	15.64	15.40
5	333.25	44.85 QP	46.00	-1.15	1.00 H	109	28.83	16.02
6	463.49	44.19 QP	46.00	-1.81	1.00 H	148	24.59	19.61
7	599.56	32.86 QP	46.00	-13.14	1.25 H	256	10.54	22.32
8	663.71	30.65 QP	46.00	-15.35	1.00 H	109	7.08	23.58
9	733.69	38.93 QP	46.00	-7.07	1.25 H	181	13.94	24.99
10	863.93	32.36 QP	46.00	-13.64	1.00 H	34	5.52	26.84
11	931.96	33.92 QP	46.00	-12.08	1.50 H	43	6.25	27.68

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	43.61	25.22 QP	40.00	-14.78	1.00 V	130	10.91	14.31
2	121.36	33.31 QP	43.50	-10.19	1.00 V	319	20.60	12.72
3	129.14	31.18 QP	43.50	-12.32	1.00 V	232	18.03	13.15
4	331.30	37.62 QP	46.00	-8.38	1.00 V	100	21.65	15.97
5	397.39	33.42 QP	46.00	-12.58	1.00 V	100	15.84	17.58
6	467.37	40.85 QP	46.00	-5.15	1.00 V	331	21.19	19.66
7	729.80	32.69 QP	46.00	-13.31	1.00 V	331	7.81	24.88
8	930.02	31.06 QP	46.00	-14.94	1.25 V	340	3.41	27.65

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	21deg. C, 62%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	1608.00	40.82 PK	74.00	-33.18	1.21 H	80	11.15	29.68
1	1608.00	33.64 AV	54.00	-20.36	1.21 H	80	3.97	29.68
2	2390.00	45.09 PK	74.00	-28.91	1.16 H	210	12.99	32.10
2	2390.00	39.83 AV	54.00	-14.17	1.16 H	210	7.73	32.10
3	*2412.00	100.33 PK			1.11 H	229	68.15	32.18
3	*2412.00	97.07 AV			1.11 H	229	64.89	32.18
4	4824.00	54.19 PK	74.00	-19.81	1.17 H	327	15.56	38.63
4	4824.00	50.84 AV	54.00	-3.16	1.17 H	327	12.21	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	1608.00	41.58 PK	74.00	-32.42	1.24 V	38	11.91	29.68
1	1608.00	33.94 AV	54.00	-20.06	1.24 V	38	4.27	29.68
2	2390.00	57.26 PK	74.00	-16.74	1.25 V	223	25.16	32.10
2	2390.00	49.42 AV	54.00	-4.58	1.25 V	223	17.32	32.10
3	*2412.00	107.57 PK			1.24 V	222	75.39	32.18
3	*2412.00	104.66 AV			1.24 V	222	72.48	32.18
4	4824.00	56.89 PK	74.00	-17.11	1.00 V	42	18.26	38.63
4	4824.00	52.73 AV	54.00	-1.27	1.00 V	42	14.10	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**	21deg. C, 62%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	1608.00	40.93 PK	74.00	-33.07	1.13 H	124	11.25	29.68
1	1608.00	33.72 AV	54.00	-20.28	1.13 H	124	4.04	29.68
2	*2437.00	100.52 PK			1.21 H	92	68.25	32.27
2	*2437.00	97.31 AV			1.21 H	92	65.04	32.27
3	4874.00	54.31 PK	74.00	-19.69	1.19 H	114	15.54	38.77
3	4874.00	50.97 AV	54.00	-3.03	1.19 H	114	12.20	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	1608.00	41.82 PK	74.00	-32.18	1.27 V	68	12.14	29.68
1	1608.00	34.26 AV	54.00	-19.74	1.27 V	68	4.58	29.68
2	*2437.00	107.91 PK			1.18 V	53	75.64	32.27
2	*2437.00	105.04 AV			1.18 V	53	72.77	32.27
3	4874.00	56.91 PK	74.00	-17.09	1.04 V	86	18.14	38.77
3	4874.00	52.85 AV	54.00	-1.15	1.04 V	86	14.08	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**	21deg. C, 62%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	1608.00	40.63 PK	74.00	-33.37	1.17 H	86	10.95	29.68
1	1608.00	33.47 AV	54.00	-20.53	1.17 H	86	3.79	29.68
2	*2462.00	100.41 PK			1.41 H	126	68.05	32.36
2	*2462.00	97.13 AV			1.41 H	126	64.77	32.36
3	2484.00	45.33 PK	74.00	-28.67	1.37 H	121	12.89	32.44
3	2484.00	40.05 AV	54.00	-13.95	1.37 H	121	7.61	32.44
4	4924.00	54.31 PK	74.00	-19.69	1.34 H	101	15.41	38.90
4	4924.00	50.96 AV	54.00	-3.04	1.34 H	101	12.06	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	1608.00	51.86 PK	74.00	-22.14	1.19 V	207	22.18	29.68
1	1608.00	34.21 AV	54.00	-19.79	1.19 V	207	4.53	29.68
2	*2462.00	107.92 PK			1.25 V	89	75.56	32.36
2	*2462.00	105.03 AV			1.25 V	89	72.67	32.36
3	2484.00	58.44 PK	74.00	-15.56	1.17 V	219	26.00	32.44
3	2484.00	49.95 AV	54.00	-4.05	1.17 V	219	17.51	32.44
4	4924.00	57.13 PK	74.00	-16.87	1.26 V	293	18.23	38.90
4	**4924.00**	**52.96 AV**	**54.00**	**-1.04**	**1.26 V**	**293**	**14.06**	**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	21deg. C, 62%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	1608.00	43.74 PK	74.00	-30.26	1.15 H	312	14.06	29.68
1	1608.00	38.71 AV	54.00	-15.29	1.15 H	312	9.03	29.68
2	2390.00	51.43 PK	74.00	-22.57	1.25 H	112	19.33	32.10
2	2390.00	41.81 AV	54.00	-12.19	1.25 H	112	9.71	32.10
3	*2412.00	102.91 PK			1.27 H	93	70.73	32.18
3	*2412.00	93.29 AV			1.27 H	93	61.11	32.18
4	4824.00	49.37 PK	74.00	-24.63	1.33 H	142	10.74	38.63
4	4824.00	36.03 AV	54.00	-17.97	1.33 H	142	-2.60	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	1608.00	43.35 PK	74.00	-30.65	1.07 V	286	13.67	29.68
1	1608.00	38.29 AV	54.00	-15.71	1.07 V	286	8.61	29.68
2	2390.00	61.11 PK	74.00	-12.89	1.01 V	351	29.01	32.10
2	2390.00	48.04 AV	54.00	-5.96	1.01 V	351	15.94	32.10
3	*2412.00	109.14 PK			1.05 V	338	76.96	32.18
3	*2412.00	99.52 AV			1.05 V	338	67.34	32.18
4	4824.00	51.25 PK	74.00	-22.75	1.14 V	96	12.62	38.63
4	4824.00	37.89 AV	54.00	-16.11	1.14 V	96	-0.74	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**	21deg. C, 62%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	1624.00	43.62 PK	74.00	-30.38	1.28 H	245	13.90	29.72
1	1624.00	38.59 AV	54.00	-15.41	1.28 H	245	8.87	29.72
2	*2437.00	103.12 PK			1.32 H	102	70.85	32.27
2	*2437.00	93.53 AV			1.32 H	102	61.26	32.27
3	4874.00	49.51 PK	74.00	-24.49	1.37 H	93	10.74	38.77
3	4874.00	36.24 AV	54.00	-17.76	1.37 H	93	-2.53	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	1624.00	43.52 PK	74.00	-30.48	1.14 V	51	13.80	29.72
1	1624.00	38.48 AV	54.00	-15.52	1.14 V	51	8.76	29.72
2	*2437.00	109.58 PK			1.09 V	321	77.31	32.27
2	*2437.00	99.95 AV			1.09 V	321	67.68	32.27
3	4874.00	51.42 PK	74.00	-22.58	1.32 V	186	12.65	38.77
3	4874.00	38.98 AV	54.00	-15.02	1.32 V	186	0.21	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**	21deg. C, 62%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	1641.00	43.50 PK	74.00	-30.50	1.09 H	124	13.75	29.75
1	1641.00	38.39 AV	54.00	-15.61	1.09 H	124	8.64	29.75
2	*2462.00	102.73 PK			1.27 H	108	70.37	32.36
2	*2462.00	93.15 AV			1.27 H	108	60.79	32.36
3	2483.50	55.44 PK	74.00	-18.56	1.32 H	196	23.00	32.44
3	2483.50	45.86 AV	54.00	-8.14	1.32 H	196	13.42	32.44
4	4924.00	49.19 PK	74.00	-24.81	1.05 H	61	10.29	38.90
4	4924.00	35.81 AV	54.00	-18.19	1.05 H	61	-3.09	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	1641.00	43.66 PK	74.00	-30.34	1.03 V	136	13.91	29.75
1	1641.00	38.57 AV	54.00	-15.43	1.03 V	136	8.82	29.75
2	*2462.00	108.94 PK			1.52 V	279	76.58	32.36
2	*2462.00	99.36 AV			1.52 V	279	67.00	32.36
3	2483.50	68.85 PK	74.00	-5.15	1.21 V	340	36.41	32.44
3	2483.50	52.07 AV	54.00	-1.93	1.21 V	340	19.63	32.44
4	4924.00	51.06 PK	74.00	-22.94	1.10 V	227	12.16	38.90
4	4924.00	37.68 AV	54.00	-16.32	1.10 V	227	-1.22	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.

