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FCC RADIO TEST REPORT

Applicant's company	**PEGATRON CORPORATION**
Applicant Address	5F., NO. 76, LIGONG ST., BEITOU DISTRICT, TAIPEI CITY 112 Taiwan
FCC ID	**VUIDPC3929C**
Manufacturer's company	**MAINTEK COMPUTER**
Manufacturer Address	233 Jinfeng Rd., Suzhou, Jiangsu, PRC

Product Name	Wireless cable modem
Brand Name	Cisco
Model No.	DPC3940XXXX (X = 0~9 and A~Z or blank)
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	Sep. 17, 2013
Final Test Date	Jan. 14, 2014
Submission Type	Class II Change

Statement

Test result included is only for the IEEE 802.11n, IEEE 802.11b/g part and IEEE 802.11a/ac (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 v03r01** and **KDB 662911 D01 v02r01**.

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

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3O0404-02AA	Rev. 01	Initial issue of report	Jan. 23, 2014

Certificate No.: CB10301191

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Wireless cable modem
Brand Name	:	Cisco
Model No.	:	DPC3940XXXX (X = 0~9 and A~Z or blank)
Applicant	:	PEGATRON CORPORATION
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 Sep. 17, 2013 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	2.28 dB
4.2	15.247(d)	Radiated Emissions	Complies	0.07 dB
4.3	15.247(d)	Band Edge Emissions	Complies	0.12 dB
4.4	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Internal Power Supply and Li-ion battery
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n/ac
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth ; 1 for 80MHz bandwidth
Channel Band Width (99%)	For 2.4GHz Band: MCS0 (20MHz): 17.28 MHz ; MCS0 (40MHz): 36.16 MHz For 5GHz Band: 802.11ac MCS0/Nss1 (20MHz): 17.92 MHz ; 802.11ac MCS0/Nss1 (40MHz): 36.48 MHz ; 802.11ac MCS0/Nss1 (80MHz): 76.48 MHz
Maximum Conducted Output Power	For 2.4GHz Band: MCS0 (20MHz): 27.43 dBm ; MCS0 (40MHz): 23.39 dBm For 5GHz Band: 802.11ac MCS0/Nss1 (20MHz): 27.72 dBm ; 802.11ac MCS0/Nss1 (40MHz): 27.58 dBm ; 802.11ac MCS0/Nss1 (80MHz): 27.29 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

802.11a/b/g

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From Internal Power Supply and Li-ion battery
Modulation	DSSS for IEEE 802.11b ; OFDM for IEEE 802.11a/g
Data Modulation	DSSS (BPSK / QPSK / CCK) ; OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11) ; OFDM (6/9/12/18/24/36/48/54)
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	11b/g: 11 ; 11a: 5
Channel Band Width (99%)	11b: 10.16 MHz ; 11g: 16.64 MHz ; 11a: 16.64 MHz
Maximum Conducted Output Power	11b: 22.18 dBm ; 11g: 24.71 dBm ; 11a: 22.43 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna and Band width

Antenna	Single (TX)			Two (TX)			Three (TX)		
Band width Mode	20 MHz	40 MHz	80 MHz	20 MHz	40 MHz	80 MHz	20 MHz	40 MHz	80 MHz
IEEE 802.11a	V	X	X	X	X	X	X	X	X
IEEE 802.11b	V	X	X	X	X	X	X	X	X
IEEE 802.11g	V	X	X	X	X	X	X	X	X
IEEE 802.11n	X	X	X	X	X	X	V	V	X
IEEE 802.11ac	X	X	X	X	X	X	V	V	V

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	3	MCS0-23
802.11n (HT40)	3	MCS0-23
802.11ac (VHT20)	3	MCS 0-9/Nss1-3
802.11ac (VHT40)	3	MCS 0-9/Nss1-3
802.11ac (VHT80)	3	MCS 0-9/Nss1-3
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: 11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

Power	Brand	Model	CISCO P/N	Rating
Li-ion Battery	PEGATRON	PB021	35-100101-01	7.5V – 3000mAh, 22Wh
Others				
Power Cable, Non-shielded, 1.45m				
RJ-45 Cable, Non-shielded, 1.2m				

3.3. Table for Filed Antenna

Ant.	Brand Holder	Model Name	P/N	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30035	PCB Antenna	I-PEX	1.94	-
2	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30036	PCB Antenna	I-PEX	4.21	2.50
3	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30037	PCB Antenna	I-PEX	4.21	2.55
4	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30038	PCB Antenna	I-PEX	-	2.38
5	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30092	PCB Antenna	I-PEX	1.94	-
6	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30093	PCB Antenna	I-PEX	4.21	2.50
7	HL TECHNOLOGY GROUP LIMITED	DPC-3940CAD and DPC-3929CAD (Q Housing)	290-30094	PCB Antenna	I-PEX	4.21	2.55

Note:

The EUT has two sets of antennas and each set has four antennas. First set includes Ant.1~4, and second set includes Ant.4~7. The difference between set 1 & set 2 is just model name, so there's only set 1 selected and recorded in the report.

