SPORTON International Inc.
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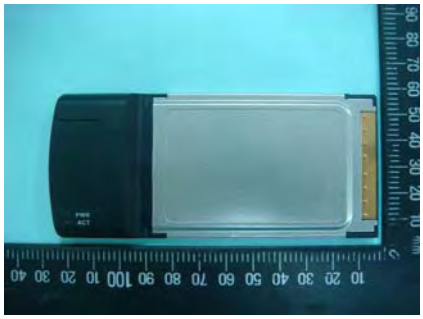
FCC RADIO TEST REPORT

Applicant's company	**Fluke Networks**
Applicant Address	6920 Seaway Boulevard Everett WA 98203, USA
FCC ID	**WA7-DNBA81**
Manufacturer's company	**Wistron NeWeb Corporation**
Manufacturer Address	No.10-1,Li-hsin Road I,Hsinchu Science Park,Hsinchu 300,Taiwan, R.O.C.

Product Name	OPTIVIEW 802.11 A/B/G/N WIRELESS NETWORK ANALYSIS OPTION
Brand Name	NETWORKSUPERVISION
Model Name	DNBA-81
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Nov. 29, 2007
Final Test Date	Dec. 22, 2007
Submission Type	Original Equipment
Operating Mode	Client (without radar detection function)



Statement

Test result included is only for the 802.11a (5150 ~ 5350MHz / 5470 ~ 5725MHz) 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.

Testing Laboratory
1190

Table of Contents

History of This Test Report

Original Issue Date: May 23, 2008

Report No.: FR7D1410-02AA

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

1. CERTIFICATE OF COMPLIANCE

Product Name	:	OPTIVIEW 802.11 A/B/G/N WIRELESS NETWORK ANALYSIS OPTION
Brand Name	:	NETWORKSUPERVISION
Model Name	:	DNBA-81
Applicant	:	Fluke Networks
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Nov. 29, 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.

Wayne Hsu

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	15.46 dB
4.2	15.407(a)	26dB Spectrum Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.20 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.72 dB
4.5	15.407(a)	Peak Excursion	Complies	7.39 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.08 dB
4.7	15.407(b)	Band Edge Emissions	Complies	3.33 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	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	$\pm 8.5 \times 10^{-8}$	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%

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (2TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	Band 1~2: 8 ; Band 3: 11
Channel Band Width (99%)	Band 1: 18.08 MHz ; Band 2: 18.08 MHz ; Band 3: 17.05 MHz
Conducted Output Power	Band 1: 16.80 dBm ; Band 2: 22.89 dBm ; Band 3: 22.08 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Single (TX)		Two (TX)	
Band width Mode	20 MHz	40 MHz	20 MHz	40 MHz
802.11a	X	X	V	X
802.11b	X	X	V	X
802.11g	X	X	V	X
Draft n	X	X	V	V

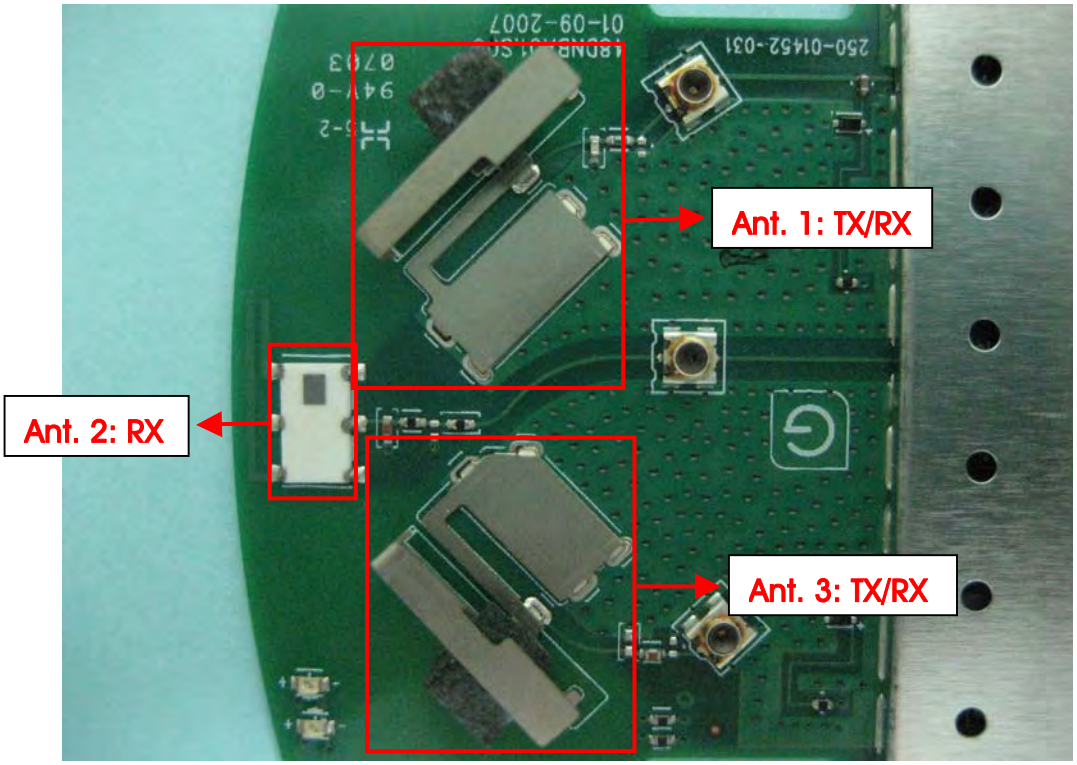
3.2. Accessories

N/A

3.3. Table for Filed Antenna

For 5GHz Band

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Remark
1	WNC	DNBA-81	PIFA Antenna	NA	4.52	TX / RX Ant.
2	WNC	DNBA-81	Chip Antenna	NA	3.68	RX Ant.
3	WNC	DNBA-81	PIFA Antenna	NA	4.52	TX / RX Ant.



3.4. Table for Carrier Frequencies

Frequency Allocation for 802.11a

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	40	5200 MHz	48	5240 MHz
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	56	5280 MHz	64	5320 MHz
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	104	5520 MHz	128	5640 MHz
	108	5540 MHz	132	5660 MHz
	112	5560 MHz	136	5680 MHz
	116	5580 MHz	140	5700 MHz
	120	5600 MHz		

3.5. 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
AC Power Conducted Emission	Normal Link	Auto
Max. Conducted Output Power	Band 1~2/BPSK	6Mbps
	Band 3/BPSK	6Mbps
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	Band 1~2/BPSK	6Mbps
Power Spectral Density Peak Excursion	Band 3/BPSK	6Mbps
Radiated Emission Below 1GHz	Normal Link	Auto
Radiated Emission Above 1GHz	Band 1~2/BPSK	6Mbps
	Band 3/BPSK	6Mbps
Band Edge Emission	Band 1~2/BPSK	6Mbps
	Band 3/BPSK	6Mbps
Frequency Stability	Un-modulation	-

3.6. 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	-
CO04-HY	Conduction	Hwa Ya	101377	IC 4088	-
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.

3.7. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D400	E2K24GBRL
Modem	ACEEX	DM1414	IFAXDM1414
Mouse	QSKY	Lx-619B	DoC
Printer	EPSON	LQ-300+	DoC
AP	PLANEX	GW-AP54SGX	DoC

3.8. 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	ART					
Frequency	5180 MHz	5260 MHz	5320 MHz	5500 MHz	5600 MHz	5700 MHz
IEEE 802.11a	12	16.5	17	17	16.5	16

An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows :

a. Turn on the power of all equipment.

b. The NB reads the test program from the SD Card and runs it.

c. The NB sends " H" messages to the panel, and the panel displays " H " patterns on the screen.

d. The NB sends " H " messages to the printer, then the printer prints them on the paper.

e. The NB sends " H " messages to the modem.

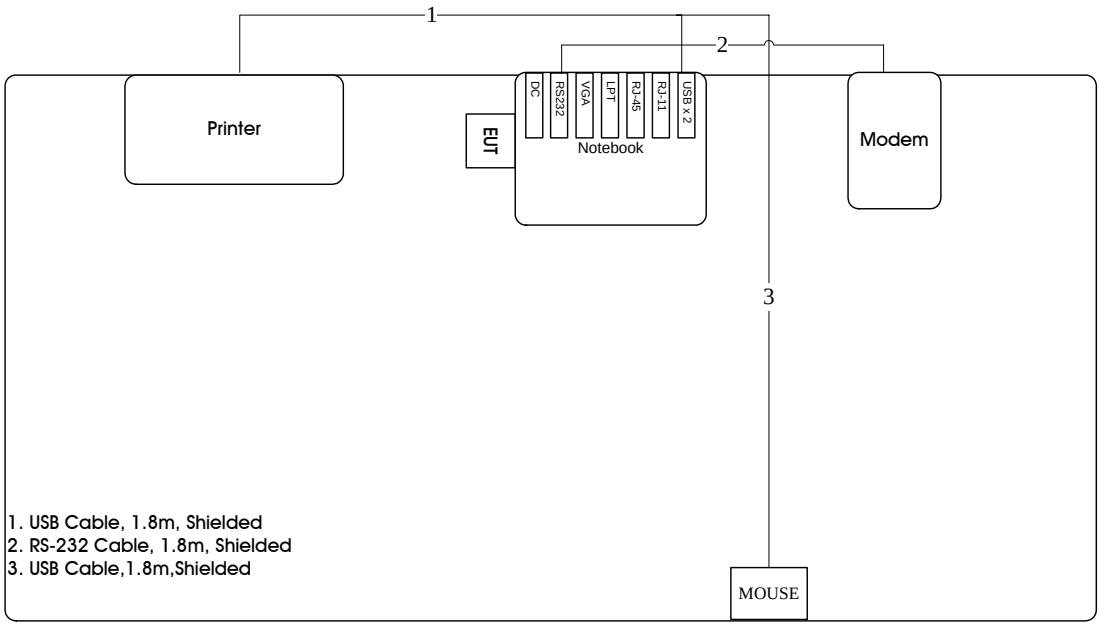
f. Repeat the steps from b to e.

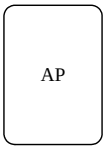
At the same time, "ART" was executed to control the EUT continuously transmit RF signal.

3.9. Test Configurations

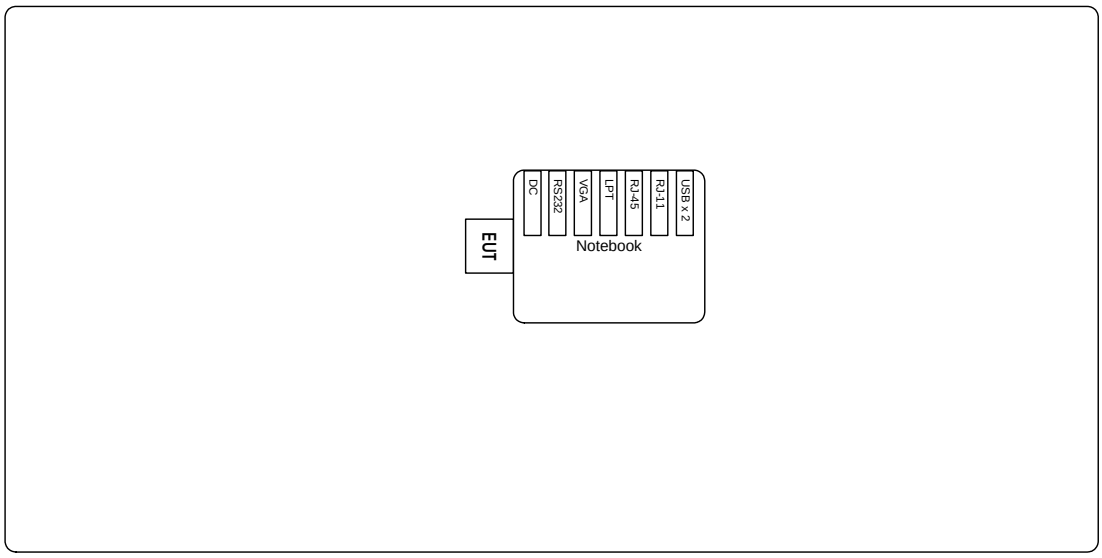
3.9.1. Radiation Emissions Test Configuration

Test Configuration: 9KHz~1GHz

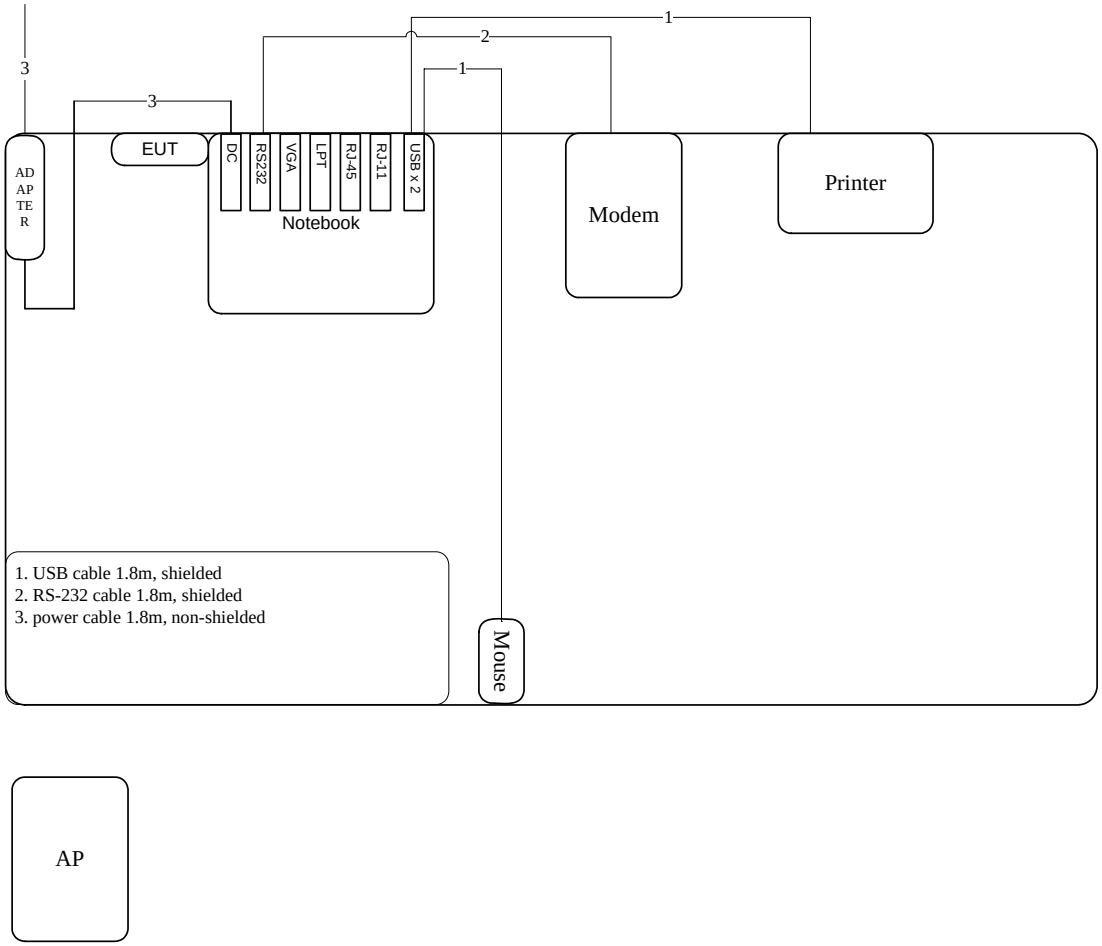




Test Configuration: above 1GHz



3.9.2. AC Power Line Conduction Emissions Test Configuration



4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. 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

4.1.2. Measuring Instruments and Setting

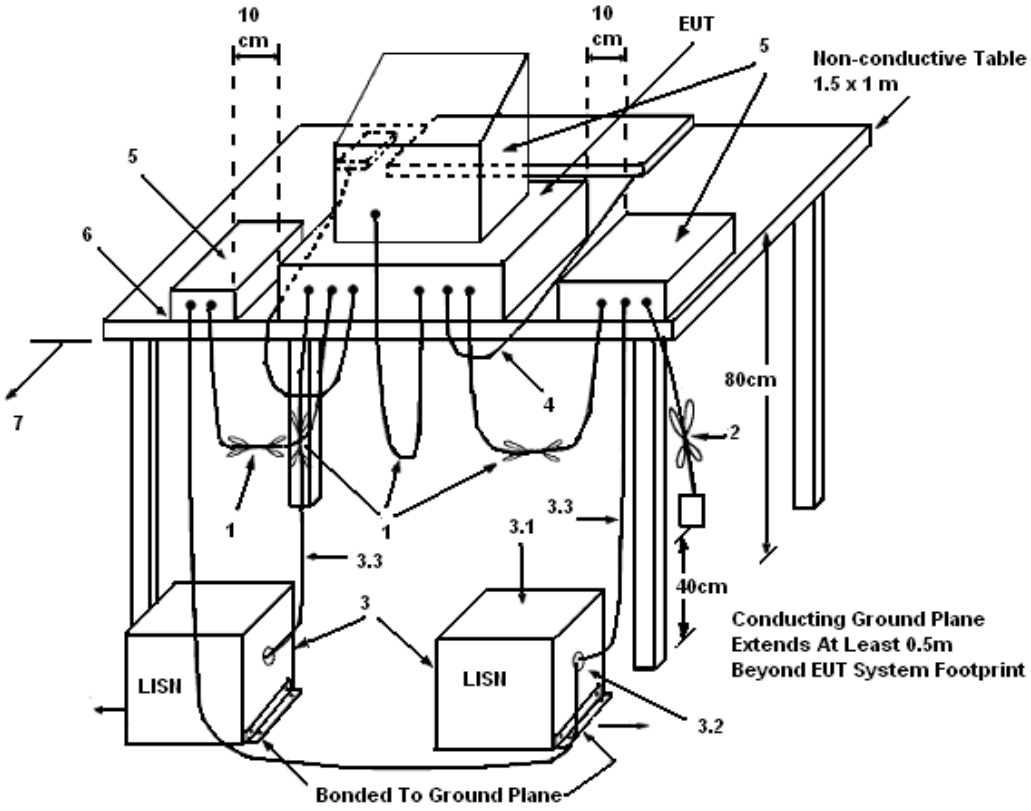
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. 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.

4.1.4. 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.

