

FCC RF Test Report

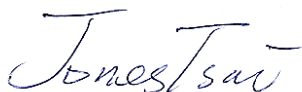
APPLICANT : Wistron NeWeb Corporation
EQUIPMENT : Mini board wi-fi edition
BRAND NAME : WNC
MODEL NAME : PW8Q7
FCC ID : NKR-PW8Q7A
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Dec. 09, 2013 and testing was completed on Dec. 19, 2013. We, SPORTON INTERNATIONAL (KUNSHAN) 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 (KUNSHAN) INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D0929D	Rev. 01	Initial issue of report	Jan. 03, 2014

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	26dB Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	$\leq 17, 24, 30$ dBm (depend on band)	Pass	-
3.3	15.407(a)	Power Spectral Density	$\leq 4, 11, 17$ dBm (depend on band)	Pass	-
3.4	15.407(a)(6)	Peak Excursion Ratio	≤ 13 dB	Pass	-
3.5	15.407(b)	Unwanted Emissions	$\leq -17, -27$ dBm (depend on band)&15.209(a)	Pass	Under limit 1.47 dB at 5467.440 MHz
3.6	15.407(g)	Frequency Stability	Within Operation Band	Pass	-
3.7	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.8	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Wistron NeWeb Corporation

20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C

1.2 Manufacturer

Wistron NeWeb Corporation

20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Mini board wi-fi edition
Brand Name	WNC
Model Name	PW8Q7
FCC ID	NKR-PW8Q7A
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n (HT20), WLAN 5GHz 802.11a/n (HT20/HT40), Bluetooth v3.0 + EDR/Bluetooth v4.0
HW Version	B1
SW Version	msm8960-eng 4.3 test-keys Px8Q7_v10.00.140040_2310025.20140102.034452
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.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz
Maximum Output Power to Antenna	<p><5180 MHz ~ 5240 MHz> 802.11a : 14.92 dBm / 0.0310 W 802.11n HT20 : 14.98 dBm / 0.0315 W 802.11n HT40 : 14.73 dBm / 0.0297 W</p> <p><5260 MHz ~ 5320 MHz> 802.11a : 16.88 dBm / 0.0488 W 802.11n HT20 : 16.81 dBm / 0.0480 W 802.11n HT40 : 17.23 dBm / 0.0528 W</p> <p><5500 MHz ~ 5580 MHz and 5660 MHz ~ 5700 MHz > 802.11a : 16.87 dBm / 0.0486 W 802.11n HT20 : 16.89 dBm / 0.0489 W 802.11n HT40 : 17.37 dBm / 0.0546 W</p>
Antenna Type	Monopole Antenna with gain 1.80 dBi
Type of Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.5 Modification of EUT

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

1.6 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC Registration No.
	TH01-KS	03CH01-KS	149928

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

1.7 Applied Standards

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

- ♦ FCC Part 15 Subpart E
- ♦ FCC KDB 789033 D01 General UNII Test Procedures v01r03
- ♦ 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).

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

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

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

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

Channel	Frequency	5GHz 802.11a Average Output Power (dBm)							
		Data Rate							
		6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
CH 36	5180 MHz	14.92	14.79	14.87	14.84	14.81	14.91	14.75	14.84
CH 44	5220 MHz	14.46	14.41	14.42	14.49	14.42	14.56	14.60	14.68
CH 48	5240 MHz	14.68	14.74	14.61	14.69	14.75	14.63	14.67	14.88
CH 052	5260 MHz	16.67	16.74	16.52	16.61	16.67	15.79	15.73	16.32
CH 060	5300 MHz	16.88	16.83	16.72	16.73	16.73	15.81	15.72	16.26
CH 064	5320 MHz	15.85	15.52	15.69	15.64	15.76	15.64	15.76	15.66
CH 100	5500 MHz	16.87	16.75	16.71	16.69	16.56	15.79	15.72	16.09
CH 116	5580MHz	16.54	16.57	16.52	16.53	16.52	15.75	15.57	15.81
CH 140	5700 MHz	15.50	15.39	15.32	15.41	15.28	15.15	15.27	15.29