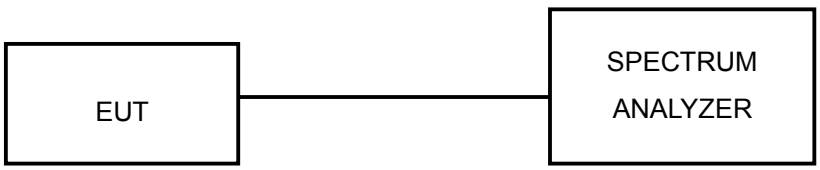
4.3.3 TEST PROCEDURE

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.

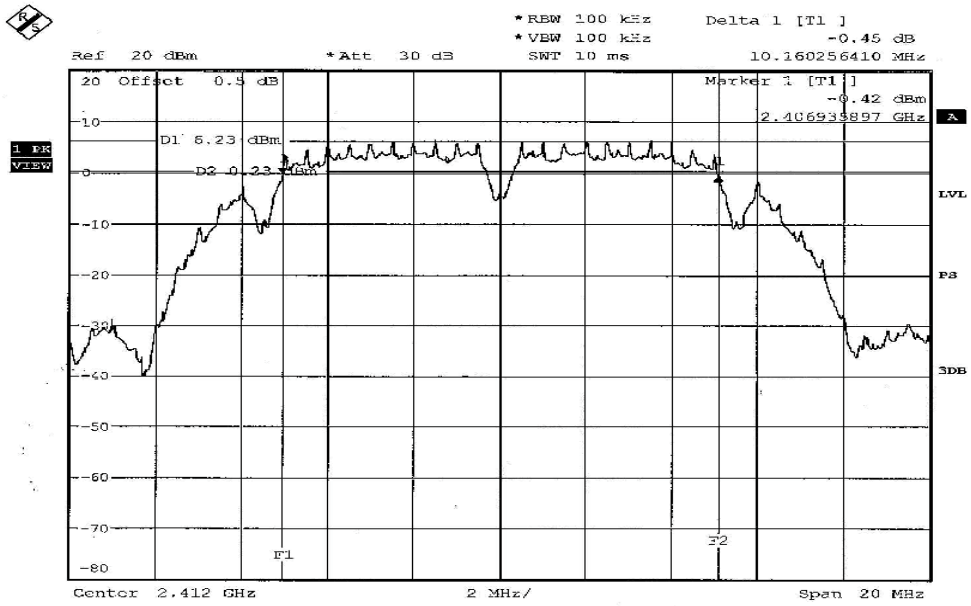
4.3.7 TEST RESULTS

802.11b DSSS modulation

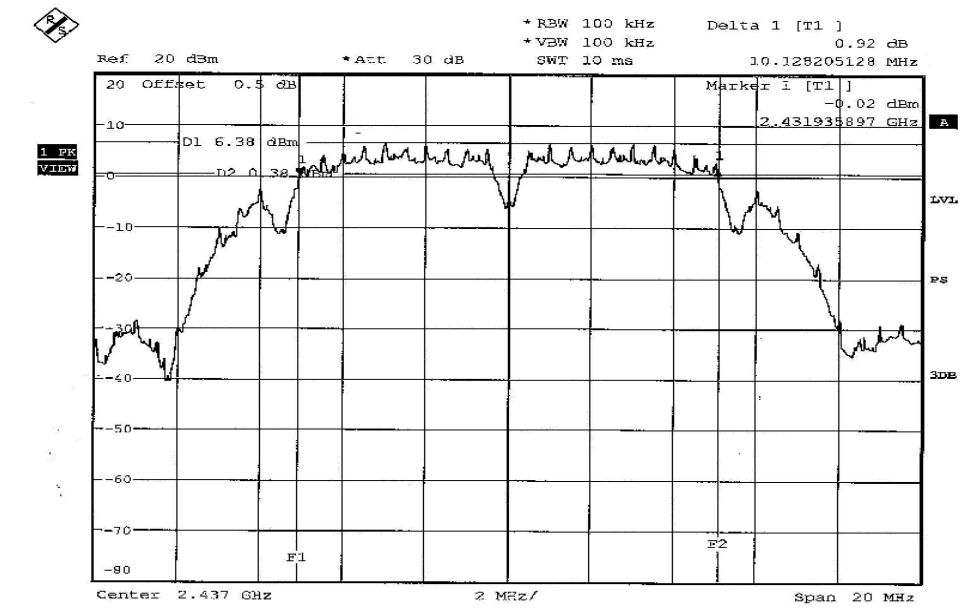
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.16	0.5	PASS
6	2437	10.12	0.5	PASS
11	2462	10.03	0.5	PASS

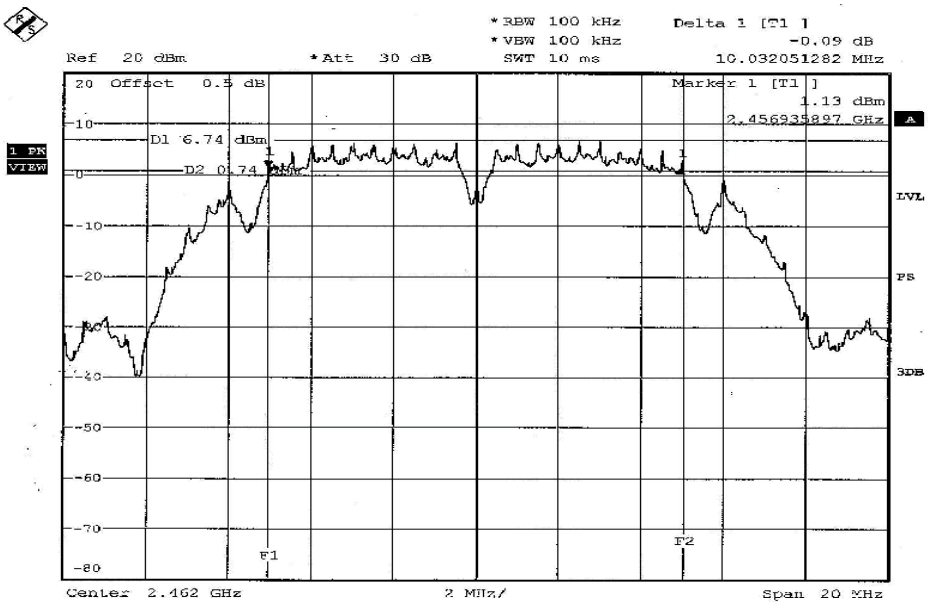
CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
-0.45 dB
10.160256410 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-0.42 dBm
2.406933897 GHz
D1 6.23 dBm
D2 0.23 dBm
1 PK
VIEW
A
LVL
PS
3DB
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH6


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
0.92 dB
10.128205128 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-0.02 dBm
2.431935897 GHz
D1 6.38 dBm
D2 0.38 dBm
1 PK
VIEW
A
LVL
PS
3DB
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11

