

FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart E § 15.407

Equipment	: FLYBOOK
Model No.	: V5W1BBHA
Brand Name	: DIALOGUE
Filing Type	: New Application
Applicant	: Dialogue Technology Corp. 10F, No. 196, Sec.2, Jungshing Rd., Shindian City, Taipei 231, Taiwan, R.O.C.
FCC ID	: JYV-V5W1BBHA
Manufacturer	: Dialogue Technology Corp. 10F, No. 196, Sec.2, Jungshing Rd., Shindian City, Taipei 231, Taiwan, R.O.C.
Received Date	: Jan. 22, 2007
Test Date	: Mar. 13, 2007

Statement

Test result included is only for the 802.11a (5150 ~ 5250MHz) of the product.

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart E**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.



Lab Code: 200079-0

SPORTON International Inc.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of This Test Report

Original Issue Date: Mar. 20, 2007

Report No.: FR6O2516AA

No additional attachment.

Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart E § 15.407

Equipment : FLYBOOK
Model No. : V5W1BBHA
Brand Name : DIALOGUE
Applicant : **Dialogue Technology Corp.**
10F, No. 196, Sec.2, Jungshing Rd., Shindian City, Taipei
231, Taiwan, R.O.C.

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jan. 22, 2007 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Roger Sheng / Manager

Reviewed Date: Mar. 20, 2007

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	Rule Section	Description of Test	Result	Under Limit
3.1	15.207	AC Power Line Conducted Emissions	Complies	9.90 dB
3.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
3.3	15.407(a)	Maximum Conducted Output Power	Complies	0.07 dB
3.4	15.407(a)	Power Spectral Density	Complies	0.71 dB
3.5	15.407(a)	Peak Excursion	Complies	8.10 dB
3.6	15.407(b)	Radiated Emissions	Complies	5.85 dB
3.7	15.407(b)	Band Edge Emissions	Complies	1.77 dB
3.8	15.407(g)	Frequency Stability	Complies	-
3.9	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.5dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
Peak Excursion	±0.5dB	Confidence levels of 95%
26dB Spectrum Bandwidth / Frequency Stability	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1. Product Details

EUT is a FLYBOOK with IEEE 802.11a/b/g, Bluetooth, 3G and GPS radio functions. Only the radio detail of IEEE 802.11a/b/g (802.11a- 5150 ~ 5250MHz) is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Power Type	19V DC from adapter; 11.1V DC from battery
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5250MHz
Channel Number	11a: 4
Channel Band Width (99%)	11a: 17.76 MHz
Conducted Output Power	16.93 dBm

2.2. Accessories

Power	Brand	Model	Rating
Adapter 1	DIALOGUE	ADP-50HH A	INPUT: 100-240V AC OUTPUT: 19V DC
Li-Ion Battery	DIALOGUE	FB-B5634	11.1 V DC 3400mAh
Others			
Stylus / Power cord			

2.3. Table for Filed Antenna

Ant.	Antenna Type	Connector	Gain (dBi)	Remark
1	PIFA Antenna	NA	3.49	IEEE 802.11a

2.4. Table for Carrier Frequencies

Frequency Allocation for 802.11a

Frequency Band	Channel No.	Frequency
5150~5250 MHz (USA/Canada)	36	5180 MHz
	40	5200 MHz
	44	5220 MHz
	48	5240 MHz

2.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
AC Power Conducted Emission	Mode 4	6Mbps	48	1
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Max. Conducted Output Power Power Spectral Density Peak Excursion	Band 1/BPSK	6Mbps	36/40/48	NA
Radiated Emission Below 1GHz	BPSK	6Mbps	40	1
Radiated Emission Above 1GHz Band Edge Emission	Band 1/BPSK	6Mbps	36/40/48	1
Band Edge Emission	Band 1/BPSK	6Mbps	36/48	1
Frequency Stability	Un-modulation	-	48	NA

Note:

For EMI test, the following modes were tested:

Mode 1. GSM850 Idle+BT Idle+WLAN Idle+Earphone+Adapter

Mode 2. EDGE Idle+BT Idle+WLAN Idle+Earphone+Adapter

Mode 3. WCDMA Idle+BT Idle+WLAN Idle+Earphone+Adapter

Mode 4. HSDPA Idle+BT Idle+WLAN Idle+Earphone+Adapter

Because "mode 4" generated the worst test result, it was reported as final data.

2.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.	VCCI Reg. No
03CH03-HY	SAC	Hwa Ya	101377	IC 4088	-
CO01-NH	Conduction	Hwa Ya	90960	IC 4086	-
TH01-HY	OVEN Room	Hwa Ya	-	-	-

Open Area Test Site (OATS); Semi Anechoic Chamber (SAC); Fully Anechoic Chamber (FAC).

Please refer section 6 for Test Site Address.

2.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Base Station	R&S	CMU 200	-
Bluetooth Earphone	Free Style	JD-100	-
WLAN AP	SMC	SMC-100	-
LCD Monitor	DELL	2405FPE	DoC
MIC+Headset	HAWK	03-MSB301	DoC
iPod x2	Apple	A1051	R33057
Express Card	APIOTEK	EC-0001	-
Notebook (Remote Workstation)	DELL	D400	DoC
Central Office (Remote Workstation)	Easy Switch	SMS-4 PLUS	-

2.8. Table for Parameters of Test Software Setting

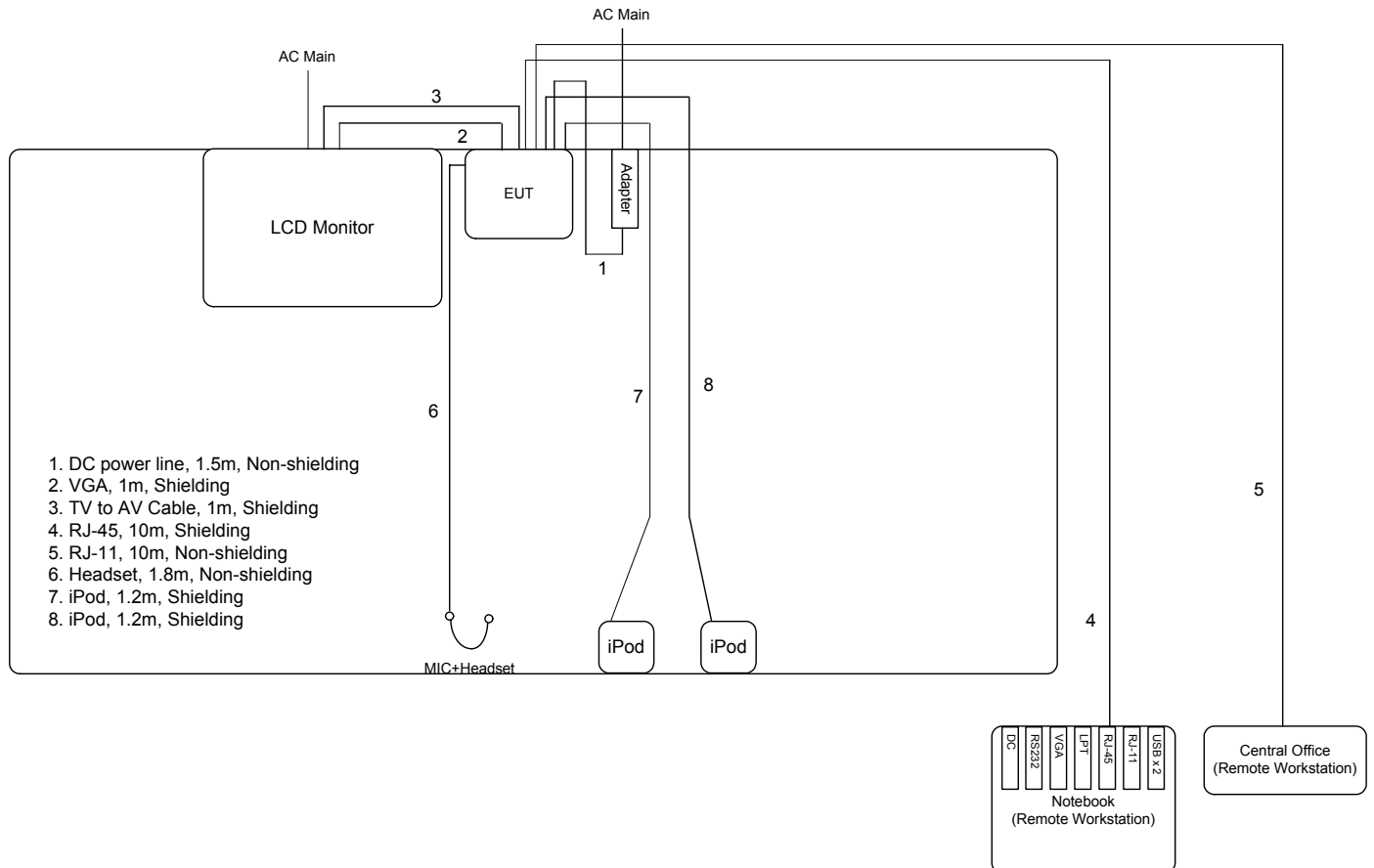
During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

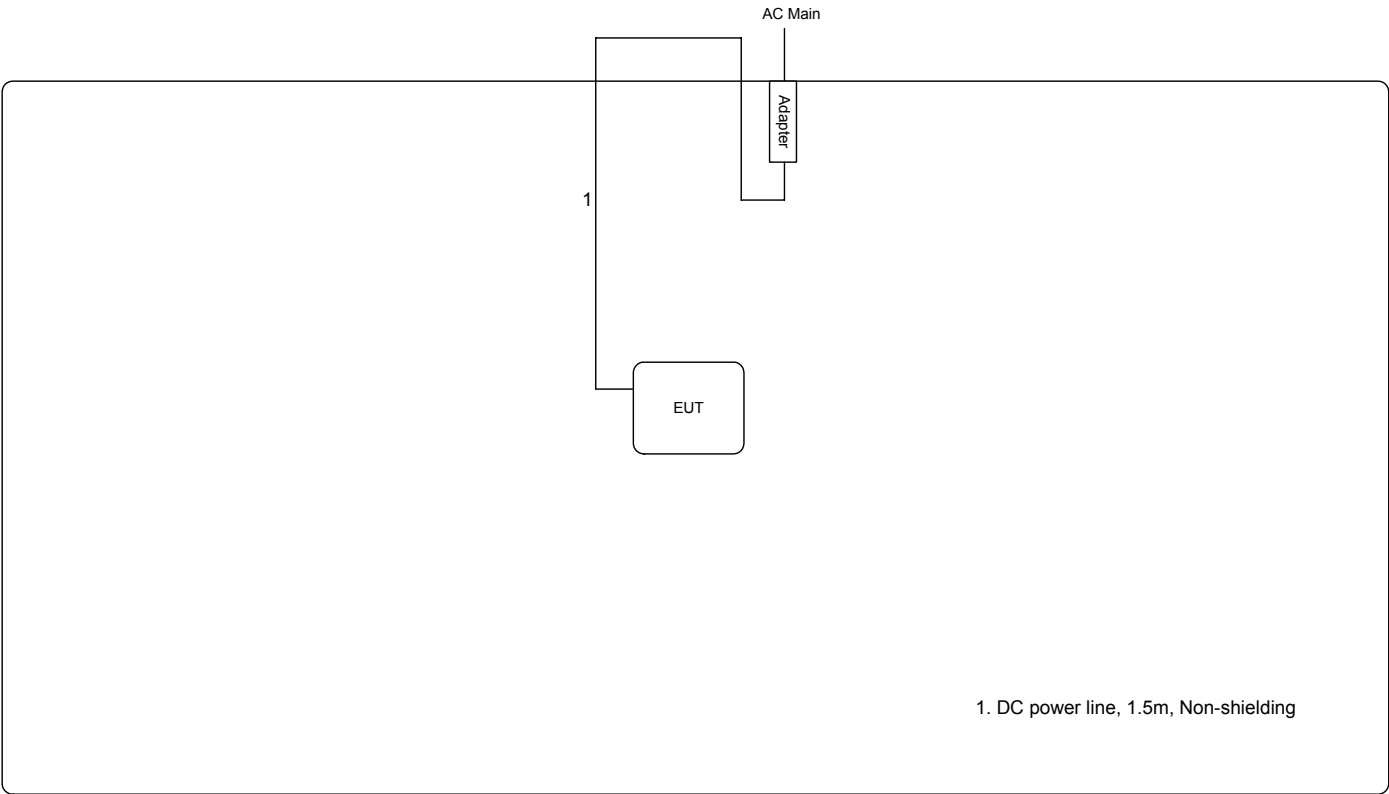
Power Parameters of IEEE 802.11a

Test Software Version	CRTU		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 802.11a	23	23	23

