

FCC TEST REPORT

REPORT NO.: RF960125L10 MODEL NO.: NSR-1220

(refer to item 3.1 for more details)

RECEIVED: Jan. 19, 2007

TESTED: Jan. 19 ~ Mar. 14, 2007

ISSUED: Mar. 16, 2007

APPLICANT: SENAO INTERNATIONAL CO., LTD.

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ISSUED BY: Advance Data Technology Corporation

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Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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No.: 2177-01



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1 CERTIFICATION

PRODUCT: Wireless LAN IEEE 802.11b/g Router

MODEL: NSR-1220 (refer to item 3.1 for more details)

BRAND: Senao (refer to item 3.1 for more details)

APPLICANT: SENAO INTERNATIONAL CO., LTD.

TESTED: Jan. 19 ~ Mar. 14, 2007

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC Part 15, Subpart C (Section 15.247)

ANSI C63.4-2003

The above equipment (model: NSR-1220) has 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

essie Wang

DATE: Mar. 16, 2007

TECHNICAL

ACCEPTANCE

Responsible for RF

DATE.

Mar. 16, 2007

APPROVED BY

ary Chang Supervisor

DATE:

Mar. 16, 2007



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 -11.08dB at 0.301MHz.			
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)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.00dB at 14472.00MHz.			
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.			
15.247(d)	Band Edge Measurement Limit: 20 dB 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
	30MHz ~ 200MHz	3.71 dB
Radiated emissions	200MHz ~1000MHz	3.73 dB
Radiated emissions	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

PRODUCT	Wireless LAN IEEE 802.11b/g Router	
MODEL NO.	NSR-1220 (refer to note 1 for more details)	
FCC ID	NI3-SR32106001	
POWER SUPPLY	12Vdc from AC adapter	
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS	
WODDLATION TIPE	64QAM, 16QAM, QPSK, BPSK for OFDM	
MODULATION TECHNOLOGY	DSSS, OFDM	
TRANSFER RATE	802.11b: 11/5.5/2/1Mbps	
TRANSPER RATE	802.11g: 54/48/36/24/18/12/9/6Mbps	
FREQUENCY RANGE	2412MHz ~ 2462MHz	
NUMBER OF CHANNEL	11	
MAXIMUM OUTPUT POWER	224.388mW	
ANTENNA TYPE	Dipole antenna with 2dBi gain	
DATA CABLE	NA	
I/O PORTS	RJ45	
ACCESSORY DEVICE	Adapter	

NOTE:

1. The models are identical as below to each other except for their model designation and brand name due to marketing requirement.

Brand	Model
EnGenius	ESR-1220
Senao	SSR-1220
Senao	NSR-1220

2. The EUT was powered by the following adapter:

Brand:	AMIGO
Model:	AM-121000
Input:	120Vac, 60Hz, 20W
Output:	12Vdc, 1000mA, 12VA
Power Line:	DC 1.8m non-shielded cable without core

- 3. 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.
- 4. 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.

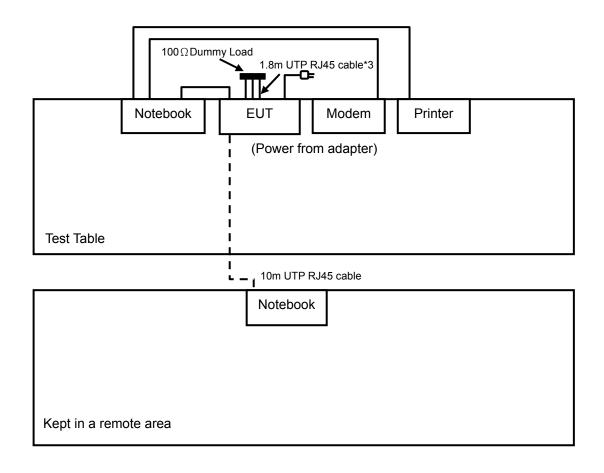


3.2 DESCRIPTION OF TEST MODES

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	Applicable to				Description
Mode	PLC	RE<1G	RE≥1G	APCM	Боотрион
-	V	\checkmark	\checkmark	\checkmark	-

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 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	Modulation	Modulation	Data Rate
		Channel	Technology	Type	(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 and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below.

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

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 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



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	33898721680	E2K24CLNS
2	MODEM	ACEEX	1414V/3	0401008248	IFAXDM1414
3	PRINTER	EPSON	LQ-300+	DCGY047265	FCC DoC Approved
4	DUMMY LOAD	NA	NA	NA	NA
5	NOTEBOOK COMPUTER	DELL	PP05L	33898721680	E2K24CLNS

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2 m shielded cable without core
3	1.2 m shielded cable without core
4	1.8 m UTP RJ45 cable * 3
5	10m UTP RJ45 cable

NOTE

- 1. All power cords of the above support units are non shielded (1.8m).
- 2. Item 5 acted as communication partners to transfer data.



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTE	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	100288	Sep. 25, 2007
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2008
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 08, 2008
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 16, 2008
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 2.
- 3. The VCCI Site Registration No. is C-2047.



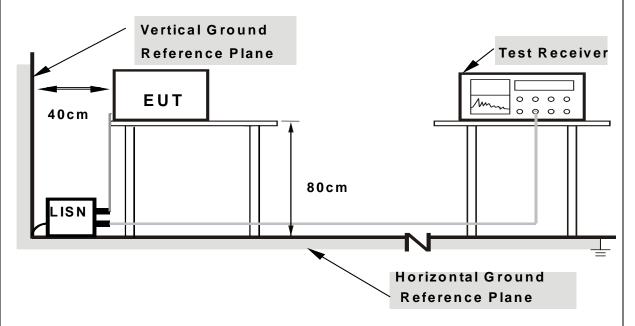
4.1.3 TEST PROCEDURES

- 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.

N	\sim	М	eviatio	n



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 attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- a. The EUT connected with notebook system via a RJ45 cable and placed on the testing table.
- b. Connected EUT with notebook system via RJ45 to act as a communication partner.
- c. The notebook system run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency via an RJ45 cable.
- d. The necessary accessories enable the EUT in full functions.



