Product Name:	Gdium
Model No.:	Liberty 1000
Applicant:	Dexxon Data Media 79 av Louis Roche 92220 GENNEVILLIERS France
Date of Receipt:	Sep. 24, 2008
Finished date of Test:	Nov. 24, 2008
Applicable Standards:	47 CFR Part 15, Subpart C ANSI C63.4: 2003

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Wayne Lin , Date: 2008/11/27
(Wayne Lin)

Approved By : , Date: 11/27/2008
(Johnson Ho, Director)

Lab Code: 200099-0
FMNG-059.10 REPORT

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1. DOCUMENT POLICY AND TEST STATEMENT

1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.
- The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- AC power source, 120 Vac/60 Hz, was used during the test.

1.3 EUT MODIFICATION

- No modification in SRT Lab.

2. DESCRIPTION OF EUT AND TEST MODE

2.1 GENERAL DESCRIPTION OF EUT

Wireless LAN Card :

PRODUCT	Gdium
MODEL NO.	Liberty 1000
POWER SUPPLY	3.3V DC form PCI interface
CABLE	N/A
FREQUENCY BAND	2412 ~ 2462MHz
CARRIER FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11
CHANNEL SPACING	5MHz
RATED RF OUTPUT POWER	11 dBm
MODULATION TYPE	802.11b: CCK,DQPSK and DBPSK 802.11g: OFDM
BIT RATE OF TRANSMISSION	802.11g: 6,9,12,18,24,36,48,54Mbit/s 801.11b: 1,2,5.5,11Mbit/s
ANTENNA TYPE	2.4G PIFA antenna
ANTENNA GAIN	2 dBi

Notebook:

Taille de l'écran	10"
Résolution	1024 x 600 pixels
Processeur	900 MHz 64bits Loongson™ 2F par STMicroelectronics
Carte Vidéo	Puce Silicon Motion SM502 avec 16Mo de mémoire
Mémoire vive	512Mo DDR2
Disque Dur (Amovible)	de 8Go à 16Go de mémoire sur clé usb G-Key
Clavier	clavier à touches douces
Webcam	0,3Mpixels
Carte Réseau sans fil	WiFi 802.11 b/g
Carte Réseau	10/100 Mbs LAN
Autonomie de la batterie	4 heures / 5000 mAh
Lecteur de carte	cartes SD / SD HC
USB	3 ports USB disponibles dont : 2 ports USB 2.0 standards et 1 port USB 2.0 dédié à la G-Key
Sortie VGA	1 sortie VGA 15 broches D-sub avec une résolution sur écran externe de 1280x1024 pixels
Sortie Casque	1 sortie casque pour prise jack de 3,5mm
Entrée Micro	1 entrée pour prise jack micro de 3,5mm
Dimensions	250 x 182 x 32mm
Poids	1,2 kg

NOTE :

For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

2.2 DESCRIPTION OF EUT INTERNAL DEVICE

DEVICE	BRAND / MAKER	MODEL	FCC ID/DOC	REMARK
N/A				

2.3 DESCRIPTION OF TEST MODE

11 channels are provided by EUT of wireless. The 3 channels of lower, medium and higher were chosen for test.
There are test modes for each test configuration as below:

Mode		Modulation Type	Channel	Frequency (MHz)
1	IEEE 802.11g	OFDM	CH1	2412
2			CH6	2437
3			CH11	2462
4	IEEE 802.11b	CCK	CH1	2412
5		DQPSK	CH6	2437
6		DBPSK	CH11	2462

NOTE :

In Modulation Type：802.11b: CCK, DQPSK and DBPSK were pre-tested in chamber. The CCK, worst case one, was chosen for conducted and radiated emission test.

2.4 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

NO	DEVICE	BRAND	MODEL	FCC ID/ DOC	CABLE
1	Wireless router	D-Link	DI-524	KA2DI524G	1.8m unshielded power cord
2	Wireless access point	D-Link	DWL-700AP	KA2DWL700AP-A2	1.8m unshielded power cord
3	USB Mouse	Tcstar	TCN125	DOC	1.4m unshielded data cord

NOTE : For the actual test configuration, please refer to the photos of testing.

3. DESCRIPTION OF APPLIED STANDARDS

The EUT is a kind of wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C
ANSI C63.4: 2003

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

4 . TECHNICAL CHARACTERISTICS TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 LIMIT

Frequency (MHz)	Class A (dBμV)		Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE :

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

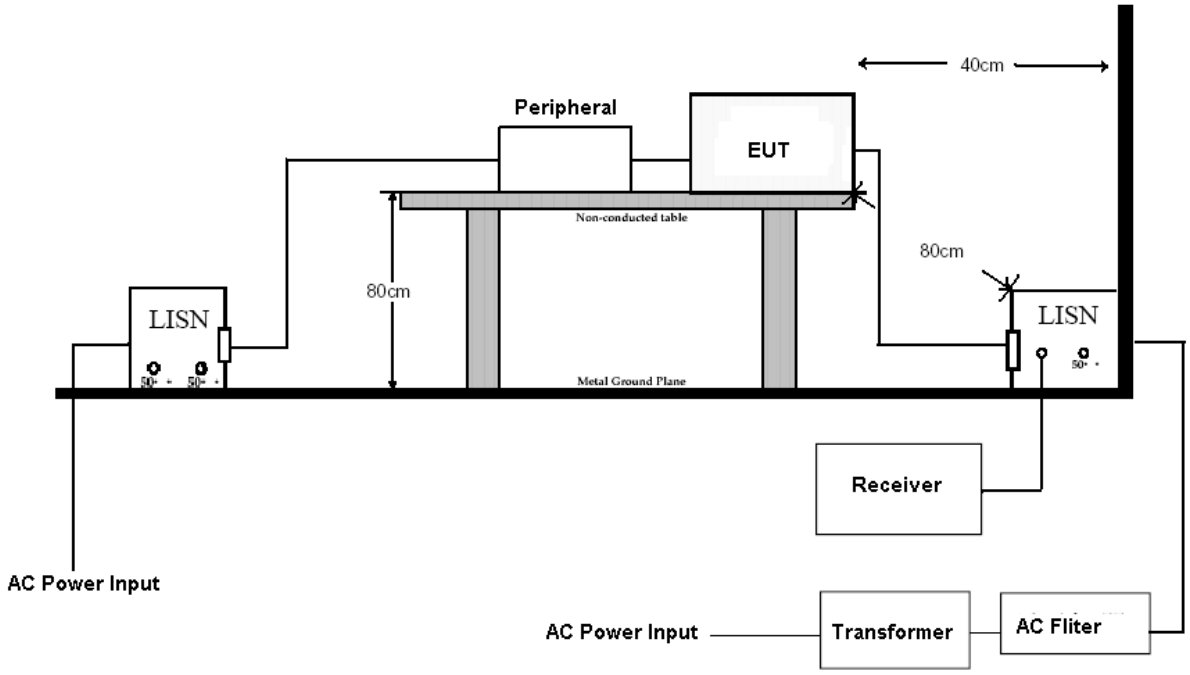
4.1.2 TEST EQUIPMENT

The following test equipment was used for the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9 kHz TO 30 MHz	ROHDE & SCHWARZ	ESHS30 / 826003/008	SEP. 2009 ETC
LISN	50 μH, 50 ohm	FCC	FCC-LISN-50-25-2 / 01017	OCT. 2009 ETC
LISN	50μH, 50 ohm	FCC	9252-50-R24-BNC / 951315	JUN. 2009 ETC
50 OHM TERMINATOR	50 ohm	HP	11593A / #2	OCT. 2009 ETC
COAXIAL CABLE	5M	TIMES	EQM-0159 / #5-5m	AUG. 2009 SRT
FILTER	2 LINE, 30A	FIL.COIL	FC-943 / 771	NCR
GROUND PLANE	2.3M (H) x 2.4M (W)	SRT	N/A	NCR
GROUND PLANE	2.4M (H) x 2.4M (W)	SRT	N/A	NCR

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.1.3 TEST SETUP



NOTE :

1. The EUT was put on a wooden table with 0.8m heights above ground plane, and 0.4m away from reference ground plane (> 2mx2m).
2. For the actual test configuration, please refer to the photos of testing.
3. The serial no. of the LISN connected to EUT is 01017.
4. The serial no. of the LISN connected to support units is 01018.

4.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR22:2003. The frequency spectrum from 0.15 MHz to 30 MHz was investigated. The LISN used was 50 ohm/50μH as specified. All readings were quasi-peak and average values with 10 kHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. Both lines of the power mains of EUT were measured and the cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.
First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

4.1.5 EUT OPERATING CONDITION

Under Linux ran "Ping" program connect with wireless router.

4.1.6 TEST RESULT

Temperature:	23 °C	Humidity:	55 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Link
Receiver Detector:	Q.P. and AV.	Modulation Type:	CCK
Tested By:	Wayne Lin	Tested Channel:	N/A
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.498	0.25	40.34	26.38	40.59	26.63	56.02	46.02	-15.43	-19.39
0.501	0.24	40.04	26.66	40.28	26.90	56.00	46.00	-15.72	-19.10
0.514	0.24	39.76	26.20	40.00	26.44	56.00	46.00	-16.00	-19.56
1.428	0.15	38.50	30.16	38.65	30.31	56.00	46.00	-17.35	-15.69
1.586	0.15	38.58	30.80	38.73	30.95	56.00	46.00	-17.27	-15.05
5.071	0.22	37.82	32.01	38.04	32.23	60.00	50.00	-21.96	-17.77

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.204	0.28	47.38	29.59	47.66	29.87	63.43	53.43	-15.77	-23.56
0.500	0.24	40.32	26.24	40.56	26.48	55.98	45.98	-15.43	-19.51
0.501	0.24	40.06	26.24	40.30	26.48	56.00	46.00	-15.70	-19.52
1.210	0.14	38.84	28.20	38.98	28.34	56.00	46.00	-17.02	-17.66
1.705	0.15	38.52	30.63	38.67	30.78	56.00	46.00	-17.33	-15.22
5.183	0.22	36.22	29.64	36.44	29.86	60.00	50.00	-23.56	-20.14

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

Temperature:	23 °C	Humidity:	55 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	Standby
Receiver Detector:	Q.P. and AV.	Modulation Type:	CCK
Tested By:	Wayne Lin	Tested Channel:	N/A
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.492	0.25	39.74	26.00	39.99	26.25	56.12	46.12	-16.13	-19.87
0.501	0.24	40.52	27.33	40.76	27.57	56.00	46.00	-15.24	-18.43
0.509	0.24	40.40	26.86	40.64	27.10	56.00	46.00	-15.36	-18.90
1.556	0.15	39.18	31.67	39.33	31.82	56.00	46.00	-16.67	-14.18
4.645	0.21	37.38	31.26	37.59	31.47	56.00	46.00	-18.41	-14.53
5.000	0.22	37.56	31.40	37.78	31.62	56.00	46.00	-18.22	-14.38

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.204	0.28	47.60	29.77	47.88	30.05	63.43	53.43	-15.55	-23.38
0.501	0.24	39.84	26.42	40.08	26.66	56.00	46.00	-15.92	-19.34
0.509	0.24	39.80	26.00	40.04	26.24	56.00	46.00	-15.96	-19.76
1.319	0.15	38.40	30.25	38.55	30.40	56.00	46.00	-17.45	-15.60
2.814	0.18	38.44	29.55	38.62	29.73	56.00	46.00	-17.38	-16.27
5.000	0.22	37.38	30.97	37.60	31.19	56.00	46.00	-18.40	-14.81

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

Temperature:	23 °C	Humidity:	55 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11g
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Tested By:	Wayne Lin	Tested Channel:	CH1: 2412MHz
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.174	0.30	55.18	47.26	55.48	47.56	64.75	54.75	-9.27	-7.19
0.177	0.30	53.92	45.79	54.22	46.09	64.61	54.61	-10.39	-8.52
0.524	0.24	38.92	37.15	39.16	37.39	56.00	46.00	-16.84	-8.61
1.279	0.14	37.26	35.13	37.40	35.27	56.00	46.00	-18.60	-10.73
2.675	0.17	30.42	20.65	30.59	20.82	56.00	46.00	-25.41	-25.18
6.512	0.22	23.58	10.81	23.80	11.03	60.00	50.00	-36.20	-38.97

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.174	0.30	53.78	46.06	54.08	46.36	64.75	54.75	-10.67	-8.39
0.177	0.30	52.22	43.99	52.52	44.29	64.61	54.61	-12.09	-10.32
0.524	0.24	37.60	35.72	37.84	35.96	56.00	46.00	-18.16	-10.04
2.952	0.18	38.26	33.07	38.44	33.25	56.00	46.00	-17.56	-12.75
3.012	0.18	36.06	31.12	36.24	31.30	56.00	46.00	-19.76	-14.70
5.041	0.22	27.26	16.65	27.48	16.87	60.00	50.00	-32.52	-33.13

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

Temperature:	23 °C	Humidity:	55 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11g
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Tested By:	Wayne Lin	Tested Channel:	CH6: 2437MHz
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.171	0.30	50.66	41.85	50.96	42.15	64.89	54.89	-13.93	-12.74
0.174	0.30	51.92	42.78	52.22	43.08	64.75	54.75	-12.53	-11.67
0.576	0.24	41.24	38.01	41.48	38.25	56.00	46.00	-14.52	-7.75
1.378	0.15	37.20	33.35	37.35	33.50	56.00	46.00	-18.65	-12.50
1.438	0.15	38.06	35.34	38.21	35.49	56.00	46.00	-17.79	-10.51
5.010	0.22	26.72	20.24	26.94	20.46	60.00	50.00	-33.06	-29.54

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.153	0.30	50.40	29.25	50.70	29.55	65.82	55.82	-15.12	-26.27
0.156	0.30	49.94	30.32	50.24	30.62	65.66	55.66	-15.42	-25.04
0.576	0.24	40.98	36.98	41.22	37.22	56.00	46.00	-14.78	-8.78
1.120	0.14	39.22	35.10	39.36	35.24	56.00	46.00	-16.64	-10.76
1.388	0.15	32.44	18.86	32.59	19.01	56.00	46.00	-23.41	-26.99
12.714	0.24	26.74	19.81	26.98	20.05	60.00	50.00	-33.02	-29.95

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

Temperature:	23°C	Humidity:	55%RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11g
Receiver Detector:	Q.P. and AV.	Modulation Type:	OFDM
Tested By:	Wayne Lin	Tested Channel:	CH11: 2462MHz
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.171	0.30	50.20	39.79	50.50	40.09	64.89	54.89	-14.39	-14.80
0.174	0.30	50.84	39.62	51.14	39.92	64.75	54.75	-13.61	-14.83
0.576	0.24	40.38	35.58	40.62	35.82	56.00	46.00	-15.38	-10.18
1.210	0.14	39.08	33.82	39.22	33.96	56.00	46.00	-16.78	-12.04
1.438	0.15	37.94	33.06	38.09	33.21	56.00	46.00	-17.91	-12.79
15.154	0.25	27.14	20.97	27.39	21.22	60.00	50.00	-32.61	-28.78

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.156	0.30	49.30	32.69	49.60	32.99	65.66	55.66	-16.06	-22.67
0.171	0.30	50.54	39.43	50.84	39.73	64.89	54.89	-14.05	-15.16
0.576	0.24	40.34	35.45	40.58	35.69	56.00	46.00	-15.42	-10.31
1.210	0.14	38.32	33.39	38.46	33.53	56.00	46.00	-17.54	-12.47
1.378	0.15	37.38	32.60	37.53	32.75	56.00	46.00	-18.47	-13.25
5.000	0.22	26.12	19.30	26.34	19.52	56.00	46.00	-29.66	-26.48

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

Temperature:	23°C	Humidity:	55 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11b
Receiver Detector:	Q.P. and AV.	Modulation Type:	CCK
Tested By:	Wayne Lin	Tested Channel:	CH1: 2412MHz
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.174	0.30	52.86	44.98	53.16	45.28	64.75	54.75	-11.59	-9.47
0.177	0.30	49.30	41.78	49.60	42.08	64.61	54.61	-15.01	-12.53
0.519	0.24	38.92	37.40	39.16	37.64	56.00	46.00	-16.84	-8.36
3.289	0.18	38.72	30.98	38.90	31.16	56.00	46.00	-17.10	-14.84
3.754	0.19	33.76	24.44	33.95	24.63	56.00	46.00	-22.05	-21.37
6.238	0.22	29.00	18.54	29.22	18.76	60.00	50.00	-30.78	-31.24

