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FCC RADIO TEST REPORT

Applicant's company	**Proxim Wireless Corporation**
Applicant Address	1561 Buckeye Drive, Milpitas CA 95035 USA
FCC ID	**HZB-PROXMB92**
Manufacturer's company	**Proxim Wireless Corporation**
Manufacturer Address	1561 Buckeye Drive, Milpitas CA 95035 USA

Product Name	miniPCI High Power MIMO IEEE 802.11 a/b/g/n RF Module
Brand Name	PROXIM
Model Name	PROXMB92
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250MHz
Received Date	May 10, 2010
Final Test Date	Jul. 17, 2010
Submission Type	Class II Change
Operating Mode	Master / Client (without radar detection function)

Statement

Test result included is 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.

Testing Laboratory
1190

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History of This Test Report

Original Issue Date: Jul. 23, 2010

Report No.: FR051015-01AA

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No.: CB9907079

1. CERTIFICATE OF COMPLIANCE

Product Name	:	miniPCI High Power MIMO IEEE 802.11 a/b/g/n RF Module
Brand Name	:	PROXIM
Model Name	:	PROXMB92
Applicant	:	Proxim Wireless Corporation
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 May 10, 2010 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.

Jordan Hsiao 2010.8.9

Jordan Hsiao
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**
-	15.207	AC Power Line Conducted Emissions	-	-
4.1	15.407(a)	26dB Spectrum Bandwidth	Complies	-
4.2	15.407(a)	Maximum Conducted Output Power	Complies	0.69 dB
4.3	15.407(a)	Power Spectral Density	Complies	0.02 dB
4.4	15.407(a)	Peak Excursion	Complies	6.33 dB
4.5	15.407(b)	Radiated Emissions	Complies	0.19 dB
4.6	15.407(b)	Band Edge Emissions	Complies	0.15 dB
4.7	15.407(g)	Frequency Stability	Complies	-
4.8	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	$\pm 8.5\times10^{-8}$	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, 2RX)
Radio Type	Intentional Transceiver
Power Type	From POE
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 ~ 5250MHz
Channel Number	4
Channel Band Width (99%)	For Ant. 3: 802.11a 5MHz: 5.00 MHz ; 802.11a 10MHz: 8.97 MHz For Ant. 4: 802.11a 5MHz: 5.00 MHz ; 802.11a 10MHz: 8.97 MHz
Conducted Output Power	For Ant. 3: 802.11a 5MHz: 6.67 dBm ; 802.11a 10MHz: 9.33 dBm For Ant. 4: 802.11a 5MHz: 11.62 dBm ; 802.11a 10MHz: 13.55 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

3.2. Accessories

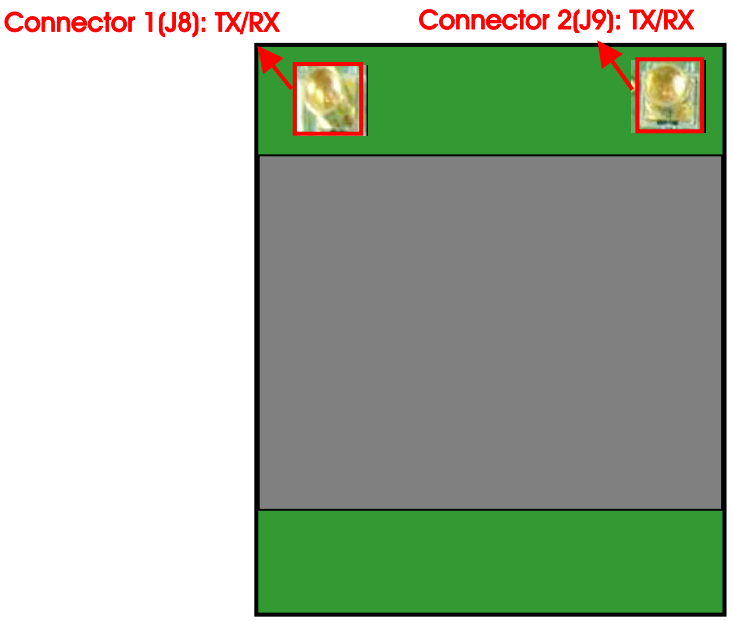
N/A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Attenuator (dBi)	Antenna gain		Cable Loss		Test Antenna gain	
						2.4GHz Band	5GHz Band	2.4GHz Band	5GHz Band	2.4GHz Band	5GHz Band
1	MARS	MA-WA55-30	Panel Antenna	N-Type	20	-	30	-	2	-	8
2	MARS	MA-WB55-20	Sector Antenna	N-Type	10	-	20	-	2	-	8
3	CSC Networks	65812 ODN	Omni Antenna	N-Type	-	-	12	-	2	-	10
4	SmartAnt	USI05-220170 -V1	Dipole Antenna	Reversed-SMA	-	2.5	5	0.5	0.5	2	4.5
5	MARS	MA-WA25-20	Panel Antenna	N-Type	10	20	-	1	-	9	-
6	CSC Networks	62420 SN-120	Sector Antenna	N Female	10	20	-	1	-	9	-
7	CSC Networks	62416 ODN	Omni Antenna	N-Type	10	17	-	1	-	6	-

Note:

The EUT has two antenna connectors that can be used for transmitting and receiving simultaneously as 2Tx and 2Rx. Also there are seven types of antenna provided to this EUT and all of them can be used as transmitting and receiving antenna.



3.4. Table for Carrier Frequencies

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz	36	5180 MHz	44	5220 MHz
Band 1	40	5200 MHz	48	5240 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	Channel	Antenna
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Power Spectral Density Peak Excursion	11a/BPSK	Band 1	6Mbps	36/40/48	3, 4
Radiated Emission Above 1GHz	11a/BPSK	Band 1	6Mbps	36/40/48	3, 4
Band Edge Emission	11a/BPSK	Band 1	6Mbps	36/40/48	3, 4

Note 1: In theory, the test mode of two antennas transmitting simultaneously is worse case than single antenna.

Note 2: IEEE 802.11a Band 1 (5150~5250MHz) support 5MHz/10MHz bandwidth.

The following test modes were performed for all tests:

Test Mode 1. EUT + Antenna 3 (5GHz Antenna) / with 5MHz bandwidth

Test Mode 2. EUT + Antenna 3 (5GHz Antenna) / with 10MHz bandwidth

Test Mode 3. EUT + Antenna 4 (5GHz Antenna) / with 5MHz bandwidth

Test Mode 4. EUT + Antenna 4 (5GHz Antenna) / with 10MHz bandwidth

For Radiated Emissions Test Above 1GHz:

All the test results were tested and recorded in the report.

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	879474	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.

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: 051015

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Add the test result of bandwidth for 5MHz and 10MHz for IEEE 802.11b/g and IEEE 802.11a Band 1, Band 4 (5150~5250MHz, 5745~5825MHz).	26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement Power Spectral Density Peak Excursion Radiated Emission Above 1GHz Band Edge Emission

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
POE	PowerDsine	PD-7001G	DoC
Notebook	DELL	M1330	E2KWM3945ABG
Notebook	DELL	D400	E2K24GBRL
Notebook	DELL	1200	E2K4965AGNM

3.9. 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.

For Antenna 3 / Mode 1:

Power Parameters of IEEE 802.11a 5MHz

Test Software Version	ART		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 11a Ant. 3	11	10	10

For Antenna 3 / Mode 2:

Power Parameters of IEEE 802.11a 10MHz

Test Software Version	ART		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 11a Ant. 3	16	15	15

For Antenna 4 / Mode 3:

Power Parameters of IEEE 802.11a 5MHz

Test Software Version	ART		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 11a Ant. 4	20	20	18

For Antenna 4 / Mode 4:

Power Parameters of IEEE 802.11a 10MHz

Test Software Version	ART		
Frequency	5180 MHz	5200 MHz	5240 MHz
IEEE 11a Ant. 4	25	25	23

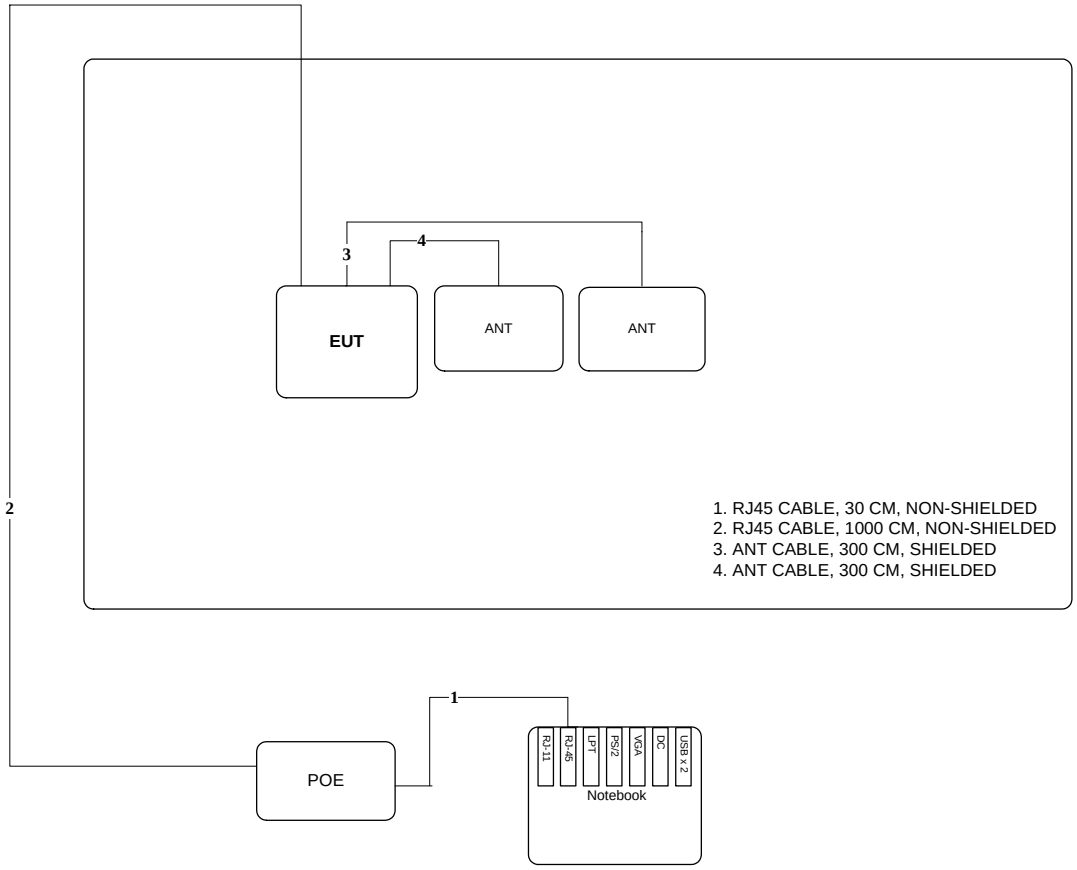
During the test, the following program under WIN XP was executed:

Executed “ART” to control the EUT continuously transmit RF signal.

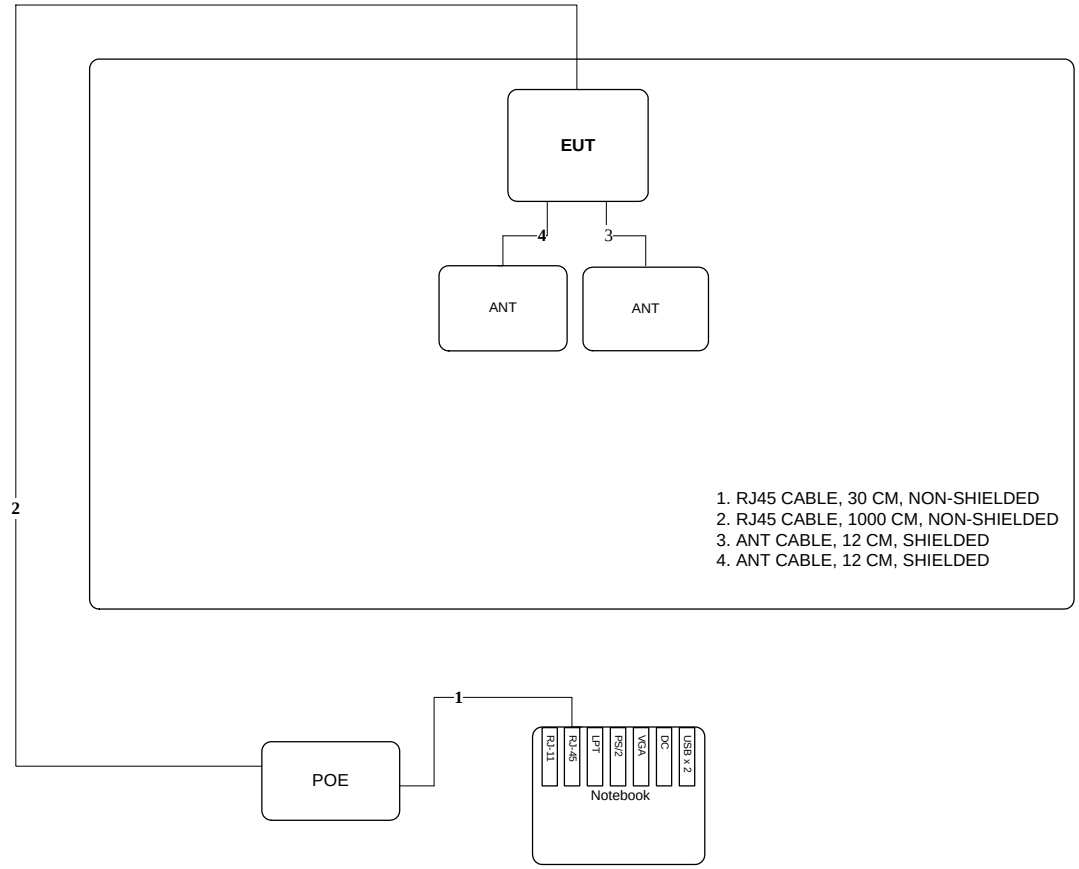
3.10. Test Configurations

3.10.1. Radiation Emissions Test Configuration

For Antenna 3:



For Antenna 4:



4. TEST RESULT

4.1. 99% Occupied Bandwidth Measurement

4.1.1. Limit

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

4.1.2. Measuring Instruments and Setting

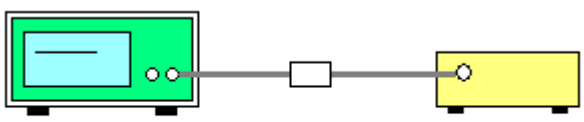
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.1.3. 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.