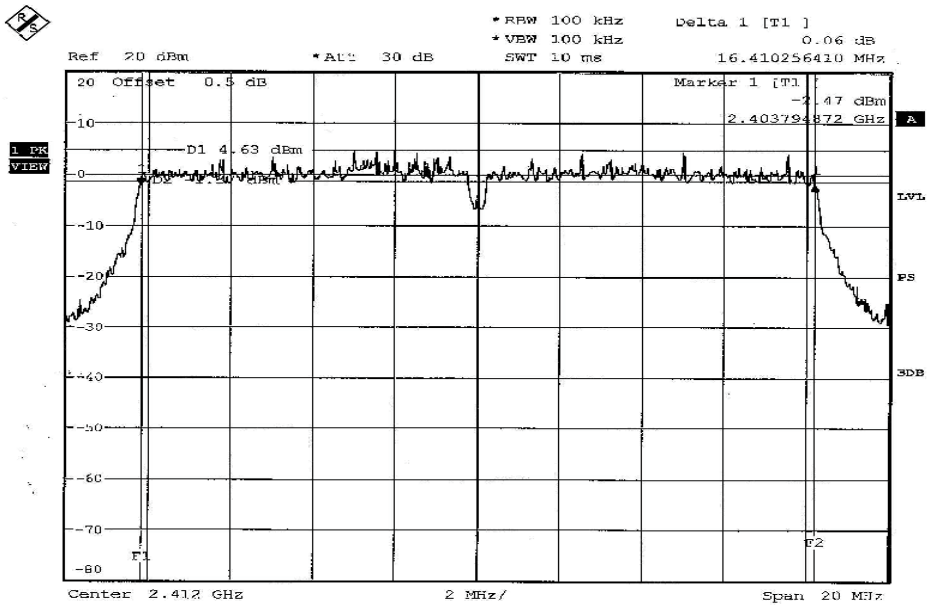

*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
-0.09 dB
10.032051282 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
1.13 dBm
2.456935897 GHz
D1 6.74 dBm
D2 0.74 dBm
1 PK VIEW
LVL
PS
3DB
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

802.11g OFDM modulation

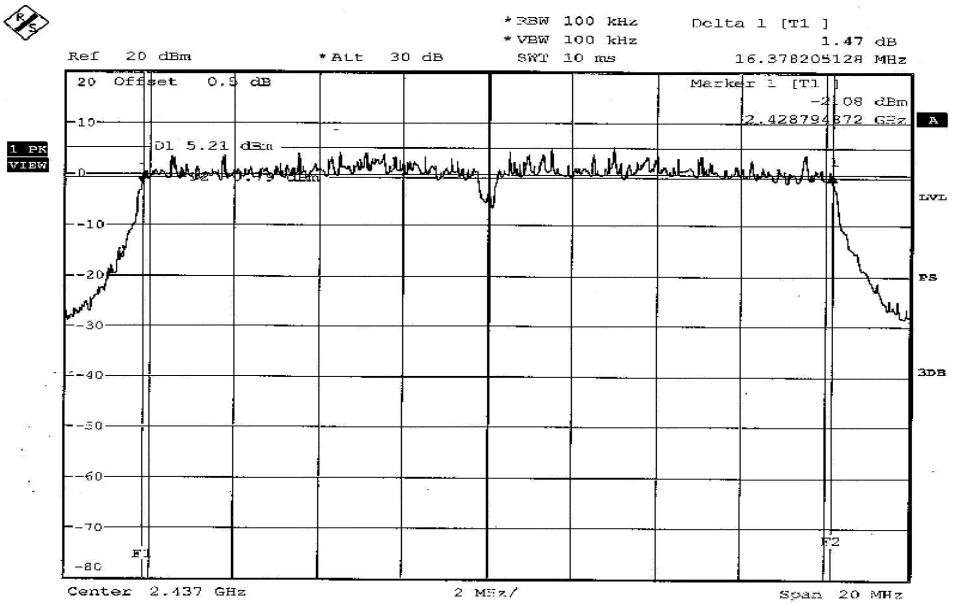
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.41	0.5	PASS
6	2437	16.37	0.5	PASS
11	2462	16.34	0.5	PASS

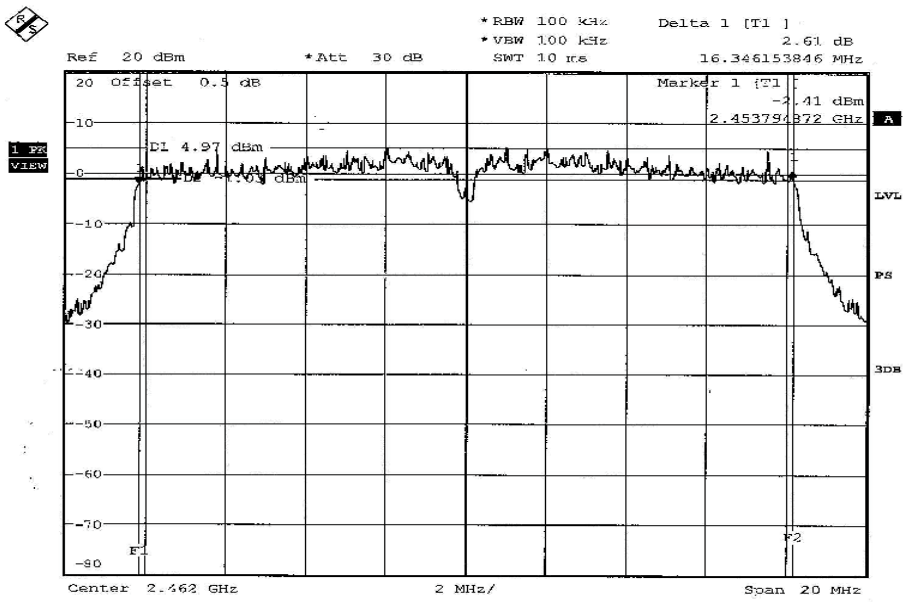
CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
0.06 dB
16.410256410 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-2.47 dBm
2.403794872 GHz
D1 4.63 dBm
1 PK VIEW
A
LVL
PS
3DB
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz

CH6


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
1.47 dB
16.378205128 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 1 [T1]
-2.08 dBm
2.428794872 GHz
D1 5.21 dBm
1 PK VIEW
A
LVL
PS
3DB
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
2.61 dB
16.346153846 MHz
Ref 20 dBm
Att 30 dB
Offset 0.5 dB
Marker 1 [T1]
-2.41 dBm
2.453794872 GHz
D1 4.97 dBm
1 PK
VIEW
LVL
PS
3DB
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 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.

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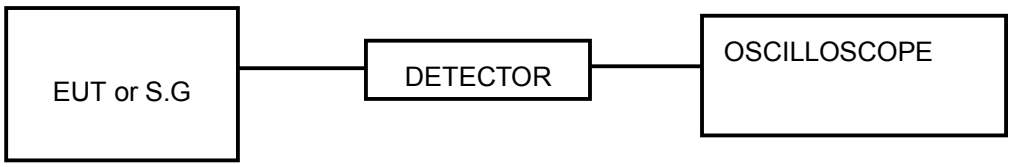
4.4.1 TEST PROCEDURES

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	80.168	19.04	30	PASS
6	2437	79.433	19.00	30	PASS
11	2462	79.983	19.03	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	71.285	18.53	30	PASS
6	2437	71.121	18.52	30	PASS
11	2462	71.121	18.52	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.

