

FCC RF Test Report

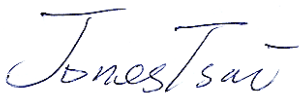
APPLICANT : Realtek Semiconductor Corp.
EQUIPMENT : 802.11b/g/n RTL8192EE Combo module
BRAND NAME : Realtek
MODEL NAME : RTL8192EEBT
FCC ID : TX2RTL8192EEBT
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : (DTS) Digital Transmission System

This is a partial report which is included the conducted power, radiated band edges, and spurious emission measurement test items. The product was received on Feb. 26, 2014 and testing was completed on Mar. 07, 2014. 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



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR421460-01C	Rev. 01	Initial issue of report	Apr. 24, 2014



SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(d)	RSS-210 A8.5	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 1.09 dB at 2390.000 MHz
3.2	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Realtek Semiconductor Corp.

No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300 Taiwan (R.O.C.)

1.2 Manufacturer

Realtek Semiconductor Corp.

No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300 Taiwan (R.O.C.)

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	802.11b/g/n RTL8192EE Combo module
Brand Name	Realtek
Model Name	RTL8192EEBT
FCC ID	TX2RTL8192EEBT
Installed into the host 1	Equipment Name: Notebook Band Name: lenovo Model Name: TP00066A Host with Antenna 1
Installed into the host 2	Equipment Name: Notebook Band Name: lenovo Model Name: TP00066A Host with Antenna 2
EUT supports Radios application	WLAN 11b/g/n HT20/HT40 Bluetooth v 4.0 EDR/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.

Antenna Information for Host			
Antenna 1 (WNC)	Manufacturer	WNC	
	P/N	Main:DQ6G15G8100	Aux:DQ6G15G8000
	Antenna Type	Main:PIFA Antenna	Aux:PIFA Antenna
	Peak gain	Main Antenna : WLAN: 0.12 dBi	Aux Antenna : Bluetooth: -2.16dBi WLAN: -2.16 dBi
Antenna 2 (Tongda)	Manufacturer	Tongda	
	P/N	Main:DQ690210201	Aux:DQ690210200
	Antenna Type	Main:PIFA Antenna	Aux:PIFA Antenna
	Peak gain	Main Antenna : WLAN: 0.79dBi	Aux Antenna : Bluetooth: -1.57dBi WLAN: -1.57dBi

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard																				
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz																			
Maximum (Average) Output Power to antenna	<p><Ant. 1> 802.11b : 18.48 dBm (0.0705 W)</p> <p><Ant. 2> 802.11b : 18.47 dBm (0.0703 W)</p> <p>SISO <Ant. 1> 802.11g : 18.47 dBm (0.0703 W) 802.11n HT20 : 18.45 dBm (0.0700 W) 802.11n HT40 : 17.48 dBm (0.0560 W)</p> <p>SISO <Ant. 2> 802.11g : 18.45 dBm (0.0700 W) 802.11n HT20 : 18.44 dBm (0.0698 W) 802.11n HT40 : 17.42 dBm (0.0552 W)</p> <p>MIMO <Ant. 1+2> 802.11g : 21.29 dBm (0.1346 W) 802.11n HT20 : 21.36 dBm (0.1368 W) 802.11n HT40 : 19.14 dBm (0.0820 W)</p>																			
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)																			
Antenna Function for Transmitter	<table border="1"> <thead> <tr> <th></th><th>Ant. 1</th><th>Ant. 2</th></tr> </thead> <tbody> <tr> <td>802.11 b</td><td>V</td><td>V</td></tr> <tr> <td>802.11 g SISO</td><td>V</td><td>V</td></tr> <tr> <td>802.11 g MIMO</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> </tbody> </table>			Ant. 1	Ant. 2	802.11 b	V	V	802.11 g SISO	V	V	802.11 g MIMO	V	V	802.11 n SISO	V	V	802.11 n MIMO	V	V
	Ant. 1	Ant. 2																		
802.11 b	V	V																		
802.11 g SISO	V	V																		
802.11 g MIMO	V	V																		
802.11 n SISO	V	V																		
802.11 n MIMO	V	V																		

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 1 st 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.		FCC/IC Registration No.
	TH02-HY	03CH06-HY	722060/4086B-1

Note: 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 C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.4-2003

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

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: radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

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)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

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 shown in the following tables.

<Ant. 1>

2.4GHz 802.11b RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	17.49	18.48	17.44

<Ant. 2>

2.4GHz 802.11b RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	17.40	18.47	17.35

SISO <Ant. 1>

2.4GHz 802.11g RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	15.44	18.47	15.08

2.4GHz 802.11n HT20 RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	15.46	18.45	15.19

2.4GHz 802.11n HT40 RF Output Power (dBm)			
Channel	Ch03	CH06	CH09
Frequency (MHz)	2422	2437	2452
Duty Cycle (%)	100.00	100.00	100.00
Average Power	14.17	17.48	14.66

SISO <Ant. 2>

2.4GHz 802.11g RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	15.35	18.45	14.99

2.4GHz 802.11n HT20 RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	15.45	18.44	15.13

2.4GHz 802.11n HT40 RF Output Power (dBm)			
Channel	Ch03	CH06	CH09
Frequency (MHz)	2422	2437	2452
Duty Cycle (%)	100.00	100.00	100.00
Average Power	14.11	17.42	14.60

MIMO <Ant. 1+2>

2.4GHz 802.11g RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	16.76	21.29	18.40

2.4GHz 802.11n HT20 RF Output Power (dBm)			
Channel	Ch01	Ch06	Ch11
Frequency (MHz)	2412	2437	2462
Duty Cycle (%)	100.00	100.00	100.00
Average Power	16.96	21.36	18.44