4.1.4. Test Setup Layout



4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of 99% Occupied Bandwidth

For Antenna 3 / Mode 1:

Temperature	21℃	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	7.05	4.87
40	5200 MHz	7.17	5.00
48	5240 MHz	6.79	5.00

For Antenna 3 / Mode 2:

Temperature	21℃	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	12.56	8.97
40	5200 MHz	12.05	8.97
48	5240 MHz	12.43	8.84

For Antenna 4 / Mode 3:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	7.05	4.87
40	5200 MHz	7.17	5.00
48	5240 MHz	6.79	5.00

For Antenna 4 / Mode 4:

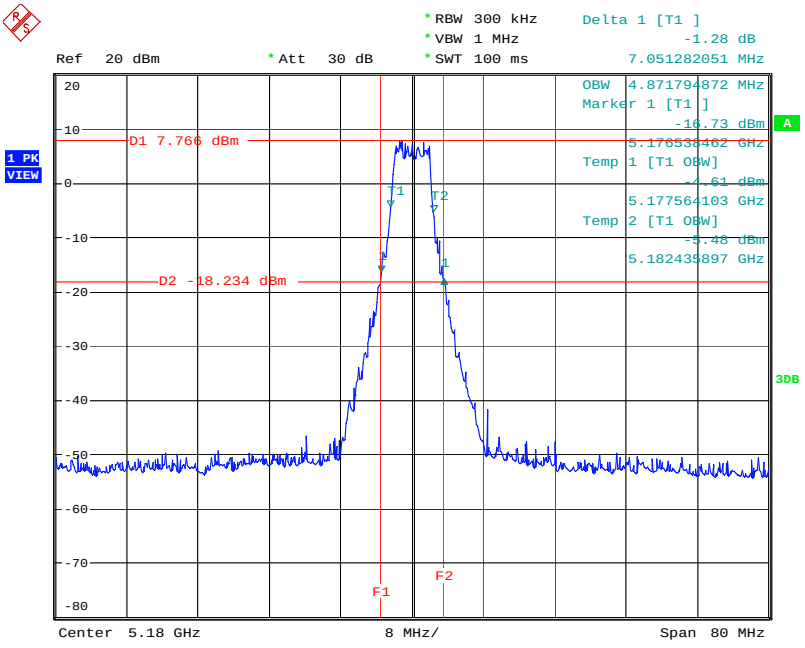
Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	12.56	8.97
40	5200 MHz	12.05	8.97
48	5240 MHz	12.43	8.84

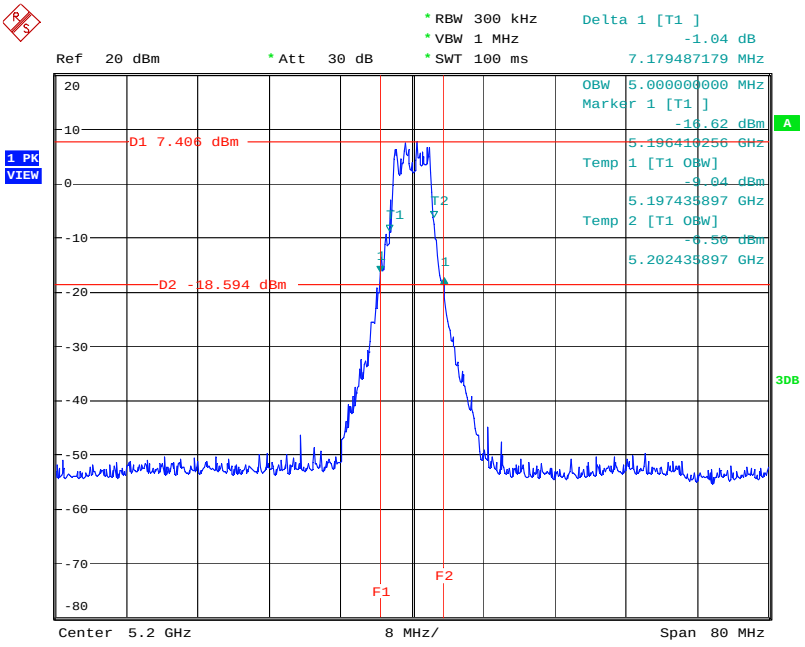
For Antenna 3 / Mode 1:

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5180 MHz



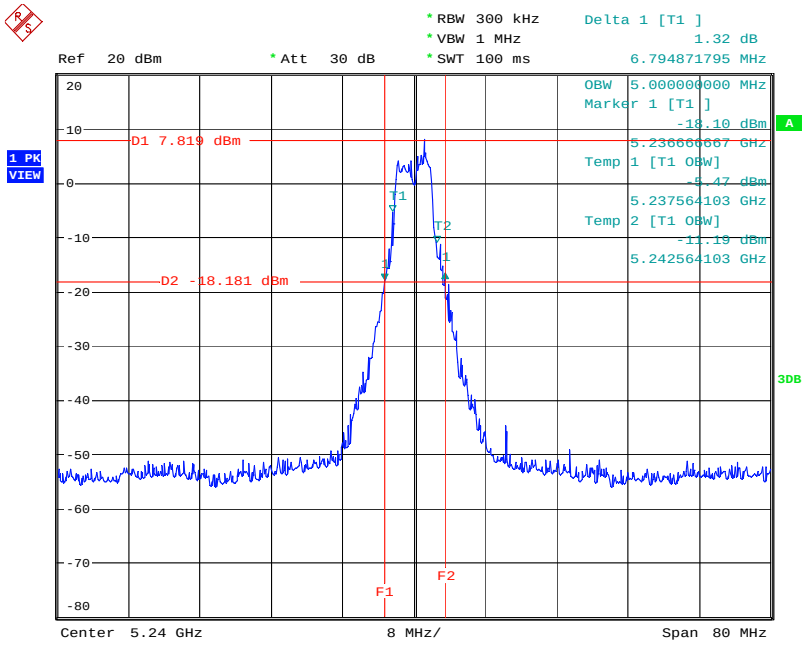
Date: 3.JUL.2010 14:46:07

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5200 MHz



Date: 3.JUL.2010 14:45:25

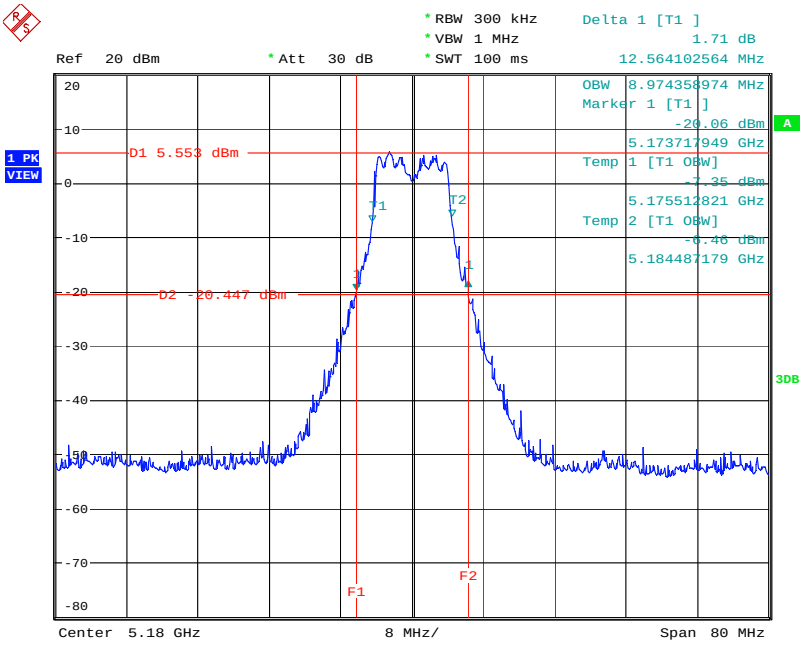
26 dB Bandwidth Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5240 MHz



Date: 3.JUL.2010 14:43:52

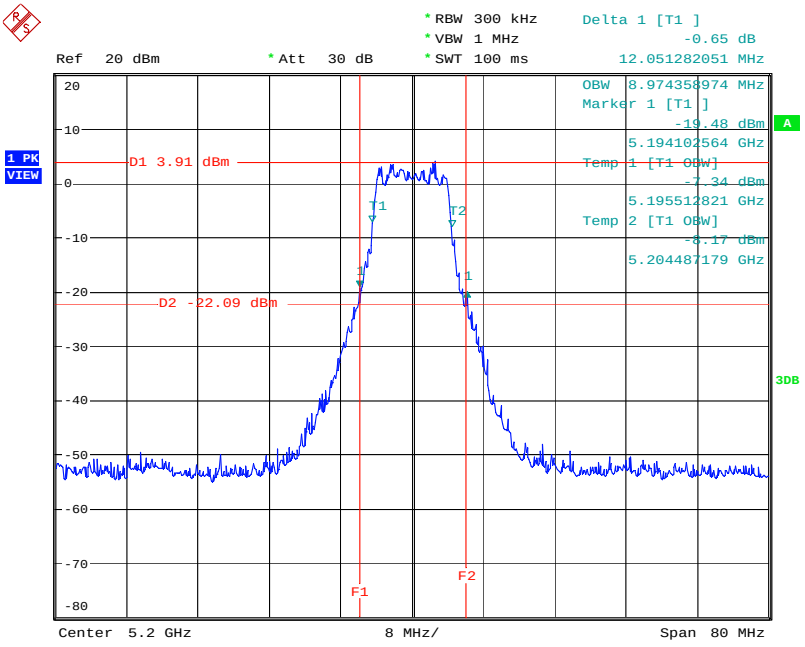
For Antenna 3 / Mode 2:

26 dB Bandwidth Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5180 MHz



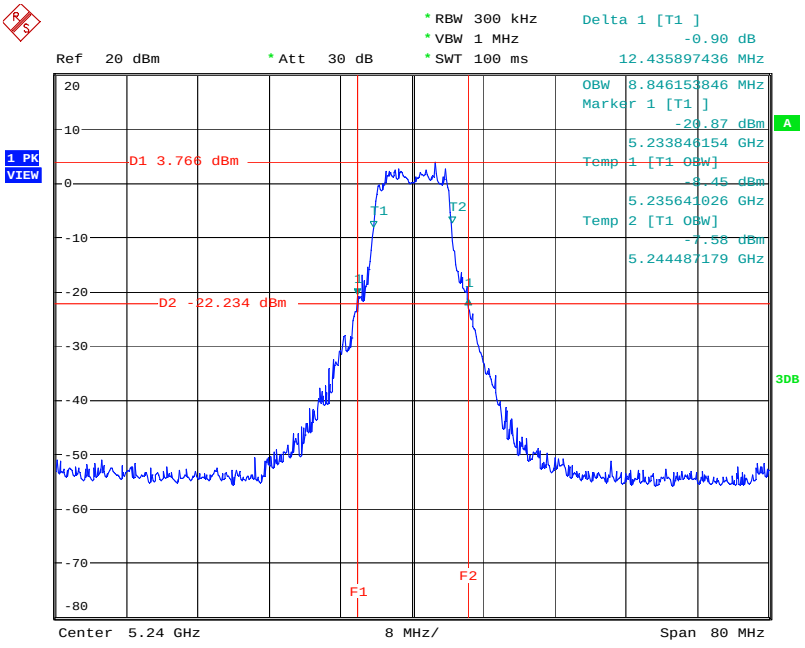
Date: 3.JUL.2010 15:13:48

26 dB Bandwidth Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5200 MHz



Date: 3.JUL.2010 15:15:35

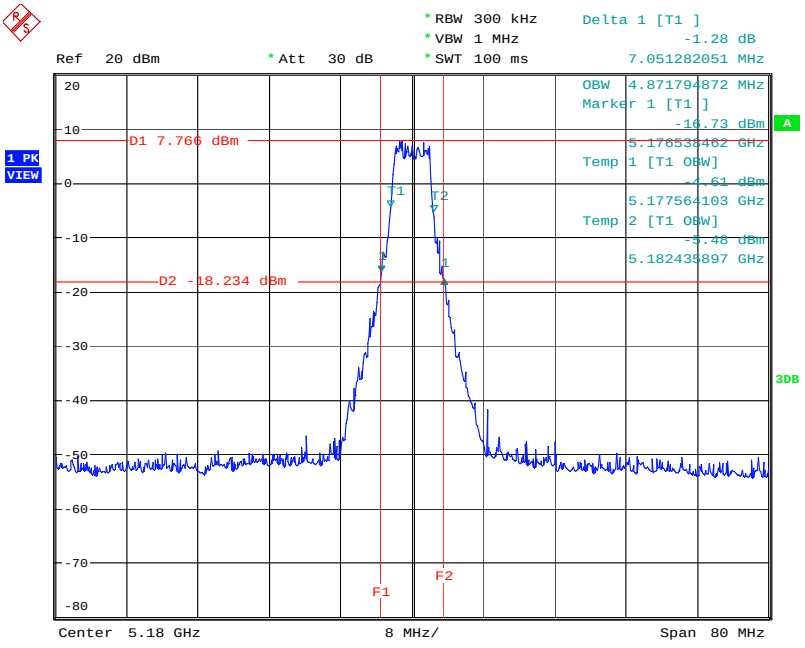
26 dB Bandwidth Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5240 MHz



Date: 3.JUL.2010 15:20:26

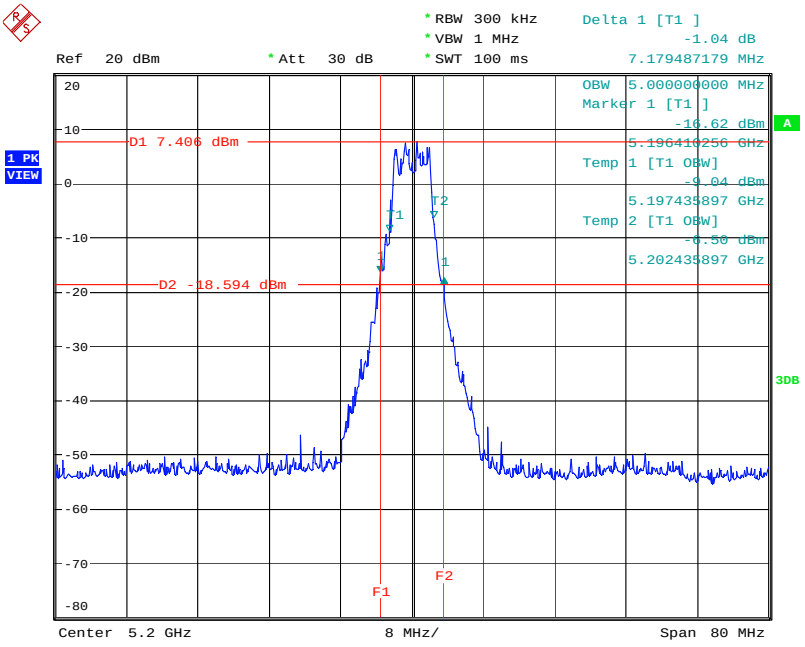
For Antenna 4 / Mode 3:

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5180 MHz



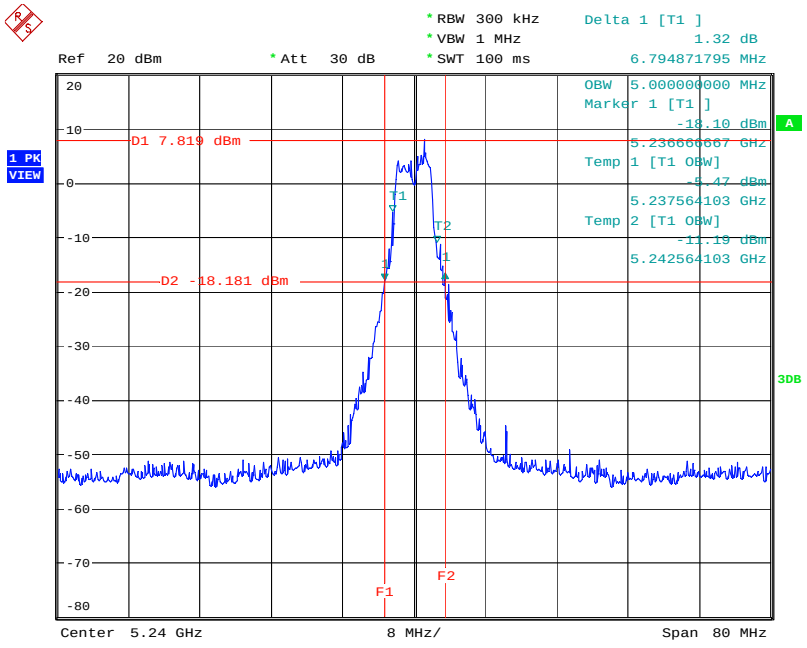
Date: 3.JUL.2010 14:46:07

26 dB Bandwidth Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5200 MHz



Date: 3.JUL.2010 14:45:25

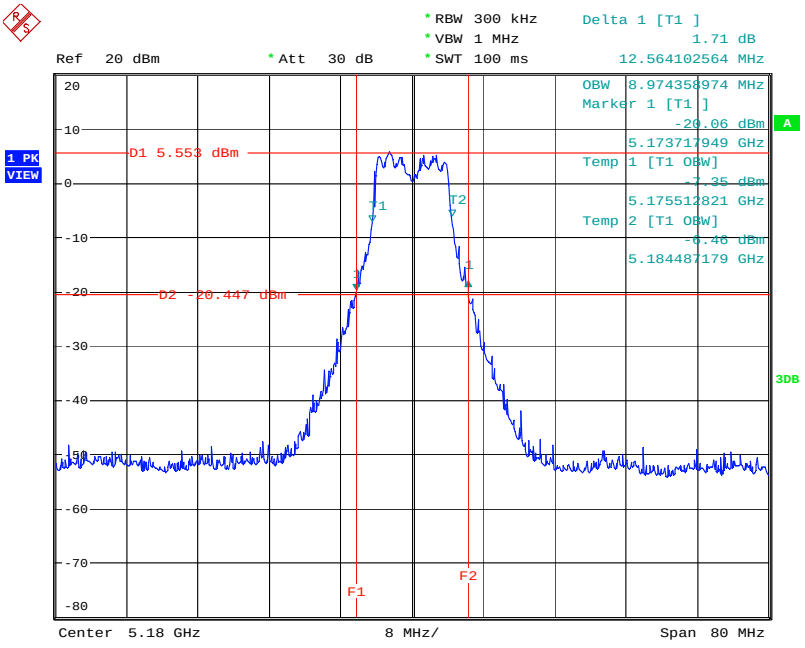
26 dB Bandwidth Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5240 MHz