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.171	0.30	52.00	44.15	52.30	44.45	64.89	54.89	-12.59	-10.44
0.174	0.30	52.90	44.97	53.20	45.27	64.75	54.75	-11.55	-9.48
0.692	0.22	41.56	40.41	41.78	40.63	56.00	46.00	-14.22	-5.37
1.269	0.14	39.98	38.04	40.12	38.18	56.00	46.00	-15.88	-7.82
1.329	0.15	38.46	35.17	38.61	35.32	56.00	46.00	-17.39	-10.68
13.830	0.25	26.30	20.14	26.55	20.39	60.00	50.00	-33.45	-29.61

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

Temperature:	23 °C	Humidity:	55 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11b
Receiver Detector:	Q.P. and AV.	Modulation Type:	CCK
Tested By:	Wayne Lin	Tested Channel:	CH6: 2437MHz
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.171	0.30	50.20	39.52	50.50	39.82	64.89	54.89	-14.39	-15.07
0.174	0.30	50.50	39.76	50.80	40.06	64.75	54.75	-13.95	-14.69
0.519	0.24	39.82	34.97	40.06	35.21	56.00	46.00	-15.94	-10.79
1.329	0.15	35.10	23.84	35.25	23.99	56.00	46.00	-20.75	-22.01
1.378	0.15	37.28	32.26	37.43	32.41	56.00	46.00	-18.57	-13.59
16.968	0.30	26.08	18.41	26.38	18.71	60.00	50.00	-33.62	-31.29

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.159	0.30	49.72	33.84	50.02	34.14	65.50	55.50	-15.48	-21.36
0.171	0.30	50.24	39.80	50.54	40.10	64.89	54.89	-14.35	-14.79
0.692	0.22	40.32	36.04	40.54	36.26	56.00	46.00	-15.46	-9.74
1.259	0.14	33.58	25.47	33.72	25.61	56.00	46.00	-22.28	-20.39
1.438	0.15	38.16	33.45	38.31	33.60	56.00	46.00	-17.69	-12.40
14.490	0.25	26.00	17.63	26.25	17.88	60.00	50.00	-33.75	-32.12

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

Temperature:	23 °C	Humidity:	53 %RH
Frequency Range:	0.15 – 30 MHz	Tested Mode:	IEEE 802.11b
Receiver Detector:	Q.P. and AV.	Modulation Type:	CCK
Tested By:	Wayne Lin	Tested Channel:	CH11: 2462MHz
Antenna Type:	N/A	Tested Date:	Nov. 06, 2008

Power Line Measured : Line

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.153	0.30	49.48	29.57	49.78	29.87	65.82	55.82	-16.04	-25.95
0.156	0.30	48.74	31.45	49.04	31.75	65.66	55.66	-16.62	-23.91
0.692	0.22	40.38	36.07	40.60	36.29	56.00	46.00	-15.40	-9.71
1.269	0.14	36.24	31.31	36.38	31.45	56.00	46.00	-19.62	-14.55
1.438	0.15	37.80	32.91	37.95	33.06	56.00	46.00	-18.05	-12.94
20.473	0.39	25.58	19.26	25.97	19.65	60.00	50.00	-34.03	-30.35

Power Line Measured : Neutral

Freq. (MHz)	Correct. Factor (dB)	Reading Value (dBμV)		Emission Level (dBμV)		Limit (dBμV)		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.159	0.30	49.64	31.83	49.94	32.13	65.50	55.50	-15.56	-23.37
0.174	0.30	50.14	39.00	50.44	39.30	64.75	54.75	-14.31	-15.45
0.692	0.22	40.16	35.60	40.38	35.82	56.00	46.00	-15.62	-10.18
1.210	0.14	38.36	32.63	38.50	32.77	56.00	46.00	-17.50	-13.23
1.378	0.15	37.34	32.53	37.49	32.68	56.00	46.00	-18.51	-13.32
5.000	0.22	25.16	17.84	25.38	18.06	56.00	46.00	-30.62	-27.94

NOTE :

1. Measurement uncertainty is +/- 2dB
2. Emission level = Reading valus + Correction factor
3. Correction Factor = Cable loss + Insertion loss of LISN
4. Margin value = Emission level - Limit
5. The emission of other frequencies was very low against the limit.
6. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

4.2 RADIATED EMISSION TEST

4.2.1 LIMIT

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (dBμV/m)
30 - 88	3	40.0
88 - 216	3	43.5
216 - 960	3	46.0
Above 960	3	54.0

NOTE :

1. In the emission tables above , the tighter limit applies at the band edges.
2. Distance refers to the distance between measuring instrument, antemma, and the closest point of any part of the device or system.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

4.2.2 TEST EQUIPMENT

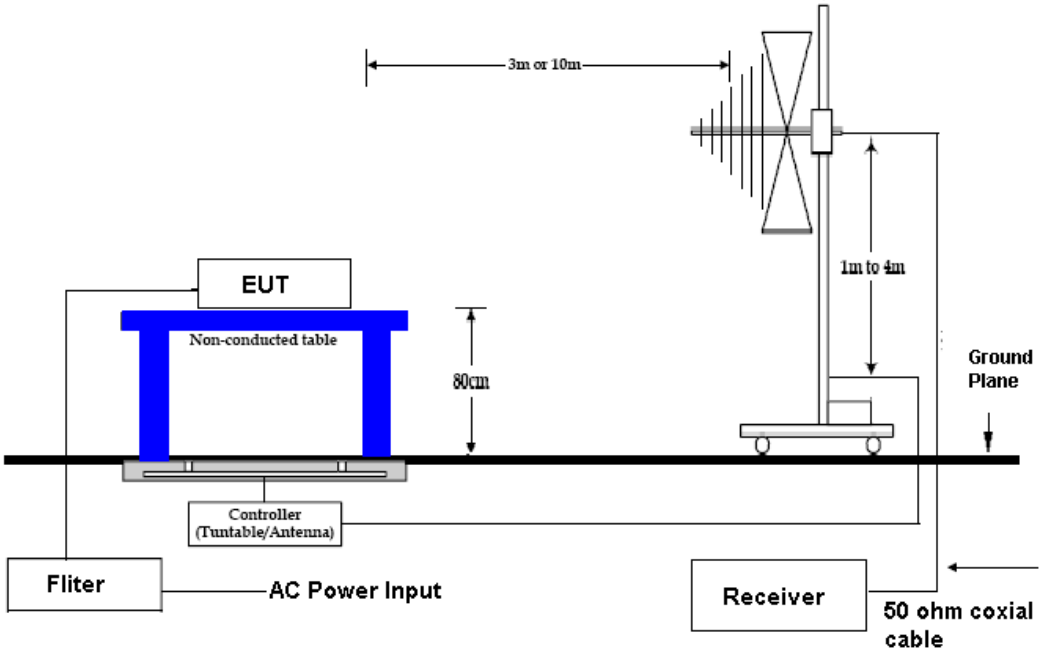
The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
EMI TEST RECEIVER	9kHz TO 2.75 GHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	OCT. 2009 ETC
SPECTRUM ANALYZER	PK-40GHz	ROHDE & SCHWARZ	FSP40/ 100093	SEP 2009 ETC
BI-LOG ANTENNA	25 MHz TO 2 GHz	EMCO	3142B/ 0005-1534	NOV. 2008 ETC
PRE-AMPLIFIER	1 GHz TO 26.5 GHz	HP	8449B/ 3008A01995	SEP. 2009 ETC
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 9602-4681	JAN. 2009 ETC
OATS	3 – 10 M MEASUREMENT	SRT	SRT-1	NOV. 2008 SRT
COAXIAL CABLE	25M	TIMES	J400/ #25M	AUG. 2009 ETC
FILTER	2 LINE, 30A	FIL.COIL	FC-943/ 869	NCR

NOTE:

1. The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.
2. The Open Area Test Site (SRT-1) is registered by FCC with No. 90957 and VCCI with No. R-1081.
3. The Open Area Test Site (SRT-2) is registered by FCC with No. 98458 and VCCI with No. R-1168.

4.2.3 TEST SET-UP



NOTE :

1. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
2. For the actual test configuration, please refer to the photos of testing.

4.2.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.
First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.

4.2.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.

4.2.6 TEST RESULT

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Link
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
73.5213	1.19	6.48	22.1	29.8	40.0	-10.2	218	2.3
137.1402	1.74	11.54	15.9	29.2	43.5	-14.3	141	1.9
166.2694	1.91	8.53	22.5	32.9	43.5	-10.6	151	1.67
184.003	1.69	9.32	22.2	33.2	43.5	-10.3	333	1.4
277.915	2.49	12.90	17.3	32.7	46.0	-13.3	18	1.5
600.103	3.72	19.20	14.3	37.2	46.0	-8.8	207	1.2

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
81.1223	1.26	7.55	21.3	30.1	40.0	-9.9	36	1
184.004	1.69	9.32	20	31.0	43.5	-12.5	268	1.1
276.025	2.44	12.85	19.8	35.1	46.0	-10.9	101	1
368.0256	3.23	15.53	17.1	35.9	46.0	-10.1	223	1
458.0316	3.04	16.95	15.3	35.3	46.0	-10.7	49	1.3
644.0051	4.65	20.08	12.1	36.8	46.0	-9.2	355	1.2

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	Standby
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
40.5880	0.95	9.50	20.0	30.5	40.0	-9.6	13.9	1.8
166.2693	1.91	8.53	23.2	33.6	43.5	-9.9	204.8	1.6
265.3516	2.33	12.28	14.0	28.6	46.0	-17.4	325.1	1.4
600.1020	3.72	19.20	15.9	38.8	46.0	-7.2	91.4	1.61
800.2560	5.23	21.40	11.1	37.7	46.0	-8.3	88.3	1.92
834.1136	4.77	22.35	10.0	37.1	46.0	-8.9	173.2	1.2

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
130.0214	1.48	9.75	20.9	32.1	43.5	-11.4	55.9	1.2
170.7964	2.05	8.75	23.5	34.3	43.5	-9.2	301.8	1.3
266.7513	2.29	12.33	16.7	31.3	46.0	-14.7	43.5	1.5
533.2270	3.62	18.06	14.2	35.9	46.0	-10.1	225.1	1
838.6420	4.71	22.46	10.1	37.3	46.0	-8.7	53.1	1
938.0130	4.87	23.17	9.5	37.5	46.0	-8.5	97.5	1.1

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11g CH01
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
186.5600	1.79	9.33	19.2	30.3	43.5	-13.2	282	2.5
240.3200	2.10	11.08	20.2	33.4	46.0	-12.6	183	2.4
226.8400	2.14	10.49	19.4	32.0	46.0	-14.0	205	2.34
385.7900	3.17	15.89	13.2	32.3	46.0	-13.7	315	2.2
576.8500	3.70	18.79	11.0	33.5	46.0	-12.5	98	1.83
647.7100	4.72	20.14	9.2	34.1	43.5	-13.2	224	1.76

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
43.4200	0.96	8.36	21.8	31.1	40.0	-8.9	156	1.23
368.0500	3.23	15.53	12.8	31.6	46.0	-14.4	305	1.42
411.3600	3.08	16.34	11.6	31.0	46.0	-15.0	174	1.58
499.7400	3.50	17.49	11.2	32.2	46.0	-13.8	287	1.8
836.6500	4.74	22.41	9.8	36.9	46.0	-9.1	58	2.1
945.3300	4.90	22.99	9.2	37.1	46.0	-8.9	96	2.4

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11g CH06
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
183.8700	1.63	9.32	22.3	33.2	43.5	-10.3	242	2.5
201.6000	2.13	9.44	20.3	31.9	43.5	-11.6	175	1.96
322.5400	2.76	14.56	12.8	30.1	46.0	-15.9	35	1.78
351.8900	3.29	15.17	14.4	32.9	46.0	-13.1	48	1.56
803.0300	5.19	21.48	9.7	36.4	46.0	-9.6	168	1.45
928.7500	4.82	23.44	8.8	37.1	46.0	-8.9	54	1.33

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
191.8500	2.02	9.36	24.3	35.7	43.5	-7.8	68	1.1
402.2600	3.11	16.23	17.6	36.9	46.0	-9.1	274	1.3
502.3200	3.52	17.53	12.5	33.6	46.0	-12.4	156	1.45
662.2400	4.59	20.44	9.2	34.2	46.0	-11.8	36	1.65
866.0600	4.60	23.25	8.7	36.5	46.0	-9.5	328	1.68
953.3800	4.94	22.77	7.6	35.3	46.0	-10.7	45	1.7

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11g CH11
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
167.5800	1.95	8.59	22.5	33.0	43.5	-10.5	256	2.5
184.2500	1.69	9.32	18.9	29.9	43.5	-13.6	62	2.14
337.0800	3.04	14.88	13.2	31.1	46.0	-14.9	98	2.3
502.1400	3.52	17.53	10.7	31.8	46.0	-14.2	184	1.46
579.8100	3.70	18.84	11.8	34.3	46.0	-11.7	236	1.64
647.2900	4.72	20.14	8.2	33.1	46.0	-12.9	38	1.7

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
49.3200	0.98	6.08	24.1	31.2	40.0	-8.8	85	1.3
227.6800	2.12	10.53	21.3	34.0	46.0	-12.0	264	1.5
407.0200	3.10	16.29	16.3	35.7	46.0	-10.3	205	1.65
502.1400	3.52	17.53	12.8	33.9	46.0	-12.1	63	1.71
866.0200	4.60	23.25	8.8	36.6	46.0	-9.4	175	1.83
955.2800	4.95	22.72	7.4	35.1	46.0	-10.9	36	1.9

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11b CH01
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
203.2500	2.08	9.53	23.6	35.2	43.5	-8.3	247	2.3
338.7800	3.06	14.90	14.3	32.3	46.0	-13.7	175	1.92
356.7400	3.27	15.28	18.4	36.9	46.0	-9.1	303	1.58
647.5700	4.72	20.14	10.2	35.1	46.0	-10.9	180	1.36
802.7800	5.20	21.46	9.1	35.8	46.0	-10.2	48	1.74
926.1000	4.81	23.50	8.4	36.7	46.0	-9.3	254	1.23

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
43.2500	0.96	8.36	24.3	33.6	40.0	-6.4	102	1.2
196.7100	2.09	9.38	22.8	34.3	43.5	-9.2	248	1.23
404.6900	3.11	16.25	12.5	31.9	46.0	-14.1	304	1.42
499.3600	3.50	17.49	9.8	30.8	46.0	-15.2	214	1.84
832.0300	4.79	22.30	7.5	34.6	46.0	-11.4	84	2
950.4200	4.92	22.85	7.6	35.4	46.0	-10.6	174	2.1

NOTE :

1. Measurement uncertainty is +/-3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11b CH06
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
167.6500	1.95	8.59	22.4	32.9	43.5	-10.6	254	2.3
201.5300	2.13	9.44	18.7	30.3	43.5	-13.2	184	1.98
339.0600	3.08	14.92	13.0	31.0	46.0	-15.0	165	1.74
579.6400	3.70	18.84	11.7	34.2	46.0	-11.8	184	1.65
647.8000	4.72	20.14	10.6	35.5	46.0	-10.5	281	1.5
926.0600	4.81	23.50	10.5	38.8	46.0	-7.2	215	1.18

Antenna Polarization : Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
46.3200	0.97	7.22	23.4	31.6	40.0	-8.4	54	1.1
196.4700	2.09	9.38	21.3	32.8	43.5	-10.7	253	1
502.3200	3.52	17.53	14.3	35.4	46.0	-10.6	210	1.3
662.1200	4.59	20.44	8.4	33.4	46.0	-12.6	124	1.5
867.6200	4.60	23.28	7.3	35.2	46.0	-10.8	87	1.68
948.3200	4.91	22.90	7.2	35.0	46.0	-11.0	63	1.8

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	30 – 1000 MHz	Measured Distance:	3m
Receiver Detector:	Q.P.	Tested Mode:	IEEE802.11b CH11
Tested By:	Wayne Lin	Tested Date:	Nov. 12, 2008

Antenna Polarization : Horizontal

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
274.3600	2.35	12.75	18.4	33.5	46.0	-12.5	247	2.1
324.2500	2.80	14.60	14.6	32.0	46.0	-14.0	56	1.92
570.1800	3.69	18.69	12.7	35.1	46.0	-10.9	196	1.61
647.6800	4.72	20.14	10.8	35.7	46.0	-10.3	36	1.45
895.0200	4.69	24.06	7.5	36.2	46.0	-9.8	74	1.5
926.2100	4.81	23.50	7.0	35.3	46.0	-10.7	204	1.18

Antenna Polarization:Vertical

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Reading Data (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	AZ(°)	EL(m)
167.2500	1.95	8.59	21.2	31.7	43.5	-11.8	215	1.1
400.2700	3.12	16.20	16.3	35.6	46.0	-10.4	278	1.2
501.8900	3.51	17.52	11.0	32.0	46.0	-14.0	170	1.4
516.3800	3.56	17.77	10.2	31.5	46.0	-14.5	78	1.5
833.9800	4.78	22.32	7.2	34.3	46.0	-11.7	307	1.65
904.7400	4.72	24.09	7.0	35.8	46.0	-10.2	147	1.89