For 2.4GHz function:

For IEEE 802.11n mode (3TX/3RX)

Chain 1, Chain 2 and Chain 3 can be used as transmitting/receiving antenna.

Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.

For IEEE 802.11b/g mode (1TX/1RX):

Only Chain 1 can be used as transmitting/receiving antenna.

For 5GHz function:

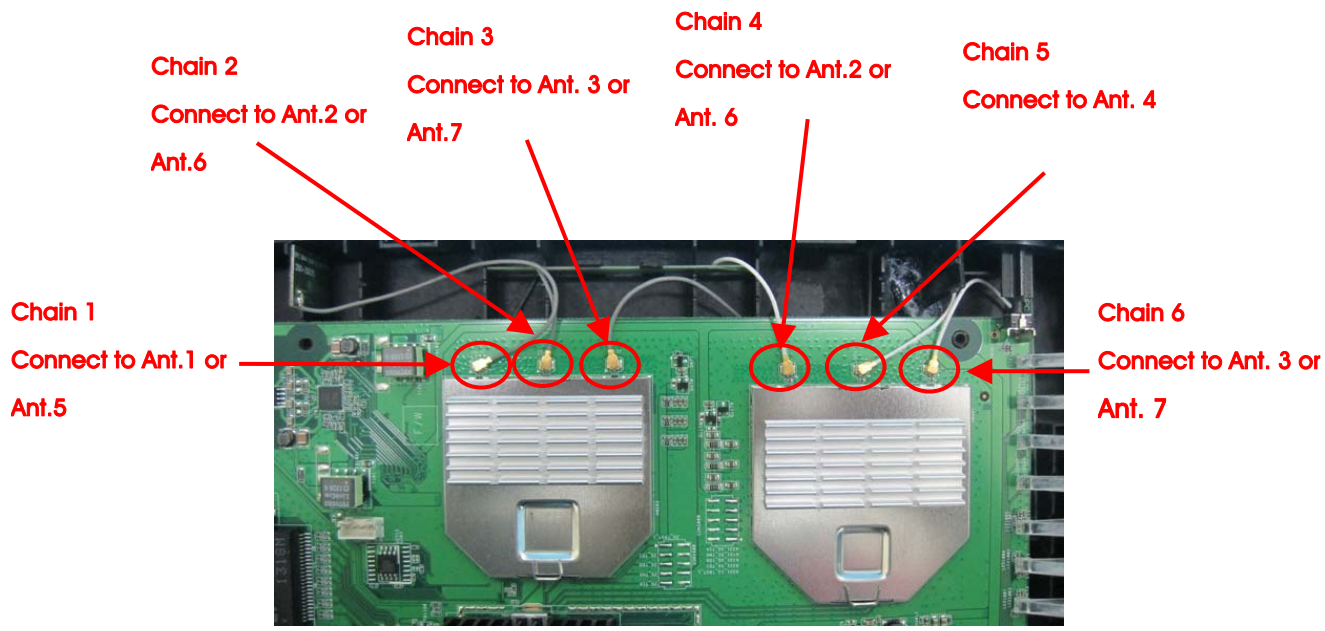
For IEEE 802.11n/ac mode (3TX/3RX)

Chain 4, Chain 5 and Chain 6 can be used as transmitting/receiving antenna.

Chain 4, Chain 5 and Chain 6 could transmit/receive simultaneously.

For IEEE 802.11a mode (1TX/1RX):

Only Chain 4 can be used as transmitting/receiving antenna.



3.4. Table for Carrier Frequencies

For 2.4GHz Band:

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

For 5GHz Band:

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 151, 159.

For 80MHz bandwidth systems, use Channel 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 MHz

3.5. Table for Class II Change

This product is an extension of original report under Sporton project number: FR3O0404AA

1. Adding new model number for new main chip.

   The differences between original model number and new model number are the model number and DOCSIS Config of main chip.

Device model number	The difference of main chip		Performance Checking
	Model no.	DOCSIS Config	
DPC3929XXXX (X = 0~9 and A~Z or blank)	BCM3383Z	8 Downstream channels & 4 Upstream channels	-
DPC3940XXXX (X = 0~9 and A~Z or blank)	BCM33843Z	16 Downstream channels & 4 Upstream channels	**For 2.4G:** 1. Radiated Emissions <Below 1GHz> 2. Radiated Emissions <Above1GHz>: IEEE 802.11n MCS0 20MHz CH 6 IEEE 802.11n MCS0 40MHz CH 6 3. Band Edge Emissions Measurement: IEEE 802.11n MCS0 20MHz CH 6 IEEE 802.11n MCS0 40MHz CH 6 **For 5G (Band 4):** 1. Radiated Emissions<Below 1GHz> 2. Radiated Emissions <Above1GHz>: IEEE 802.11ac MCS0/Nss1 20MHz CH 149 IEEE 802.11ac MCS0/Nss1 40MHz CH 159 IEEE 802.11ac MCS0/Nss1 80MHz CH 155

2. Adding the same type antennas, and the antenna gain of new antennas is lower than originally approved antennas.

There is no change in existing RF relevant portion.