Channel	Frequency	5GHz 802. 11n HT20 Average Output Power (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 36	5180 MHz	14.98	14.96	14.94	14.90	14.75	14.80	14.79	14.76
CH 44	5220 MHz	14.55	14.62	14.63	14.53	14.51	14.52	14.55	14.39
CH 48	5240 MHz	14.74	14.78	14.85	14.74	14.68	14.70	14.68	14.58
CH 052	5260 MHz	16.81	16.79	16.79	16.69	16.71	16.03	16.04	14.89
CH 060	5300 MHz	16.71	16.77	16.74	16.74	16.66	15.98	15.96	14.60
CH 064	5320 MHz	15.80	15.79	15.62	15.53	15.51	15.60	15.54	15.56
CH 100	5500 MHz	16.89	16.87	16.72	16.62	16.88	16.31	15.87	14.66
CH 116	5580MHz	16.46	16.60	16.63	16.38	16.61	16.27	15.72	14.51
CH 140	5700 MHz	14.47	14.25	14.24	13.86	14.07	14.16	14.04	14.19



Channel	Frequency	5GHz 802. 11n HT40 Average Output Power (dBm)							
		Data Rate							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
CH 38	5190 MHz	11.99	11.79	11.87	11.36	11.24	11.57	11.39	11.16
CH 46	5230 MHz	14.73	14.53	14.35	14.36	14.62	14.37	14.14	14.05
CH 54	5270 MHz	17.23	17.20	17.22	16.13	16.20	16.18	15.97	14.93
CH 62	5310 MHz	12.71	12.98	12.76	12.87	12.64	12.82	12.80	12.82
CH 102	5510 MHz	13.68	13.37	13.44	13.36	13.20	13.59	13.26	13.21
CH 110	5550 MHz	17.19	17.07	17.22	16.74	16.66	15.81	15.50	14.58
CH 134	5670 MHz	17.37	17.31	17.35	17.32	17.22	15.84	15.80	14.81

2.3 Test Mode

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

Test Cases				
	Test Items	Mode	Data rate	Test Channel
Conducted TCs	26dB BW Power Spectral Density	802.11a	6 Mbps	L/M/H
		802.11n HT20	MCS0	L/M/H
		802.11n HT40	MCS0	L/M/H
	Output Power	802.11a	6 Mbps	L/M/H
		802.11n HT20	MCS0	L/M/H
		802.11n HT40	MCS0	L/M/H
	Peak Excursion	802.11a	6 Mbps	L/M/H
		802.11n HT20	MCS0	L/M/H
		802.11n HT40	MCS0	L/M/H
	Frequency Stability	802.11a	6 Mbps	L/M/H
		802.11n HT20	MCS0	L/M/H
		802.11n HT40	MCS0	L/M/H
Radiated TCs	Radiated Band Edge	802.11a	6 Mbps	L/H
		802.11n HT20	MCS0	L/H
		802.11n HT40	MCS0	L/H
	Radiated Spurious Emission	802.11a	6 Mbps	L/M/H
		802.11n HT20	MCS0	L/M/H
		802.11n HT40	MCS0	L/M/H

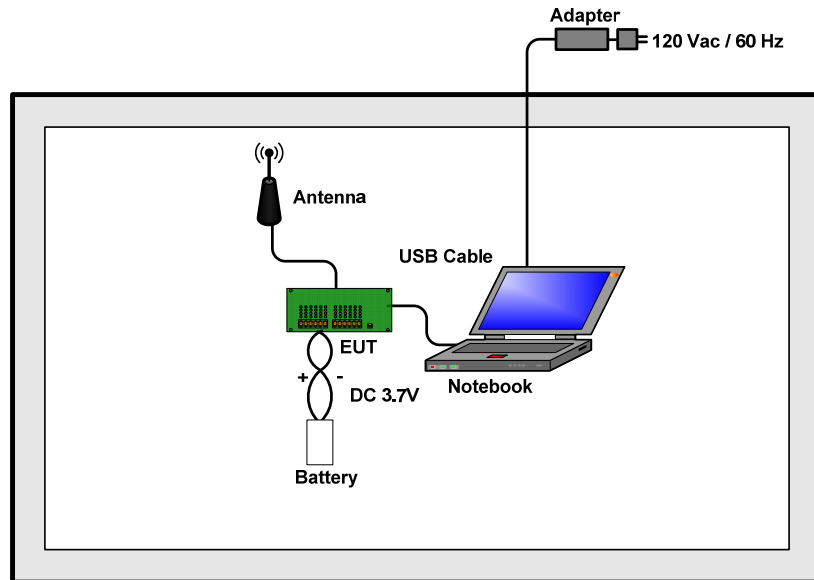


Ch. #		5GHz Band I	5GHz Band II	5GHz Band III
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

