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FCC RADIO TEST REPORT

Applicant's company	NETGEAR, Inc.
Applicant Address	350 East Plumeria Drive, San Jose, California 95134, USA
FCC ID	PY312200200
Manufacturer's company	Ambit Microsystems (Shanghai) Ltd.
Manufacturer Address	No. 1925, Nanle Road, Songjiang Export Processing Zone, Shanghai, China

Product Name	WiFi USB Adapter
Brand Name	NETGEAR
Model Name	A6200
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	5725 ~ 5850MHz
Received Date	Jun. 22, 2012
Final Test Date	Mar. 11, 2013
Submission Type	Class II Change

Statement

Test result included is only for the IEEE 802.11ac (5725 ~ 5850MHz) 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 C63.10-2009, 47 CFR FCC Part 15 Subpart C, KDB 558074 D01 v02 and KDB 662911 D01 v01r02.**

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



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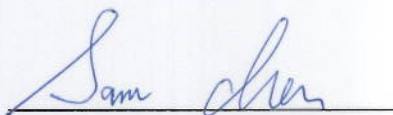
History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR262930AB	Rev. 01	Initial issue of report	Aug. 01, 2012
FR262930-02AB	Rev. 01	1. Add the product has beam-forming function for 802.11ac VHT80 in 5725-5850MHz. 2. Please refer to section 3.7 for re-test item.	Mar. 12, 2013

1. CERTIFICATE OF COMPLIANCE

Product Name : WiFi USB Adapter
Brand Name : NETGEAR
Model Name : A6200
Applicant : NETGEAR, Inc.
Test Rule Part(s) : 47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jun. 22, 2012 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.



Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: , 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.247(b)(3)	Maximum Conducted Output Power	Complies	14.88 dB
4.2	15.247(e)	Power Spectral Density	Complies	7.37 dB
4.3	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.4	15.247(d)	Radiated Emissions	Complies	16.50 dB
4.5	15.247(d)	Band Edge Emissions	Complies	11.76 dB
4.6	15.203	Antenna Requirements	Complies	-

Note: The product has beam-forming function for 802.11ac VHT80 in 5150-5250MHz and 5725-5850MHz.

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Conducted Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1GHz)	±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°C	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

IEEE 802.11ac

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From Host System
Modulation	see the below table for IEEE 802.11ac
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) For 802.11ac
Data Rate (Mbps)	see the below table for IEEE 802.11ac
Frequency Range	5725 ~ 5850MHz
Channel Number	1 for 80MHz bandwidth
Channel Band Width (99%)	MCS0 VHT80: 76.16 MHz
Conducted Output Power	MCS0 VHT80: 13.81 dBm.
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna & Band width

Antenna	Two (TX)		
Band width Mode	20 MHz	40 MHz	80MHz
IEEE 802.11ac	X	X	V

Note : The beam-forming function only support 802.11ac VHT80

IEEE 802.11ac Spec.

Worst Modulation Used for Conformance Testing				
Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS	Worst Data Rate / MCS	Worst Modulation Mode
802.11ac VHT80	2	MCS 0-9	MCS 0-Nss1	11AC5.8G-80M
Note 1: IEEE 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160. Then EUT support VHT20, VHT40, VHT80. (VHT: Very High Throughput).				
Note 2: Modulation modes consist of 11AC5.8G-80M				
Note 3: 11AC: IEEE 802.11ac. 5.8G: 5.725-5.850GHz band				
Note 4: 80M: Channel Bandwidth 80MHz				