4.1.5. Test Deviation

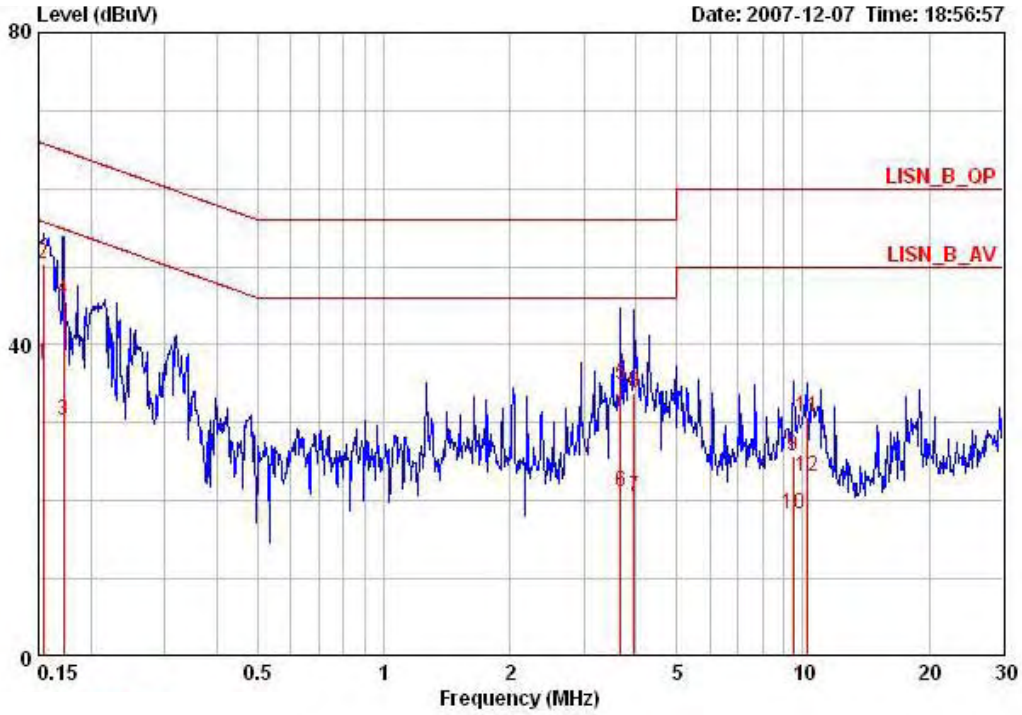
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

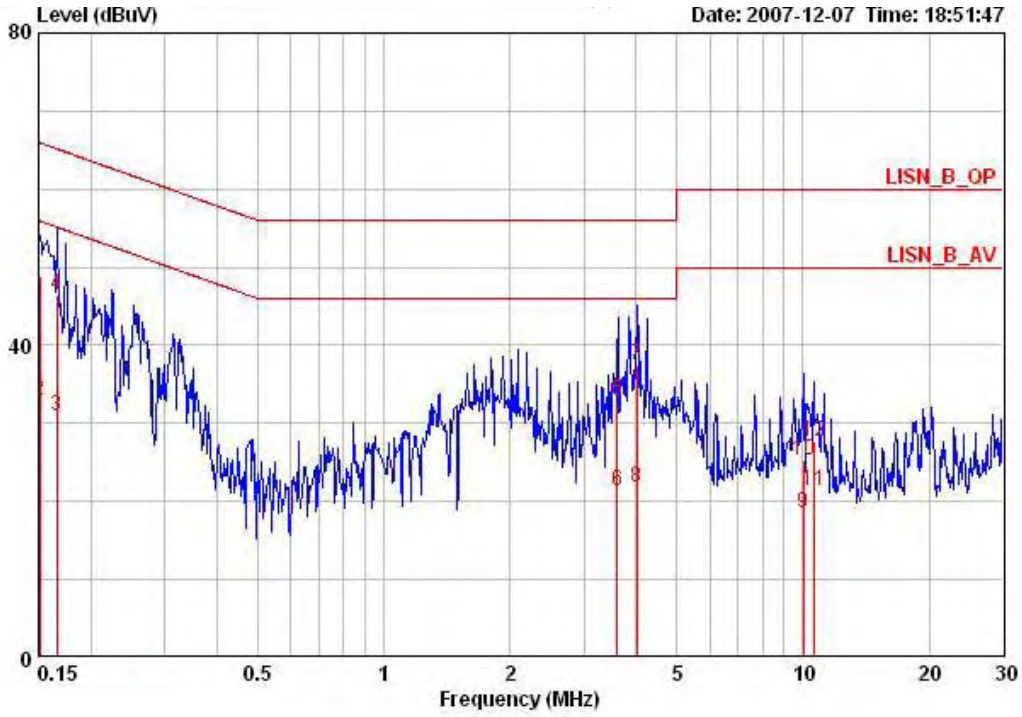
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23℃	Humidity	47%
Test Engineer	Andy Tsai	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15403	37.55	-18.23	55.78	37.15	0.20	0.20	AVERAGE	LINE
2 @	0.15403	50.32	-15.46	65.78	49.92	0.20	0.20	QP	LINE
3	0.17215	30.35	-24.51	54.86	30.00	0.15	0.20	AVERAGE	LINE
4	0.17215	45.68	-19.18	64.86	45.33	0.15	0.20	QP	LINE
5	3.671	34.80	-21.20	56.00	34.50	0.00	0.30	QP	LINE
6	3.671	21.05	-24.95	46.00	20.75	0.00	0.30	AVERAGE	LINE
7	3.964	20.39	-25.61	46.00	20.09	0.00	0.30	AVERAGE	LINE
8	3.964	33.88	-22.12	56.00	33.58	0.00	0.30	QP	LINE
9	9.502	25.76	-34.24	60.00	25.37	0.09	0.30	QP	LINE
10	9.502	18.37	-31.63	50.00	17.98	0.09	0.30	AVERAGE	LINE
11	10.288	30.70	-29.30	60.00	30.24	0.10	0.36	QP	LINE
12	10.288	23.10	-26.90	50.00	22.64	0.10	0.36	AVERAGE	LINE

Temperature	23℃	Humidity	47%
Test Engineer	Andy Tsai	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15080	48.79	-17.17	65.96	48.29	0.30	0.20	QP	NEUTRAL
2	0.15080	33.01	-22.95	55.96	32.51	0.30	0.20	AVERAGE	NEUTRAL
3	0.16589	30.89	-24.27	55.16	30.44	0.25	0.20	AVERAGE	NEUTRAL
4	0.16589	46.37	-18.79	65.16	45.92	0.25	0.20	QP	NEUTRAL
5	3.613	32.97	-23.03	56.00	32.57	0.10	0.30	QP	NEUTRAL
6	3.613	21.44	-24.56	46.00	21.04	0.10	0.30	AVERAGE	NEUTRAL
7	4.006	37.41	-18.59	56.00	37.01	0.10	0.30	QP	NEUTRAL
8	4.006	21.76	-24.24	46.00	21.36	0.10	0.30	AVERAGE	NEUTRAL
9	10.019	18.54	-31.46	50.00	18.14	0.10	0.30	AVERAGE	NEUTRAL
10	10.019	25.33	-34.67	60.00	24.93	0.10	0.30	QP	NEUTRAL
11	10.612	21.41	-28.59	50.00	20.91	0.10	0.40	AVERAGE	NEUTRAL
12	10.612	27.78	-32.22	60.00	27.28	0.10	0.40	QP	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 99% Occupied Bandwidth Measurement

4.2.1. Limit

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

4.2.2. Measuring Instruments and Setting

Please refer to section 5 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

4.2.3. 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.
4. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

4.2.4. Test Setup Layout

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

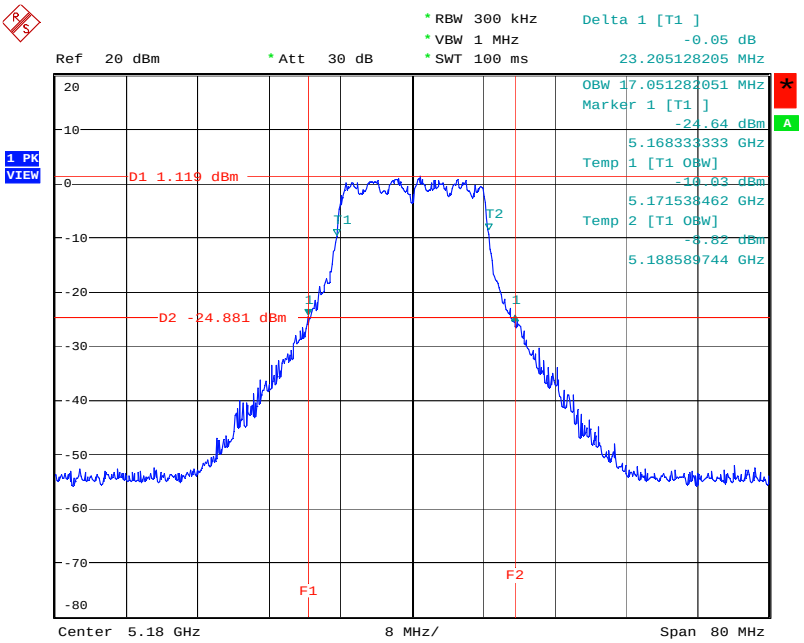
4.2.7. Test Result of 99% Occupied Bandwidth

Temperature	26℃	Humidity	60%
Test Engineer	Sam Lee	Configurations	802.11a

Configuration IEEE 802.11a Ant. 1 + Ant. 3

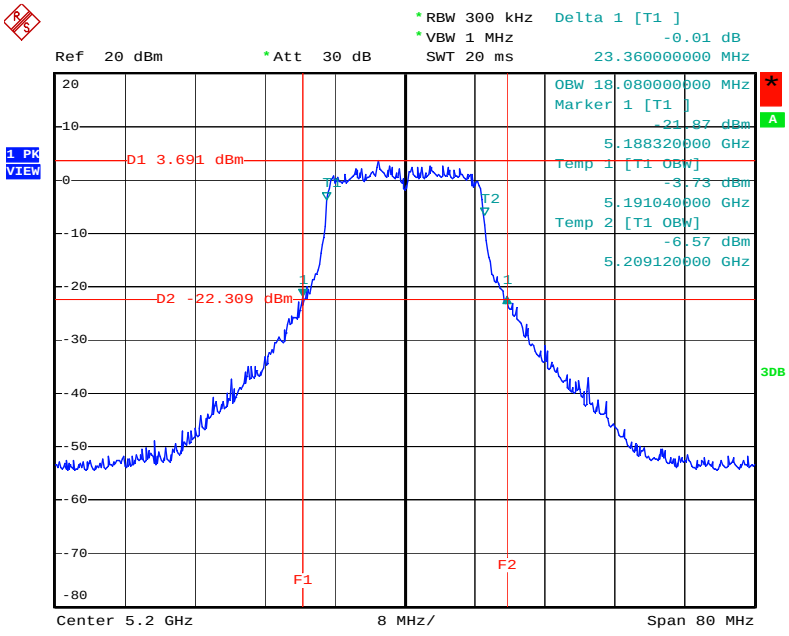
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	23.20	17.05
40	5200 MHz	23.36	18.08
48	5240 MHz	23.20	17.92
52	5260 MHz	23.07	16.92
60	5300 MHz	23.52	18.08
64	5320 MHz	23.20	16.92
100	5500 MHz	23.20	17.05
120	5600 MHz	23.69	16.92
140	5700 MHz	24.23	16.92

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5180 MHz



Date: 9.DEC.2007 11:49:55

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5200 MHz



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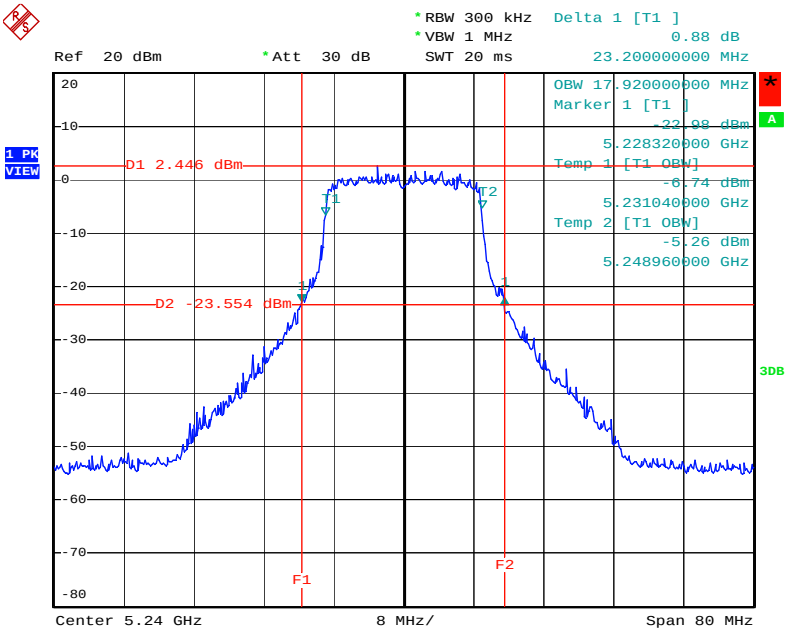
26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5240 MHz



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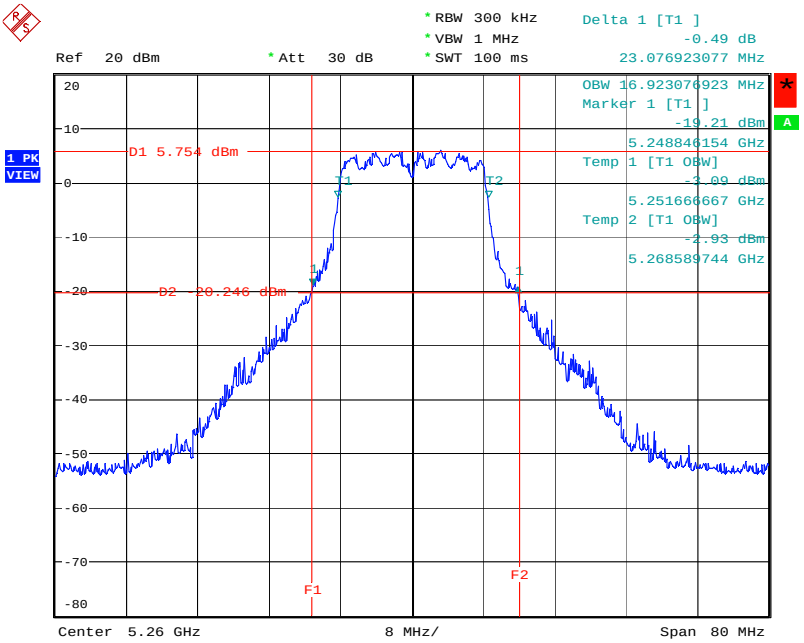
26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5260 MHz



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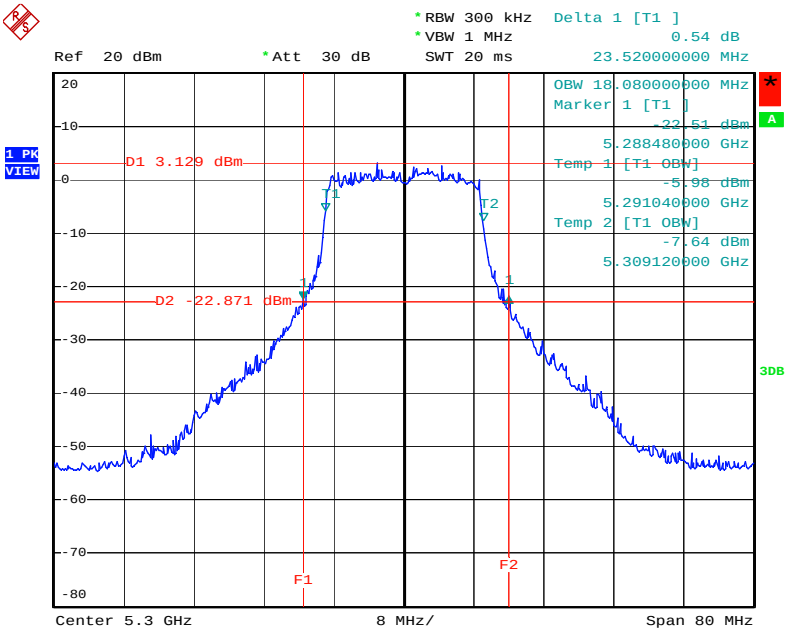
26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5300 MHz



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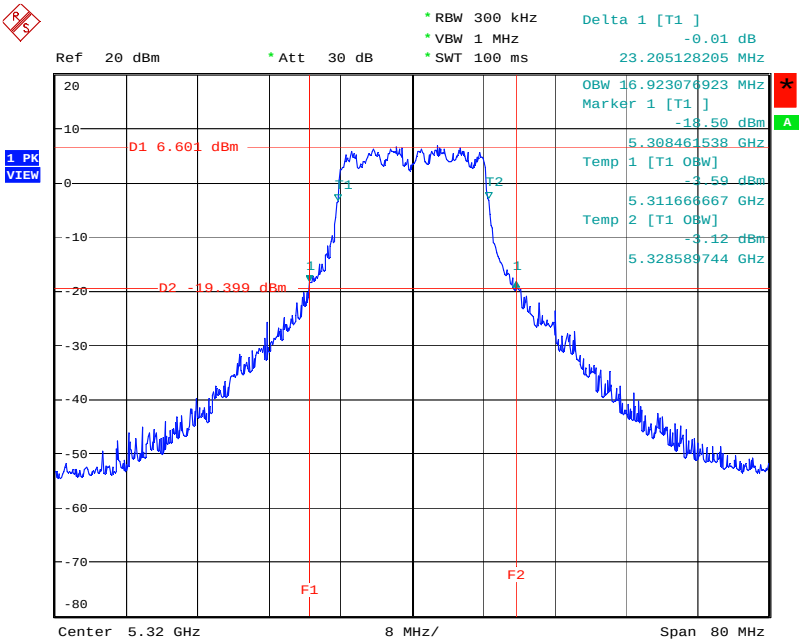
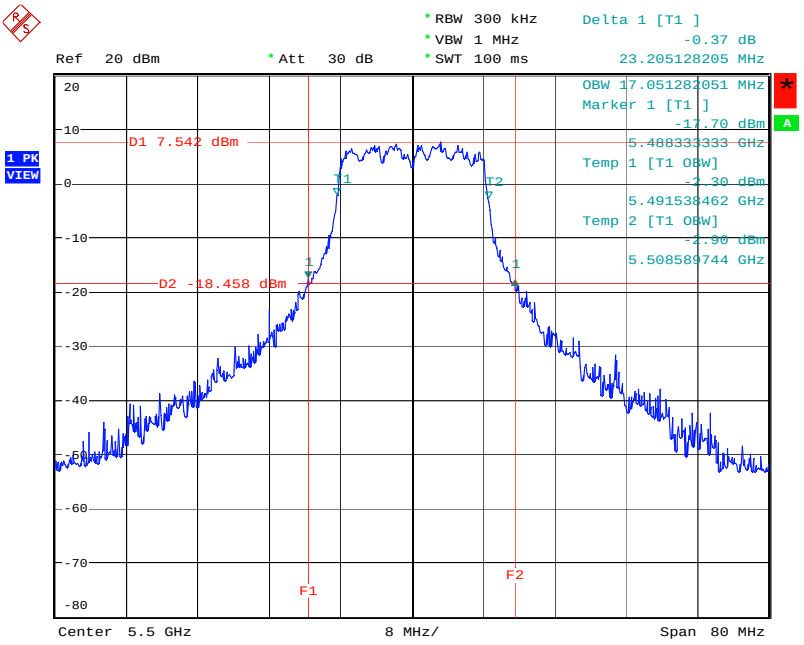
26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5320 MHz



Date: 9.DEC.2007 11:56:46

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5500 MHz



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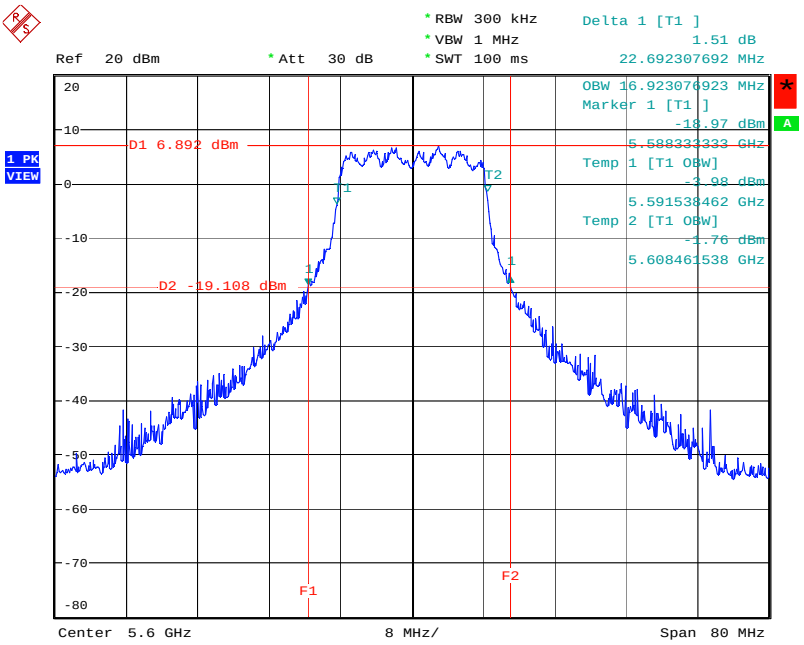
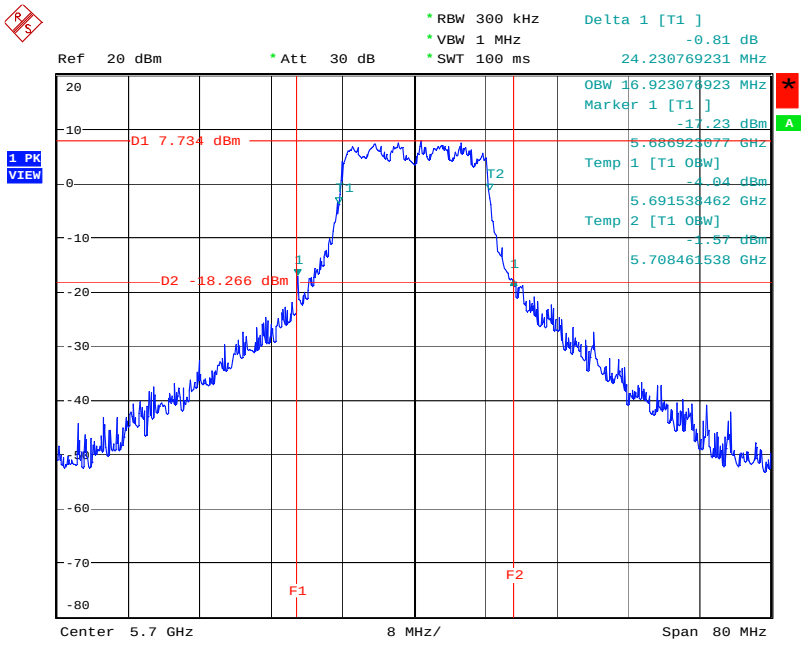
26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5600 MHz



Date: 9.DEC.2007 12:02:23

26 dB Bandwidth Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5700 MHz



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4.3. Maximum Conducted Output Power Measurement

4.3.1. 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 5.470-5.725 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.