Ch. #		5GHz Band I	5GHz Band II	5GHz Band III
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140

Ch. #		5GHz Band I	5GHz Band II	5GHz Band III
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134

2.4 Connection Diagram of Test System



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1	DC Power Supply	GWINSTEK	GPS-3030D	N/A	N/A	Unshielded, 1.8 m
2	Test Jig	N/A	N/A	N/A	N/A	N/A
3	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.6 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

2.7 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5.6 dB and 10dB attenuator.

$$\begin{aligned} \text{Offset (dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\ &= 5.6 + 10 = 15.6 \text{ (dB)} \end{aligned}$$

3 Test Result

3.1 26dB Bandwidth Measurement

3.1.1 Description of 26dB Bandwidth

There is no restriction limits for bandwidth. The maximum conducted output power can be limited by measured emission bandwidth (B).

For the band 5150-5250 MHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.

For the bands 5250-5350 MHz and 5470-5600 MHz and 5650-5725MHz, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B.

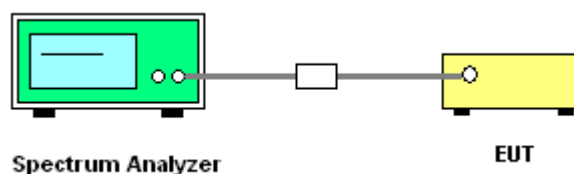
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.
Section D) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission.
Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. Measure and record the results in the test report.

3.1.4 Test Setup





3.1.5 Test Result of 26dB Bandwidth Plots

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	26dB Bandwidth (MHz)	FCC 26dB Bandwidth Power Limit (dBm)
11a	6Mbps	1	36	5180	22.25	16.99
11a	6Mbps	1	44	5220	22.20	16.99
11a	6Mbps	1	48	5240	22.25	16.99
HT20	MCS0	1	36	5180	22.35	16.99
HT20	MCS0	1	44	5220	22.45	16.99
HT20	MCS0	1	48	5240	22.75	16.99
HT40	MCS0	1	38	5190	45.09	16.99
HT40	MCS0	1	46	5230	44.82	16.99

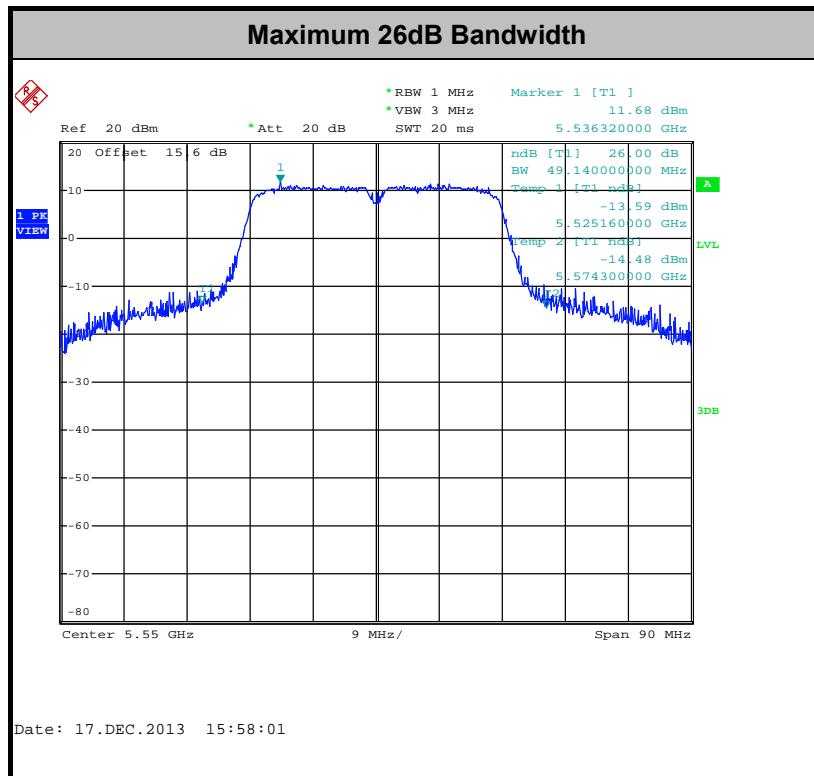
Test Band :	5GHz band 2	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	26dB Bandwidth (MHz)	FCC 26dB Bandwidth Power Limit (dBm)
11a	6Mbps	1	52	5260	22.1	23.98
11a	6Mbps	1	60	5300	25.7	23.98
11a	6Mbps	1	64	5320	22.35	23.98
HT20	MCS0	1	52	5260	22.95	23.98
HT20	MCS0	1	60	5300	25.1	23.98
HT20	MCS0	1	64	5320	22.8	23.98
HT40	MCS0	1	54	5270	47.07	23.98
HT40	MCS0	1	62	5310	44.82	23.98