3.6. 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.

For 2.4GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
Maximum Conducted Output Power	11n 20MHz	MCS0	1/6/11	1+2+3
	11n 40MHz	MCS0	3/6/9	1+2+3
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11n 20MHz	MCS0	1/6/11	1+2+3
	11n 40MHz	MCS0	3/6/9	1+2+3
	11b/CCK	1 Mbps	1/6/11	1
	11g/BPSK	6 Mbps	1/6/11	1

For 5GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
Maximum Conducted Output Power	11ac 20MHz	MCS0/Nss1	149/157/165	4+5+6
	11ac 40MHz	MCS0/Nss1	151/159	4+5+6
	11ac 80MHz	MCS0/Nss1	155	4+5+6
	11a/BPSK	6 Mbps	149/157/165	4
Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	11ac 20MHz	MCS0/Nss1	149/157/165	4+5+6
	11ac 40MHz	MCS0/Nss1	151/159	4+5+6
	11ac 80MHz	MCS0/Nss1	155	4+5+6
	11a/BPSK	6 Mbps	149/157/165	4

The following test modes were performed for all tests:

For Radiated Emission below 1GHz test:

Mode 1. Stand of EUT (CTX) with 2.4GHz

Mode 2. Stand of EUT (CTX) with 5GHz

Mode 1 is the worst case, so it was selected to record in this test report.

For Radiated Emission above 1GHz test:

Mode 1. Stand of EUT (CTX)

3.7. Table for Testing Locations

Test Site Location				
Address:	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			
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	-	-

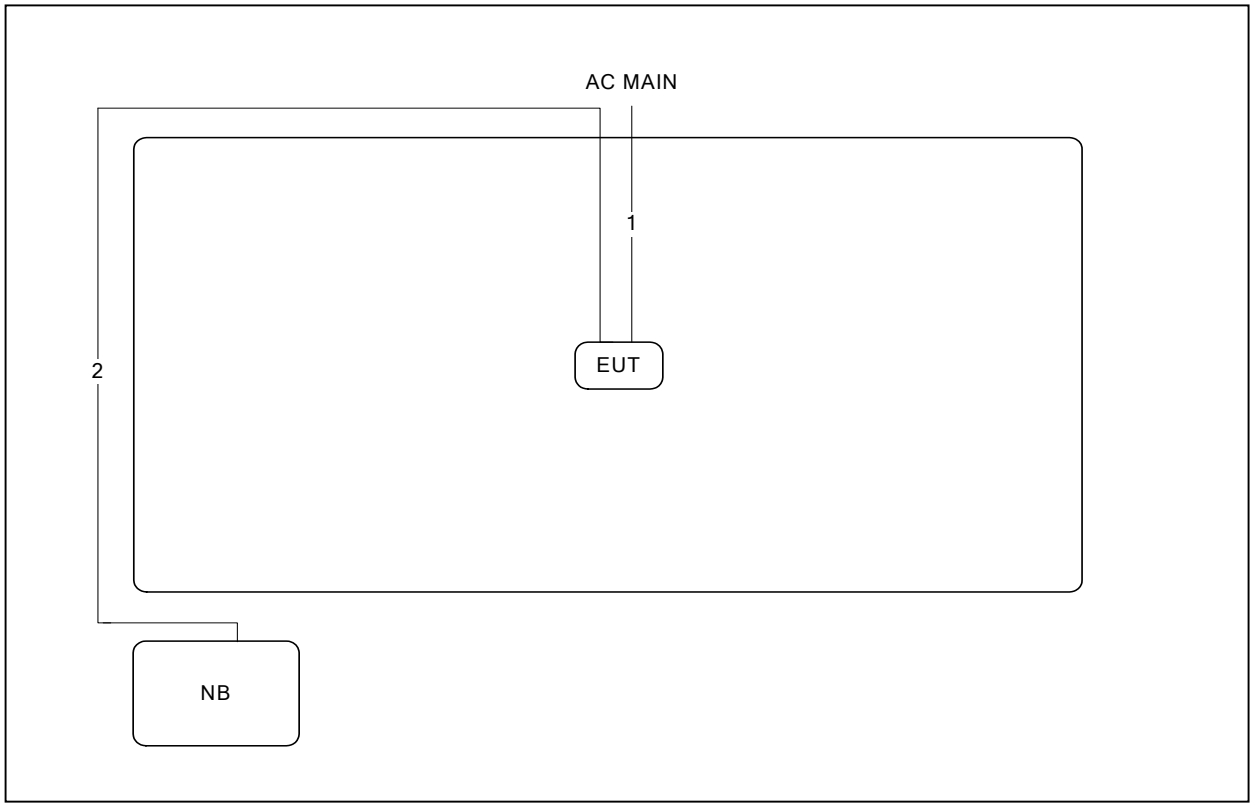
Open Area Test Site (OATS); Semi Anechoic Chamber (SAC).