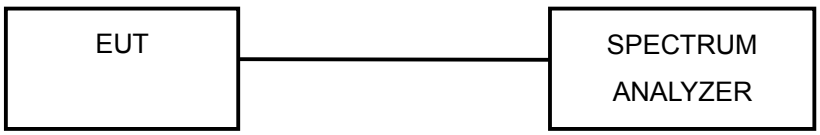
4.5.3 TEST PROCEDURE

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

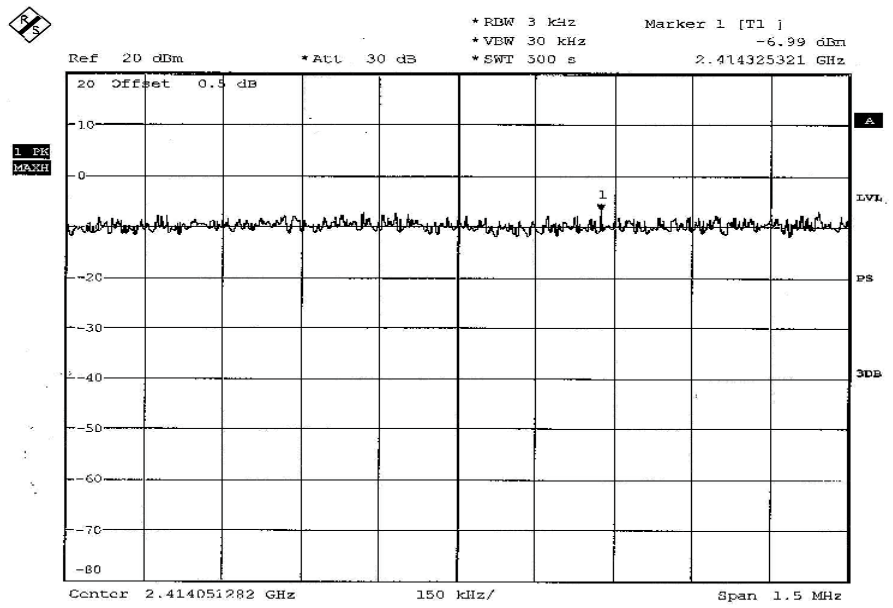
4.5.7 TEST RESULTS

802.11b DSSS modulation

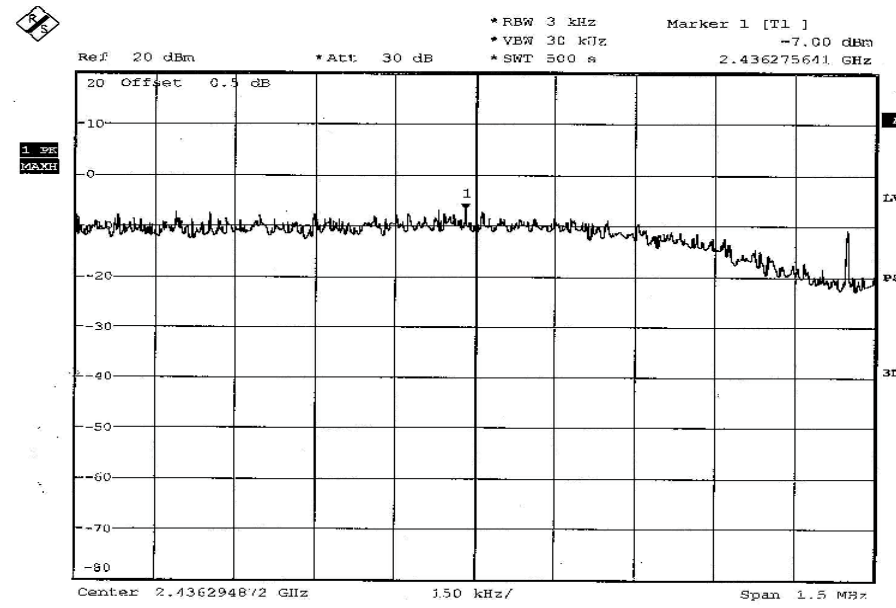
MODULATION TYPE	DBPSK	**TRANSFER RATE**	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-6.99	8	PASS
6	2437	-7.00	8	PASS
11	2462	-7.21	8	PASS

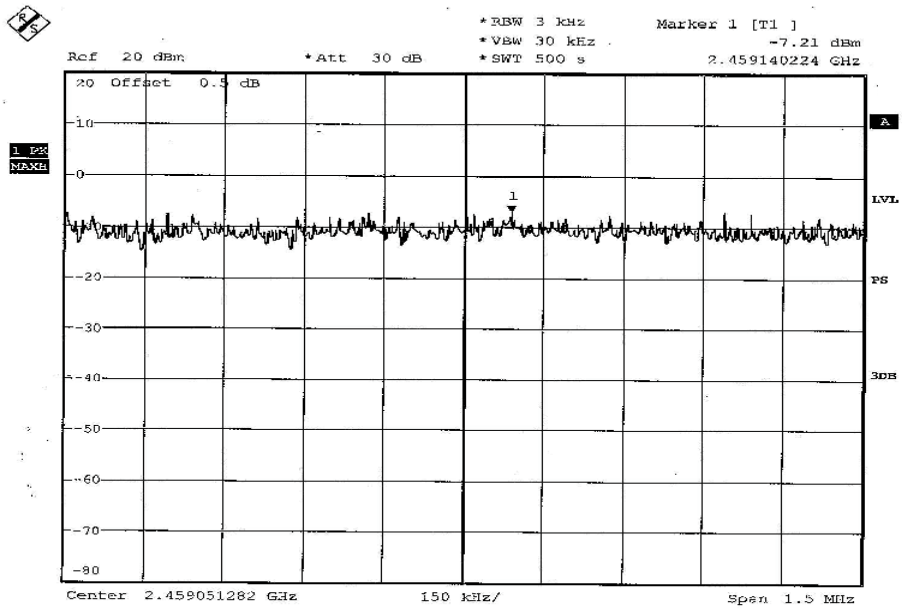
CH1


RBW 3 kHz
VBW 30 kHz
SWT 300 s
Marker 1 [T1]
-6.99 dBm
2.414325321 GHz
Ref 20 dBm
Att 30 dB
Offset 0.5 dB
1 PK
MAXH
A
LVL
PS
3DB
Center 2.414051282 GHz
150 kHz/
Span 1.5 MHz

CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-7.00 dBm
2.436275641 GHz
Ref 20 dBm
Att 30 dB
Offset 0.5 dB
1 PK
MAXH
A
LVL
PS
3DB
Center 2.436294872 GHz
150 kHz/
Span 1.5 MHz

CH11

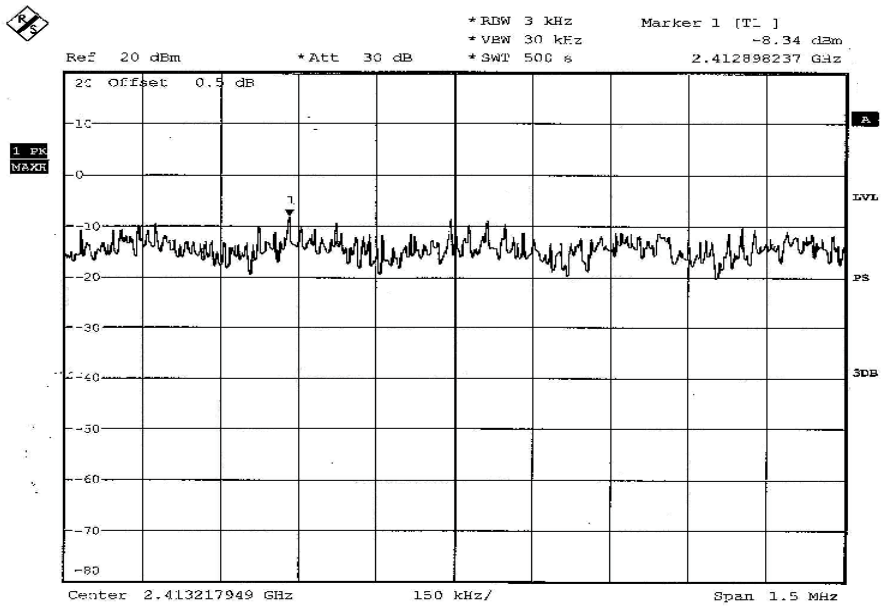

*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-7.21 dBm
2.459140224 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
1 PK
MAXH
10
0
-10
-20
-30
-40
-50
-60
-70
-80
A
LVL
PS
3DB
Center 2.459051282 GHz
150 kHz/
Span 1.5 MHz

802.11g OFDM modulation

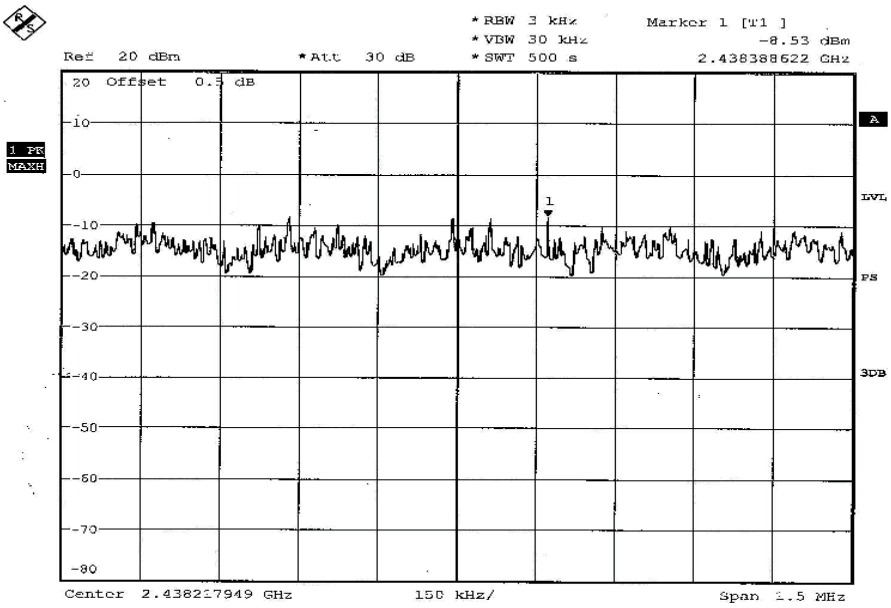
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	26deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-8.34	8	PASS
6	2437	-8.53	8	PASS
11	2462	-8.42	8	PASS

