Partial FCC RF Test Report

APPLICANT	:	**Getac Technology Corporation.**
EQUIPMENT	:	**WLAN module**
BRAND NAME	:	**Intel**
MODEL NAME	:	**7260HMW**
FCC ID	:	**QYL7260NGW**
STANDARD	:	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	:	**(NII) Unlicensed National Information Infrastructure**

This is a partial report which is included conducted power and AC conducted emission measurement. The product was received on Sep. 06, 2013 and testing was completed on Oct. 21, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown to be compliant with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

TABLE OF CONTENTS

REVISION HISTORY **3**

SUMMARY OF TEST RESULT **4**

1 GENERAL DESCRIPTION **5**

1.1 Applicant 5
1.2 Manufacturer 5
1.3 Feature of Equipment Under Test 5
1.4 Product Specification of Equipment Under Test 7
1.5 Modification of EUT 8
1.6 Testing Site 9
1.7 Applied Standards 9

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST **10**

2.1 Carrier Frequency and Channel 10
2.2 Pre-Scanned RF Power 11
2.3 Test Mode 16
2.4 Connection Diagram of Test System 17
2.5 Support Unit used in test configuration and system 17

3 TEST RESULT **18**

3.1 AC Conducted Emission Measurement 18
3.2 Antenna Requirements 22

4 LIST OF MEASURING EQUIPMENT **23**

5 UNCERTAINTY OF EVALUATION **24**

APPENDIX A. SETUP PHOTOGRAPHS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR390613-01D	Rev. 01	Initial issue of report	Nov. 12, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 15.70 dB at 6.798 MHz
3.2	15.203 & 15.407(a)	RSS-210 A9.2	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Getac Technology Corporation.
5F., Building A, No. 209, Sec. 1, Nangang Rd., Nangang Dist., Taipei City 11568, Taiwan, R.O.C.

1.2 Manufacturer

Getac Technology (Kunshan) Co., LTD.
No. 269, No. 2 Avenue, Kunshan Comprehensive Free Trade Zone, Jiangsu Province, P.R.C

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	WLAN module
Brand Name	Intel
Model Name	7260HMW
FCC ID	QYL7260NGW
installed into Tablet	Brand Name: Getac Model Name: F110 Marketing Name: F110
Sample 1	EUT installed into SKU B-1
Sample 2	EUT installed into SKU B-2
EUT supports Radios application	WLAN 2.4GHz 802.11a/b/g/n (HT20/HT40) WLAN 5GHz 802.11ac (VHT20/VHT40/VHT80) Bluetooth v3.0 + EDR / v4.0 - LE
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Information of Host		
	SKU B-1	**SKU B-2**
OS	Win8 64 bit	Win8 64 bit
CPU	Haswell sharkbay i5 15W(vPro) 4300U	Haswell sharkbay i5 15W(vPro) 4300U
DDR	8G	8G
SDD	256G	256G
Battery	BP3S1P2160-S	BP3S1P2160-S
GPS	EB-5631RC	EB-5631RC
Panel	AUO HD: B116XW05V006 sunlight readable, 800 Nits maximum brightness	AUO HD: B116XW05V006 sunlight readable, 800 Nits maximum brightness
Default IO	USB3.0 port	USB3.0 port
	HDMI	HDMI
Optional I/O	Smart Card	Smart Card
Customization port	LAN	RS232
WLAN	Wilkins peak 2	Wilkins peak 2
BT	Wilkins peak 2,BT4.0 +EDR	Wilkins peak 2,BT4.0 +EDR
3G/LTE	Gobi5000 EM7355	Gobi5000 EM7355
RF pass thru	YES (3G + WiFi)	YES (3G + WiFi)
Camera	Yes	Yes
Webcam	Yes	Yes