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": Measurement does not apply for this frequency.
3. Emissiom Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11g
Tested By:	Wayne Lin	Tested Channel:	CH 1 : 2412MHz
Tested Date:	Nov. 12, 2008	Modulation Type:	OFDM

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-32.18	28.56	90.3	82.4	86.7	78.8	74.0	54.0	NA	NA	325	1.54
4824.00	-30.41	33.66	50.3	42.4	53.5	45.6	74.0	54.0	-20.5	-8.4	145	1.61
7248.00	-29.01	36.30	41.3	*	48.6	*	74.0	54.0	-25.4	*	54	1.43
1205.32	-33.86	24.65	41.0	*	31.8	*	74.0	54.0	-42.2	*	306	1.65
1290.65	-33.77	24.84	40.1	*	31.2	*	74.0	54.0	-42.8	*	143	1.42
1958.27	-32.55	27.04	40.0	*	34.5	*	74.0	54.0	-39.5	*	156	1.5

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-32.18	28.02	89.5	81.6	85.3	77.4	74.0	54.0	NA	NA	215	1.20
4824.00	-30.41	33.66	50.3	43.8	53.5	47.0	74.0	54.0	-20.5	-7.0	184	1.34
9648.00	-28.65	37.86	40.3	*	49.5	*	74.0	54.0	-24.5	*	65	1.42
1102.87	-34.74	24.42	42.3	*	32.0	*	74.0	54.0	-42.0	*	173	1.56
1302.86	-33.75	24.86	41.1	*	32.2	*	74.0	54.0	-41.8	*	347	1.52
1582.94	-32.97	25.61	40.1	*	32.7	*	74.0	54.0	-41.3	*	68	1.65

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11g
Tested By:	Wayne Lin	Tested Channel:	CH 6 : 2437MHz
Tested Date:	Nov. 12, 2008	Modulation Type:	OFDM

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-32.22	28.61	90.3	83.2	86.7	79.6	74.0	54.0	NA	NA	201	1.80
4874.00	-30.28	33.70	50.3	41.2	53.7	44.6	74.0	54.0	-20.3	-9.4	251	1.75
7311.00	-29.07	36.35	40.3	*	47.6	*	74.0	54.0	-26.4	*	36	1.45
1207.90	-33.85	24.66	40.2	*	31.0	*	74.0	54.0	-43.0	*	78	1.32
1253.20	-33.68	24.76	41.3	*	32.4	*	74.0	54.0	-41.6	*	314	1.21
1302.98	-33.75	24.86	40.1	*	31.2	*	74.0	54.0	-42.8	*	284	1.20

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-32.22	28.07	89.7	82.6	85.6	78.5	74.0	54.0	NA	NA	56	1.10
4874.00	-30.28	33.70	50.2	43.9	53.6	47.3	74.0	54.0	-20.4	-6.7	312	1.23
7311.00	-29.07	36.35	40.2	*	47.5	*	74.0	54.0	-26.5	*	175	1.45
1103.20	-34.74	24.43	42.3	*	32.0	*	74.0	54.0	-42.0	*	250	1.50
1205.00	-33.86	24.65	43.8	*	34.6	*	74.0	54.0	-39.4	*	52	1.47
1253.10	-33.68	24.76	41.0	*	32.1	*	74.0	54.0	-41.9	*	290	1.32

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11g
Tested By:	Wayne Lin	Tested Channel:	CH 11 : 2462MHz
Tested Date:	Nov. 12, 2008	Modulation Type:	OFDM

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-32.22	28.69	90.2	81.3	86.7	77.8	74.0	54.0	NA	NA	189	1.75
4924.00	-30.23	33.74	50.6	42.8	54.1	46.3	74.0	54.0	-19.9	-7.7	165	1.60
7386.00	-28.94	36.41	41.8	*	49.3	*	74.0	54.0	-24.7	*	256	1.54
1103.23	-34.74	24.43	42.5	*	32.2	*	74.0	54.0	-41.8	*	98	1.44
1205.40	-33.86	24.65	45.1	41.3	35.9	32.1	74.0	54.0	-38.1	-21.9	325	1.27
1305.84	-33.69	24.87	40.1	*	31.3	*	74.0	54.0	-42.7	*	270	1.15

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-32.22	28.12	90.2	84.3	86.1	80.2	74.0	54.0	NA	NA	254	1.10
4924.00	-30.23	33.74	50.6	42.8	54.1	46.3	74.0	54.0	-19.9	-7.7	145	1.21
7386.00	-28.94	36.41	40.2	*	47.7	*	74.0	54.0	-26.3	*	63	1.34
1152.78	-34.55	24.53	44.8	40.2	34.8	30.2	74.0	54.0	-39.2	-23.8	304	1.45
1205.41	-33.86	24.65	41.0	*	31.8	*	74.0	54.0	-42.2	*	75	1.65
1305.28	-33.69	24.87	40.8	*	32.0	*	74.0	54.0	-42.0	*	84	1.98

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11b
Tested By:	Wayne Lin	Tested Channel:	CH 1 : 2412MHz
Tested Date:	Nov. 12, 2008	Modulation Type:	CCK

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-32.18	28.56	90.3	82.4	86.7	78.8	74.0	54.0	NA	NA	212	1.52
4824.00	-30.41	33.66	52.1	44.2	55.3	47.4	74.0	54.0	-18.7	-6.6	145	1.47
7236.00	-28.98	36.29	42.3	*	49.6	*	74.0	54.0	-24.4	*	54	1.32
1204.89	-33.86	24.65	41.3	*	32.1	*	74.0	54.0	-41.9	*	85	1.54
1355.23	-32.68	24.98	43.2	*	35.5	*	74.0	54.0	-38.5	*	104	1.52
1609.70	-32.89	25.71	40.1	*	32.9	*	74.0	54.0	-41.1	*	214	1.63

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2412.00	-32.18	28.02	90.1	83.5	85.9	79.3	74.0	54.0	NA	NA	147	1.10
4824.00	-30.41	33.66	50.3	42.8	53.5	46.0	74.0	54.0	-20.5	-8.0	154	1.39
9648.00	-28.65	37.86	42.3	*	51.5	*	74.0	54.0	-22.5	*	62	1.54
1204.80	-33.86	24.65	42.8	*	33.6	*	74.0	54.0	-40.4	*	186	1.38
1399.87	-31.72	25.08	40.1	*	33.5	*	74.0	54.0	-40.5	*	85	1.62
2412.00	-32.18	28.02	41.3	*	34.1	*	74.0	54.0	-39.9	*	265	1.24

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11b
Tested By:	Wayne Lin	Tested Channel:	CH 6 : 2437MHz
Tested Date:	Nov. 12, 2008	Modulation Type:	CCK

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-32.22	28.61	89.0	84.3	85.4	80.7	74.0	54.0	NA	NA	204	1.75
4874.00	-30.28	33.70	50.3	44.1	53.7	47.5	74.0	54.0	-20.3	-6.5	145	1.63
7311.00	-29.07	36.35	40.3	*	47.6	*	74.0	54.0	-26.4	*	65	1.54
1204.87	-33.86	24.65	41.2	*	32.0	*	74.0	54.0	-42.0	*	67	1.35
1355.20	-32.68	24.98	47.3	*	39.6	*	74.0	54.0	-34.4	*	324	1.30
1610.23	-32.89	25.72	40.0	*	32.8	*	74.0	54.0	-41.2	*	271	1.20

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2437.00	-32.22	28.07	90.1	83.3	86.0	79.2	74.0	54.0	NA	NA	282	1.10
4874.00	-30.28	33.70	51.2	44.3	54.6	47.7	74.0	54.0	-19.4	-6.3	154	1.20
7311.00	-29.07	36.35	40.8	*	48.1	*	74.0	54.0	-25.9	*	173	1.42
1205.10	-33.86	24.65	42.4	*	33.2	*	74.0	54.0	-40.8	*	65	1.48
1400.20	-31.70	25.08	40.1	*	33.5	*	74.0	54.0	-40.5	*	56	1.25
1610.30	-32.89	25.72	41.3	*	34.1	*	74.0	54.0	-39.9	*	295	1.48

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

Temperature:	24 °C	Humidity:	68 %RH
Frequency Range:	1 – 25 GHz	Measured Distance:	3m
Receiver Detector:	PK. or AV.	Tested Mode:	IEEE 802.11b
Tested By:	Wayne Lin	Tested Channel:	CH 11 : 2462MHz
Tested Date:	Nov. 12, 2008	Modulation Type:	CCK

Antenna Polarization : Horizontal

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-32.22	28.69	90.2	81.6	86.7	78.1	74.0	54.0	NA	NA	57	1.75
4924.00	-30.23	33.74	50.6	42.8	54.1	46.3	74.0	54.0	-19.9	-7.7	170	1.65
7386.00	-28.94	36.41	40.2	*	47.7	*	74.0	54.0	-26.3	*	308	1.56
1208.40	-33.85	24.66	40.0	*	30.8	*	74.0	54.0	-43.2	*	204	1.48
1403.20	-31.58	25.09	41.3	*	34.8	*	74.0	54.0	-39.2	*	157	1.26
1642.80	-32.76	25.84	40.1	*	33.2	*	74.0	54.0	-40.8	*	140	1.20

Antenna Polarization : Vertical

Frequency (MHz)	Correct Factor (dB)	Ant. Factor (dB/m)	Reading Data (dBμV)		Emission Level (dBμV/m)		Limit (dBμV/m)		Margin (dB)		AZ (°)	EL (m)
			PK.	AV.	PK.	AV.	PK.	AV.	PK.	AV.		
2462.00	-32.22	28.12	89.4	82.6	85.3	78.5	74.0	54.0	NA	NA	56	1.10
4924.00	-30.23	33.74	50.1	42.6	53.6	46.1	74.0	54.0	-20.4	-7.9	178	1.21
7386.00	-28.94	36.41	40.5	*	48.0	*	74.0	54.0	-26.0	*	130	1.39
1275.65	-33.73	24.81	42.8	*	33.9	*	74.0	54.0	-40.1	*	264	1.45
1643.30	-32.76	25.84	40.2	*	33.3	*	74.0	54.0	-40.7	*	48	1.54
1868.20	-32.91	26.70	40.0	*	33.8	*	74.0	54.0	-40.2	*	102	1.84

NOTE :

1. Measurement uncertainty is +/- 3.7dB.
2. "*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emissiom Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field stregth of fundamental frequency.

4.3 6dB BANDWIDTH TEST

4.3.1 LIMIT

FCC Part15, Subpart C Section 15.247 (a)(2).

The minimum 6 dB bandwidth shall be at least 500kHz.

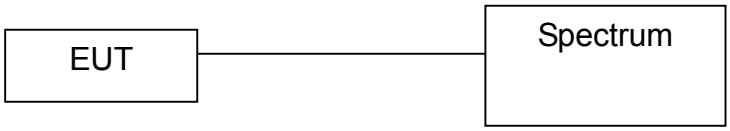
4.3.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-40GHz	ROHDE & SCHWARZ	FSP40/ 100093	SEP. 2009 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.3.4 TEST PROCEDURE

The EUT was operated in hopping mode or any specific channel.
Printed out the test result from the spectrum by hard copy function.

4.3.5 EUT OPERATING CONDITION

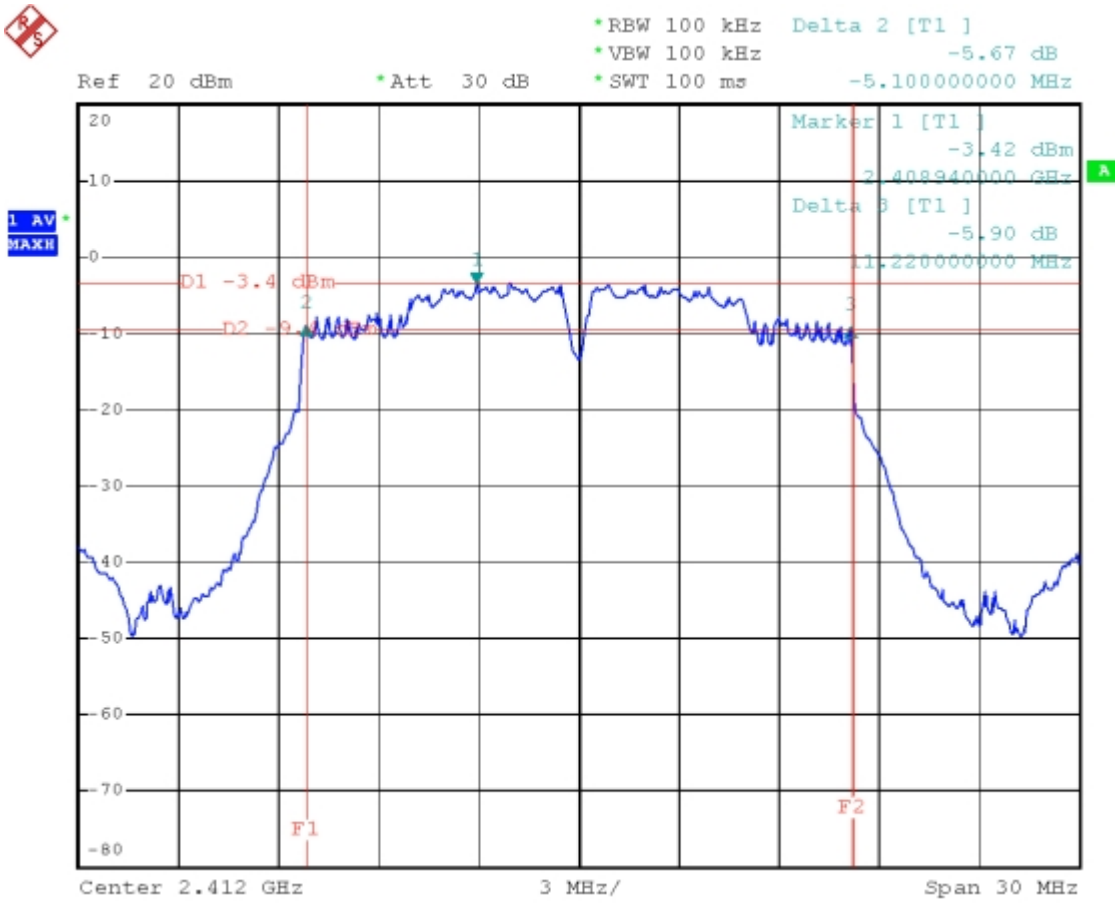
Same as section 4.1.5 of this report.