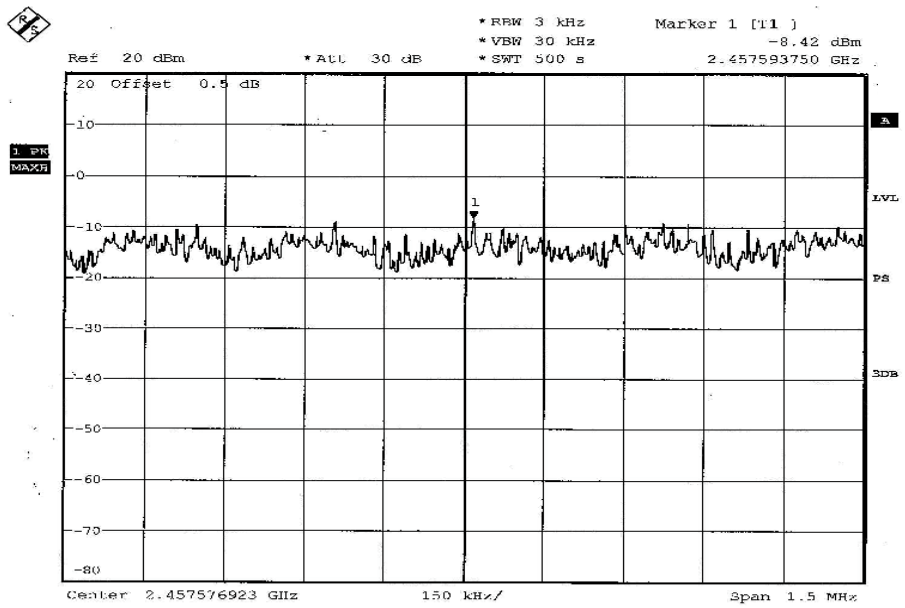
CH1


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.34 dBm
2.412898237 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
1 PK
MAXH
A
LVL
PS
3DB
Center 2.413217949 GHz
150 kHz/
Span 1.5 MHz

CH6


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.53 dBm
2.438388622 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
1 PK
MAXH
A
LVL
PS
3DB
Center 2.438217949 GHz
150 kHz/
Span 1.5 MHz

CH11


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-8.42 dBm
2.457593750 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
1 PK
MAXH
10
0
-10
-20
-30
-40
-50
-60
-70
-80
A
LVL
PS
3DB
Center 2.457576923 GHz
150 kHz/
Span 1.5 MHz

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	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 100kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded. The spectrum plots (Peak RBW=VBW=100kHz; Average RBW=1MHz, VBW=1kHz) 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).

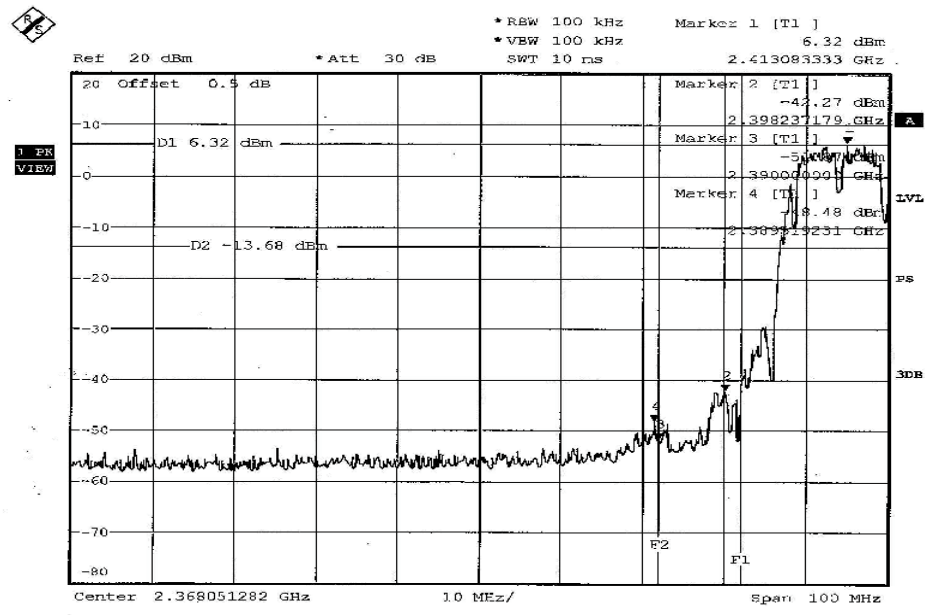
802.11b DSSS modulation

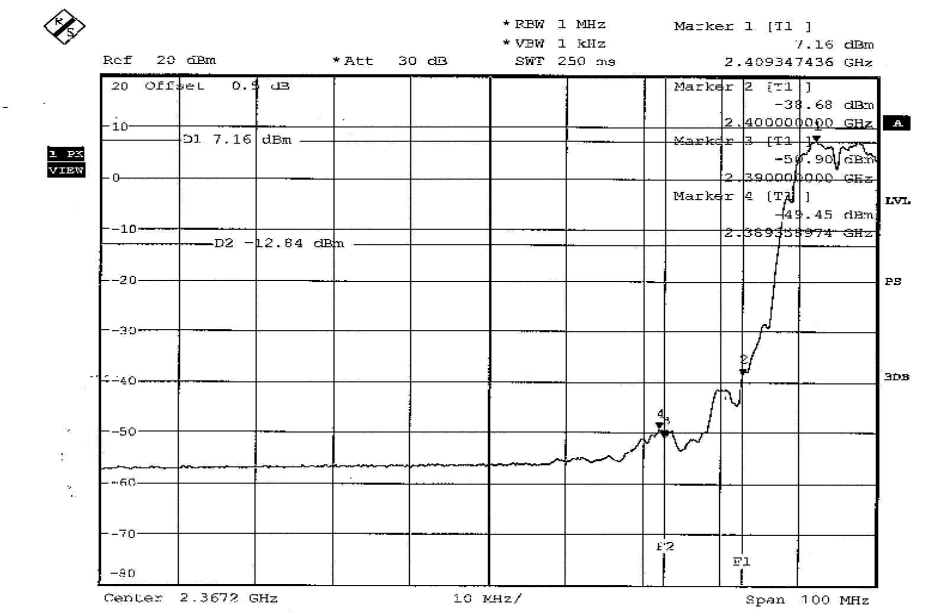
NOTE 1: The band edge emission plot on following first page shows 54.80dBc delta between carrier maximum power and local maximum emission in restrict band (2.38951GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 107.57dBuV/m (Peak), so the maximum field strength in restrict band is 107.57-54.80=52.77dBuV/m which is under 74dBuV/m limit.

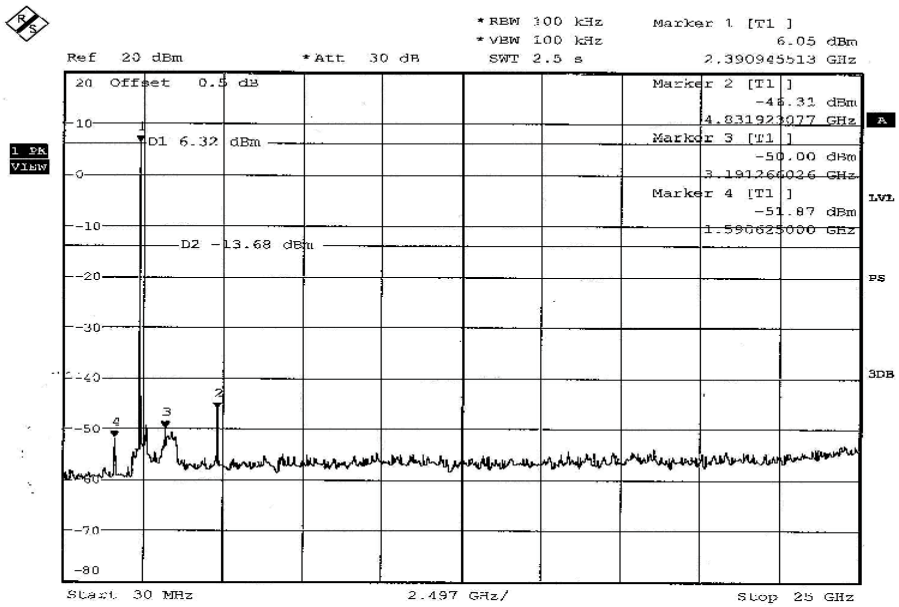
The band edge emission plot on following first page shows 56.61dBc delta between carrier maximum power and local maximum emission in restrict band (2.38935GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 104.66dBuV/m (Average), so the maximum field strength in restrict band is 104.66-56.61=48.05dBuV/m which is under 54dBuV/m limit.

