



FCC RF Test Report

APPLICANT : Redpine Signals Inc.
EQUIPMENT : 802.11 abgn MODULE
BRAND NAME : Redpine Signals
MODEL NAME : RS9110-N-11-03
FCC ID : XF6-RS9110N1103
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 Radiated Spurious Emission, and AC Conducted Emission test items. The product was received on Jul. 22, 2014 and testing was completed on Sep. 03, 2014. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance 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.

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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 Product Feature of Equipment Under Test	5
1.4 Product Specification subjective to this standard	6
1.5 Modification of EUT	6
1.6 Testing Location	6
1.7 Applicable Standards	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Carrier Frequency Channel	8
2.2 Pre-Scanned RF Power	9
2.3 Test Mode	10
2.4 Connection Diagram of Test System	11
2.5 Support Unit used in test configuration and system	12
2.6 EUT Operation Test Setup	12
3 TEST RESULT	13
3.1 Radiated Band Edges and Spurious Emission Measurement	13
3.2 AC Conducted Emission Measurement	37
3.3 Antenna Requirements	45
4 LIST OF MEASURING EQUIPMENT	46
5 UNCERTAINTY OF EVALUATION	47
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR472246A	Rev. 01	Initial issue of report	Sep. 05, 2014
FR472246A	Rev. 02	Update report of adding average power at page 6 and 9	Sep. 11, 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 0.14 dB at 2483.530 MHz
3.2	15.207	RSS-Gen 7.2.4	AC Conducted Emission	15.207(a)	Pass	Under limit 10.30 dB at 4.462 MHz
3.3	15.203 & 15.247(b)	RSS-210 A8.4	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Redpine Signals Inc.

2107 N.First Street Suite 680 San Jose, CA 95131-2019 U.S.A

1.2 Manufacturer

Redpine Signals Inc.

2107 N.First Street Suite 680 San Jose, CA 95131-2019 U.S.A

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	802.11 abgn MODULE
Brand Name	Redpine Signals
Model Name	RS9110-N-11-03
FCC ID	XF6-RS9110N1103
Host (WLAN Access Point Card)	Brand Name : Option Model Name : CG2102
Host (CloudGate)	Brand Name : Option Model Name : CG0114
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20
EUT Stage	Identical Prototype

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

1.4 Product Specification subjective to this standard

Product Specification subjective to this standard	
Tx/Rx Channel Frequency Range	802.11b/g/n : 2412 MHz ~ 2462 MHz 802.11a/n: 5745~5825MHz.
Maximum (Peak) Output Power to Antenna	<2412 MHz ~ 2462 MHz> 802.11b : 18.01 dBm (0.0632 W) 802.11g : 18.82 dBm (0.0762 W) 802.11n HT20 : 18.81 dBm (0.0760 W) <5745 MHz ~ 5825 MHz> 802.11a : 11.32 dBm (0.0136 W) 802.11n HT20 : 11.31 dBm (0.0135 W)
Maximum (Average) Output Power to Antenna	<2412 MHz ~ 2462 MHz> 802.11b : 15.12 dBm (0.0325 W) 802.11g : 13.91 dBm (0.0246 W) 802.11n HT20 : 14.16 dBm (0.0261 W) <5745 MHz ~ 5825 MHz> 802.11a : 5.60 dBm (0.0036 W) 802.11n HT20 : 5.22 dBm (0.0033 W)
Antenna Type	802.11b/g/n : Dipole Antenna type with gain 3.00 dBi 802.11a/n : Dipole Antenna type with gain 3.00 dBi
Type of Modulation	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

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: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		
	TH02-HY	CO05-HY	03CH05-HY



1.7 Applicable 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 v03r02
- ♦ 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) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane for 2.4GHz and X plane for 5GHz) were recorded in this report.

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 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	-	-

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4	149	5745	159	5795
	151	5755	161	5805
	153	5765	165	5825
	157	5785	-	-



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.

2.4GHz 802.11b CH01				
Data Rate (MHz)	1M bps	2M bps	5.5M bps	11M bps
Peak Power (dBm)	18.01	17.97	17.92	17.95
Average Power (dBm)	15.12	15.07	15.09	15.10

2.4GHz 802.11g CH06								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	18.82	18.73	18.68	18.75	18.77	18.80	18.79	18.74
Average Power (dBm)	13.91	13.89	13.83	13.87	13.85	13.82	13.86	13.90

2.4GHz 802.11n HT20 CH06								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	18.81	18.79	18.73	18.77	18.75	18.69	18.77	18.80
Average Power (dBm)	14.16	14.11	14.08	14.13	14.10	14.09	14.06	14.12

5GHz 802.11a CH149								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Peak Power (dBm)	11.32	11.08	11.28	11.29	11.26	11.09	11.15	11.27
Average Power (dBm)	5.60	5.53	5.48	5.55	5.57	5.51	5.48	5.55

5GHz 802.11n HT20 CH149								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Peak Power (dBm)	11.31	11.27	11.26	11.22	11.23	11.19	11.14	11.16
Average Power (dBm)	5.22	5.13	5.18	5.15	5.11	5.19	5.17	5.20

*measured by power meter

2.3 Test Mode

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

<2.4GHz>

Test Cases				
Radiated TCs	Test Items	Mode	Data Rate	Test Channel
	Radiated Band Edge	802.11b	1 Mbps	1/11
		802.11g	6 Mbps	1/11
		802.11n HT20	MCS0	1/11
	Radiated Spurious Emission	802.11b	1 Mbps	1/6/11
		802.11g	6 Mbps	1/6/11
		802.11n HT20	MCS0	1/6/11

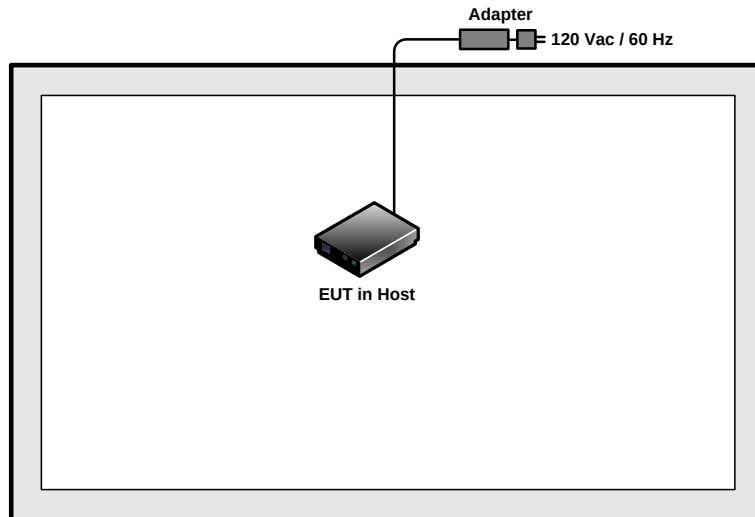
<5GHz>

Test Cases				
Radiated TCs	Test Items	Mode	Data Rate	Test Channel
	Radiated Spurious Emission	802.11a	6 Mbps	149/157/165
		802.11n HT20	MCS0	149/157/165