4.3.6 TEST RESULT

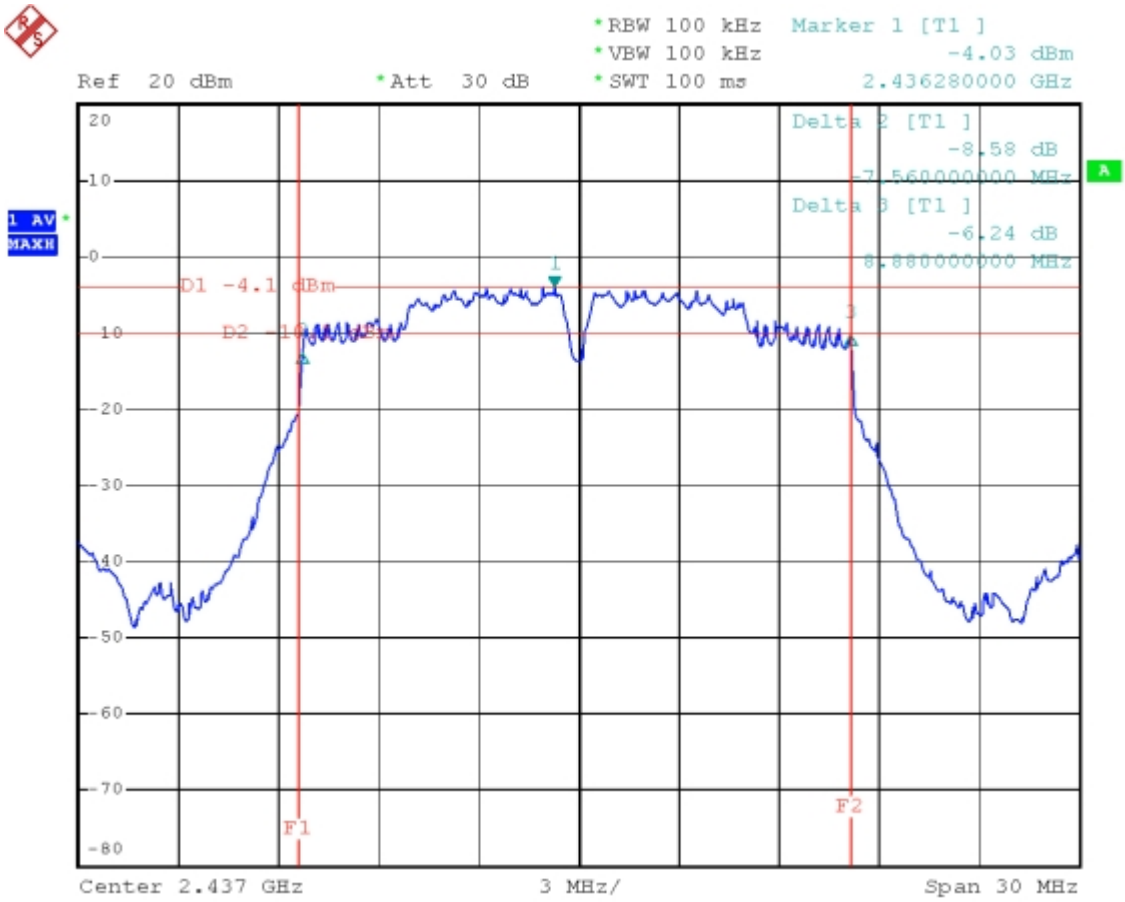
Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK.	Tested Mode:	IEEE 802.11g
Tested By:	Wayne Lin	Modulation Type:	OFDM
Tested Date:	Nov. 19, 2008		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	6dB DOWN BW (MHz)
1	2412	16.32
6	2437	16.44
11	2462	16.32

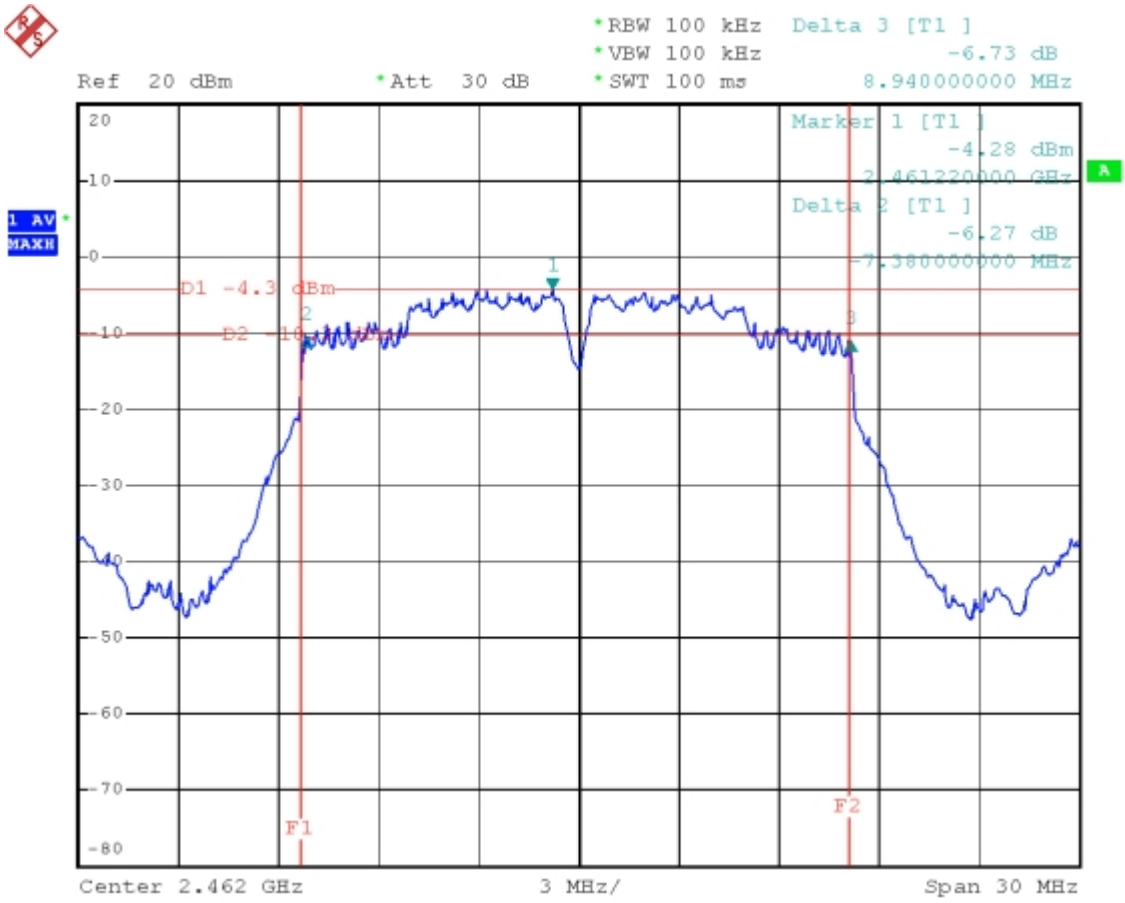
CH1:



CH 6:


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Marker 1 [T1]
-4.03 dBm
2.436280000 GHz
Ref 20 dBm
*Att 30 dB
Delta 2 [T1]
-8.58 dB
-7.560000000 MHz
Delta 3 [T1]
-6.24 dB
8.880000000 MHz
1 AV
MAXH
A
D1 -4.1 dBm
D2 -16.1 dBm
F1
F2
Center 2.437 GHz
3 MHz/
Span 30 MHz

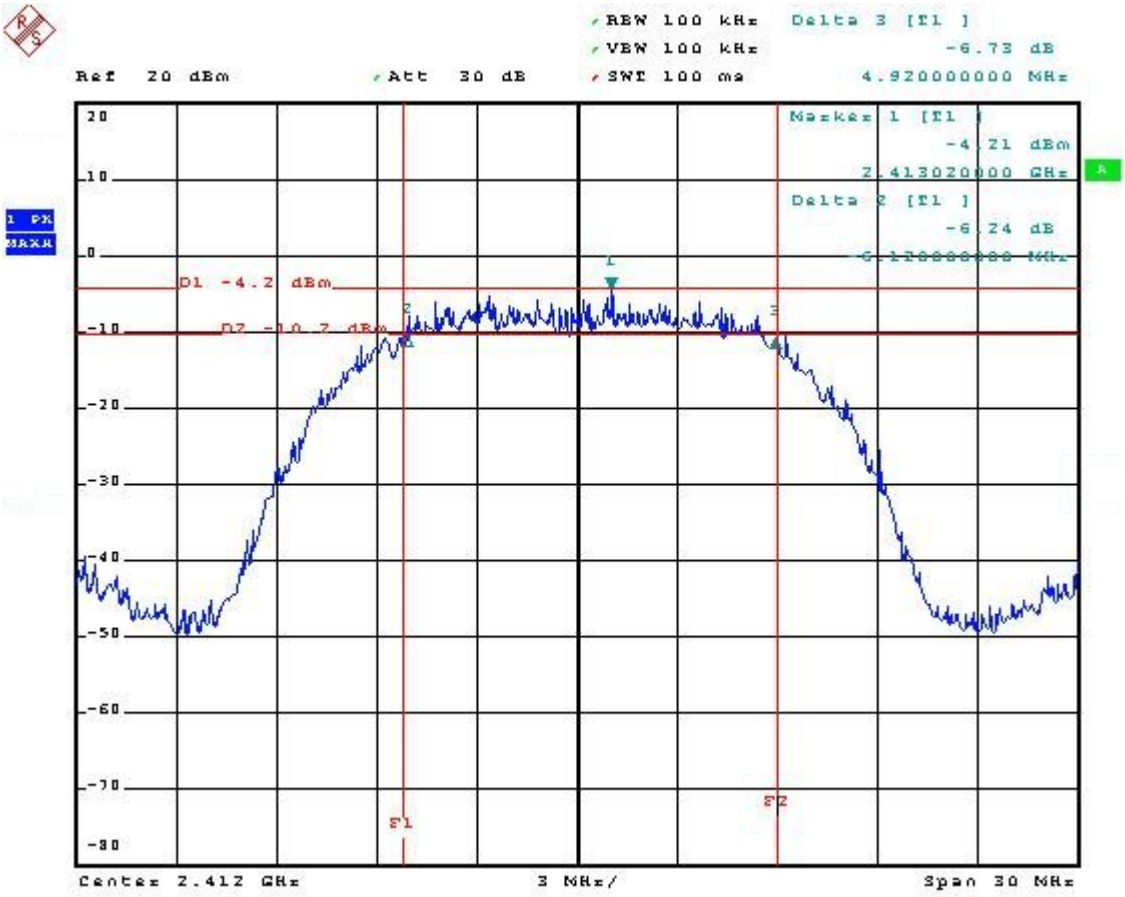
CH 11:


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Delta 3 [T1]
-6.73 dB
8.940000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-4.28 dBm
2.461220000 GHz
Delta 2 [T1]
-6.27 dB
-7.380000000 MHz
1 AV
MAXH
A
D1 -4.3 dBm
D2 -10 dB
F1
F2
Center 2.462 GHz
3 MHz/
Span 30 MHz

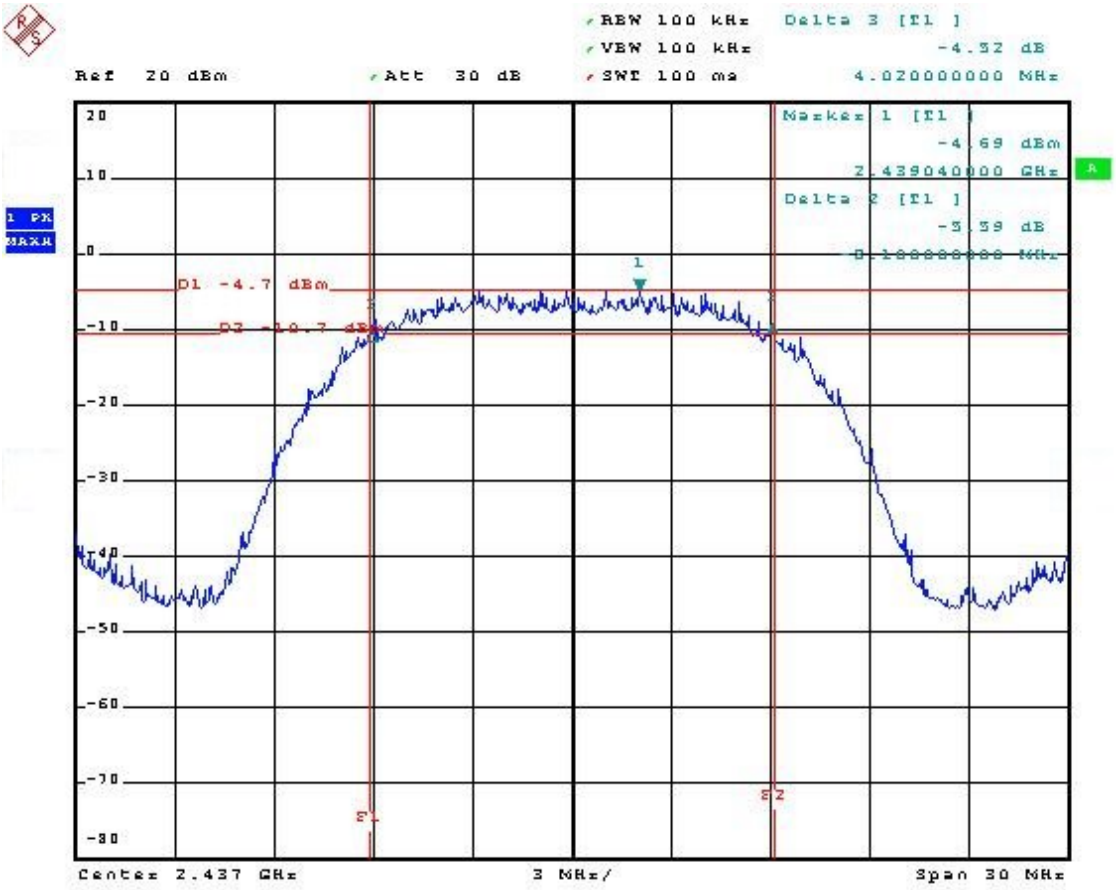
Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK.	Tested Mode:	IEEE 802.11b
Tested By:	Wayne Lin	Modulation Type:	CCK
Tested Date:	Nov. 19, 2008		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	6dB DOWN BW (MHz)
1	2412	11.04
6	2437	12.12
11	2462	12.18

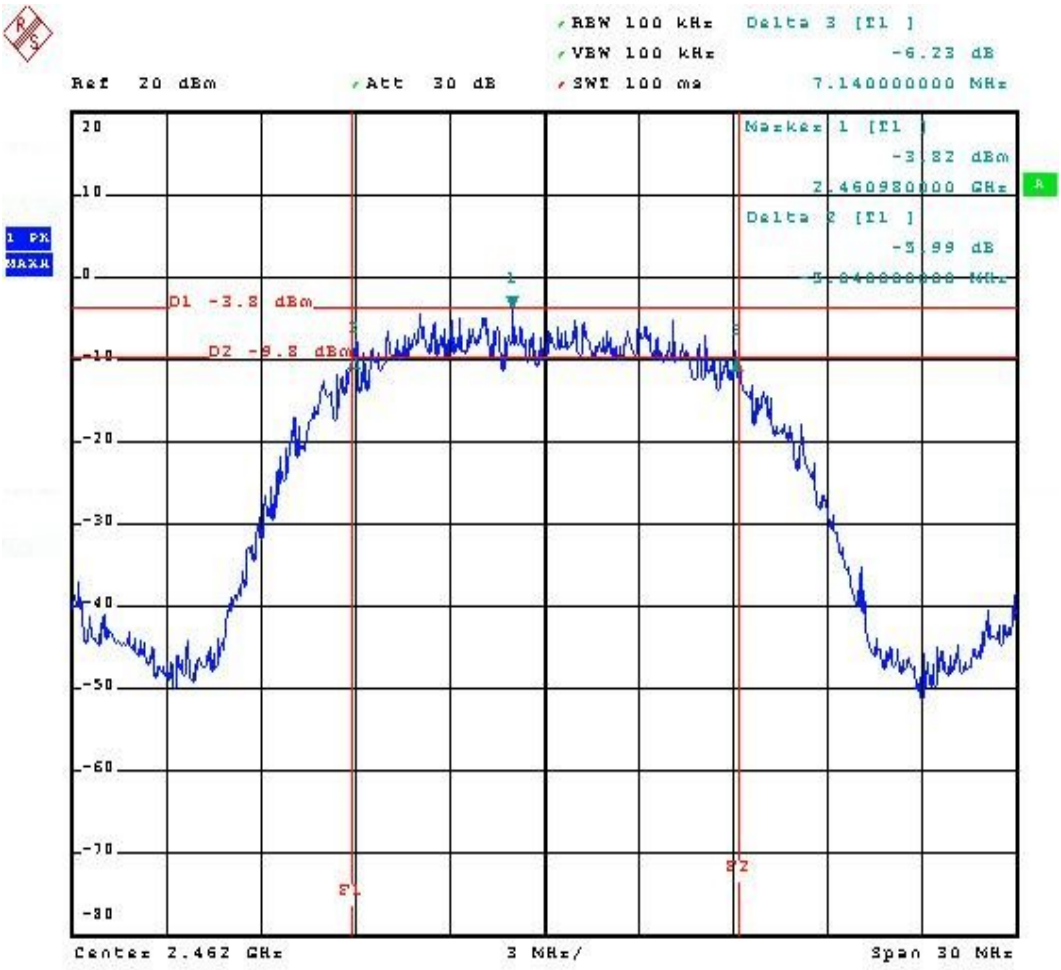
CH1:



CH6


RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 3 [T1]
-4.52 dB
4.020000000 MHz
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-4.69 dBm
2.439040000 GHz
Delta 2 [T1]
-5.59 dB
1 PK
MAXH
D1 -4.7 dBm
D2 -10.7 dB
Center 2.437 GHz
3 MHz/
Span 30 MHz

CH11


RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Delta 3 [T1]
-6.23 dB
7.140000000 MHz
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-3.82 dBm
2.460980000 GHz
Delta 2 [T1]
-5.99 dB
D1 -3.8 dBm
D2 -9.8 dBm
Center 2.462 GHz
3 MHz/
Span 30 MHz

4.4 PEAK POWER TEST

4.4.1 LIMIT

FCC Part15, Subpart C Section 15.247.