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC

3.9. Test Configurations

3.9.1. Radiation Emissions Test Configuration



Item	Connection	Shield	Length(m)
1	Power cable	No	1.45m
2	RJ-45 cable	No	10m

4. TEST RESULT

4.1. Maximum Conducted Output Power Measurement

4.1.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi. 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

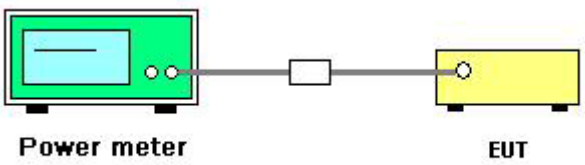
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.1.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r01 section 9.2.2 Measurement using a power meter (PM).
2. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

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	Magic Lai	Configurations	IEEE 802.11n/ac
Test Date	Oct. 11, 2013 ~ Oct. 12, 2013		

For 2.4GHz Band

Configuration IEEE 802.11n MCS0 20MHz / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
1	2412 MHz	15.01	15.60	13.37	19.53	30.00	Complies
6	2437 MHz	22.83	23.07	22.01	27.43	30.00	Complies
11	2462 MHz	15.01	15.63	13.41	19.55	30.00	Complies

Configuration IEEE 802.11n MCS0 40MHz / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
3	2422 MHz	12.53	14.05	11.00	17.47	30.00	Complies
6	2437 MHz	18.84	19.26	17.60	23.39	30.00	Complies
9	2452 MHz	12.76	14.11	10.90	17.55	30.00	Complies

For 5GHz Band

Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
149	5745 MHz	22.37	22.72	23.65	27.72	30.00	Complies
157	5785 MHz	22.41	22.62	23.63	27.69	30.00	Complies
165	5825 MHz	22.05	22.43	23.45	27.46	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
151	5755 MHz	20.41	20.95	22.13	26.00	30.00	Complies
159	5795 MHz	22.25	22.58	23.51	27.58	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
155	5775 MHz	21.45	22.31	23.53	27.29	30.00	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a/b/g
Test Date	Oct. 11, 2013 ~ Oct. 12, 2013		

Configuration IEEE 802.11b / Chain 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	20.53	30.00	Complies
6	2437 MHz	22.18	30.00	Complies
11	2462 MHz	20.66	30.00	Complies

Configuration IEEE 802.11g / Chain 1

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
1	2412 MHz	16.43	30.00	Complies
6	2437 MHz	24.71	30.00	Complies
11	2462 MHz	16.77	30.00	Complies

Configuration IEEE 802.11a / Chain 4

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
149	5745 MHz	22.43	30.00	Complies
157	5785 MHz	22.33	30.00	Complies
165	5825 MHz	22.25	30.00	Complies

4.2. Radiated Emissions Measurement

4.2.1. 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

4.2.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1GHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

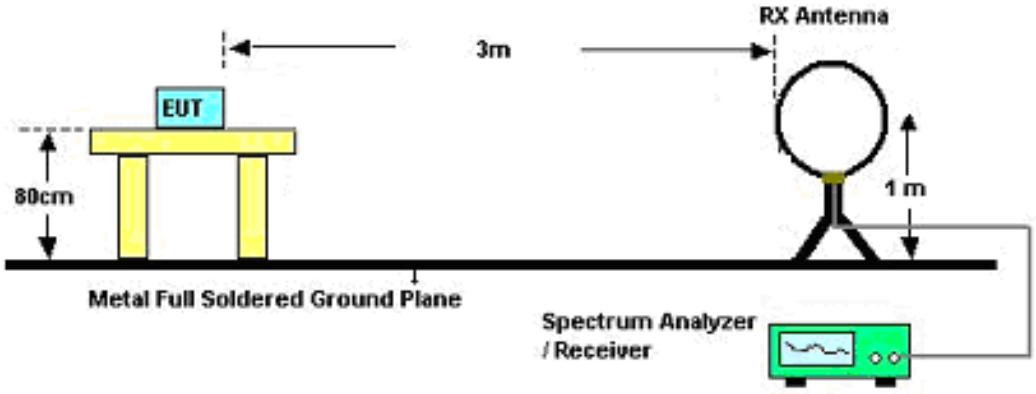
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.2.3. Test Procedures