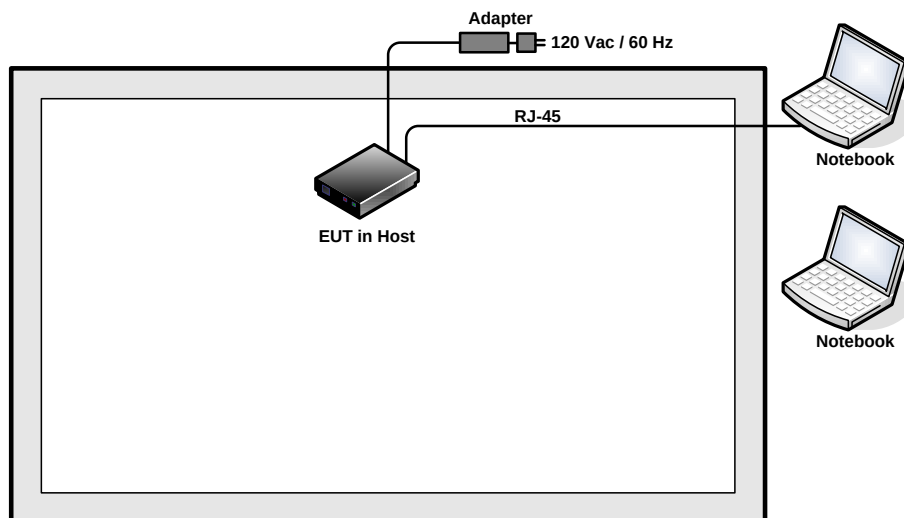
Test Cases	
AC Conducted Emission	Mode 1 : WLAN (2.4GHz) Link + RJ-45 Link + Adapter

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	Notebook	DELL	P20G	FCC DoC/ Contains FCC ID: QDS-BRCM1051	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.6 EUT Operation Test Setup

For WLAN function, programmed RF utility, “putty” installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.



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 Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r02.
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 - Preamp 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.

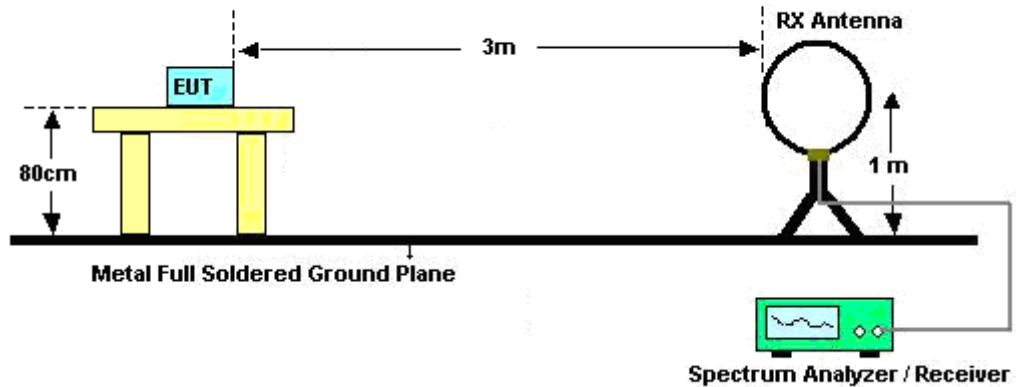
For average measurement:

 - 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.

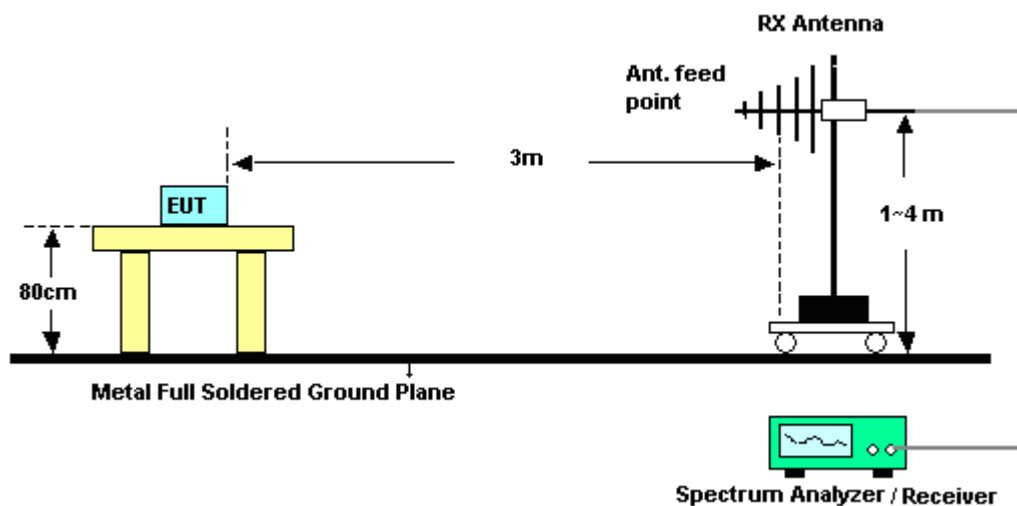
Band	Duty Cycle(%)	T(μ s)	1/T(kHz)	VBW Setting
802.11b	100.00	-	-	10Hz
802.11g	100.00	-	-	10Hz
2.4GHz 802.11n HT20	100.00	-	-	10Hz
802.11a	100.00	-	-	10Hz
5GHz 802.11n HT20	100.00	-	-	10Hz

3.1.4 Test Setup

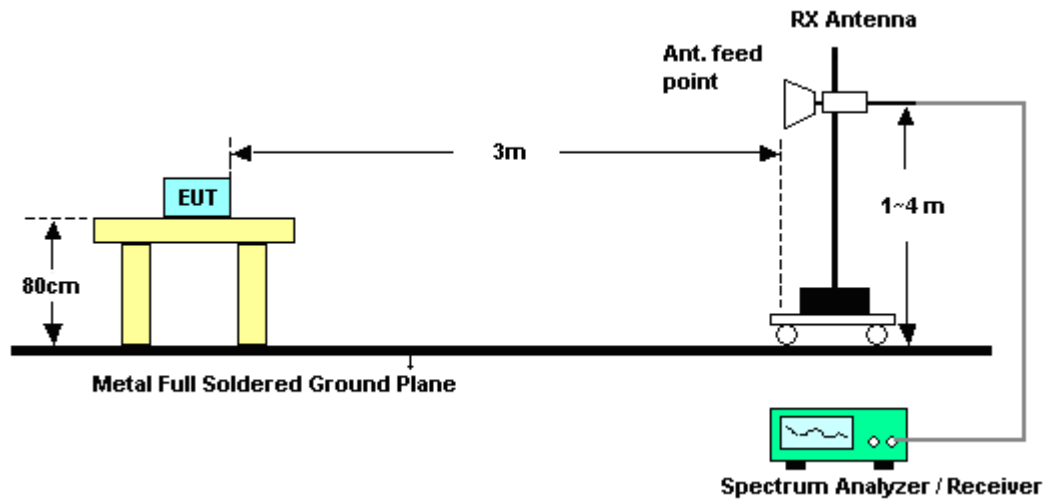
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 Test Results of Radiated Spurious 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