3.2. Accessories

Other
USB Cable * 1, No-Shield 0.8m

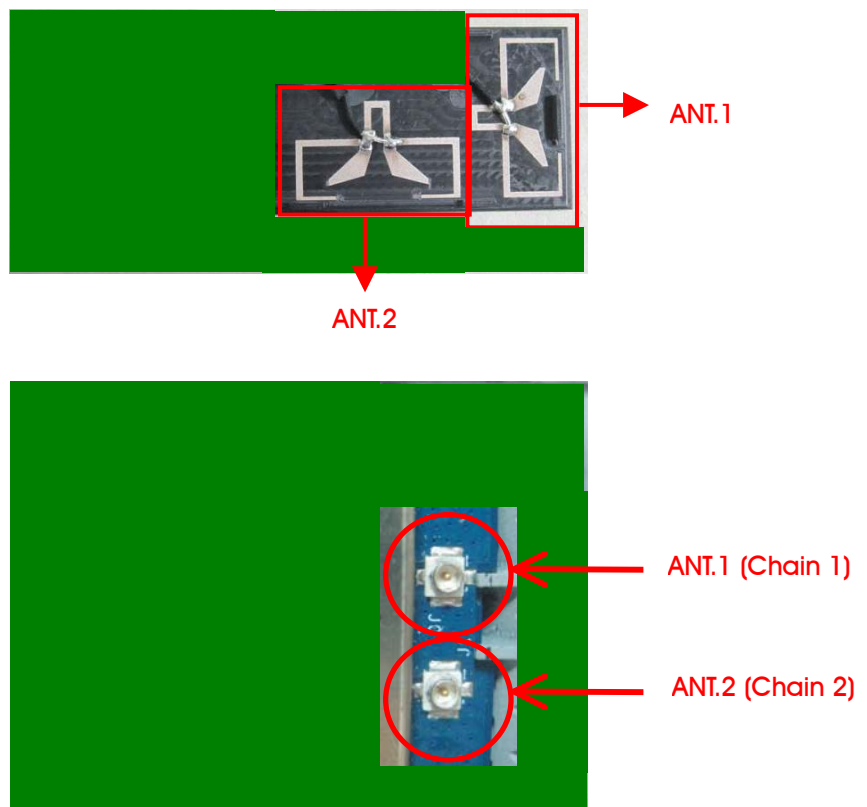
3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
1	WNC	-	LCD Antenna	I-PEX	5GHz Band 4	4.30
2	WNC	-	LCD Antenna	I-PEX	5GHz Band 4	4.30

Note: The EUT has two antennas

For IEEE 802.11ac mode (2TX/2RX):

Ant. 1 and Ant. 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

For 80MHz bandwidth systems, use Channel 155.

Frequency Band	Channel No.	Frequency
5725~5850 MHz	155	5775 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
Conducted Output Power	11ac VHT80	MCS0NSS1	155	1+2
Power Spectral Density	11ac VHT80	MCS0NSS1	155	1+2
6dB Spectrum Bandwidth	11ac VHT80	MCS0NSS1	155	1+2
Radiated Emissions Above 1GHz	11ac VHT80	MCS0NSS1	155	1+2
Band Edge Emissions	11ac VHT80	MCS0NSS1	155	1+2

The following test modes were performed for all tests:

Mode 1: EUT - X axis + antenna 0°

Mode 2: EUT - X axis + antenna 90°

Mode 3: EUT - X axis + antenna 180°

Mode 3 has been evaluated to be the worst case, thus measurement will follow this same test mode.

Mode 4: EUT - Y axis + antenna 180°

Mode 5: EUT - Z axis + antenna 180°

For Radiated Emission test:

<For Radiated Emissions Test above 1GHz:> Radiated Emissions (1GHz~10th Harmonic)

Due to Mode 4 generated the worst test result, it was recorded in this report.

<For Radiated Emissions Test above 1GHz:> Band Edge Emissions

Due to Mode 2 generated the worst test result, it was recorded in this report.

3.6. Table for Testing Locations

Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

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: FR262930AB

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

Modifications	Performance Checking
It adds beam-forming function for 802.11ac VHT80 mode in 5150-5250MHz and 5725-5850MHz.	1. Maximum Conducted Output Power 2. Power Spectral Density 3. 6dB Spectrum Bandwidth 4. Radiated Emissions (1GHz~10th Harmonic) 5. Band Edge Emissions