4.3.2. Measuring Instruments and Setting

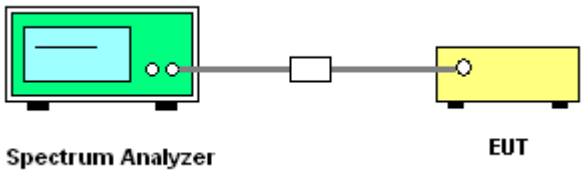
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1000 kHz
VB	300 kHz
Detector	Sample
Trace	MAX HOLD
Sweep Time	20ms

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with method #3 of FCC Public Notice DA-02-2138.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of Maximum Conducted Output Power

Temperature	26℃	Humidity	60%
Test Engineer	Sam Lee	Configurations	802.11a

Configuration IEEE 802.11a Ant. 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	14.08	17.00	Complies
40	5200 MHz	14.01	17.00	Complies
48	5240 MHz	13.98	17.00	Complies
52	5260 MHz	17.97	24.00	Complies
60	5300 MHz	18.75	24.00	Complies
64	5320 MHz	19.85	24.00	Complies
100	5500 MHz	18.72	24.00	Complies
120	5600 MHz	18.96	24.00	Complies
140	5700 MHz	19.02	24.00	Complies

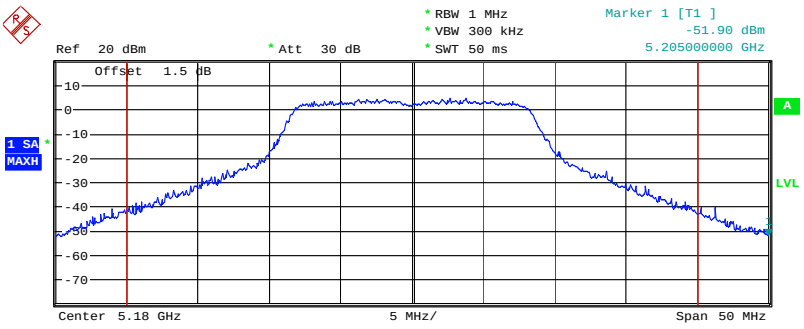
Configuration IEEE 802.11a Ant. 3

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	13.28	17.00	Complies
40	5200 MHz	13.49	17.00	Complies
48	5240 MHz	13.59	17.00	Complies
52	5260 MHz	17.93	24.00	Complies
60	5300 MHz	18.27	24.00	Complies
64	5320 MHz	19.90	24.00	Complies
100	5500 MHz	18.33	24.00	Complies
120	5600 MHz	19.17	24.00	Complies
140	5700 MHz	18.82	24.00	Complies

Configuration IEEE 802.11a Ant. 1 + Ant. 3

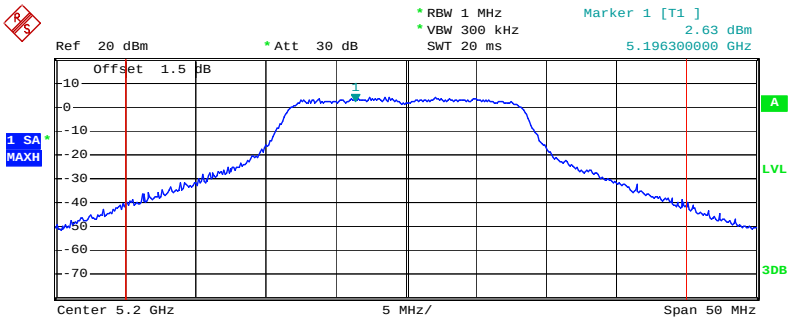
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	16.71	17.00	Complies
40	5200 MHz	16.73	17.00	Complies
48	5240 MHz	16.80	17.00	Complies
52	5260 MHz	20.96	24.00	Complies
60	5300 MHz	21.53	24.00	Complies
64	5320 MHz	22.89	24.00	Complies
100	5500 MHz	21.54	24.00	Complies
120	5600 MHz	22.08	24.00	Complies
140	5700 MHz	21.93	24.00	Complies

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5180 MHz



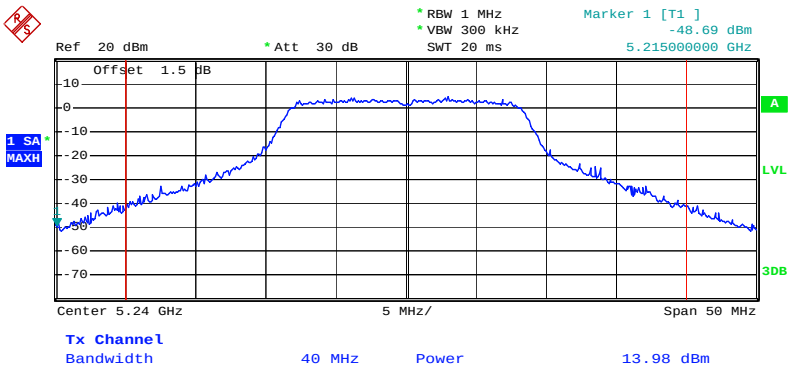
Date: 9.DEC.2007 10:22:23

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5200 MHz



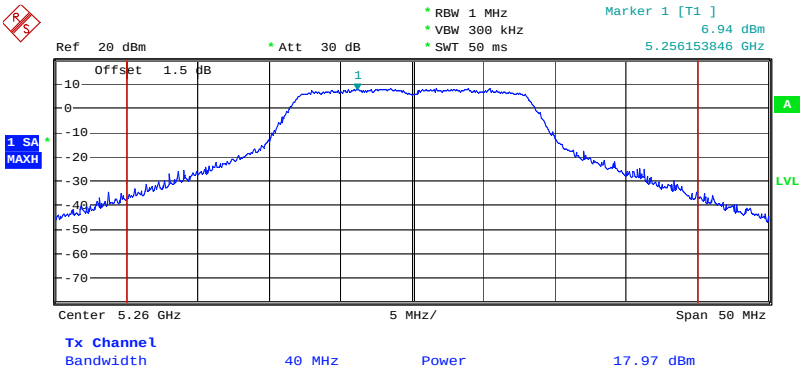
Date: 22.DEC.2007 12:25:47

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5240 MHz



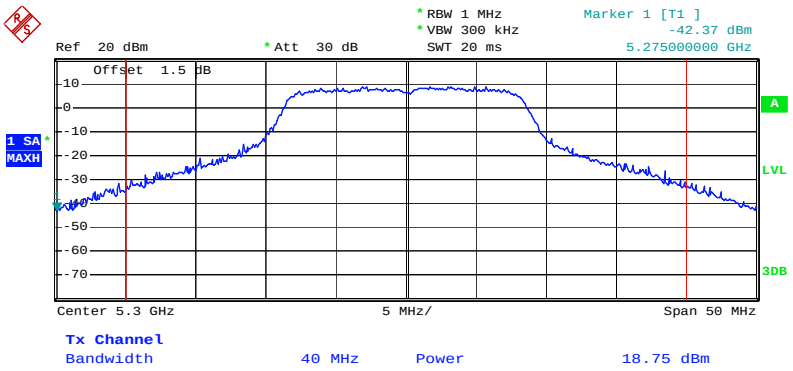
Date: 22.DEC.2007 12:51:28

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5260 MHz



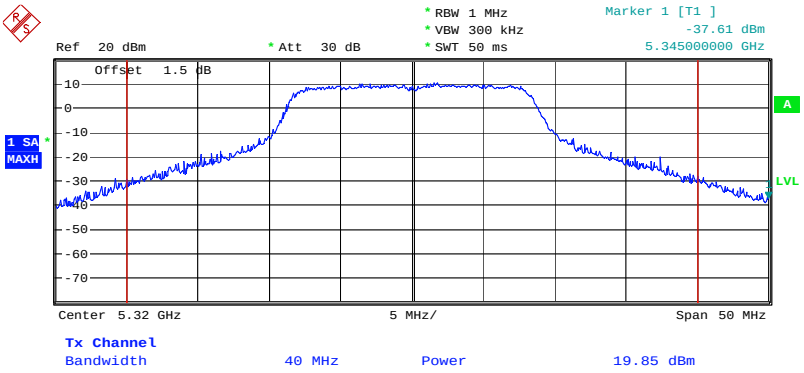
Date: 9.DEC.2007 11:13:44

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5300 MHz



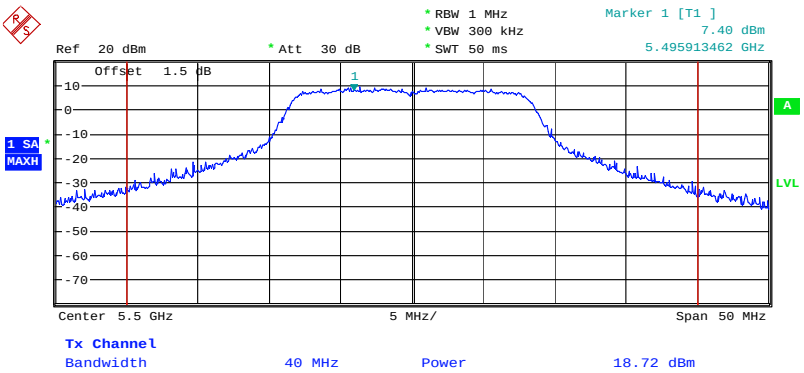
Date: 22.DEC.2007 12:53:21

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5320 MHz



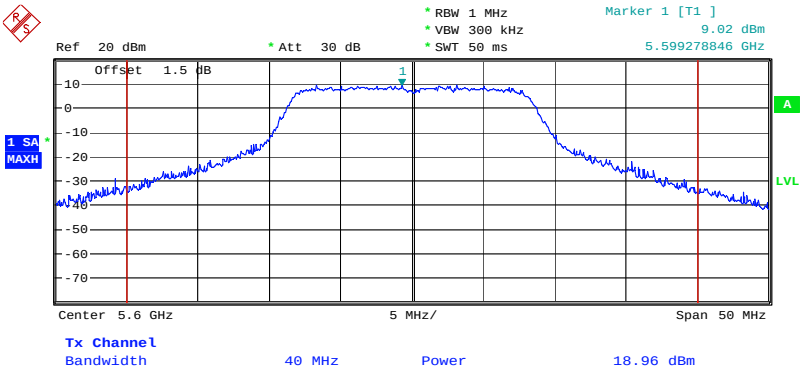
Date: 9.DEC.2007 11:10:10

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5500 MHz



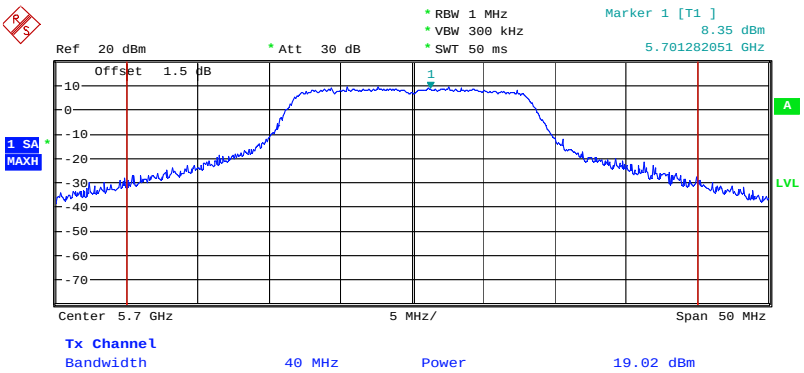
Date: 9.DEC.2007 11:07:34

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5600 MHz



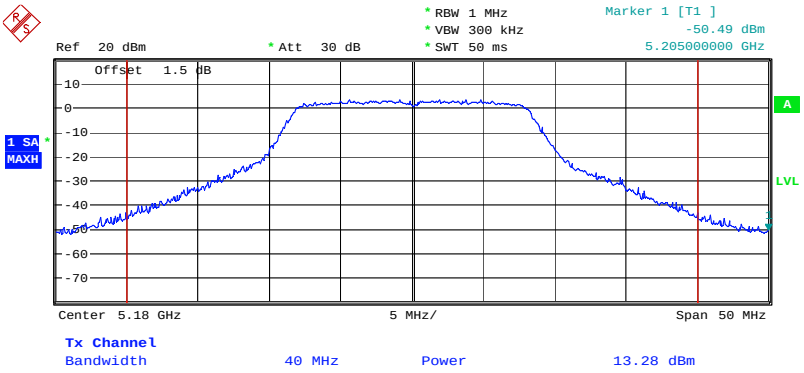
Date: 9.DEC.2007 11:03:04

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 1 / 5700 MHz



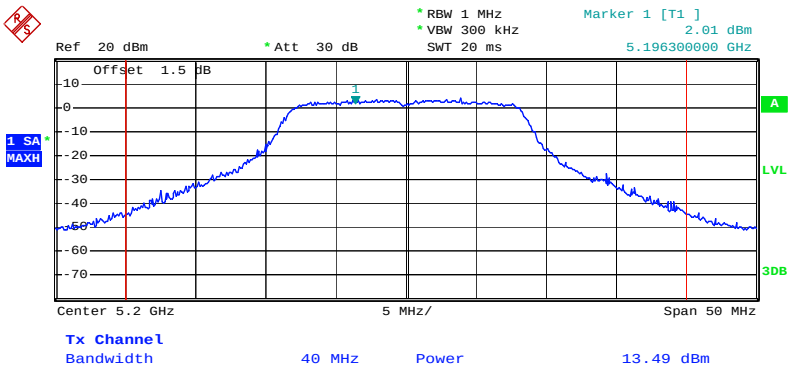
Date: 9.DEC.2007 11:01:30

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5180 MHz



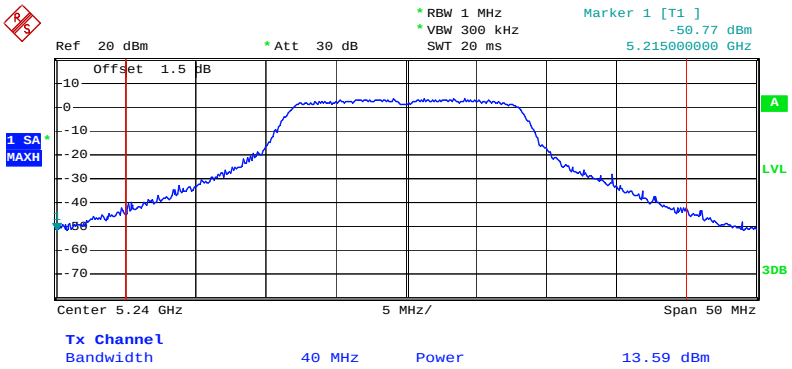
Date: 9.DEC.2007 10:24:02

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5200 MHz



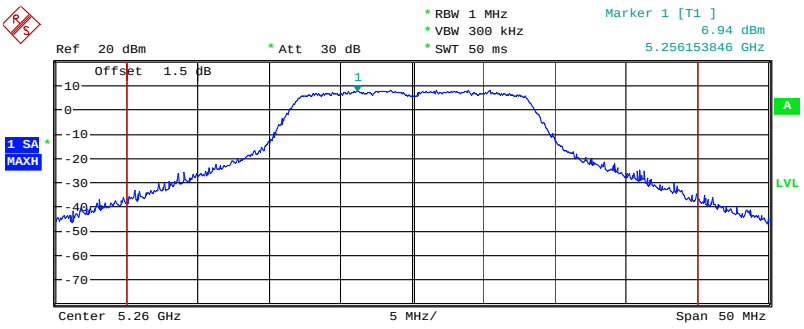
Date: 22.DEC.2007 12:42:03

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5240 MHz



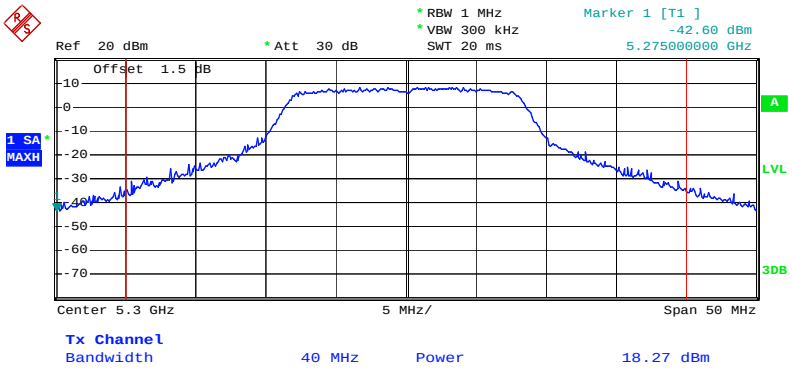
Date: 22.DEC.2007 12:50:48

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5260 MHz



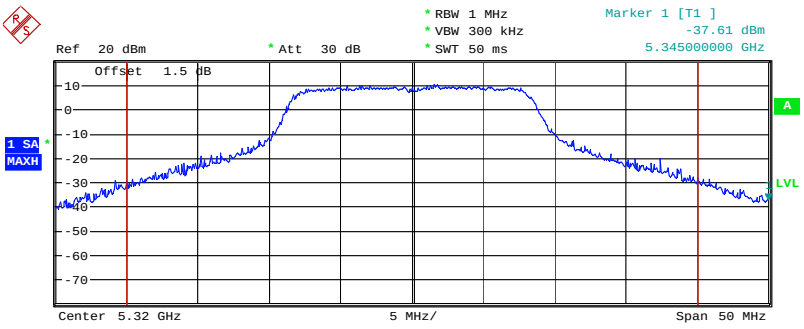
Date: 9.DEC.2007 11:13:16

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5300 MHz



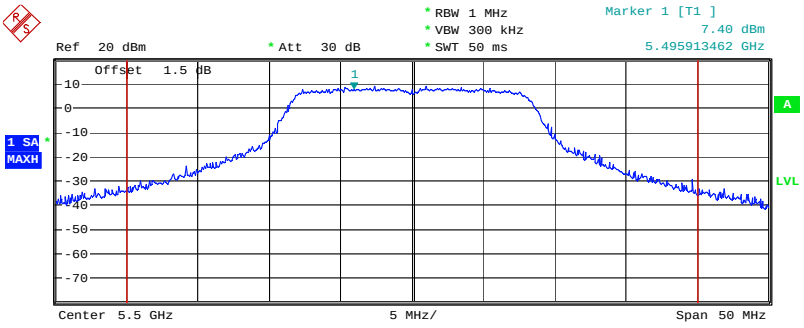
Date: 22.DEC.2007 12:54:20

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5320 MHz



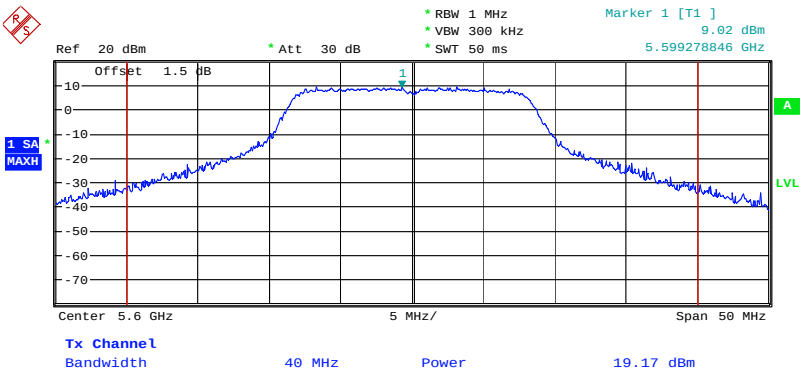
Date: 9.DEC.2007 11:10:37

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5500 MHz



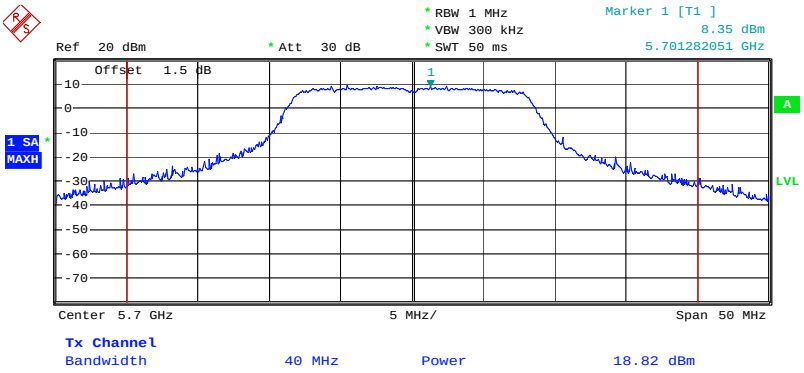
Date: 9.DEC.2007 11:06:54

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5600 MHz



Date: 9.DEC.2007 11:05:08

Channel Output Power Plot on Configuration IEEE 802.11a Ant. 3 / 5700 MHz



Date: 9.DEC.2007 11:00:59

4.4. Power Spectral Density Measurement

4.4.1. 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 4.3.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5470-5725	11