Test Mode :	802.11b	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	50~51%
Test Channel :	01	Test Engineer :	Kyle Jhuang

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	56.85	-17.15	74	53.11	32.77	4.62	33.65	101	242	Peak
2390	45.98	-8.02	54	42.24	32.77	4.62	33.65	101	242	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
2389.56	61.36	-12.64	74	57.62	32.77	4.62	33.65	100	4	Peak
2390	52.25	-1.75	54	48.51	32.77	4.62	33.65	100	4	Average

Test Mode :	802.11b	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	50~51%
Test Channel :	11	Test Engineer :	Kyle Jhuang

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	56.14	-17.86	74	52.02	32.96	4.73	33.57	158	242	Peak
2483.5	43.53	-10.47	54	39.41	32.96	4.73	33.57	158	242	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
2484.1	58.69	-15.31	74	54.57	32.96	4.73	33.57	123	35	Peak
2483.5	46.82	-7.18	54	42.7	32.96	4.73	33.57	123	35	Average



Test Mode :	802.11g	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	50~51%
Test Channel :	01	Test Engineer :	Kyle Jhuang

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	65.37	-8.63	74	61.63	32.77	4.62	33.65	101	242	Peak
2390	45.95	-8.05	54	42.21	32.77	4.62	33.65	101	242	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	73.75	-0.25	74	70.01	32.77	4.62	33.65	100	2	Peak
2390	51.85	-2.15	54	48.11	32.77	4.62	33.65	100	2	Average

Test Mode :	802.11g	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	50~51%
Test Channel :	11	Test Engineer :	Kyle Jhuang

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
2483.5	70.6	-3.4	74	66.48	32.96	4.73	33.57	158	242	Peak
2483.5	50.39	-3.61	54	46.27	32.96	4.73	33.57	158	242	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
2483.53	73.45	-0.55	74	69.33	32.96	4.73	33.57	123	35	Peak
2483.5	53.04	-0.96	54	48.92	32.96	4.73	33.57	123	35	Average



Test Mode :	802.11n HT20	Temperature :	25~26°C
Test Band :	Low	Relative Humidity :	50~51%
Test Channel :	01	Test Engineer :	Kyle Jhuang

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
2389.74	63.51	-10.49	74	59.77	32.77	4.62	33.65	100	243	Peak
2390	44.18	-9.82	54	40.44	32.77	4.62	33.65	100	243	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
2389.92	73.78	-0.22	74	70.04	32.77	4.62	33.65	100	360	Peak
2390	50.43	-3.57	54	46.69	32.77	4.62	33.65	100	360	Average

Test Mode :	802.11n HT20	Temperature :	25~26°C
Test Band :	High	Relative Humidity :	50~51%
Test Channel :	11	Test Engineer :	Kyle Jhuang

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
2483.89	68.34	-5.66	74	64.22	32.96	4.73	33.57	162	241	Peak
2483.5	47.19	-6.81	54	43.07	32.96	4.73	33.57	162	241	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
2483.53	73.86	-0.14	74	69.74	32.96	4.73	33.57	121	360	Peak
2483.5	51.31	-2.69	54	47.19	32.96	4.73	33.57	121	360	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.

Test Mode :	802.11b	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	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
2412	97.59	-	-	93.76	32.81	4.65	33.63	101	242	Average
2412	102.11	-	-	98.28	32.81	4.65	33.63	101	242	Peak
4824	40.27	-33.73	74	57.31	35.03	6.54	58.61	100	0	Peak

Test Mode :	802.11b	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	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
2412	102.54	-	-	98.71	32.81	4.65	33.63	100	4	Average
2412	107.48	-	-	103.65	32.81	4.65	33.63	100	4	Peak
4824	42.39	-31.61	74	59.43	35.03	6.54	58.61	100	0	Peak



Test Mode :	802.11b	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	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	101.88	-	-	97.97	32.85	4.68	33.62	195	236	Average
2436	102.71	-	-	98.8	32.85	4.68	33.62	195	236	Peak
4875	40.74	-33.26	74	57.68	35.02	6.56	58.52	100	0	Peak
7311	43.47	-30.53	74	57	36.39	8.24	58.16	100	0	Peak

Test Mode :	802.11b	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2437 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
2437	101.58	-	-	97.61	32.89	4.68	33.6	100	0	Average
2437	106.36	-	-	102.39	32.89	4.68	33.6	100	0	Peak
4875	40.36	-33.64	74	57.3	35.02	6.56	58.52	100	0	Peak
7311	42.84	-31.16	74	56.37	36.39	8.24	58.16	100	0	Peak



Test Mode :	802.11b	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	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	97.02	-	-	92.99	32.92	4.7	33.59	158	242	Average
2463	101.14	-	-	97.11	32.92	4.7	33.59	158	242	Peak
4923	39.74	-34.26	74	56.56	35.01	6.59	58.42	100	0	Peak
7386	41.47	-32.53	74	55.03	36.44	8.31	58.31	100	0	Peak

Test Mode :	802.11b	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2462 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
2462	104.08	-	-	100.05	32.92	4.7	33.59	123	35	Average
2462	108.6	-	-	104.57	32.92	4.7	33.59	123	35	Peak
4923	40.29	-33.71	74	57.11	35.01	6.59	58.42	100	0	Peak
7386	41.61	-32.39	74	55.17	36.44	8.31	58.31	100	0	Peak



Test Mode :	802.11g	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2410 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
2410	90.6	-	-	86.77	32.81	4.65	33.63	101	242	Average
2410	101.74	-	-	97.91	32.81	4.65	33.63	101	242	Peak
4824	39.94	-34.06	74	56.98	35.03	6.54	58.61	100	0	Peak

Test Mode :	802.11g	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2410 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
2410	95.72	-	-	91.89	32.81	4.65	33.63	100	2	Average
2410	106.79	-	-	102.96	32.81	4.65	33.63	100	2	Peak
4824	39.26	-34.74	74	56.3	35.03	6.54	58.61	100	0	Peak



Test Mode :	802.11g	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2438 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
2438	94.05	-	-	90.08	32.89	4.68	33.6	160	241	Average
2438	104.83	-	-	100.86	32.89	4.68	33.6	160	241	Peak
4875	40.07	-33.93	74	57.01	35.02	6.56	58.52	100	0	Peak
7311	42.96	-31.04	74	56.49	36.39	8.24	58.16	100	0	Peak

Test Mode :	802.11g	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2438 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
2438	97.48	-	-	93.51	32.89	4.68	33.6	100	0	Average
2438	108.43	-	-	104.46	32.89	4.68	33.6	100	0	Peak
4875	40.89	-33.11	74	57.83	35.02	6.56	58.52	100	0	Peak
7311	42.11	-31.89	74	55.64	36.39	8.24	58.16	100	0	Peak

Test Mode :	802.11g	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2464 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
2464	93.1	-	-	89.07	32.92	4.7	33.59	158	242	Average
2464	104.26	-	-	100.23	32.92	4.7	33.59	158	242	Peak
4923	40.87	-33.13	74	57.69	35.01	6.59	58.42	100	0	Peak
7386	42.46	-31.54	74	56.02	36.44	8.31	58.31	100	0	Peak