3.8. EUT Operation during Test

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

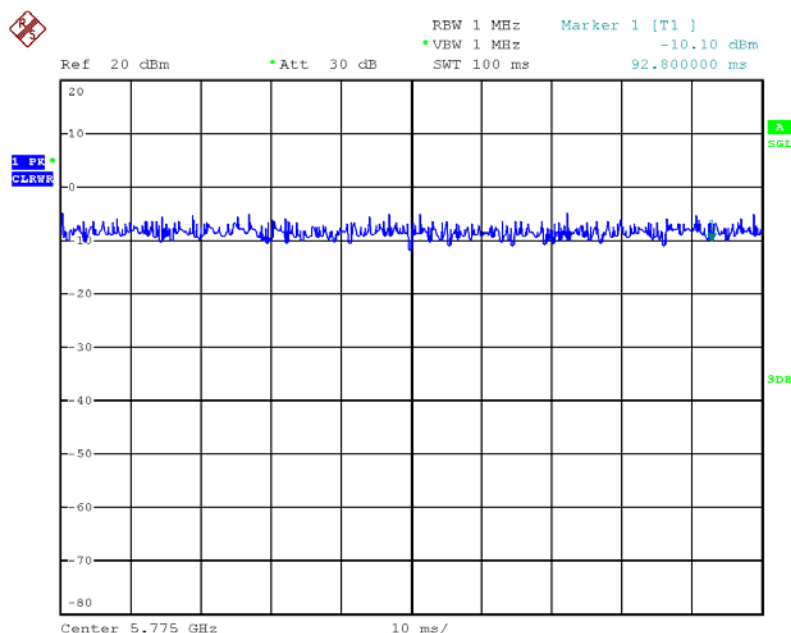
For Radiated Mode:

During the test, the following programs under WIN XP were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under DOS.
3. Executed "Latest.exe " to link with the remote workstation to receive and transmit packet by Wireless AP and transmit duty cycle no less 98%.

3.9. Duty Cycle



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3.10. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Wireless AP	NETGEAR	R6300	PY312100188
Notebook*2	DELL	1340	E2K4965AGNM

3.11. 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.

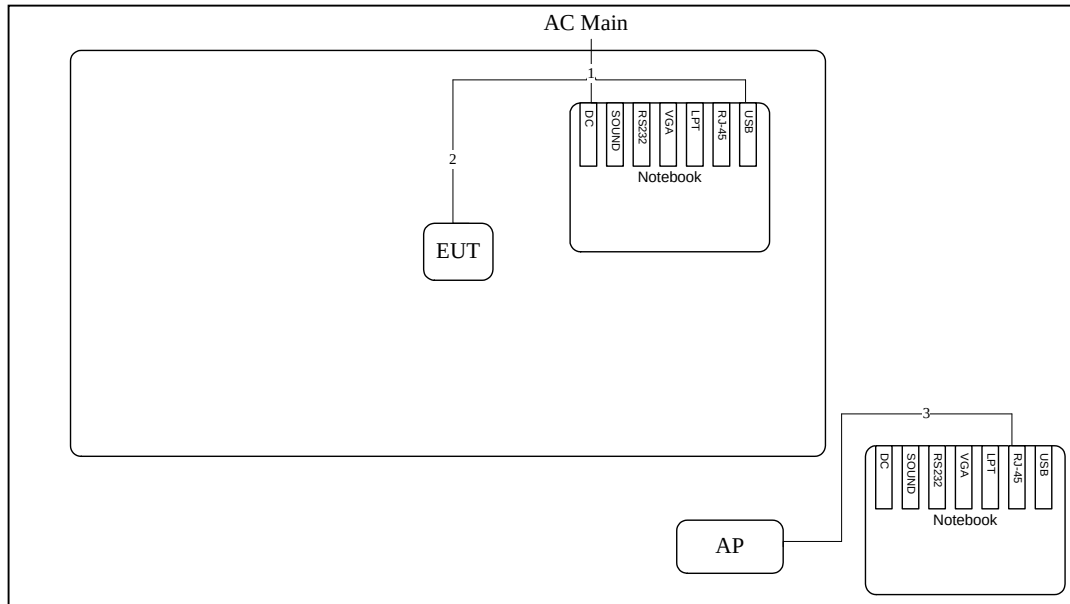
Power Parameters of IEEE 802.11ac MCS0 VHT80

Test Software Version	DOS
Frequency	5775 MHz
MCS0 VHT80	48

3.12. Test Configurations

3.12.1. Radiation Emissions Test Configuration

For Radiated Emission test above 1GHz :



Item	Connection	Shield	Length
1	Power Cable	No	2.6m
2	USB Cable	Yes	1.8m
3	RJ-45	No	1.5m

4. TEST RESULT

4.1. Maximum Conducted Output Power Measurement

4.1.1. Limit

For systems using digital modulation in the 5725-5850MHz, the limit for output power is 30dBm.

Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter output power.