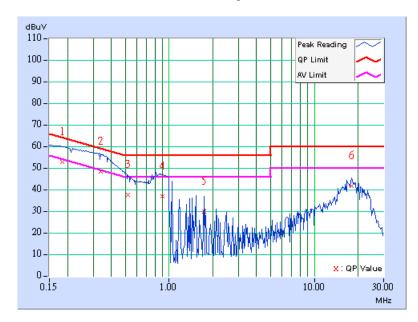
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA

EUT TEST CONDITION	N	MEASUREMENT DETAIL					
CHANNEL Channel 1		PHASE	Line 1				
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz				
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20 deg. C, 60%RH, 991hPa				
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui				

No	Freq. [MHz]	Corr. Factor (dB)	Va	ding lue (uV)]	Le	ssion vel (uV)]	Limit [dB (uV)]		Margin (dB)	
		(ub)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.185	0.10	52.26	-	52.36	-	64.26	54.26	-11.90	-
2	0.338	0.10	48.01	-	48.11	-	59.26	49.26	-11.15	-
3	0.521	0.10	37.31	-	37.41	-	56.00	46.00	-18.59	-
4	0.902	0.11	36.59	-	36.70	-	56.00	46.00	-19.30	-
5	1.734	0.19	29.48	-	29.67	-	56.00	46.00	-26.33	-
6	18.010	0.53	41.24	-	41.77	-	60.00	50.00	-18.23	-

- 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.

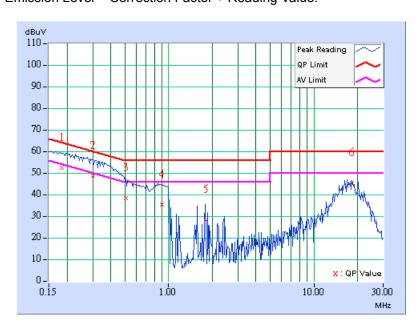




EUT TEST CONDITION	N	MEASUREMENT DETAIL			
CHANNEL Channel 1		PHASE	Line 2		
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz		
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20 deg. C, 60%RH, 991hPa		
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui		

No	Freq. [MHz]	Corr. Factor (dB)	Read Val [dB (lue		ssion vel (uV)]	Limit [dB (uV)]		Margin] (dB)	
		(db)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.184	0.10	52.14	-	52.24	-	64.32	54.32	-12.08	-
2	0.301	0.10	48.29	-	48.39	-	60.22	50.22	-11.83	-
3	0.509	0.12	38.01	-	38.13	-	56.00	46.00	-17.87	-
4	0.900	0.19	34.96	-	35.15	-	56.00	46.00	-20.85	-
5	1.801	0.22	27.81	-	28.03	-	56.00	46.00	-27.97	-
6	18.309	0.54	45.13	-	45.67	-	60.00	50.00	-14.33	-

- 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.

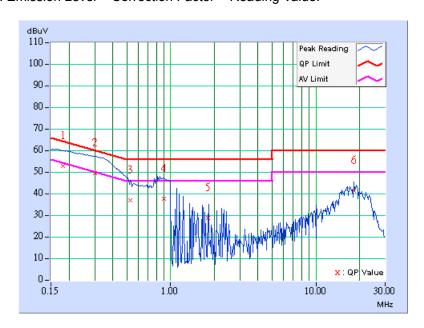




EUT TEST CONDITION	N	MEASUREMENT DETAIL		
CHANNEL Channel 6		PHASE	Line 1	
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20 deg. C, 60%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui	

No	Freq. [MHz]	IMH ₂ 1 Factor		Freq. Factor Value Level		vel			Margin (dB)	
		(ub)	Q.P.	AV.	Q.P.	AV.	Q.P.	Q.P. AV.		AV.
1	0.181	0.10	52.45	-	52.55	-	64.43	54.43	-11.88	-
2	0.301	0.10	49.04	•	49.14	-	60.22	50.22	-11.08	-
3	0.529	0.10	36.46	-	36.56	-	56.00	46.00	-19.44	-
4	0.900	0.11	37.34	-	37.45	-	56.00	46.00	-18.55	-
5	1.803	0.20	28.40	-	28.60	-	56.00	46.00	-27.40	-
6	18.164	0.54	41.09	-	41.63	-	60.00	50.00	-18.37	-

- 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.

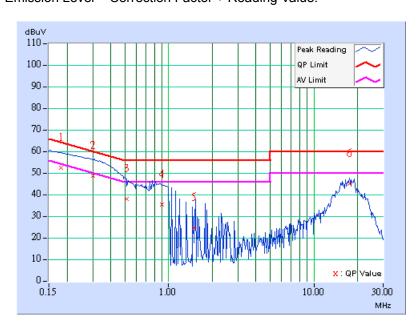




EUT TEST CONDITION	N	MEASUREMENT DETAIL		
CHANNEL Channel 6		PHASE	Line 2	
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20 deg. C, 60%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui	

No	Freq. [MHz]	Corr. Factor (dB)		ding lue (uV)]	_	ssion vel (uV)]	Lir [dB (nit (uV)]	Mar (d	_
		(ub)	Q.P.	AV.	Q.P.	AV.	Q.P.	Q.P. AV.		AV.
1	0.181	0.10	52.18	-	52.28	-	64.43	54.43	-12.15	-
2	0.302	0.10	48.33	-	48.43	-	60.19	50.19	-11.76	-
3	0.513	0.12	37.51	-	37.63	-	56.00	46.00	-18.37	-
4	0.904	0.19	34.90	-	35.09	-	56.00	46.00	-20.91	-
5	1.501	0.22	24.43	-	24.65	-	56.00	46.00	-31.35	-
6	17.560	0.53	44.81	-	45.34	-	60.00	50.00	-14.66	-

- 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.

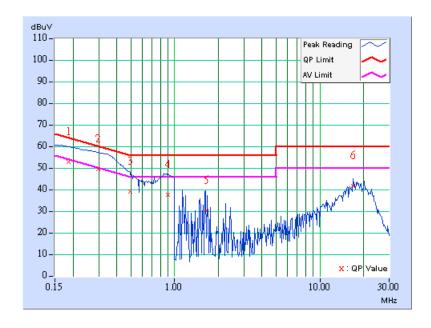




EUT TEST CONDITION	N	MEASUREMENT DETAIL		
CHANNEL Channel 11		PHASE	Line 1	
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20 deg. C, 60%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui	

No	Freq. [MHz]	Corr. Factor (dB)	Va	Reading Value [dB (uV)]		ssion vel (uV)]	Limit [dB (uV)]		Maı (d	gin B)
		(ub)	Q.P.	AV.	Q.P.	AV.	Q.P.	Q.P. AV.		AV.
1	0.185	0.10	52.33	-	52.43	-	64.25	54.25	-11.82	-
2	0.299	0.10	49.05	-	49.15	-	60.26	50.26	-11.11	-
3	0.494	0.10	38.77	-	38.87	-	56.10	46.10	-17.23	-
4	0.901	0.11	37.28	-	37.39	-	56.00	46.00	-18.61	-
5	1.651	0.18	29.78	-	29.96	-	56.00	46.00	-26.04	-
6	16.965	0.52	41.44	-	41.96	-	60.00	50.00	-18.04	-

- 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.