4.4.2. Measuring Instruments and Setting

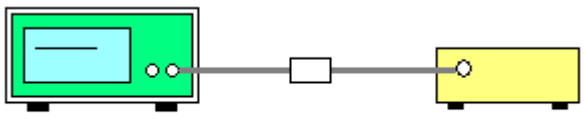
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	40MHz
RB	1000 kHz
VB	3000 kHz
Detector	Sample
Trace	Average
Sweep Time	Auto

4.4.3. 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. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

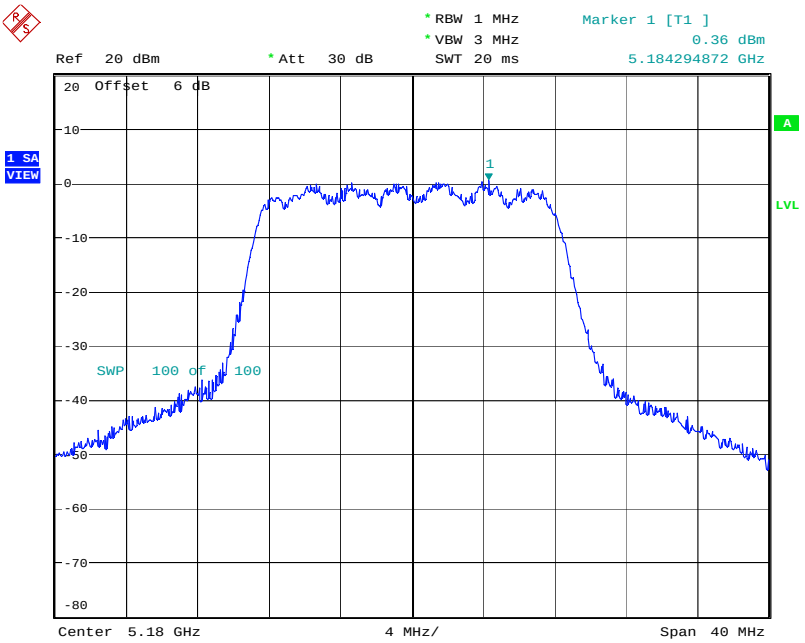
4.4.7. Test Result of Power Spectral Density

Temperature	26℃	Humidity	60%
Test Engineer	Sam Lee	Configurations	802.11a

Configuration IEEE 802.11a Ant. 1 + Ant. 3

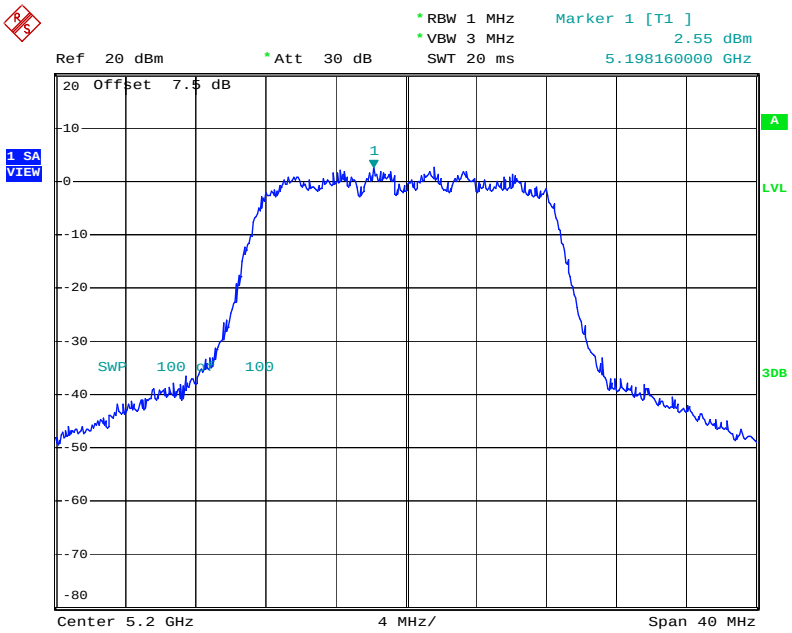
Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	0.36	4.00	Complies
40	5200 MHz	2.55	4.00	Complies
48	5240 MHz	3.28	4.00	Complies
52	5260 MHz	5.15	11.00	Complies
60	5300 MHz	3.61	11.00	Complies
64	5320 MHz	5.85	11.00	Complies
100	5500 MHz	6.22	11.00	Complies
120	5600 MHz	5.57	11.00	Complies
140	5700 MHz	6.36	11.00	Complies

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5180 MHz



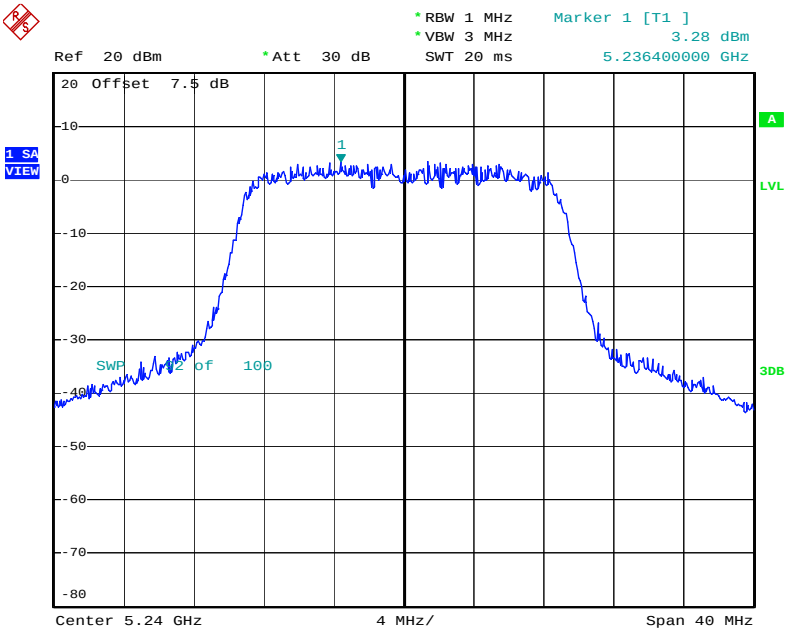
Date: 9.DEC.2007 11:50:02

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5200 MHz



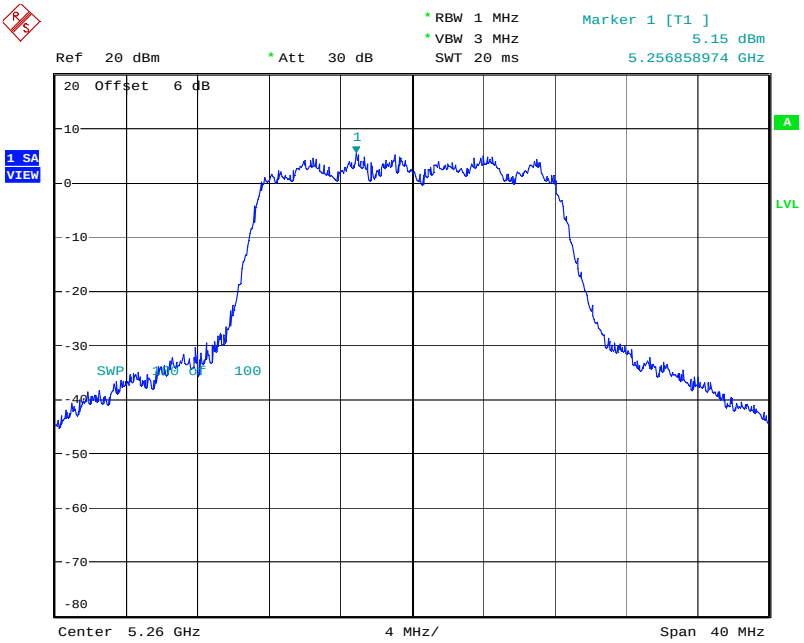
Date: 22.DEC.2007 13:55:25

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5240 MHz



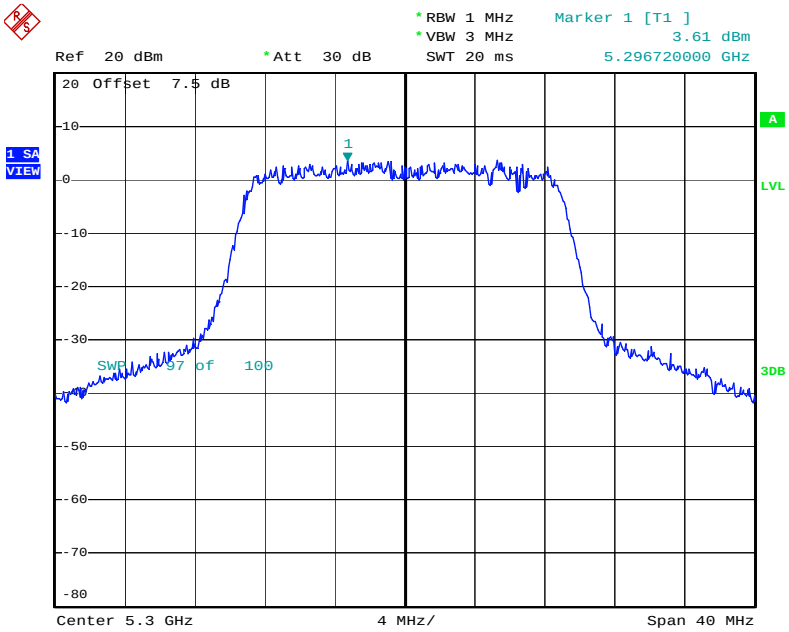
Date: 22.DEC.2007 13:36:13

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5260 MHz



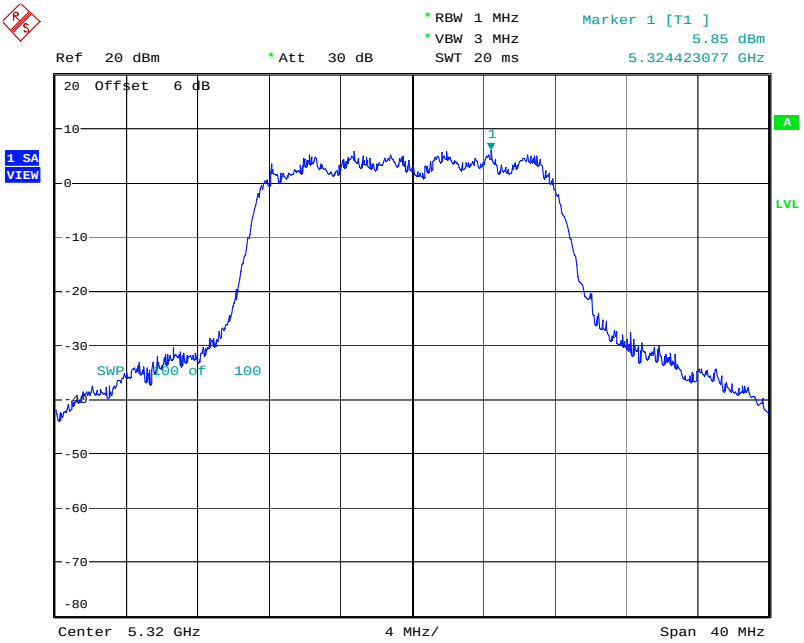
Date: 9.DEC.2007 11:55:05

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5300 MHz



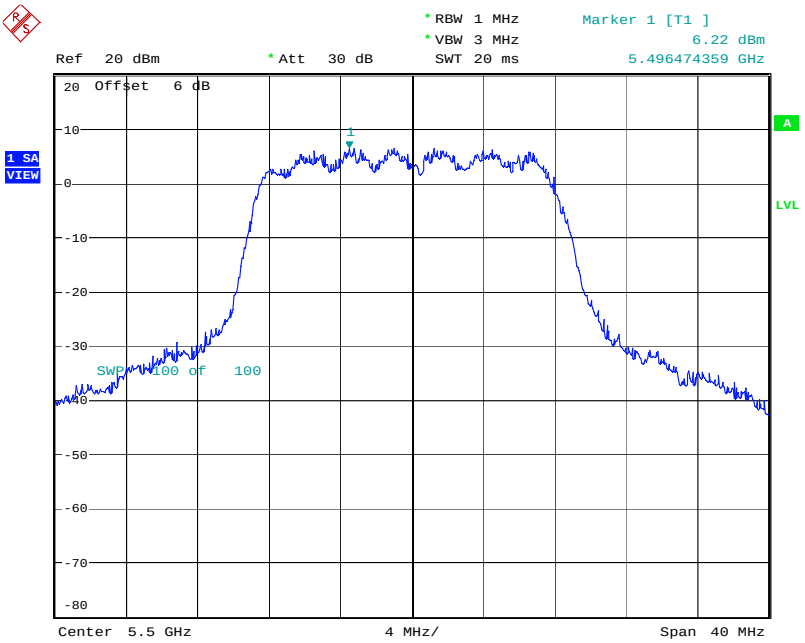
Date: 22.DEC.2007 13:34:26

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5320 MHz



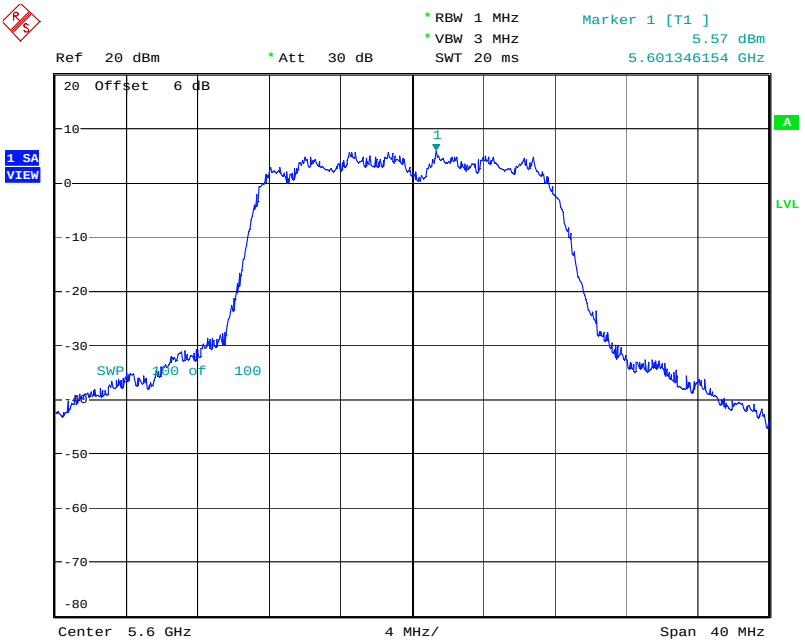
Date: 9.DEC.2007 11:56:53

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5500 MHz



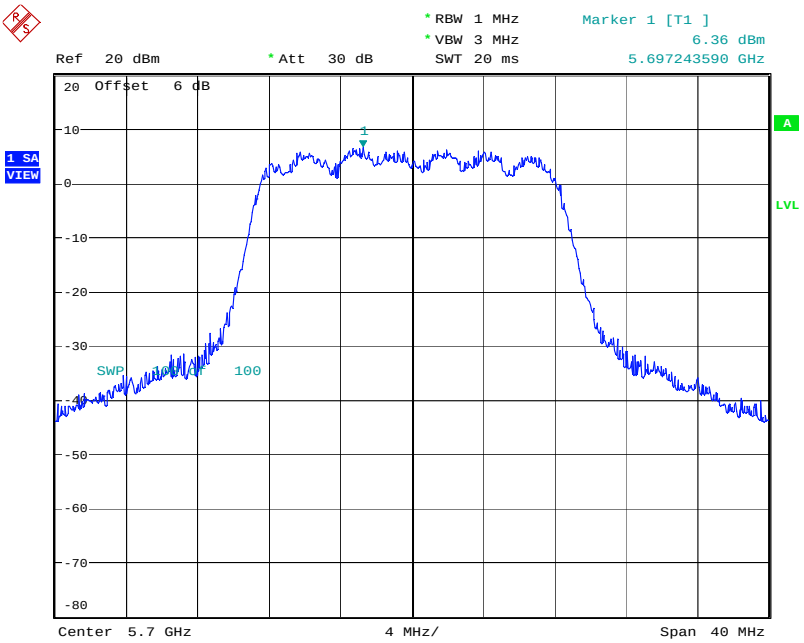
Date: 9.DEC.2007 11:59:31

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5600 MHz



Date: 9.DEC.2007 12:02:31

Power Density Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5700 MHz



4.5. Peak Excursion Measurement

4.5.1. 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.

4.5.2. Measuring Instruments and Setting

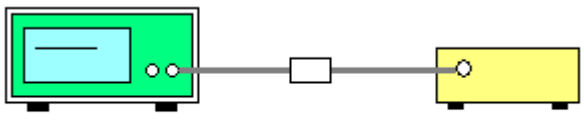
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.3. 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 ≥ 1/T (IEEE 802.11a VBW = 300kHz ≥ 1/4 μs). 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.
5. Measuring multiple antennas, the connector is required to link with spectrum analyzer through a combiner.

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

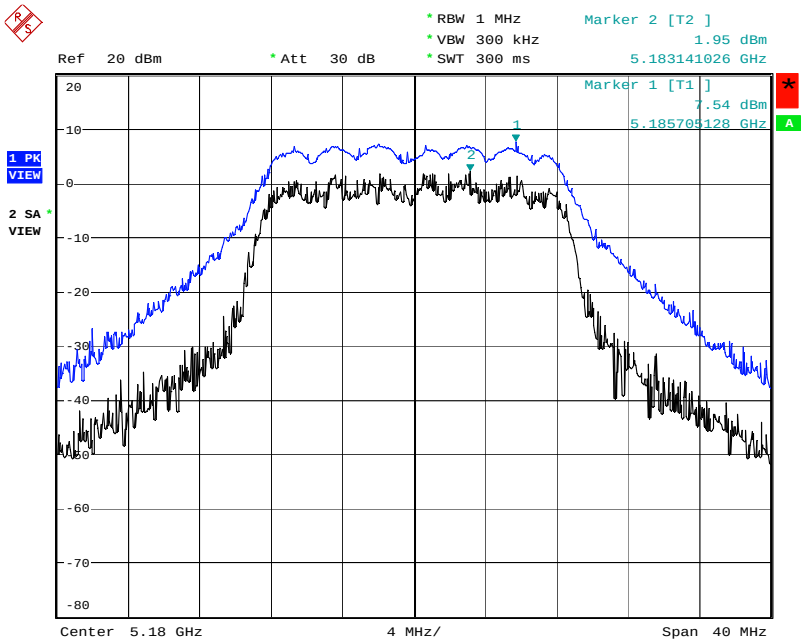
4.5.7. Test Result of Peak Excursion

Temperature	26℃	Humidity	60%
Test Engineer	Sam Lee	Configurations	802.11a

Configuration IEEE 802.11a Ant. 1 + Ant. 3

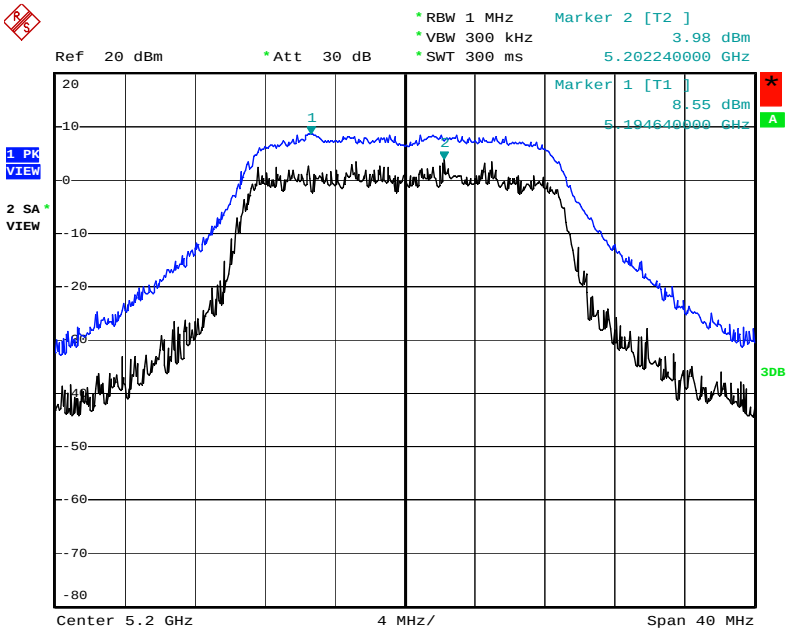
Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180 MHz	5.59	13	Complies
40	5200 MHz	4.57	13	Complies
48	5240 MHz	5.61	13	Complies
52	5260 MHz	5.04	13	Complies
60	5300 MHz	5.53	13	Complies
64	5320 MHz	4.32	13	Complies
100	5500 MHz	5.09	13	Complies
120	5600 MHz	5.24	13	Complies
140	5700 MHz	4.86	13	Complies