Test Band :	5GHz band 3	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	26dB Bandwidth (MHz)	FCC 26dB Bandwidth Power Limit (dBm)
11a	6Mbps	1	100	5500	23	23.98
11a	6Mbps	1	116	5580	22.4	23.98
11a	6Mbps	1	140	5700	22.4	23.98
HT20	MCS0	1	100	5500	23.4	23.98
HT20	MCS0	1	116	5580	23	23.98
HT20	MCS0	1	140	5700	22.35	23.98
HT40	MCS0	1	102	5510	45	23.98
HT40	MCS0	1	110	5550	49.14	23.98
HT40	MCS0	1	134	5670	45.18	23.98



3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5150-5250 MHz, the maximum conducted output power shall not exceed the lesser of 50 mW (17dBm) or $4 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in 1-MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the bands 5250-5350 MHz and 5470-5600 MHz and 5650-5725 MHz, bands, the maximum conducted output power shall not exceed the lesser of 250 mW (24dBm) or $11 \text{ dBm} + 10\log B$, where B is the 26 dB emissions bandwidth in 1-MHz. If transmitting antenna directional gain is greater than 6 dBi, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

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

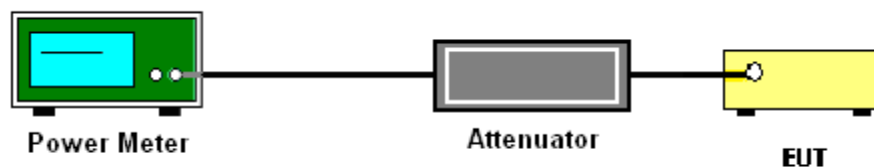
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.

3.2.4 Test Setup





3.2.5 Test Result of Maximum Conducted Output Power

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	36	5180	0.61	14.92	16.99	1.80	Pass
11a	6Mbps	1	44	5220	0.61	14.46	16.99	1.80	Pass
11a	6Mbps	1	48	5240	0.61	14.68	16.99	1.80	Pass
HT20	MCS0	1	36	5180	0.60	14.98	16.99	1.80	Pass
HT20	MCS0	1	44	5220	0.60	14.55	16.99	1.80	Pass
HT20	MCS0	1	48	5240	0.60	14.74	16.99	1.80	Pass
HT40	MCS0	1	38	5190	0.65	11.99	16.99	1.80	Pass
HT40	MCS0	1	46	5230	0.65	14.73	16.99	1.80	Pass

Note:

1. Final Output Power equals to Measured Output Power adds the duty factor.
2. For the band 5150-5250 MHz, the maximum average conducted output power shall not exceed lesser of 50 mW (17dBm) or 4 dBm + 10log (B), where B is 26dB BW for FCC.



Test Band :	5GHz band 2	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	52	5260	0.61	16.67	23.98	1.80	Pass
11a	6Mbps	1	60	5300	0.61	16.88	23.98	1.80	Pass
11a	6Mbps	1	64	5320	0.61	15.85	23.98	1.80	Pass
HT20	MCS0	1	52	5260	0.60	16.81	23.98	1.80	Pass
HT20	MCS0	1	60	5300	0.60	16.71	23.98	1.80	Pass
HT20	MCS0	1	64	5320	0.60	15.80	23.98	1.80	Pass
HT40	MCS0	1	54	5270	0.65	17.23	23.98	1.80	Pass
HT40	MCS0	1	62	5310	0.65	12.71	23.98	1.80	Pass

Note:

1. Final Output Power equals to Measured Output Power adds the duty factor.
2. For the 5250-5350 MHz and 5470-5600 MHz and 5650-5725 MHz bands, the maximum conducted output power shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log (B), where B is 26dB BW for FCC.