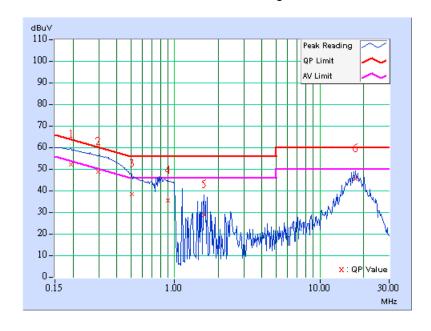




EUT TEST CONDITION	N	MEASUREMENT DETAIL		
CHANNEL Channel 11		PHASE	Line 2	
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20 deg. C, 60%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui	

No	Freq. [MHz]	Corr. Factor (dB)	Va	Reading Value [dB (uV)]		ssion vel (uV)]	Limit [dB (uV)]		Maı (d	_
		(ub)	Q.P.	AV.	Q.P.	AV.	Q.P.	Q.P. AV.		AV.
1	0.193	0.10	51.85	-	51.95	-	63.91	53.91	-11.96	-
2	0.299	0.10	48.40	-	48.50	-	60.26	50.26	-11.76	-
3	0.505	0.12	38.09	-	38.21	-	56.00	46.00	-17.79	-
4	0.901	0.19	35.02	-	35.21	-	56.00	46.00	-20.79	-
5	1.586	0.22	28.39	-	28.61	-	56.00	46.00	-27.39	-
6	17.562	0.53	45.09	-	45.62	-	60.00	50.00	-14.38	-

- 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	Oct. 05, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2007
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 27, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 28, 2007
Preamplifier Agilent	8447D	2944A10633	Oct. 26, 2007
Preamplifier Agilent	8449B	3008A01964	Oct. 26, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238137/4	Dec. 11, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	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 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 VCCI Site Registration No. is R-237.
- 5. The IC Site Registration No. is IC3789B-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 meters 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 lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak method or average method as specified and then reported in data sheet.

NOTE:

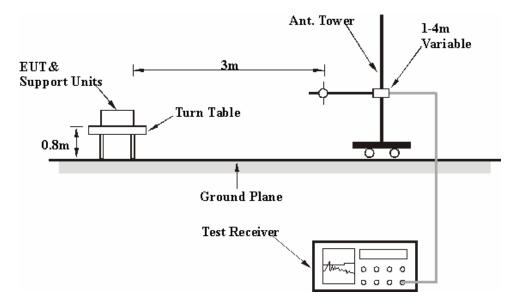
- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



4.2.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.



Report Format Version 2.0.5

4.2.7 TEST RESULTS

RADIATED WORST-CASE DATA: BELOW 1GHz

EUT TEST CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz	
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	A	ANTENNA F	POLARITY 8	TEST DIS	TANCE: HC	RIZONTAL	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	136.84	39.53 QP	43.50	-3.97	1.25 H	268	25.95	13.57
2	185.44	41.89 QP	43.50	-1.61	1.25 H	94	29.36	12.53
3	204.89	37.81 QP	43.50	-5.69	1.00 H	70	26.33	11.48
4	323.49	40.38 QP	46.00	-5.62	1.25 H	244	24.62	15.76
5	432.37	40.57 QP	46.00	-5.43	1.00 H	343	21.79	18.78
6	539.30	44.89 QP	46.00	-1.11	1.50 H	91	23.84	21.05
7	580.13	44.95 QP	46.00	-1.05	1.50 H	106	22.97	21.98
8	619.02	44.05 QP	46.00	-1.95	1.25 H	82	21.16	22.89
9	648.01	41.96 QP	46.00	-4.04	1.15 H	0	18.41	23.54
10	657.91	41.64 QP	46.00	-4.36	1.25 H	82	17.95	23.69

- 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.



EUT TEST CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz	
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	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	47.79	38.81 QP	40.00	-1.19	1.67 V	11	24.23	14.58		
2	78.51	37.13 QP	40.00	-2.87	1.50 V	247	26.26	10.87		
3	97.95	39.90 QP	43.50	-3.60	1.00 V	232	29.97	9.93		
4	136.84	42.19 QP	43.50	-1.31	1.00 V	313	28.62	13.57		
5	186.53	41.98 QP	43.50	-1.52	1.00 V	140	29.55	12.43		
6	199.05	38.21 QP	43.50	-5.29	1.00 V	10	26.87	11.34		
7	539.30	41.97 QP	46.00	-4.03	1.50 V	10	20.93	21.05		

- 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 CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz	
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)	
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m									
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
1	2387.00	58.88 PK	74.00	-15.12	1.64 H	290	26.56	32.32		
2	2387.00	47.42 AV	54.00	-6.58	1.64 H	290	15.10	32.32		
3	*2412.00	100.95 PK			1.61 H	294	68.52	32.43		
4	*2412.00	96.46 AV			1.61 H	294	64.03	32.43		
5	4824.00	52.69 PK	74.00	-21.31	1.20 H	54	13.93	38.76		
6	4824.00	46.86 AV	54.00	-7.14	1.20 H	54	8.10	38.76		
7	14472.00	63.21 PK	74.00	-10.79	1.02 H	106	5.78	57.43		
8	14472.00	50.02 AV	54.00	-3.98	1.02 H	106	-7.41	57.43		

	ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 m									
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
1	2387.00	58.65 PK	74.00	-15.35	1.03 V	328	26.34	32.32		
2	2387.00	49.85 AV	54.00	-4.15	1.03 V	328	17.54	32.32		
3	*2412.00	112.83 PK			1.06 V	331	80.41	32.43		
4	*2412.00	108.08 AV			1.06 V	331	75.66	32.43		
5	4824.00	55.23 PK	74.00	-18.77	1.10 V	359	16.47	38.76		
6	4824.00	50.95 AV	54.00	-3.05	1.10 V	359	12.19	38.76		
7	14472.00	66.62 PK	74.00	-7.38	1.01 V	57	9.19	57.43		
8	14472.00	53.00 AV	54.00	-1.00	1.01 V	57	-4.43	57.43		