Date: 3.JUL.2010 14:43:52

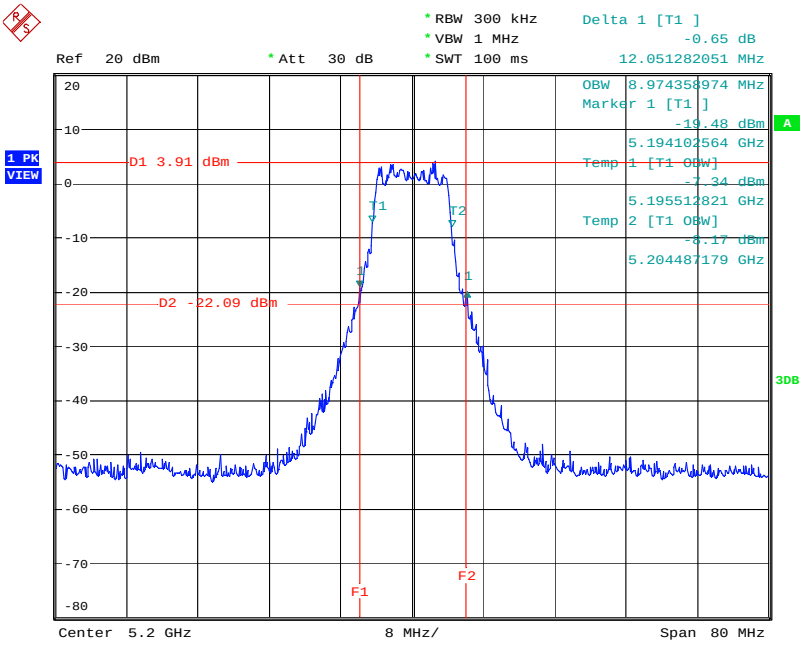
For Antenna 4 / Mode 4:

26 dB Bandwidth Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5180 MHz



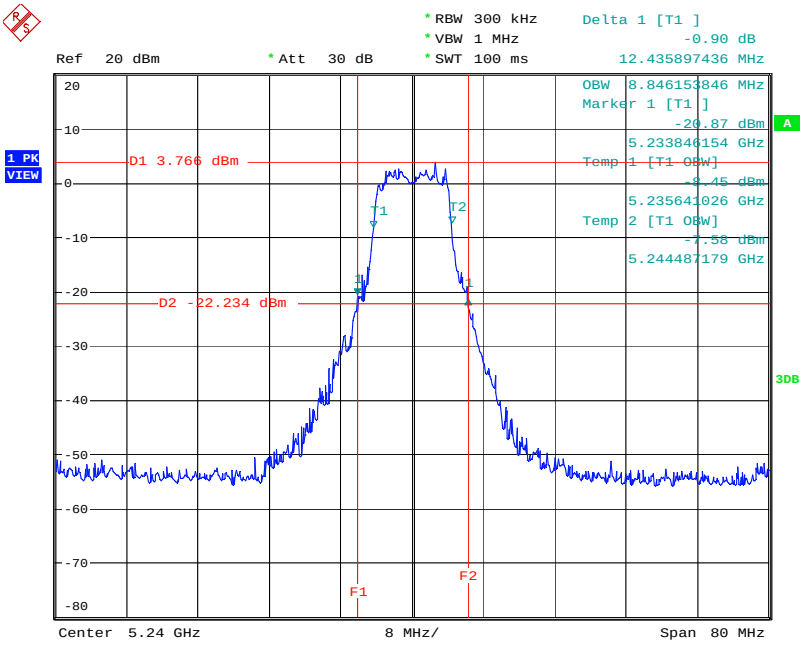
Date: 3.JUL.2010 15:13:48

26 dB Bandwidth Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5200 MHz



Date: 3.JUL.2010 15:15:35

26 dB Bandwidth Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5240 MHz



Date: 3.JUL.2010 15:20:26

4.2. Maximum Conducted Output Power Measurement

4.2.1. 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.

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.

4.2.2. Measuring Instruments and Setting

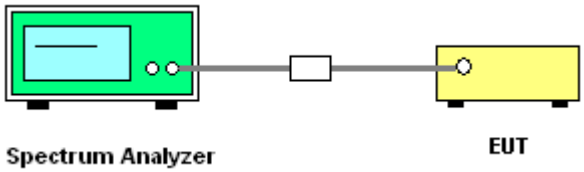
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with FCC Public Notice DA 02-2138, August 30, 2002.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

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 Maximum Conducted Output Power

For Antenna 3 / Mode 1:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	4.17	8.31	Complies
40	5200 MHz	3.54	8.31	Complies
48	5240 MHz	4.11	8.31	Complies

Configuration IEEE 802.11a Ant. 3-2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	3.09	8.31	Complies
40	5200 MHz	2.91	8.31	Complies
48	5240 MHz	2.63	8.31	Complies

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	6.67	8.31	Complies
40	5200 MHz	6.25	8.31	Complies
48	5240 MHz	6.44	8.31	Complies

For Antenna 3 / Mode 2:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	6.62	10.08	Complies
40	5200 MHz	6.66	10.08	Complies
48	5240 MHz	6.83	10.08	Complies

Configuration IEEE 802.11a Ant. 3-2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	5.43	10.08	Complies
40	5200 MHz	5.95	10.08	Complies
48	5240 MHz	5.55	10.08	Complies

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	9.08	10.08	Complies
40	5200 MHz	9.33	10.08	Complies
48	5240 MHz	9.25	10.08	Complies

For Antenna 4 / Mode 3:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	8.97	12.31	Complies
40	5200 MHz	8.89	12.31	Complies
48	5240 MHz	8.33	12.31	Complies

Configuration IEEE 802.11a Ant. 4-2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	7.72	12.31	Complies
40	5200 MHz	8.32	12.31	Complies
48	5240 MHz	6.75	12.31	Complies

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	11.40	12.31	Complies
40	5200 MHz	11.62	12.31	Complies
48	5240 MHz	10.62	12.31	Complies

For Antenna 4 / Mode 4:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	10.60	14.80	Complies
40	5200 MHz	11.12	14.80	Complies
48	5240 MHz	10.39	14.80	Complies

Configuration IEEE 802.11a Ant. 4-2

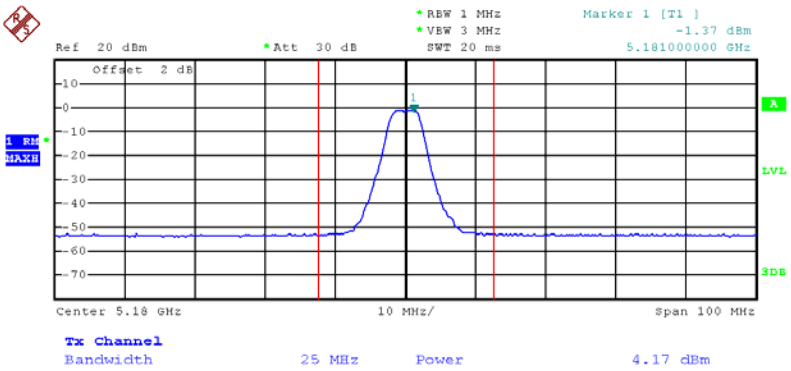
Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	9.58	14.80	Complies
40	5200 MHz	9.88	14.80	Complies
48	5240 MHz	9.37	14.80	Complies

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	13.13	14.80	Complies
40	5200 MHz	13.55	14.80	Complies
48	5240 MHz	12.92	14.80	Complies

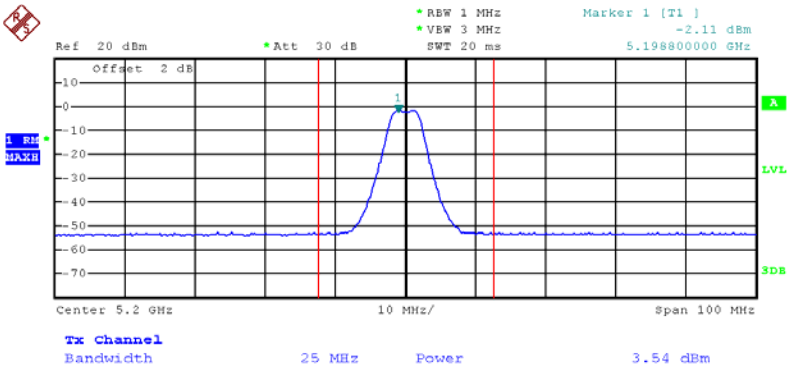
For Antenna 3 / Mode 1:

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 / 5180 MHz



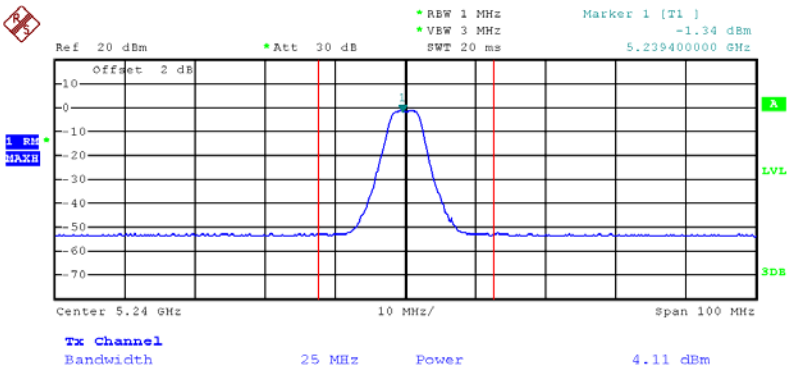
Date: 7.JUL.2010 20:31:53

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 / 5200 MHz



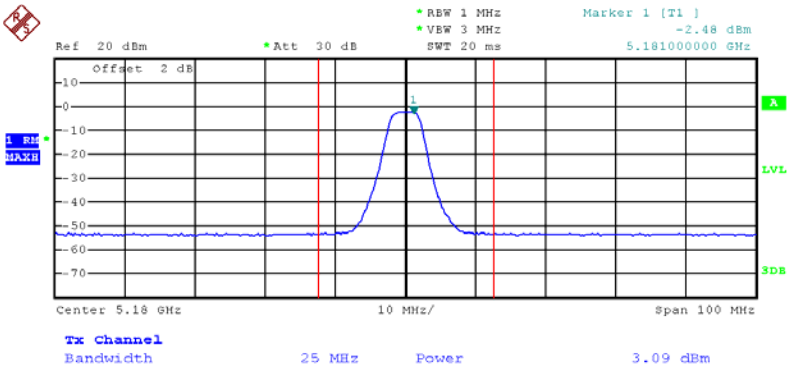
Date: 7.JUL.2010 20:27:55

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 / 5240 MHz



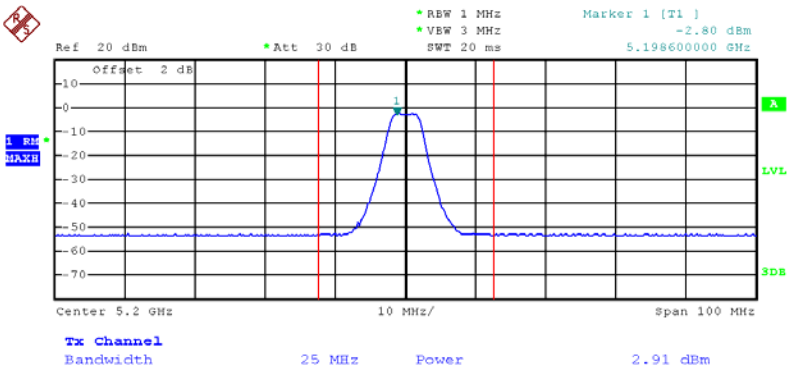
Date: 7.JUL.2010 20:25:01

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 3-2 / 5180 MHz



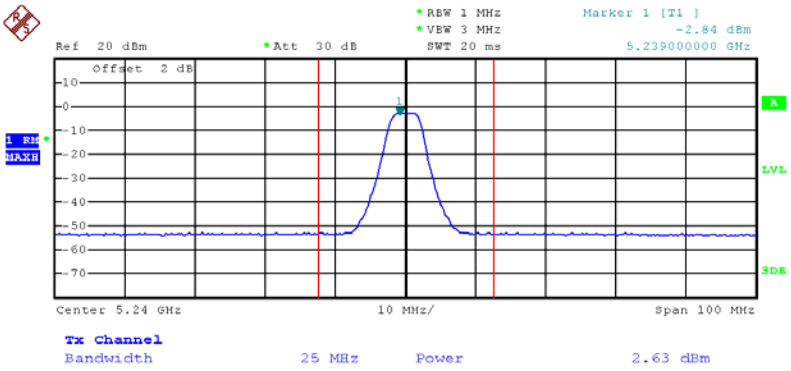
Date: 7.JUL.2010 20:32:23

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 3-2 / 5200 MHz



Date: 7.JUL.2010 20:27:29

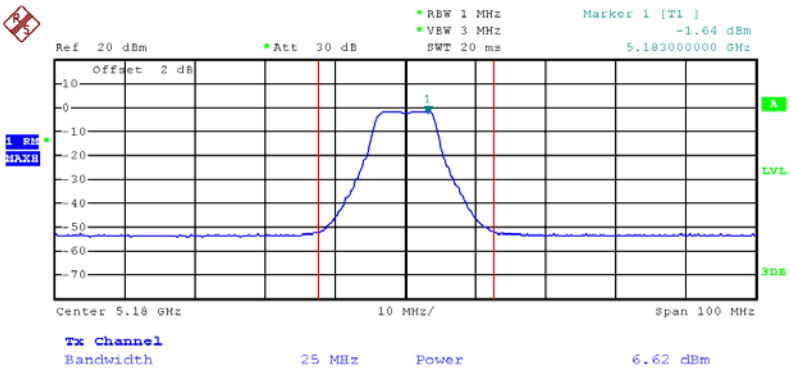
Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 3-2 / 5240 MHz