Test Band :	5GHz band 3	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	100	5500	0.61	16.87	23.98	1.80	Pass
11a	6Mbps	1	116	5580	0.61	16.54	23.98	1.80	Pass
11a	6Mbps	1	140	5700	0.61	15.50	23.98	1.80	Pass
HT20	MCS0	1	100	5500	0.60	16.89	23.98	1.80	Pass
HT20	MCS0	1	116	5580	0.60	16.46	23.98	1.80	Pass
HT20	MCS0	1	140	5700	0.60	14.47	23.98	1.80	Pass
HT40	MCS0	1	102	5510	0.65	13.68	23.98	1.80	Pass
HT40	MCS0	1	110	5550	0.65	17.19	23.98	1.80	Pass
HT40	MCS0	1	134	5670	0.65	17.37	23.98	1.80	Pass

Note:

1. Final Output Power equals to Measured Output Power adds the duty factor.
2. For the 5250-5350 MHz and 5470-5600 MHz and 5650-5725 MHz bands, the maximum conducted output power shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log (B), where B is 26dB BW for FCC.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5150-5250 MHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.

For the bands 5250-5350 MHz and 5470-5600 and 5650-5725 MHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.

If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section F) Peak power spectral density (PPSD).

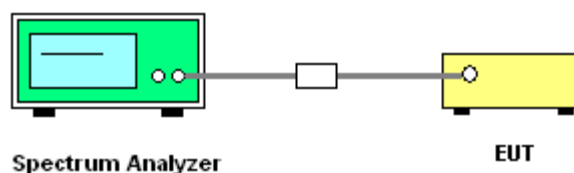
Note: Though the rule refers to “peak power spectral density”, the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission.

Method SA-2

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

1. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.
 - Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW \geq 3 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Test Band :	5GHz band 1	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	CH	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	36	5180	0.61	2.36	4.00	1.80	Pass
11a	6Mbps	1	44	5220	0.61	2.26	4.00	1.80	Pass
11a	6Mbps	1	48	5240	0.61	2.61	4.00	1.80	Pass
HT20	MCS0	1	36	5180	0.60	2.95	4.00	1.80	Pass
HT20	MCS0	1	44	5220	0.60	2.78	4.00	1.80	Pass
HT20	MCS0	1	48	5240	0.60	2.78	4.00	1.80	Pass
HT40	MCS0	1	38	5190	0.65	-5.79	4.00	1.80	Pass
HT40	MCS0	1	46	5230	0.65	-0.36	4.00	1.80	Pass

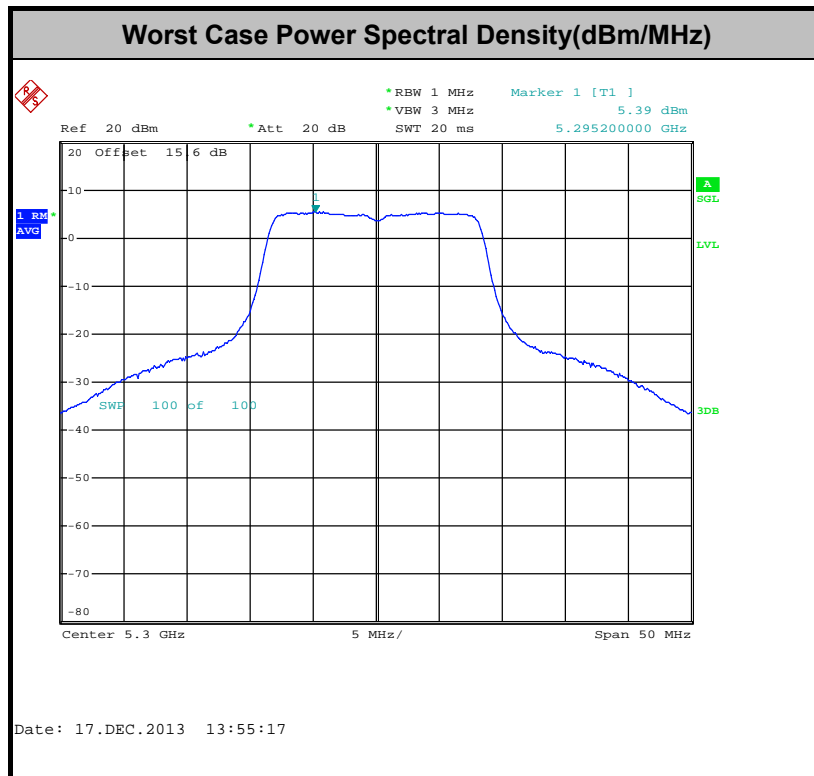
Test Band :	5GHz band 2	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	52	5260	0.61	5.16	11.00	1.80	Pass
11a	6Mbps	1	60	5300	0.61	6.00	11.00	1.80	Pass
11a	6Mbps	1	64	5320	0.61	2.33	11.00	1.80	Pass
HT20	MCS0	1	52	5260	0.60	5.17	11.00	1.80	Pass
HT20	MCS0	1	60	5300	0.60	5.66	11.00	1.80	Pass
HT20	MCS0	1	64	5320	0.60	2.14	11.00	1.80	Pass
HT40	MCS0	1	54	5270	0.65	3.08	11.00	1.80	Pass
HT40	MCS0	1	62	5310	0.65	-4.45	11.00	1.80	Pass