Test Mode :	802.11g	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2464 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
2464	97.87	-	-	93.84	32.92	4.7	33.59	123	35	Average
2464	109.03	-	-	105	32.92	4.7	33.59	123	35	Peak
4923	40.78	-33.22	74	57.6	35.01	6.59	58.42	100	0	Peak
7386	41.8	-32.2	74	55.36	36.44	8.31	58.31	100	0	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2410 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
2410	88.95	-	-	85.12	32.81	4.65	33.63	100	243	Average
2410	99.69	-	-	95.86	32.81	4.65	33.63	100	243	Peak
4824	39.56	-34.44	74	56.6	35.03	6.54	58.61	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	01	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2410 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
2410	94.31	-	-	90.48	32.81	4.65	33.63	100	360	Average
2410	105.24	-	-	101.41	32.81	4.65	33.63	100	360	Peak
4824	39.82	-34.18	74	56.86	35.03	6.54	58.61	100	0	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 2439 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
2439	93.31	-	-	89.34	32.89	4.68	33.6	193	239	Average
2439	104.05	-	-	100.08	32.89	4.68	33.6	193	239	Peak
4875	40.87	-33.13	74	57.81	35.02	6.56	58.52	100	0	Peak
7311	42.94	-31.06	74	56.47	36.39	8.24	58.16	100	0	Peak

Test Mode :	2.4GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	06	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 2437 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
2437	97.23	-	-	93.26	32.89	4.68	33.6	100	360	Average
2437	108.1	-	-	104.13	32.89	4.68	33.6	100	360	Peak
4875	41.37	-32.63	74	58.31	35.02	6.56	58.52	100	0	Peak
7311	43.14	-30.86	74	56.67	36.39	8.24	58.16	100	0	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	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
121.8	28.86	-14.64	43.5	47.91	11.54	1.19	31.78	-	-	Peak
179.85	27.75	-15.75	43.5	49.16	8.97	1.4	31.78	-	-	Peak
250.05	35.15	-10.85	46	52.88	12.4	1.64	31.77	100	163	Peak
359.5	31.66	-14.34	46	46.92	14.6	1.92	31.78	-	-	Peak
479.9	27.89	-18.11	46	39.87	17.7	2.19	31.87	-	-	Peak
617.1	27.46	-18.54	46	36.9	20.11	2.49	32.04	-	-	Peak
2461	91.11	-	-	87.08	32.92	4.7	33.59	162	241	Average
2461	101.57	-	-	97.54	32.92	4.7	33.59	162	241	Peak
4923	40.31	-33.69	74	57.13	35.01	6.59	58.42	100	0	Peak
7386	42.28	-31.72	74	55.84	36.44	8.31	58.31	100	0	Peak



Test Mode :	2.4GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	11	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	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
64.29	29.87	-10.13	40	54.79	5.98	0.89	31.79	100	47	Peak
129.09	20.66	-22.84	43.5	39.22	12	1.22	31.78	-	-	Peak
250.05	25.29	-20.71	46	43.02	12.4	1.64	31.77	-	-	Peak
359.5	29.86	-16.14	46	45.12	14.6	1.92	31.78	-	-	Peak
479.9	27.56	-18.44	46	39.54	17.7	2.19	31.87	-	-	Peak
622.7	24.99	-21.01	46	34.25	20.28	2.5	32.04	-	-	Peak
2461	96.05	-	-	92.02	32.92	4.7	33.59	121	360	Average
2461	107.03	-	-	103	32.92	4.7	33.59	121	360	Peak
4923	40.38	-33.62	74	57.2	35.01	6.59	58.42	100	0	Peak
7386	41.64	-32.36	74	55.2	36.44	8.31	58.31	100	0	Peak



Test Mode :	802.11a	Temperature :	25~26°C
Test Channel :	149	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 5743 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
63.48	20.5	-19.5	40	45.42	5.98	0.89	31.79	-	-	Peak
130.98	28.81	-14.69	43.5	47.38	11.98	1.23	31.78	100	118	Peak
171.75	28.13	-15.37	43.5	49	9.54	1.37	31.78	-	-	Peak
479.9	26.55	-19.45	46	38.53	17.7	2.19	31.87	-	-	Peak
617.1	28.11	-17.89	46	37.55	20.11	2.49	32.04	-	-	Peak
936.3	29.24	-16.76	46	32.91	24.42	3.05	31.14	-	-	Peak
5743	86.88	-	-	76.02	35.79	7.18	32.11	100	41	Average
5743	98.08	-	-	87.22	35.79	7.18	32.11	100	41	Peak
11490	43.8	-30.2	74	51.39	38.99	10.33	56.91	100	0	Peak



Test Mode :	802.11a	Temperature :	25~26°C
Test Channel :	149	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 5746 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
81.57	27.23	-12.77	40	50.73	7.3	0.99	31.79	100	33	Peak
129.63	22.82	-20.68	43.5	41.27	12.1	1.23	31.78	-	-	Peak
250.05	27.36	-18.64	46	45.09	12.4	1.64	31.77	-	-	Peak
359.5	29.96	-16.04	46	45.22	14.6	1.92	31.78	-	-	Peak
479.9	27.76	-18.24	46	39.74	17.7	2.19	31.87	-	-	Peak
840.4	26.94	-19.06	46	32.56	23.2	2.9	31.72	-	-	Peak
5746	85.73	-	-	74.87	35.79	7.18	32.11	100	6	Average
5746	96.47	-	-	85.61	35.79	7.18	32.11	100	6	Peak
11490	45.28	-28.72	74	52.87	38.99	10.33	56.91	100	0	Peak



Test Mode :	802.11a	Temperature :	25~26°C
Test Channel :	157	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 5783 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
5783	84.95	-	-	74.03	35.82	7.2	32.1	100	39	Average
5783	95.48	-	-	84.56	35.82	7.2	32.1	100	39	Peak
11570	45.01	-28.99	74	52.53	39.03	10.36	56.91	100	0	Peak

Test Mode :	802.11a	Temperature :	25~26°C
Test Channel :	157	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 5783 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
5783	83.53	-	-	72.61	35.82	7.2	32.1	100	5	Average
5783	94.3	-	-	83.38	35.82	7.2	32.1	100	5	Peak
11570	44.71	-29.29	74	52.23	39.03	10.36	56.91	100	0	Peak



Test Mode :	802.11a	Temperature :	25~26°C
Test Channel :	165	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 5824 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
5824	83.38	-	-	72.37	35.86	7.24	32.09	100	40	Average
5824	94	-	-	82.99	35.86	7.24	32.09	100	40	Peak
11650	43.61	-30.39	74	51.07	39.06	10.41	56.93	100	0	Peak

Test Mode :	802.11a	Temperature :	25~26°C
Test Channel :	165	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 5823 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
5823	82	-	-	70.99	35.86	7.24	32.09	109	3	Average
5823	92.98	-	-	81.97	35.86	7.24	32.09	109	3	Peak
11650	43.22	-30.78	74	50.68	39.06	10.41	56.93	100	0	Peak