2.9. Test Configurations

2.9.1. Radiation Emissions Test Configuration





3. TEST RESULT

3.1. AC Power Line Conducted Emissions Measurement

3.1.1. Limit

For this product that is designed to connect to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

3.1.2. Measuring Instruments and Setting

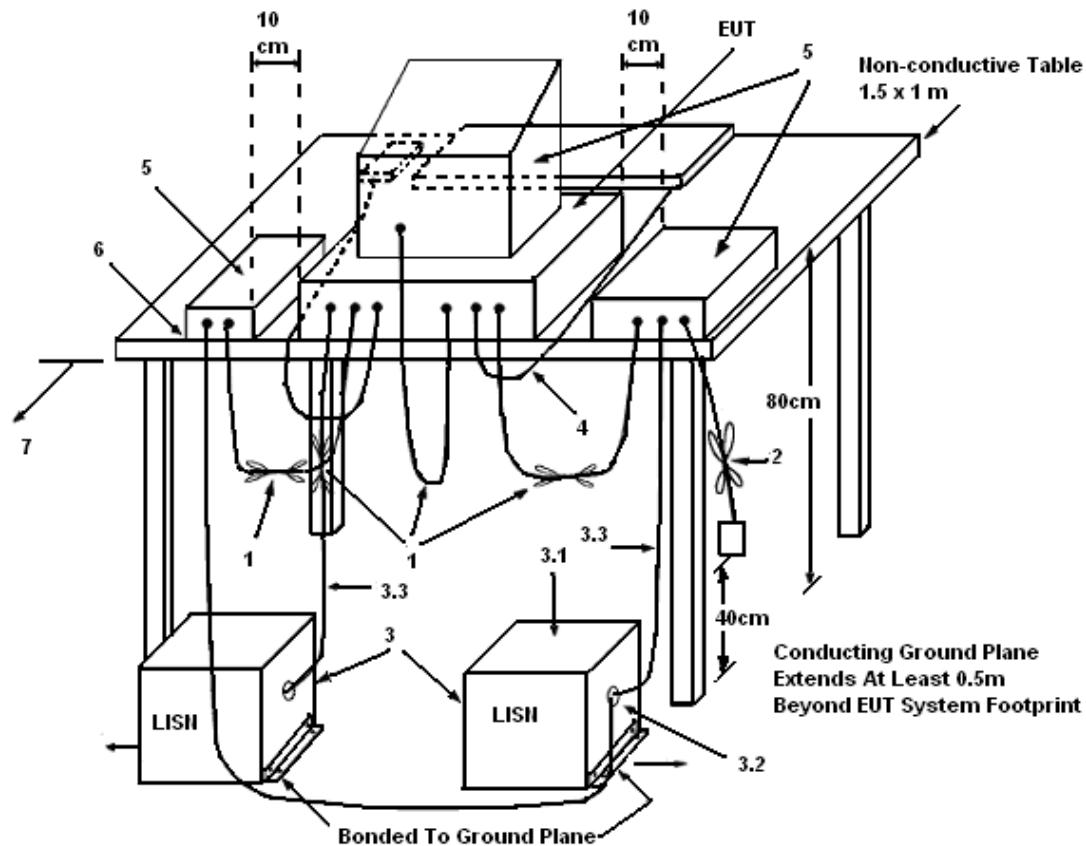
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

3.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 KHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

3.1.4. Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω . LISN can be placed on top of, or immediately beneath, reference ground plane.
 - (3.1) All other equipment powered from additional LISN(s).
 - (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
 - (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

3.1.5. Test Deviation

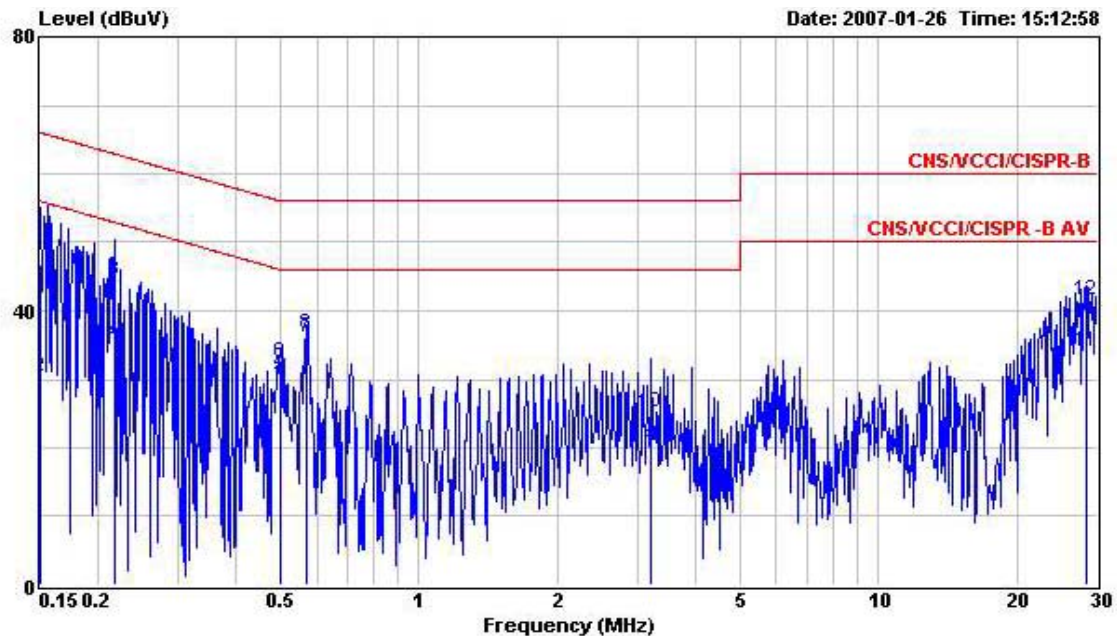
There is no deviation with the original standard.

3.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

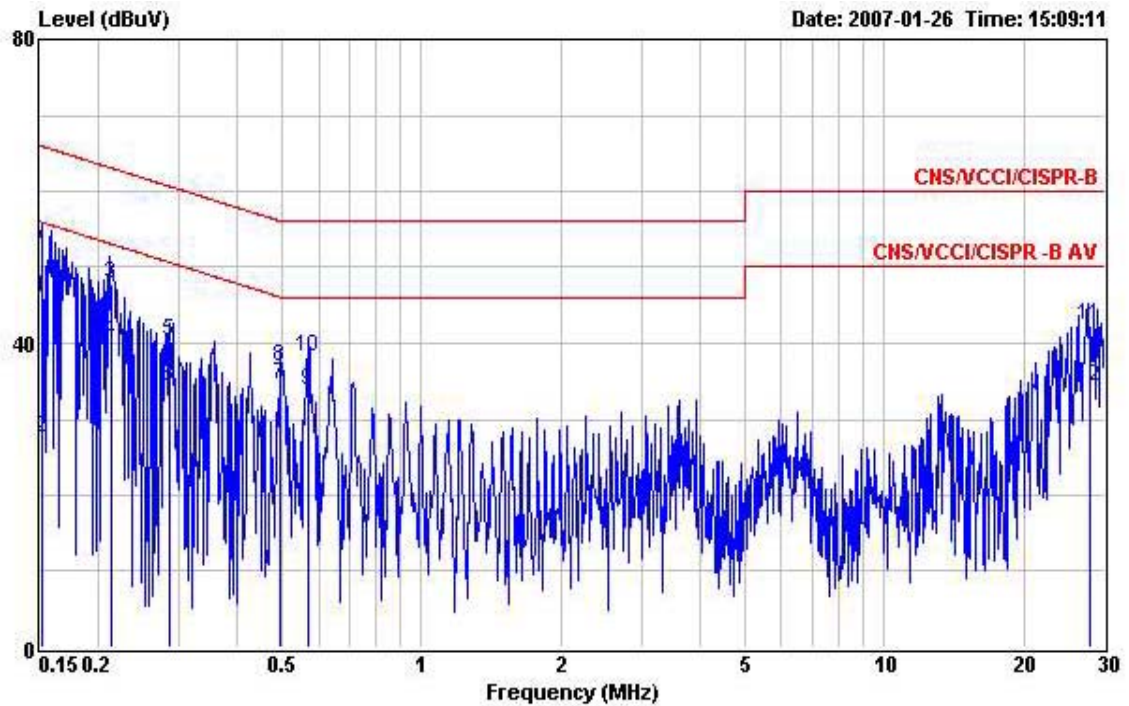
3.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24	Humidity	51%
Test Engineer	James	Phase	Line
Configuration	Mode 4		



	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	46.64	-19.36	66.00	46.49	0.10	0.05	QP
2	0.150	30.43	-25.57	56.00	30.28	0.10	0.05	Average
3	0.217	44.41	-18.52	62.93	44.27	0.10	0.04	QP
4	0.217	35.21	-17.72	52.93	35.07	0.10	0.04	Average
5	0.499	30.37	-15.64	46.01	30.20	0.10	0.07	Average
6	0.499	32.34	-23.67	56.01	32.17	0.10	0.07	QP
7	0.570	36.10	-9.90	46.00	35.92	0.10	0.08	Average
8	0.570	36.70	-19.30	56.00	36.52	0.10	0.08	QP
9	3.210	20.72	-25.28	46.00	20.48	0.17	0.07	Average
10	3.210	25.29	-30.71	56.00	25.05	0.17	0.07	QP
11	28.408	34.12	-15.88	50.00	33.40	0.57	0.15	Average
12	28.408	41.55	-18.45	60.00	40.83	0.57	0.15	QP

Temperature	24	Humidity	51%
Test Engineer	James	Phase	Neutral
Configuration	Mode 4		



	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.151	45.94	-20.00	65.94	45.79	0.10	0.05	QP
2	0.151	27.66	-28.28	55.94	27.51	0.10	0.05	Average
3	0.213	47.70	-15.39	63.09	47.56	0.10	0.04	QP
4	0.213	40.14	-12.95	53.09	40.00	0.10	0.04	Average
5	0.286	40.32	-20.32	60.64	40.17	0.10	0.05	QP
6	0.286	34.20	-16.44	50.64	34.05	0.10	0.05	Average
7	0.497	34.46	-11.59	46.05	34.29	0.10	0.07	Average
8	0.497	36.88	-19.17	56.05	36.71	0.10	0.07	QP
9	0.568	33.81	-12.19	46.00	33.63	0.10	0.08	Average
10	0.568	38.28	-17.72	56.00	38.10	0.10	0.08	QP
11	27.965	42.35	-17.65	60.00	41.51	0.69	0.15	QP
12	27.965	34.41	-15.59	50.00	33.57	0.69	0.15	Average

Note:

Level = Read Level + LISN Factor + Cable Loss.