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5180 MHz



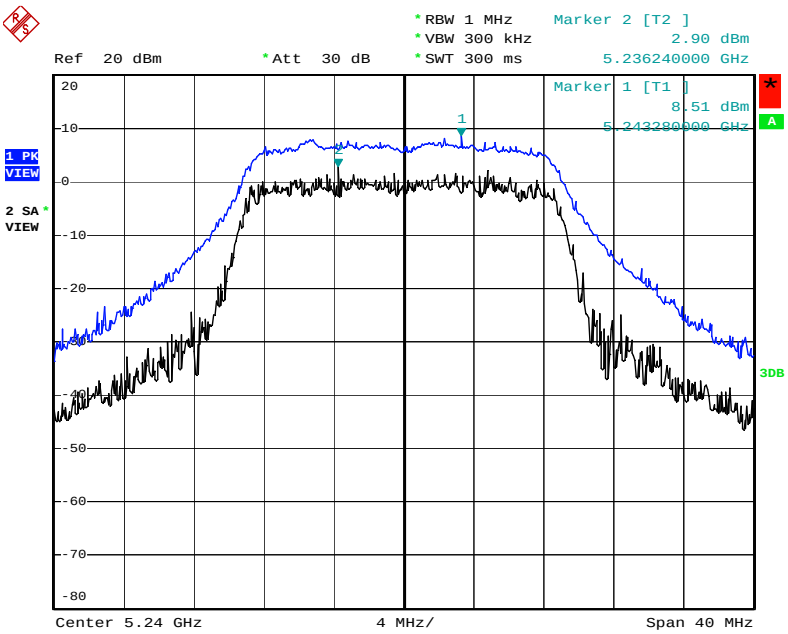
Date: 9.DEC.2007 11:50:49

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5200 MHz



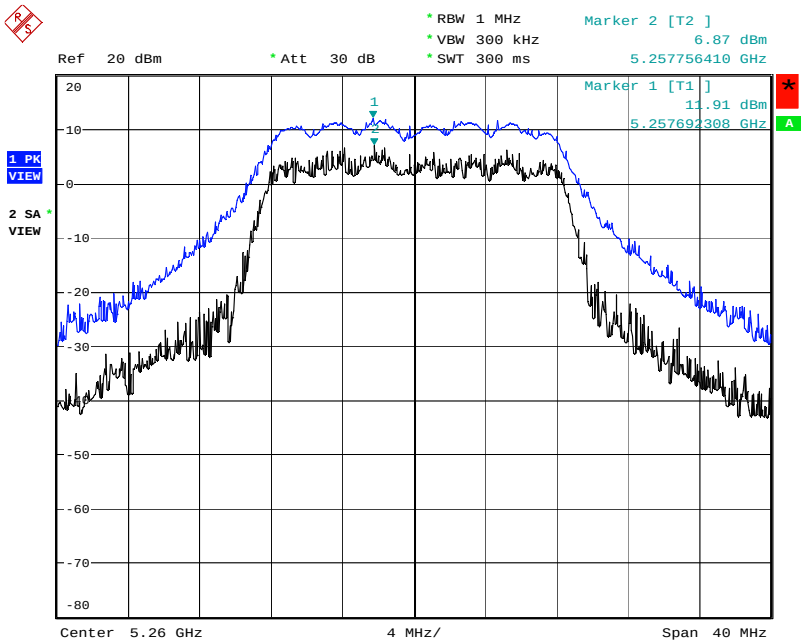
Date: 22.DEC.2007 13:38:20

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5240 MHz



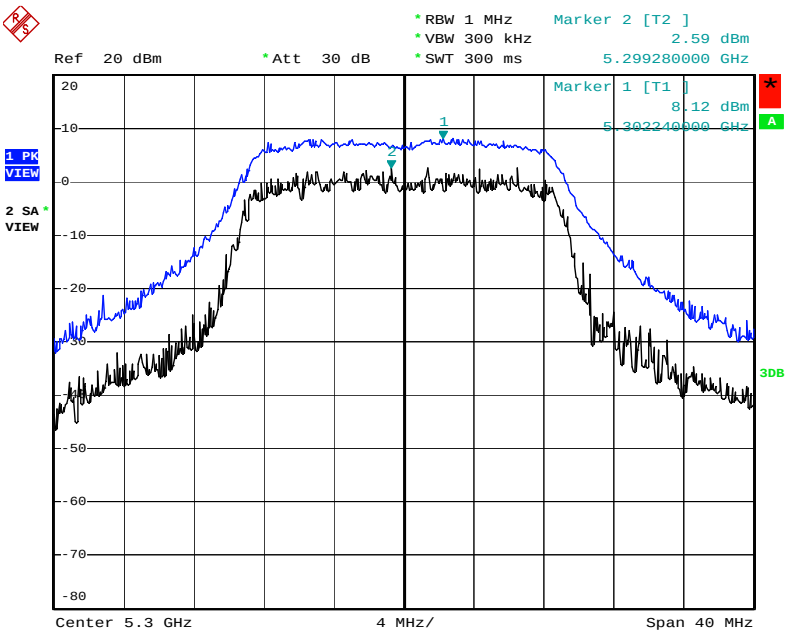
Date: 22.DEC.2007 13:36:59

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5260 MHz



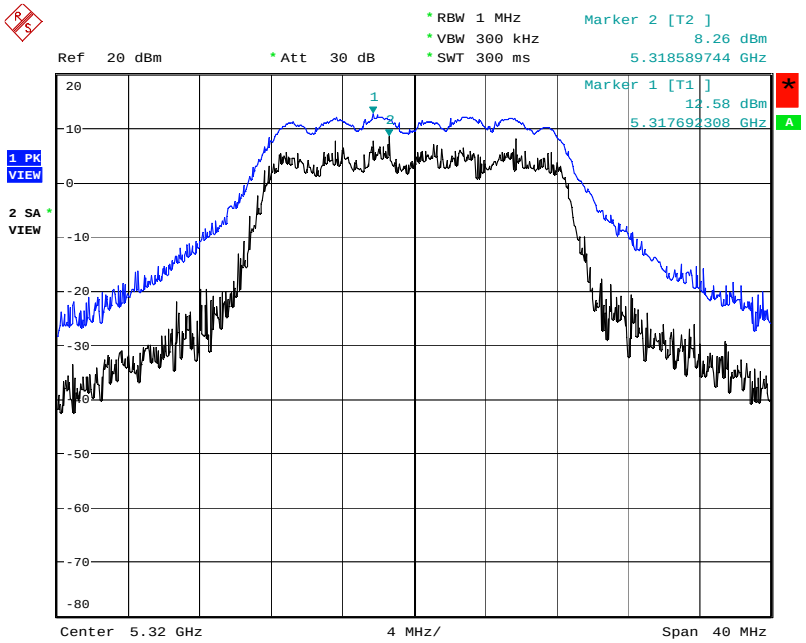
Date: 9.DEC.2007 11:55:52

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5300 MHz



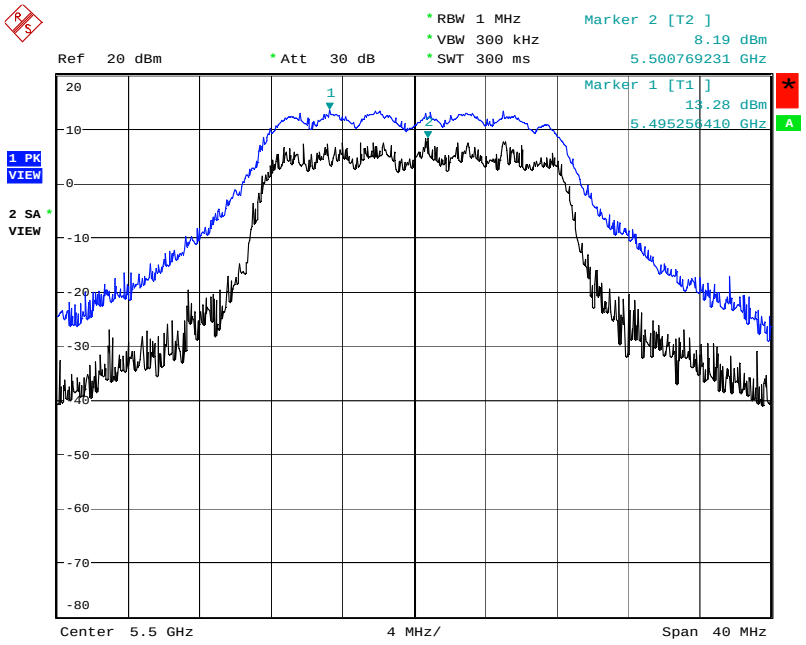
Date: 22.DEC.2007 13:35:12

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5320 MHz



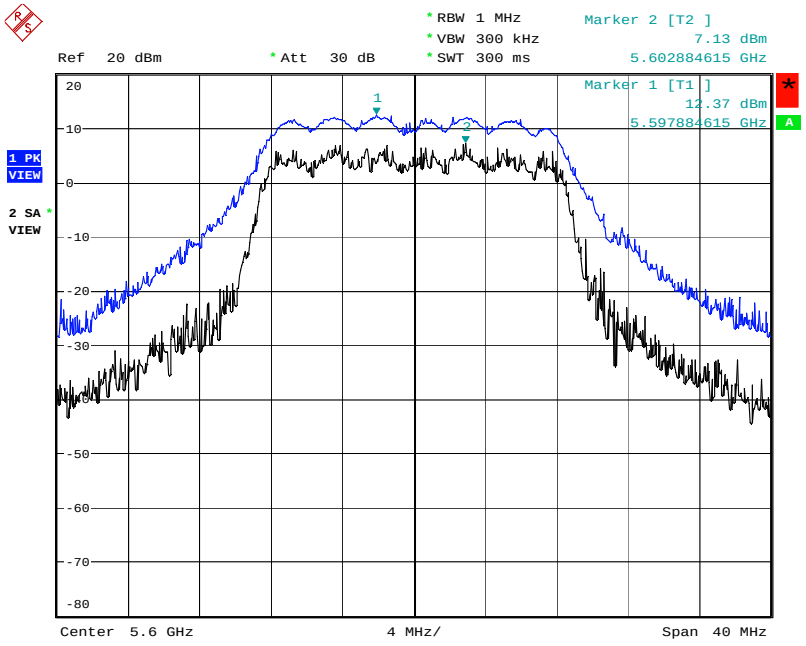
Date: 9.DEC.2007 11:57:40

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5500 MHz



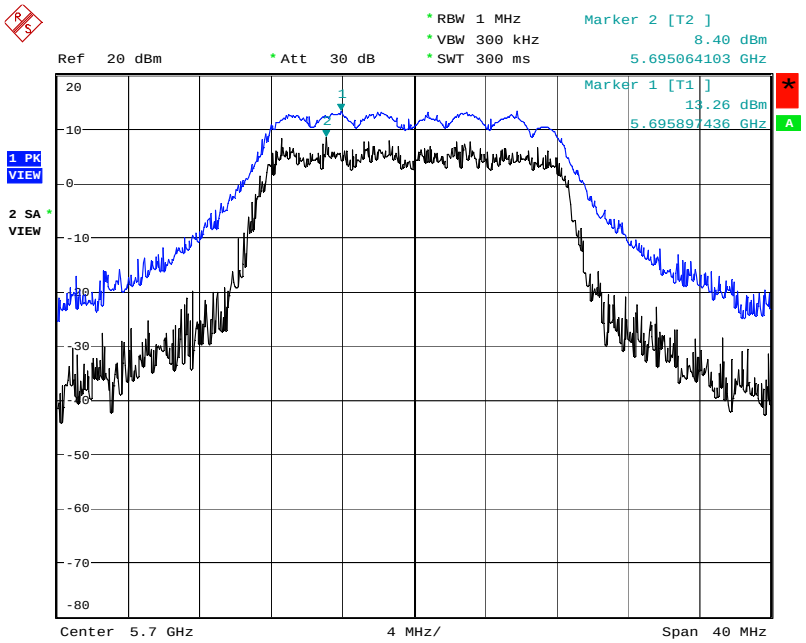
Date: 9.DEC.2007 12:00:20

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5600 MHz



Date: 9.DEC.2007 12:03:20

Peak Excursion Plot on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5700 MHz



Date: 9.DEC.2007 12:05:11

4.6. Radiated Emissions Measurement

4.6.1. 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 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 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

4.6.2. Measuring Instruments and Setting

Please refer to section 5 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

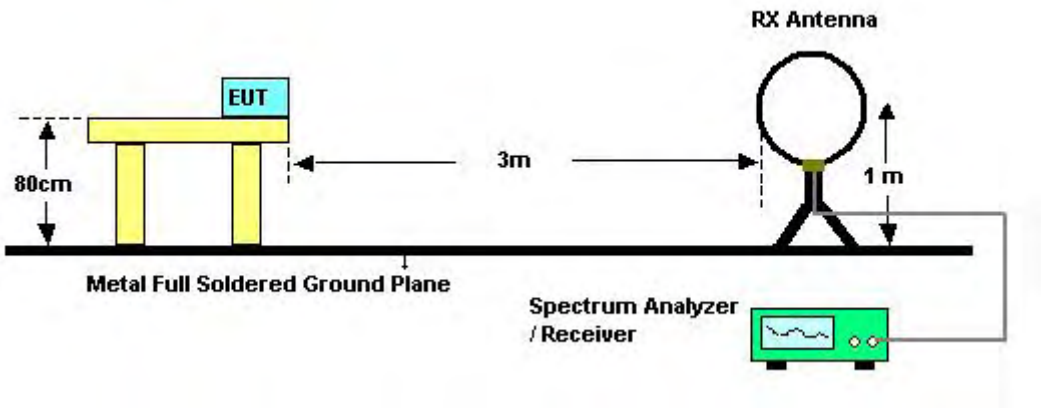
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.6.3. Test Procedures

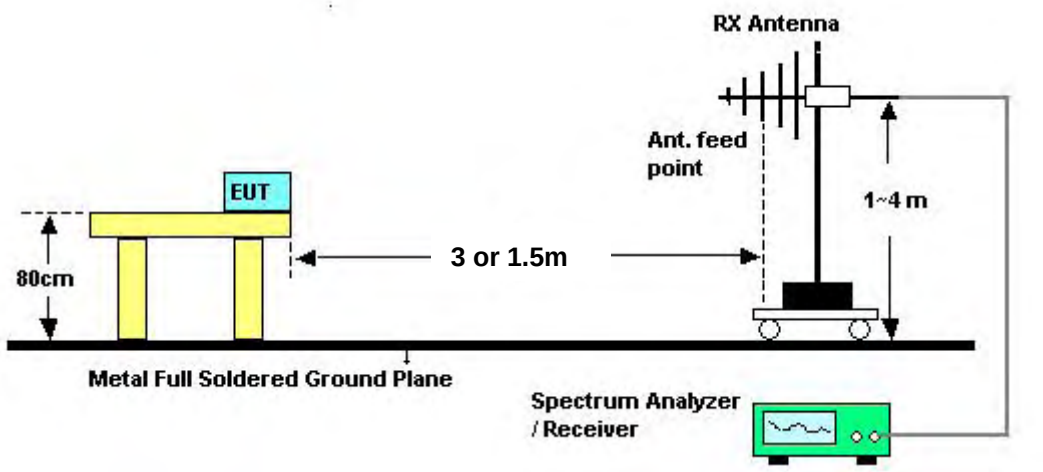
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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.

4.6.4. 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 form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	Normal Link

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.

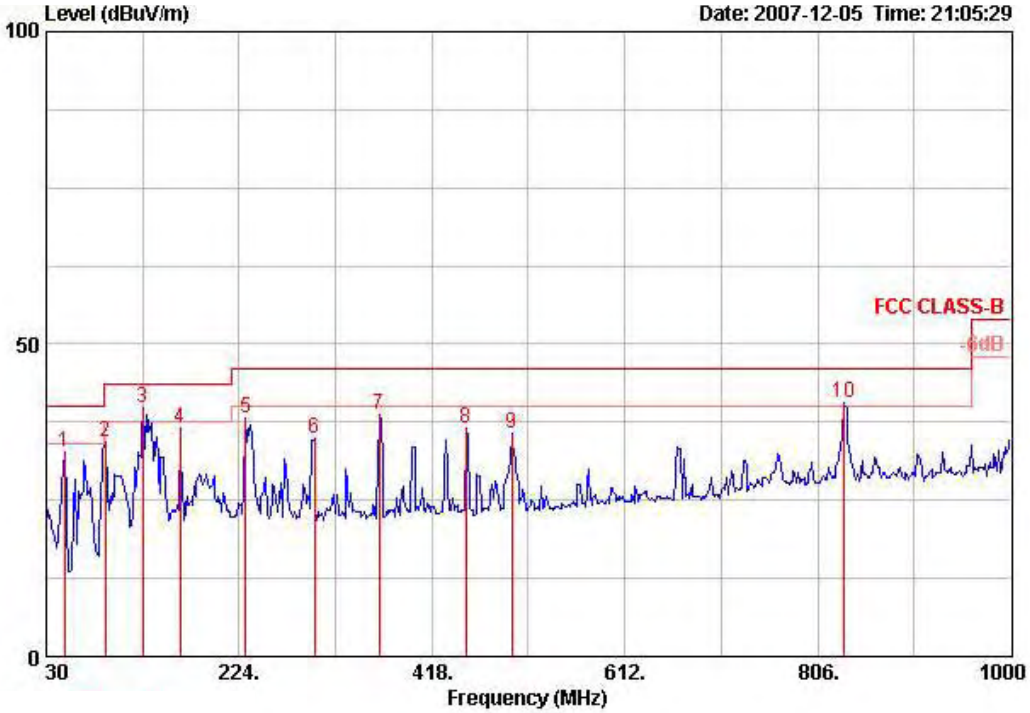
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

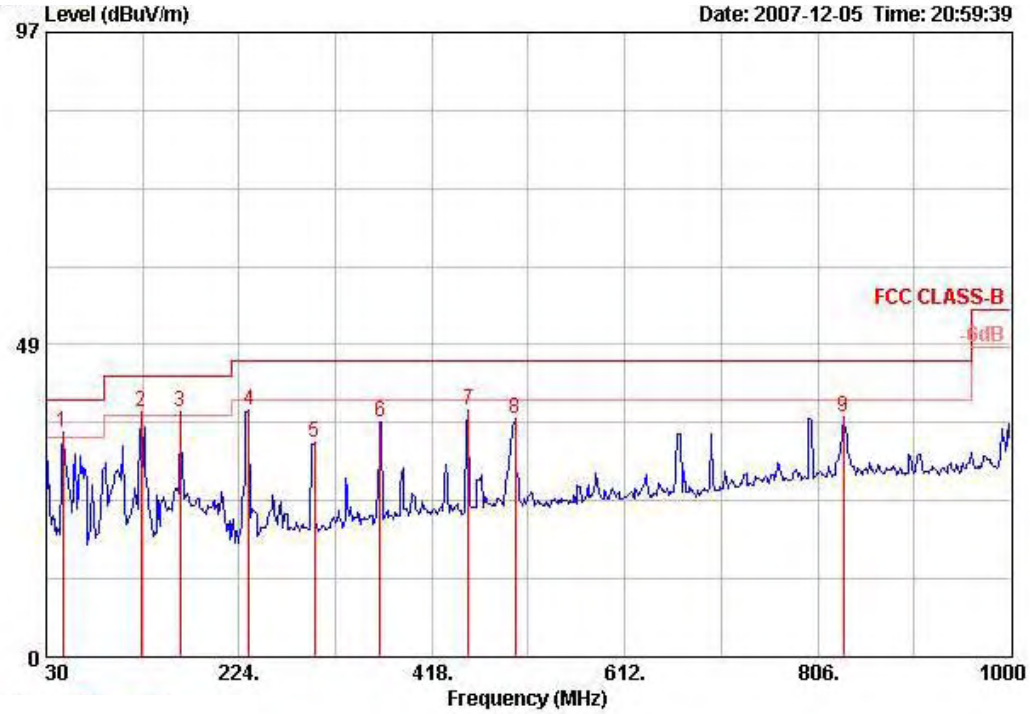
Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	Normal Link

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	48.430	32.76	-7.24	40.00	48.80	9.77	0.67	26.47	Peak	100	0	HORIZONTAL
2	89.170	34.29	-9.21	43.50	50.70	9.14	0.57	26.12	Peak	100	0	HORIZONTAL
3 @	127.000	39.67	-3.83	43.50	52.25	12.59	0.75	25.92	Peak	100	0	HORIZONTAL
4	164.830	36.60	-6.90	43.50	51.19	10.35	0.72	25.66	Peak	100	0	HORIZONTAL
5	230.790	38.24	-7.76	46.00	51.21	11.39	1.08	25.44	Peak	100	0	HORIZONTAL
6	299.660	34.80	-11.20	46.00	44.70	13.90	1.14	24.94	Peak	100	0	HORIZONTAL
7	364.650	38.68	-7.32	46.00	46.89	15.65	1.29	25.15	Peak	100	0	HORIZONTAL
8	451.950	36.47	-9.53	46.00	43.77	17.22	1.44	25.96	Peak	100	0	HORIZONTAL
9	498.510	35.70	-10.30	46.00	42.46	17.78	1.80	26.33	Peak	100	0	HORIZONTAL
10 !	832.190	40.49	-5.51	46.00	41.76	21.15	2.52	24.94	Peak	100	0	HORIZONTAL