Date: 7.JUL.2010 20:25:29

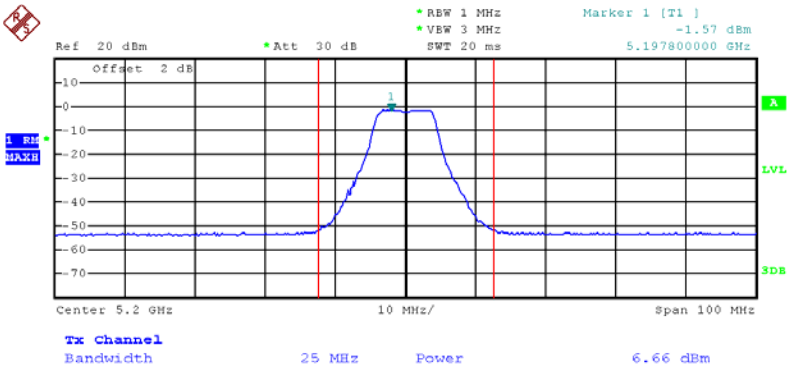
For Antenna 3 / Mode 2:

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 / 5180 MHz



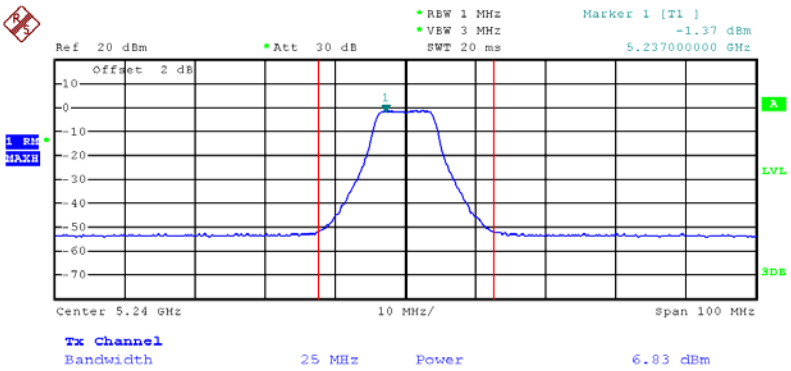
Date: 7.JUL.2010 22:57:13

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 / 5200 MHz



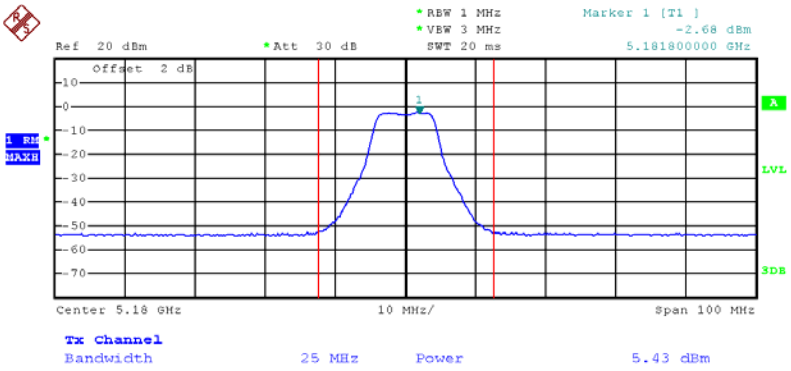
Date: 7.JUL.2010 22:56:40

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 / 5240 MHz



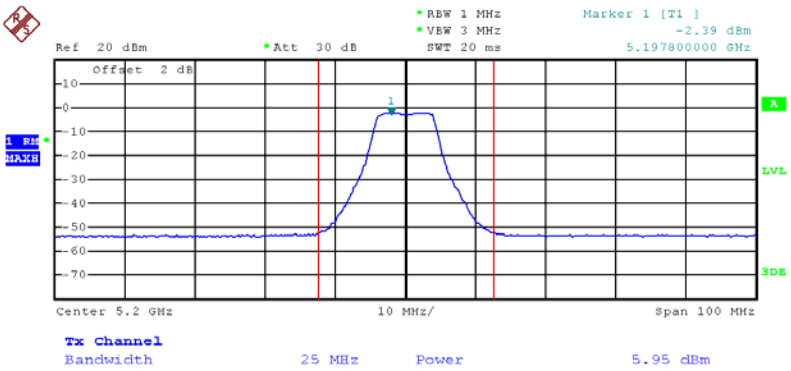
Date: 7.JUL.2010 22:55:17

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 3-2 / 5180 MHz



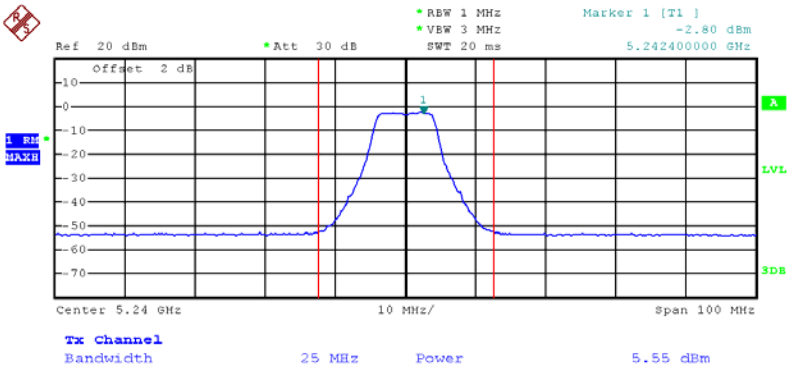
Date: 7.JUL.2010 22:57:39

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 3-2 / 5200 MHz



Date: 7.JUL.2010 22:56:16

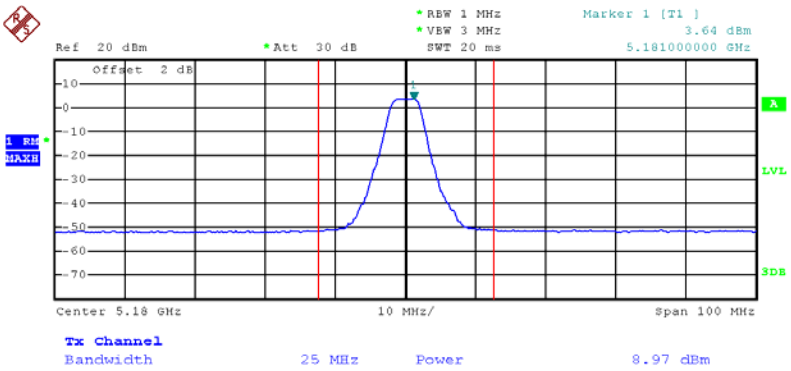
Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 3-2 / 5240 MHz



Date: 7.JUL.2010 22:55:41

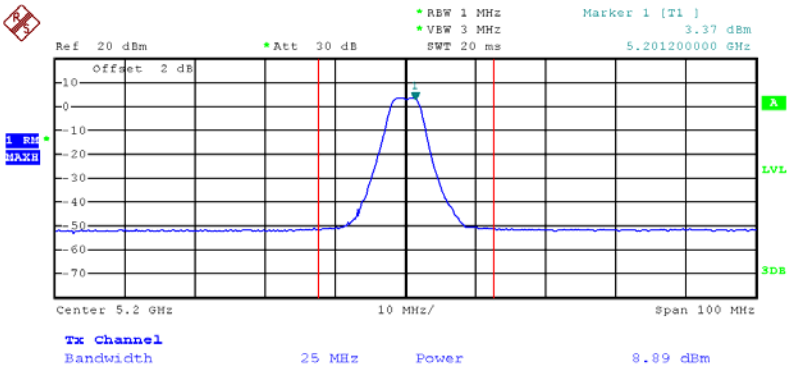
For Antenna 4 / Mode 3:

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 / 5180 MHz



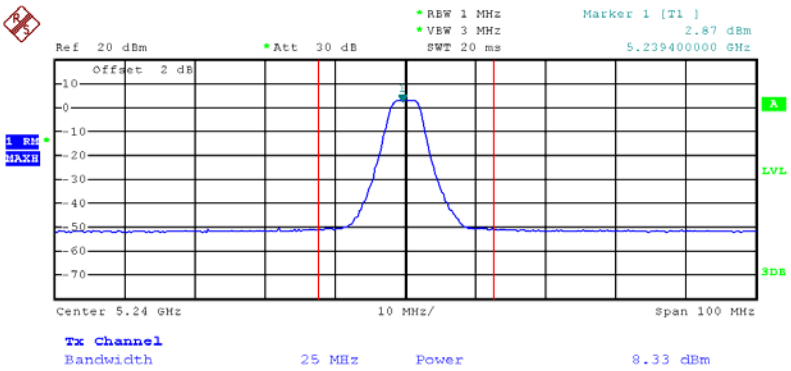
Date: 7.JUL.2010 21:07:06

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 / 5200 MHz



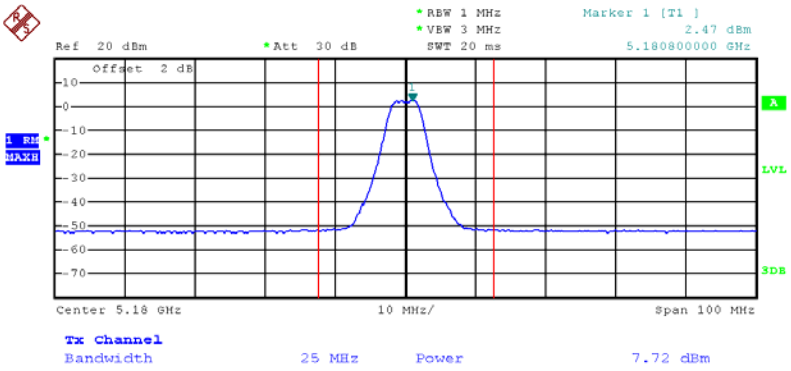
Date: 7.JUL.2010 21:06:31

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 / 5240 MHz



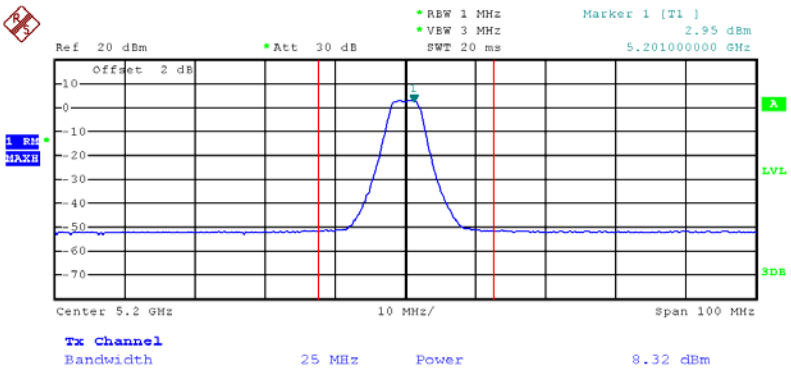
Date: 7.JUL.2010 21:04:43

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 4-2 / 5180 MHz



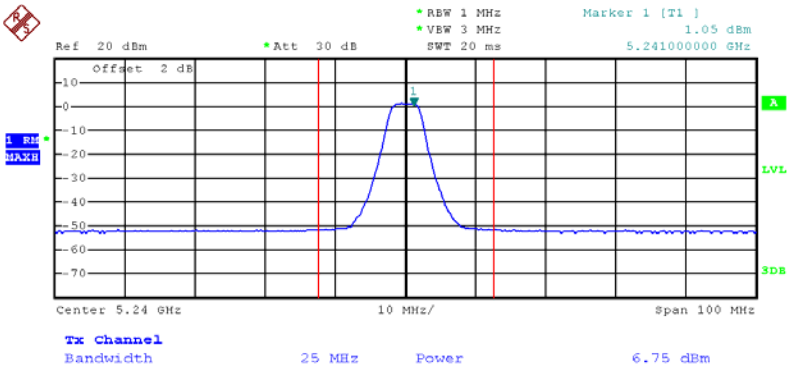
Date: 7.JUL.2010 21:07:30

Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 4-2 / 5200 MHz



Date: 7.JUL.2010 21:05:59

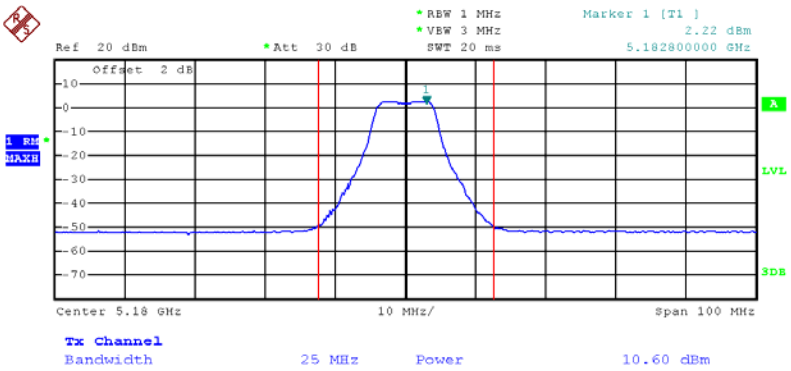
Conducted Output Power Plot on Configuration IEEE 802.11a 5MHz Ant. 4-2 / 5240 MHz



Date: 7.JUL.2010 21:05:10

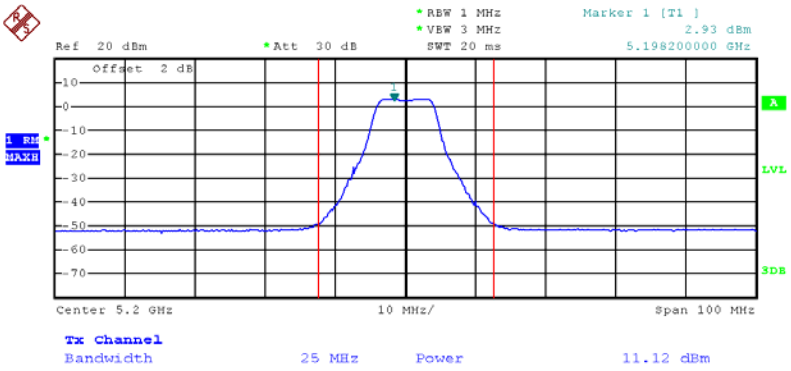
For Antenna 4 / Mode 4:

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 / 5180 MHz



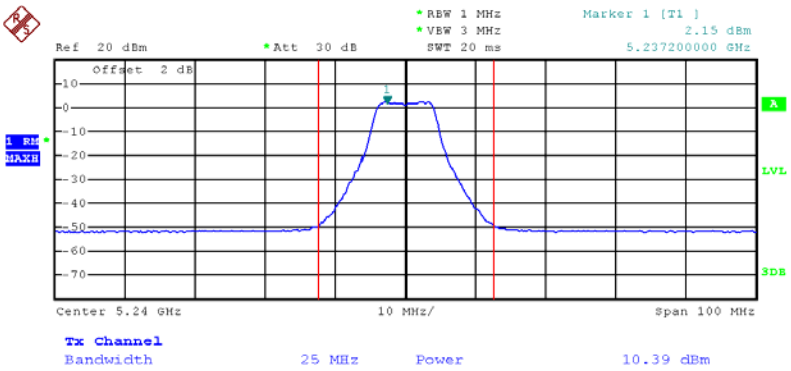
Date: 7.JUL.2010 21:48:47

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 / 5200 MHz



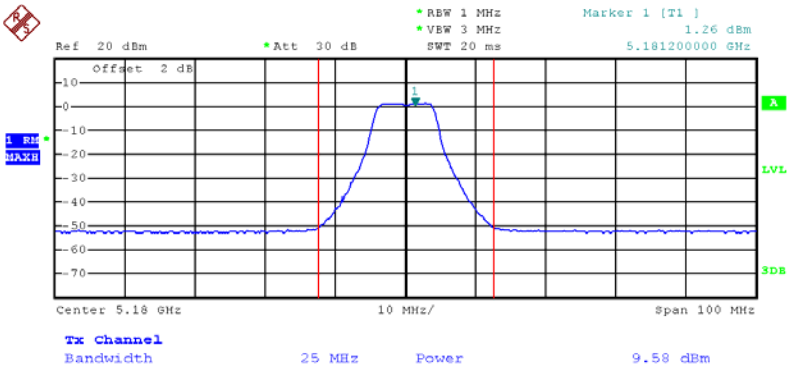
Date: 7.JUL.2010 21:49:31

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 / 5240 MHz



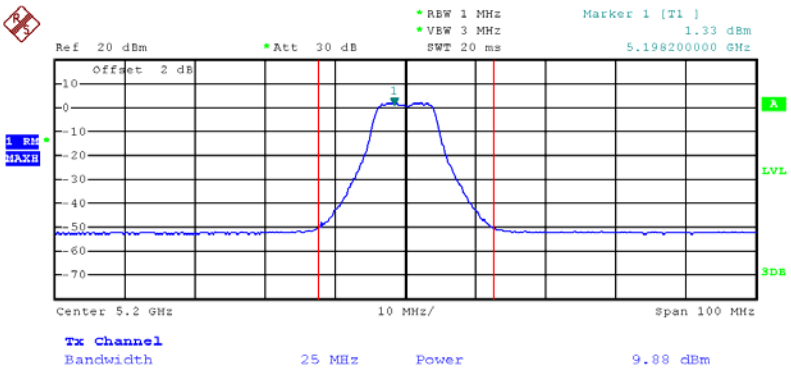
Date: 7.JUL.2010 21:51:52

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 4-2 / 5180 MHz



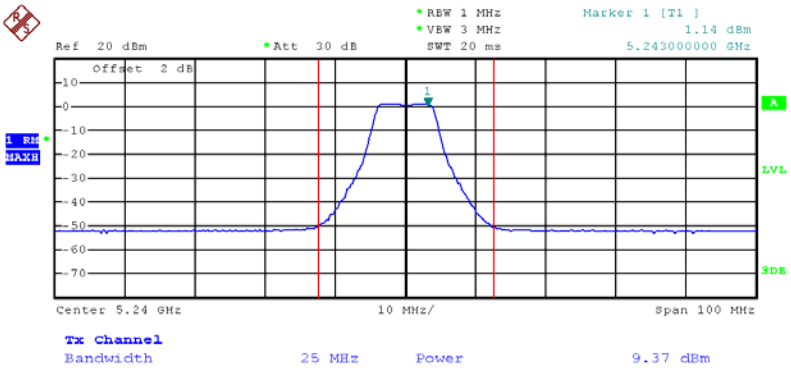
Date: 7.JUL.2010 21:48:20

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 4-2 / 5200 MHz



Date: 7.JUL.2010 21:49:57

Conducted Output Power Plot on Configuration IEEE 802.11a 10MHz Ant. 4-2 / 5240 MHz



Date: 7.JUL.2010 21:51:24

4.3. Power Spectral Density Measurement

4.3.1. 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.

For Antenna 3:

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	0.00

For Antenna 4:

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4.00

4.3.2. Measuring Instruments and Setting

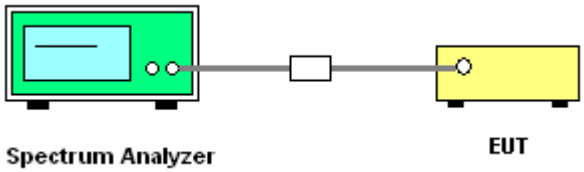
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. 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.

4.3.4. 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 Power Spectral Density

For Antenna 3 / Mode 1:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	-0.15	0.00	Complies
40	5200 MHz	-0.87	0.00	Complies
48	5240 MHz	-1.08	0.00	Complies

For Antenna 3 / Mode 2:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	-0.68	0.00	Complies
40	5200 MHz	-0.55	0.00	Complies
48	5240 MHz	-0.62	0.00	Complies

For Antenna 4 / Mode 3:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	3.98	4.00	Complies
40	5200 MHz	3.94	4.00	Complies
48	5240 MHz	3.51	4.00	Complies

For Antenna 4 / Mode 4:

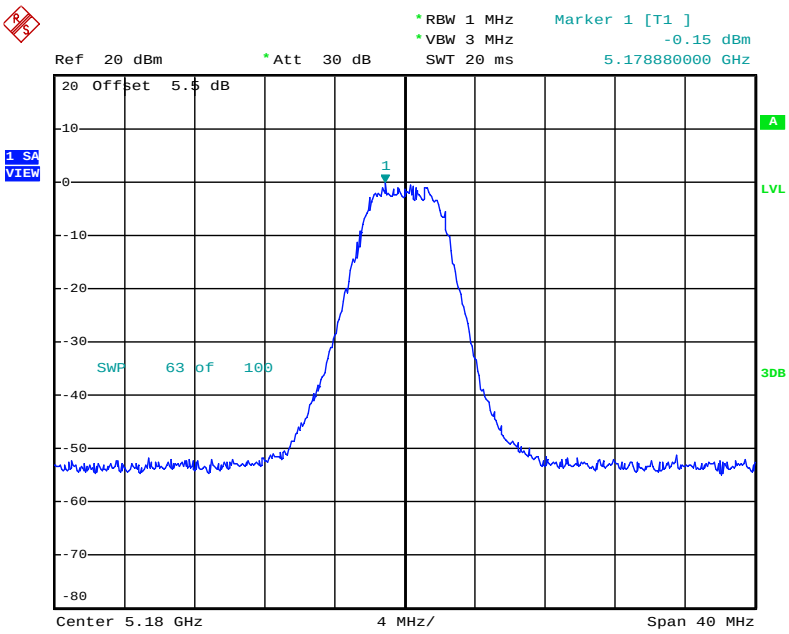
Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

Channel	Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	3.34	4.00	Complies
40	5200 MHz	3.81	4.00	Complies
48	5240 MHz	3.43	4.00	Complies

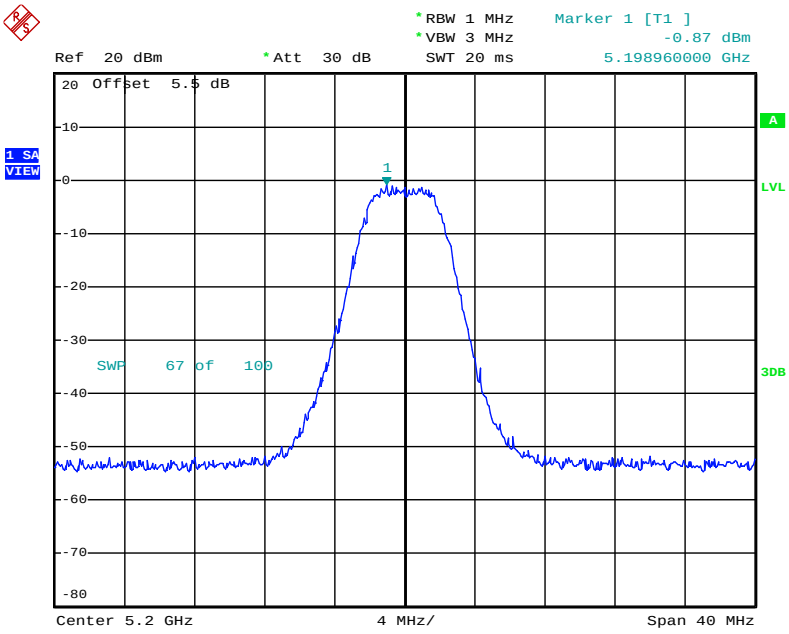
For Antenna 3 / Mode 1:

Power Density Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5180 MHz



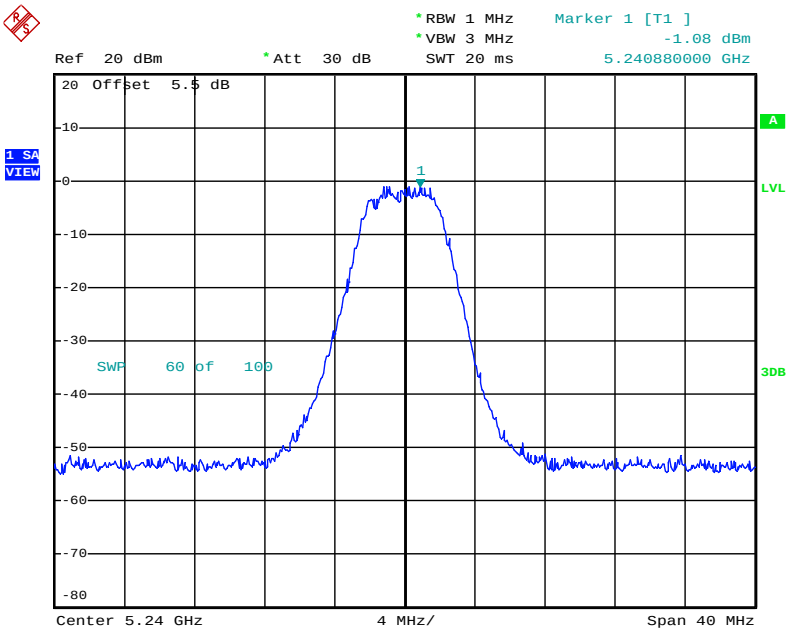
Date: 7.JUL.2010 20:04:43

Power Density Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5200 MHz



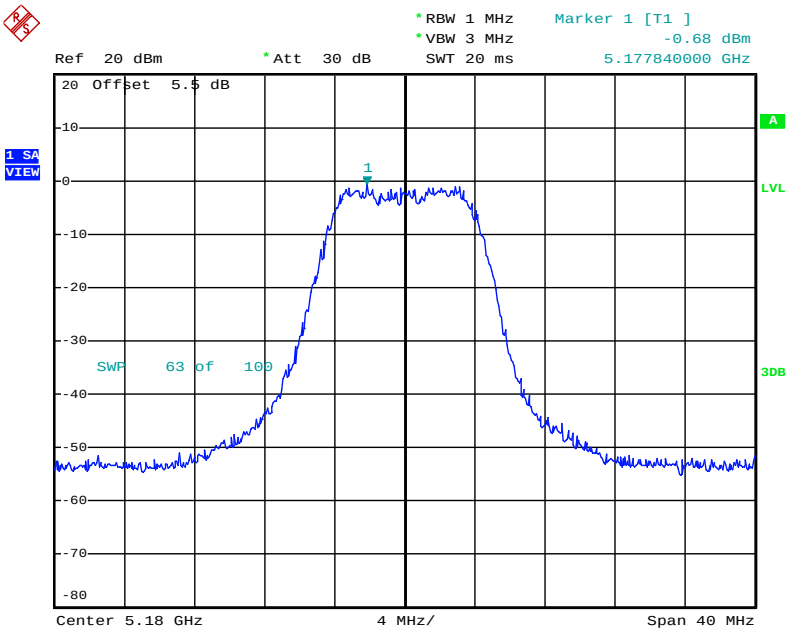
Date: 7.JUL.2010 20:06:16

Power Density Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5240 MHz



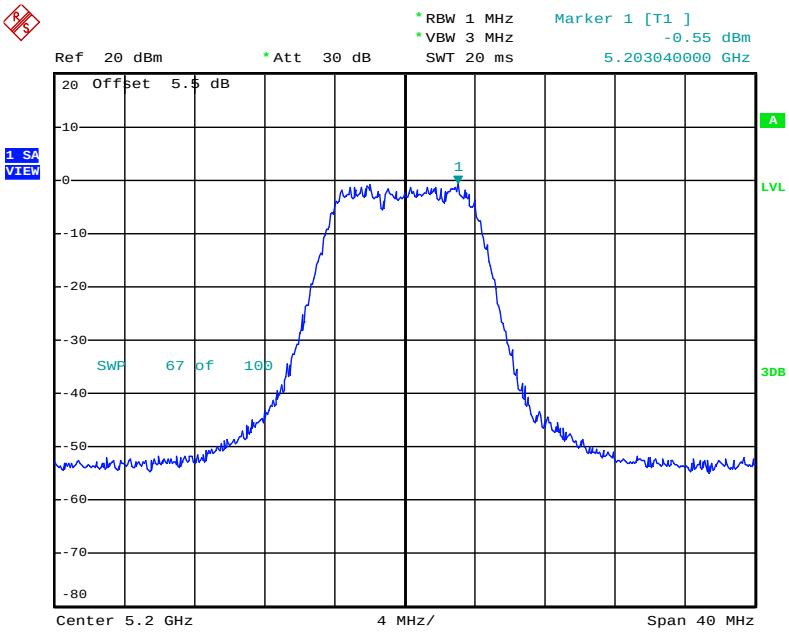
For Antenna 3 / Mode 2:

Power Density Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5180 MHz



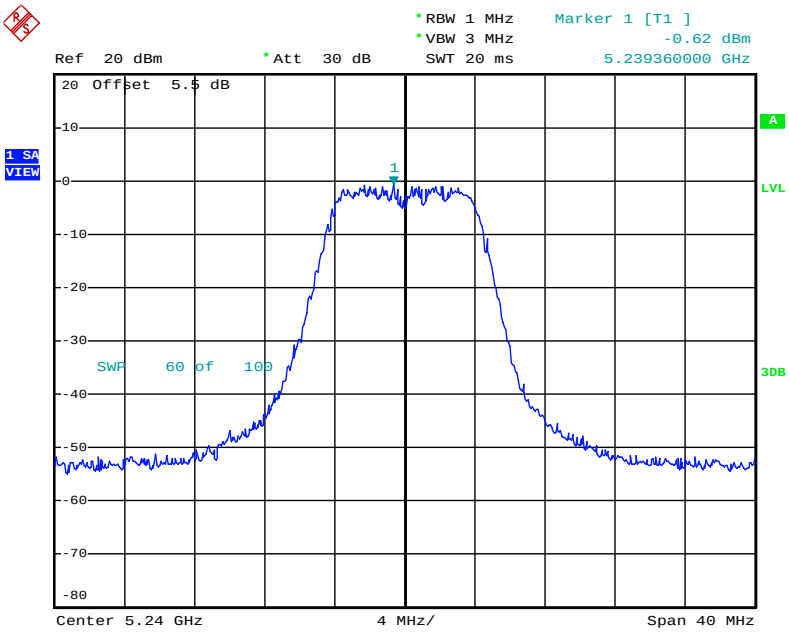
Date: 7.JUL.2010 22:29:25

Power Density Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5200 MHz



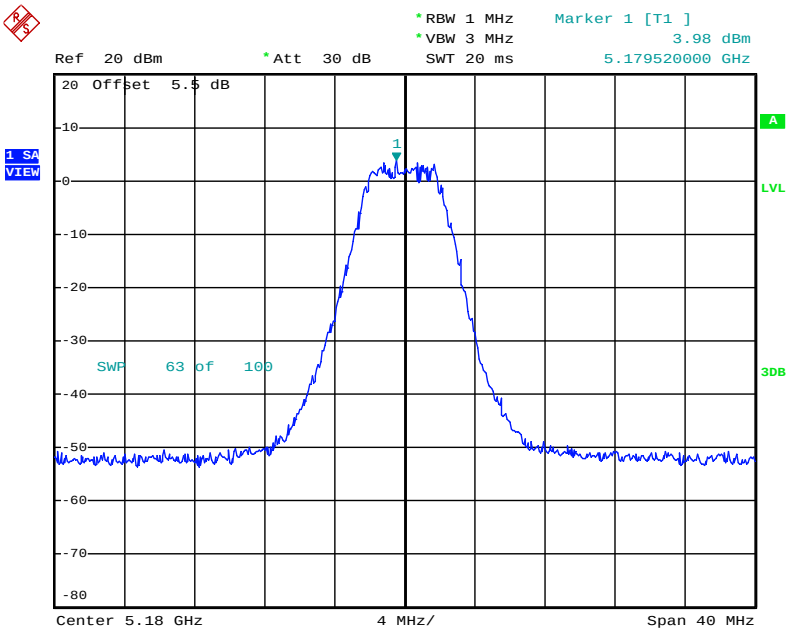
Date: 7.JUL.2010 22:32:02

Power Density Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5240 MHz



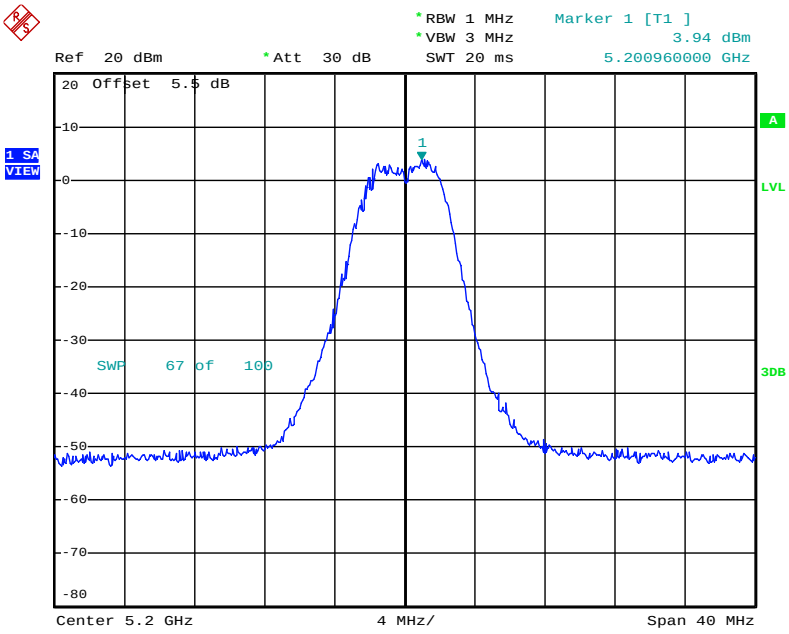
For Antenna 4 / Mode 3:

Power Density Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5180 MHz



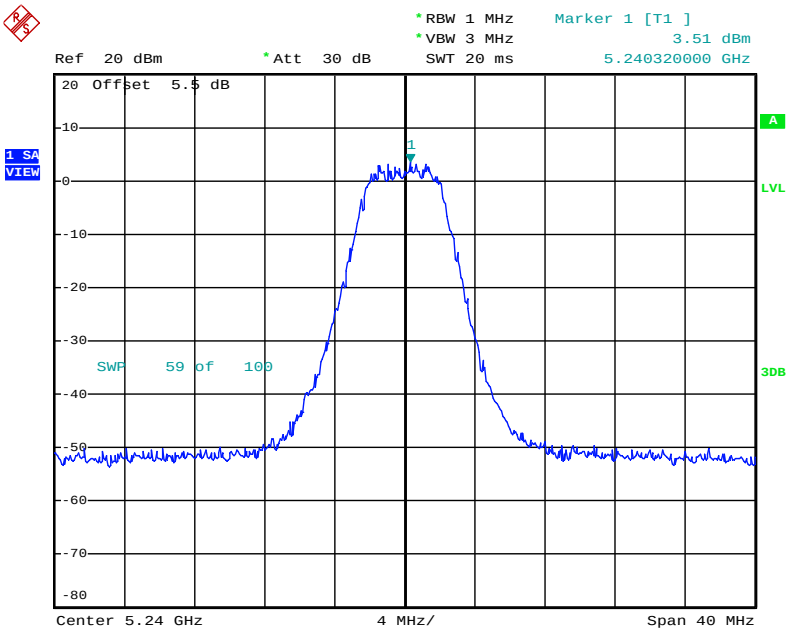
Date: 7.JUL.2010 20:40:56

Power Density Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5200 MHz



Date: 7.JUL.2010 20:41:59

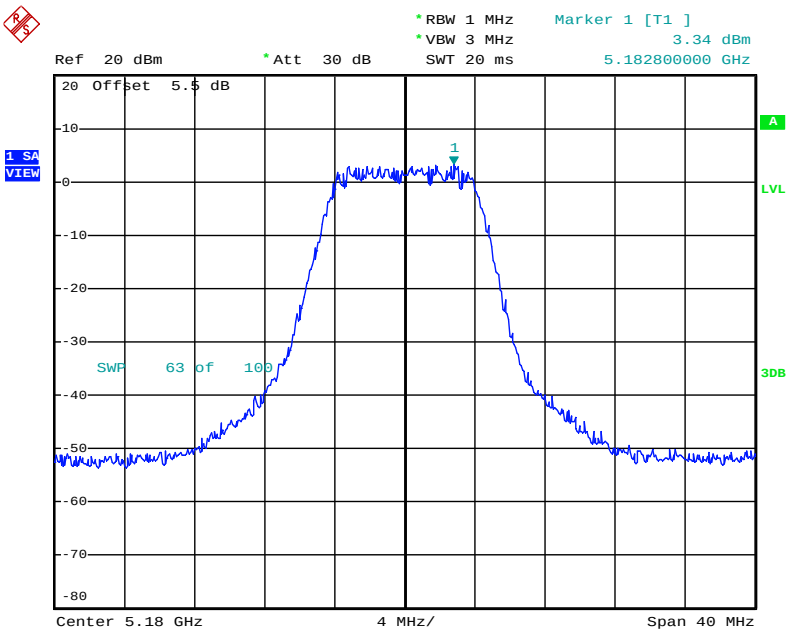
Power Density Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5240 MHz



Date: 7.JUL.2010 20:43:52

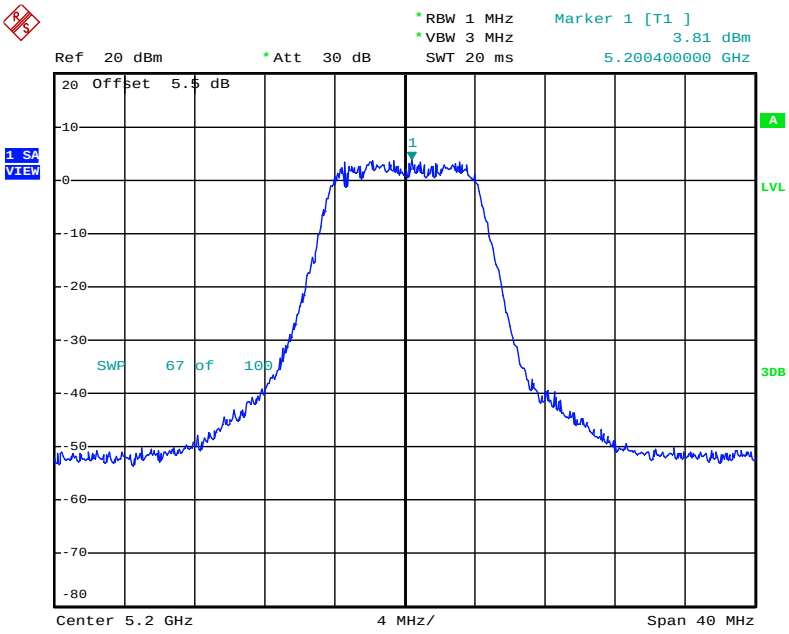
For Antenna 4 / Mode 4:

Power Density Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5180 MHz



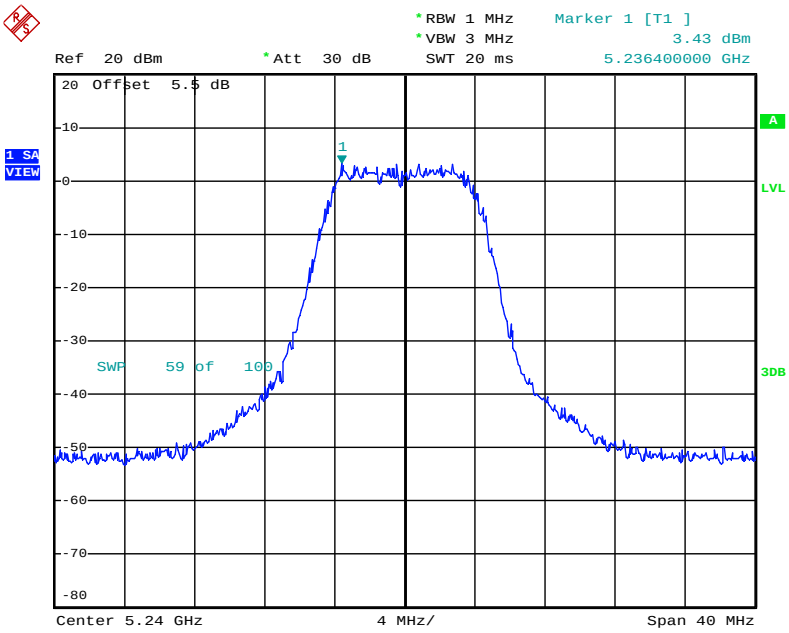
Date: 7.JUL.2010 21:20:54

Power Density Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5200 MHz



Date: 7.JUL.2010 21:21:45

Power Density Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5240 MHz



4.4. Peak Excursion Measurement

4.4.1. 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.

4.4.2. Measuring Instruments and Setting

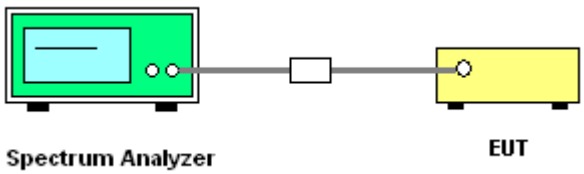
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	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

4.4.3. 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 802.11n VBW = 300kHz ≥ 1/4μs). 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.

4.4.4. 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 Peak Excursion

For Antenna 3 / Mode 1:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180 MHz	6.01	13	Complies
40	5200 MHz	6.45	13	Complies
48	5240 MHz	6.67	13	Complies

For Antenna 3 / Mode 2:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 3

Configuration IEEE 802.11a Ant. 3-1 + Ant. 3-2

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180 MHz	5.59	13	Complies
40	5200 MHz	5.71	13	Complies
48	5240 MHz	5.82	13	Complies

For Antenna 4 / Mode 3:

Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 5MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180 MHz	5.76	13	Complies
40	5200 MHz	6.33	13	Complies
48	5240 MHz	4.16	13	Complies

For Antenna 4 / Mode 4:

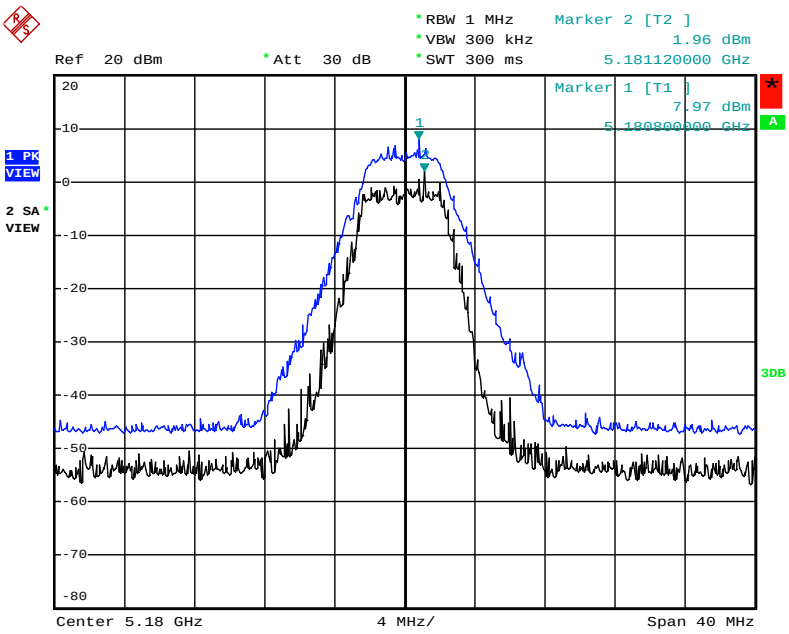
Temperature	21°C	Humidity	56%
Test Engineer	Johnson Chang	Configurations	802.11a 10MHz / Antenna 4

Configuration IEEE 802.11a Ant. 4-1 + Ant. 4-2

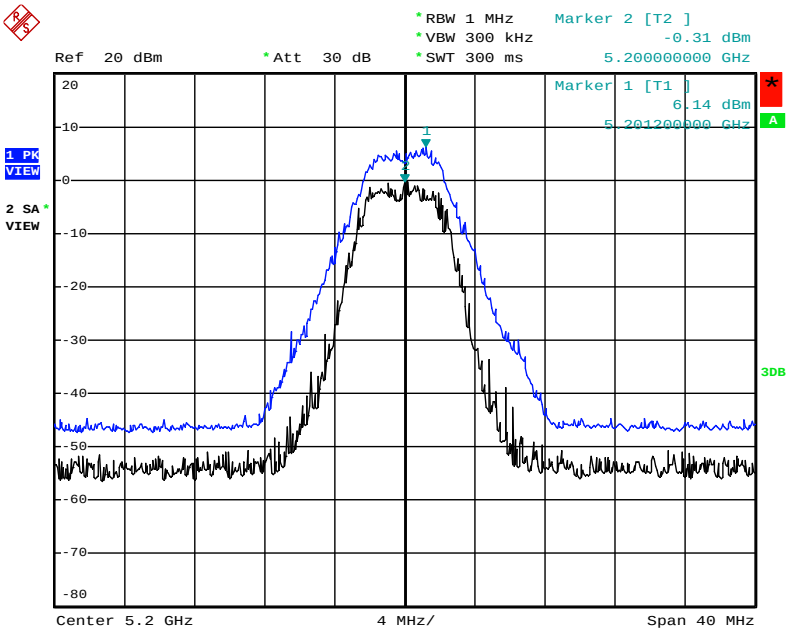
Channel	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
36	5180 MHz	6.09	13	Complies
40	5200 MHz	6.39	13	Complies
48	5240 MHz	5.72	13	Complies

For Antenna 3 / Mode 1:

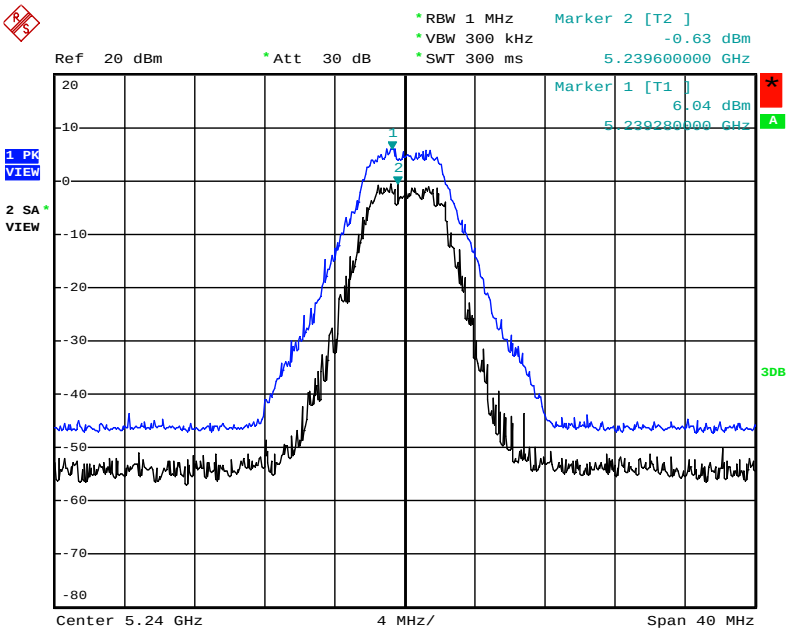
Peak Excursion Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5180 MHz