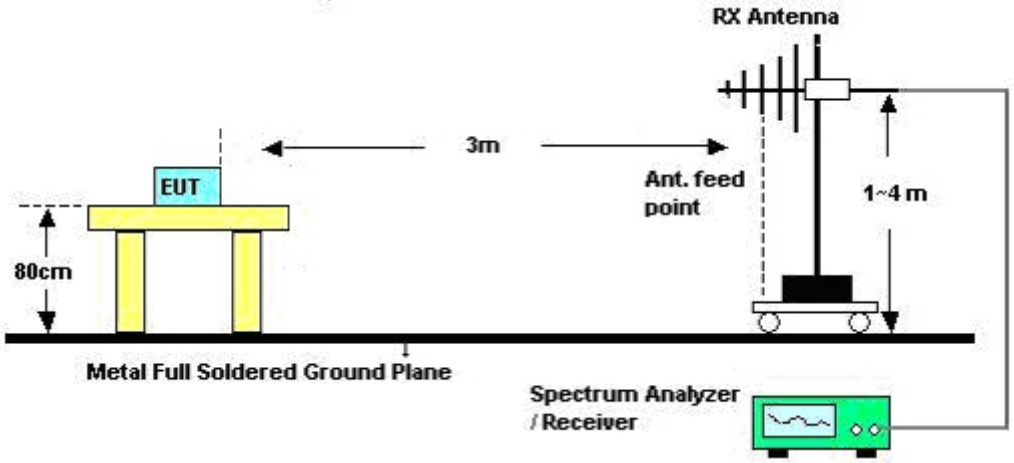
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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.

4.2.4. Test Setup Layout

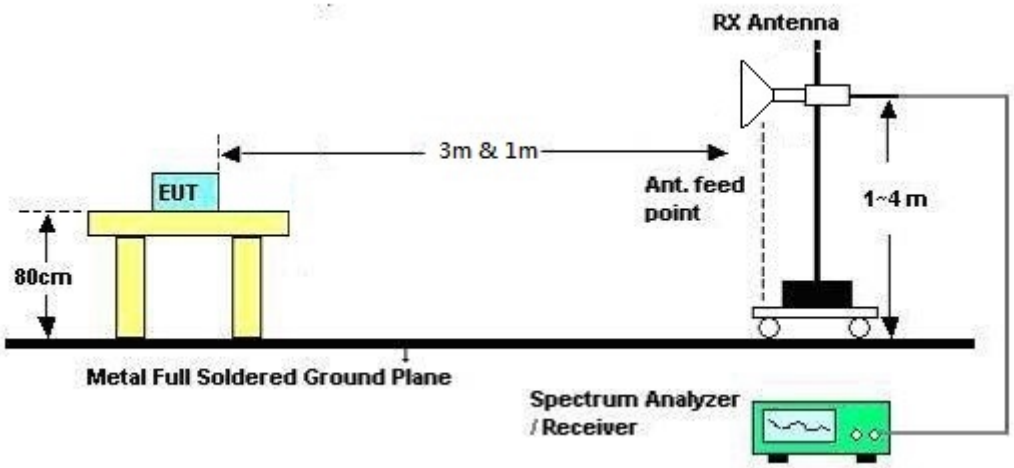
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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

Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	CTX
Test Date	Jan. 14, 2014	Test Mode	Mode 1

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

Note:

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

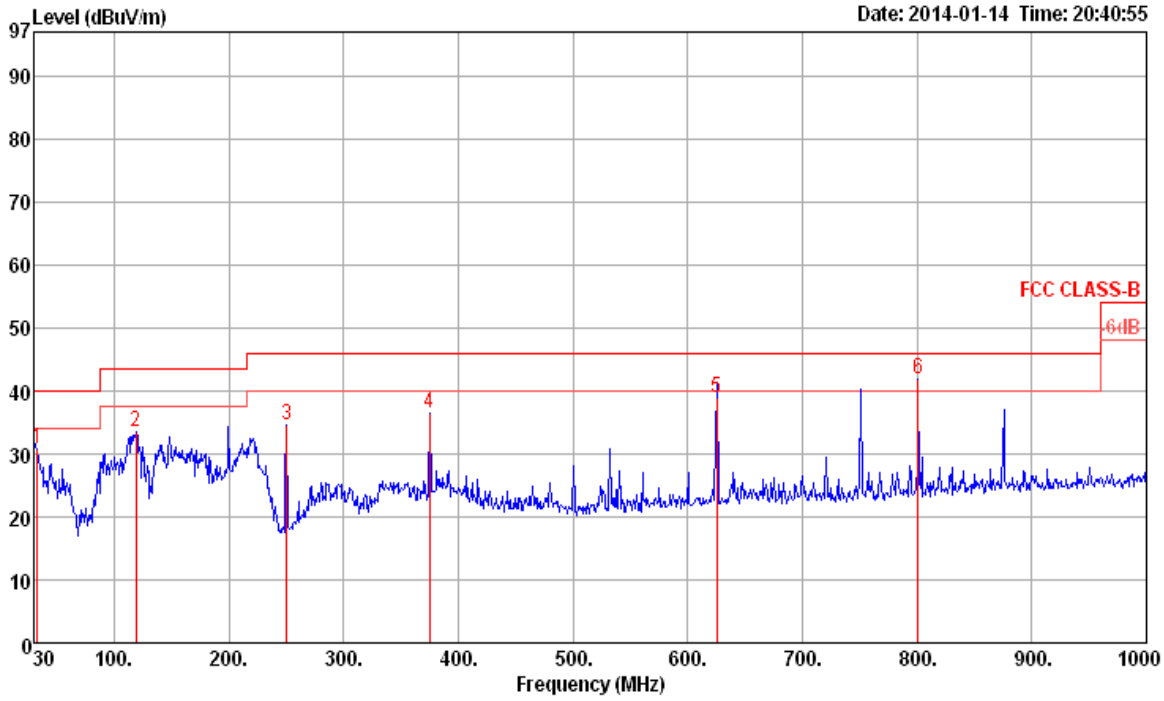
Distance extrapolation factor = 40 log (specific distance / test distance) (Db);