- 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 CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz	
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)	
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m									
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
1	*2437.00	101.02 PK			1.46 H	303	68.37	32.65		
2	*2437.00	96.50 AV			1.46 H	303	63.85	32.65		
3	4874.00	52.98 PK	74.00	-21.02	1.08 H	113	13.63	39.35		
4	4874.00	47.01 AV	54.00	-6.99	1.08 H	113	7.66	39.35		
5	7311.00	52.85 PK	74.00	-21.15	1.08 H	205	6.81	46.04		
6	7311.00	41.86 AV	54.00	-12.14	1.08 H	205	-4.18	46.04		

	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	113.15 PK			1.17 V	145	80.50	32.65		
2	*2437.00	107.95 AV			1.17 V	145	75.30	32.65		
3	4874.00	56.65 PK	74.00	-17.35	1.40 V	6	17.30	39.35		
4	4874.00	52.82 AV	54.00	-1.18	1.40 V	6	13.47	39.35		
5	7311.00	55.15 PK	74.00	-18.85	1.05 V	259	9.11	46.04		
6	7311.00	44.28 AV	54.00	-9.72	1.05 V	259	-1.76	46.04		

- 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 CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz	
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)	
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m									
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)		
1	*2462.00	101.08 PK			1.04 H	290	68.32	32.76		
2	*2462.00	96.83 AV			1.04 H	290	64.07	32.76		
3	2487.00	58.10 PK	74.00	-15.90	1.02 H	265	25.23	32.87		
4	2487.00	47.99 AV	54.00	-6.01	1.02 H	265	15.12	32.87		
5	4924.00	54.43 PK	74.00	-19.57	1.31 H	55	15.01	39.42		
6	4924.00	49.00 AV	54.00	-5.00	1.31 H	55	9.58	39.42		
7	7386.00	52.23 PK	74.00	-21.77	1.05 H	213	6.10	46.13		
8	7386.00	41.21 AV	54.00	-12.79	1.05 H	213	-4.92	46.13		

	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	113.31 PK			1.00 V	43	80.55	32.76		
2	*2462.00	107.84 AV			1.00 V	43	75.08	32.76		
3	2487.00	59.76 PK	74.00	-14.24	1.00 V	43	26.89	32.87		
4	2487.00	50.45 AV	54.00	-3.55	1.00 V	43	17.58	32.87		
5	4924.00	57.35 PK	74.00	-16.65	1.10 V	355	17.93	39.42		
6	4924.00	52.35 AV	54.00	-1.65	1.10 V	355	12.93	39.42		
7	7386.00	55.54 PK	74.00	-18.46	1.08 V	265	9.40	46.13		
8	7386.00	44.41 AV	54.00	-9.59	1.08 V	265	-1.73	46.13		

- 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 CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz	
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)	
1	2360.00	55.19 PK	74.00	-18.81	1.15 H	329	22.89	32.30	
2	2360.00	47.48 AV	54.00	-6.52	1.15 H	329	15.18	32.30	
3	2390.00	54.05 PK	74.00	-19.95	1.12 H	315	21.61	32.44	
4	2390.00	46.35 AV	54.00	-7.65	1.12 H	315	13.91	32.44	
5	*2412.00	105.11 PK			1.17 H	321	72.58	32.53	
6	*2412.00	93.56 AV			1.17 H	321	61.03	32.53	
7	4824.00	49.22 PK	74.00	-24.78	1.19 H	346	9.94	39.28	
8	4824.00	36.01 AV	54.00	-17.99	1.19 H	346	-3.27	39.28	

	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	2280.00	59.24 PK	74.00	-14.76	1.04 V	328	27.38	31.86		
2	2280.00	51.69 AV	54.00	-2.31	1.04 V	328	19.83	31.86		
3	2360.00	61.20 PK	74.00	-12.80	1.04 V	347	29.00	32.20		
4	2360.00	52.92 AV	54.00	-1.08	1.04 V	347	20.72	32.20		
5	2372.00	61.34 PK	74.00	-12.66	1.04 V	329	29.09	32.25		
6	2372.00	52.02 AV	54.00	-1.98	1.04 V	329	19.77	32.25		
7	2390.00	67.15 PK	74.00	-6.85	1.04 V	336	34.82	32.33		
8	2390.00	51.16 AV	54.00	-2.84	1.04 V	336	18.83	32.33		
9	*2412.00	114.01 PK			1.00 V	0	81.58	32.43		
10	*2412.00	101.70 AV			1.00 V	0	69.27	32.43		
11	4824.00	51.34 PK	74.00	-22.66	1.24 V	358	12.59	38.76		
12	4824.00	38.28 AV	54.00	-15.72	1.24 V	358	-0.47	38.76		

- 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 CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz	
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)	
1	*2437.00	109.31 PK			1.19 H	342	76.66	32.65	
2	*2437.00	97.58 AV			1.19 H	342	64.93	32.65	
3	4874.00	52.11 PK	74.00	-21.89	1.15 H	315	12.76	39.35	
4	4874.00	38.98 AV	54.00	-15.02	1.15 H	315	-0.37	39.35	

	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	2390.00	62.69 PK	74.00	-11.31	1.02 V	345	30.25	32.44		
2	2390.00	49.98 AV	54.00	-4.02	1.02 V	345	17.55	32.44		
3	*2437.00	119.23 PK			1.00 V	18	86.58	32.65		
4	*2437.00	107.85 AV			1.00 V	18	75.20	32.65		
5	2483.50	61.97 PK	74.00	-12.03	1.05 V	32	29.11	32.86		
6	2483.50	52.29 AV	54.00	-1.71	1.05 V	32	19.43	32.86		
7	4874.00	55.45 PK	74.00	-18.55	1.18 V	342	16.10	39.35		
8	4874.00	42.35 AV	54.00	-11.65	1.18 V	342	3.00	39.35		

- 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 CONDITIO	N	MEASUREMENT DETAIL		
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz	
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)	
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	23 deg. C, 66%RH, 991hPa	
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen	

	ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)	
1	*2462.00	102.85 PK			1.00 H	345	70.09	32.76	
2	*2462.00	90.46 AV			1.00 H	345	57.70	32.76	
3	2483.50	53.89 PK	74.00	-20.11	1.13 H	325	21.03	32.86	
4	2483.50	46.21 AV	54.00	-7.79	1.13 H	325	13.35	32.86	
5	4924.00	50.01 PK	74.00	-23.99	1.18 H	340	10.59	39.42	
6	4924.00	36.25 AV	54.00	-17.75	1.18 H	340	-3.17	39.42	