4.1.2. Measuring Instruments and Setting

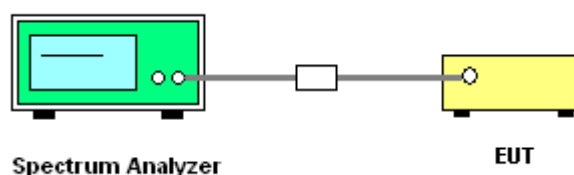
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RB	1MHz
VB	3MHz
Detector	RMS
Trace	Average 100
Sweep Time	Auto

4.1.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Test was performed in accordance with KDB 558074 Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 5.2.2.2. Multiple antenna systems was performed in accordance with KDB 662911 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

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 Maximum Conducted Output Power

Temperature	26°C	Humidity	63%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0 VHT80 / Ant. 1 + Ant. 2

Channel	Frequency	Conducted Power (dBm)		Total Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1	Ant. 2			
155	5775 MHz	10.76	10.83	13.81	28.69	Complies

Note:

Directional gain = $G_{ANT} + 10 \log(N_{ANT}/N_{ss}) = 7.31 \text{ dBi} > 6 \text{ dBi}$, so the power limit = $30 - (7.31 - 6) = 28.69 \text{ dBm}$



The screenshot displays a spectrum analyzer interface. At the top, a red 'X' icon is in the upper left corner. The main display area shows a frequency spectrum with a blue trace. A green arrow points to a peak at 5.775 GHz. The power level is indicated as 10.76 dBm. The bandwidth is set to 80 MHz. The center frequency is 5.775 GHz. The span is 120 MHz. The offset is 11.5 dB. The reference level is 31.5 dBm. The attenuation is 30 dB. The sweep time is 20 ms. The marker is labeled [T1] with a value of -7.23 dBm. The signal is identified as Tx Channel.

Ref 31.5 dBm *Att 30 dB SWT 20 ms Marker 1 [T1] -7.23 dBm
5.769480000 GHz

30 Offset 11.5 dB

1.00 AVG

SWP 100 100

Center 5.775 GHz 12 MHz/ Span 120 MHz

Tx Channel Bandwidth 80 MHz Power 10.76 dBm

Ref 31.5 dBm Att 30 dB SWT 20 ms 5.769480000 GHz

Marker 1 [T1] -6.45 dBm

30 Offset 11.5 dB

20

10

0

-10

-20

-30

-40

-50

-60

1. MHz

AVG

SWP 100 100

Center 5.775 GHz 12 MHz/ Span 120 MHz

Tx Channel

Bandwidth 80 MHz Power 10.93 dBm

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Issued Date : Mar. 12, 2013

4.2. Power Spectral Density Measurement

4.2.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.2.2. Measuring Instruments and Setting

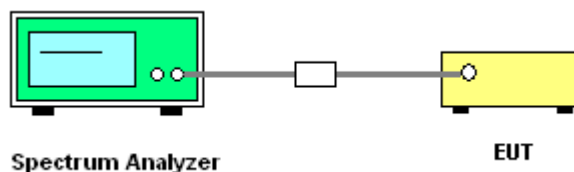
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RB	≥ 3 kHz
VB	$\geq 3 \times$ RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 v01 r02 section 9.1 option 1 & KDB662911 D01 Multiple Transmitter Output v01r02 section In-Band Power Spectral Density (PSD) Measurements option (2) Measure and add $10 \log(NANT)$ dB.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

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 Power Spectral Density

Temperature	26°C	Humidity	63%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11 ac