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

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

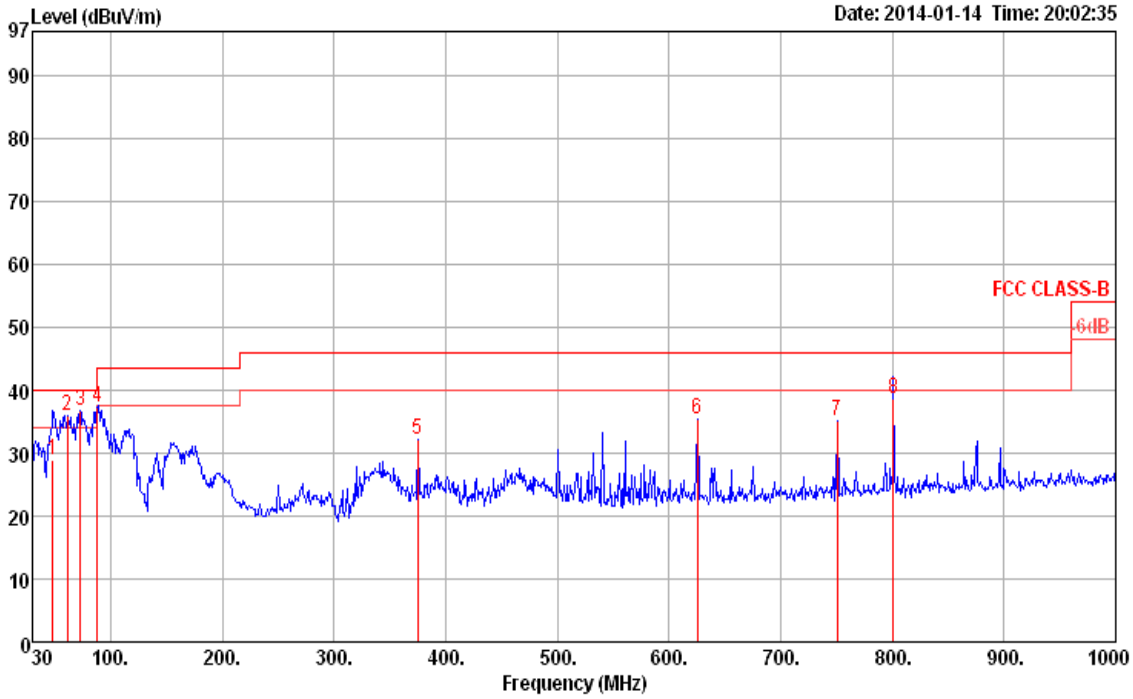
Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	CTX
Test Mode	Mode 1		

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	32.91	30.82	40.00	-9.18	40.81	0.66	17.15	27.80	Peak	100	360	HORIZONTAL
2	119.24	33.45	43.50	-10.05	47.20	1.29	12.46	27.50	Peak	100	360	HORIZONTAL
3	250.19	34.67	46.00	-11.33	47.12	1.78	12.77	27.00	Peak	100	360	HORIZONTAL
4	375.32	36.54	46.00	-9.46	46.37	2.20	15.40	27.43	Peak	100	360	HORIZONTAL
5	625.58	38.83	46.00	-7.17	45.15	2.90	18.85	28.07	QP	100	310	HORIZONTAL
6	801.15	41.91	46.00	-4.09	46.51	3.22	19.78	27.60	QP	100	360	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	48.43	28.96	40.00	-11.04	46.81	0.82	9.13	27.80	QP	100	71	VERTICAL
2	61.04	36.06	40.00	-3.94	56.14	0.92	6.76	27.76	Peak	159	0	VERTICAL
3	72.68	36.69	40.00	-3.31	56.67	0.95	6.78	27.71	Peak	159	0	VERTICAL
4	88.20	37.29	43.50	-6.21	55.24	1.08	8.62	27.65	Peak	100	0	VERTICAL
5	375.32	32.03	46.00	-13.97	41.86	2.20	15.40	27.43	Peak	100	0	VERTICAL
6	625.58	35.34	46.00	-10.66	41.66	2.90	18.85	28.07	Peak	100	0	VERTICAL
7	750.71	35.14	46.00	-10.86	40.31	3.20	19.43	27.80	Peak	100	0	VERTICAL
8	801.15	38.52	46.00	-7.48	43.12	3.22	19.78	27.60	QP	100	41	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.