2.4GHz 802.11n HT40 RF Output Power (dBm)			
Channel	Ch03	CH06	CH09
Frequency (MHz)	2422	2437	2452
Duty Cycle (%)	100.00	100.00	100.00
Average Power	15.85	19.14	15.94

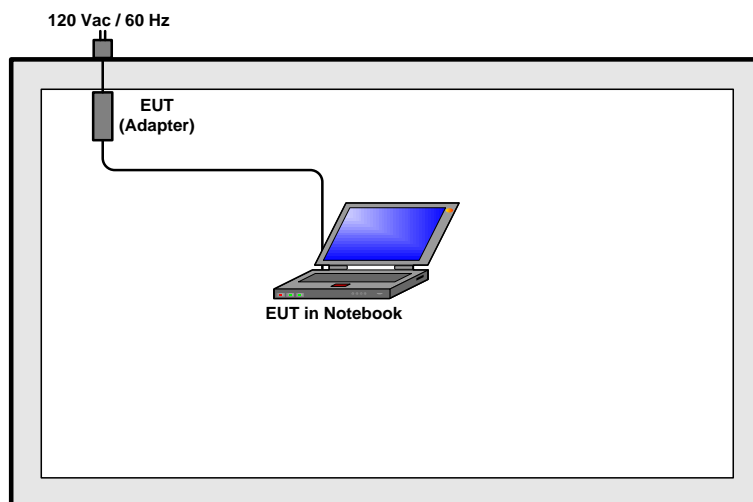
Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

2.3 Test Mode

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

Test Cases					
Radiated TCs	Test Items	Mode	Data Rate	Test Channel	Remark
	Radiated Band Edge	802.11b	1 Mbps	1/11	<Ant. 1>
		802.11g	6 Mbps	1/11	SISO <Ant. 1> & MIMO <Ant. 1+2>
		802.11n HT20	MCS0 & MCS8	1/11	SISO <Ant. 1> & MIMO <Ant. 1+2>
		802.11n HT40	MCS0 & MCS8	3/9	SISO <Ant. 1> & MIMO <Ant. 1+2>
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11	<Ant. 1>
		802.11g	6 Mbps	1/6/11	SISO <Ant. 1> & MIMO <Ant. 1+2>
		802.11n HT20	MCS0 & MCS8	1/6/11	SISO <Ant. 1> & MIMO <Ant. 1+2>
		802.11n HT40	MCS0 & MCS8	3/6/9	SISO <Ant. 1> & MIMO <Ant. 1+2>
Remark: All the radiated test cases were performed with host 2, adapter 1, and battery 1.					

2.4 Connection Diagram of Test System





2.5 EUT Operation Test Setup

The programmed RF utility “MP tool” is installed in notebook to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. 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.

3 Test Result

3.1 Radiated Band Edges and Spurious Emission Measurement

3.1.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/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

3.1.2 Measuring Instruments

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



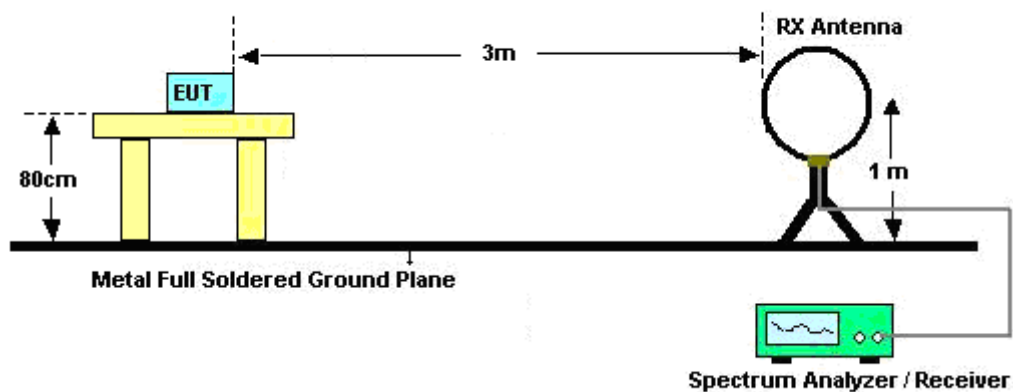
3.1.3 Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r01.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamplifier Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; $VBW \geq RBW$; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f \geq 1$ GHz for peak measurement.
For average measurement:
 - $VBW = 10$ Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

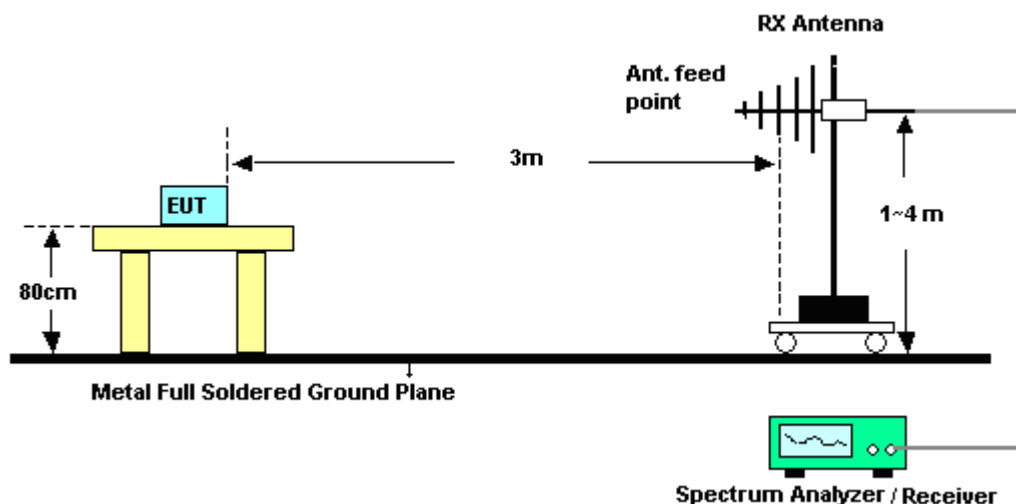
Antenna	Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting
1	802.11b	100.00	-	-	10Hz
2	802.11b	100.00	-	-	
1	802.11g for Ant. 1	100.00	-	-	
2	802.11g for Ant. 2	100.00	-	-	
1+2	802.11g for Ant. 1	100.00	-	-	
1+2	802.11g for Ant. 2	100.00	-	-	
1	2.4GHz 802.11n HT20 for Ant. 1	100.00	-	-	
2	2.4GHz 802.11n HT20 for Ant. 2	100.00	-	-	
1+2	2.4GHz 802.11n HT20 for Ant. 1	100.00	-	-	
1+2	2.4GHz 802.11n HT20 for Ant. 2	100.00	-	-	
1	2.4GHz 802.11n HT40 for Ant. 1	100.00	-	-	
2	2.4GHz 802.11n HT40 for Ant. 2	100.00	-	-	
1+2	2.4GHz 802.11n HT40 for Ant. 1	100.00	-	-	
1+2	2.4GHz 802.11n HT40 for Ant. 2	100.00	-	-	