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	46.490	34.93	-5.07	40.00	50.18	10.63	0.59	26.48	Peak	400	0	VERTICAL
2 !	125.060	38.06	-5.44	43.50	50.56	12.65	0.79	25.94	Peak	400	0	VERTICAL
3 !	164.830	38.14	-5.36	43.50	52.73	10.35	0.72	25.66	Peak	400	0	VERTICAL
4	233.700	38.30	-7.70	46.00	50.99	11.66	1.09	25.43	Peak	400	0	VERTICAL
5	299.660	33.22	-12.78	46.00	43.12	13.90	1.14	24.94	Peak	400	0	VERTICAL
6	365.620	36.59	-9.41	46.00	44.78	15.68	1.30	25.16	Peak	400	0	VERTICAL
7	454.860	38.38	-7.62	46.00	45.64	17.26	1.46	25.98	Peak	400	0	VERTICAL
8	501.420	37.03	-8.97	46.00	43.75	17.82	1.81	26.35	Peak	400	0	VERTICAL
9	832.190	37.27	-8.73	46.00	38.54	21.15	2.52	24.94	Peak	400	0	VERTICAL

Note:

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

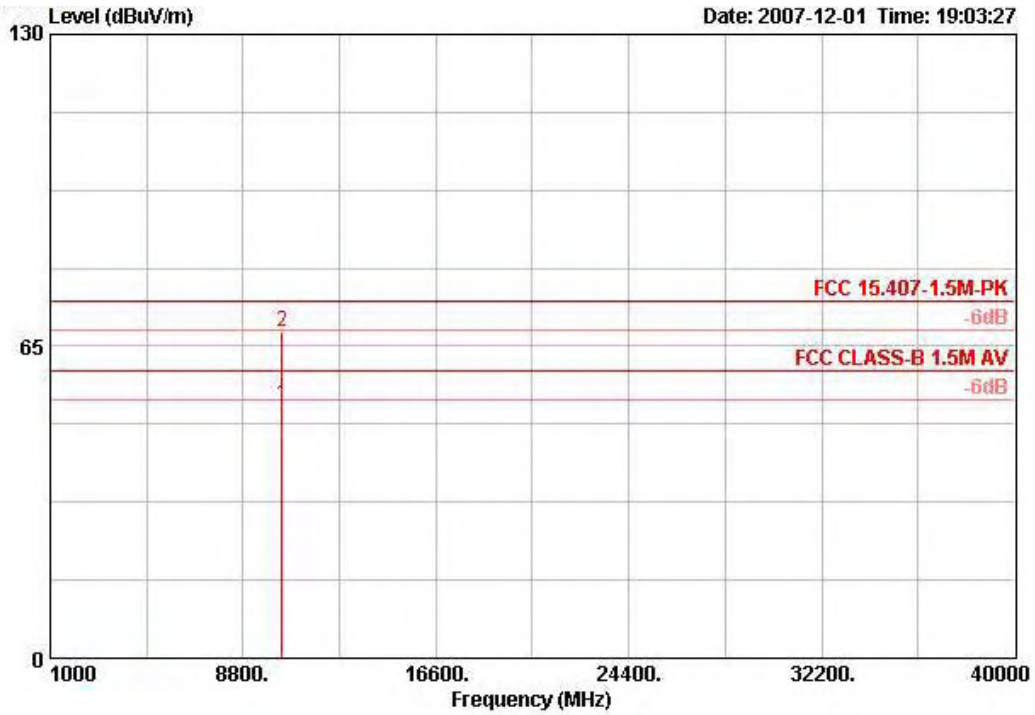
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

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

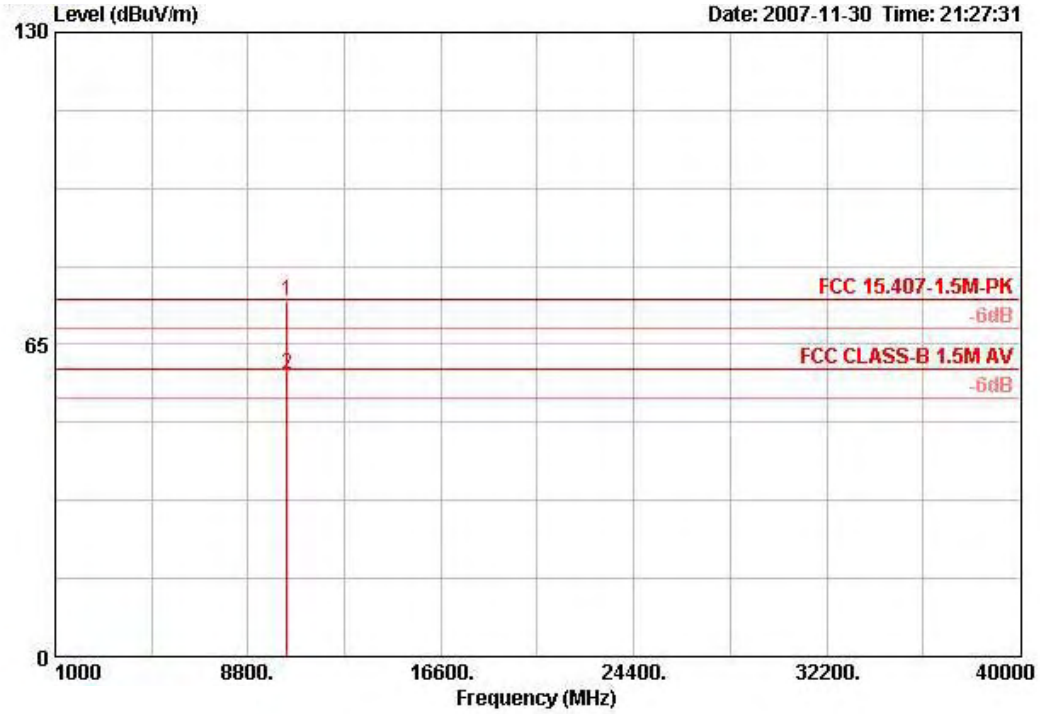
Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 36 Ant. 1 + Ant. 3

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
2	10358.840	68.18	-6.12	74.30	56.33	39.76	6.83	34.74	PEAK	111	33	HORIZONTAL

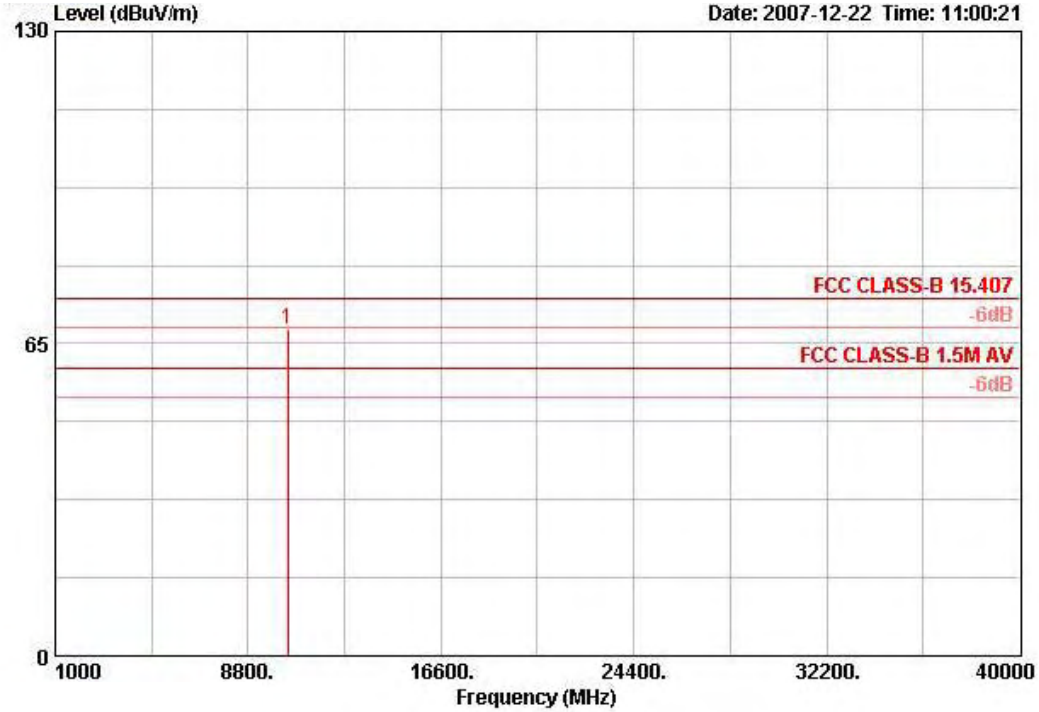
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10360.440	74.13	-0.17	74.30	62.29	39.76	6.83	34.74	PEAK	114	274	VERTICAL

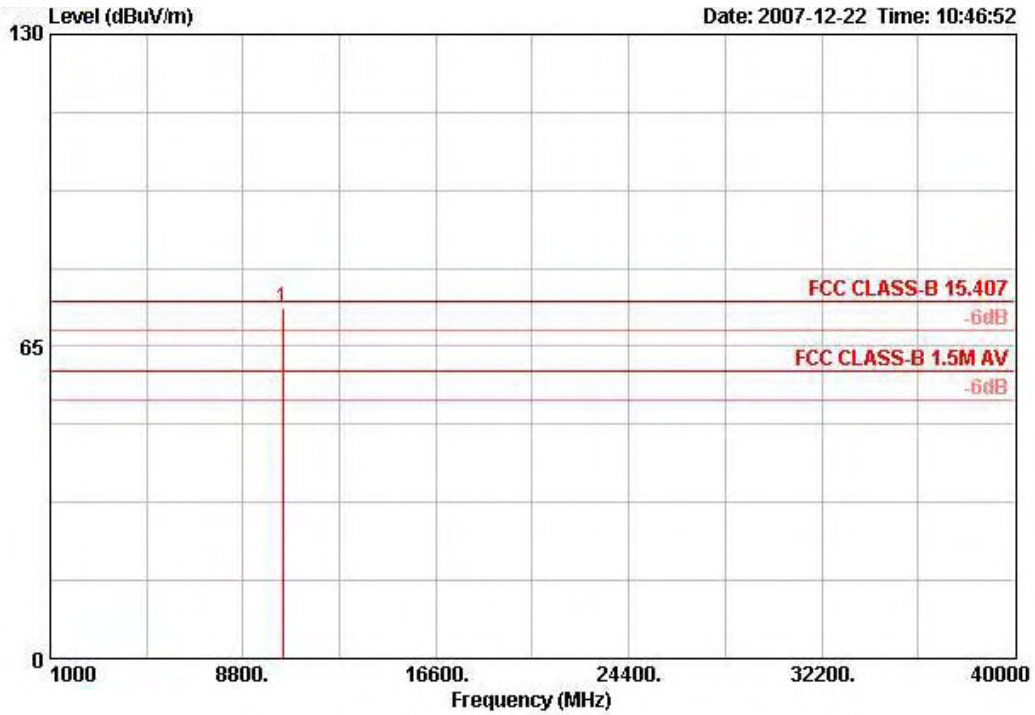
Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 40 Ant. 1 + Ant. 3

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10398.800	68.15	-6.15	74.30	56.18	39.82	6.83	34.69	PEAK	120	278	HORIZONTAL

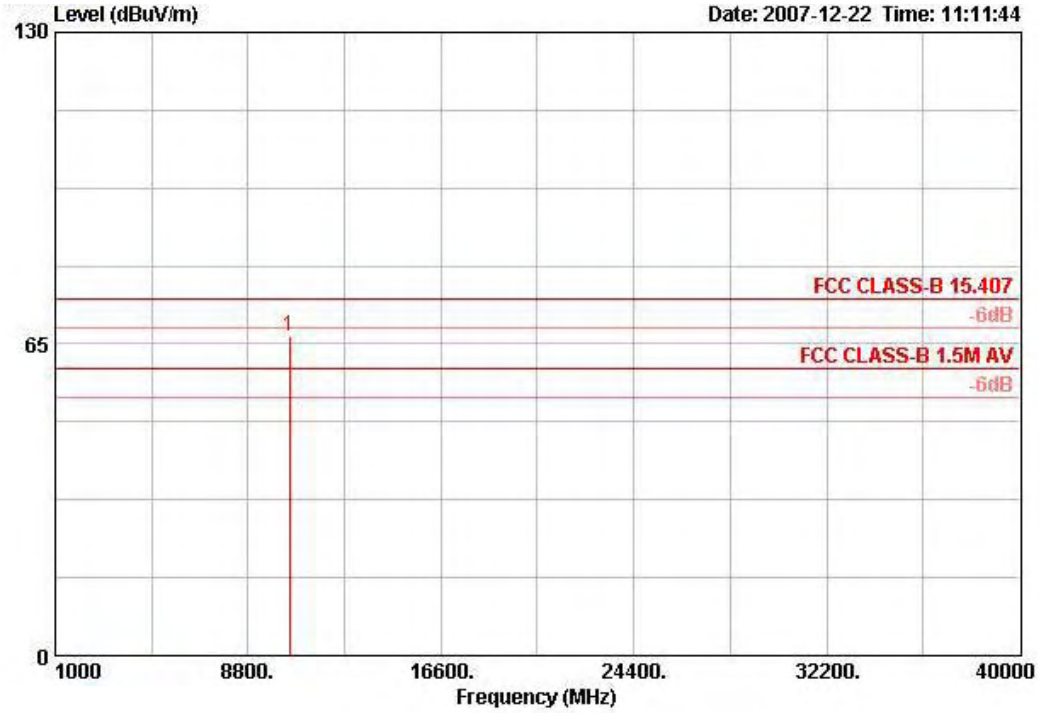
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10400.400	72.89	-1.41	74.30	60.93	39.82	6.83	34.69	PEAK	100	273	VERTICAL

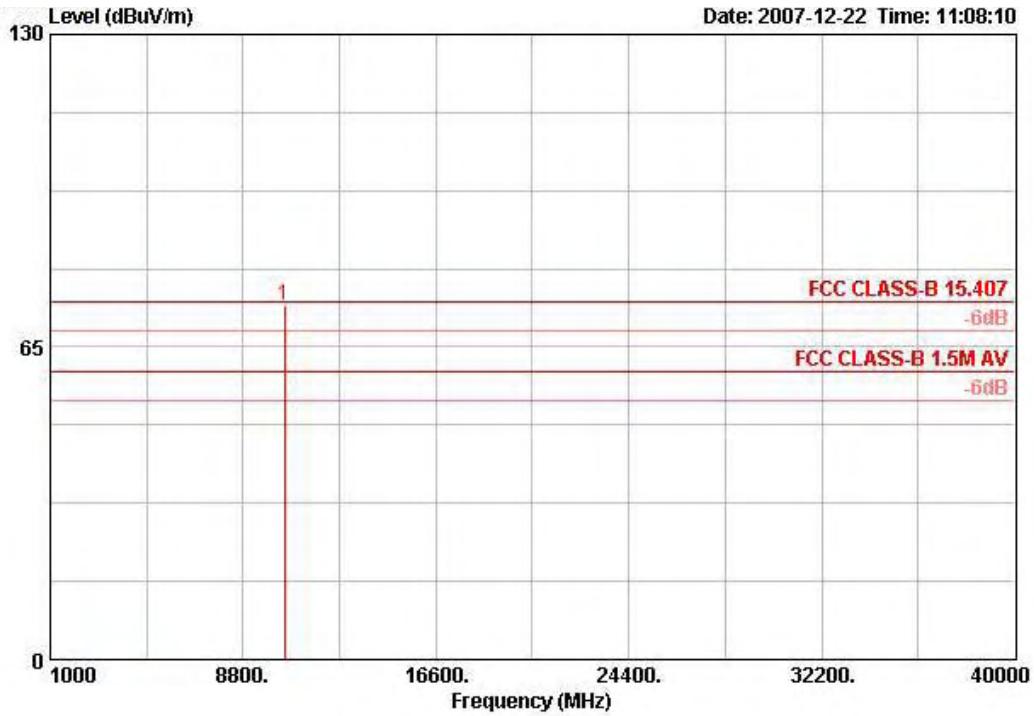
Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 48 Ant. 1 + Ant. 3

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	10478.800	66.46	-7.84	74.30	54.26	39.97	6.85	34.62	PEAK	114	272	HORIZONTAL

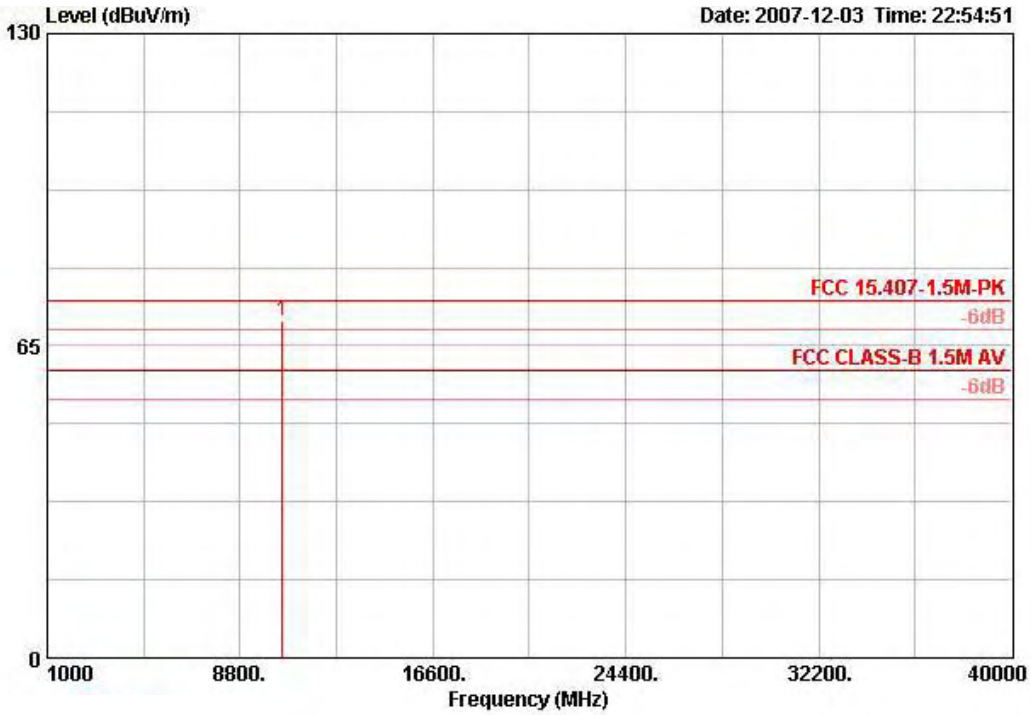
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10480.600	73.60	-0.70	74.30	61.40	39.97	6.85	34.62	PEAK	132	286	VERTICAL

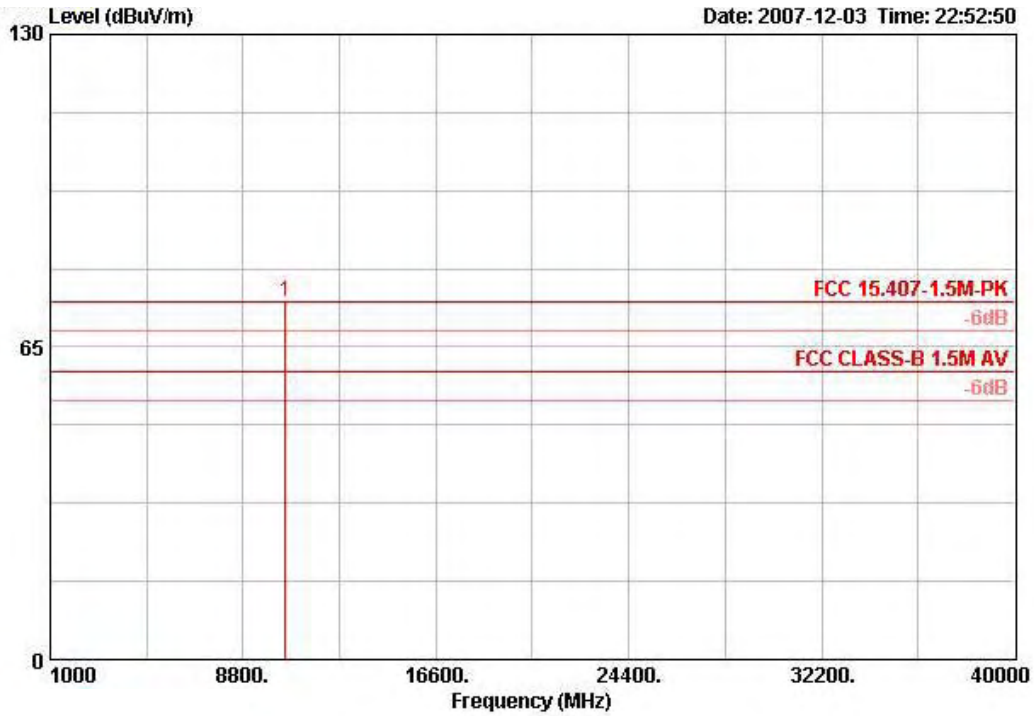
Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 52 Ant. 1 + Ant. 3