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

Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	IEEE 802.11n MCS0 20MHz CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jan. 10, 2014	Test Mode	Mode 1

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	4870.38	70.82	74.00	-3.18	66.65	5.92	33.45	35.20	Peak	100	280	HORIZONTAL
2	4870.47	53.93	54.00	-0.07	49.76	5.92	33.45	35.20	Average	100	280	HORIZONTAL
3	7315.01	41.64	54.00	-12.36	33.43	7.13	36.51	35.43	Average	100	46	HORIZONTAL
4	7315.17	55.80	74.00	-18.20	47.59	7.13	36.51	35.43	Peak	100	46	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	4870.51	64.38	74.00	-9.62	60.21	5.92	33.45	35.20	Peak	100	247	VERTICAL
2	4870.64	49.38	54.00	-4.62	45.21	5.92	33.45	35.20	Average	100	247	VERTICAL
3	7305.71	54.25	74.00	-19.75	46.06	7.13	36.48	35.42	Peak	100	274	VERTICAL
4	7310.87	39.58	54.00	-14.42	31.37	7.13	36.51	35.43	Average	100	274	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.

Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	IEEE 802.11n MCS0 40MHz CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jan. 02, 2014		

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	4869.67	44.13	54.00	-9.87	42.71	3.33	33.12	35.03	Average	100	63	HORIZONTAL
2	4873.84	60.63	74.00	-13.37	59.17	3.33	33.16	35.03	Peak	100	63	HORIZONTAL
3	7289.77	54.66	74.00	-19.34	50.11	4.06	35.89	35.40	Peak	170	101	HORIZONTAL
4	7305.07	38.87	54.00	-15.13	34.29	4.06	35.92	35.40	Average	170	101	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	4864.14	56.09	74.00	-17.91	54.67	3.33	33.12	35.03	Peak	100	71	VERTICAL
2	4880.17	37.62	54.00	-16.38	36.16	3.33	33.16	35.03	Average	100	71	VERTICAL
3	7309.16	35.35	54.00	-18.65	30.73	4.06	35.96	35.40	Average	161	10	VERTICAL
4	7310.44	49.70	74.00	-24.30	45.08	4.06	35.96	35.40	Peak	161	10	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 149 / Chain 4 + Chain 5 + Chain 6
Test Date	Jan. 10, 2014	Test Mode	Mode 1

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	11490.22	62.06	74.00	-11.94	48.40	9.24	39.50	35.08	Peak	100	287	HORIZONTAL
2	11490.29	48.62	54.00	-5.38	34.96	9.24	39.50	35.08	Average	100	287	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	11490.48	53.46	54.00	-0.54	39.80	9.24	39.50	35.08	Average	100	253	VERTICAL
2	11491.06	66.45	74.00	-7.55	52.79	9.24	39.50	35.08	Peak	100	253	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 159 / Chain 4 + Chain 5 + Chain 6
Test Date	Jan. 10, 2014	Test Mode	Mode 1

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	11586.41	46.14	54.00	-7.86	32.48	9.27	39.47	35.08	Average	100	225	HORIZONTAL
2	11586.63	59.94	74.00	-14.06	46.28	9.27	39.47	35.08	Peak	100	225	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	11586.57	63.81	74.00	-10.19	50.15	9.27	39.47	35.08	Peak	100	227	VERTICAL
2	11591.67	50.78	54.00	-3.22	37.12	9.27	39.47	35.08	Average	100	227	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 155 / Chain 4 + Chain 5 + Chain 6
Test Date	Jan. 10, 2014	Test Mode	Mode 1

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	5133.30	56.52	74.00	-17.48	51.62	6.12	33.98	35.20	Peak	124	175	HORIZONTAL
2	5133.37	52.67	54.00	-1.33	47.77	6.12	33.98	35.20	Average	124	175	HORIZONTAL
3	11541.96	45.24	54.00	-8.76	31.58	9.26	39.49	35.09	Average	100	4	HORIZONTAL
4	11542.12	56.89	74.00	-17.11	43.23	9.26	39.49	35.09	Peak	100	4	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	5133.33	56.91	74.00	-17.09	52.01	6.12	33.98	35.20	Peak	100	24	VERTICAL
2	5133.40	52.31	54.00	-1.69	47.41	6.12	33.98	35.20	Average	100	24	VERTICAL
3	11541.57	48.77	54.00	-5.23	35.11	9.26	39.49	35.09	Average	100	300	VERTICAL
4	11546.03	62.75	74.00	-11.25	49.09	9.26	39.49	35.09	Peak	100	300	VERTICAL

4.3. Emissions Measurement

4.3.1. 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

4.3.2. 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	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 10Hz for Average
RBW / VBW (Emission in non-restricted band)	100 kHz / 300 kHz for Peak

4.3.3. Test Procedures

For Radiated band edges Measurement:

1. The test procedure is the same as section 4.2.3, only the freqeuncy range investigated is limited to 100MHz around band edges.