Peak Excursion Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5200 MHz



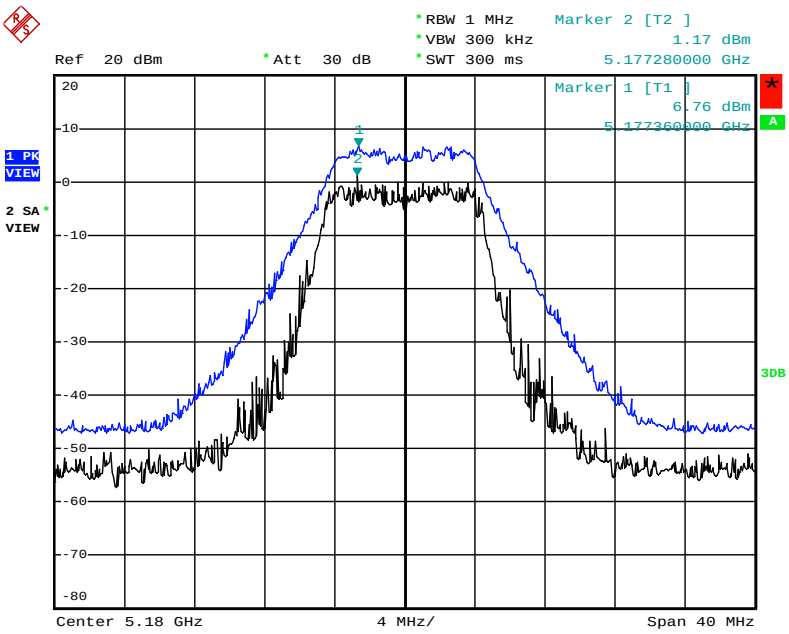
Peak Excursion Plot on Configuration IEEE 802.11a 5MHz Ant. 3-1 + Ant. 3-2 / 5240 MHz



Date: 7.JUL.2010 20:07:46

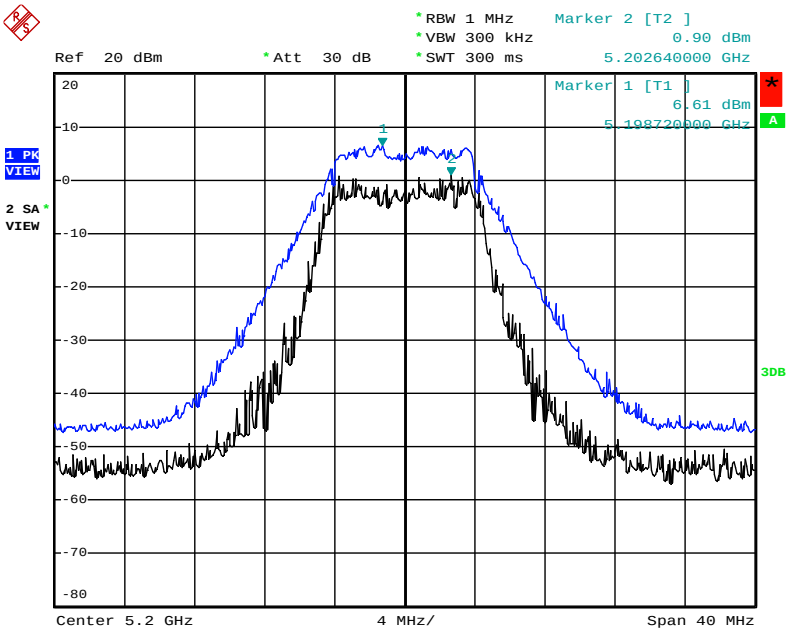
For Antenna 3 / Mode 2:

Peak Excursion Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5180 MHz



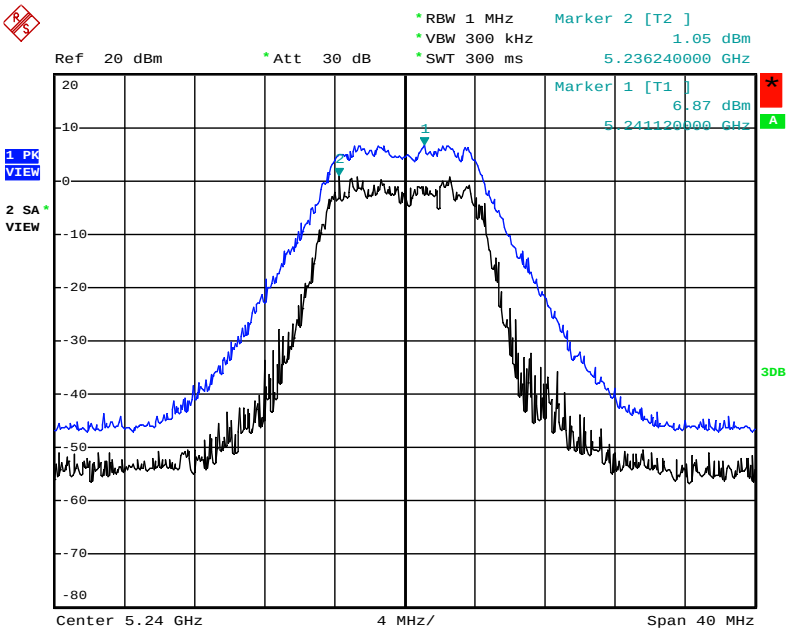
Date: 7.JUL.2010 22:29:37

Peak Excursion Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5200 MHz



Date: 7.JUL.2010 22:32:14

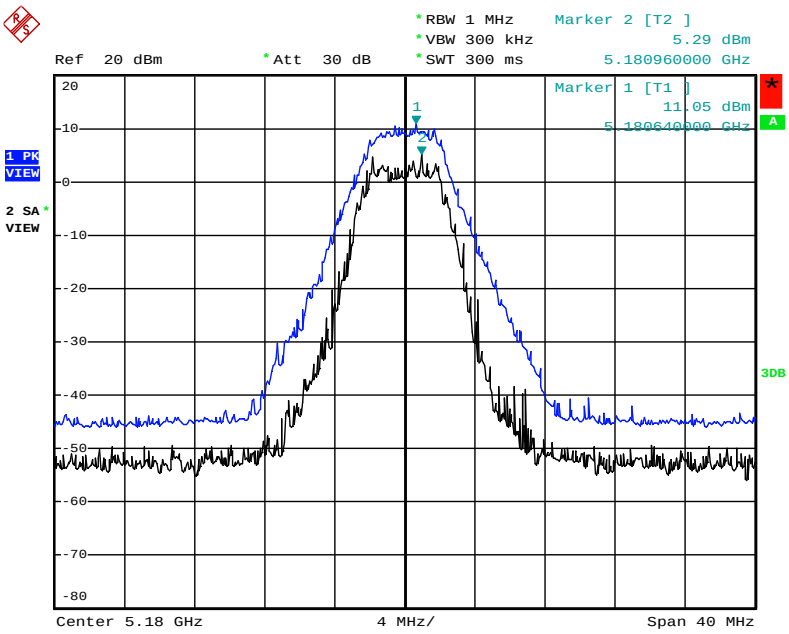
Peak Excursion Plot on Configuration IEEE 802.11a 10MHz Ant. 3-1 + Ant. 3-2 / 5240 MHz



Date: 7.JUL.2010 22:33:15

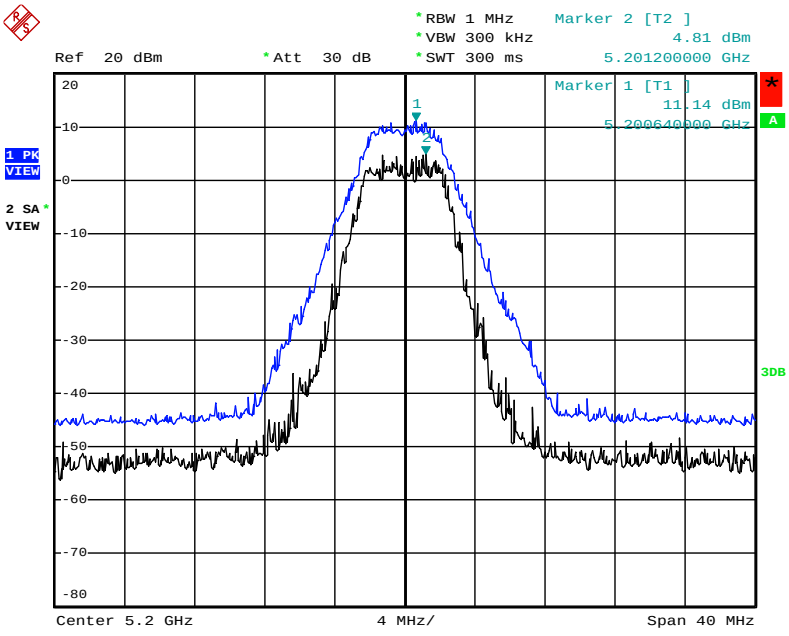
For Antenna 4 / Mode 3:

Peak Excursion Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5180 MHz



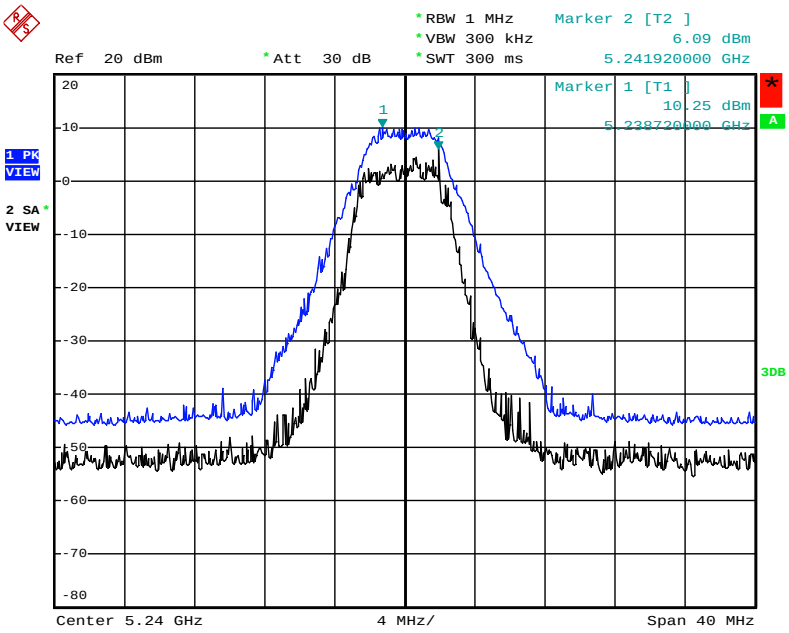
Date: 7.JUL.2010 20:41:08

Peak Excursion Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5200 MHz



Date: 7.JUL.2010 20:42:11

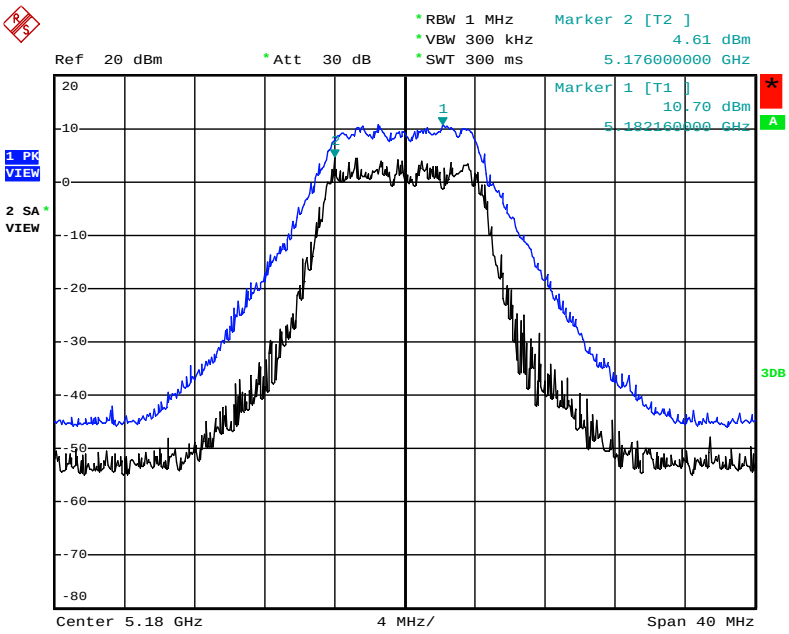
Peak Excursion Plot on Configuration IEEE 802.11a 5MHz Ant. 4-1 + Ant. 4-2 / 5240 MHz



Date: 7.JUL.2010 20:44:04

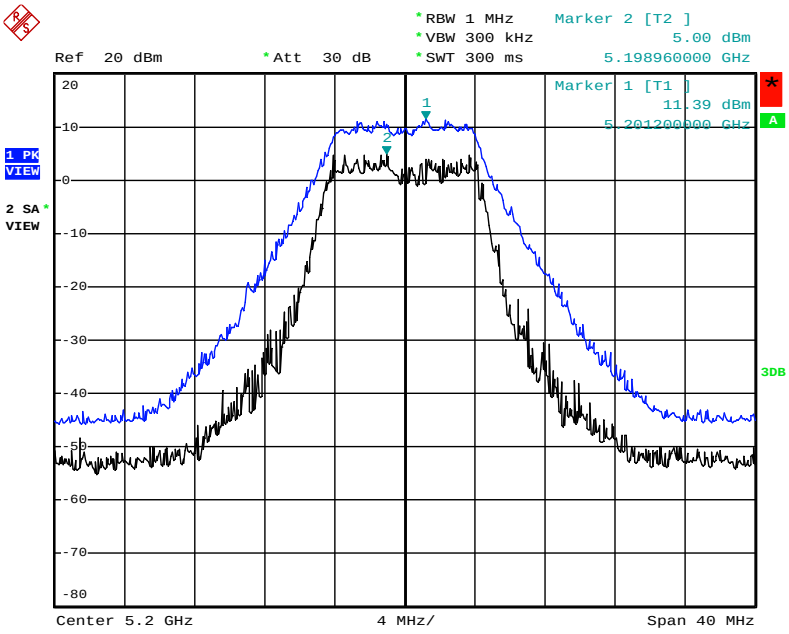
For Antenna 4 / Mode 4:

Peak Excursion Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5180 MHz



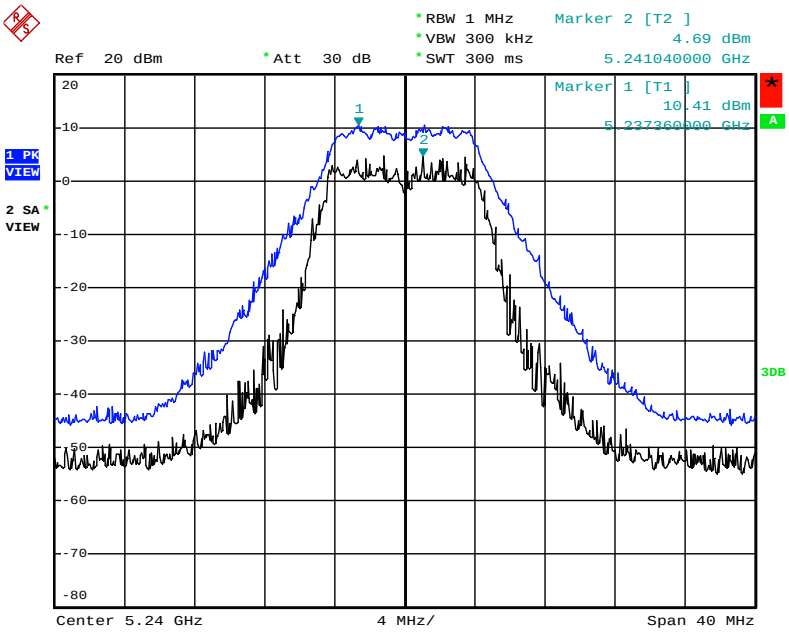
Date: 7.JUL.2010 21:21:06

Peak Excursion Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5200 MHz



Date: 7.JUL.2010 21:21:57

Peak Excursion Plot on Configuration IEEE 802.11a 10MHz Ant. 4-1 + Ant. 4-2 / 5240 MHz



Date: 7.JUL.2010 21:23:53

4.5. Radiated Emissions Measurement

4.5.1. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.25 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/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

4.5.2. 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.