3.1.4 Test Setup

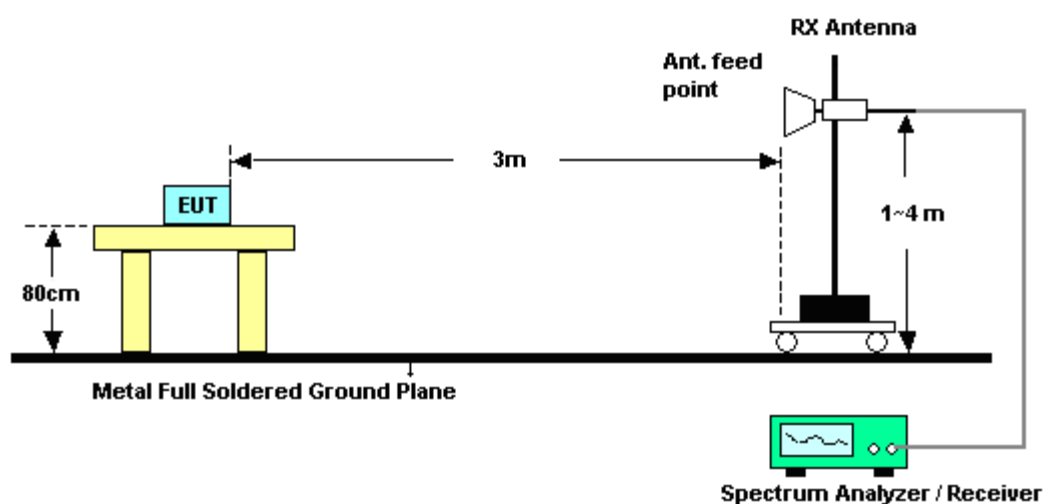
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 Test Results of Radiated Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.1.6 Test Result of Radiated Spurious at Band Edges

<Ant. 1>

Test Mode :	802.11b	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	55.58	-18.42	74	51.54	31.92	6.45	34.33	194	166	Peak
2385.24	42.93	-11.07	54	38.91	31.9	6.45	34.33	194	166	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2385.96	54.29	-19.71	74	50.25	31.92	6.45	34.33	200	84	Peak
2385.24	42.26	-11.74	54	38.24	31.9	6.45	34.33	200	84	Average

Test Mode :	802.11b	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2487.97	54.41	-19.59	74	50.12	32	6.59	34.3	189	169	Peak
2487.22	41.54	-12.46	54	37.26	31.99	6.59	34.3	189	169	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.12	52.28	-21.72	74	48	31.99	6.59	34.3	195	80	Peak
2487.19	39.39	-14.61	54	35.11	31.99	6.59	34.3	195	80	Average



SISO <Ant. 1>

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.47	68.39	-5.61	74	64.35	31.92	6.45	34.33	195	169	Peak
2390	52.64	-1.36	54	48.6	31.92	6.45	34.33	195	169	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2388.39	65.94	-8.06	74	61.9	31.92	6.45	34.33	200	83	Peak
2390	49.91	-4.09	54	45.87	31.92	6.45	34.33	200	83	Average

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.91	68.86	-5.14	74	64.58	31.99	6.59	34.3	190	168	Peak
2483.5	50.99	-3.01	54	46.71	31.99	6.59	34.3	190	168	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.76	67.58	-6.42	74	63.3	31.99	6.59	34.3	196	123	Peak
2483.5	49.43	-4.57	54	45.15	31.99	6.59	34.3	196	123	Average



Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.92	71.52	-2.48	74	67.48	31.92	6.45	34.33	196	168	Peak
2390	52.66	-1.34	54	48.62	31.92	6.45	34.33	196	168	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	66.09	-7.91	74	62.05	31.92	6.45	34.33	200	85	Peak
2390	49.44	-4.56	54	45.4	31.92	6.45	34.33	200	85	Average