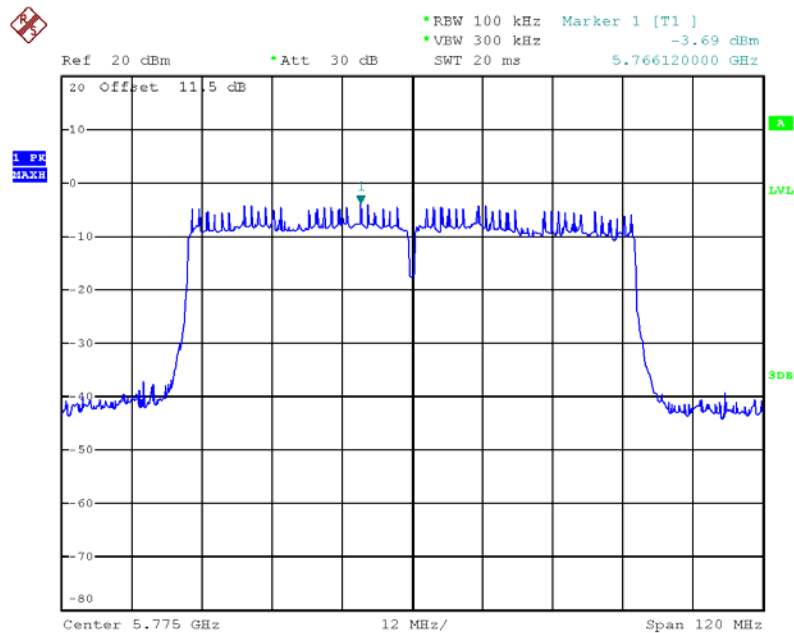
Configuration IEEE 802.11ac MCS0 VHT80 / Ant. 1 & Ant. 2

Channel	Frequency	Power Density (dBm/100kHz)		Max. Limit (dBm/3kHz)	Result
		Ant.1	Ant.2		
155	5775 MHz	-3.69	-3.80	3.68	Complies

Note:

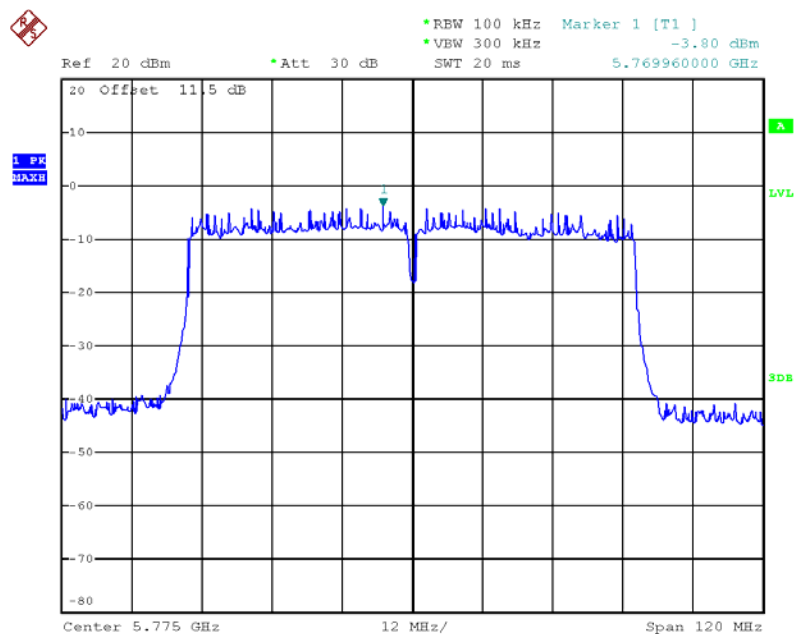
Directional gain = $G_{ANT} + 10\log(N_{ANT}/N_{ss}) = 7.31\text{ dBi} > 6\text{ dBi}$, so the power limit = $8 - (7.31 - 6) - (10\log(2))$
 $= 3.68\text{ dBm/3kHz}$

Power Density Plot on Configuration IEEE 802.11ac MCS0 VHT80 / Ant. 1 / 5775 MHz



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Power Density Plot on Configuration IEEE 802.11ac MCS0 VHT80 / Ant. 2 / 5775 MHz



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4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

4.3.2. Measuring Instruments and Setting

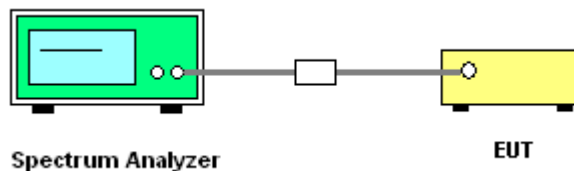
Please refer to section 5 of equipments list in this report. The following table is the setting of spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	1-5 % or DTS BW, not exceed 100KHz
VB	$\geq 3 \times \text{RBW}$
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 in peak hold mode.
2. Test was performed in accordance with KDB 558074 Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 5.1.1 EBW Measurement Procedure
3. Multiple antenna systems was performed in accordance with KDB 662911 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

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.