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 !	10518.640	70.00	-4.30	74.30	57.76	39.98	6.85	34.59	PEAK	122	285	HORIZONTAL

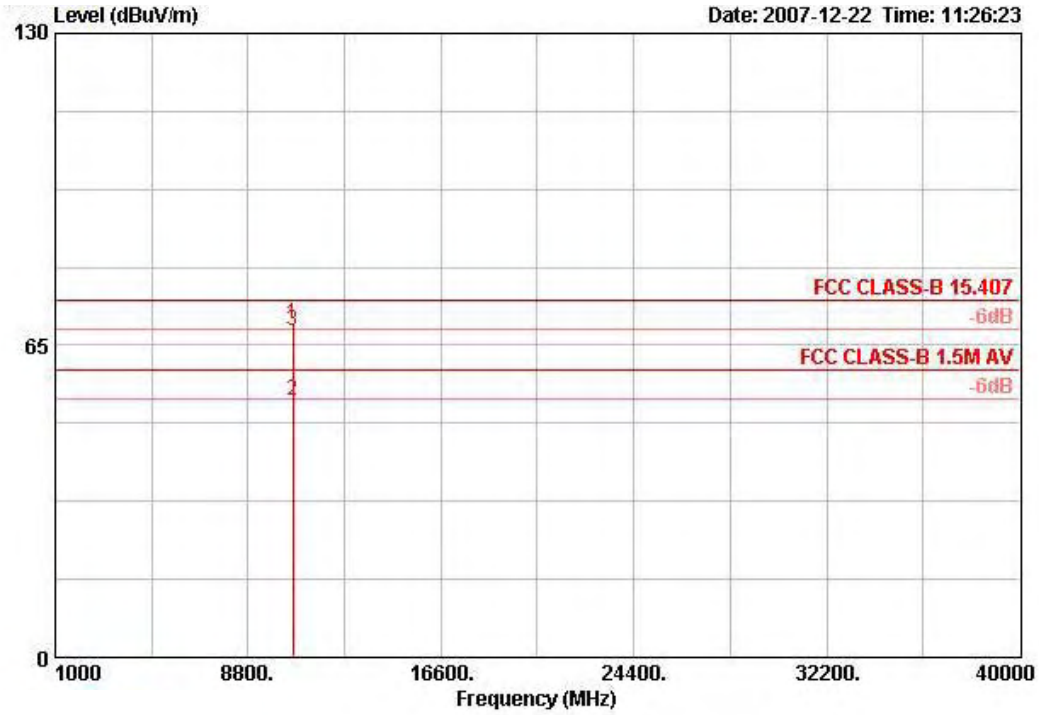
Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10522.000	74.22	-0.08	74.30	61.98	39.98	6.85	34.59	PEAK	118	288	VERTICAL

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 60 Ant. 1 + Ant. 3

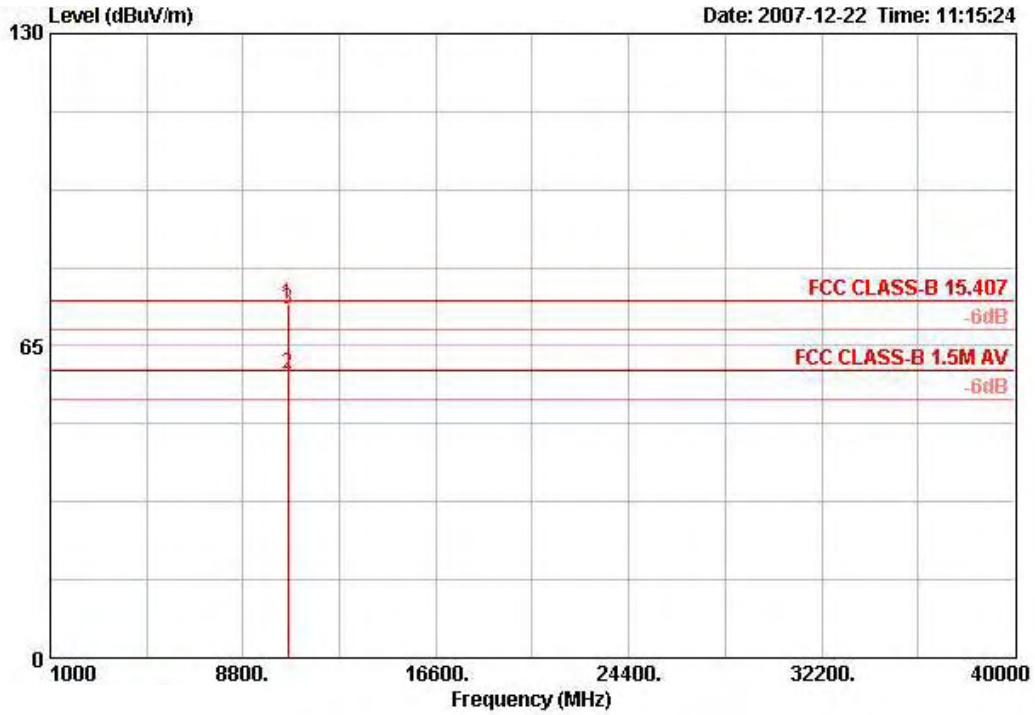
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10599.000	69.25	-5.05	74.30	57.10	39.90	6.88	34.62	PEAK	116	285	HORIZONTAL
2 @	10603.600	53.50	-6.50	60.00	41.35	39.90	6.89	34.63	AVERAGE	116	285	HORIZONTAL
3 @	10603.800	68.11			55.96	39.90	6.89	34.63	PEAK	116	285	HORIZONTAL

Note: Item 3 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Vertical

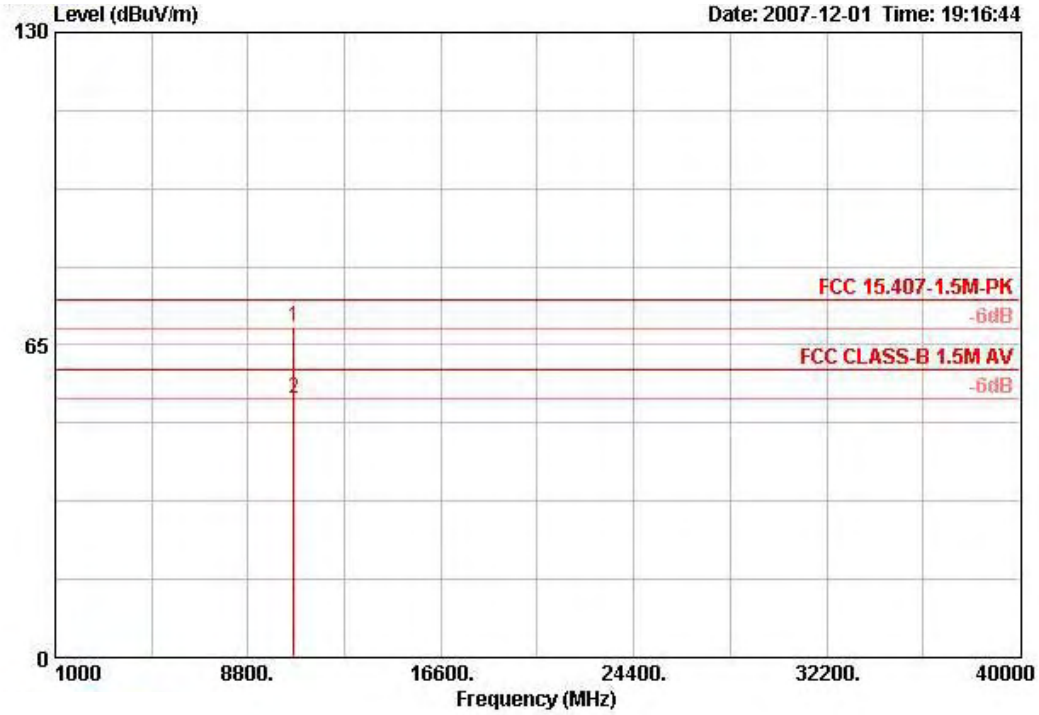


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10596.800	73.60	-0.70	74.30	61.44	39.90	6.88	34.62	Peak	127	285	VERTICAL
2 @	10601.400	59.14	-0.86	60.00	46.99	39.90	6.89	34.63	AVERAGE	127	285	VERTICAL
3 @	10601.600	72.66			60.51	39.90	6.89	34.63	PEAK	127	285	VERTICAL

Note: Item 3 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 64 Ant. 1 + Ant. 3

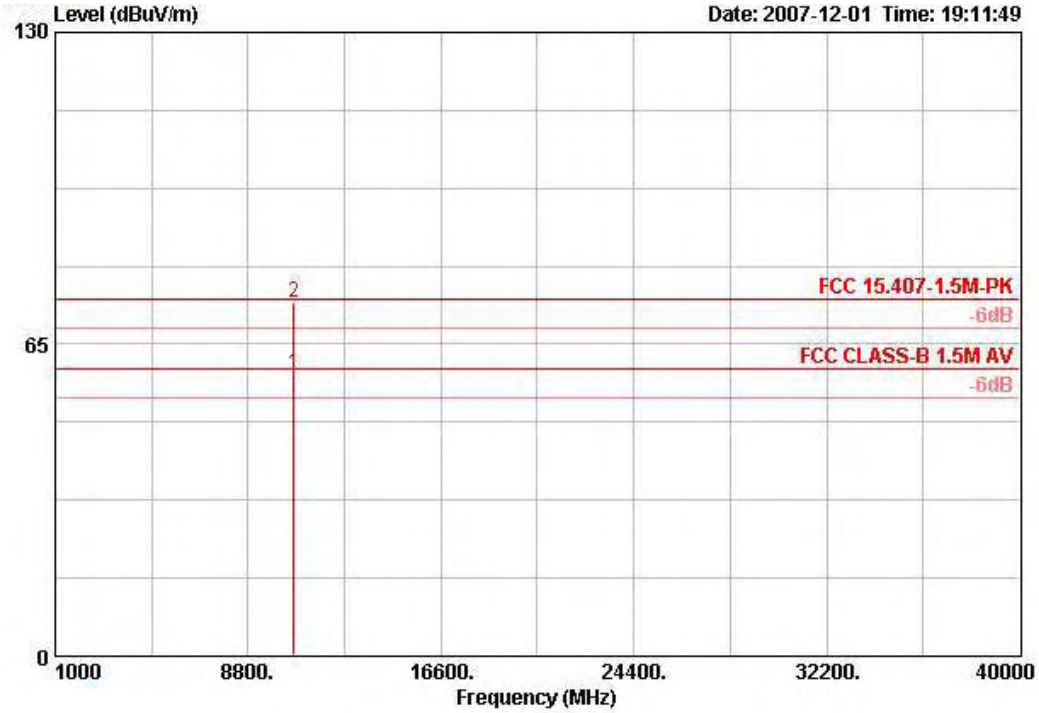
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 !	10639.080	68.73			56.61	39.86	6.89	34.64	PEAK	124	286	HORIZONTAL
2	10639.200	53.96	-6.04	60.00	41.84	39.86	6.89	34.64	AVERAGE	0	286	HORIZONTAL

Note: Item 1 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Vertical

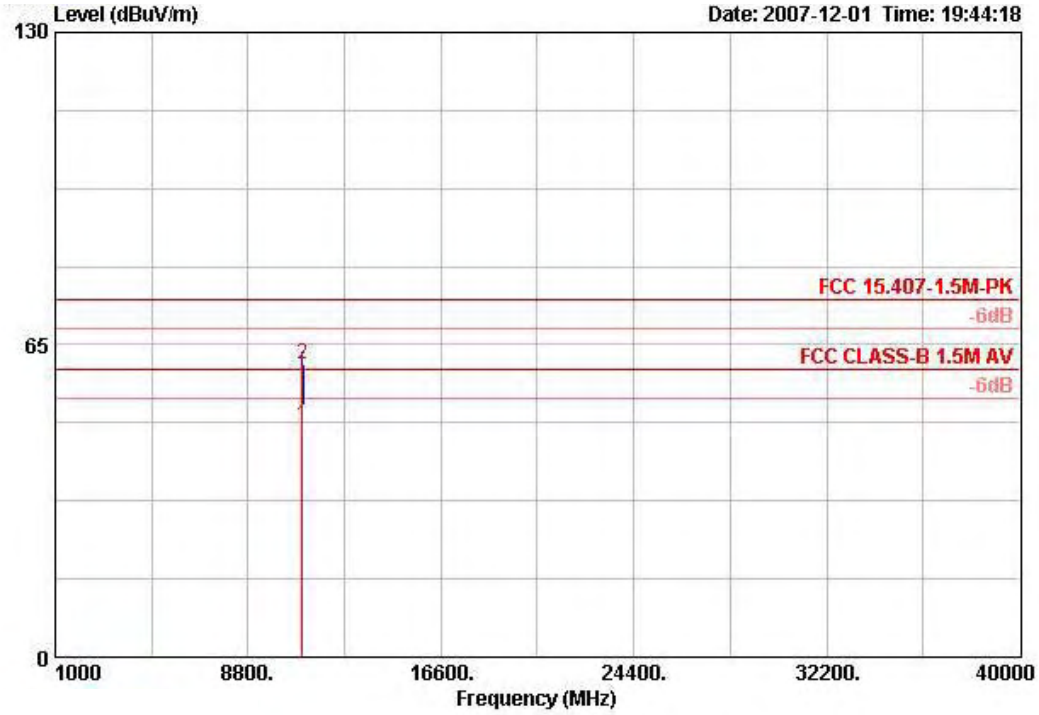


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	10641.880	58.89	-1.11	60.00	46.77	39.86	6.89	34.64	AVERAGE	110	289	VERTICAL
2 @	10642.000	73.77			61.65	39.86	6.89	34.64	PEAK	110	289	VERTICAL

Note: Item 2 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 100 Ant. 1 + Ant. 3

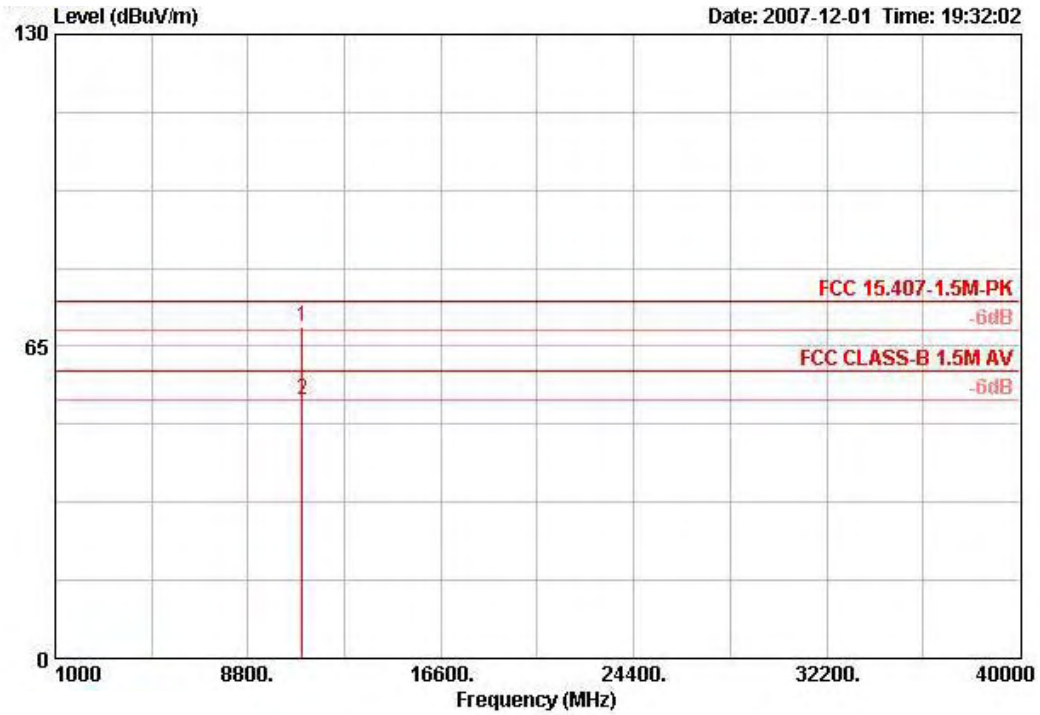
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	10997.760	48.03	-11.97	60.00	36.28	39.50	7.02	34.77	AVERAGE	109	268	HORIZONTAL
2	10997.760	60.96			49.21	39.50	7.02	34.77	PEAK	109	268	HORIZONTAL

Note: Item 2 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Vertical

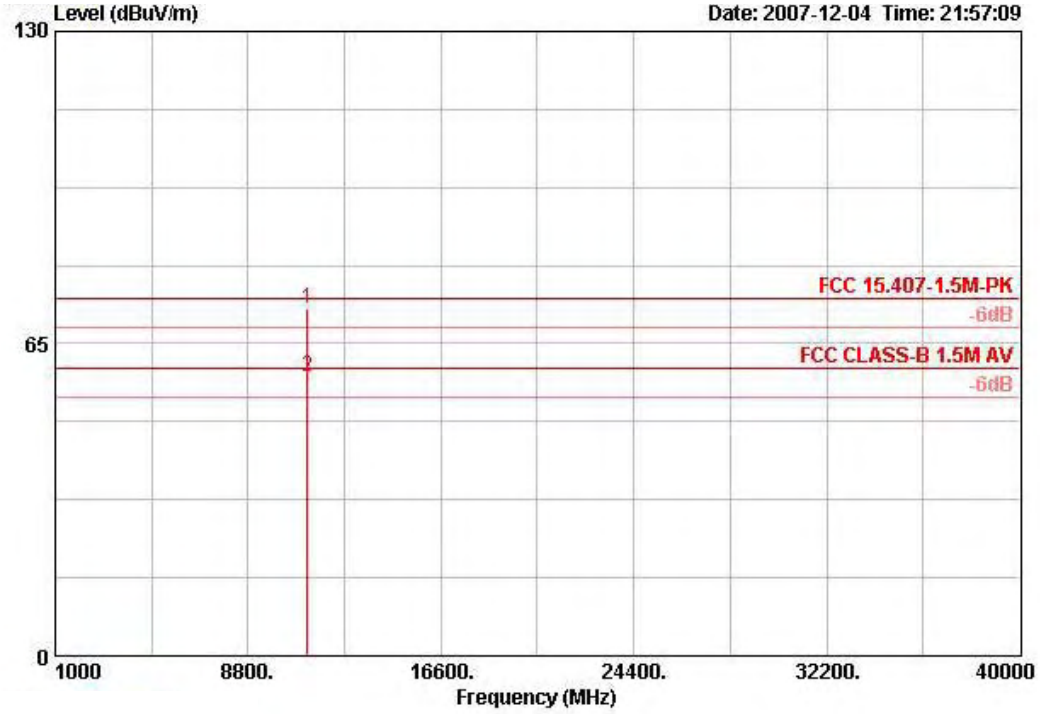


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 !	10998.040	69.07			57.32	39.50	7.02	34.77	PEAK	120	294	VERTICAL
2	10998.160	53.71	-6.29	60.00	41.96	39.50	7.02	34.77	AVERAGE	120	294	VERTICAL

Note: Item 1 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 120 Ant. 1 + Ant. 3