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5580 MHz 5660 MHz ~ 5700 MHz
Maximum Output Power	**<Ant. 1>** **<5180 MHz ~ 5240 MHz>** 802.11a : 15.45 dBm / 0.0351 W 802.11n HT20 : 15.56 dBm / 0.0360 W 802.11n HT40 : 15.45 dBm / 0.0351 W 802.11n VHT20 : 15.34 dBm / 0.0342 W 802.11n VHT40 : 15.42 dBm / 0.0348 W 802.11n VHT80 : 7.90 dBm / 0.0062 W **<5260 MHz ~ 5320 MHz>** 802.11a : 15.41 dBm / 0.0348 W 802.11n HT20 : 15.83 dBm / 0.0383 W 802.11n HT40 : 10.97 dBm / 0.0125 W 802.11n VHT20 : 15.53 dBm / 0.0357 W 802.11n VHT40 : 10.85 dBm / 0.0122 W 802.11n VHT80 : 10.42 dBm / 0.0110 W **<5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz >** 802.11a : 16.18 dBm / 0.0415 W 802.11n HT20 : 16.27 dBm / 0.0424 W 802.11n HT40 : 16.29 dBm / 0.0426 W 802.11n VHT20 : 16.03 dBm / 0.0401 W 802.11n VHT40 : 16.30 dBm / 0.0427 W 802.11n VHT80 : 8.59 dBm / 0.0072 W **<Ant. 2>** **<5180 MHz ~ 5240 MHz>** 802.11a : 15.41 dBm / 0.0348 W 802.11n HT20 : 15.44 dBm / 0.0350 W 802.11n HT40 : 15.11 dBm / 0.0324 W 802.11n VHT20 : 15.50 dBm / 0.0355 W 802.11n VHT40 : 14.69 dBm / 0.0294 W 802.11n VHT80 : 8.04 dBm / 0.0064 W **<5260 MHz ~ 5320 MHz>** 802.11a : 15.58 dBm / 0.0361 W 802.11n HT20 : 15.78 dBm / 0.0378 W 802.11n HT40 : 10.96 dBm / 0.0125 W 802.11n VHT20 : 15.73 dBm / 0.0374 W 802.11n VHT40 : 10.79 dBm / 0.0120 W 802.11n VHT80 : 10.49 dBm / 0.0112 W **<5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz >** 802.11a : 16.36 dBm / 0.0433 W 802.11n HT20 : 16.05 dBm / 0.0403 W 802.11n HT40 : 16.42 dBm / 0.0439 W 802.11n VHT20 : 16.26 dBm / 0.0423 W 802.11n VHT40 : 16.42 dBm / 0.0439 W 802.11n VHT80 : 8.63 dBm / 0.0073 W

<table>
<tr><th colspan="2">Product Specification subjective to this standard</th></tr>
<tr><td>Maximum Output Power</td><td>MIMO <Ant. 1+2>
<5180 MHz ~ 5240 MHz>
802.11n HT20 : 13.27 dBm / 0.0212 W
802.11n HT40 : 12.30dBm / 0.0170 W
802.11n VHT20 : 13.25 dBm / 0.0211 W
802.11n VHT40 : 12.13 dBm / 0.0163 W
802.11n VHT80 : 6.49 dBm / 0.0045 W
<5260 MHz ~ 5320 MHz>
802.11n HT20 : 13.44 dBm / 0.0221 W
802.11n HT40 : 9.23 dBm / 0.0084 W
802.11n VHT20 : 13.40 dBm / 0.0219 W
802.11n VHT40 : 9.03 dBm / 0.0080 W
802.11n VHT80 : 8.85 dBm / 0.0077 W
<5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz >
802.11n HT20 : 16.48 dBm / 0.0445 W
802.11n HT40 : 16.40 dBm / 0.0437 W
802.11n VHT20 : 16.45 dBm / 0.0442 W
802.11n VHT40 : 16.40 dBm / 0.0437 W
802.11n VHT80 : 9.19 dBm / 0.0083 W</td></tr>
<tr><td>Antenna Type</td><td><5180 MHz ~ 5240 MHz>
Ant. 1 : PIFA Antenna with gain 0 dBi
Ant. 2 : PIFA Antenna with gain 3.55 dBi
<5260 MHz ~ 5320 MHz>
Ant. 1 : PIFA Antenna with gain -0.08 dBi
Ant. 2 : PIFA Antenna with gain 3.47 dBi
<5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz >
Ant. 1 : PIFA Antenna with gain 0.43 dBi
Ant. 2 : PIFA Antenna with gain 3.14 dBi</td></tr>
<tr><td>Type of Modulation</td><td>OFDM (BPSK / QPSK / 16QAM / 64QAM)</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><th></th><th>Ant. 1</th><th>Ant. 2</th></tr>
<tr><td>802.11 a</td><td>V</td><td>V</td></tr>
<tr><td>802.11 n SISO</td><td>V</td><td>V</td></tr>
<tr><td>802.11 n MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978	
Test Site No.	Sporton Site No.	
	TH02-HY	CO05-HY