	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	111.62 PK			1.00 V	337	78.86	32.76	
2	*2462.00	99.57 AV			1.00 V	337	66.81	32.76	
3	2483.50	69.66 PK	74.00	-4.34	1.18 V	31	36.80	32.86	
4	2483.50	52.03 AV	54.00	-1.97	1.18 V	31	19.17	32.86	
5	4924.00	50.38 PK	74.00	-23.62	1.03 V	100	10.96	39.42	
6	4924.00	38.32 AV	54.00	-15.68	1.03 V	100	-1.10	39.42	

- 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	FSP 40	100040	Jun. 07, 2007

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

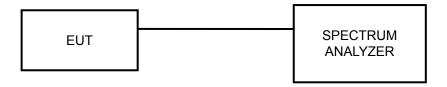
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.



4.3.5 TEST SETUP



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

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.

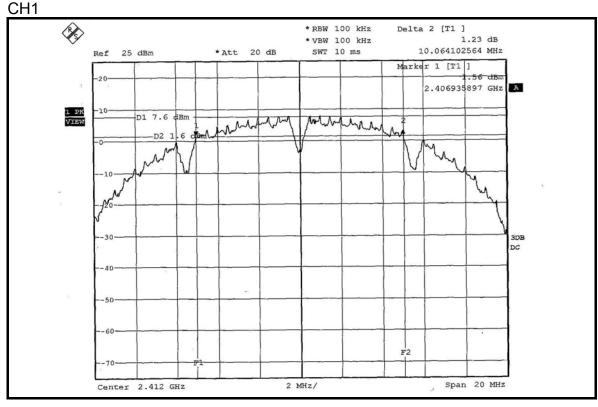


4.3.7 TEST RESULTS

802.11b DSSS MODULATION

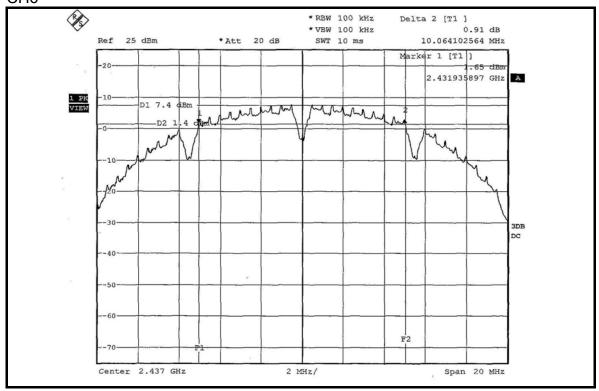
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz		26 deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.06	0.5	PASS
6	2437	10.06	0.5	PASS
11	2462	10.10	0.5	PASS

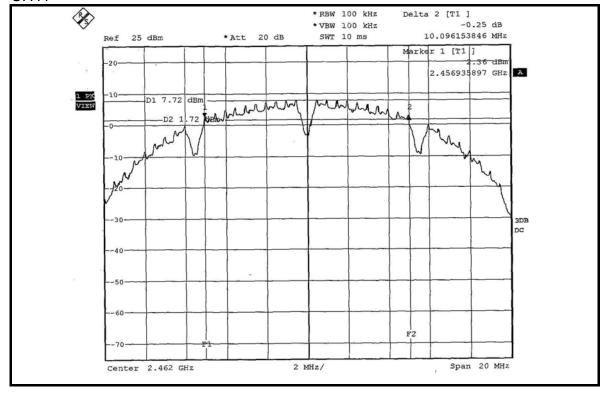








CH11



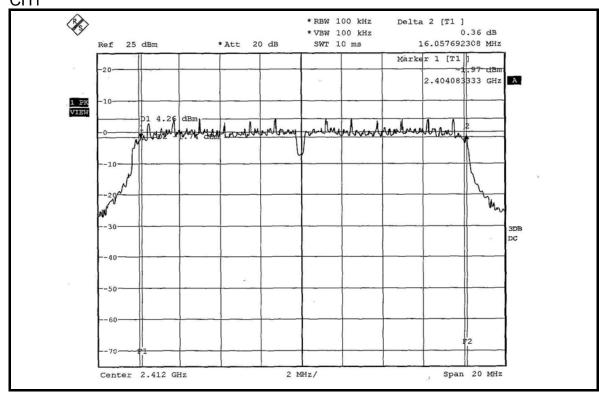


802.11g OFDM MODULATION

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

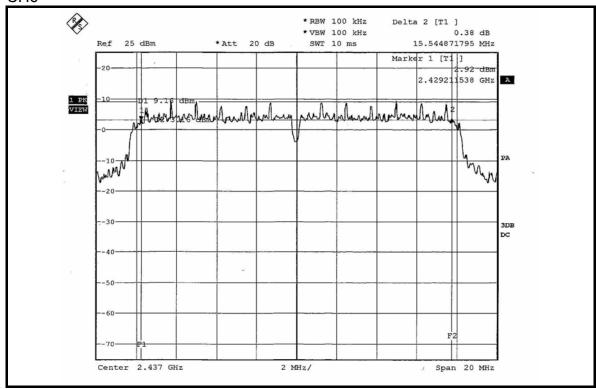
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.05	0.5	PASS
6	2437	15.54	0.5	PASS
11	2462	16.25	0.5	PASS

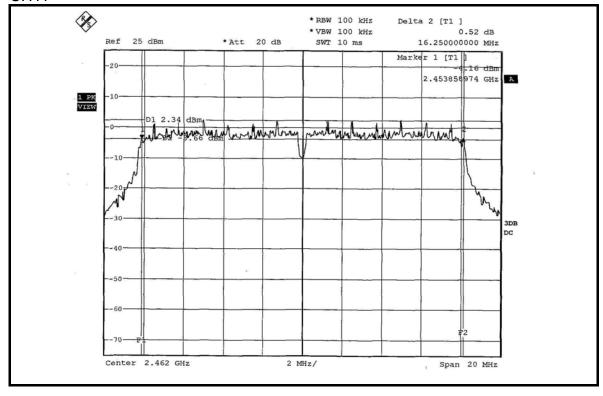
CH1













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 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP 40	100040	Jun. 07, 2007
ANRITSU SYNTHESIZED SIGNAL GENERATOR	68247B	984703	May 08, 2007
DIGITAL RT OSCILLOSCOPE	TDS1012	C037299	Nov. 28, 2007
NARDA DETECTOR	4503A	FSCM99899	NA

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



4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6.