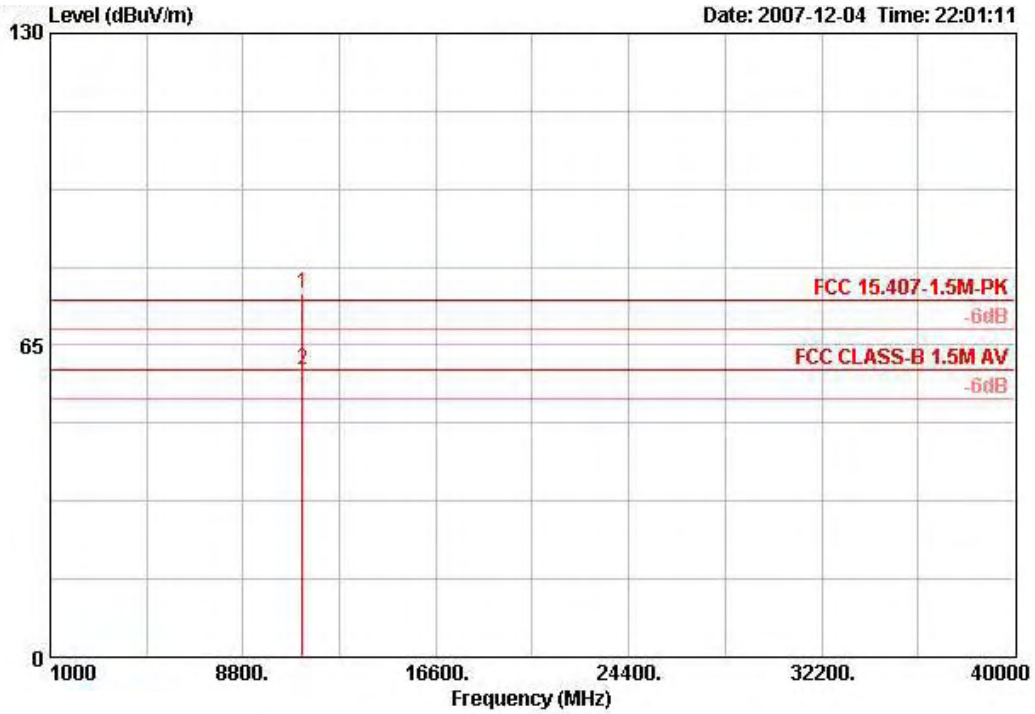
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	11194.680	72.41			60.66	39.50	7.10	34.85	PEAK	116	325	HORIZONTAL
2 @	11199.880	58.06	-1.94	60.00	46.31	39.50	7.10	34.85	AVERAGE	116	325	HORIZONTAL

Note: Item 1 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Vertical

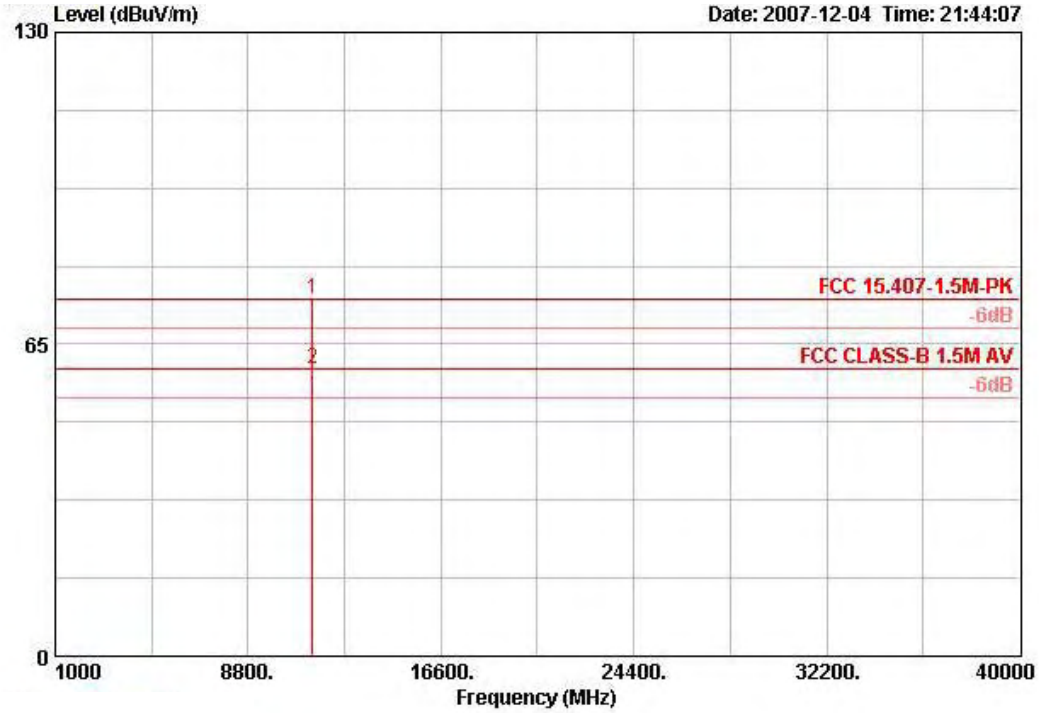


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	11197.360	75.88			64.13	39.50	7.10	34.85	PEAK	101	287	VERTICAL
2 @	11197.440	59.69	-0.31	60.00	47.94	39.50	7.10	34.85	AVERAGE	101	287	VERTICAL

Note: Item 1 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 140 Ant. 1 + Ant. 3

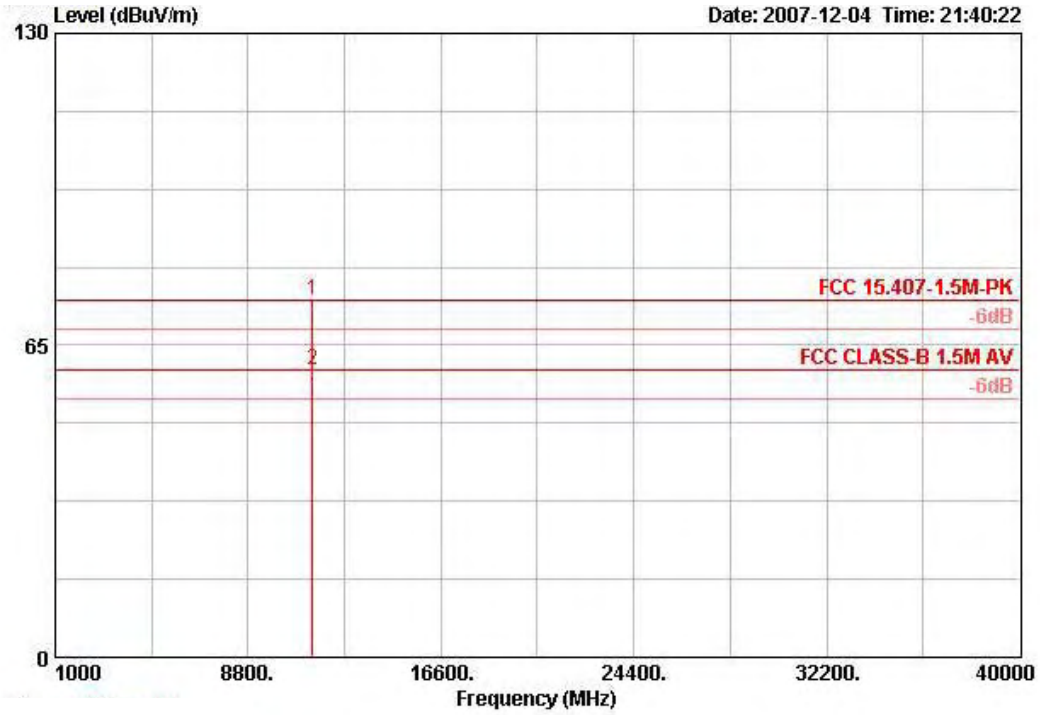
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	11397.040	74.27			62.52	39.50	7.17	34.92	PEAK	108	288	HORIZONTAL
2 @	11398.000	59.74	-0.26	60.00	47.99	39.50	7.17	34.92	AVERAGE	108	288	HORIZONTAL

Note: Item 1 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	11397.640	74.48			62.73	39.50	7.17	34.92	PEAK	108	289	VERTICAL
2 @	11397.920	59.79	-0.21	60.00	48.04	39.50	7.17	34.92	AVERAGE	108	289	VERTICAL

Note: Item 1 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

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 form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

4.7. Band Edge Emissions Measurement

4.7.1. 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 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 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

4.7.2. Measuring Instruments and Setting

Please refer to section 5 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

4.7.3. Test Procedures

1. The test procedure is the same as section 4.6.3, 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.

4.7.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.6.4.

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 36, 52, 64 Ant. 1 + Ant. 3

Channel 36

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 !	5150.000	55.59	-4.41	60.00	16.65	34.00	4.95	0.00	AVERAGE	100	49	VERTICAL
2	5150.000	67.14			28.20	34.00	4.95	0.00	PEAK	100	49	VERTICAL
3 @	5181.400	104.62			65.59	34.07	4.97	0.00	AVERAGE	100	49	VERTICAL
4 @	5182.400	113.64			74.60	34.07	4.97	0.00	PEAK	100	49	VERTICAL

Item 3, 4 are the fundamental frequency at 5180 MHz.

Note: Item 2 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Channel 52

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	5259.200	102.53			63.26	34.23	5.04	0.00	AVERAGE	100	232	VERTICAL
2 @	5261.000	113.00			73.73	34.23	5.04	0.00	PEAK	100	232	VERTICAL

Item 1, 2 are the fundamental frequency at 5260 MHz.

Channel 64

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	5316.800	105.27			65.86	34.33	5.08	0.00	AVERAGE	129	49	VERTICAL
2 @	5322.400	116.48			77.05	34.33	5.10	0.00	PEAK	129	49	VERTICAL
3	5350.000	67.23			27.70	34.40	5.13	0.00	PEAK	129	49	VERTICAL
4 @	5350.000	56.28	-3.72	60.00	16.75	34.40	5.13	0.00	AVERAGE	129	49	VERTICAL

Item 1, 2 are the fundamental frequency at 5320 MHz.

Note: Item 3 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Temperature	26℃	Humidity	60%
Test Engineer	Aric Li	Configurations	802.11a Ch 100, 120, 140 Ant. 1 + Ant. 3

Channel 100

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1	5460.000	67.99			28.17	34.60	5.22	0.00	PEAK	128	36	VERTICAL
2 @	5460.000	56.67	-3.33	60.00	16.86	34.60	5.22	0.00	AVERAGE	128	36	VERTICAL
3	5470.000	67.05	-7.25	74.30	27.20	34.63	5.22	0.00	PEAK	128	36	VERTICAL
4 @	5495.400	113.88			73.97	34.67	5.24	0.00	PEAK	128	36	VERTICAL
5 @	5502.800	102.86			62.91	34.70	5.25	0.00	AVERAGE	128	36	VERTICAL

Item 4, 5 are the fundamental frequency at 5500 MHz.

Note: Item 1 fall in restricted band, thus 15.209 limit applies. However, the test site distance has been moved to 1.5m, the corresponding limit will be adjusted to 80dBuV/m.

Channel 120

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	5596.400	101.75			61.69	34.77	5.29	0.00	AVERAGE	110	104	VERTICAL
2 @	5598.200	113.28			73.23	34.77	5.29	0.00	PEAK	110	104	VERTICAL

Item 3, 4 are the fundamental frequency at 5600 MHz.

Channel 140

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg	
1 @	5697.400	114.39			74.20	34.85	5.34	0.00	PEAK	110	81	VERTICAL
2 @	5701.800	103.27			63.07	34.87	5.34	0.00	AVERAGE	110	81	VERTICAL
3 @	5725.400	70.84	-3.46	74.30	30.60	34.88	5.35	0.00	PEAK	110	81	VERTICAL

Item 1, 2 are the fundamental frequency at 5700 MHz.

Note:

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

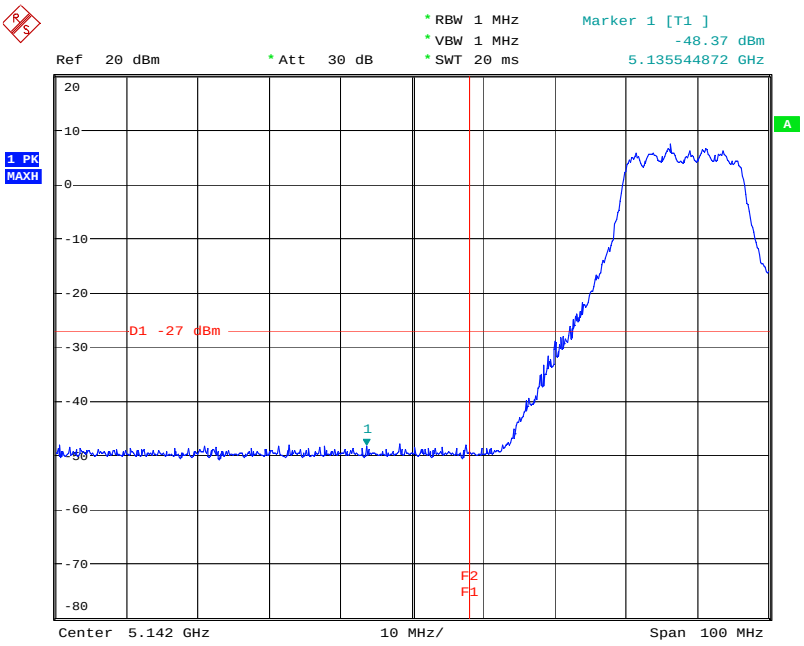
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

The limits above 5GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1.5m.

Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1.5m]) (dB);

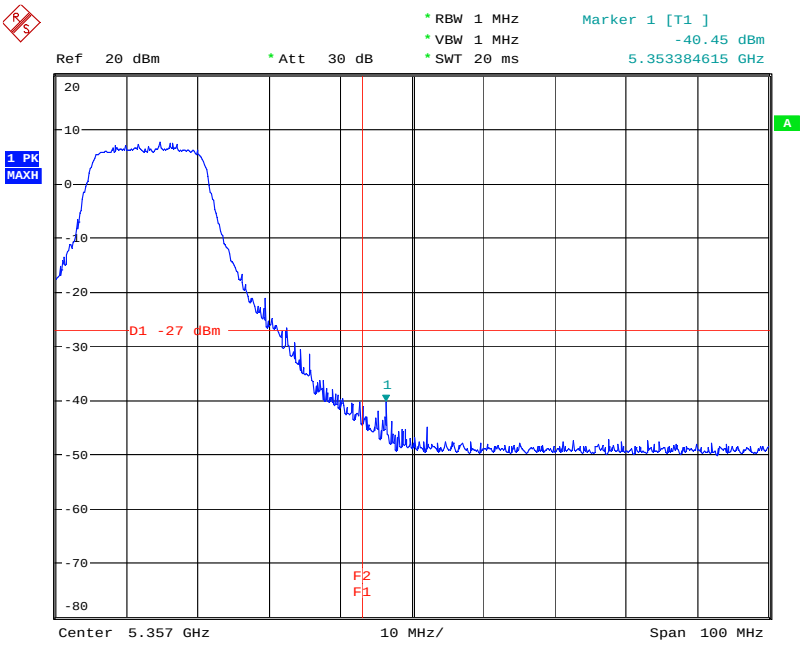
Limit line = specific limits (dBuV) + distance extrapolation factor [6 dB].

EIRP Emission in Band on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5180 MHz



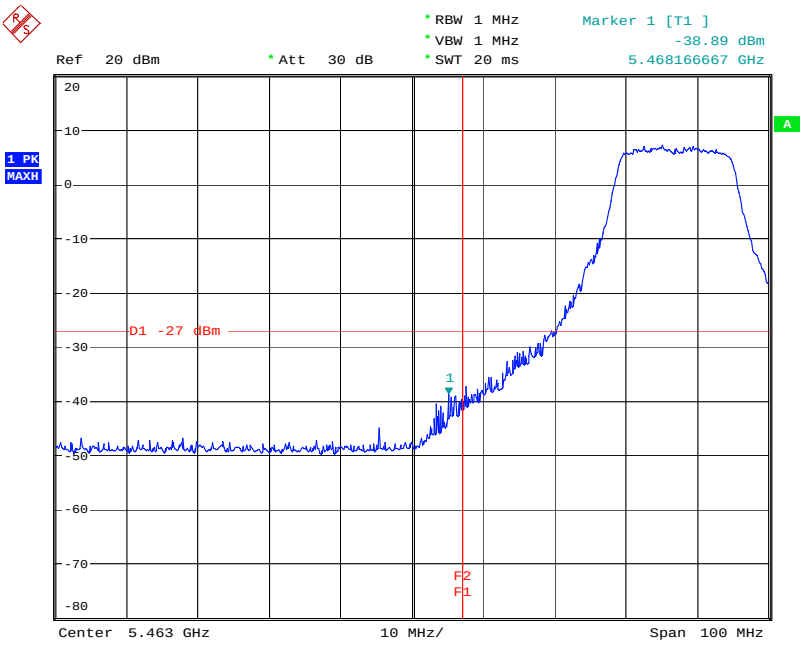
Date: 9.DEC.2007 11:53:43

EIRP Emission in Band on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5320 MHz



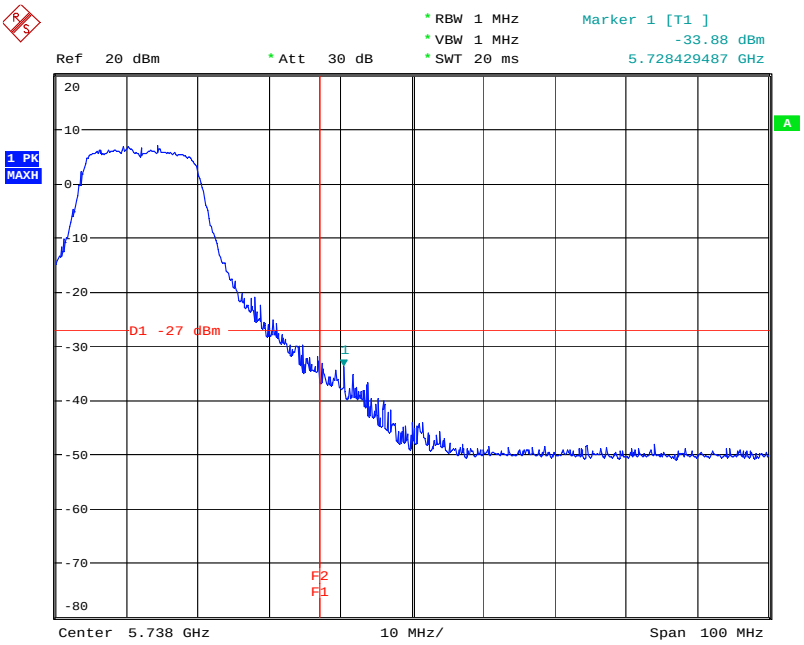
Date: 9.DEC.2007 12:11:42

EIRP Emission in Band on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5500 MHz



Date: 9.DEC.2007 12:10:25

EIRP Emission in Band on Configuration IEEE 802.11a Ant. 1 + Ant. 3 / 5700 MHz



Date: 9.DEC.2007 12:07:56

4.8. Frequency Stability Measurement

4.8.1. 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 ±20ppm (IEEE 802.11a specification).

4.8.2. Measuring Instruments and Setting

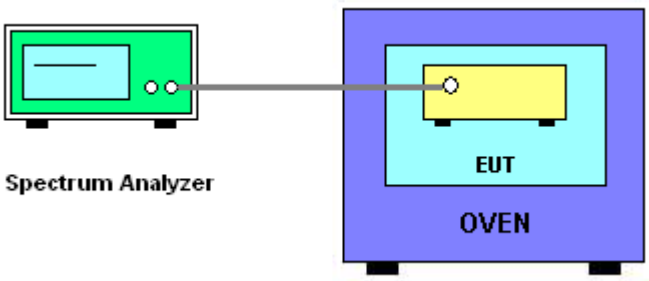
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyser.
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. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (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°C~50°C.
8. Measuring multiple antennas, the connector is required to link with spectrum analyser through a combiner.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5260 MHz
126.50	5260.009300
110.00	5260.023500
93.50	5259.993200
Max. Deviation (MHz)	0.023500
Max. Deviation (ppm)	4.47

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(℃)	5260 MHz
-30	5260.046300
-20	5260.050570
-10	5260.045700
0	5260.014100
10	5260.012900
20	5259.983500
30	5259.965300
40	5259.961200
50	5259.955600
Max. Deviation (MHz)	0.050570
Max. Deviation (ppm)	9.61

4.9. Antenna Requirements

4.9.1. 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.

4.9.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100359	9kHz – 2.75GHz	Mar. 01, 2007	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99079	9kHz – 30MHz	Mar. 31, 2007	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 22, 2007	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2007	Conduction (CO04-HY)
ISN	SCHAFFNER	ISN T400	21653	9kHz –30MHz	May 09, 2007	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	Conduction (CO04-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 14, 2007	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	Jun. 07, 2007	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	923364	26.5 GHz - 40 GHz	Jan. 22, 2007*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100305	9 kHz - 40 GHz	Sep. 27, 2007	Radiation (03CH03-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	May 23, 2006*	Radiation (03CH03-HY)
Bilog Antenna	SCHAFFNER	CBL 6112D	22237	30 MHz – 1 GHz	Jul. 21, 2007	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	May 04, 2007	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. 03, 2007	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Dec. 03, 2007	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, 2007	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100458	DC ~ 30GHz	Jun. 27, 2007	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jun. 27, 2007	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	May 04, 2007*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 03, 2007	Conducted (TH01-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2007	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 01, 2007	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 01, 2007	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Nov. 14, 2007	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 07, 2007	Conducted (TH01-HY)

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

* Calibration Interval of instruments listed above is two year.

NCR means Non-Calibration required.

6. 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 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

7. TAF CERTIFICATE OF ACCREDITATION

Certificate No. : L1190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2007 to January 09, 2010
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

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The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.