3.2. 99% Occupied Bandwidth Measurement

3.2.1. Limit

No restriction limits. But resolution bandwidth within band edge measurement is 1% of the 99% occupied bandwidth.

3.2.2. Measuring Instruments and Setting

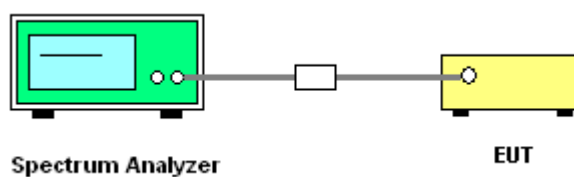
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 26dB Bandwidth
RB	300 kHz
VB	1000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 300 kHz and the video bandwidth of 1000 kHz were used.
3. Measured the spectrum width with power higher than 26dB below carrier.

3.2.4. Test Setup Layout



3.2.5. Test Deviation

There is no deviation with the original standard.

3.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

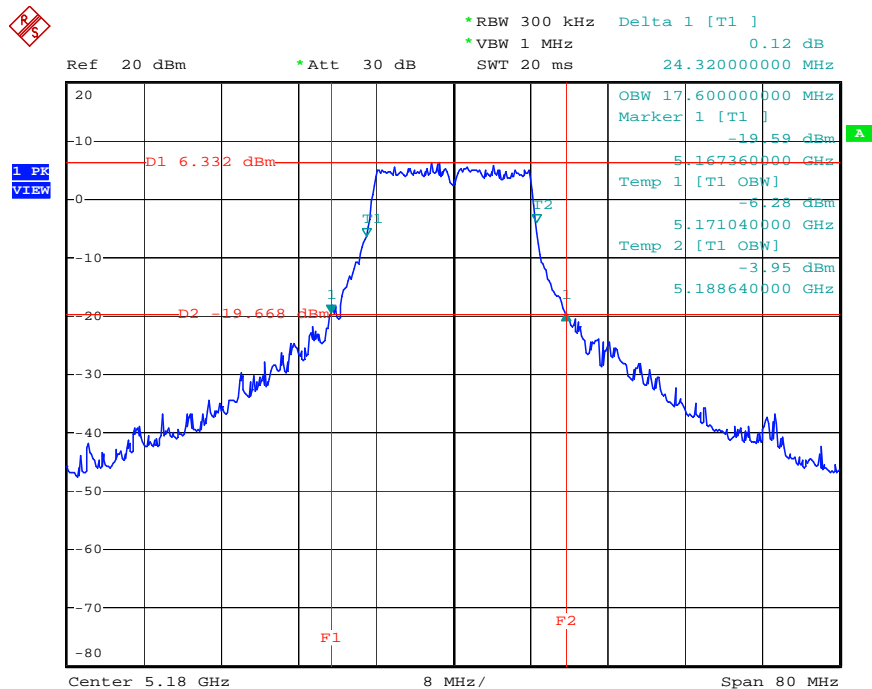
3.2.7. Test Result of 99% Occupied Bandwidth

Temperature	26.8	Humidity	54%
Test Engineer	Murphy Lin	Configurations	802.11a

Configuration IEEE 802.11a

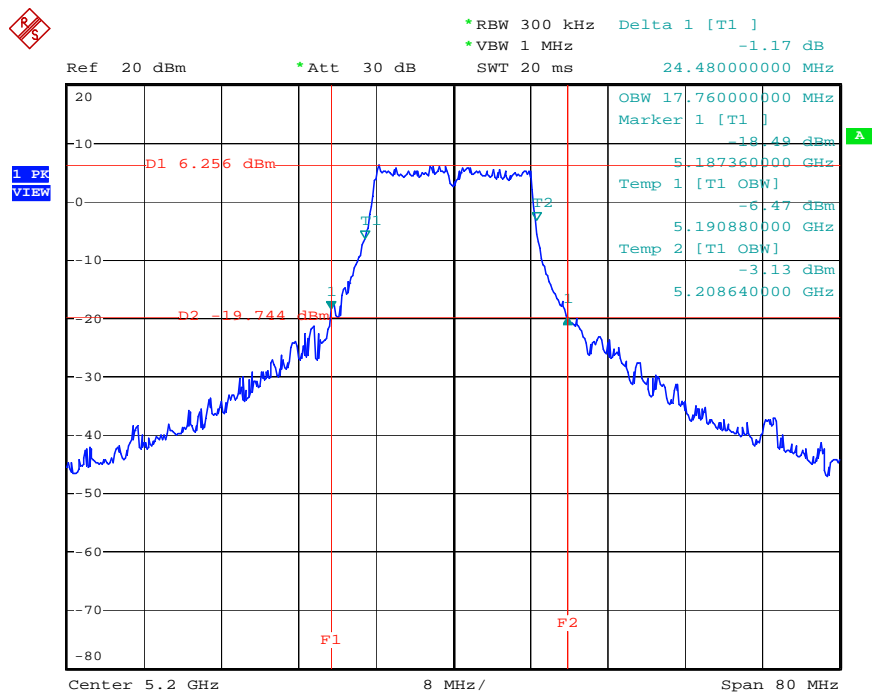
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	24.32	17.60
40	5200 MHz	24.48	17.76
48	5240 MHz	24.32	17.60

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5180 MHz



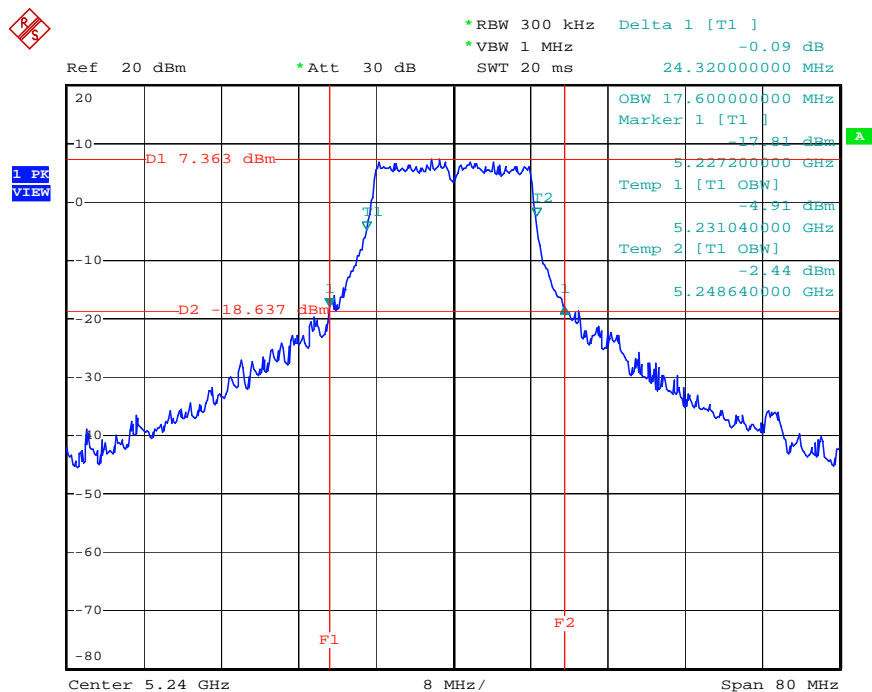
Date: 5.FEB.2007 19:15:54

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5200 MHz



Date: 5.FEB.2007 19:17:35

26 dB Bandwidth Plot on Configuration IEEE 802.11a / 5240 MHz



Date: 5.FEB.2007 19:18:38

3.3. Maximum Conducted Output Power Measurement

3.3.1. Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W (30dBm) or 17 dBm + 10log B. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power and power density from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power and peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required.

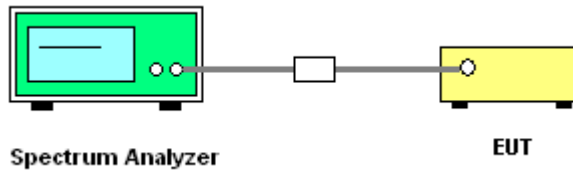
3.3.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	300 kHz
Detector	Sample ; 100 times
Trace	Max Hold

3.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with method #1 of FCC Public Notice DA-02-2138.

3.3.4. Test Setup Layout**3.3.5. Test Deviation**

There is no deviation with the original standard.

3.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

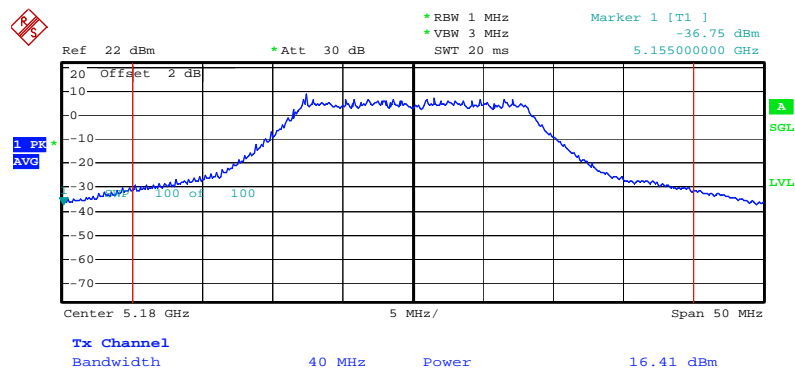
3.3.7. Test Result of Maximum Conducted Output Power

Temperature	26.8	Humidity	54%
Test Engineer	Murphy Lin	Configurations	802.11a

Configuration IEEE 802.11a

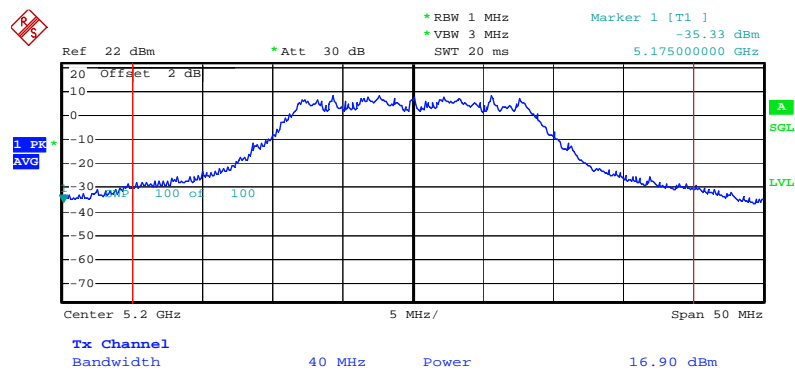
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	16.41	17.00	Complies
40	5200 MHz	16.90	17.00	Complies
48	5240 MHz	16.93	17.00	Complies