Test Mode :	5GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	149	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 5747 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
5747	86.91	-	-	76.05	35.79	7.18	32.11	101	37	Average
5747	97.45	-	-	86.59	35.79	7.18	32.11	101	37	Peak
11490	43.96	-30.04	74	51.55	38.99	10.33	56.91	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	149	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 5744 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
5744	85.67	-	-	74.81	35.79	7.18	32.11	100	4	Average
5744	96.78	-	-	85.92	35.79	7.18	32.11	100	4	Peak
11490	44.51	-29.49	74	52.1	38.99	10.33	56.91	100	0	Peak



Test Mode :	5GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	157	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 5786 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
5786	84.83	-	-	73.9	35.83	7.2	32.1	100	39	Average
5786	95.6	-	-	84.67	35.83	7.2	32.1	100	39	Peak
11571	43.72	-30.28	74	51.24	39.03	10.36	56.91	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	157	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 5787 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
5787	83.46	-	-	72.53	35.83	7.2	32.1	100	5	Average
5787	94.12	-	-	83.19	35.83	7.2	32.1	100	5	Peak
11571	43.33	-30.67	74	50.85	39.03	10.36	56.91	100	0	Peak



Test Mode :	5GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	165	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	1. 5823 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
5823	83.33	-	-	72.32	35.86	7.24	32.09	100	77	Average
5823	93.9	-	-	82.89	35.86	7.24	32.09	100	77	Peak
11649	44.49	-29.51	74	51.95	39.06	10.41	56.93	100	0	Peak

Test Mode :	5GHz 802.11n HT20	Temperature :	25~26°C
Test Channel :	165	Relative Humidity :	50~51%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	1. 5824 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
5824	82.17	-	-	71.16	35.86	7.24	32.09	109	4	Average
5824	93.22	-	-	82.21	35.86	7.24	32.09	109	4	Peak
11649	44.2	-29.8	74	51.66	39.06	10.41	56.93	100	0	Peak

3.2 AC Conducted Emission Measurement

3.2.1 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 (dB μ V)	
	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.

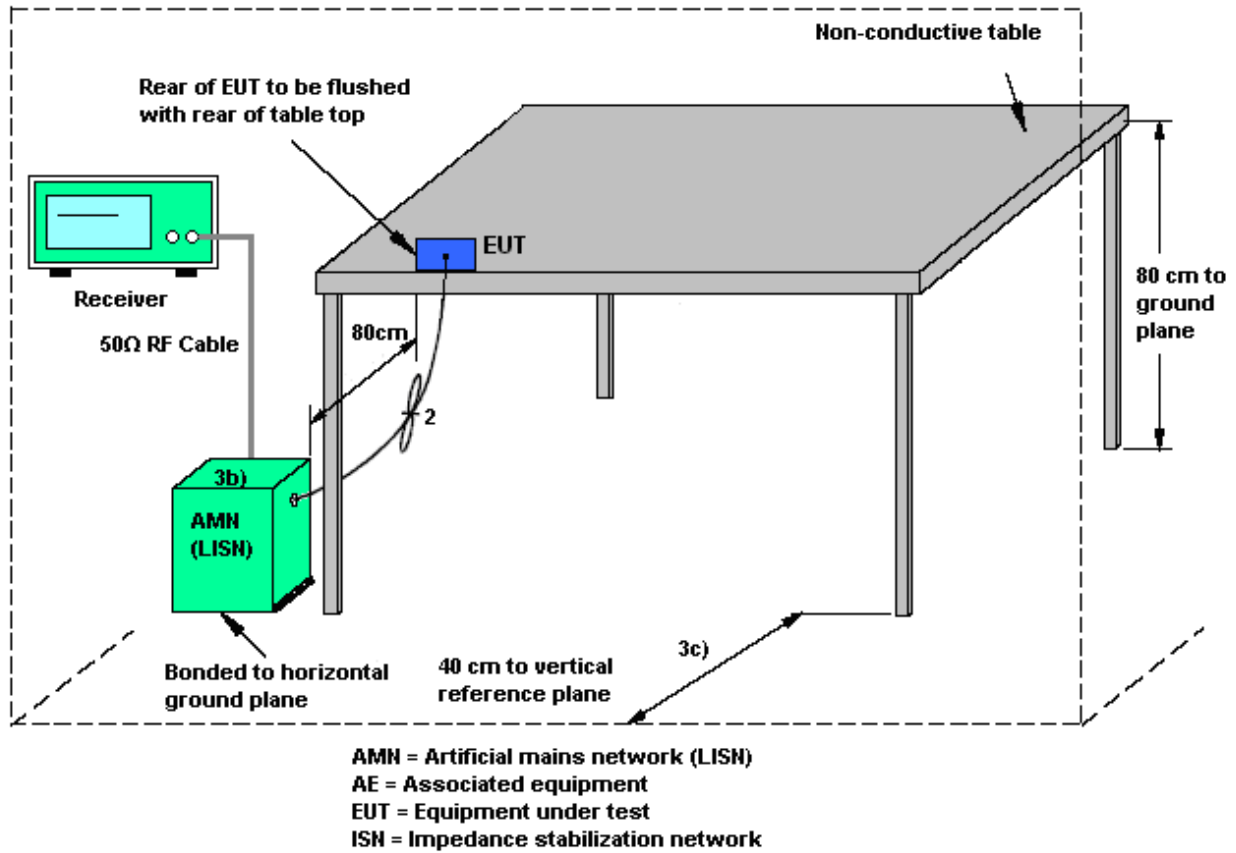
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

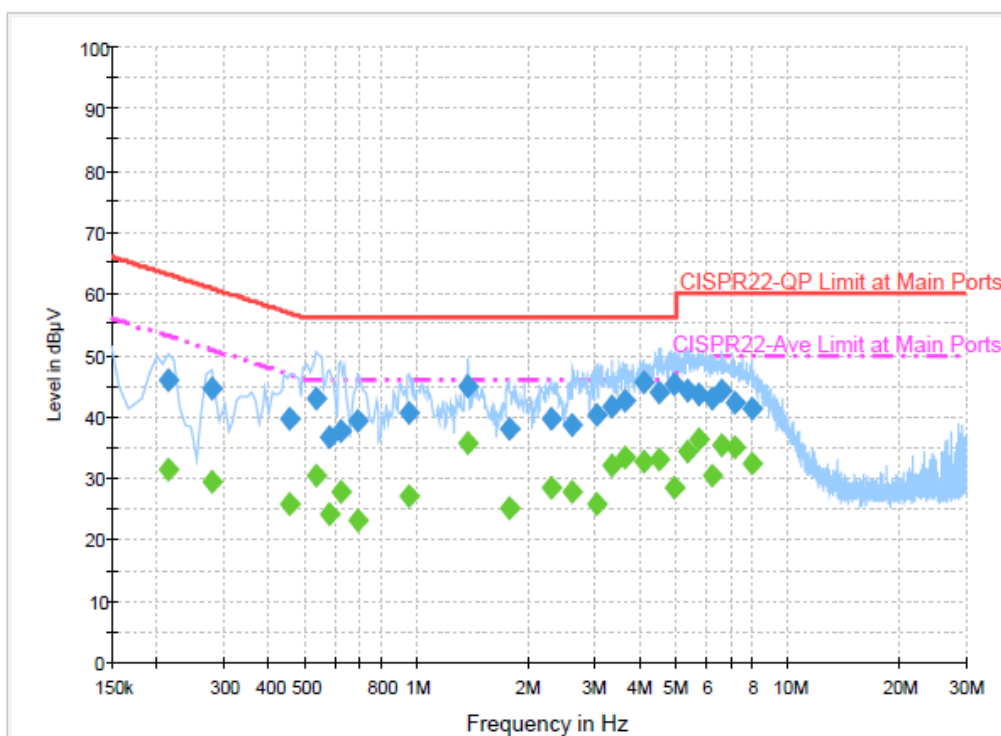
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other 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 (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.2.4 Test Setup