Frequency Range (MHz)	Limit(w)				
	Quantity of Hopping Channel	50	25	15	75
902-928		1(30dBm)	0.125(21dBm)	NA	NA
2400-2483.5		NA	NA	0.125(21dBm)	1(30dBm)
5725-5850		NA	NA	NA	1(30dBm)

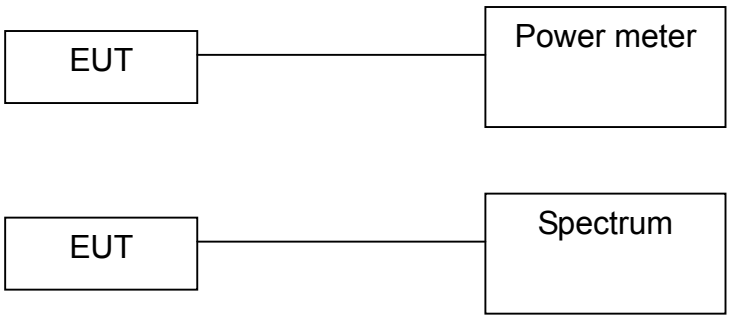
4.4.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-40GHz	ROHDE & SCHWARZ	FSP40/ 100093	SEP. 2009 ETC
POWER METER	N/A	BOONTON	4232A/ 29001	MAY 2009 ETC
POWER SENSOR	DC-8GHz 50 Ω	BOONTON	51011EMC/ 31181	JUN. 2009 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

4.4.4 TEST PROCEDURE

The EUT was operating in hopping mode or could control its channel.
Printed out the test result from the spectrum by hard copy function.
Recorded the read value of the power meter.

4.4.5 EUT OPERATING CONDITION

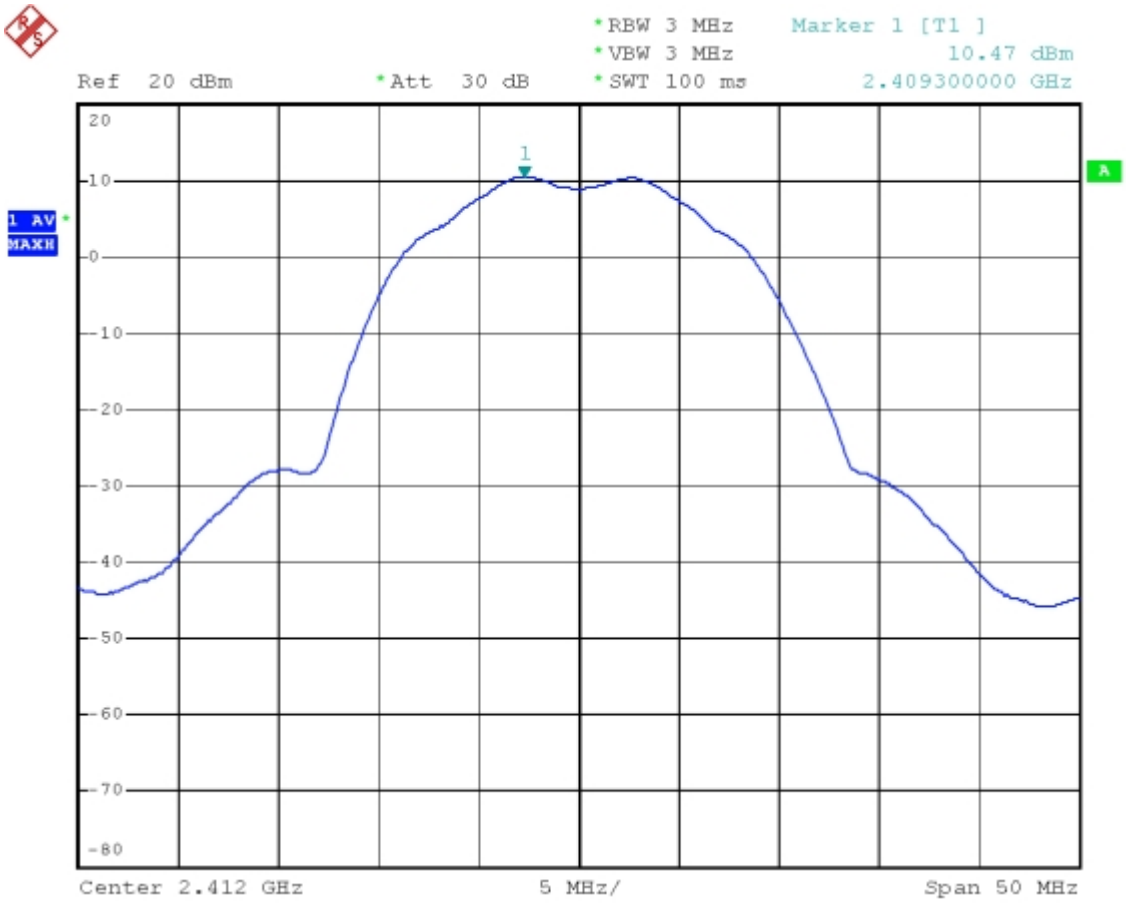
Same as section 4.1.5 of this report.

4.4.6 TEST RESULT

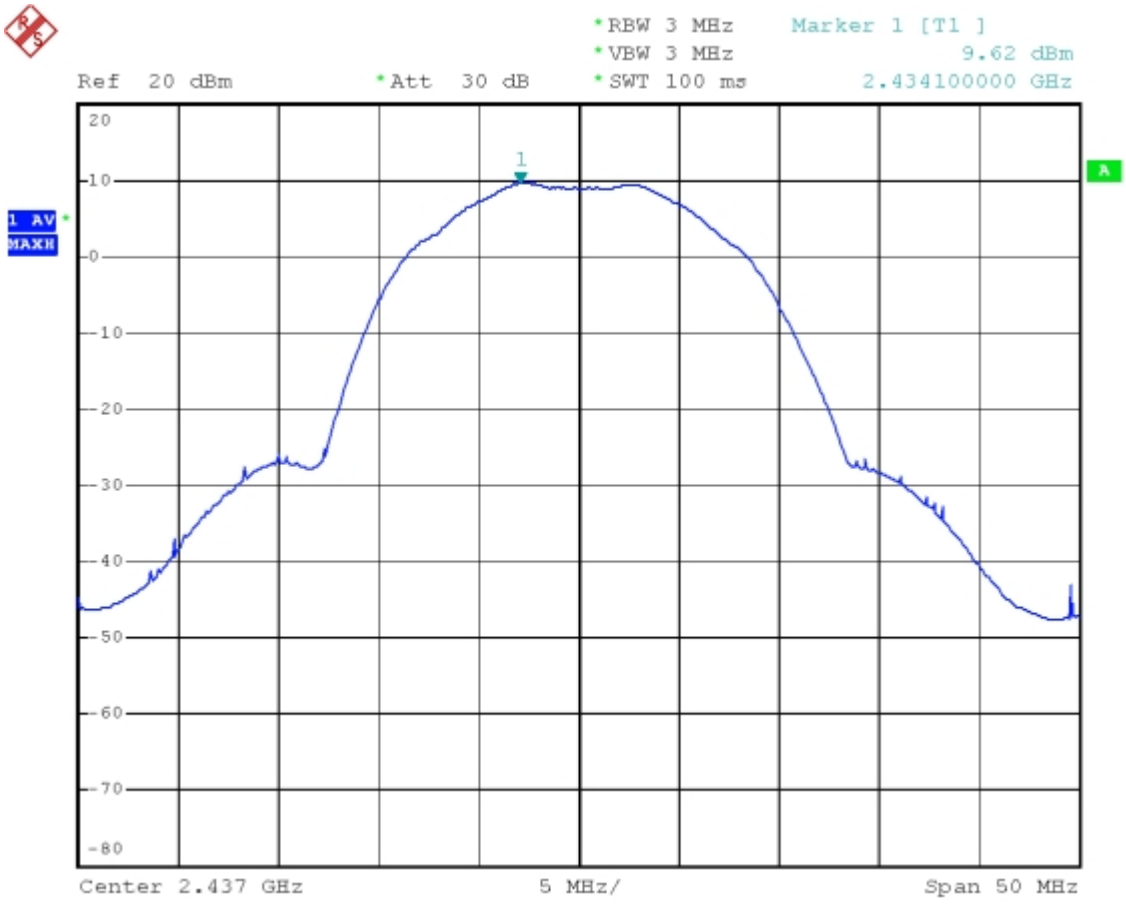
Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK.	Tested Mode:	IEEE 802.11g
Tested By:	Wayne Lin	Modulation Type:	OFDM
Tested Date:	Mar. 27, 2008		

Channel Number	Channel Frequency (MHz)	Peak Output Power (dBm)	Peak Power Limit (dBm)
1	2411.6000	10.47	30
6	2437.0000	9.62	30
11	2462.0820	8.87	30

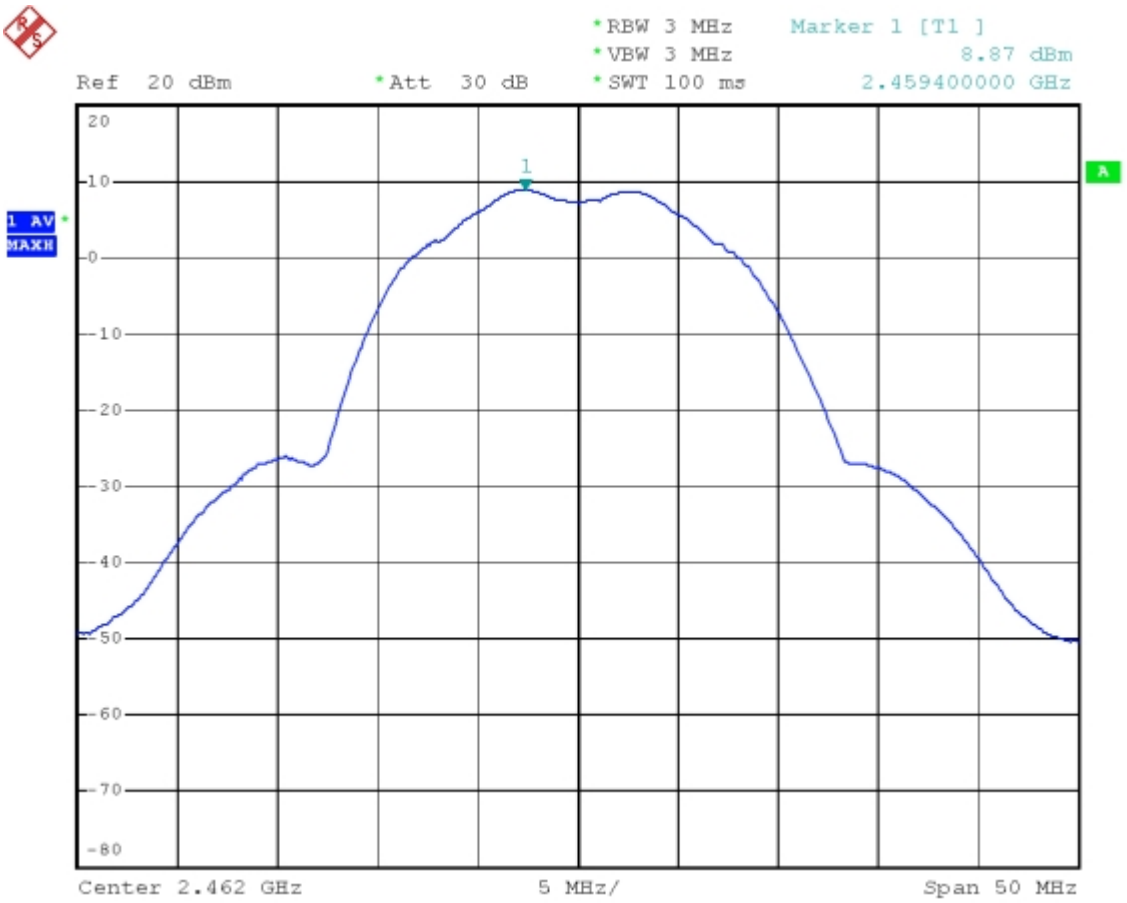
CH1:



CH6


RBW 3 MHz
VBW 3 MHz
SWT 100 ms
Marker 1 [T1]
9.62 dBm
2.434100000 GHz
Ref 20 dBm
Att 30 dB
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.437 GHz
5 MHz/
Span 50 MHz

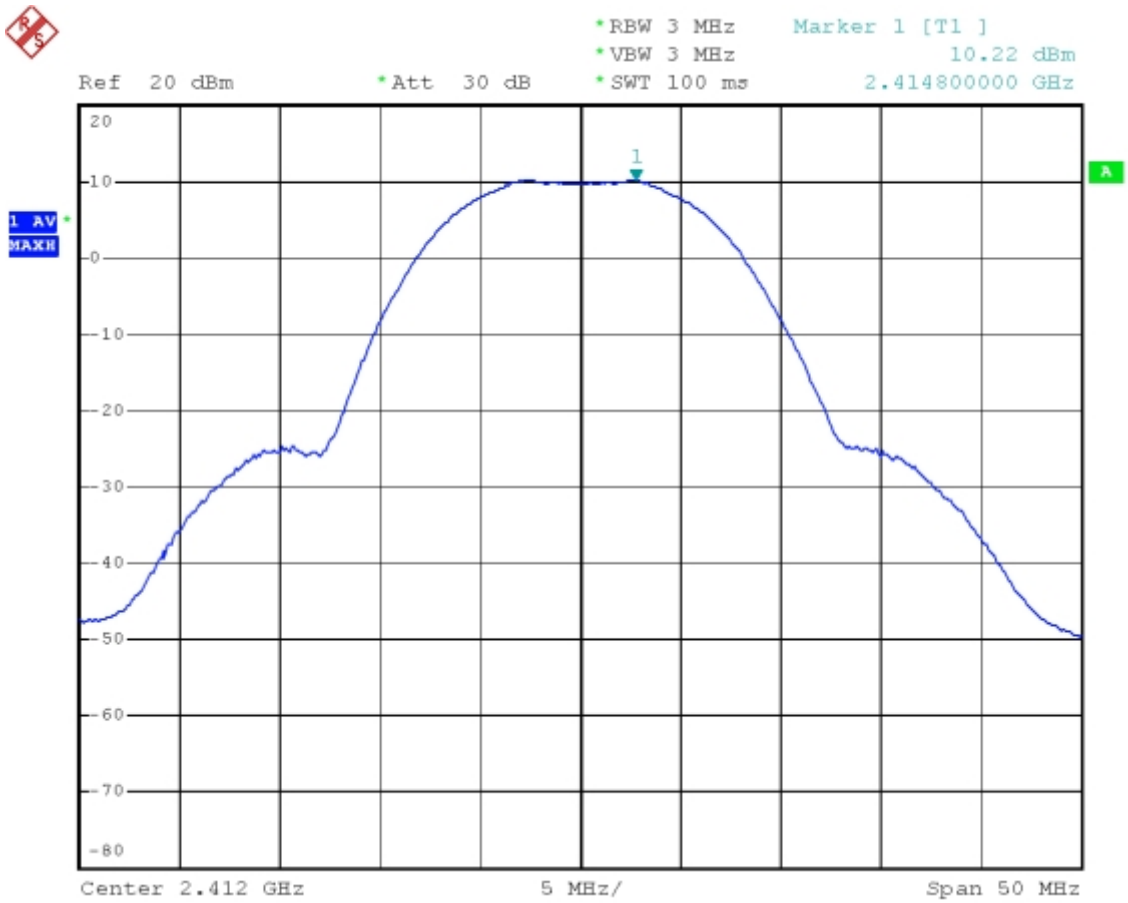
CH11


*RBW 3 MHz
Marker 1 [T1]
*VBW 3 MHz
8.87 dBm
Ref 20 dBm
*Att 30 dB
*SWT 100 ms
2.459400000 GHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
A
1 AV
MAXH
Center 2.462 GHz
5 MHz/
Span 50 MHz