The test site complies with ANSI C63.4 2003 requirement.

1.7 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D01 General UNII Test Procedures v01r03
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.4-2003

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz).

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38	**5190**	**46**	**5230**
	40	5200	48	5240

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2 (U-NII-2)	52	5260	60	5300
	54	**5270**	**62**	**5310**
	56	5280	64	5320

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5470-5600 MHz and 5650-5725 MHz Band 3 (U-NII-2ext)	100	5500	116	5580
	102	**5510**	132	5660
	104	5520	**134**	**5670**
	108	5540	136	5680
	110	**5550**	140	5700
	112	5560		

Note: The above Frequency and Channel in boldface were 802.11n HT40.

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables.

<Ant. 1>

5GHz 802.11a mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.45	15.44	15.43	15.42	15.33	15.42	15.44	15.08
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	15.41	15.36	15.26	15.19	15.14	15.29	15.35	15.28
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.18	16.04	16.02	16.00	16.10	16.11	16.09	16.07

5GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.56	15.53	15.54	15.50	15.55	15.54	15.54	15.52
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	15.83	15.39	15.68	15.66	15.81	15.73	15.77	15.72
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.27	16.21	16.19	16.20	16.17	16.21	16.21	16.21

5GHz 802.11n HT40mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.45	14.93	15.09	15.44	15.39	15.42	15.40	15.41
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	10.97	10.83	10.84	10.85	10.86	10.86	10.86	10.86
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.29	16.14	16.20	16.25	16.23	16.28	16.16	16.04

5GHz 802.1 VHT20 mode									
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.34	15.29	15.30	15.33	15.26	15.21	15.28	15.29	15.31
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	15.53	15.44	15.42	15.40	15.36	15.40	15.35	15.35	15.46
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.03	16.03	16.03	16.01	15.94	16.01	15.92	15.92	15.95

5GHz 802.11n VHT40 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.42	15.39	15.41	15.35	15.37	15.39	15.37	15.41	15.36	15.40
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	10.85	10.84	10.82	10.84	10.83	10.84	10.79	10.73	10.81	10.84
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.30	16.27	16.24	16.27	16.27	16.24	16.27	16.25	16.25	16.29

5GHz 802.11n VHT80 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	7.90	7.88	7.89	7.89	7.77	7.81	7.70	7.81	7.78	7.89
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	10.42	10.37	10.39	10.40	10.30	10.39	10.33	10.26	10.20	10.34
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	8.59	8.57	8.59	8.56	8.49	8.49	8.44	8.55	8.48	8.54

<Ant. 2>

5GHz 802.11a mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.41	15.38	15.31	15.36	15.33	15.36	15.36	15.34
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	15.58	15.36	15.33	15.32	15.36	15.34	15.41	15.28
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.36	16.31	16.30	16.31	16.30	16.30	16.21	16.29

5GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.44	15.39	15.39	15.39	15.43	15.41	15.34	15.40
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	15.78	15.63	15.59	15.52	15.56	15.51	15.54	15.63
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.05	15.96	15.96	16.04	16.01	15.99	16.03	16.03

5GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.11	15.09	15.10	15.08	15.10	15.08	15.05	15.08
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	10.96	10.91	10.95	10.95	10.91	10.94	10.94	10.62
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.42	16.27	16.25	16.25	16.25	16.18	16.28	16.34

5GHz 802.1 VHT20 mode									
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	15.50	15.39	15.31	15.38	15.33	15.47	15.39	15.48	15.43
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	15.73	15.65	15.65	15.60	15.59	15.65	15.64	15.61	15.54
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.26	16.21	16.23	16.22	16.17	16.25	16.25	16.25	16.18

5GHz 802.11n VHT40 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	14.69	14.57	14.65	14.65	14.60	14.64	14.68	14.65	14.68	14.65
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	10.79	10.75	10.75	10.78	10.49	10.76	10.78	10.78	10.68	10.61
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.42	16.15	16.19	16.15	16.10	16.11	16.10	16.14	16.08	16.16

5GHz 802.11n VHT80 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	8.04	7.98	7.86	7.96	8.01	8.02	8.01	8.02	7.94	8.03
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	10.49	10.37	10.40	10.46	10.43	10.45	10.26	10.45	10.45	10.48
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	8.63	8.60	8.55	8.60	8.59	8.63	8.58	8.55	8.56	8.58

MIMO <Ant. 1+2>

5GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS 8	MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS 15
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	13.27	13.25	13.15	12.96	13.20	12.60	12.74	12.70
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	13.44	13.43	13.12	13.41	13.41	13.26	12.99	13.12
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.48	16.46	16.45	16.42	16.47	16.30	16.46	16.47

5GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS 8	MCS 9	MCS 10	MCS 11	MCS 12	MCS 13	MCS 14	MCS 15
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	12.30	12.17	12.20	12.20	12.27	11.84	11.79	12.05
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	9.23	9.01	9.20	8.88	9.06	9.08	9.21	9.15
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.40	16.35	16.03	16.16	16.21	16.34	16.34	16.31

5GHz 802.1 VHT20 mode									
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	13.25	13.24	13.14	13.04	12.99	12.90	13.02	13.08	13.22
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	13.40	13.35	13.05	13.34	13.32	13.37	13.10	13.14	12.84
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.45	16.38	16.39	16.38	15.55	16.31	15.81	15.86	15.97

5GHz 802.11n VHT40 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	12.13	11.94	11.96	12.11	12.10	11.85	12.04	12.12	12.10	12.10
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	9.03	8.97	9.00	8.98	9.00	9.02	9.02	9.02	8.94	8.93
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	16.40	16.39	16.14	15.71	15.90	15.98	15.99	16.15	16.28	16.23

5GHz 802.11n VHT80 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm) <5180 MHz ~ 5240MHz>	6.49	6.48	6.47	6.41	6.42	6.45	6.42	6.43	6.46	6.43
Avg. Power(dBm) <5260 MHz ~ 5320MHz>	8.85	8.71	8.80	8.65	8.82	8.82	8.84	8.83	8.75	8.73
Avg. Power(dBm) <5500 MHz ~ 5580MHz>& <5660 MHz ~ 5700MHz>	9.19	9.05	9.14	9.18	9.17	9.06	8.98	8.96	9.18	9.11