Temperature	26°C	Humidity	63%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac

Channel	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
155	5775 MHz	76.16	76.16	500	Complies

Ref 20 dBm * Att 30 dB * RBW 100 kHz Delta 1 [T1] -0.12 dB
* VBW 300 kHz SWT 20 ms 76.16000000 MHz

OBW 76.16000000 MHz
Marker 1 [T1] 5.736920000 GHz
Temp 1 [T1 OBW] -13.37 dBm
Temp 2 [T1 OBW] 5.813080000 GHz
-13.50 dBm

D1 -7.95 dBm
D2 -13.95 dBm

F1 F2

Center 5.775 GHz 16 MHz/
Span 160 MHz

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4.4. Radiated Emissions Measurement

4.4.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. 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

4.4.2. 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	1GHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 3MHz for peak

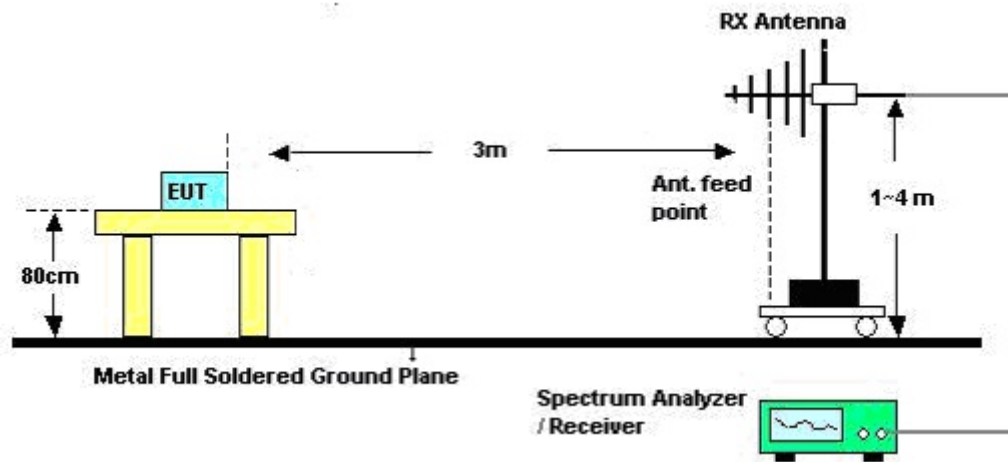
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RB 120kHz for QP

4.4.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. 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 3MHz 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.

4.4.4. Test Setup Layout

For radiated emissions above 1GHz



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 beam-forming transmitting mode.

4.4.7. Results for Radiated Emissions (1GHz~10th Harmonic)

Temperature	25.6°C	Humidity	56%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0 VHT80 CH 155 / Ant. 1 + Ant. 2
Test Date	Feb. 05, 2013	Test Mode	Mode 4

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11550.16	37.50	54.00	-16.50	28.86	5.13	38.81	35.30	Average	100	98	HORIZONTAL
2	11550.16	48.27	74.00	-25.73	39.63	5.13	38.81	35.30	Peak	100	98	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11550.16	36.80	54.00	-17.20	28.16	5.13	38.81	35.30	Average	100	187	VERTICAL
2	11550.16	48.17	74.00	-25.83	39.53	5.13	38.81	35.30	Peak	100	187	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.

4.5. Band Edge Emissions Measurement

4.5.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. 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 the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 3MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 kHz / 300 kHz for Peak

4.5.3. Test Procedures

For Radiated band edges Measurement:

- The test procedure is the same as section 4.4.3, only the frequency range investigated is limited to 100MHz around bandedges.

For Conducted Out of Band Emission Measurement:

- Test was performed in accordance with KDB 558074 v02 Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure
- The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit.
Only worst data of each operating mode is presented.

4.5.4. Test Setup Layout

For Radiated band edges Measurement:

This test setup layout is the same as that shown in section 4.4.4.

For Conducted Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.3.4.