Channel Output Power Plot on Configuration IEEE 802.11a / 5180 MHz



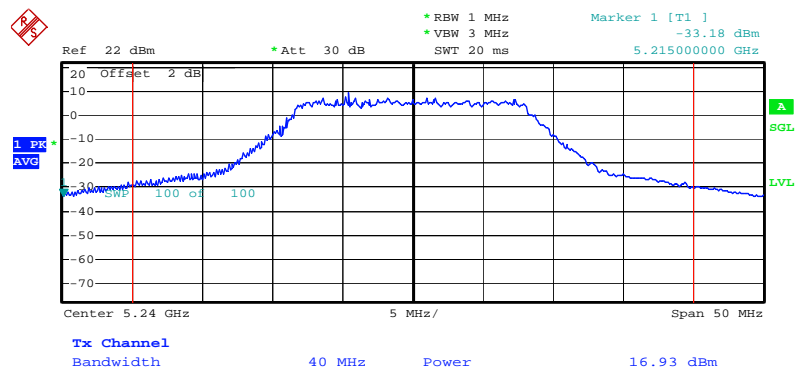
Date: 13.MAR.2007 09:46:35

Channel Output Power Plot on Configuration IEEE 802.11a / 5200 MHz



Date: 13.MAR.2007 09:53:42

Channel Output Power Plot on Configuration IEEE 802.11a / 5240 MHz



Date: 13.MAR.2007 09:55:01

3.4. Power Spectral Density Measurement

3.4.1. Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 3.3.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5.725-5.825	17

3.4.2. Measuring Instruments and Setting

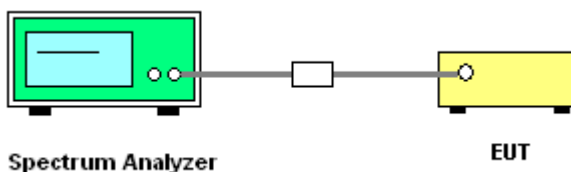
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	3000 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 3000kHz. Set Detector to Peak, Trace to Max Hold. Mark the frequency with maximum peak power as the center of the display of the spectrum.

3.4.4. Test Setup Layout



3.4.5. Test Deviation

There is no deviation with the original standard.

3.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

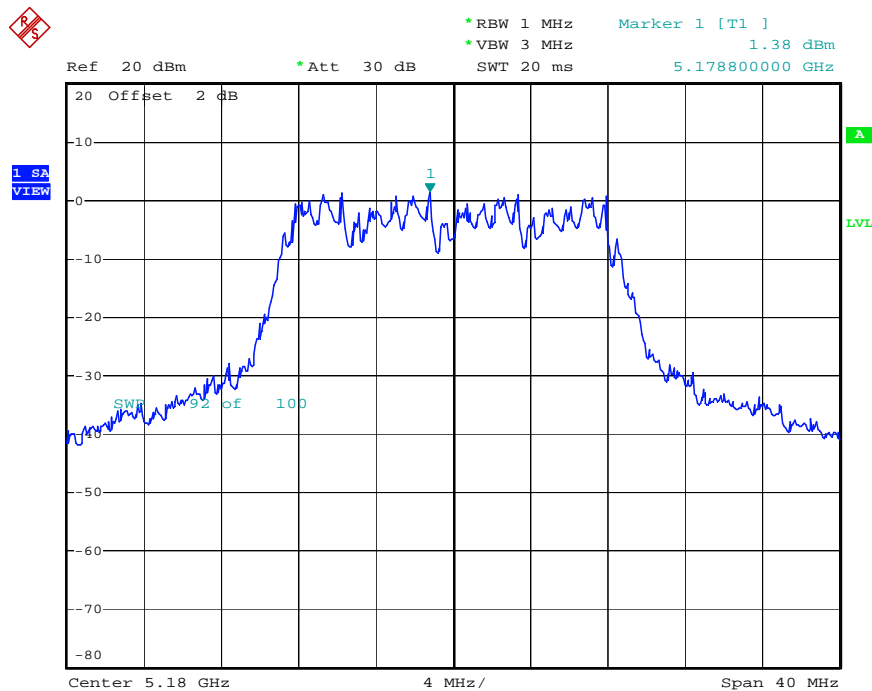
3.4.7. Test Result of Power Spectral Density

Temperature	26.8	Humidity	54%
Test Engineer	Murphy Lin	Configurations	802.11a

Configuration IEEE 802.11a

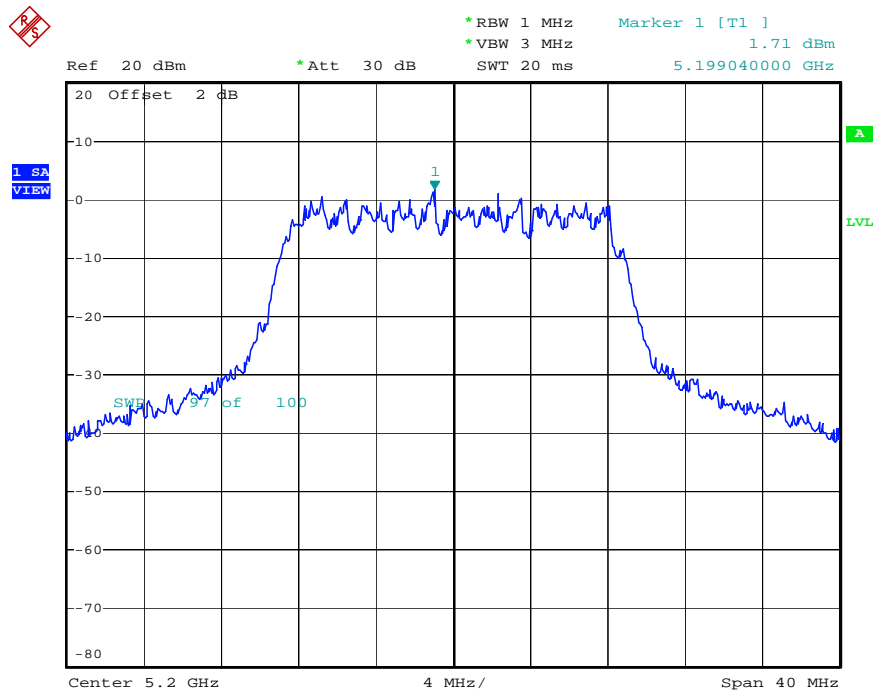
Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
5180 MHz	1.38	4.00	Complies
5200 MHz	1.71	4.00	Complies
5240 MHz	3.29	4.00	Complies

Power Density Plot on Configuration IEEE 802.11a / 5180 MHz



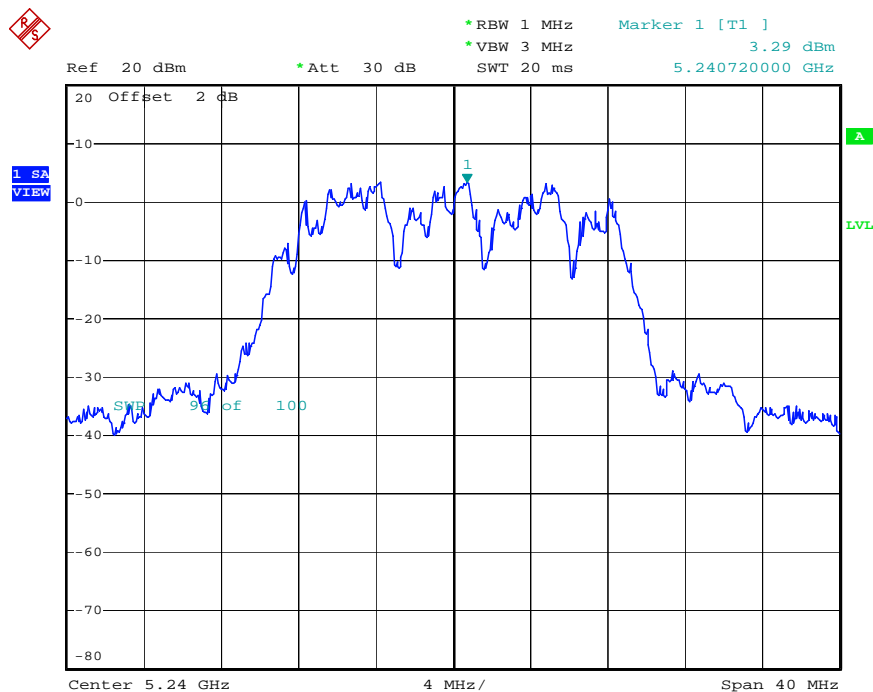
Date: 5.FEB.2007 19:16:01

Power Density Plot on Configuration IEEE 802.11a / 5200 MHz



Date: 5.FEB.2007 19:17:42

Power Density Plot on Configuration IEEE 802.11a / 5240 MHz



Date: 5.FEB.2007 19:18:44

3.5. Peak Excursion Measurement

3.5.1. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emissions bandwidth whichever is less.

3.5.2. Measuring Instruments and Setting

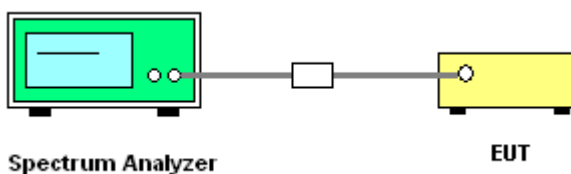
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz (Peak Trace) / 1000 kHz (Average Trace)
VB	3000 kHz (Peak Trace) / 300 kHz (Average Trace)
Detector	Peak (Peak Trace) / Sample (Average Trace)
Trace	Max Hold
Sweep Time	60s

3.5.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emissions bandwidth. The largest difference between the following two traces (Peak Trace and Average Trace) must be ≤ 13 dB for all frequencies across the emissions bandwidth. Submit a plot.
3. Peak Trace: Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and max-hold settings.
4. Average Trace: Method #3—video averaging with max hold—and sum power across the band. Set span to encompass the entire emissions bandwidth (EBW) of the signal. Set sweep trigger to “free run”. Set RBW = 1 MHz. Set VBW $\geq 1/T$ (IEEE 802.11a VBW = 300kHz $\geq 1/4 \mu$ s). Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode. Set max hold. Allow max hold to run for 60 seconds.

3.5.4. Test Setup Layout



3.5.5. Test Deviation

There is no deviation with the original standard.