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

2.3 Test Mode

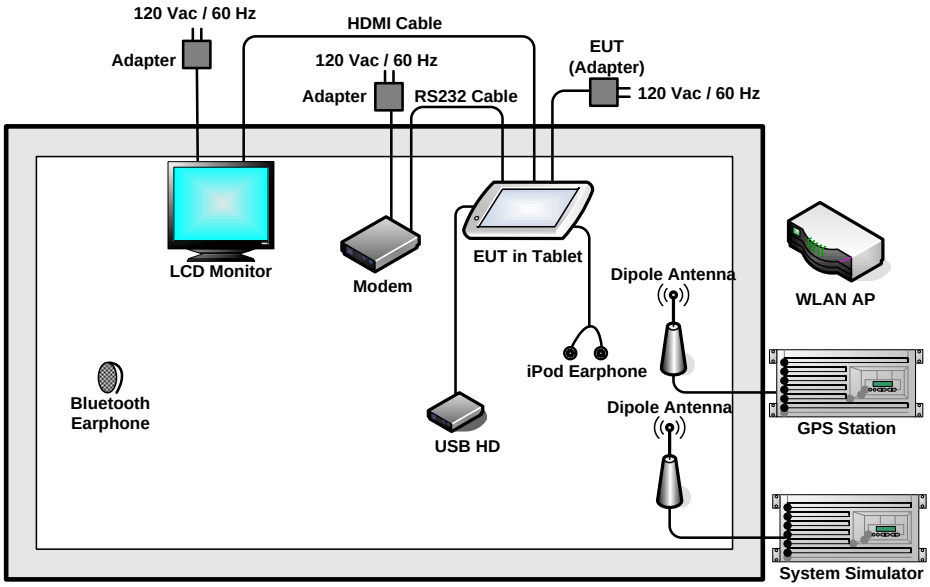
Final results of test modes, data rates and test channels are shown as following table.

Test Cases	
AC Conducted Emission	Mode 1 : WWAN Idle + WLAN (5 GHz) Idle + RS232 (Load with Modem) + Adapter 2 + TF + TC for Sample 2

Remark:

1. TF stands for Test Function, and consists of GPS Rx, Camera, MPEG4, H-Pattern, and Bluetooth Idle.
2. TC stands for Test Configuration, and consists of LCD Monitor, Earphone, and USB HD.

2.4 Connection Diagram of Test System



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
3.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
4.	WLAN AP	D-Link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
5.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
6.	Modem	ACEEX	DM1414	IFAXDM1414	Shielded, 1.5 m	Unshielded, 1.8 m
7.	USB HD	WD	WDBAAR3200 ABK-PESN	FCC DoC	Unshielded, 0.5 m	N/A
8.	iPod Earphone	Apple	N/A	N/A	Unshielded, 1.0 m	N/A

3 Test Result

3.1 AC Conducted Emission Measurement

3.1.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

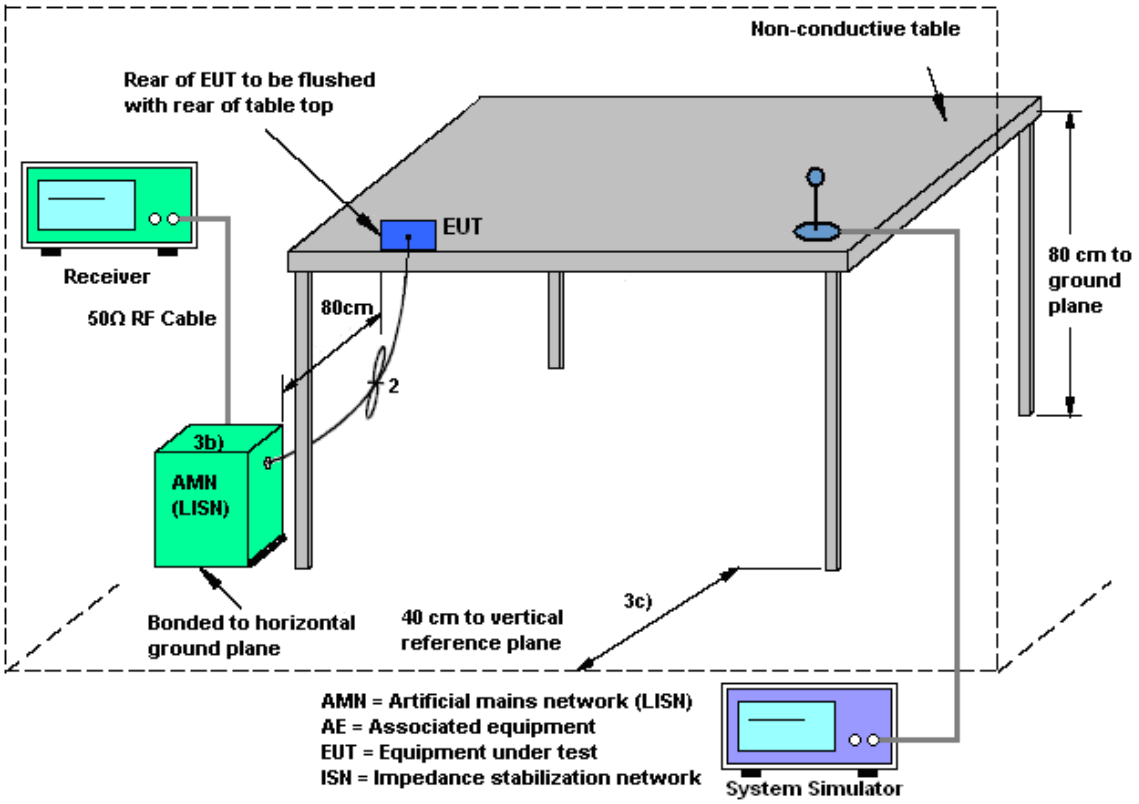
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