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 beam-forming transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

Temperature	25.6°C	Humidity	56%
Test Engineer	Satoshi Yang	Configurations	IEEE 802. 11ac MCS0 VHT80 CH 155 / Ant. 1 + Ant. 2
Test Date	Feb. 05, 2013	Test Mode	Mode 2

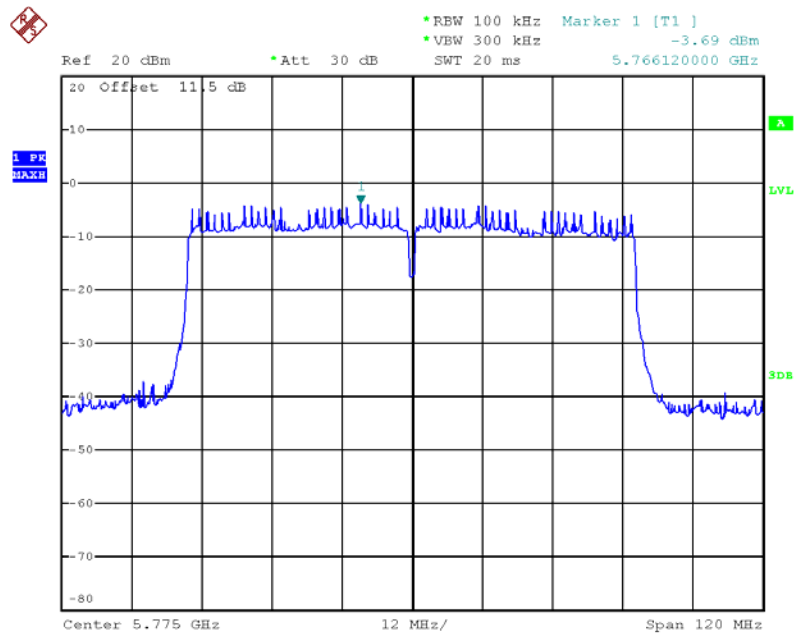
Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5133.00	42.24	54.00	-11.76	5.17	3.43	33.64	0.00	Average	100	156	HORIZONTAL
2	5133.00	50.77	74.00	-23.23	13.70	3.43	33.64	0.00	Peak	100	156	HORIZONTAL
3	5771.00	84.89			46.92	3.62	34.35	0.00	Average	100	156	HORIZONTAL
4	5783.00	95.79			57.80	3.63	34.36	0.00	Peak	100	156	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5775 MHz.

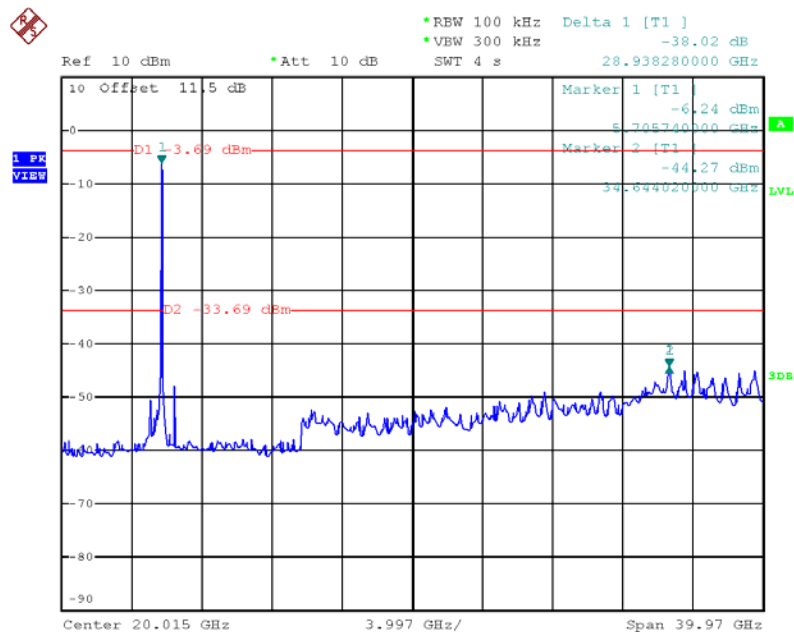
For Emission not in Restricted Band

Plot on Configuration IEEE 802.11ac MCS0 VHT80 / Reference Level



Date: 6.FEB.2013 07:45:55

Plot on Configuration IEEE 802.11ac MCS0 VHT80 / CH 155 (down 30dBc)



Date: 6.FEB.2013 07:48:57

4.6. Antenna Requirements

4.6.1. 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.

4.6.2. 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
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2013	Radiation (03CH01-CB)
forHorn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 16, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Nov. 28, 2012	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Nov. 27, 2012	Conducted (TH01-CB)

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

Note: N.C.R. 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., Neihsu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085