Test Band :	5GHz band 3	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm)	DG (dBi)	Pass/Fail
11a	6Mbps	1	100	5500	0.61	3.97	11.00	1.80	Pass
11a	6Mbps	1	116	5580	0.61	4.38	11.00	1.80	Pass
11a	6Mbps	1	140	5700	0.61	2.01	11.00	1.80	Pass
HT20	MCS0	1	100	5500	0.60	3.49	11.00	1.80	Pass
HT20	MCS0	1	116	5580	0.60	3.82	11.00	1.80	Pass
HT20	MCS0	1	140	5700	0.60	0.78	11.00	1.80	Pass
HT40	MCS0	1	102	5510	0.65	-3.49	11.00	1.80	Pass
HT40	MCS0	1	110	5550	0.65	2.39	11.00	1.80	Pass
HT40	MCS0	1	134	5670	0.65	0.28	11.00	1.80	Pass



Note: Average Power Density (dB) = Measured value+ Duty Factor

3.4 Peak Excursion Ratio Measurement

3.4.1 Limit of Peak Excursion Ratio

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

3.4.2 Measuring Instruments

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

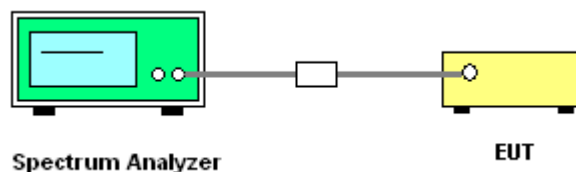
3.4.3 Test Procedures

The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section G) Peak excursion measurement

1. The transmitter output is connected to the spectrum analyzer.
2. Set the spectrum analyzer span to view the entire emission bandwidth.
3. Find the maximum of the peak-max-hold spectrum.
 - *Set RBW = 1MHz.
 - *Set VBW \geq 3MHz.
 - *Detector = peak.
 - *Trace mode = max-hold.
 - *Allow the sweeps to continue until the trace stabilizes.
 - *Use the peak search function to find the peak of the spectrum.
4. Use the procedure found under section 3.3 to measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