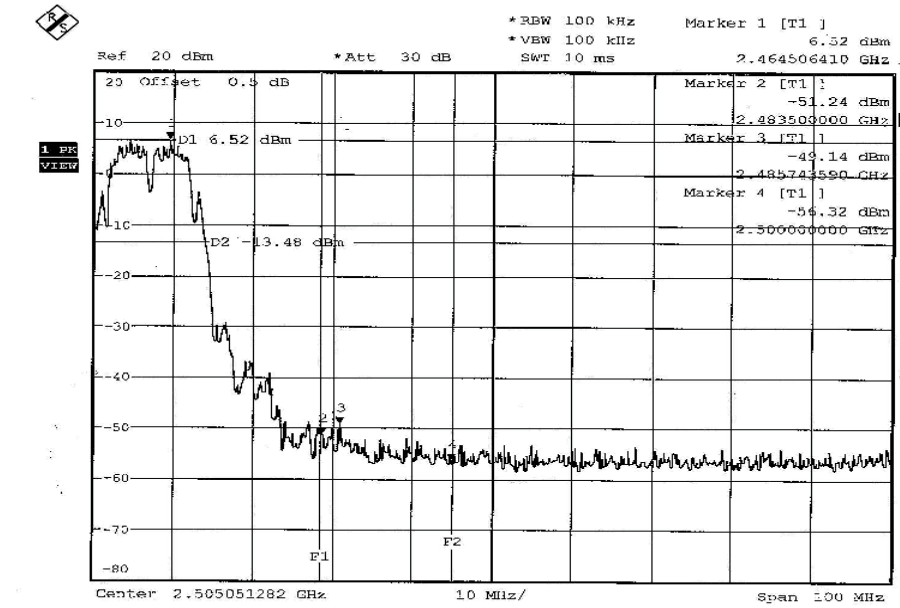
NOTE 2: The band edge emission plot on following second page shows 55.66dBc delta between carrier maximum power and local maximum emission in restrict band (2.48574GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 107.92dBuV/m (Peak), so the maximum field strength in restrict band is 107.92-55.66=52.26dBuV/m which is under 74dBuV/m limit.

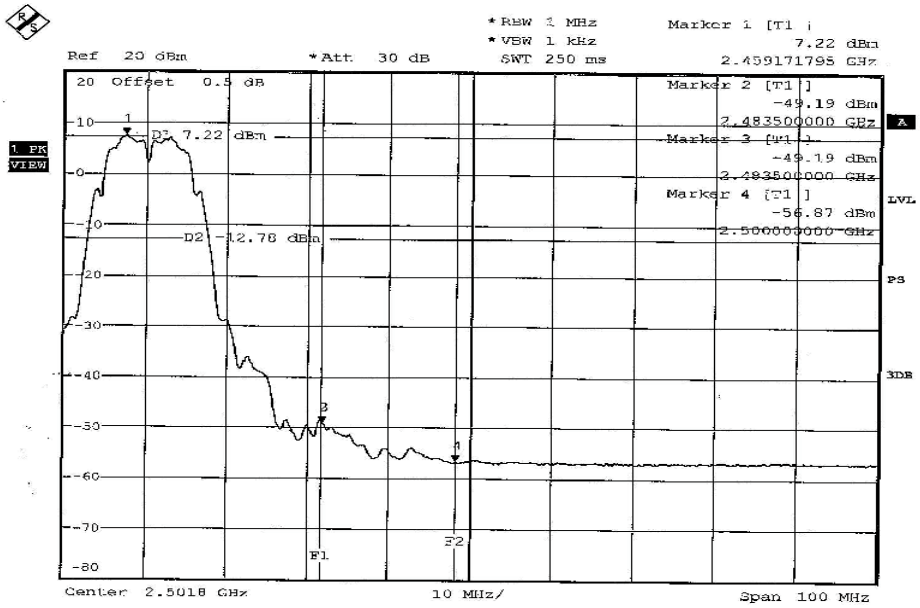
The band edge emission plot on following third page shows 56.41dBc delta between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 105.03dBuV/m (Average), so the maximum field strength in restrict band is 105.03-56.41=48.62dBuV/m which is under 54dBuV/m limit.

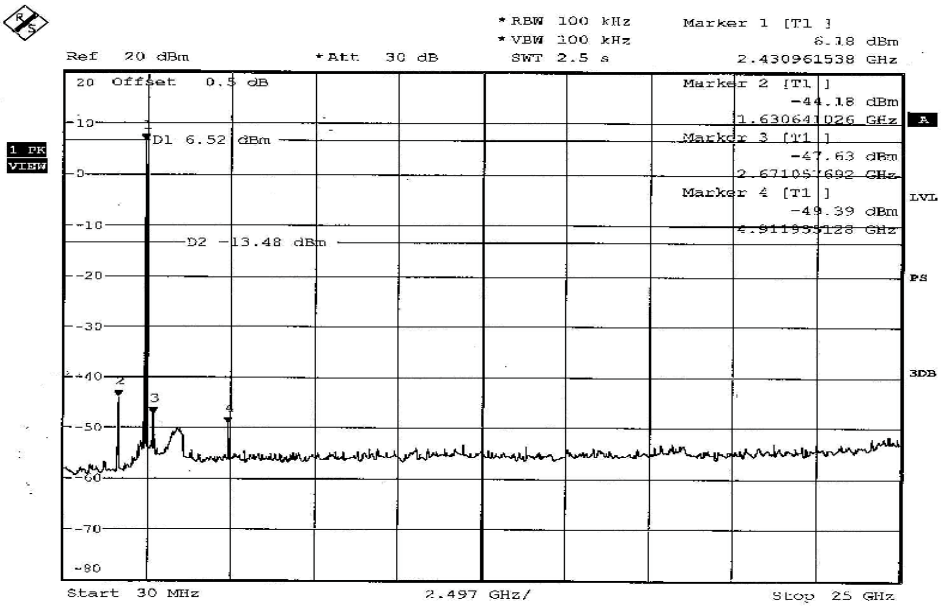

RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
6.32 dBm
2.413083333 GHz
Ref 20 dBm
Att 30 dB
Offset 0.5 dB
D1 6.32 dBm
D2 -13.68 dBm
Marker 2 [T1]
-42.27 dBm
2.398237179 GHz
Marker 3 [T1]
Marker 4 [T1]
-48.48 dBm
1 PK
VIEW
A
LVL
PS
3DB
F2
F1
Center 2.368051282 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 1 kHz
SWT 250 ms
Marker 1 [T1]
7.16 dBm
2.409347436 GHz
Ref 20 dBm
Att 30 dB
Offset 0.5 dB
D1 7.16 dBm
D2 -12.84 dBm
Marker 2 [T1]
-38.68 dBm
2.400000000 GHz
Marker 3 [T1]
-50.90 dBm
2.390000000 GHz
Marker 4 [T1]
-49.45 dBm
2.369358974 GHz
1 PK
VIEW
A
LVL
PS
3DB
F2
F1
Center 2.3672 GHz
10 kHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
6.05 dBm
2.390945513 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-46.31 dBm
4.831923077 GHz
Marker 3 [T1]
-50.00 dBm
3.191266026 GHz
Marker 4 [T1]
-51.87 dBm
1.596625000 GHz
D1 6.32 dBm
D2 -13.68 dBm
1 PK
VIEW
LVL
PS
3DB
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
6.52 dBm
2.464506410 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-51.24 dBm
2.483500000 GHz
Marker 3 [T1]
-49.14 dBm
2.485743590 GHz
Marker 4 [T1]
-56.32 dBm
2.500000000 GHz
D1 6.52 dBm
D2 -13.48 dBm
1 PK
VIEW
LVL
PS
3DB
F1
F2
Center 2.505051282 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 1 [T1]
7.22 dBm
2.459171795 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-49.19 dBm
2.483500000 GHz
Marker 3 [T1]
-49.19 dBm
2.483500000 GHz
Marker 4 [T1]
-56.87 dBm
2.500000000 GHz
1 PK
VIEW
D1 7.22 dBm
D2 -12.78 dBm
A
LVL
PS
3DB
F1
F2
Center 2.5018 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
6.18 dBm
2.430961538 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-44.18 dBm
1.630641026 GHz
Marker 3 [T1]
-47.63 dBm
2.671057692 GHz
Marker 4 [T1]
-49.39 dBm
4.911935128 GHz
1 PK
VIEW
D1 6.52 dBm
D2 -13.48 dBm
A
LVL
PS
3DB
Start 30 MHz
2.497 GHz/
Stop 25 GHz