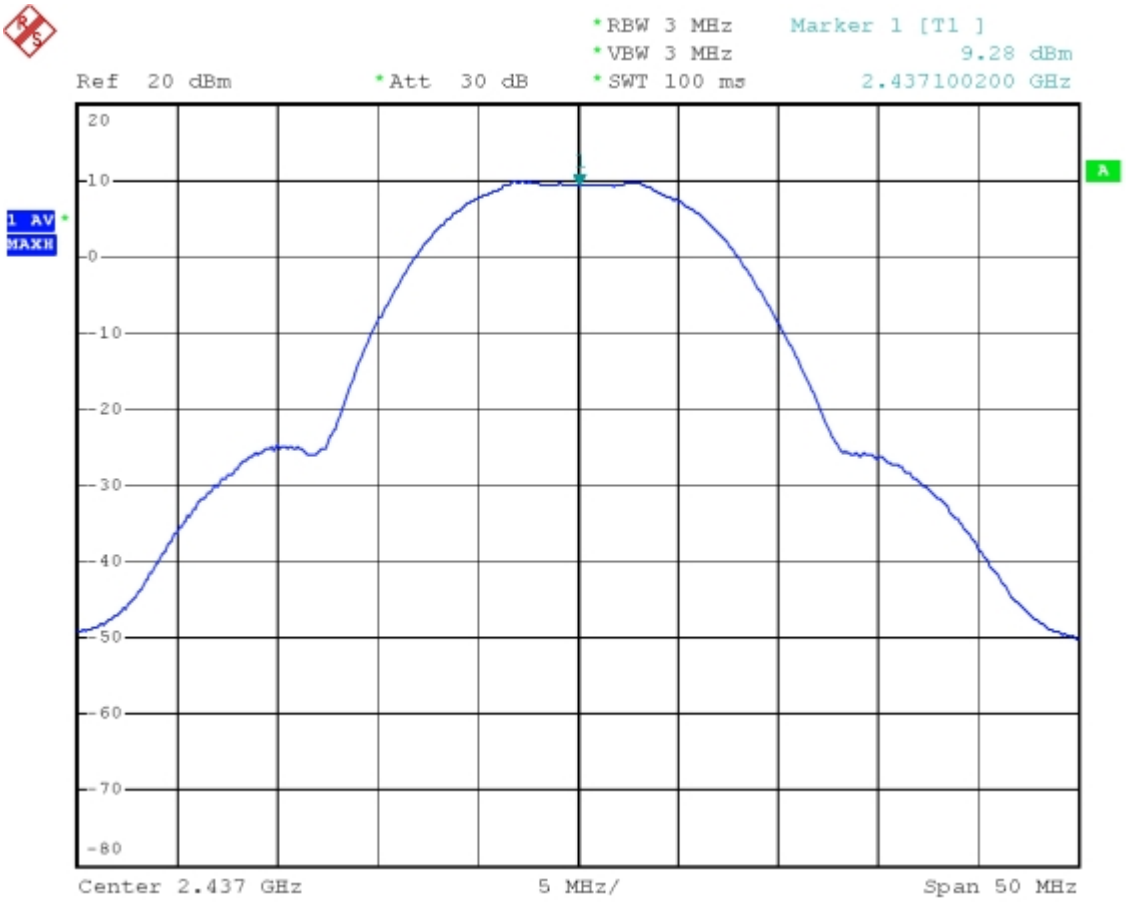
Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK.	Tested Mode:	IEEE 802.11b
Tested By:	Wayne Lin	Modulation Type:	CCK
Tested Date:	Nov. 19, 2008		

Channel Number	Channel Frequency (MHz)	Peak Output Power (dBm)	Peak Power Limit (dBm)
1	2412.0000	10.22	30
6	2437.0000	9.28	30
11	2462.1000	9.40	30

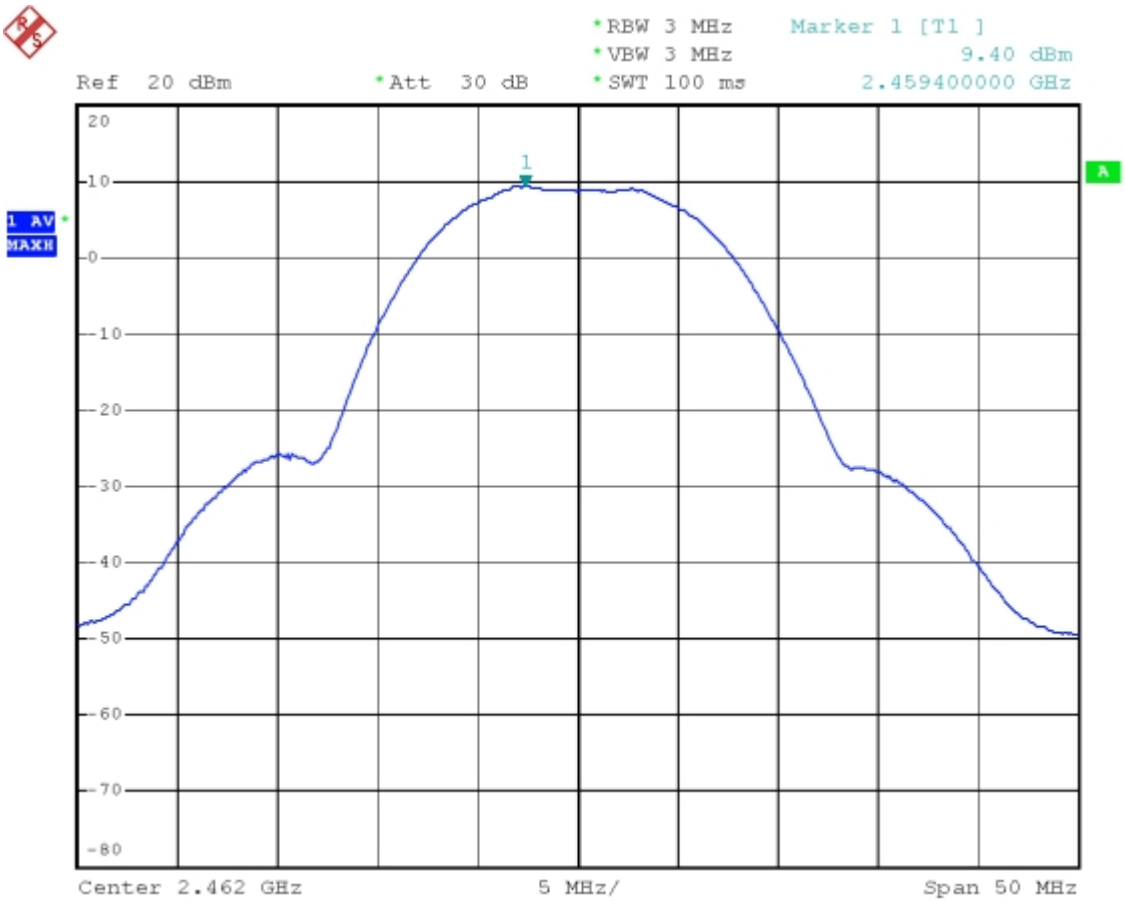
CH1:



CH6


*RBW 3 MHz
*VBW 3 MHz
*SWT 100 ms
Marker 1 [T1]
9.28 dBm
2.437100200 GHz
Ref 20 dBm
*Att 30 dB
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.437 GHz
5 MHz/
Span 50 MHz

CH11


*RBW 3 MHz
*VBW 3 MHz
*SWT 100 ms
Marker 1 [T1]
9.40 dBm
2.459400000 GHz
Ref 20 dBm
*Att 30 dB
1 AV
MAXH
A
20
10
0
10
20
30
40
50
60
70
80
Center 2.462 GHz
5 MHz/
Span 50 MHz

4.5 BAND EDGE TEST

4.5.1 LIMIT

Bluetooth: FCC Part15, Subpart C Section 15.249 (c), Emission radiated outside of the specified frequency bands, except for harmonics, shall attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Operating Frequency Range (MHz)	Limit (dBμV/m)	
	Peak	Average
902-928	74	54
2400-2483.5		
5725-5850		

Wi-Fi:FCC Part15, Subpart C Section 15.247. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

OPERATING FREQUENCY RANGE (MHz)	SPURIOUS EMISSION FREQUENCY (MHz)	LIMIT	
		Peak power ration to emission(dBc)	Emission level(dBuV/m)
902 - 928	<902	>20	NA
	>928	>20	NA
	960-1240	NA	54
2400 - 2483.5	<2400	>20	NA
	>2483.5-2500	NA	54
5725 - 5850	<5350-5460	NA	54
	<5725	>20	NA
	>5850	>20	NA

4.5.2 TEST EQUIPMENT

The following test equipment was used during the test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-40GHz	ROHDE & SCHWARZ	FSP40/ 100093	SEP. 2009 ETC
EMI TEST RECEIVER	9 kHz TO 2750 MHz	ROHDE & SCHWARZ	ESCS30/ 830245/012	OCT. 2009 ETC
SPECTRUM	9KHz-26.5GHz	HP	8953E/ 3710A03220	MAY 2009 ETC
PRE-AMPLIFIER	1GHz-26.5GHz Gain:30dB	HP	8449B/ 3008A01019	NOV. 2009 ETC
BI-LOG ANTENNA	25 MHz TO 2 GHz	EMCO	3142/ 9701-1124	FEB. 2009 SRT
HORN ANTENNA	1GHz to 18GHz	EMCO	3115/ 9602-4681	DEC. 2008 ETC
OATS	3 - 10 M measurement	SRT	SRT-1	APR. 2009 SRT

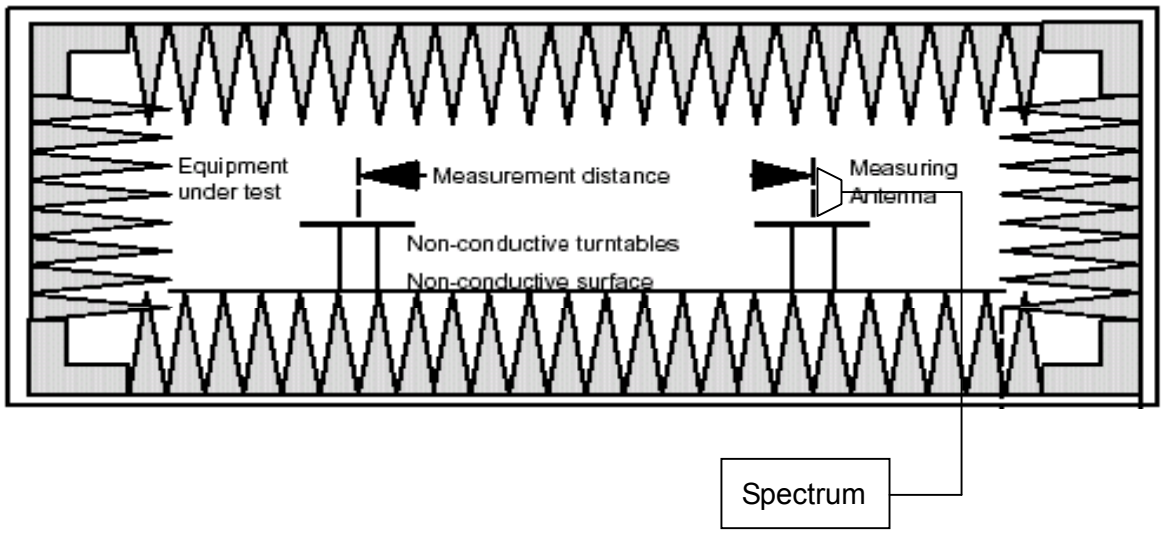
NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST SET-UP

FOR RF CONDUCTED TEST (dBc)

The EUT was connected to a spectrum through a 50Ω RF cable.

FOR RADIATED EMISSION TEST



NOTE :

3. The EUT system was put on a wooden table with 0.8m heights above a ground plane.
4. For the actual test configuration, please refer to the photos of testing.

4.5.4 TEST PROCEDURE

1. The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.
2. The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 10 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

4.5.5 EUT OPERATING CONDITION

Same as section 4.1.5 of this report.

4.5.6 TEST RESULT

Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK. & AV.	Tested Mode:	IEEE 802.11g
Tested By:	Wayne Lin	Modulation Type:	OFDM
Tested Date:	Nov. 19, 2008		

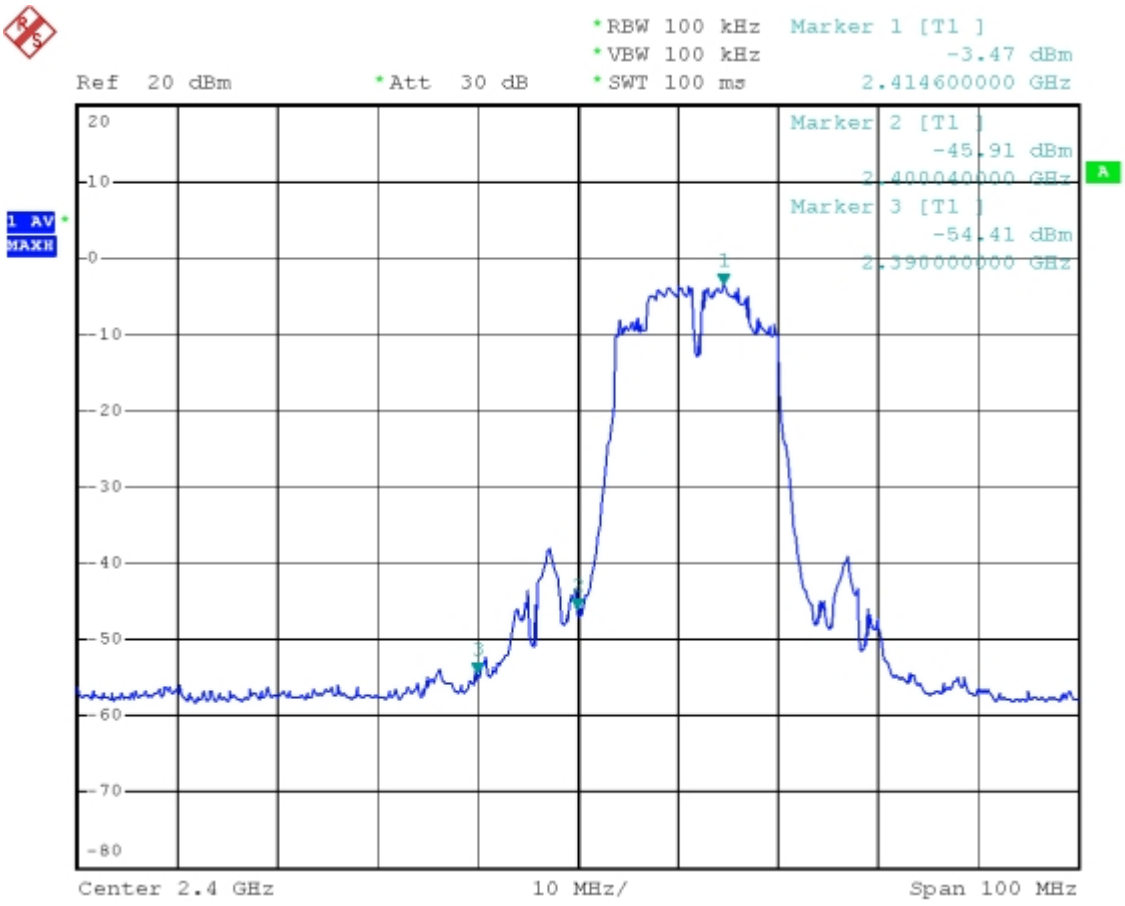
1.Conducted test

Frequency (MHz)	PEAK POWER OUTPUT (dBm)	Emission read Value(dBm)	Result of Band edge (dBc)	Band edge LIMIT (dBc)
<2400	-3.47	-45.91	42.44	>20dBc
>2483.5	-4.45	-54.42	49.97	>20dBc

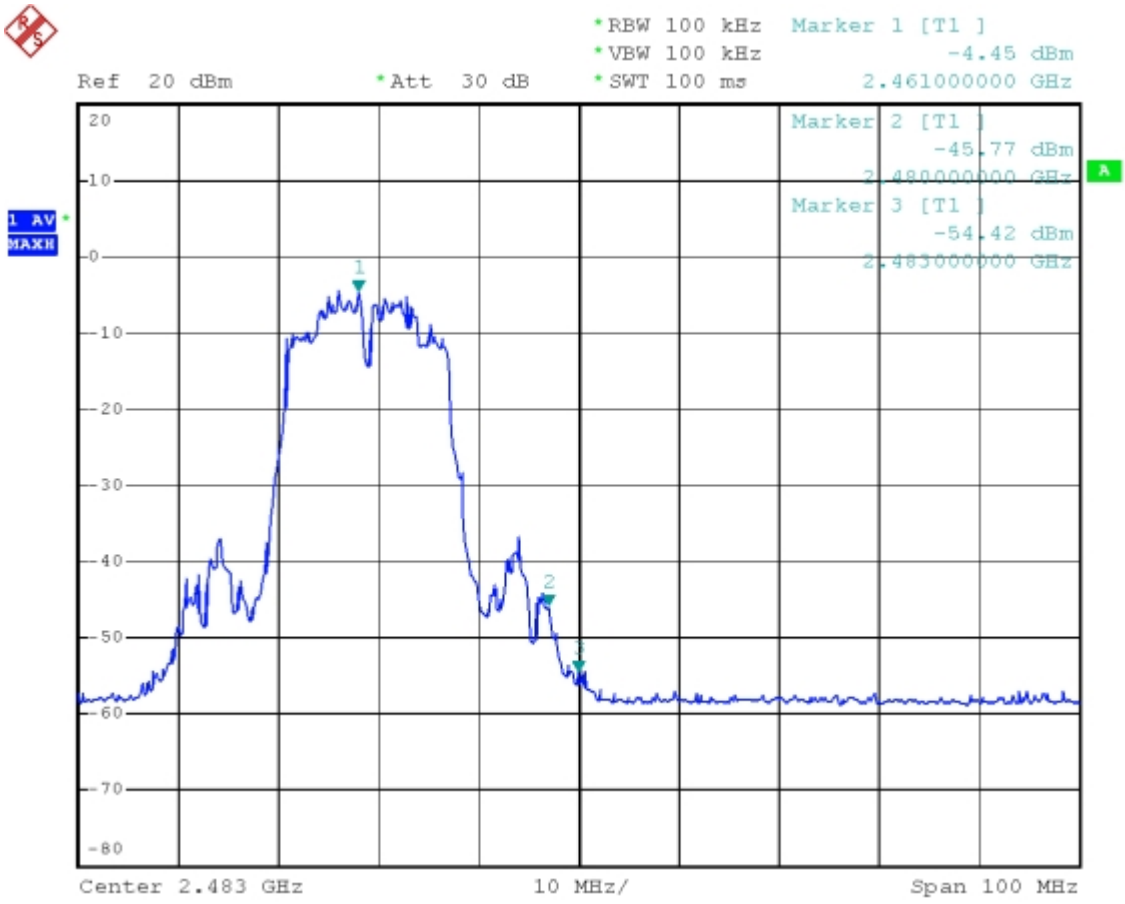
2.Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Reading (dBuV)		Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PK	AV	PK	AV	PK	AV
<2400	V	64.7	45.5	60.5	41.3	74.0	54.0
>2483.5	V	62.2	44.4	58.2	40.4	74.0	54.0