3.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

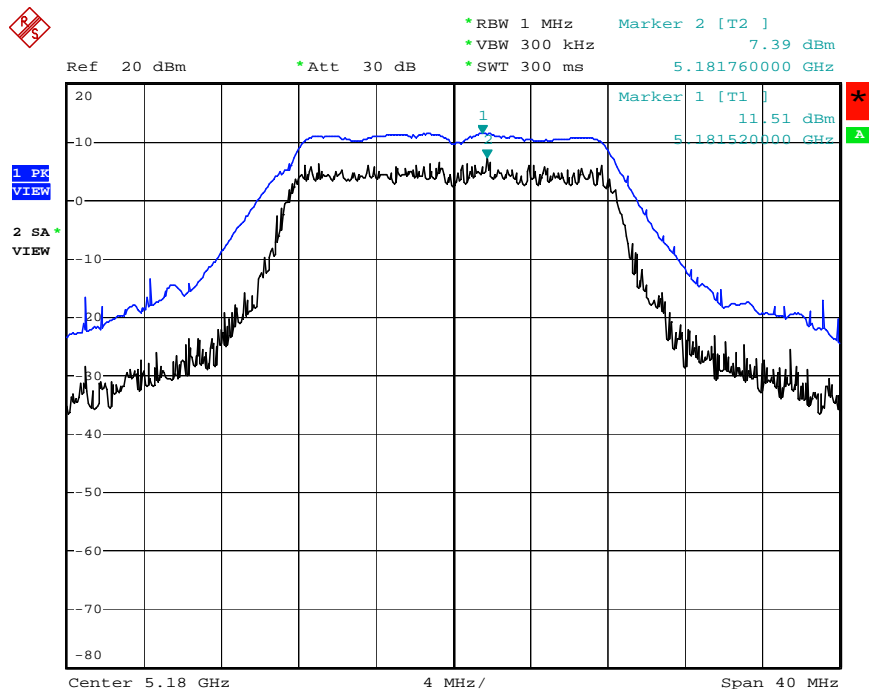
3.5.7. Test Result of Peak Excursion

Temperature	26.8	Humidity	54%
Test Engineer	Murphy Lin	Configurations	802.11a

Configuration IEEE 802.11a

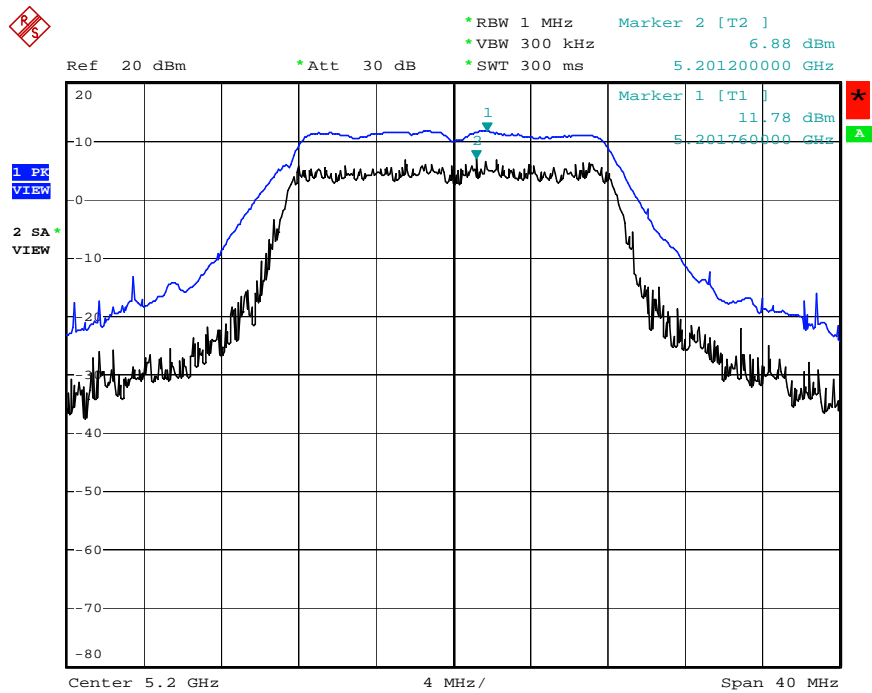
Frequency	Peak Excursion (dBm)	Max. Limit (dBm)	Result
5180 MHz	4.12	13	Complies
5200 MHz	4.90	13	Complies
5240 MHz	4.38	13	Complies

Peak Excursion Plot on Configuration IEEE 802.11a / 5180 MHz



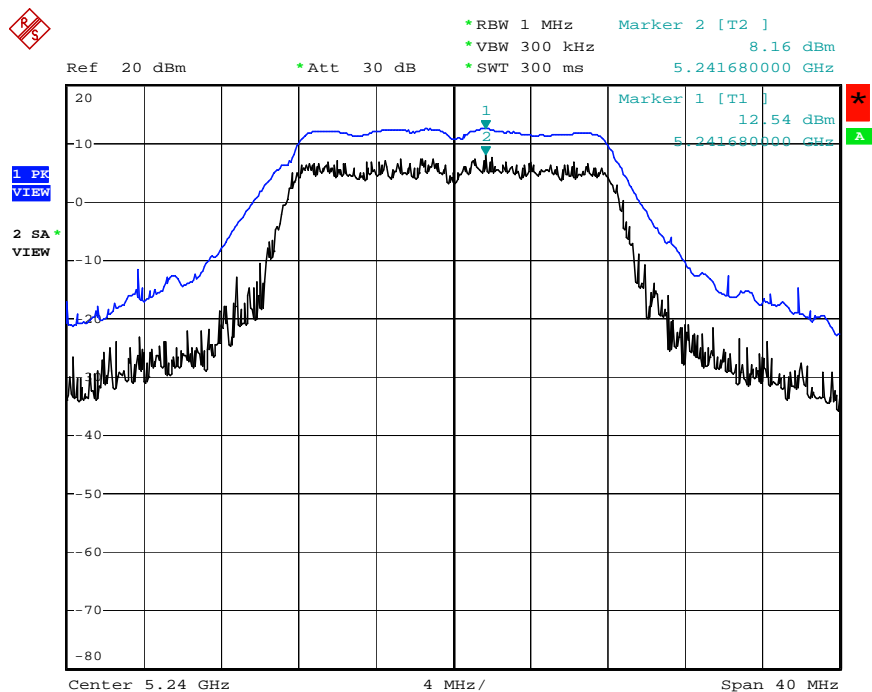
Date: 5.FEB.2007 19:16:23

Peak Excursion Plot on Configuration IEEE 802.11a / 5200 MHz



Date: 5.FEB.2007 19:18:04

Peak Excursion Plot on Configuration IEEE 802.11a / 5240 MHz



Date: 5.FEB.2007 19:19:06

3.6. Radiated Emissions Measurement

3.6.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

3.6.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1000KHz / 1000KHz for peak

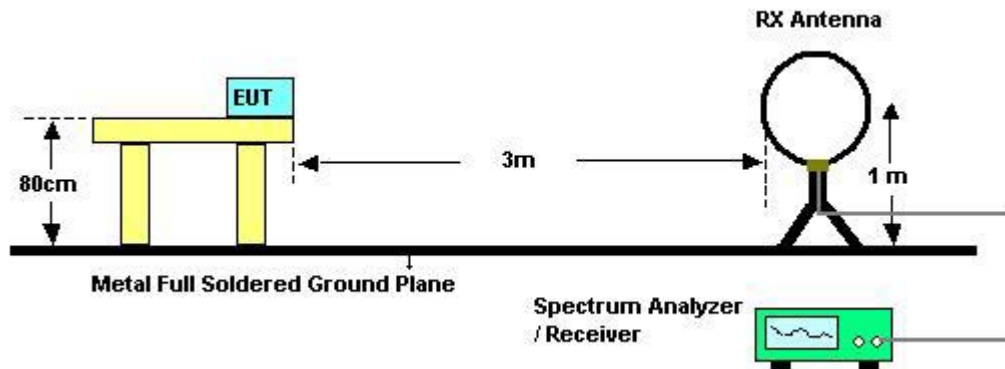
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.6.3. Test Procedures

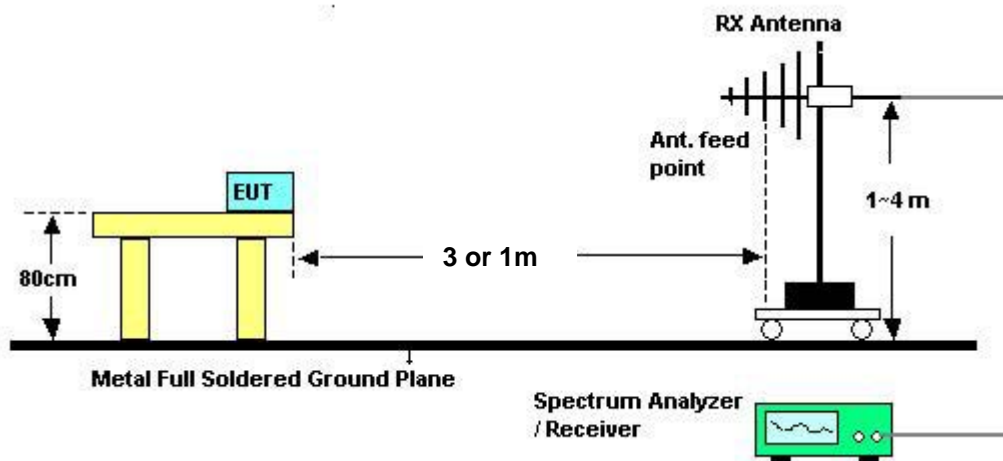
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.6.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = $20 \log (\text{specific distance [3m]} / \text{test distance [1m]})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.6.5. Test Deviation

There is no deviation with the original standard.

3.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.6.7. Results of Radiated Emissions (9kHz~30MHz)

Temperature	24	Humidity	52%
Test Engineer	Vic Hsiao		

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

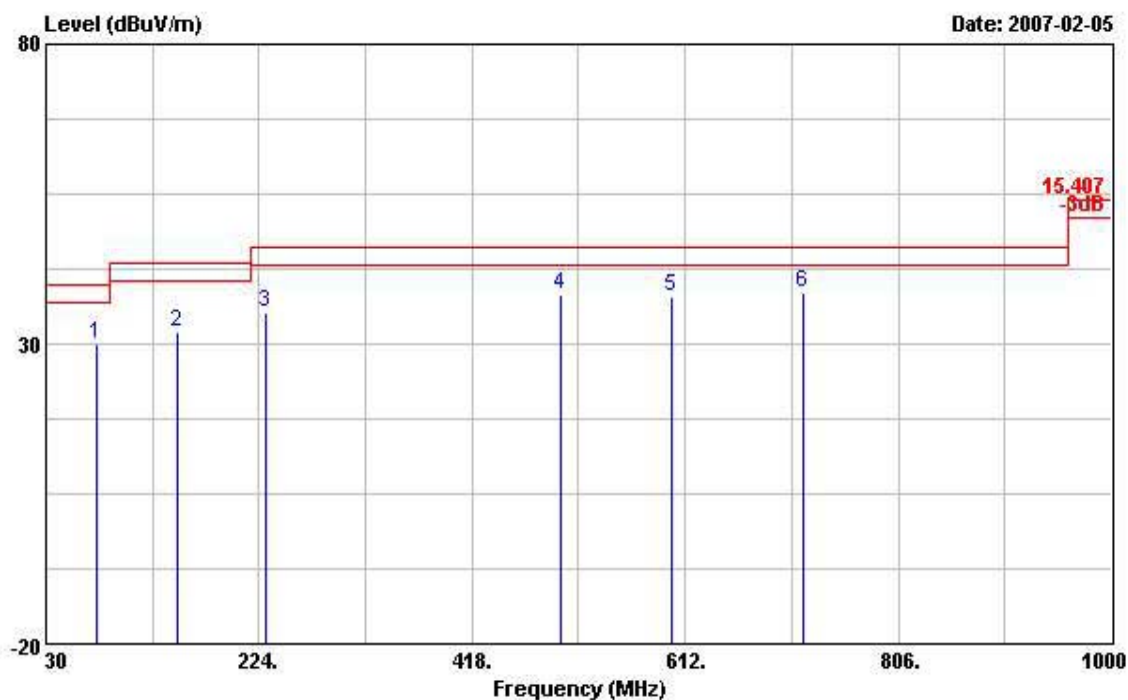
The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