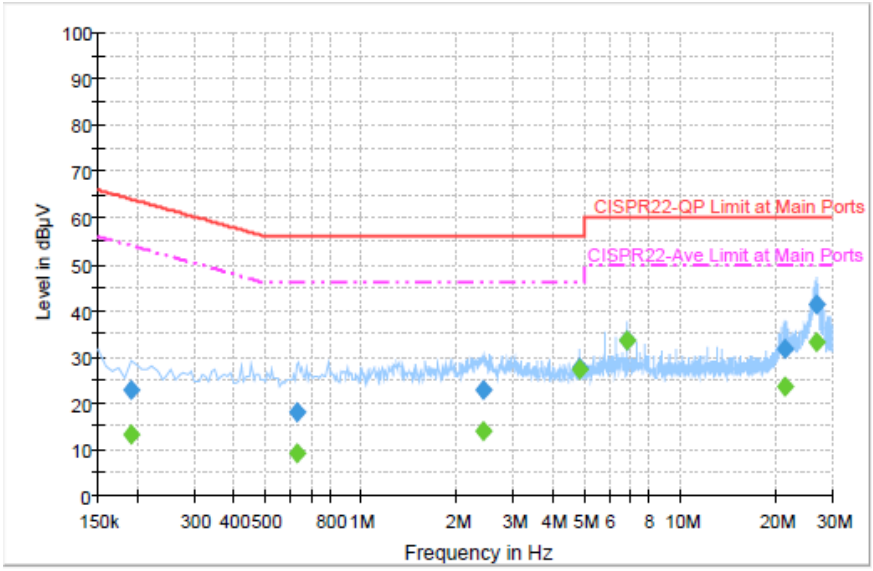
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WWAN Idle + WLAN (5 GHz) Idle + RS232 (Load with Modem) + Adapter 2 + TF + TC for Sample 2		