3.2.5 Test Result of AC Conducted Emission

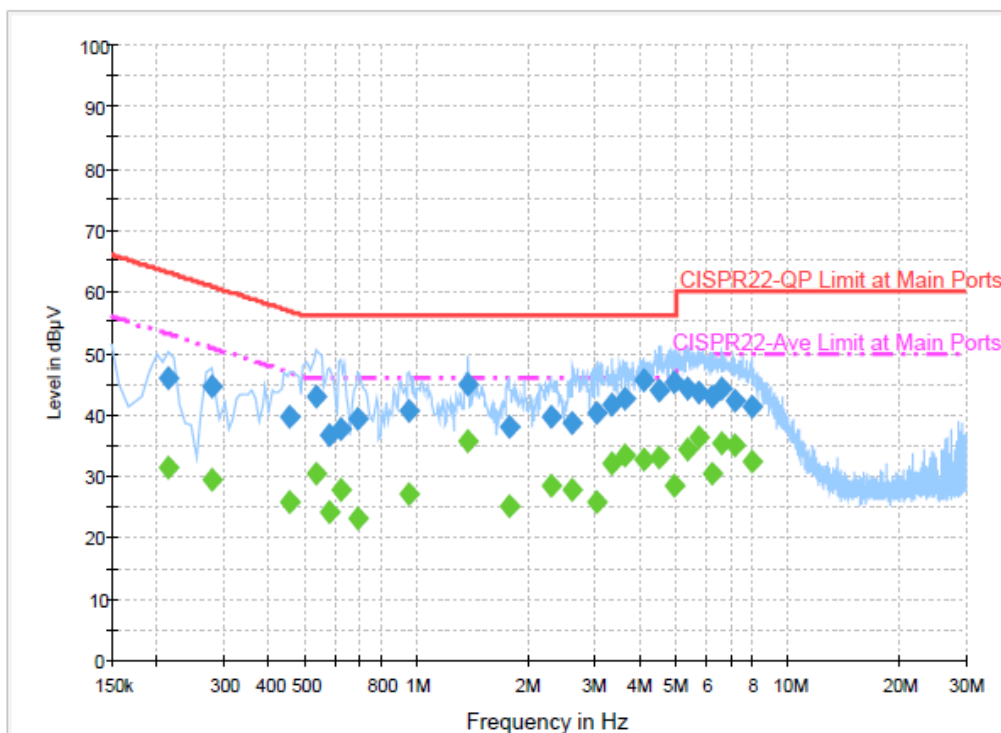
Test Mode :	Mode 1	Temperature :	20~22℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) Link + RJ-45 Link + Adapter		



Final Result : Quasi-Peak

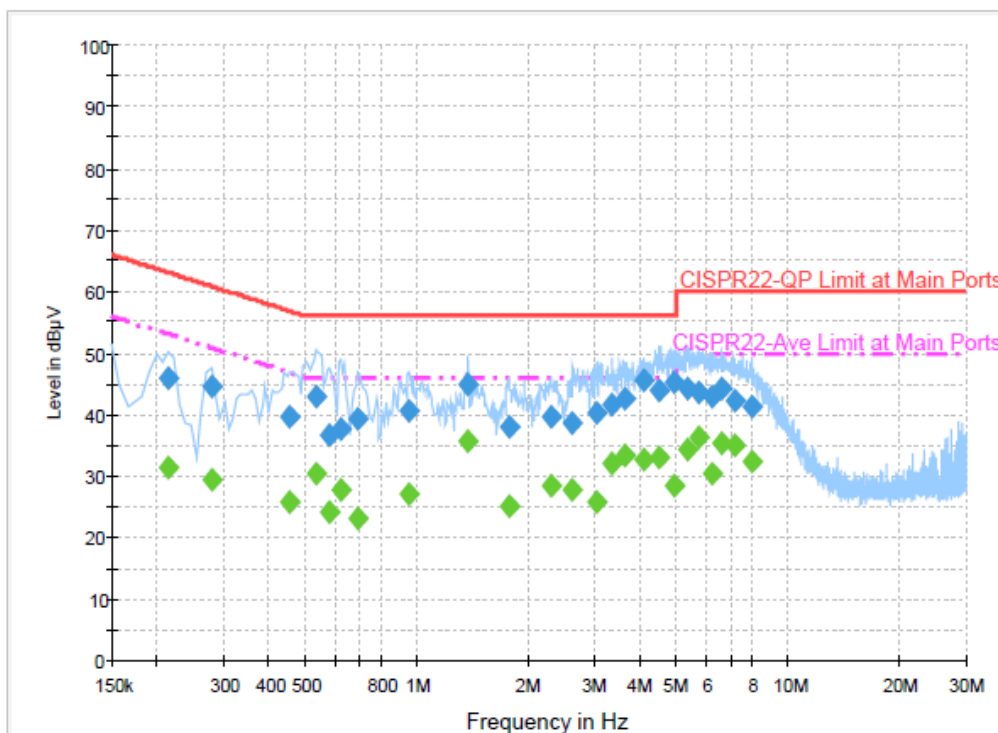
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.214000	45.8	Off	L1	19.4	17.2	63.0
0.278000	44.5	Off	L1	19.4	16.4	60.9
0.454000	39.6	Off	L1	19.4	17.2	56.8
0.534000	43.0	Off	L1	19.4	13.0	56.0
0.582000	36.6	Off	L1	19.4	19.4	56.0
0.622000	37.6	Off	L1	19.4	18.4	56.0
0.694000	39.2	Off	L1	19.5	16.8	56.0
0.950000	40.5	Off	L1	19.5	15.5	56.0
1.366000	44.9	Off	L1	19.5	11.1	56.0
1.766000	37.9	Off	L1	19.6	18.1	56.0
2.286000	39.7	Off	L1	19.5	16.3	56.0
2.614000	38.5	Off	L1	19.5	17.5	56.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) Link + RJ-45 Link + Adapter		