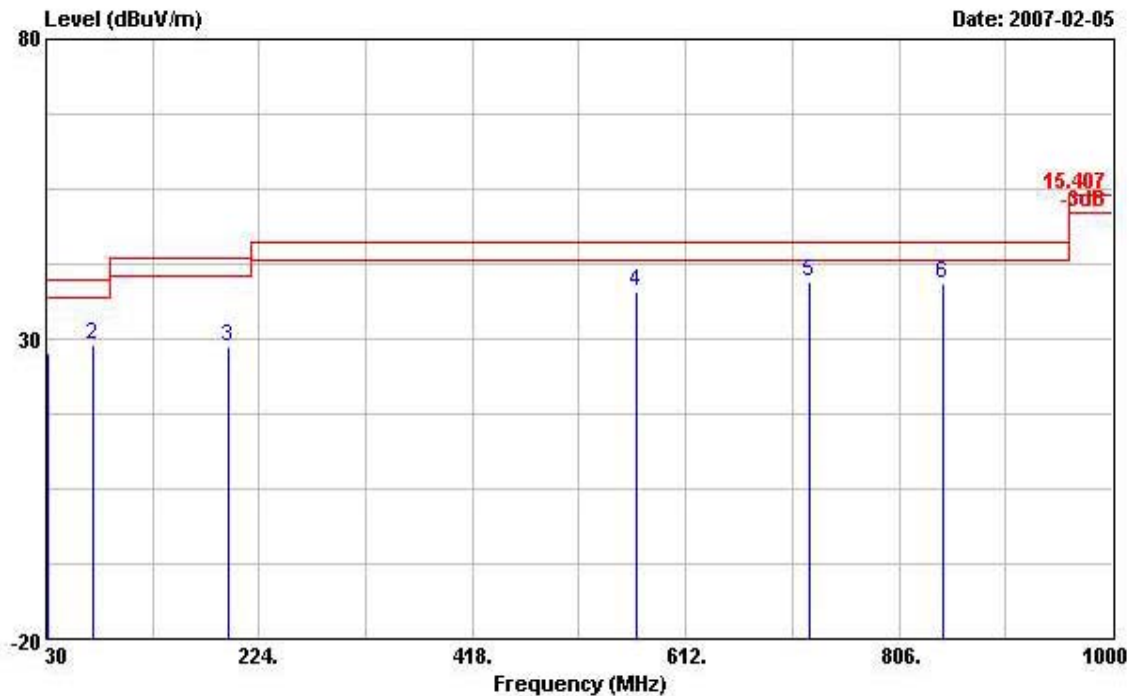
3.6.8. Results of Radiated Emissions (30MHz~1GHz)

Temperature	24	Humidity	52%
Test Engineer	Vic Hsiao	Configurations	802.11a Ch 40

Horizontal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	75.640	30.03	-9.97	40.00	52.27	6.68	1.37	30.28	Peak	---	---
2	150.020	32.13	-11.37	43.50	50.14	10.50	1.80	30.31	Peak	---	---
3	230.000	35.24	-10.76	46.00	52.77	10.35	2.44	30.33	Peak	---	---
4	498.480	38.28	-7.72	46.00	46.58	18.09	3.81	30.21	Peak	---	---
5	599.560	38.02	-7.98	46.00	44.33	19.30	4.47	30.07	Peak	---	---
6 @	720.140	38.44	-7.56	46.00	43.42	20.27	4.71	29.96	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	32.020	27.55	-12.45	40.00	40.15	17.30	0.33	30.24	Peak	---	---
2	72.480	28.99	-11.01	40.00	51.56	6.33	1.37	30.27	Peak	---	---
3	196.120	28.84	-14.66	43.50	47.25	9.51	2.31	30.23	Peak	---	---
4	567.380	38.01	-7.99	46.00	44.65	19.30	4.19	30.14	Peak	---	---
5 @	724.560	39.65	-6.35	46.00	44.56	20.33	4.73	29.96	Peak	---	---
6 @	846.740	39.20	-6.80	46.00	42.98	20.83	5.40	30.01	Peak	---	---

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

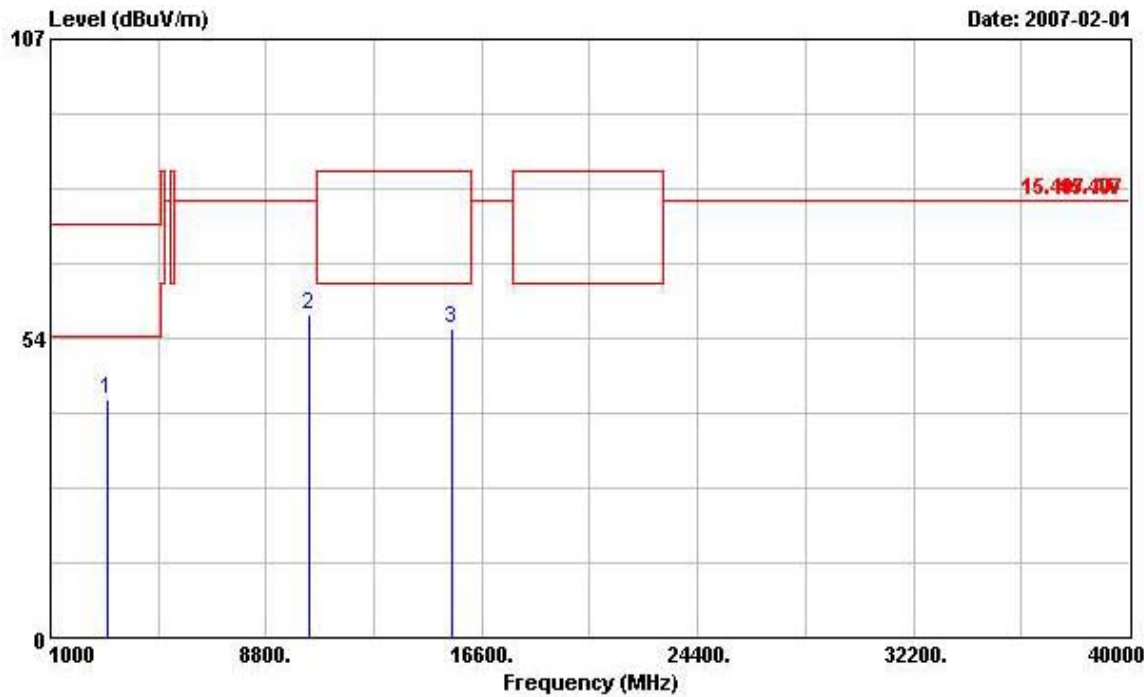
Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.6.9. Results for Radiated Emissions (1GHz~40GHz)

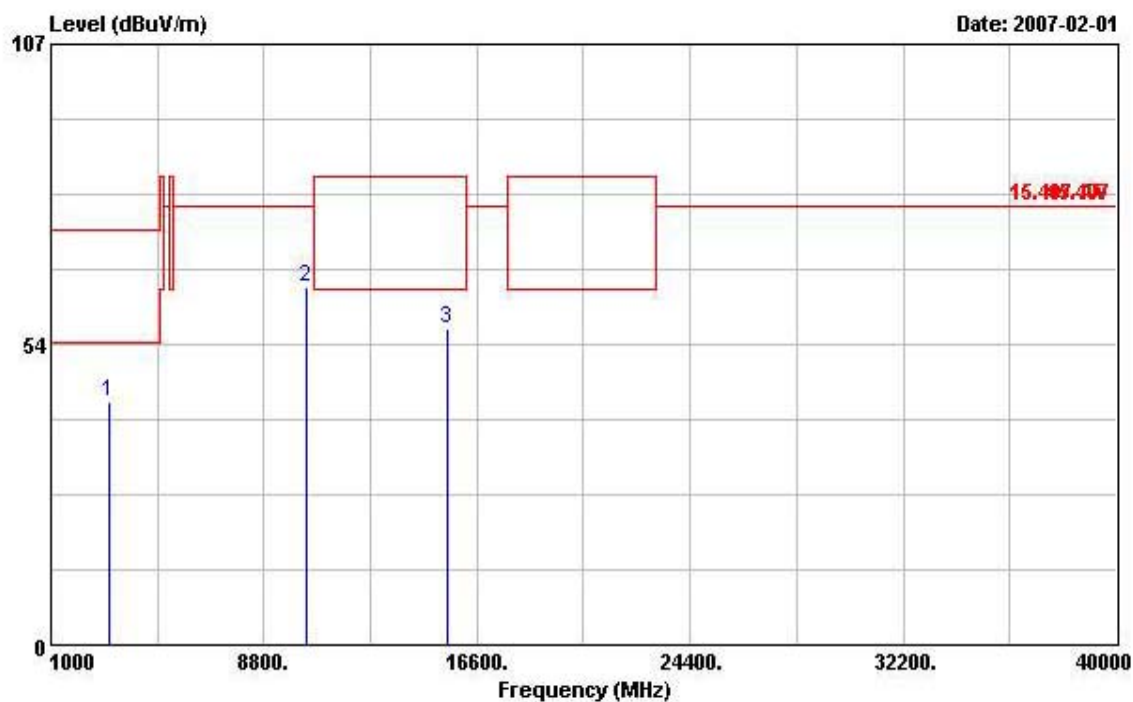
Temperature	24	Humidity	52%
Test Engineer	Vic Hsiao	Configurations	802.11a Ch 36

Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	3090.000	42.43	-31.57	74.00	42.94	30.21	2.00	32.71	PEAK	---
2 @	10356.000	57.83	-20.47	78.30	46.58	38.85	4.87	32.48	PEAK	---
3	15536.000	55.37	-28.13	83.50	45.12	37.75	5.11	32.62	PEAK	---

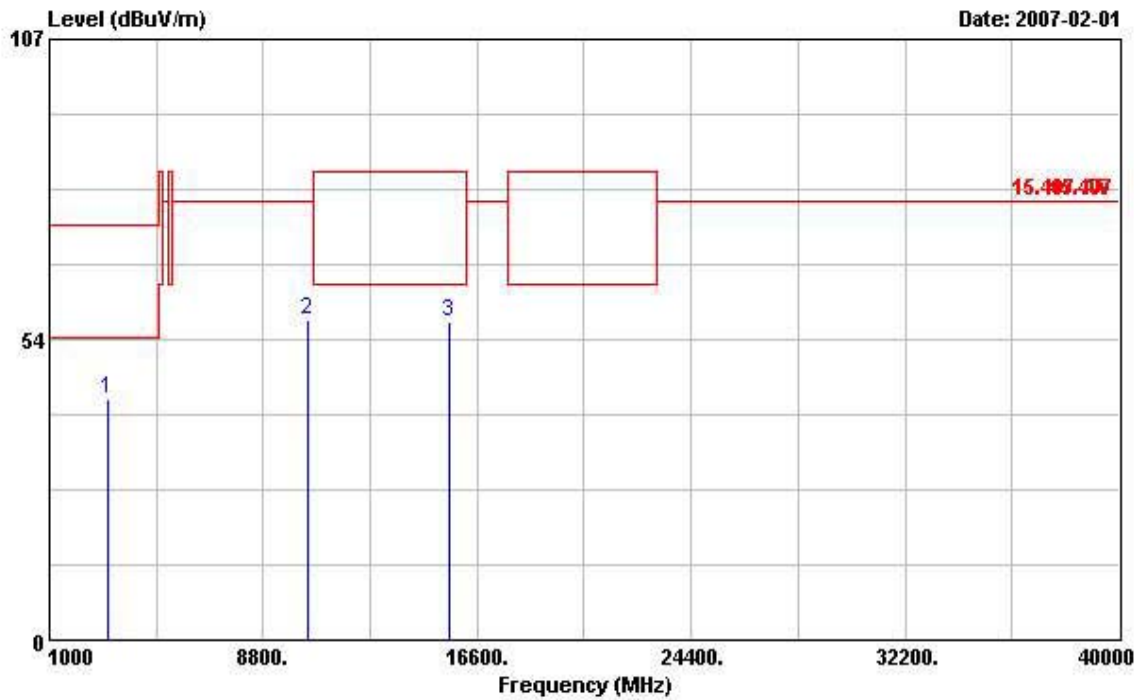
Vertical



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	3165.000	43.13	-30.87	74.00	43.44	30.37	2.02	32.71	PEAK	---	---
2 @	10364.000	63.82	-14.48	78.30	52.58	38.83	4.87	32.48	PEAK	---	---
3	15544.000	56.19	-27.31	83.50	45.96	37.73	5.11	32.62	PEAK	---	---