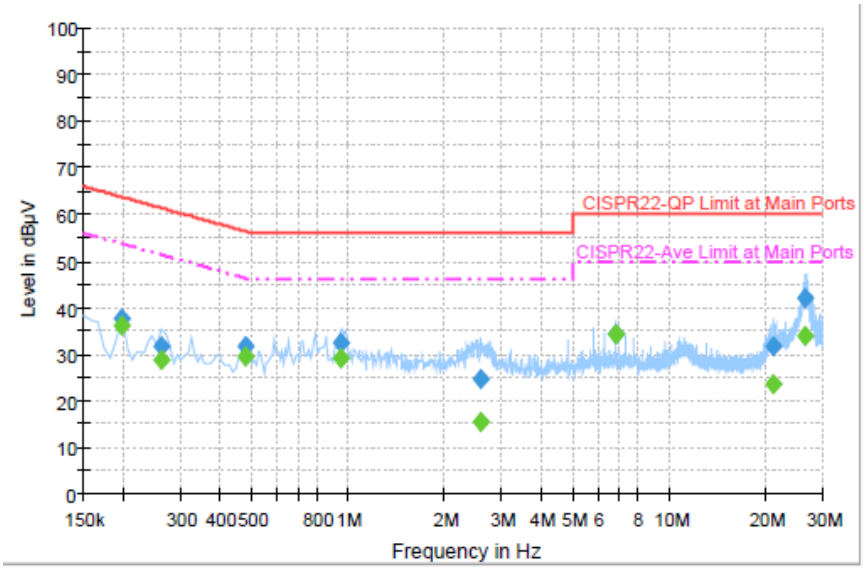
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	22.7	Off	L1	19.4	41.3	64.0
0.630000	18.2	Off	L1	19.4	37.8	56.0
2.406000	22.8	Off	L1	19.6	33.2	56.0
4.854000	27.6	Off	L1	19.6	28.4	56.0
6.798000	33.7	Off	L1	19.7	26.3	60.0
21.382000	31.6	Off	L1	20.0	28.4	60.0
26.782000	41.4	Off	L1	19.9	18.6	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	13.2	Off	L1	19.4	40.8	54.0
0.630000	9.3	Off	L1	19.4	36.7	46.0
2.406000	14.0	Off	L1	19.6	32.0	46.0
4.854000	27.4	Off	L1	19.6	18.6	46.0
6.798000	33.5	Off	L1	19.7	16.5	50.0
21.382000	23.4	Off	L1	20.0	26.6	50.0
26.782000	33.1	Off	L1	19.9	16.9	50.0

Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WWAN Idle + WLAN (5 GHz) Idle + RS232 (Load with Modem) + Adapter 2 + TF + TC for Sample 2		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	37.7	Off	N	19.3	26.0	63.7
0.262000	31.8	Off	N	19.4	29.6	61.4
0.478000	31.9	Off	N	19.4	24.5	56.4
0.950000	32.4	Off	N	19.4	23.6	56.0
2.590000	24.6	Off	N	19.6	31.4	56.0
6.798000	34.3	Off	N	19.7	25.7	60.0
21.126000	31.8	Off	N	20.0	28.2	60.0
26.518000	42.1	Off	N	20.1	17.9	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.198000	36.1	Off	N	19.3	17.6	53.7
0.262000	28.9	Off	N	19.4	22.5	51.4
0.478000	29.5	Off	N	19.4	16.9	46.4
0.950000	29.1	Off	N	19.4	16.9	46.0
2.590000	15.5	Off	N	19.6	30.5	46.0
6.798000	34.3	Off	N	19.7	15.7	50.0
21.126000	23.6	Off	N	20.0	26.4	50.0
26.518000	33.8	Off	N	20.1	16.2	50.0

3.2 Antenna Requirements

3.2.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.2.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(N_{ANT}/N_{SS}=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

The EUT supports CDD mode.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

	Ant 1 (dBi)	Ant 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band I	0.00	3.55	2.13	5.14	0.00	0.00
Band II	-0.08	3.47	2.05	5.06	0.00	0.00
Band III	0.43	3.14	1.99	5.00	0.00	0.00

Power limit reduction = Composite gain – 6dBi, (min = 0)

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Aug. 17, 2013	Oct. 30, 2013	Aug. 16, 2014	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 17, 2013	Oct. 30, 2013	Aug. 16, 2014	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 13, 2012	Oct. 21, 2013	Nov. 12, 2013	Conduction (CO05-HY)
Two-LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2012	Oct. 21, 2013	Dec. 11, 2013	Conduction (CO05-HY)
Two-LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 06, 2012	Oct. 21, 2013	Dec. 05, 2013	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	Oct. 21, 2013	N/A	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.26**