Final Result : Quasi-Peak

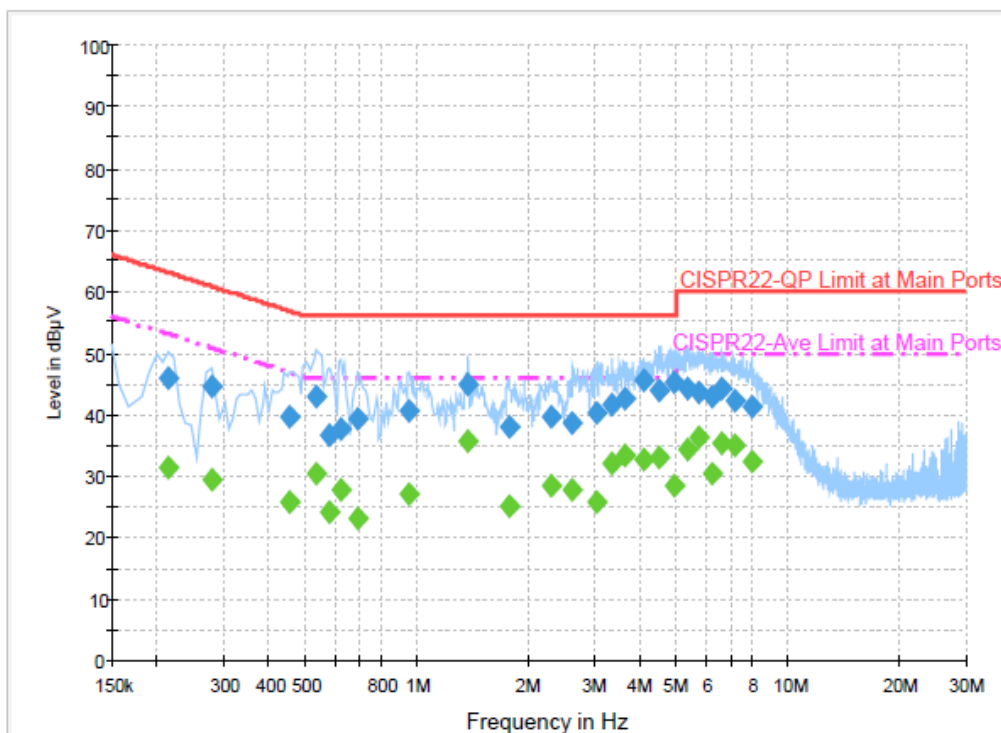
Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
3.038000	40.3	Off	L1	19.6	15.7	56.0
3.342000	41.6	Off	L1	19.6	14.4	56.0
3.622000	42.6	Off	L1	19.5	13.4	56.0
4.054000	45.6	Off	L1	19.6	10.4	56.0
4.462000	44.0	Off	L1	19.6	12.0	56.0
4.902000	45.3	Off	L1	19.6	10.7	56.0
5.334000	44.3	Off	L1	19.6	15.7	60.0
5.750000	43.6	Off	L1	19.5	16.4	60.0
6.214000	42.9	Off	L1	19.6	17.1	60.0
6.622000	44.2	Off	L1	19.6	15.8	60.0
7.174000	42.2	Off	L1	19.6	17.8	60.0
7.966000	41.1	Off	L1	19.6	18.9	60.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) Link + RJ-45 Link + Adapter		


Final Result : Average

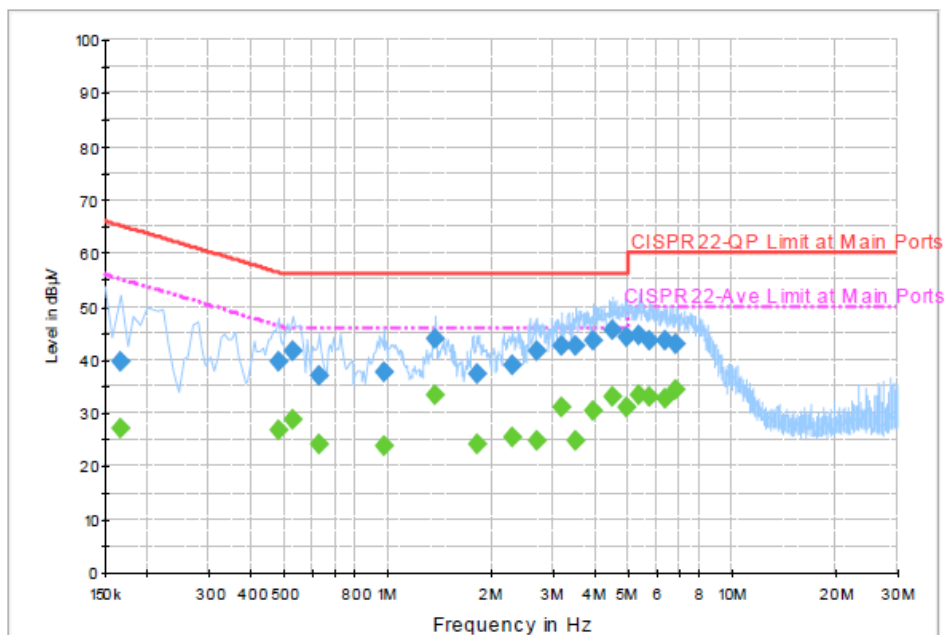
Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.214000	31.4	Off	L1	19.4	21.6	53.0
0.278000	29.5	Off	L1	19.4	21.4	50.9
0.454000	25.8	Off	L1	19.4	21.0	46.8
0.534000	30.4	Off	L1	19.4	15.6	46.0
0.582000	24.1	Off	L1	19.4	21.9	46.0
0.622000	27.8	Off	L1	19.4	18.2	46.0
0.694000	23.2	Off	L1	19.5	22.8	46.0
0.950000	27.2	Off	L1	19.5	18.8	46.0
1.366000	35.6	Off	L1	19.5	10.4	46.0
1.766000	25.0	Off	L1	19.6	21.0	46.0
2.286000	28.5	Off	L1	19.5	17.5	46.0
2.614000	27.7	Off	L1	19.5	18.3	46.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (2.4GHz) Link + RJ-45 Link + Adapter		