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2486.02	69.65	-4.35	74	65.37	31.99	6.59	34.3	161	136	Peak
2483.5	51.14	-2.86	54	46.86	31.99	6.59	34.3	161	136	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.63	68.32	-5.68	74	64.04	31.99	6.59	34.3	161	76	Peak
2483.5	48.59	-5.41	54	44.31	31.99	6.59	34.3	161	76	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	03	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.05	67.5	-6.5	74	63.46	31.92	6.45	34.33	194	165	Peak
2390	52.79	-1.21	54	48.75	31.92	6.45	34.33	194	165	Average
2484.67	54.53	-19.47	74	50.25	31.99	6.59	34.3	194	165	Peak
2483.8	41.13	-12.87	54	36.85	31.99	6.59	34.3	194	165	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2386.41	64.03	-9.97	74	59.99	31.92	6.45	34.33	200	78	Peak
2390	50.18	-3.82	54	46.14	31.92	6.45	34.33	200	78	Average
2484.4	51.35	-22.65	74	47.07	31.99	6.59	34.3	200	78	Peak
2483.65	38.78	-15.22	54	34.5	31.99	6.59	34.3	200	78	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	09	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	56.02	-17.98	74	51.98	31.92	6.45	34.33	134	139	Peak
2389.65	42.23	-11.77	54	38.19	31.92	6.45	34.33	134	139	Average
2488.12	68.25	-5.75	74	63.96	32	6.59	34.3	134	139	Peak
2484.28	52.82	-1.18	54	48.54	31.99	6.59	34.3	134	139	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.65	53.92	-20.08	74	49.88	31.92	6.45	34.33	195	54	Peak
2389.47	40.27	-13.73	54	36.23	31.92	6.45	34.33	195	54	Average
2488.15	62.27	-11.73	74	57.98	32	6.59	34.3	195	54	Peak
2483.53	47.74	-6.26	54	43.46	31.99	6.59	34.3	195	54	Average



MIMO <Ant. 1+2>

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.38	72.13	-1.87	74	68.09	31.92	6.45	34.33	167	15	Peak
2389.92	52.9	-1.1	54	48.86	31.92	6.45	34.33	167	15	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2384.79	63.66	-10.34	74	59.64	31.9	6.45	34.33	200	86	Peak
2390	46.34	-7.66	54	42.3	31.92	6.45	34.33	200	86	Average

Test Mode :	802.11g	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.62	69.91	-4.09	74	65.63	31.99	6.59	34.3	135	8	Peak
2483.5	52.29	-1.71	54	48.01	31.99	6.59	34.3	135	8	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.77	64.95	-9.05	74	60.67	31.99	6.59	34.3	190	115	Peak
2484.43	46.72	-7.28	54	42.44	31.99	6.59	34.3	190	115	Average



Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	01	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	67.49	-6.51	74	63.45	31.92	6.45	34.33	166	14	Peak
2390	52.57	-1.43	54	48.53	31.92	6.45	34.33	166	14	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2390	63.14	-10.86	74	59.1	31.92	6.45	34.33	200	99	Peak
2390	49.22	-4.78	54	45.18	31.92	6.45	34.33	200	99	Average

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	11	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.56	67.87	-6.13	74	63.59	31.99	6.59	34.3	192	17	Peak
2483.5	52.39	-1.61	54	48.11	31.99	6.59	34.3	192	17	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2484.16	64.17	-9.83	74	59.89	31.99	6.59	34.3	195	87	Peak
2483.5	48.54	-5.46	54	44.26	31.99	6.59	34.3	195	87	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	Low	Relative Humidity :	47~49%
Test Channel :	03	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2382.45	66.29	-7.71	74	62.27	31.9	6.45	34.33	193	16	Peak
2390	52.91	-1.09	54	48.87	31.92	6.45	34.33	193	16	Average
2484.67	58.73	-15.27	74	54.45	31.99	6.59	34.3	193	16	Peak
2484.55	43.04	-10.96	54	38.76	31.99	6.59	34.3	193	16	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2389.83	65.04	-8.96	74	61	31.92	6.45	34.33	198	94	Peak
2390	51.55	-2.45	54	47.51	31.92	6.45	34.33	198	94	Average
2485.36	53.37	-20.63	74	49.09	31.99	6.59	34.3	198	94	Peak
2484.37	39.31	-14.69	54	35.03	31.99	6.59	34.3	198	94	Average



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Band :	High	Relative Humidity :	47~49%
Test Channel :	09	Test Engineer :	Marlboro Hsu

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2383.71	55.21	-18.79	74	51.19	31.9	6.45	34.33	192	20	Peak
2389.47	41.62	-12.38	54	37.58	31.92	6.45	34.33	192	20	Average
2483.95	66.58	-7.42	74	62.3	31.99	6.59	34.3	192	20	Peak
2483.71	52.73	-1.27	54	48.45	31.99	6.59	34.3	192	20	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2385.51	53.46	-20.54	74	49.42	31.92	6.45	34.33	194	87	Peak
2389.56	40.94	-13.06	54	36.9	31.92	6.45	34.33	194	87	Average
2485.09	64.13	-9.87	74	59.85	31.99	6.59	34.3	194	87	Peak
2483.68	49.92	-4.08	54	45.64	31.99	6.59	34.3	194	87	Average

3.1.7 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Note: Pre-scanned all test modes and only choose the worst case mode recorded in the test report for radiated spurious emission below 1GHz.

<Ant. 1>

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
246.27	30.82	-15.18	46	48.8	12.04	1.72	31.74	-	-	Peak
254.64	32.96	-13.04	46	49.78	13.15	1.76	31.73	-	-	Peak
264.36	31.74	-14.26	46	48.22	13.45	1.8	31.73	-	-	Peak
419	37.37	-8.63	46	50.22	16.75	2.24	31.84	-	-	Peak
441.4	37.58	-8.42	46	50.35	16.81	2.29	31.87	-	-	Peak
517	37.84	-8.16	46	49.31	17.97	2.51	31.95	100	124	Peak
2412	104.67	-	-	100.58	31.93	6.49	34.33	194	166	Average
2412	109.24	-	-	105.15	31.93	6.49	34.33	194	166	Peak
4824	48.13	-25.87	74	59.15	34.4	10.17	55.59	100	0	Peak



Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
257.88	33.87	-12.13	46	50.22	13.6	1.78	31.73	-	-	Peak
264.36	35.64	-10.36	46	52.12	13.45	1.8	31.73	100	165	Peak
268.95	34.06	-11.94	46	50.89	13.09	1.81	31.73	-	-	Peak
469.4	35.5	-10.5	46	47.7	17.38	2.32	31.9	-	-	Peak
499.5	34.5	-11.5	46	46.16	17.79	2.48	31.93	-	-	Peak
550.6	33.79	-12.21	46	43.77	19.48	2.54	32	-	-	Peak
2412	102.17	-	-	98.08	31.93	6.49	34.33	200	84	Average
2412	106.92	-	-	102.83	31.93	6.49	34.33	200	84	Peak
4824	48.34	-25.66	74	59.36	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	104.28	-	-	100.14	31.94	6.52	34.32	194	171	Average
2436	109.05	-	-	104.91	31.94	6.52	34.32	194	171	Peak
4875	48.19	-25.81	74	59.32	34.37	10.18	55.68	100	0	Peak
7311	50.06	-23.94	74	59.79	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	102.74	-	-	98.6	31.94	6.52	34.32	200	73	Average
2436	107.52	-	-	103.38	31.94	6.52	34.32	200	73	Peak
4875	48.17	-25.83	74	59.3	34.37	10.18	55.68	100	0	Peak
7311	49.15	-24.85	74	58.88	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2463 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2463	103.74	-	-	99.52	31.97	6.56	34.31	189	169	Average
2463	108.5	-	-	104.28	31.97	6.56	34.31	189	169	Peak
4923	47.46	-26.54	74	58.7	34.34	10.2	55.78	100	0	Peak
7386	50.49	-23.51	74	60.12	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11b	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2463 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2463	101.7	-	-	97.48	31.97	6.56	34.31	195	80	Average
2463	106.41	-	-	102.19	31.97	6.56	34.31	195	80	Peak
4923	47.14	-26.86	74	58.38	34.34	10.2	55.78	100	0	Peak
7386	48.71	-25.29	74	58.34	35.56	10.92	56.11	100	0	Peak

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Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2411 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
245.46	30.97	-15.03	46	49.05	11.95	1.71	31.74	-	-	Peak
254.64	33.82	-12.18	46	50.64	13.15	1.76	31.73	-	-	Peak
260.85	34.02	-11.98	46	50.15	13.81	1.79	31.73	-	-	Peak
424.6	38.37	-7.63	46	51.17	16.8	2.25	31.85	100	149	Peak
450.5	38.05	-7.95	46	50.69	16.93	2.31	31.88	-	-	Peak
471.5	34.91	-11.09	46	47.08	17.42	2.31	31.9	-	-	Peak
2411	100.73	-	-	96.64	31.93	6.49	34.33	195	169	Average
2411	111.51	-	-	107.42	31.93	6.49	34.33	195	169	Peak
4824	47.28	-26.72	74	58.3	34.4	10.17	55.59	100	0	Peak



Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2411 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
205.5	25.73	-17.77	43.5	46.77	9.15	1.56	31.75	-	-	Peak
249.24	27.5	-18.5	46	45.2	12.31	1.73	31.74	-	-	Peak
265.44	27.67	-18.33	46	44.24	13.36	1.8	31.73	-	-	Peak
468	35.63	-10.37	46	47.84	17.36	2.32	31.89	-	-	Peak
499.5	36.75	-9.25	46	48.41	17.79	2.48	31.93	102	207	Peak
601	34.24	-11.76	46	44.12	19.41	2.77	32.06	-	-	Peak
2411	98.15	-	-	94.06	31.93	6.49	34.33	200	83	Average
2411	109.18	-	-	105.09	31.93	6.49	34.33	200	83	Peak
4824	47.36	-26.64	74	58.38	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	101.07	-	-	96.93	31.94	6.52	34.32	162	145	Average
2436	111.41	-	-	107.27	31.94	6.52	34.32	162	145	Peak
4875	48.33	-25.67	74	59.46	34.37	10.18	55.68	100	0	Peak
7311	49.09	-24.91	74	58.82	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	98.27	-	-	94.13	31.94	6.52	34.32	200	81	Average
2436	109.02	-	-	104.88	31.94	6.52	34.32	200	81	Peak
4875	47.01	-26.99	74	58.14	34.37	10.18	55.68	100	0	Peak
7311	49.19	-24.81	74	58.92	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2463 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2463	100.94	-	-	96.72	31.97	6.56	34.31	190	168	Average
2463	111.92	-	-	107.7	31.97	6.56	34.31	190	168	Peak
4923	47.69	-26.31	74	58.93	34.34	10.2	55.78	100	0	Peak
7386	48.56	-25.44	74	58.19	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	99.05	-	-	94.83	31.97	6.56	34.31	196	123	Average
2461	109.91	-	-	105.69	31.97	6.56	34.31	196	123	Peak
4923	47.56	-26.44	74	58.8	34.34	10.2	55.78	100	0	Peak
7386	48.55	-25.45	74	58.18	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2411 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
253.56	33.23	-12.77	46	50.36	12.85	1.75	31.73	-	-	Peak
265.44	33.54	-12.46	46	50.11	13.36	1.8	31.73	-	-	Peak
271.65	32.33	-13.67	46	49.28	12.96	1.82	31.73	-	-	Peak
426	38.62	-7.38	46	51.42	16.8	2.25	31.85	100	132	Peak
454	36.77	-9.23	46	49.31	17.02	2.32	31.88	-	-	Peak
461	36.03	-9.97	46	48.37	17.22	2.33	31.89	-	-	Peak
2411	100.06	-	-	95.97	31.93	6.49	34.33	196	168	Average
2411	111.05	-	-	106.96	31.93	6.49	34.33	196	168	Peak
4824	47.82	-26.18	74	58.84	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2411 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
199.56	25.19	-18.31	43.5	46.2	9.2	1.54	31.75	-	-	Peak
255.45	27.84	-18.16	46	44.66	13.15	1.76	31.73	-	-	Peak
267.06	27.72	-18.28	46	44.38	13.27	1.8	31.73	-	-	Peak
426	34.44	-11.56	46	47.24	16.8	2.25	31.85	-	-	Peak
471.5	35.03	-10.97	46	47.2	17.42	2.31	31.9	100	258	Peak
511.4	33.33	-12.67	46	44.86	17.91	2.5	31.94	-	-	Peak
2411	97.6	-	-	93.51	31.93	6.49	34.33	200	85	Average
2411	108.29	-	-	104.2	31.93	6.49	34.33	200	85	Peak
4824	47.7	-26.3	74	58.72	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	100.19	-	-	96.05	31.94	6.52	34.32	191	168	Average
2436	111.7	-	-	107.56	31.94	6.52	34.32	191	168	Peak
4875	49.97	-24.03	74	61.1	34.37	10.18	55.68	100	0	Peak
7311	49.3	-24.7	74	59.03	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	99.09	-	-	94.95	31.94	6.52	34.32	200	112	Average
2436	110	-	-	105.86	31.94	6.52	34.32	200	112	Peak
4875	46.87	-27.13	74	58	34.37	10.18	55.68	100	0	Peak
7311	48.88	-25.12	74	58.61	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	100.53	-	-	96.31	31.97	6.56	34.31	161	136	Average
2461	111.48	-	-	107.26	31.97	6.56	34.31	161	136	Peak
4923	48.22	-25.78	74	59.46	34.34	10.2	55.78	100	0	Peak
7386	49.19	-24.81	74	58.82	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	98.37	-	-	94.15	31.97	6.56	34.31	161	76	Average
2461	109.82	-	-	105.6	31.97	6.56	34.31	161	76	Peak
4923	48.67	-25.33	74	59.91	34.34	10.2	55.78	100	0	Peak
7386	49.13	-24.87	74	58.76	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2424 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2424	97.18	-	-	93.07	31.94	6.49	34.32	194	165	Average
2424	108.02	-	-	103.91	31.94	6.49	34.32	194	165	Peak
4845	48.55	-25.45	74	59.61	34.39	10.17	55.62	100	0	Peak
7266	48.6	-25.4	74	58.37	35.63	10.95	56.35	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	95.01	-	-	90.87	31.94	6.52	34.32	200	78	Average
2436	106.06	-	-	101.92	31.94	6.52	34.32	200	78	Peak
4845	47.64	-26.36	74	58.7	34.39	10.17	55.62	100	0	Peak
7266	49.17	-24.83	74	58.94	35.63	10.95	56.35	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	99.13	-	-	94.99	31.94	6.52	34.32	139	140	Average
2436	109.93	-	-	105.79	31.94	6.52	34.32	139	140	Peak
4875	48.22	-25.78	74	59.35	34.37	10.18	55.68	100	0	Peak
7311	48.74	-25.26	74	58.47	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	96.88	-	-	92.74	31.94	6.52	34.32	200	76	Average
2436	107.63	-	-	103.49	31.94	6.52	34.32	200	76	Peak
4875	48.58	-25.42	74	59.71	34.37	10.18	55.68	100	0	Peak
7311	48.73	-25.27	74	58.46	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	09	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2454 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
254.1	33.05	-12.95	46	50.03	13	1.75	31.73	-	-	Peak
261.66	33.83	-12.17	46	50.05	13.72	1.79	31.73	-	-	Peak
270.3	33.33	-12.67	46	50.27	12.98	1.81	31.73	-	-	Peak
427.4	38.01	-7.99	46	50.8	16.8	2.26	31.85	101	217	Peak
447	37.91	-8.09	46	50.61	16.87	2.3	31.87	-	-	Peak
462.4	37.15	-8.85	46	49.46	17.25	2.33	31.89	-	-	Peak
2454	97.16	-	-	92.94	31.97	6.56	34.31	134	139	Average
2454	107.87	-	-	103.65	31.97	6.56	34.31	134	139	Peak
4905	47.6	-26.4	74	58.79	34.35	10.2	55.74	100	0	Peak
7356	48.09	-25.91	74	57.77	35.58	10.92	56.18	100	0	Peak



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	09	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2452 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
199.56	24.33	-19.17	43.5	45.34	9.2	1.54	31.75	-	-	Peak
248.16	27.82	-18.18	46	45.62	12.22	1.72	31.74	-	-	Peak
263.55	27.03	-18.97	46	43.42	13.54	1.8	31.73	-	-	Peak
466.6	36.45	-9.55	46	48.69	17.33	2.32	31.89	101	138	Peak
499.5	34.29	-11.71	46	45.95	17.79	2.48	31.93	-	-	Peak
550.6	34.14	-11.86	46	44.12	19.48	2.54	32	-	-	Peak
2452	94.02	-	-	89.85	31.96	6.52	34.31	195	54	Average
2452	104.78	-	-	100.61	31.96	6.52	34.31	195	54	Peak
4905	47.02	-26.98	74	58.21	34.35	10.2	55.74	100	0	Peak
7356	48.7	-25.3	74	58.38	35.58	10.92	56.18	100	0	Peak