CH1


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Marker 1 [T1]
-3.47 dBm
2.414600000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-45.91 dBm
2.400040000 GHz
Marker 3 [T1]
-54.41 dBm
2.390000000 GHz
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.4 GHz
10 MHz/
Span 100 MHz

CH11


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Marker 1 [T1]
-4.45 dBm
2.461000000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-45.77 dBm
2.480000000 GHz
Marker 3 [T1]
-54.42 dBm
2.483000000 GHz
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.483 GHz
10 MHz/
Span 100 MHz

Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK. & AV.	Tested Mode:	IEEE 802.11b
Tested By:	Wayne Lin	Modulation Type:	CCK
Tested Date:	Nov. 19, 2008		

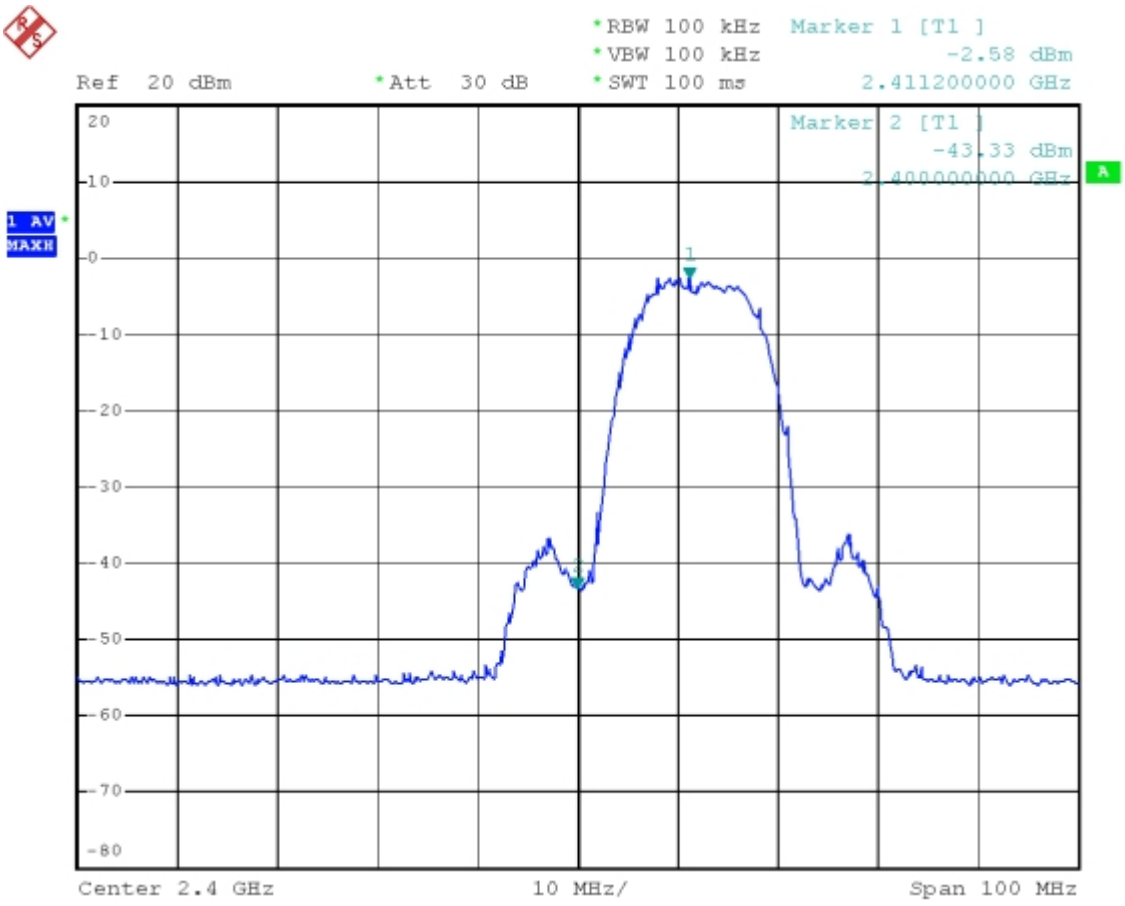
1.Conducted test

Frequency (MHz)	PEAK POWER OUTPUT (dBm)	Emission read Value(dBm)	Result of Band edge (dBc)	Band edge LIMIT (dBc)
<2400	-2.58	-43.33	40.75	>20dBc
>2483.5	-3.25	-54.23	50.98	>20dBc

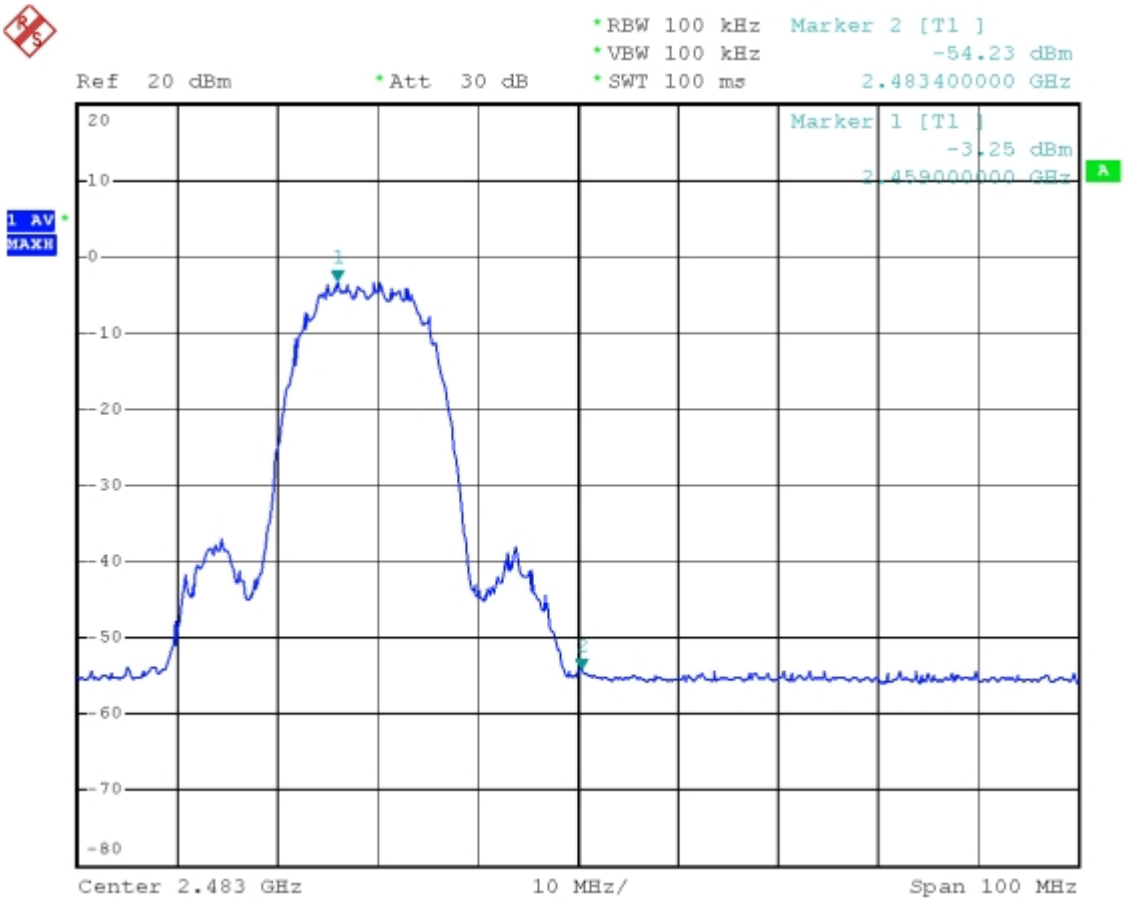
2.Radiated emission test

Frequency (MHz)	Antenna polarization (H/V)	Reading (dBuV)		Emission (dBuV/m)		Band edge Limit (dBuV/m)	
		PK	AV	PK	AV	PK	AV
<2400	V	63.5	45.6	59.3	41.4	74.0	54.0
>2483.5	V	66.1	46.9	62.1	42.9	74.0	54.0

CH1


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Marker 1 [T1]
-2.58 dBm
2.411200000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-43.33 dBm
2.400000000 GHz
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.4 GHz
10 MHz/
Span 100 MHz

CH11


*RBW 100 kHz
*VBW 100 kHz
*SWT 100 ms
Marker 2 [T1]
-54.23 dBm
2.483400000 GHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-3.25 dBm
2.459000000 GHz
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.483 GHz
10 MHz/
Span 100 MHz

4.6 POWER DENSITY TEST

4.6.1 LIMIT

FCC Part15, Subpart C Section 15.247

FREQUENCY RANGE (MHz)	Limit(dBm/kHz)
902-928	8dBm/3kHz
2400-2483.5	
5725-5850	

4.6.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DUE DATE OF CAL. & CAL. CENTER
SPECTRUM	9kHz-40GHz	ROHDE & SCHWARZ	FSP40/ 100093	SEP. 2009 ETC

NOTE: The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST SET-UP

The EUT was connected to a spectrum through a 50Ω RF cable.

4.6.4 TEST PROCEDURE

The EUT was operating in transmitter mode and could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

4.6.5 EUT OPERATING CONDITION

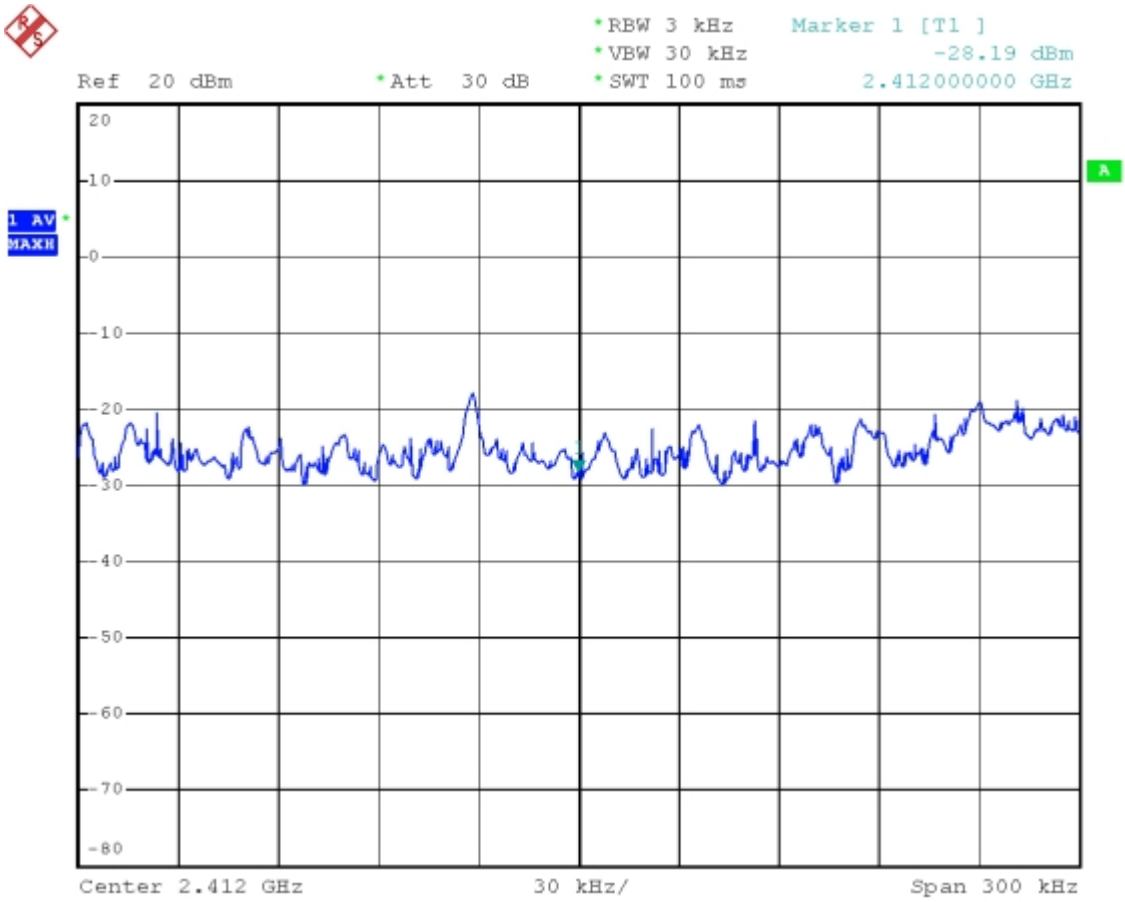
Same as section 4.1.5 of this report.

4.6.6 TEST RESULT

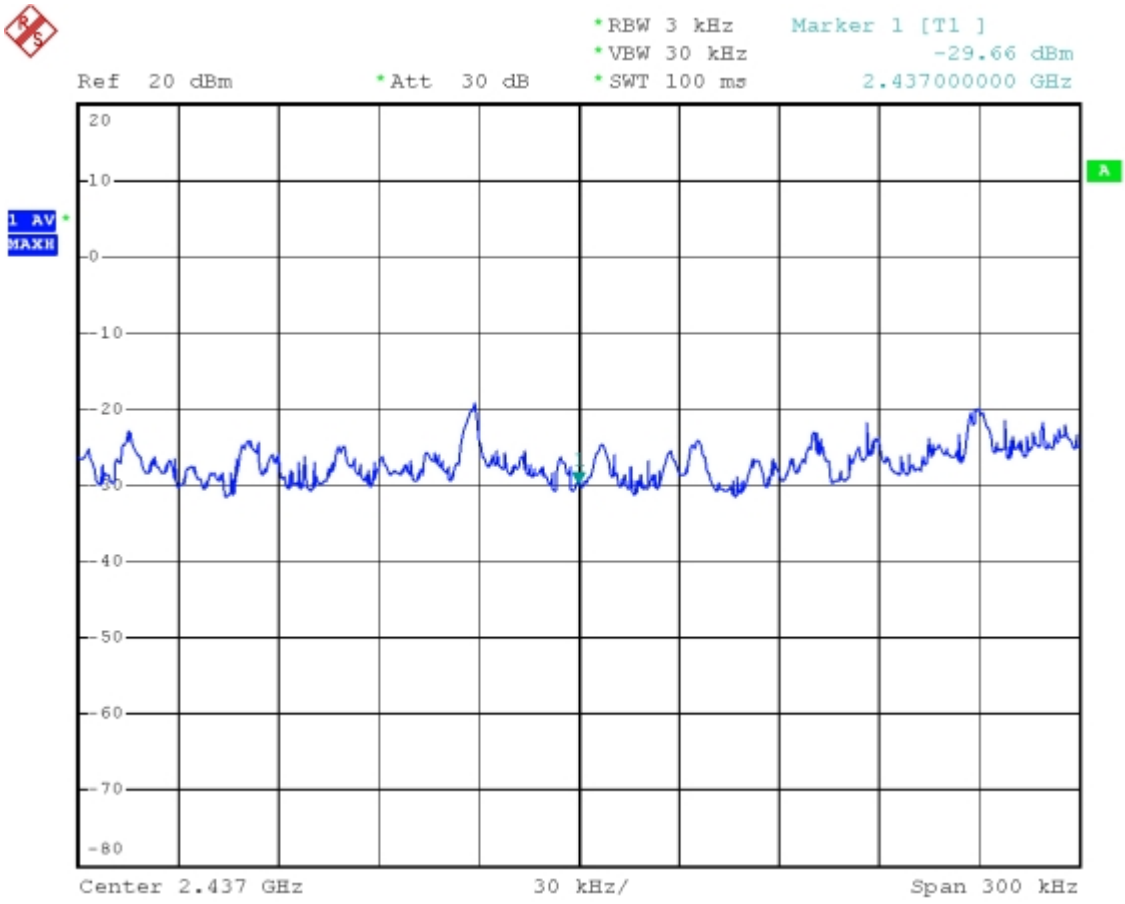
Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK.	Tested Mode:	IEEE 802.11g
Tested By:	Wayne Lin	Modulation Type:	OFDM
Tested Date:	Nov. 19, 2008		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3KHz BW (dBm/3kHz)	MAXIMUM LIMIT (dBm/3kHz)
1	2412.0000	-28.19	8
6	2437.0000	-29.66	8
11	2462.0000	-28.70	8