4.4.7 TEST RESULTS

802.11b DSSS MODULATION

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	1120Vac 60 Hz	ENVIRONMENTAL CONDITIONS	26 deg. 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	63.973	18.06	30	PASS
6	2437	64.714	18.11	30	PASS
11	2462	64.121	18.07	30	PASS

802.11g OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	1120Vac 60 Hz	ENVIRONMENTAL CONDITIONS	26 deg. 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	89.743	19.53	30	PASS
6	2437	224.388	23.51	30	PASS
11	2462	50.350	17.02	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	FSP 40	100040	Jun. 07, 2007

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

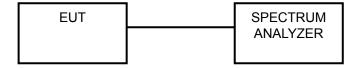
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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 CONDITIONS

Same as 4.3.6.

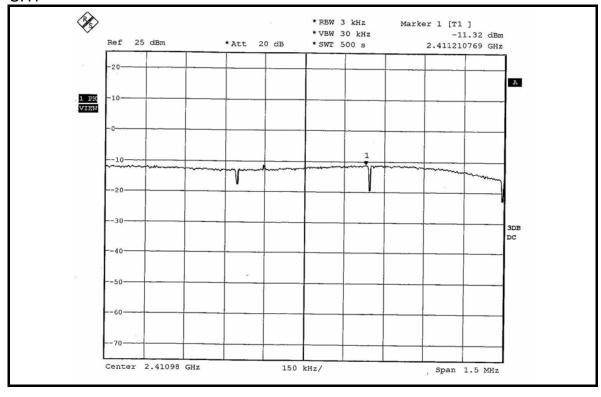


4.5.7 TEST RESULTS

802.11b DSSS MODULATION

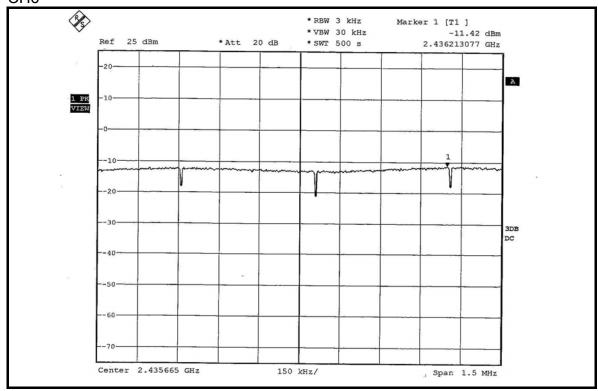
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac 60 Hz		26 deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

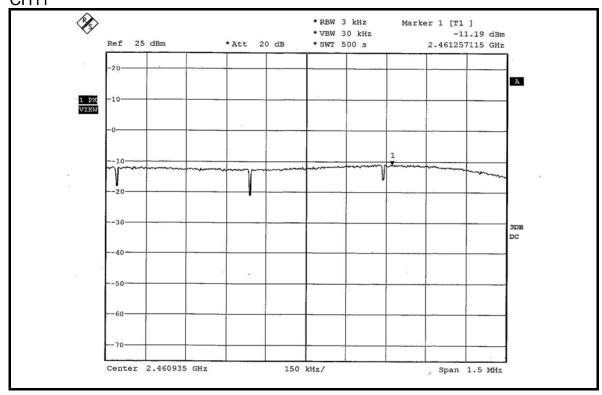
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-11.32	8	PASS
6	2437	-11.42	8	PASS
11	2462	-11.19	8	PASS





CH6



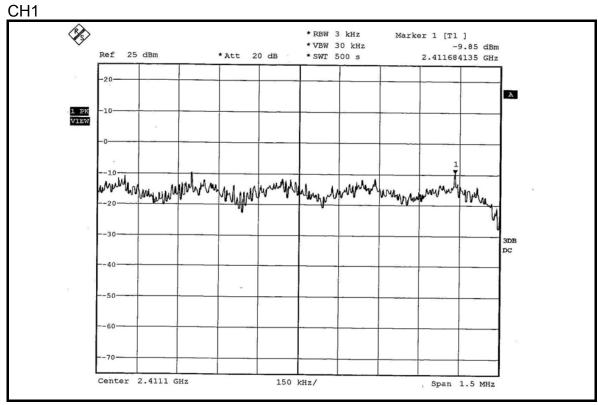




802.11g OFDM MODULATION

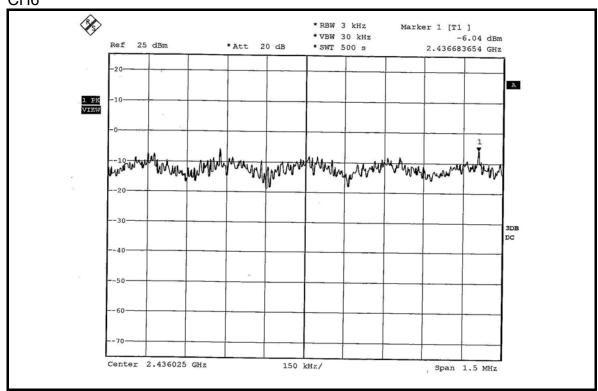
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	1120Vac 60 Hz		26 deg. C, 66%RH, 991hPa
TESTED BY	Morgan Chen		

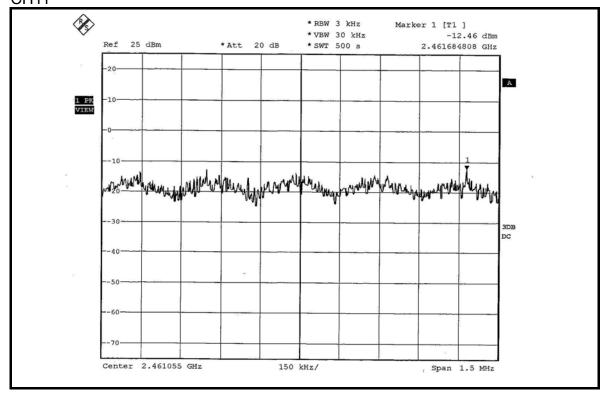
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-9.85	8	PASS
6	2437	-6.04	8	PASS
11	2462	-12.46	8	PASS





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	FSP 40	100040	Jun. 07, 2007