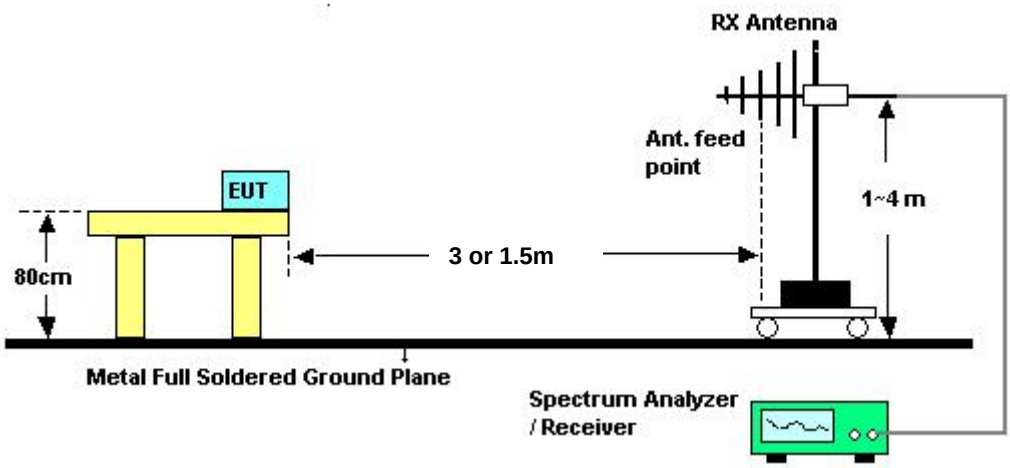
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1000KHz / 1000KHz for peak

4.5.3. 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.

4.5.4. Test Setup Layout

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].

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

For Antenna 3 / Mode 1:

Temperature	23°C	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 36 / Antenna 3 / Mode 1
Test Date	Jul. 17, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10359.76	75.50	94.00	-18.50	67.76	4.99	38.37	35.62	230	106	Peak	HORIZONTAL
2	10360.50	64.64	74.00	-9.36	56.90	4.99	38.37	35.62	230	106	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10360.11	73.81	74.00	-0.19	66.07	4.99	38.37	35.62	249	101	Average	VERTICAL
2	10360.40	90.35	94.00	-3.65	82.61	4.99	38.37	35.62	249	101	Peak	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 40 / Antenna 3 / Mode 1
Test Date	Jul. 17, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10400.25	63.31	74.00	-10.69	55.49	5.02	38.38	35.58	229	99	Average	HORIZONTAL
2	10400.31	79.66	94.00	-14.34	71.84	5.02	38.38	35.58	229	99	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10400.27	73.47	74.00	-0.53	65.65	5.02	38.38	35.58	249	101	Average	VERTICAL
2	10400.50	88.87	94.00	-5.13	81.05	5.02	38.38	35.58	249	101	Peak	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 48 / Antenna 3 / Mode 1
Test Date	Jul. 17, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10480.14	79.05	94.00	-14.95	71.11	5.07	38.39	35.52	205	106	Peak	HORIZONTAL
2	10480.38	62.60	74.00	-11.40	54.66	5.07	38.39	35.52	205	106	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10480.17	73.28	74.00	-0.72	65.33	5.07	38.40	35.52	248	100	Average	VERTICAL
2	10480.23	90.00	94.00	-4.00	82.05	5.07	38.40	35.52	248	100	Peak	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.

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].

For Antenna 3 / Mode 2:

Temperature	23°C	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 36 / Antenna 3 / Mode 2
Test Date	Jul. 17, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10360.43	80.80	94.00	-13.20	73.06	4.99	38.37	35.62	229	107	Peak	HORIZONTAL
2	10360.46	64.40	74.00	-9.60	56.66	4.99	38.37	35.62	229	107	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10360.32	73.79	74.00	-0.21	66.05	4.99	38.37	35.62	243	100	Average	VERTICAL
2	10360.49	90.24	94.00	-3.76	82.50	4.99	38.37	35.62	243	100	Peak	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 40 / Antenna 3 / Mode 2
Test Date	Jul. 17, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10400.47	80.89	94.00	-13.11	73.07	5.02	38.38	35.58	229	109	Peak	HORIZONTAL
2	10400.50	64.25	74.00	-9.75	56.43	5.02	38.38	35.58	229	109	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10400.37	90.47	94.00	-3.53	82.65	5.02	38.38	35.58	244	102	Peak	VERTICAL
2	10400.42	73.73	74.00	-0.27	65.91	5.02	38.38	35.58	244	102	Average	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 48 / Antenna 3 / Mode 2
Test Date	Jul. 17, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10480.38	63.55	74.00	-10.45	55.61	5.07	38.39	35.52	248	100	Average	HORIZONTAL
2	10480.43	80.14	94.00	-13.86	72.20	5.07	38.39	35.52	248	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10480.34	73.02	74.00	-0.98	65.07	5.07	38.40	35.52	243	100	Average	VERTICAL
2	10480.47	89.37	94.00	-4.63	81.42	5.07	38.40	35.52	243	100	Peak	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.

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].

For Antenna 4 / Mode 3:

Temperature	23°C	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 36 / Antenna 4 / Mode 3
Test Date	Jul. 15, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10359.77	62.40	74.00	-11.60	54.66	4.99	38.37	35.62	321	120	Average	HORIZONTAL
2	10359.81	76.58	94.00	-17.42	68.84	4.99	38.37	35.62	321	120	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10359.52	85.32	94.00	-8.68	77.58	4.99	38.37	35.62	238	100	Peak	VERTICAL
2	10359.74	71.12	74.00	-2.88	63.38	4.99	38.37	35.62	238	100	Average	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 40 / Antenna 4 / Mode 3
Test Date	Jul. 15, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10399.74	61.46	74.00	-12.54	53.64	5.02	38.38	35.58	324	114	Average	HORIZONTAL
2	10400.41	76.19	94.00	-17.81	68.37	5.02	38.38	35.58	324	114	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10399.70	70.87	74.00	-3.13	63.05	5.02	38.38	35.58	242	131	Average	VERTICAL
2	10399.81	86.31	94.00	-7.69	78.49	5.02	38.38	35.58	242	131	Peak	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 48 / Antenna 4 / Mode 3
Test Date	Jul. 15, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10480.46	57.59	74.00	-16.41	49.65	5.07	38.39	35.52	123	119	Average	HORIZONTAL
2	10480.48	72.41	94.00	-21.59	64.47	5.07	38.39	35.52	123	119	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10479.55	81.04	94.00	-12.96	73.09	5.07	38.40	35.52	237	100	Peak	VERTICAL
2	10479.72	65.96	74.00	-8.04	58.01	5.07	38.40	35.52	237	100	Average	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.

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].

For Antenna 4 / Mode 4:

Temperature	23°C	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 36 / Antenna 4 / Mode 4
Test Date	Jul. 15, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10359.50	59.58	74.00	-14.42	51.84	4.99	38.37	35.62	322	121	Average	HORIZONTAL
2	10359.66	74.60	94.00	-19.40	66.86	4.99	38.37	35.62	322	121	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10359.52	66.94	74.00	-7.06	59.20	4.99	38.37	35.62	239	100	Average	VERTICAL
2	10359.97	81.04	94.00	-12.96	73.30	4.99	38.37	35.62	239	100	Peak	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 40 / Antenna 4 / Mode 4
Test Date	Jul. 15, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10399.50	58.26	74.00	-15.74	50.44	5.02	38.38	35.58	242	117	Average	HORIZONTAL
2	10399.55	73.18	94.00	-20.82	65.36	5.02	38.38	35.58	242	117	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10399.50	66.62	74.00	-7.38	58.80	5.02	38.38	35.58	240	100	Average	VERTICAL
2	10399.72	80.96	94.00	-13.04	73.14	5.02	38.38	35.58	240	100	Peak	VERTICAL

Temperature	23℃	Humidity	60%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 48 / Antenna 4 / Mode 4
Test Date	Jul. 15, 2010		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10480.49	68.57	94.00	-25.43	60.63	5.07	38.39	35.52	121	124	Peak	HORIZONTAL
2	10480.50	55.24	74.00	-18.76	47.30	5.07	38.39	35.52	121	124	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10479.50	64.60	74.00	-9.40	56.65	5.07	38.40	35.52	244	132	Average	VERTICAL
2	10479.58	78.25	94.00	-15.75	70.30	5.07	38.40	35.52	244	132	Peak	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.

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].

4.6. Band Edge Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.25 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.3dBuV/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 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

4.6.3. 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.

4.6.4. Test Setup Layout

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

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. Test Result of Band Edge and Fundamental Emissions

For Antenna 3 / Mode 1:

Temperature	21°C	Humidity	56%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 36, 40 / Antenna 3 / Mode 1
Test Date	Jul. 17, 2010		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5134.80	58.96	60.00	-1.04	22.77	2.55	33.64	0.00	339	100	Average	VERTICAL
2	5143.20	73.79	80.00	-6.21	37.59	2.56	33.64	0.00	339	100	Peak	VERTICAL
3	5181.60	117.26	74.00			2.58	33.73	0.00	339	100	Average	VERTICAL
4	5181.60	130.18	94.00			2.58	33.73	0.00	339	100	Peak	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5106.40	70.43	80.00	-9.57	34.32	2.53	33.58	0.00	310	99	Peak	VERTICAL
2	5140.40	57.85	60.00	-2.15	21.65	2.56	33.64	0.00	310	99	Average	VERTICAL
3	5198.80	114.99	74.00			2.59	33.76	0.00	310	99	Average	VERTICAL
4	5198.80	127.59	94.00			2.59	33.76	0.00	310	99	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5200 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].

For Antenna 3 / Mode 2:

Temperature	21°C	Humidity	56%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 36, 40 / Antenna 3 / Mode 2
Test Date	Jul. 17, 2010		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5144.20	59.32	60.00	-0.68	23.09	2.56	33.67	0.00	310	100	Average	VERTICAL
2	5149.00	75.69	80.00	-4.31	39.46	2.56	33.67	0.00	310	100	Peak	VERTICAL
3	5183.20	116.24	74.00			2.58	33.73	0.00	310	100	Average	VERTICAL
4	5183.20	128.94	94.00			2.58	33.73	0.00	310	100	Peak	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5143.60	59.85	60.00	-0.15	23.62	2.56	33.67	0.00	302	102	Average	VERTICAL
2	5147.20	71.97	80.00	-8.03	35.74	2.56	33.67	0.00	302	102	Peak	VERTICAL
3	5201.60	128.08	94.00			2.59	33.76	0.00	302	102	Peak	VERTICAL
4	5202.80	115.99	74.00			2.59	33.76	0.00	302	102	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5200 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].

For Antenna 4 / Mode 3:

Temperature	21°C	Humidity	56%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 5MHz Ch 36, 40 / Antenna 4 / Mode 3
Test Date	Jul. 15, 2010		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5141.60	58.45	60.00	-1.55	22.25	2.56	33.64	0.00	107	103	Average	VERTICAL
2	5149.20	70.43	80.00	-9.57	34.20	2.56	33.67	0.00	107	103	Peak	VERTICAL
3	5179.60	118.93	74.00			2.58	33.73	0.00	107	103	Average	VERTICAL
4	5180.60	131.38	94.00			2.58	33.73	0.00	107	103	Peak	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5136.80	57.43	60.00	-2.57	21.23	2.56	33.64	0.00	109	101	Average	VERTICAL
2	5141.60	71.42	80.00	-8.58	35.22	2.56	33.64	0.00	109	101	Peak	VERTICAL
3	5199.60	118.83	74.00			2.59	33.76	0.00	109	101	Average	VERTICAL
4	5201.20	131.12	94.00			2.59	33.76	0.00	109	101	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 5200 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].

For Antenna 4 / Mode 4:

Temperature	21°C	Humidity	56%
Test Engineer	Alan Huang	Configurations	IEEE 802.11a 10MHz Ch 36, 40 / Antenna 4 / Mode 4
Test Date	Jul. 15, 2010		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5149.80	73.20	80.00	-6.80	36.97	2.56	33.67	0.00	122	104	Peak	VERTICAL
2	5150.00	57.72	60.00	-2.28	21.49	2.56	33.67	0.00	122	104	Average	VERTICAL
3	5177.80	127.96	94.00			2.58	33.73	0.00	122	104	Peak	VERTICAL
4	5182.80	116.13	74.00			2.58	33.73	0.00	122	104	Average	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5147.20	69.25	80.00	-10.75	33.02	2.56	33.67	0.00	119	100	Peak	VERTICAL
2	5148.00	56.72	60.00	-3.28	20.49	2.56	33.67	0.00	119	100	Average	VERTICAL
3	5198.00	128.20	94.00			2.59	33.76	0.00	119	100	Peak	VERTICAL
4	5199.20	115.93	74.00			2.59	33.76	0.00	119	100	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 5200 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].

4.7. Antenna Requirements

4.7.1. 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.

4.7.2. 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
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30 MHz - 1 GHz 3m	Jun. 07, 2010	Radiation (03CH03-HY)
Amplifier	SCHAFFNER	COA9231A	18667	9 kHz - 2 GHz	Jan. 24, 2010	Radiation (03CH03-HY)
Amplifier	Agilent	8449B	3008A02120	1 GHz - 26.5 GHz	Jul. 21, 2009	Radiation (03CH03-HY)
Amplifier	MITEQ	AMF-6F-260400	9121372	26.5 GHz - 40 GHz	Apr. 06, 2009*	Radiation (03CH03-HY)
Spectrum Analyzer	R&S	FSP40	100004	9 kHz - 40 GHz	Oct. 03, 2009	Radiation (03CH03-HY)
Horn Antenna	EMCO	3115	6741	1GHz ~ 18GHz	Apr. 28, 2010	Radiation (03CH03-HY)
Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170154	15 GHz - 40 GHz	Jan. 11, 2010	Radiation (03CH03-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX 106	03CH03-HY	1 GHz - 40 GHz	Jan. 05, 2010	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	FSU26.5	100015	20Hz ~ 26.5GHz	Oct. 29, 2009	Conducted (TH01-HY)
Power Meter	R&S	NRVS	100444	DC ~ 40GHz	Jul. 31, 2009	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z51	100666	DC ~ 30GHz	Aug. 05, 2009	Conducted (TH01-HY)
Power Sensor	R&S	NRV-Z32	100057	30MHz ~ 6GHz	Jul. 31, 2009	Conducted (TH01-HY)
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jul. 12, 2009*	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Mar. 13, 2010	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Aug. 06, 2009	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 02, 2009	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 02, 2009	Conducted (TH01-HY)
Vector Signal Generator	R&S	SMU200A	102098	100kHz ~ 6GHz	Feb. 13, 2010	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 25, 2010	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	Dec. 03, 2009	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	0949003	300MHz~40GHz	Dec. 03, 2009	Conducted (TH01-HY)

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

Note: For "*" Calibration Interval of instruments listed above is two years.

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. : L1190-091230

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, 2010 to January 09, 2013
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 Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : December 30, 2009

P1, total 22 pages

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