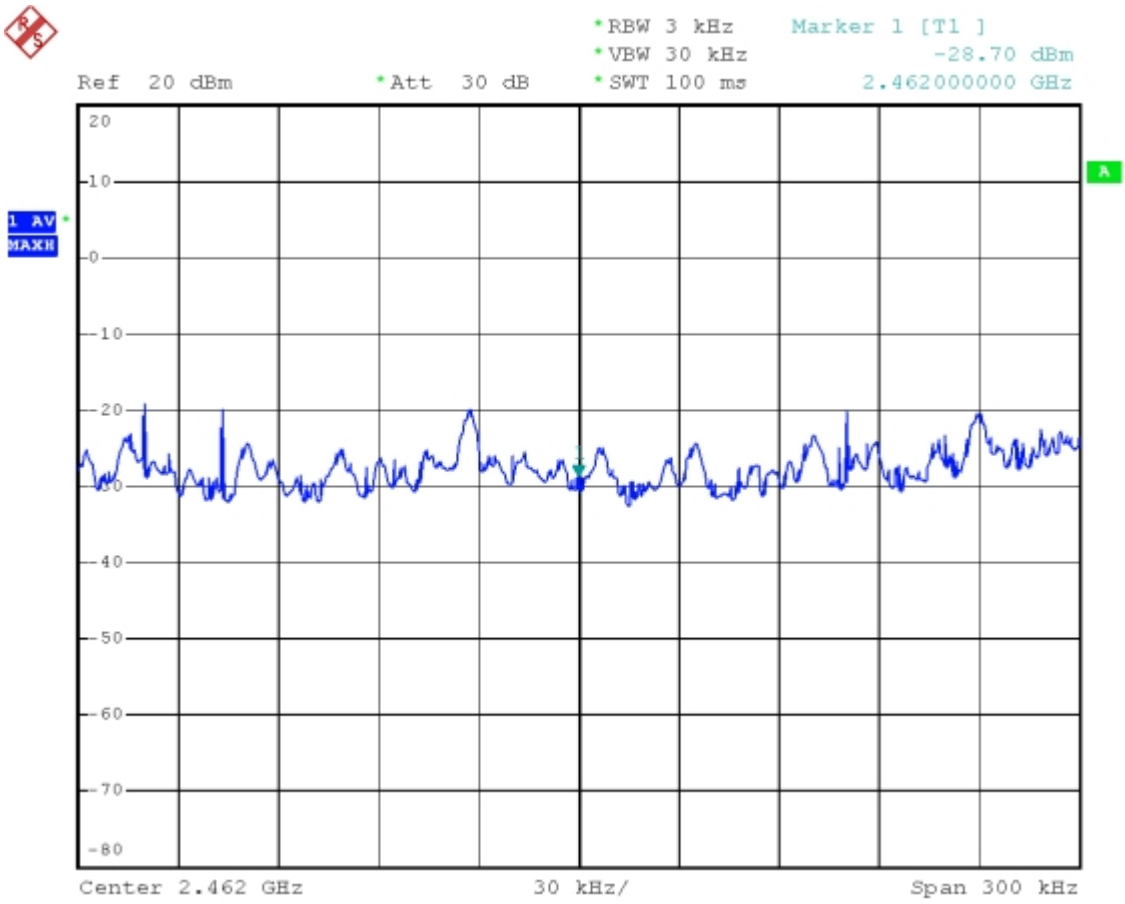
CH 1:



CH 6:


*RBW 3 kHz
*VBW 30 kHz
*SWT 100 ms
Marker 1 [T1]
-29.66 dBm
2.437000000 GHz
Ref 20 dBm
*Att 30 dB
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.437 GHz
30 kHz/
Span 300 kHz

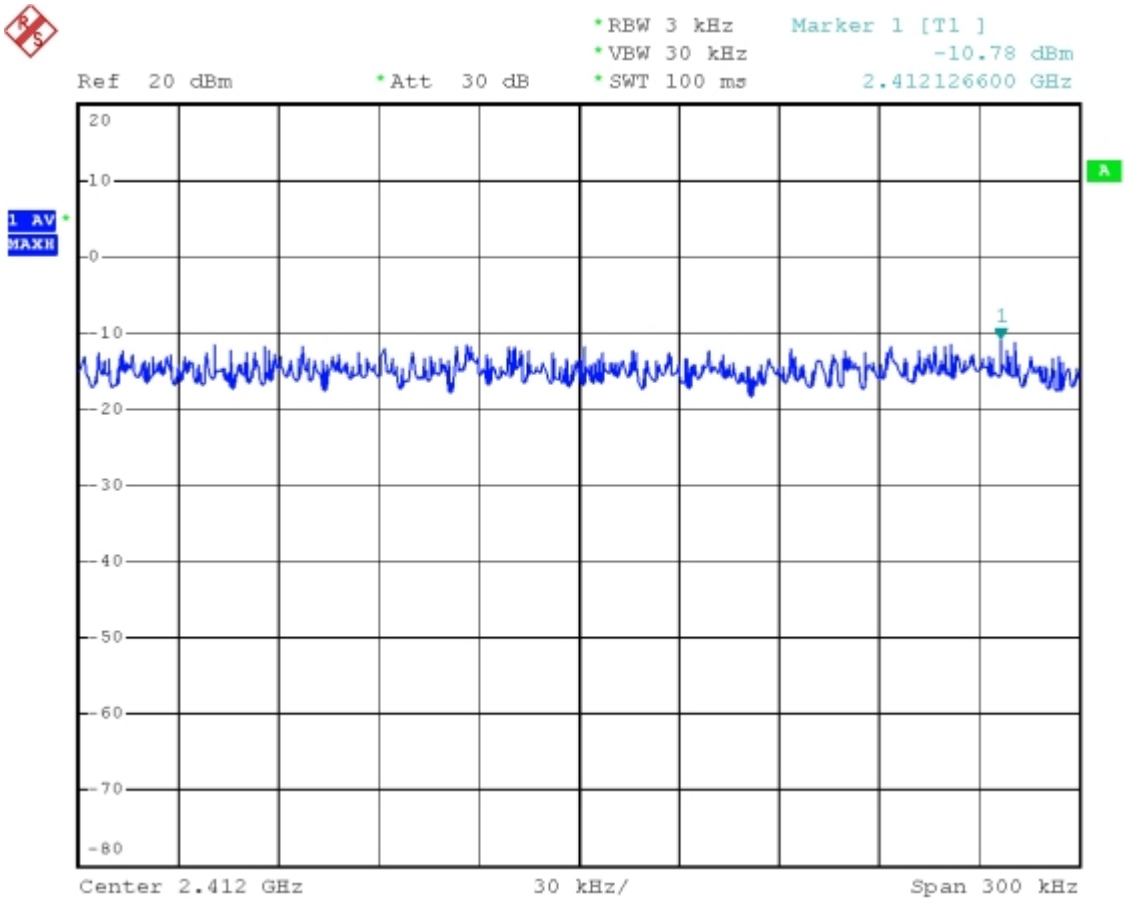
CH 11:


*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
-28.70 dBm
Ref 20 dBm
*Att 30 dB
*SWT 100 ms
2.462000000 GHz
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.462 GHz
30 kHz/
Span 300 kHz

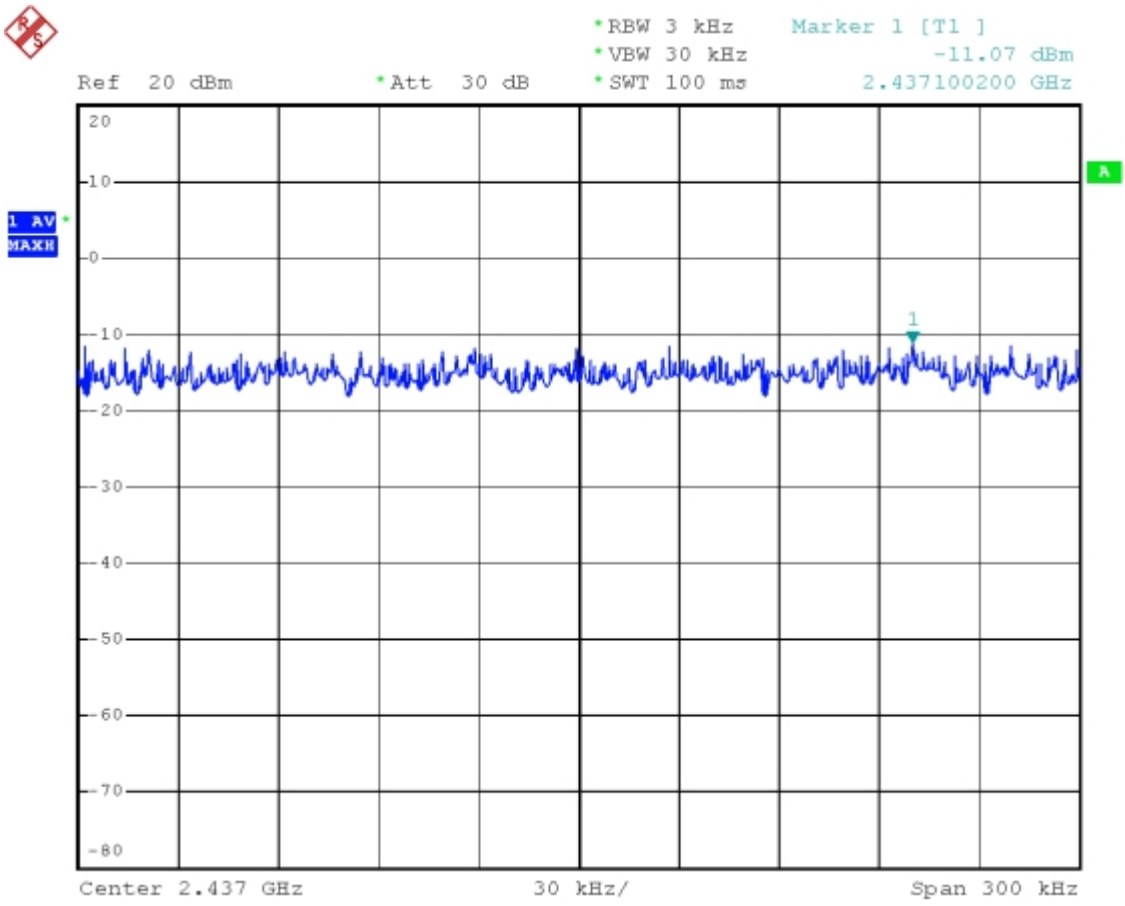
Temperature:	22°C	Humidity:	69%RH
Spectrum Detector:	PK.	Tested Mode:	IEEE 802.11b
Tested By:	Wayne Lin	Modulation Type:	CCK
Tested Date:	Nov. 19, 2008		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3KHz BW (dBm/3kHz)	MAXIMUM LIMIT (dBm/3kHz)
1	2412.0000	-10.87	8
6	2437.0000	-11.07	8
11	2462.0000	-13.67	8

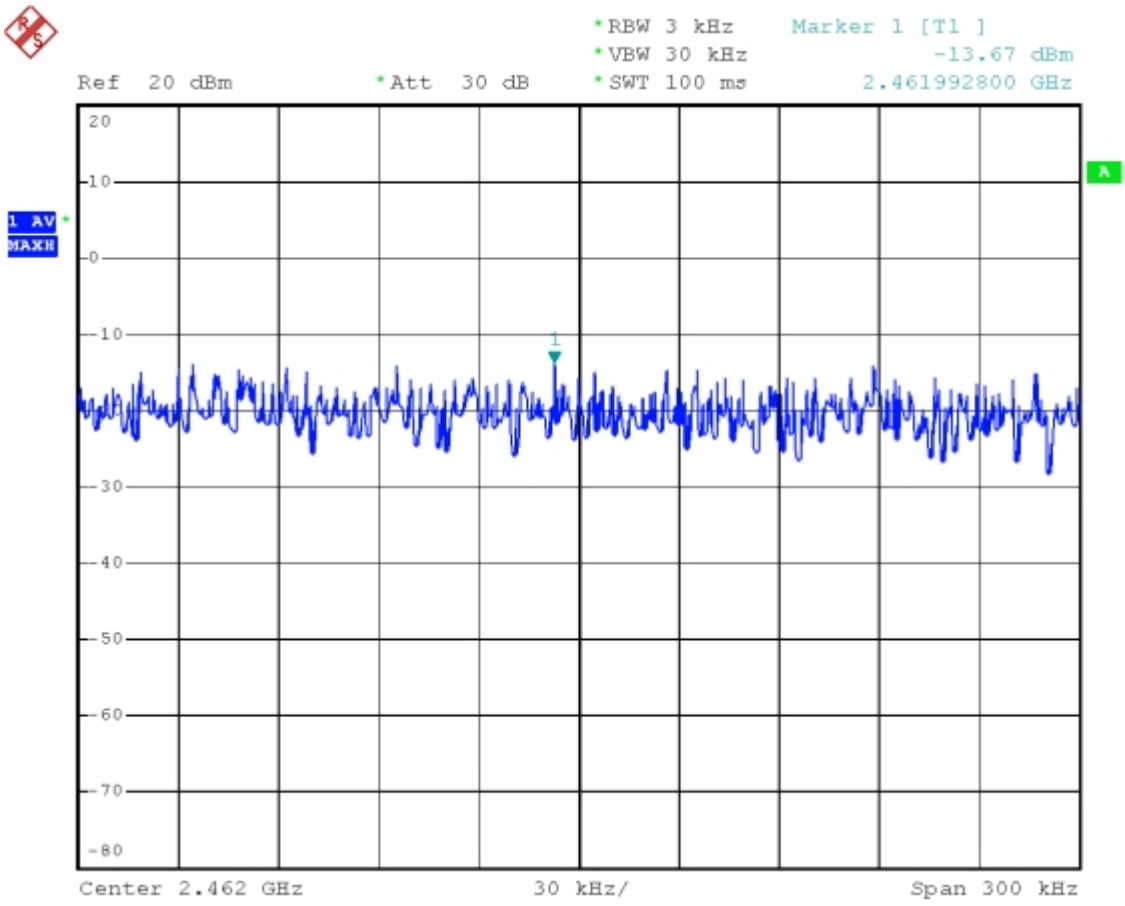
CH 1:



CH 6:


*RBW 3 kHz
*VBW 30 kHz
*SWT 100 ms
Marker 1 [T1]
-11.07 dBm
2.437100200 GHz
Ref 20 dBm
*Att 30 dB
1 AV
MAXH
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.437 GHz
30 kHz/
Span 300 kHz

CH 11:


*RBW 3 kHz
*VBW 30 kHz
*SWT 100 ms
Marker 1 [T1]
-13.67 dBm
2.461992800 GHz
Ref 20 dBm
*Att 30 dB
1 AV
MAXH
A
20
10
0
-10
-30
-40
-50
-60
-70
-80
Center 2.462 GHz
30 kHz/
Span 300 kHz

5. Antenna application

5.1 Antenna requirement

The EUT's antenna is met the requirement of FCC part15C section15.203 and 15.204.

FCC part15C section15.247 requirement:
Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Result

The EUT's antenna used a 2.4G PIFA antenna. Gain of antenna types is 2.0 dBi that meet the requirement.

7. TERMS OF ABBREVIATION

AV.	Average detection
AZ(°)	Turn table azimuth
Correct.	Correction
EL(m)	Antenna height (meter)
EUT	Equipment Under Test
Horiz.	Horizontal direction
LISN	Line Impedance Stabilization Network
NSA	Normalized Site Attenuation
Q.P.	Quasi-peak detection
SRT Lab	Spectrum Research & Testing Laboratory, Inc.
Vert.	Vertical direction