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=10Hz) are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 EUT OPERATING CONDITION

Same as 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

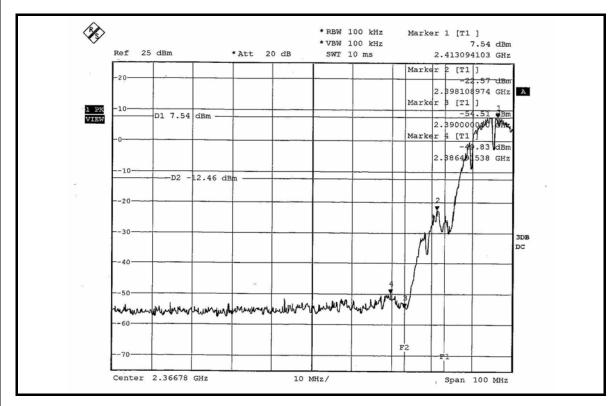
NOTE 1: The band edge emission plot on the next page shows 57.37 dBc between carrier maximum power and local maximum emission in restrict band (2.386490538 GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 112.83 dBuV/m (Peak), so the maximum field strength in restrict band is 112.83 - 57.37 = 55.46 dBuV/m which is under 74 dBuV/m limit.

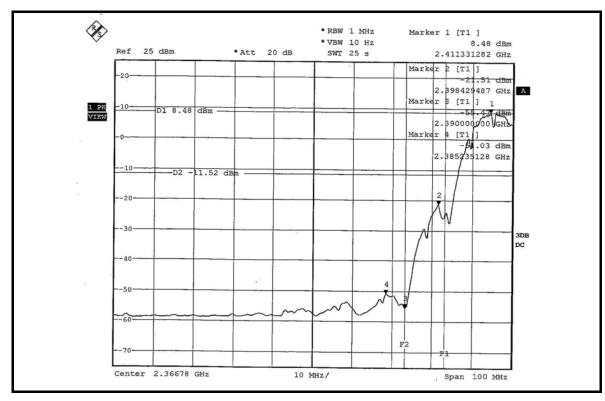
The band edge emission plot on the next page shows 59.51dBc between carrier maximum power and local maximum emission in restrict band (2.385235128GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 108.08dBuV/m (Average), so the maximum field strength in restrict band is 108.08 – 59.51 = 48.57dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on the next second page shows 55.74dBc between carrier maximum power and local maximum emission in restrict band (2.487647436GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 113.31dBuV/m (Peak), so the maximum field strength in restrict band is 113.31 - 55.74 = 57.57dBuV/m which is under 74dBuV/m limit.

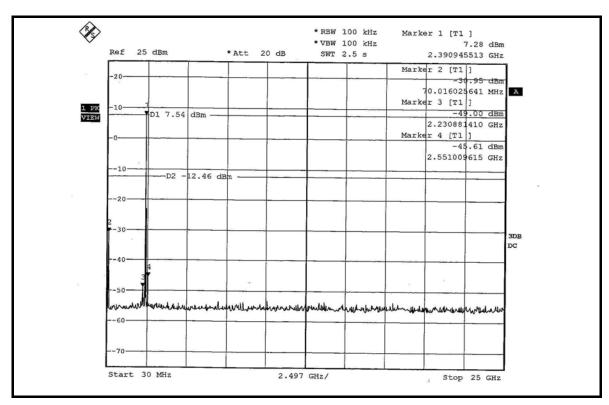
The band edge emission plot on the next third page shows 56.99 dBc between carrier maximum power and local maximum emission in restrict band (2.487705128 GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 107.84 dBuV/m (Average), so the maximum field strength in restrict band is 107.84 - 56.99 = 50.85 dBuV/m which is under 54 dBuV/m limit.

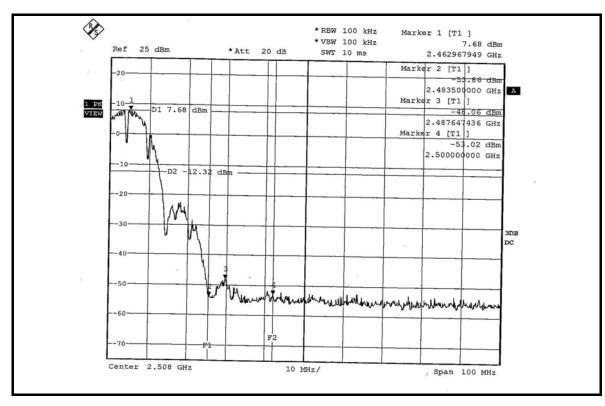




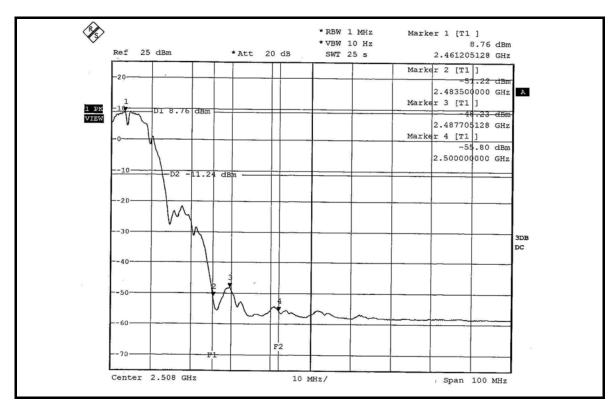


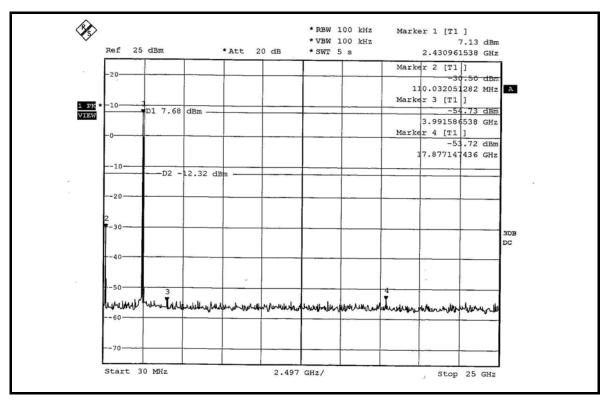














802.11g OFDM MODULATION

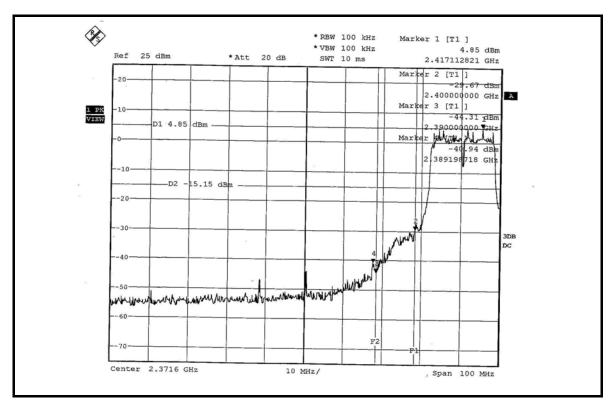
NOTE 1: The band edge emission plot on the next page shows 45.79 dBc between carrier maximum power and local maximum emission in restrict band (2.389198718GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 114.01 dBuV/m (Peak), so the maximum field strength in restrict band is 114.01 - 45.79 = 68.22 dBuV/m which is under 74 dBuV/m limit.