3.4.4 Test Setup



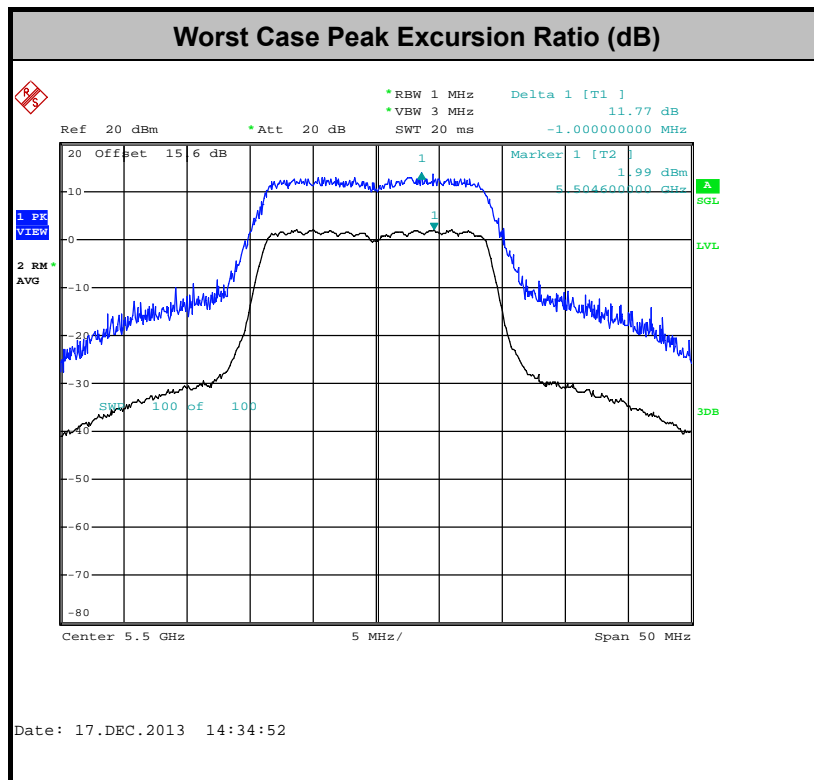


3.4.5 Test Result of Peak Excursion Ratio

Test Band :	5GHz band 3	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	N _{TX}	Channel	Freq. (MHz)	Peak Excursion Ratio (dB)					Max. Limits (dB)	Pass/Fail
				BPSK	QPSK	16QAM	64QAM	256QAM		
11a	1	100	5500	9.36	9.40	9.56	9.21	-	13	Pass
HT20	1	100	5500	9.35	9.29	9.82	9.02	-	13	Pass
HT40	1	102	5510	9.31	9.09	9.22	9.27	-	13	Pass

Note: All modulation measured based on the minimum data rate setting.



Note: Peak Excursion Ratio (dB) = Peak – (Average + Duty Cycle Offset)

Duty Cycle Offset: 1.95 dB

3.5 Unwanted Radiated Emission Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

3.5.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,

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

Note: The following formula is used to convert the EIRP to field strength.

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3



- (3) KDB789033 v01r03 H)2)c(i) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

1. The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03. Section H) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - The setting follows the H) 5) of FCC KDB 789033.
 - RBW = 1 MHz
 - VBW ≥ 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
 - (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
 - The setting follows H) 6) of FCC KDB 789033.
 - RBW = 1 MHz
 - 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.

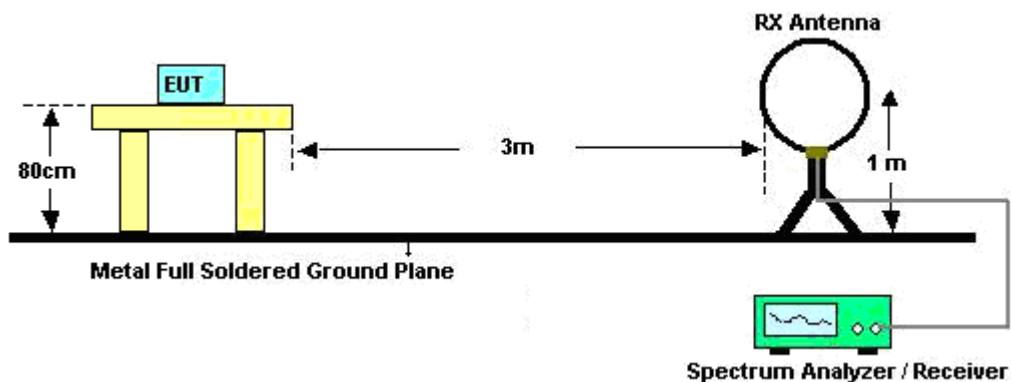
Band	Duty Cycle (%)	T(ms)	1/T(kHz)	VBW Setting
802.11a	86.95	1.372	0.729	1kHz
802.11n HT20	87.03	1.288	0.776	1kHz
802.11n HT40	86.02	0.640	1.563	3kHz