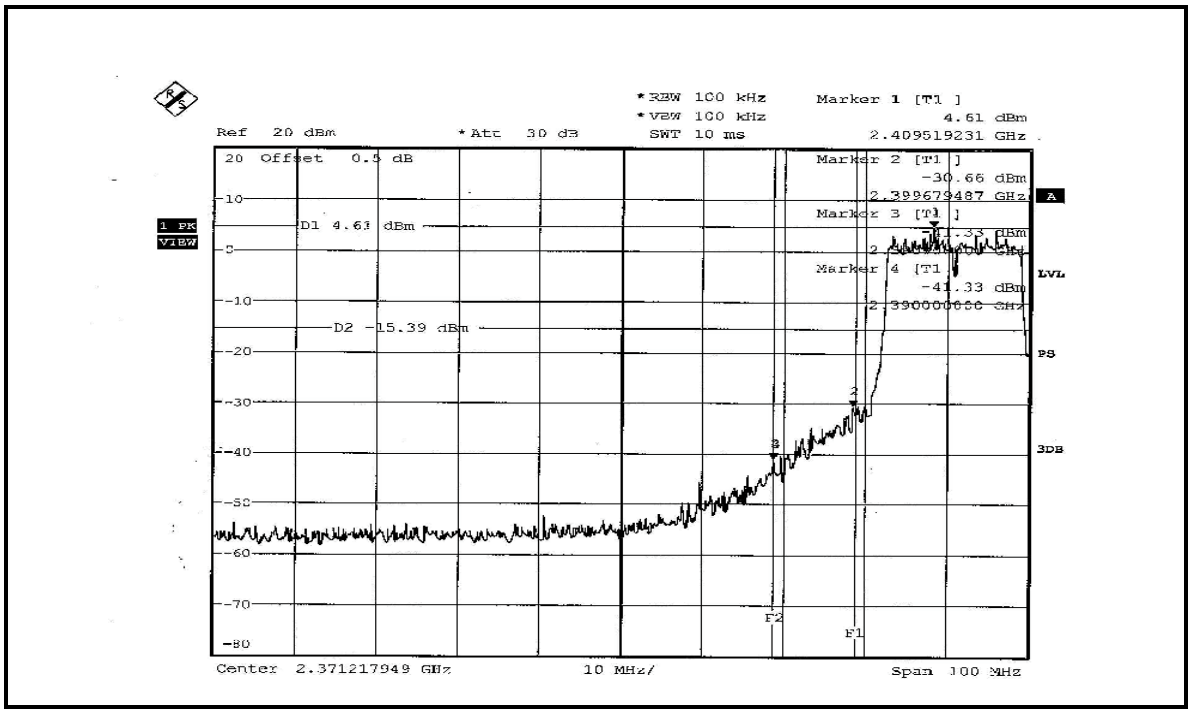
802.11g OFDM modulation

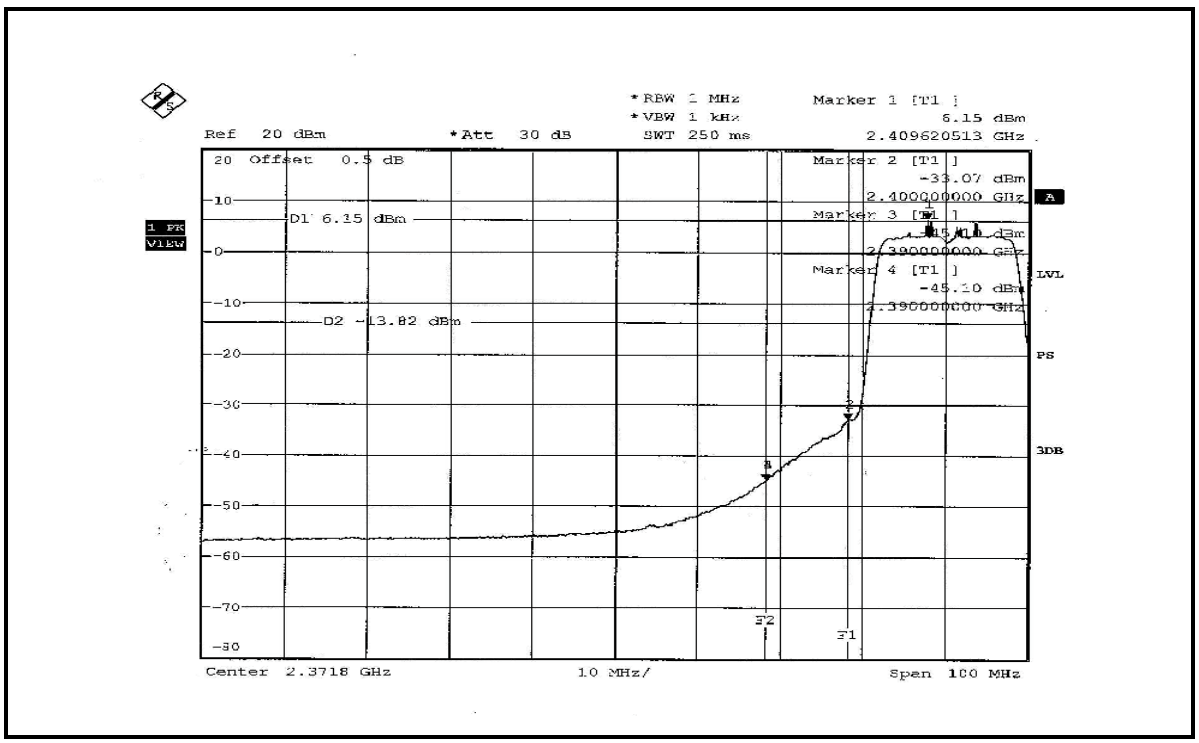
NOTE 1: The band edge emission plot on following first page shows 45.94dBc delta between carrier maximum power and local maximum emission in restrict band (2.39000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 109.14dBuV/m (Peak), so the maximum field strength in restrict band is 109.14-44.79=63.20dBuV/m which is under 74dBuV/m limit.

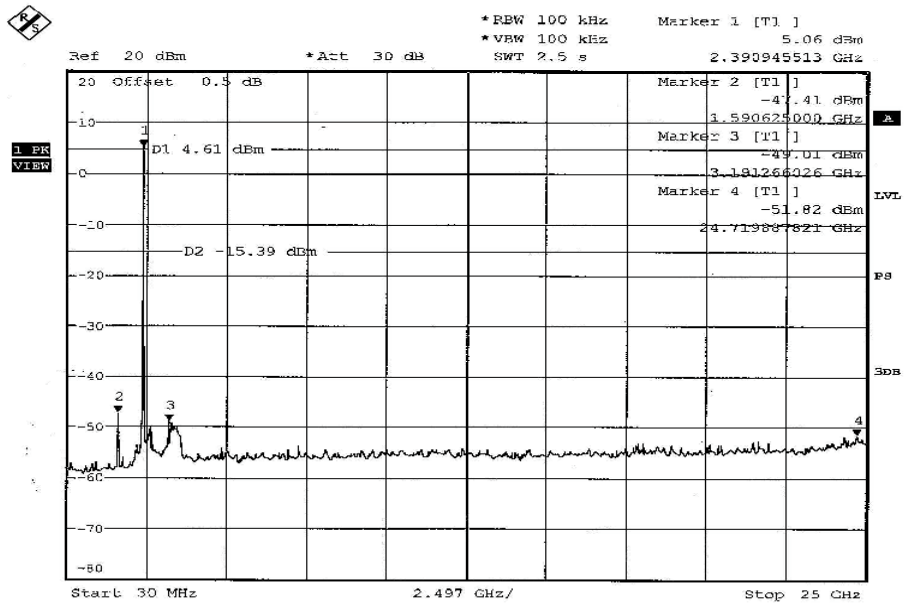
The band edge emission plot on following first page shows 51.25dBc delta between carrier maximum power and local maximum emission in restrict band (2.39000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 99.52dBuV/m (Average), so the maximum field strength in restrict band is 99.52-51.25=48.27dBuV/m which is under 54dBuV/m limit.