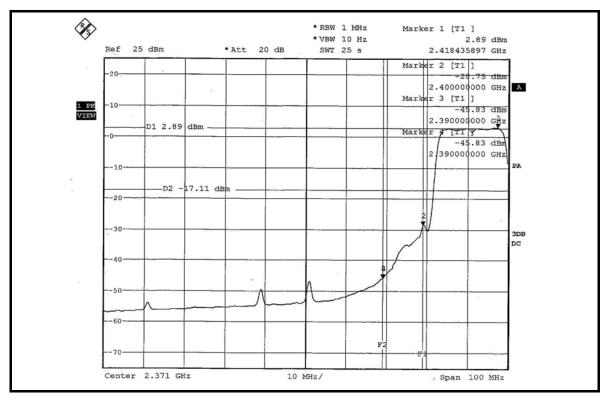
The band edge emission plot on the next page shows 48.72dBc between carrier maximum power and local maximum emission in restrict band (2.390000000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 101.70dBuV/m (Average), so the maximum field strength in restrict band is 101.70 – 48.72 = 52.98dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on the next second page shows 47.42dBc between carrier maximum power and local maximum emission in restrict band (2.483500000GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 111.62dBuV/m (Peak), so the maximum field strength in restrict band is 111.62 - 47.42 = 64.20dBuV/m which is under 74dBuV/m limit.

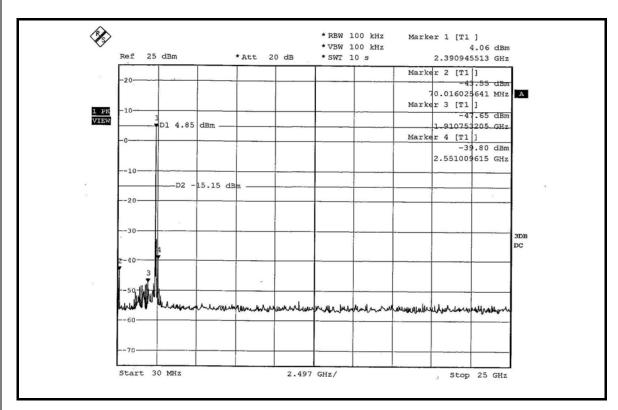
The band edge emission plot on the next third page shows 48.96dBc between carrier maximum power and local maximum emission in restrict band (2.483500000GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 99.57dBuV/m (Average), so the maximum field strength in restrict band is 99.57 – 48.96 = 50.61dBuV/m which is under 54dBuV/m limit.

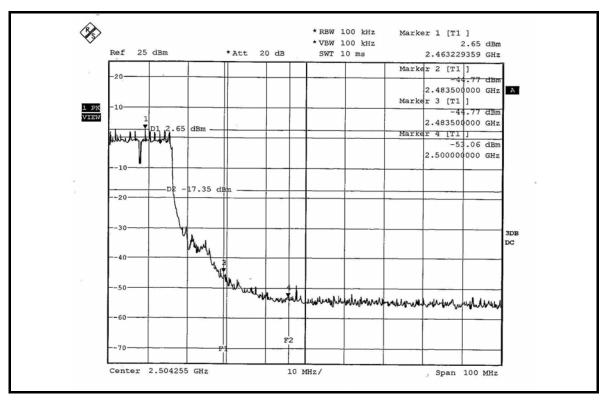




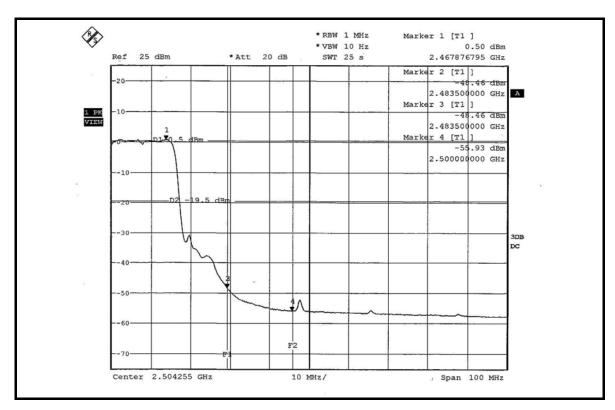


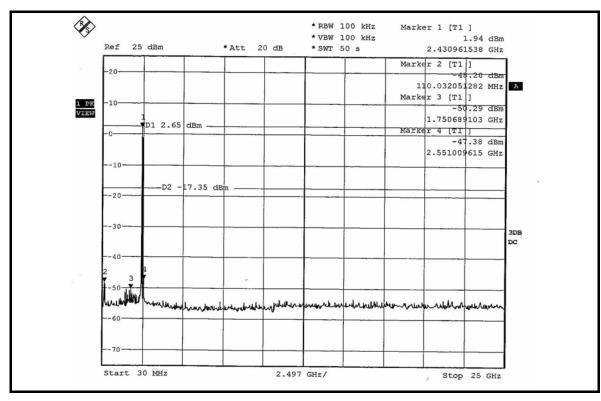














4.7 ANTENNA REQUIREMENT

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 antenna type used in this product is Dipole antenna with RSMA antenna connector. The maximum Gain of the antenna is 2dBi.



5 PHOTOGRAPHS OF THE TEST CONFIGURATION Please refer to the attached file (Test Setup Photo).



6 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, NCC

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 LabHsin Chu EMC/RF LabTel: 886-2-26052180Tel: 886-3-5935343Fax: 886-2-26051924Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab Web Site: www.adt.com.tw

Tel: 886-3-3183232 Fax: 886-3-3185050

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.