MIMO <Ant. 1+2>

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2411 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
42.96	21.73	-18.27	40	41.85	10.92	0.75	31.79	-	-	Peak
195.24	24.12	-19.38	43.5	45.26	9.1	1.51	31.75	-	-	Peak
258.69	33.07	-12.93	46	49.27	13.75	1.78	31.73	-	-	Peak
324.5	34.37	-11.63	46	50.44	13.7	1.97	31.74	-	-	Peak
439.3	36.45	-9.55	46	49.22	16.8	2.29	31.86	100	135	Peak
499.5	34.27	-11.73	46	45.93	17.79	2.48	31.93	-	-	Peak
2411	105.18	-	-	101.09	31.93	6.49	34.33	167	15	Average
2411	115.73	-	-	111.64	31.93	6.49	34.33	167	15	Peak
4824	47.72	-26.28	74	58.74	34.4	10.17	55.59	100	0	Peak



Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2413 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
34.05	23.8	-16.2	40	38.81	16.1	0.68	31.79	-	-	Peak
121.8	23.41	-20.09	43.5	41.81	12.12	1.23	31.75	-	-	Peak
250.05	27.05	-18.95	46	44.66	12.4	1.73	31.74	-	-	Peak
375.6	32.81	-13.19	46	47.49	15	2.12	31.8	-	-	Peak
499.5	35.03	-10.97	46	46.69	17.79	2.48	31.93	100	64	Peak
588.4	33.76	-12.24	46	43.77	19.31	2.72	32.04	-	-	Peak
2413	100.15	-	-	96.06	31.93	6.49	34.33	200	86	Average
2413	110.63	-	-	106.54	31.93	6.49	34.33	200	86	Peak
4824	48.59	-25.41	74	59.61	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2435 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2435	106.92	-	-	102.78	31.94	6.52	34.32	194	16	Average
2435	117.46	-	-	113.32	31.94	6.52	34.32	194	16	Peak
4875	48.33	-25.67	74	59.46	34.37	10.18	55.68	100	0	Peak
7311	50.26	-23.74	74	59.99	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2432 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2432	102.35	-	-	98.21	31.94	6.52	34.32	200	89	Average
2432	113.19	-	-	109.05	31.94	6.52	34.32	200	89	Peak
4875	48.57	-25.43	74	59.7	34.37	10.18	55.68	100	0	Peak
7311	49.31	-24.69	74	59.04	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	103.32	-	-	99.1	31.97	6.56	34.31	135	8	Average
2461	113.87	-	-	109.65	31.97	6.56	34.31	135	8	Peak
4923	47.97	-26.03	74	59.21	34.34	10.2	55.78	100	0	Peak
7386	49.07	-24.93	74	58.7	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11g	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2463 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2463	99.06	-	-	94.84	31.97	6.56	34.31	190	115	Average
2463	109.75	-	-	105.53	31.97	6.56	34.31	190	115	Peak
4923	48.05	-25.95	74	59.29	34.34	10.2	55.78	100	0	Peak
7386	49.56	-24.44	74	59.19	35.56	10.92	56.11	100	0	Peak



Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2412 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
42.96	18.2	-21.8	40	38.32	10.92	0.75	31.79	-	-	Peak
248.16	30.93	-15.07	46	48.73	12.22	1.72	31.74	-	-	Peak
272.46	31.81	-14.19	46	48.77	12.95	1.82	31.73	-	-	Peak
324.5	33.17	-12.83	46	49.24	13.7	1.97	31.74	-	-	Peak
436.5	37.71	-8.29	46	50.49	16.8	2.28	31.86	100	109	Peak
445.6	37.62	-8.38	46	50.34	16.85	2.3	31.87	-	-	Peak
2412	101.78	-	-	97.69	31.93	6.49	34.33	166	14	Average
2412	112.64	-	-	108.55	31.93	6.49	34.33	166	14	Peak
4824	48.27	-25.73	74	59.29	34.4	10.17	55.59	100	0	Peak



Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	01	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2411 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
34.05	24.4	-15.6	40	39.41	16.1	0.68	31.79	-	-	Peak
125.04	23.75	-19.75	43.5	42.25	12	1.25	31.75	-	-	Peak
254.1	27.59	-18.41	46	44.57	13	1.75	31.73	-	-	Peak
464.5	35.21	-10.79	46	47.49	17.29	2.32	31.89	-	-	Peak
499.5	36.3	-9.7	46	47.96	17.79	2.48	31.93	100	141	Peak
700.4	31.63	-14.37	46	41.36	19.4	2.89	32.02	-	-	Peak
2411	97.94	-	-	93.85	31.93	6.49	34.33	200	99	Average
2411	108.71	-	-	104.62	31.93	6.49	34.33	200	99	Peak
4824	47.3	-26.7	74	58.32	34.4	10.17	55.59	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	104.88	-	-	100.74	31.94	6.52	34.32	160	20	Average
2436	116.01	-	-	111.87	31.94	6.52	34.32	160	20	Peak
4875	48.12	-25.88	74	59.25	34.37	10.18	55.68	100	0	Peak
7311	49.3	-24.7	74	59.03	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2436 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2436	101.73	-	-	97.59	31.94	6.52	34.32	199	124	Average
2436	112.44	-	-	108.3	31.94	6.52	34.32	199	124	Peak
4875	47.96	-26.04	74	59.09	34.37	10.18	55.68	100	0	Peak
7311	48.79	-25.21	74	58.52	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	101.65	-	-	97.43	31.97	6.56	34.31	192	17	Average
2461	112.8	-	-	108.58	31.97	6.56	34.31	192	17	Peak
4923	47.46	-26.54	74	58.7	34.34	10.2	55.78	100	0	Peak
7386	48.45	-25.55	74	58.08	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11n HT20	Temperature :	22~24°C
Test Channel :	11	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2461 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2461	97.66	-	-	93.44	31.97	6.56	34.31	195	87	Average
2461	108.45	-	-	104.23	31.97	6.56	34.31	195	87	Peak
4923	48.51	-25.49	74	59.75	34.34	10.2	55.78	100	0	Peak
7386	49.39	-24.61	74	59.02	35.56	10.92	56.11	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2424 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
252.75	32.44	-13.56	46	49.57	12.85	1.75	31.73	-	-	Peak
258.96	33.11	-12.89	46	49.31	13.75	1.78	31.73	-	-	Peak
268.14	33.14	-12.86	46	49.97	13.09	1.81	31.73	-	-	Peak
420.4	38.15	-7.85	46	50.95	16.8	2.24	31.84	100	163	Peak
452.6	36.95	-9.05	46	49.52	16.99	2.32	31.88	-	-	Peak
499.5	34.97	-11.03	46	46.63	17.79	2.48	31.93	-	-	Peak
2424	98.8	-	-	94.69	31.94	6.49	34.32	193	16	Average
2424	109.95	-	-	105.84	31.94	6.49	34.32	193	16	Peak
4845	48	-26	74	59.06	34.39	10.17	55.62	100	0	Peak
7266	48.62	-25.38	74	58.39	35.63	10.95	56.35	100	0	Peak



Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	03	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2424 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
201.45	25.39	-18.11	43.5	46.41	9.18	1.55	31.75	-	-	Peak
246	27.78	-18.22	46	45.76	12.04	1.72	31.74	-	-	Peak
267.6	27.88	-18.12	46	44.62	13.18	1.81	31.73	-	-	Peak
475	36.49	-9.51	46	48.58	17.5	2.31	31.9	104	225	Peak
499.5	36.3	-9.7	46	47.96	17.79	2.48	31.93	-	-	Peak
601	34.89	-11.11	46	44.77	19.41	2.77	32.06	-	-	Peak
2424	95.56	-	-	91.45	31.94	6.49	34.32	198	94	Average
2424	106.46	-	-	102.35	31.94	6.49	34.32	198	94	Peak
4845	47.9	-26.1	74	58.96	34.39	10.17	55.62	100	0	Peak
7266	49.28	-24.72	74	59.05	35.63	10.95	56.35	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2435 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2435	100.99	-	-	96.85	31.94	6.52	34.32	194	16	Average
2435	111.96	-	-	107.82	31.94	6.52	34.32	194	16	Peak
4875	48.42	-25.58	74	59.55	34.37	10.18	55.68	100	0	Peak
7311	49.62	-24.38	74	59.35	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	06	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2435 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2435	97.53	-	-	93.39	31.94	6.52	34.32	199	100	Average
2435	109.05	-	-	104.91	31.94	6.52	34.32	199	100	Peak
4875	47.78	-26.22	74	58.91	34.37	10.18	55.68	100	0	Peak
7311	48.28	-25.72	74	58.01	35.61	10.94	56.28	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	09	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Horizontal
Remark :	1. 2454 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2454	98.01	-	-	93.79	31.97	6.56	34.31	192	20	Average
2454	109.36	-	-	105.14	31.97	6.56	34.31	192	20	Peak
4905	46.95	-27.05	74	58.14	34.35	10.2	55.74	100	0	Peak
7356	48.93	-25.07	74	58.61	35.58	10.92	56.18	100	0	Peak

Test Mode :	802.11n HT40	Temperature :	22~24°C
Test Channel :	09	Relative Humidity :	47~49%
Test Engineer :	Marlboro Hsu	Polarization :	Vertical
Remark :	1. 2454 MHz is fundamental signal which can be ignored. 2. Average measurement was not performed if peak level went lower than the average limit.		

Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2454	94.55	-	-	90.33	31.97	6.56	34.31	194	87	Average
2454	105.86	-	-	101.64	31.97	6.56	34.31	194	87	Peak
4905	48.09	-25.91	74	59.28	34.35	10.2	55.74	100	0	Peak
7356	49.04	-24.96	74	58.72	35.58	10.92	56.18	100	0	Peak

3.2 Antenna Requirements

3.2.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the Antenna exceeds 6 dBi. 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 FCC rule.

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 v02r01.

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k / 20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;

G_k is the gain in dBi of the k th antenna.

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.

			DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. Port 1 (dBi)	Ant. Port 2 (dBi)				
Antenna 1	0.12	-2.16	2.06	2.06	0.00	0.00
Antenna 2	0.79	-1.57	2.70	2.70	0.00	0.00

$Power\ Limit\ Reduction = DG(Power) - 6dBi, (min = 0)$

$PSD\ Limit\ Reduction = DG(PSD) - 6dBi, (min = 0)$

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	Feb. 27, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 17, 2013	Feb. 27, 2014	Aug. 16, 2014	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101067	9kHz ~ 30GHz	Nov. 20, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Nov. 19, 2014	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9kHz ~ 26.5GHz	Dec. 02, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Dec. 01, 2014	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 06, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	May 05, 2014	Radiation (03CH06-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	860004/0001	9kHz ~ 30MHz	Jul. 03, 2012	Mar. 04, 2014 ~ Mar. 07, 2014	Jul. 02, 2014	Radiation (03CH06-HY)
Bilog Antenna	Schaffner	CBL6112B	2885	30MHz ~ 2GHz	Oct. 10, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Oct. 09, 2014	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 02, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Aug. 01, 2014	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9kHz ~ 1GHz	Apr. 12, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Jul. 17, 2014	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Oct. 03, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Oct. 02, 2014	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 12, 2013	Mar. 04, 2014 ~ Mar. 07, 2014	Apr. 11, 2014	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	Mar. 04, 2014 ~ Mar. 07, 2014	N/A	Radiation (03CH06-HY)
Antenna Mast	MF	MF-7802	MF780208212	1 m ~ 4 m	N/A	Mar. 04, 2014 ~ Mar. 07, 2014	N/A	Radiation (03CH06-HY)



5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.50
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