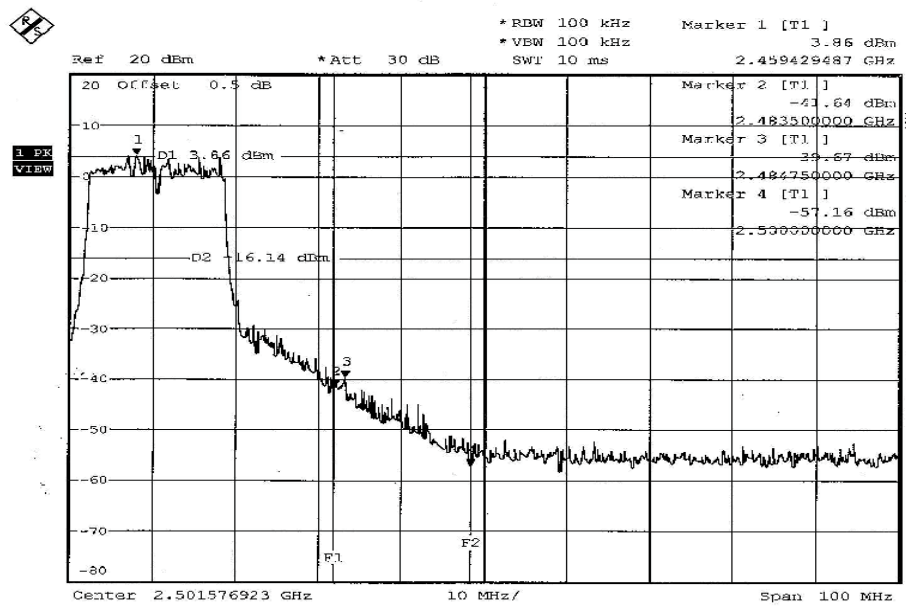
NOTE 2: The band edge emission plot on following second page shows 43.53dBc delta between carrier maximum power and local maximum emission in restrict band (2.48475GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 108.94dBuV/m (Peak), so the maximum field strength in restrict band is 108.94-43.53=65.41dBuV/m which is under 74dBuV/m limit.

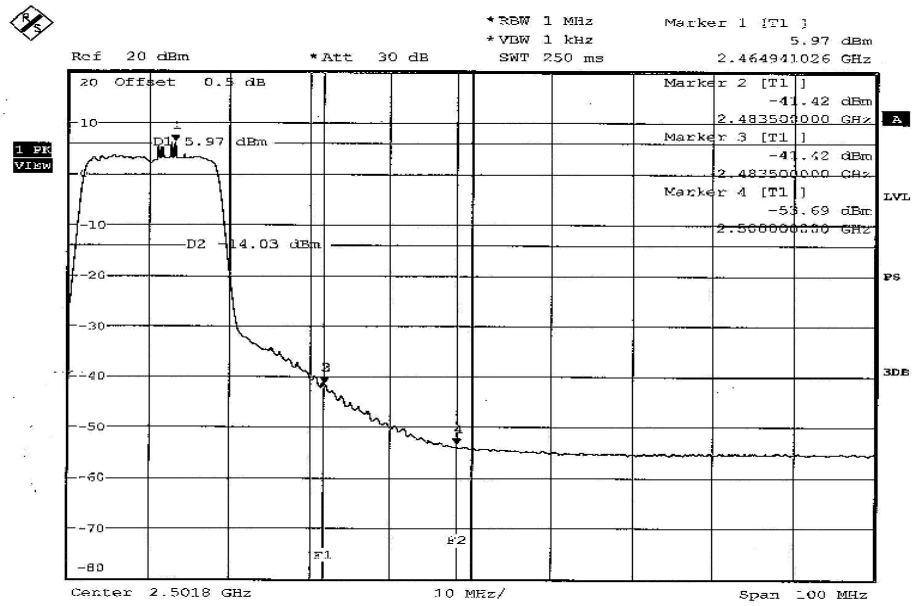
The band edge emission plot on following third page shows show 47.39dBc delta between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 99.36dBuV/m (Average), so the maximum field strength in restrict band is 99.36-47.39=51.97dBuV/m which is under 54dBuV/m limit.

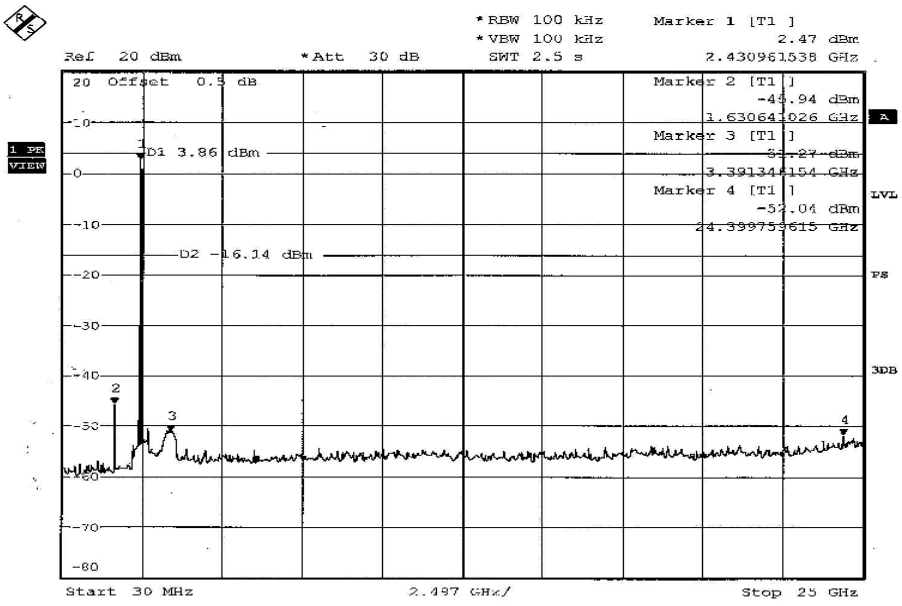

*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
4.61 dBm
2.409519231 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-30.66 dBm
2.399679487 GHz
Marker 3 [T1]
Marker 4 [T1]
-41.33 dBm
1 PK
VIEW
D1 4.61 dBm
D2 -15.39 dBm
A
LVL
PS
3DB
F2
F1
Center 2.371217949 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 1 [T1]
6.15 dBm
2.409620513 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-33.07 dBm
2.400000000 GHz
Marker 3 [T1]
Marker 4 [T1]
-45.10 dBm
1 PK
VIEW
D1 6.15 dBm
D2 -13.82 dBm
A
LVL
PS
3DB
F2
F1
Center 2.3718 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
5.06 dBm
2.390945513 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-47.41 dBm
1.590625000 GHz
Marker 3 [T1]
-49.01 dBm
3.181266026 GHz
Marker 4 [T1]
-51.82 dBm
24.719887821 GHz
1 PK
VIEW
D1 4.61 dBm
D2 -15.39 dBm
LVL
PS
3DB
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
3.86 dBm
2.459429487 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-41.64 dBm
2.483500000 GHz
Marker 3 [T1]
-39.67 dBm
2.484750000 GHz
Marker 4 [T1]
-57.16 dBm
2.500000000 GHz
1 PK
VIEW
D1 3.86 dBm
D2 -16.14 dBm
LVL
PS
3DB
F1
F2
Center 2.501576923 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 kHz
SWT 250 ms
Marker 1 [T1]
5.97 dBm
2.464941026 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-41.42 dBm
2.483500000 GHz
Marker 3 [T1]
-41.42 dBm
2.483500000 GHz
Marker 4 [T1]
-53.69 dBm
2.500000000 GHz
D1 5.97 dBm
D2 -14.03 dBm
1 PK VIEW
LVL
PS
3DB
Center 2.5018 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
2.47 dBm
2.430961538 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 0.5 dB
Marker 2 [T1]
-45.94 dBm
1.630641026 GHz
Marker 3 [T1]
-51.27 dBm
3.391346154 GHz
Marker 4 [T1]
-52.04 dBm
24.399759615 GHz
D1 3.86 dBm
D2 -16.14 dBm
1 PK VIEW
LVL
PS
3DB
Start 30 MHz
2.497 GHz/
Stop 25 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is PCB antenna without UFL 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

Linko RF Lab.
Tel: 886-3-3270910
Fax: 886-3-3270892

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.