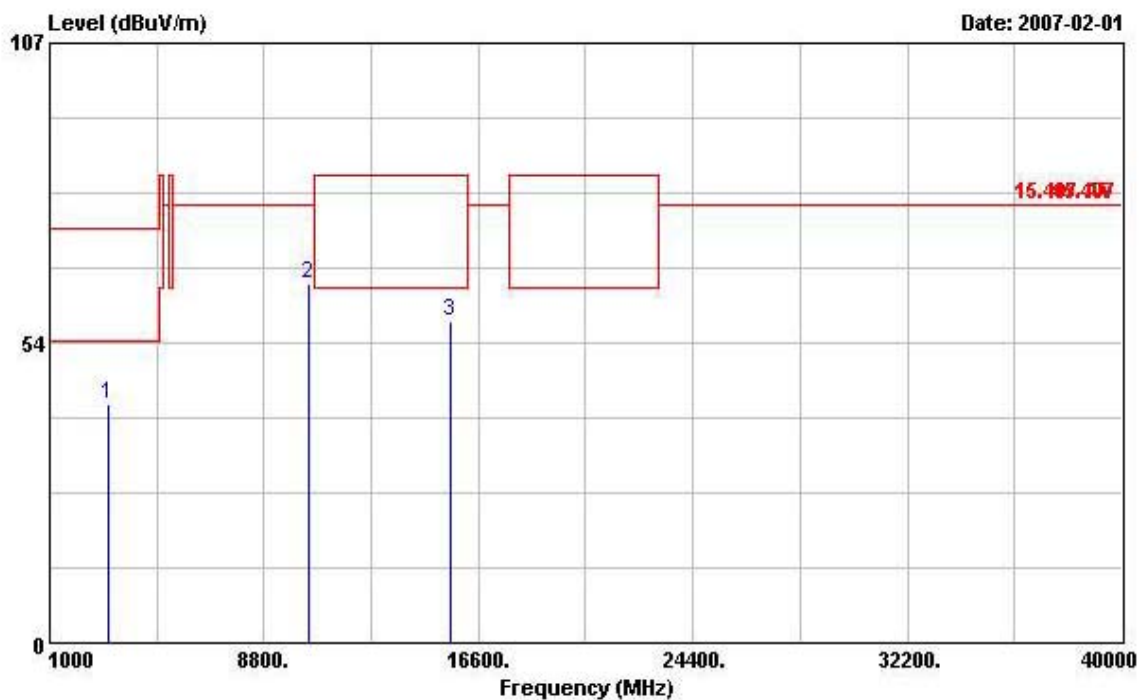
Temperature	24	Humidity	52%
Test Engineer	Vic Hsiao	Configurations	802.11a Ch 40

Horizontal



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	3162.000	42.98	-31.02	74.00	43.29	30.37	2.02	32.71 PEAK	---	---
2 @	10404.000	57.14	-21.16	78.30	45.88	38.80	4.89	32.43 PEAK	---	---
3	15600.000	56.56	-26.94	83.50	46.41	37.66	5.14	32.63 PEAK	---	---

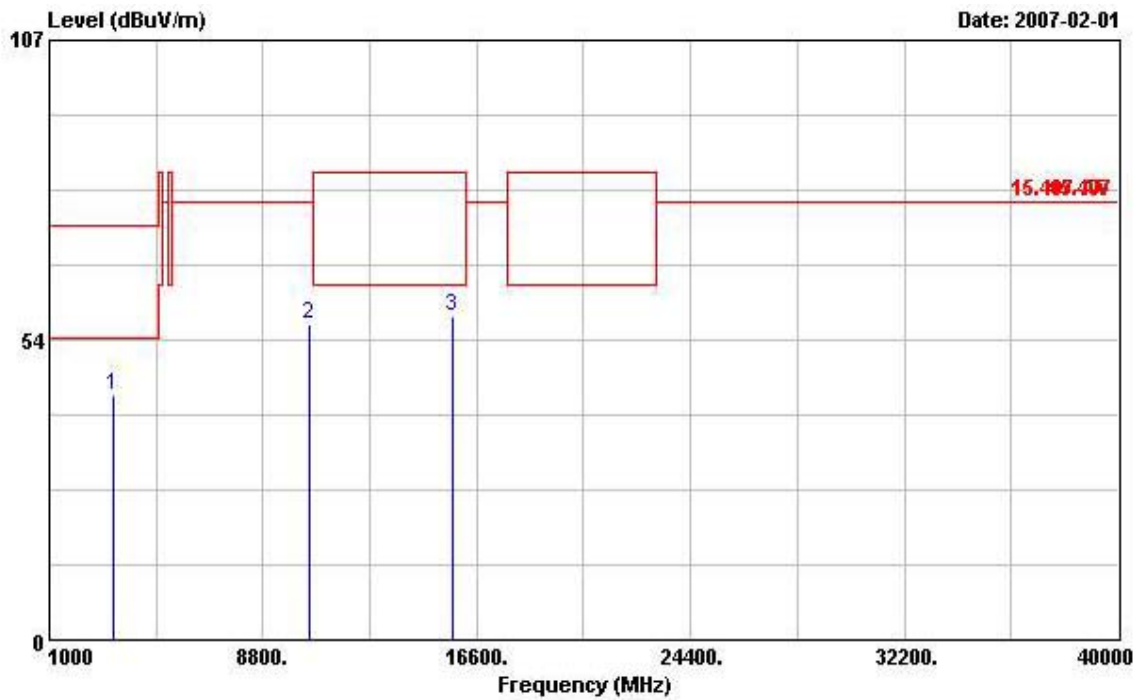
Vertical



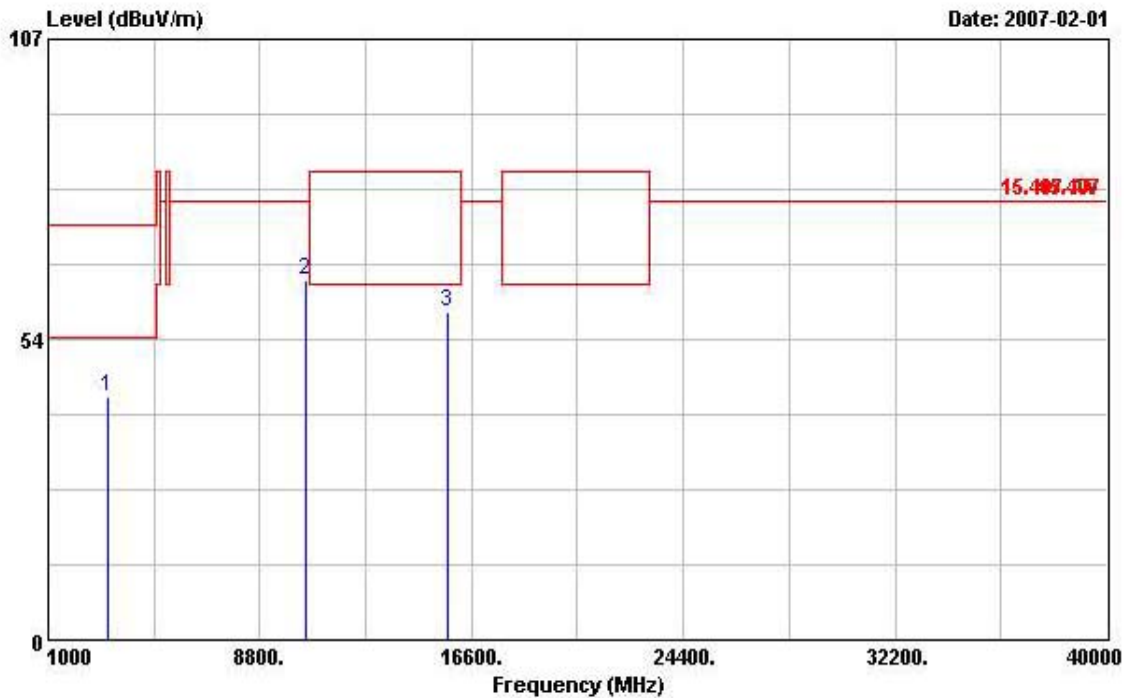
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	3117.000	42.59	-31.41	74.00	43.01	30.29	2.00	32.71 PEAK	---	---
2 @	10404.000	63.96	-14.34	78.30	52.70	38.80	4.89	32.43 PEAK	---	---
3	15596.000	57.20	-26.30	83.50	47.03	37.66	5.14	32.63 PEAK	---	---

Temperature	24	Humidity	52%
Test Engineer	Vic Hsiao	Configurations	802.11a Channel 48

Horizontal



	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	3327.000	43.81	-30.19	74.00	43.66	30.79	2.07	32.70 PEAK	---	---
2 @	10480.000	56.32	-21.98	78.30	45.04	38.72	4.93	32.36 PEAK	---	---
3	15720.000	57.66	-25.84	83.50	47.63	37.49	5.20	32.66 PEAK	---	---

Vertical

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	3171.000	43.31	-30.69	74.00	43.59	30.41	2.02	32.71	PEAK	---
2 @	10484.000	64.04	-14.26	78.30	52.76	38.72	4.93	32.36	PEAK	---
3	15716.000	58.59	-24.91	83.50	48.56	37.49	5.20	32.66	PEAK	---

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.7. Band Edge Emissions Measurement

3.7.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/m at 3m). In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

3.7.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1 MHz / 1 MHz for Peak

3.7.3. Test Procedures

1. The test procedure is the same as section 3.6.3, only the frequency range investigated is limited to 100MHz around bandedges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

3.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 3.6.4.

3.7.5. Test Deviation

There is no deviation with the original standard.

3.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	20	Humidity	70%
Test Engineer	Ted Chiu	Configurations	802.11a Channel 36, 48

Channel 36

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	5147.000	79.60	-3.90	83.50	43.13	33.64	2.83	0.00 Peak	---	---
2 @	5173.000	120.17			83.68	33.67	2.83	0.00 Peak	---	---
1 @	5149.900	61.73	-1.77	63.50	25.26	33.64	2.83	0.00 Average	---	---
2 @	5173.000	110.12			73.63	33.67	2.83	0.00 Average	---	---

Channel 48

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
2 @	5242.000	120.54			83.87	33.80	2.87	0.00 Peak	---	---
3 @	5360.080	68.86	-14.64	83.50	31.97	33.96	2.93	0.00 Peak	---	---
2 @	5242.000	110.66			73.99	33.80	2.87	0.00 Average	---	---
3 @	5360.080	55.90	-7.60	63.50	19.01	33.96	2.93	0.00 Average	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.8. Frequency Stability Measurement

3.8.1. Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emissions is maintained within the band of operation under all conditions of normal operation as specified in the user's manual or $\pm 20\text{ppm}$ (IEEE 802.11a specification).