Final Result : Average

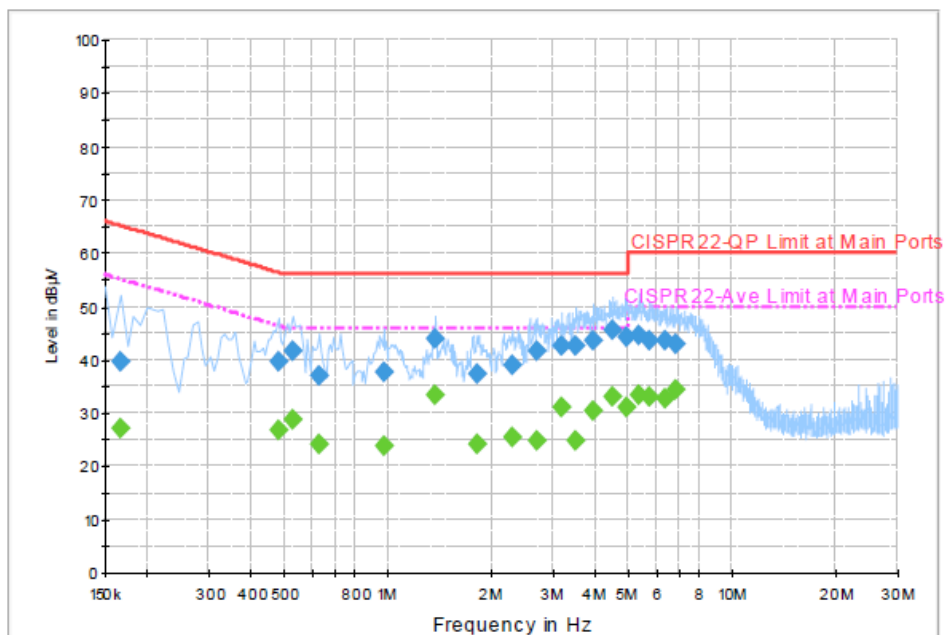
Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
3.038000	25.7	Off	L1	19.6	20.3	46.0
3.342000	32.2	Off	L1	19.6	13.8	46.0
3.622000	33.4	Off	L1	19.5	12.6	46.0
4.054000	32.6	Off	L1	19.6	13.4	46.0
4.462000	33.0	Off	L1	19.6	13.0	46.0
4.902000	28.4	Off	L1	19.6	17.6	46.0
5.334000	34.4	Off	L1	19.6	15.6	50.0
5.750000	36.3	Off	L1	19.5	13.7	50.0
6.214000	30.4	Off	L1	19.6	19.6	50.0
6.622000	35.4	Off	L1	19.6	14.6	50.0
7.174000	35.0	Off	L1	19.6	15.0	50.0
7.966000	32.2	Off	L1	19.6	17.8	50.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (2.4GHz) Link + RJ-45 Link + Adapter		


Final Result : Quasi-Peak

Frequency (MHz)	Quasi-Peak (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	39.5	Off	N	19.3	25.7	65.2
0.478000	39.6	Off	N	19.5	16.8	56.4
0.526000	41.7	Off	N	19.4	14.3	56.0
0.630000	37.1	Off	N	19.5	18.9	56.0
0.966000	37.6	Off	N	19.5	18.4	56.0
1.366000	44.0	Off	N	19.5	12.0	56.0
1.806000	37.3	Off	N	19.6	18.7	56.0
2.278000	39.0	Off	N	19.5	17.0	56.0
2.702000	41.5	Off	N	19.6	14.5	56.0
3.182000	42.4	Off	N	19.6	13.6	56.0
3.510000	42.5	Off	N	19.6	13.5	56.0
3.918000	43.5	Off	N	19.6	12.5	56.0
4.462000	45.7	Off	N	19.6	10.3	56.0
4.926000	44.2	Off	N	19.6	11.8	56.0
5.342000	44.4	Off	N	19.6	15.6	60.0
5.750000	43.5	Off	N	19.5	16.5	60.0
6.342000	43.4	Off	N	19.6	16.6	60.0
6.822000	42.7	Off	N	19.7	17.3	60.0

Test Mode :	Mode 1	Temperature :	20~22°C
Test Engineer :	Kai-Chun Chu	Relative Humidity :	46~48%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (2.4GHz) Link + RJ-45 Link + Adapter		


Final Result : Average

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	27.0	Off	N	19.3	28.2	55.2
0.478000	26.6	Off	N	19.5	19.8	46.4
0.526000	28.7	Off	N	19.4	17.3	46.0
0.630000	24.1	Off	N	19.5	21.9	46.0
0.966000	23.8	Off	N	19.5	22.2	46.0
1.366000	33.2	Off	N	19.5	12.8	46.0
1.806000	24.0	Off	N	19.6	22.0	46.0
2.278000	25.4	Off	N	19.5	20.6	46.0
2.702000	24.7	Off	N	19.6	21.3	46.0
3.182000	30.9	Off	N	19.6	15.1	46.0
3.510000	24.8	Off	N	19.6	21.2	46.0
3.918000	30.5	Off	N	19.6	15.5	46.0
4.462000	33.0	Off	N	19.6	13.0	46.0
4.926000	31.1	Off	N	19.6	14.9	46.0
5.342000	33.2	Off	N	19.6	16.8	50.0
5.750000	32.9	Off	N	19.5	17.1	50.0
6.342000	32.6	Off	N	19.6	17.4	50.0
6.822000	34.2	Off	N	19.7	15.8	50.0



3.3 Antenna Requirements

3.3.1 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.

3.3.2 Antenna Anti-Replacement Construction

Non-standard antenna connector is used.

3.3.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



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. 09, 2014	Aug. 30, 2014 ~ Sep. 03, 2014	Aug. 08, 2015	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Aug. 09, 2014	Aug. 30, 2014 ~ Sep. 03, 2014	Aug. 08, 2015	Conducted (TH02-HY)
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100356	9kHz ~ 2.75GHz	Nov. 15, 2013	Jul. 31, 2014	Nov. 14, 2014	Conduction (CO05-HY)
LISN (for auxiliary equipment)	Rohde & Schwarz	ENV216	100081	9kHz ~ 30MHz	Dec. 12, 2013	Jul. 31, 2014	Dec. 11, 2014	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz ~ 30MHz	Dec. 04, 2013	Jul. 31, 2014	Dec. 03, 2014	Conduction (CO05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 31, 2014	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 09, 2014	Aug. 29, 2014 ~ Aug. 30, 2014	Jun. 08, 2015	Radiation (03CH05-HY)
Bilog Antenna	Schaffner	CBL6111C	2725	30MHz~1GHz	Oct. 10, 2013	Aug. 29, 2014 ~ Aug. 30, 2014	Oct. 09, 2014	Radiation (03CH05-HY)
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-12 41	1GHz~18GHz	Apr. 16, 2014	Aug. 29, 2014 ~ Aug. 30, 2014	Apr. 15, 2015	Radiation (03CH05-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917 0251	18GHz~40GHz	Oct. 03, 2013	Aug. 29, 2014 ~ Aug. 30, 2014	Oct. 02, 2014	Radiation (03CH05-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	100kHz~18GHz	Jul. 07, 2014	Aug. 29, 2014 ~ Aug. 30, 2014	Jul. 06, 2015	Radiation (03CH05-HY)
Preamplifier	EMCI	EMC011830	980148	DC~18GHz	Jun. 23, 2014	Aug. 29, 2014 ~ Aug. 30, 2014	Jun. 22, 2015	Radiation (03CH05-HY)
Preamplifier	COM-POWER	PA-103	161075	9kHz~30MHz	Apr. 15, 2014	Aug. 29, 2014 ~ Aug. 30, 2014	Apr. 14, 2015	Radiation (03CH05-HY)
Preamplifier	Miteq	TTA0204	1872107	18GHz~40GHz	May 23, 2014	Aug. 29, 2014 ~ Aug. 30, 2014	May 22, 2015	Radiation (03CH05-HY)
Turn Table	HD	HD100	420/611	0 - 360 degree	N/A	Aug. 29, 2014 ~ Aug. 30, 2014	N/A	Radiation (03CH05-HY)
Antenna Mast	HD	HD100	240/666	1 m - 4 m	N/A	Aug. 29, 2014 ~ Aug. 30, 2014	N/A	Radiation (03CH05-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
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.10
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