For Radiated Out of Band Emission Measurement:

1. Test was performed in accordance with KDB 558074 D01 v03r01 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.
2. The radiated emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
   Only worst data of each operating mode is presented.

4.3.4. Test Setup Layout

For Radiated band edges Measurement:

This test setup layout is the same as that shown in section 4.2.4.

For Radiated Out of Band Emission Measurement:

This test setup layout is the same as that shown in section 4.2.4.

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 Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	40%
Test Engineer	Will Tung	Configurations	IEEE 802.11n MCS0 20MHz CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jan. 02, 2014		

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m		
1	2388.40	67.88	74.00	-6.12	36.30	27.90	HORIZONTAL	Peak
2	2390.00	53.27	54.00	-0.73	21.69	27.90	HORIZONTAL	Average
3	2441.10	111.46	54.00			27.90	HORIZONTAL	Average
4	2441.30	122.69	74.00			27.90	HORIZONTAL	Peak
5	2483.50	49.54	54.00	-4.46	17.91	27.90	HORIZONTAL	Average
6	2483.50	63.33	74.00	-10.67	31.70	27.90	HORIZONTAL	Peak

Item 3, 4 are the fundamental frequency at 2437 MHz.

Note:

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

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

Temperature	25℃	Humidity	40%
Test Engineer	Will Tung	Configurations	IEEE 802.11n MCS0 40MHz CH 6 / Chain 1 + Chain 2 + Chain 3
Test Date	Jan. 02, 2014		

Channel 6

	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	2388.40	52.53	54.00	-1.47	22.15	2.21	28.17	0.00	Average	100	34	VERTICAL
2	2388.40	68.43	74.00	-5.57	38.05	2.21	28.17	0.00	Peak	100	34	VERTICAL
3	2438.28	102.44			71.92	2.23	28.29	0.00	Average	100	34	VERTICAL
4	2438.28	115.35			84.83	2.23	28.29	0.00	Peak	100	34	VERTICAL
5	2483.50	53.88	54.00	-0.12	23.25	2.26	28.37	0.00	Average	100	34	VERTICAL
6	2483.50	69.89	74.00	-4.11	39.26	2.26	28.37	0.00	Peak	100	34	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Note:

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

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

4.4. Antenna Requirements

4.4.1. 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.

4.4.2. 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	Apr. 16, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Dec. 17, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Oct. 23, 2013	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 12, 2013	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. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Oct. 08, 2013	Conducted (TH01-CB)
RF Power Divider	Woken	2 Way	0120A02056002D	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	3 Way	MDC2366	2GHz ~ 18GHz	Nov. 18, 2012	Conducted (TH01-CB)
RF Power Divider	Woken	4 Way	0120A04056002D	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	Sep. 18, 2013	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)

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

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

N.C.R. means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	0.026	dB	normal(k=2)	0.013
Cable loss	0.002	dB	normal(k=2)	0.001
AMN/LISN specification	1.200	dB	normal(k=2)	0.600
Mismatch Receiver VSWR 1= AMN/LISN VSWR 2=	-0.080	dB	U-shaped	0.060
Combined standard uncertainty Uc(y)				1.2
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				2.4

Uncertainty of Radiated Emission Measurement (30MHz ~ 1,000MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.173	dB	K=1	0.086
Cable loss	±0.174	dB	K=2	0.087
Antenna gain	±0.169	dB	K=2	0.084
Site imperfection	±0.433	dB	Triangular	0.214
Pre-amplifier gain	±0.366	dB	K=2	0.183
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.778
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.555

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.191	dB	K=1	0.095
Cable loss	±0.169	dB	K=2	0.084
Antenna gain	±0.191	dB	K=2	0.096
Site imperfection	±0.582	dB	Triangular	0.291
Pre-amplifier gain	±0.304	dB	K=2	0.152
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.839
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.678

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	±0.186	dB	K=1	0.093
Cable loss	±0.167	dB	K=2	0.083
Antenna gain	±0.190	dB	K=2	0.095
Site imperfection	±0.488	dB	Triangular	0.244
Pre-amplifier gain	±0.269	dB	K=2	0.134
Transmitter antenna	±1.200	dB	Rectangular	0.600
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				1.771
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				3.541

Uncertainty of Conducted Emission Measurement

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Cable loss	±0.038	dB	K=2	0.019
Attenuator	±0.047	dB	K=2	0.024
Power Meter specification	±0.300	dB	Triangular	0.150
Power Sensor specification	±0.300	dB	Rectangular	0.150
Signal generator	±0.461	dB	Rectangular	0.231
Mismatch	±0.080	dB	U-shape	0.040
Spectrum analyzer	±0.500	dB	Rectangular	0.250
Combined standard uncertainty Uc(y)				0.863
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)				1.726