3.8.2. Measuring Instruments and Setting

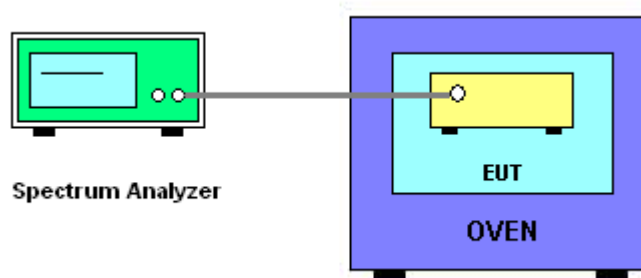
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	10 kHz
VB	10 kHz
Sweep Time	Auto

3.8.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f)/f_c \times 10^6$ ppm and the limit is less than $\pm 20\text{ppm}$ (IEEE 802.11a specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is $-30^\circ\text{C} \sim 50^\circ\text{C}$.

3.8.4. Test Setup Layout



3.8.5. Test Deviation

There is no deviation with the original standard.

3.8.6. EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

3.8.7. Test Result of Frequency Stability**Voltage vs. Frequency Stability**

Voltage	Measurement Frequency (MHz)
(V)	5240 MHz
126.50	5239.9852
110.00	5239.9848
93.50	5239.9850
Max. Deviation (MHz)	0.0152
Max. Deviation (ppm)	2.9008

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
()	5240 MHz
-20	5239.9862
-10	5239.9858
0	5239.9856
10	5239.9852
20	5239.9850
30	5239.9912
40	5239.9918
50	5239.9950
Max. Deviation (MHz)	0.0150
Max. Deviation (ppm)	2.8626

3.9. Antenna Requirements

3.9.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

3.9.2. Antenna Connector Construction

Please refer to section 2.3 in this test report; antenna connector complied with the requirements.

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9kHz – 2.75GHz	July. 04, 2006	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/004	9kHz – 30MHz	Apr. 28, 2006	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9kHz – 30MHz	Apr. 19, 2006	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 – 60Hz	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9kHz – 30MHz	Dec. 21, 2006	Conduction (CO01-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 15, 2006	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	CPA9231A	1886	9 kHz - 2 GHz	Jan. 22, 2007	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	May 29, 2006	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004/040	9 kHz - 40 GHz	Sep. 21, 2006	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 24, 2006	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 27, 2006	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	NCR	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz - 1 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 02, 2006	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 – 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP30	100023	9kHz ~ 30GHz	Dec. 17, 2006	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100764	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 40GHz	Jul. 20, 2006	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 10, 2006	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 03, 2007	Conducted (TH01-HY)
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 02, 2006	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2006	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2006	Conducted (TH01-HY)
Oscilloscope	Tektronix	TDS1012	CO38515	100MHz / 1GS/s	Jun. 20, 2006	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 07, 2007	Conducted (TH01-HY)
Data Generator	Tektronix	DG2030	063-2920-50	0.1Hz~400MHz	Jun. 16, 2006	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year. NCR: Non-Calibration required.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Apr. 21, 2005*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two year.

5. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

6. NVLAP CERTIFICATE OF ACCREDITATION

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200079-0

Sporton International, Inc. Hwa Ya EMC Laboratory
Tao Yuan Hsien 333
TAIWAN

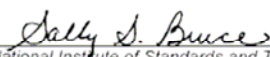
*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).*

2007-01-01 through 2007-12-31
Effective dates




For the National Institute of Standards and Technology

NVLAP-01C (REV. 2006-09-13)

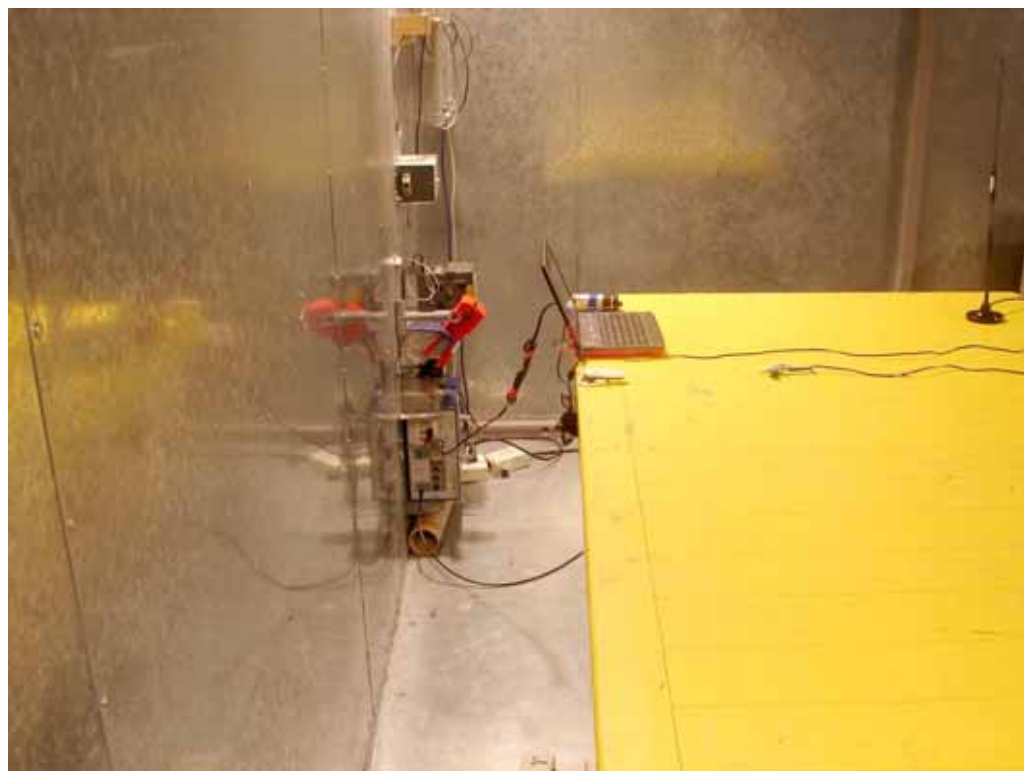
Appendix B. Test Photos

1. Photographs of Conducted Emissions Test Configuration

FRONT VIEW



REAR VIEW

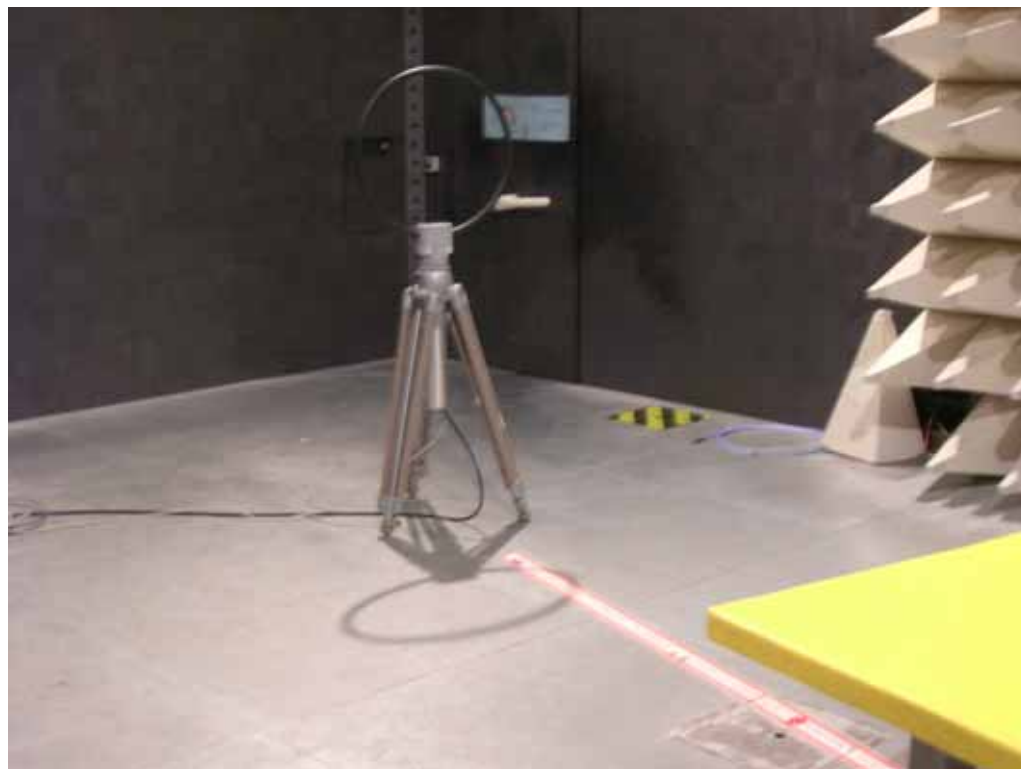


SIDE VIEW



2. Photographs of Radiated Emissions Test Configuration

FRONT VIEW



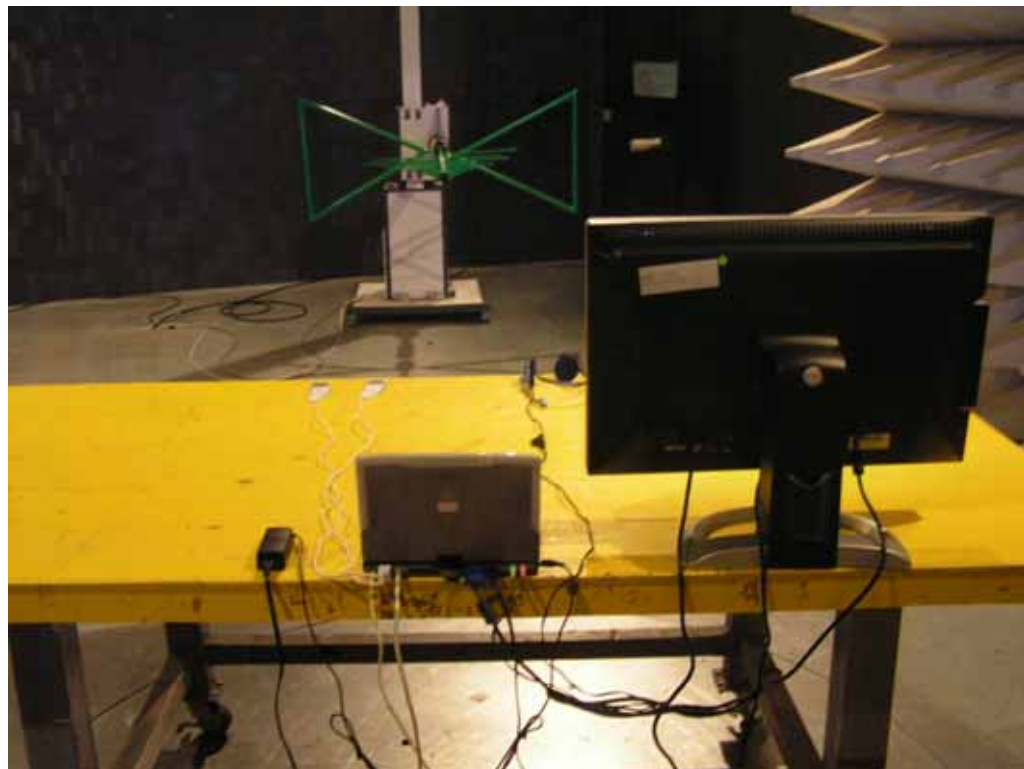
REAR VIEW



FRONT VIEW



REAR VIEW



FRONT VIEW



REAR VIEW