2. The EUT was placed on a rotatable table top 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.

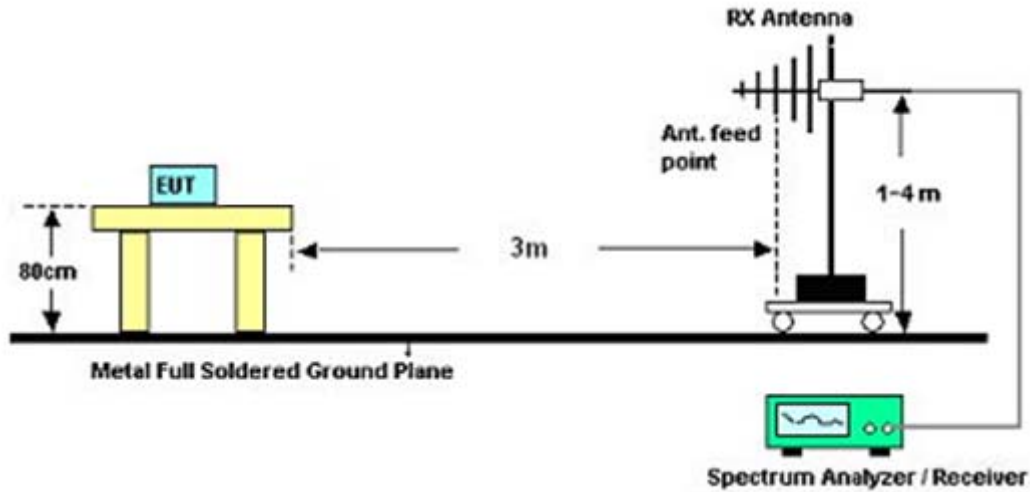
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.5.4 Test Setup

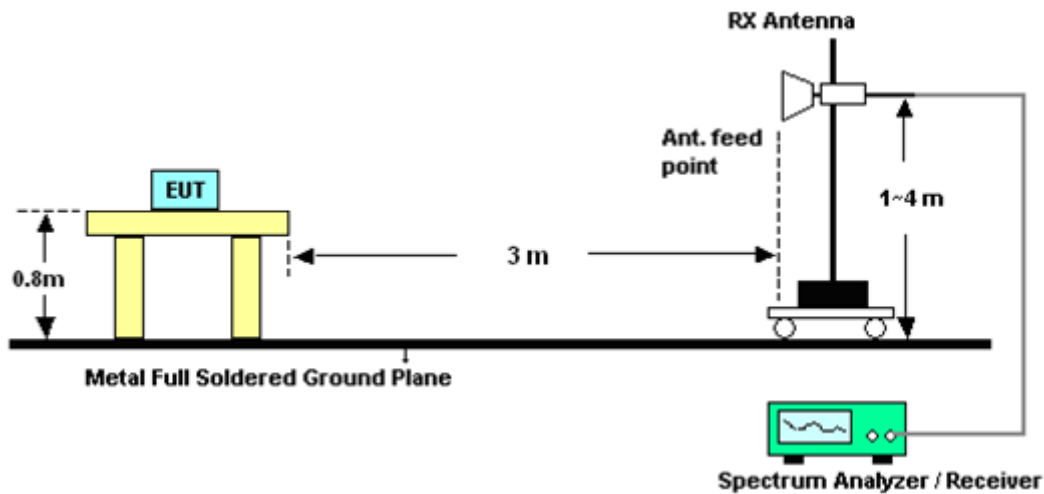
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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.

3.5.6 Test Result

3.5.6.1 Test Result of Radiated Band Edges

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5148.55	64.03	-9.97	74	57.17	35.25	5.38	33.77	100	165	Peak
5149.85	39.26	-14.74	54	32.4	35.25	5.38	33.77	100	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
5148.65	71.98	-2.02	74	65.12	35.25	5.38	33.77	100	104	Peak
5127.7	45.35	-8.65	54	38.51	35.24	5.38	33.78	100	104	Average

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	52	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5105.5	51.61	-22.39	74	44.78	35.23	5.38	33.78	100	279	Peak
5134.45	38.7	-15.3	54	31.86	35.24	5.38	33.78	100	279	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
5121.2	53.17	-20.83	74	46.34	35.23	5.38	33.78	102	85	Peak
5123.4	39.47	-14.53	54	32.63	35.24	5.38	33.78	102	85	Average



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	64	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5351.3	64.56	-9.44	74	57.52	35.32	5.45	33.73	110	261	Peak
5372.4	42.84	-11.16	54	35.78	35.33	5.45	33.72	110	261	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
5350.75	71	-3	74	63.96	35.32	5.45	33.73	100	83	Peak
5372.45	45.14	-8.86	54	38.08	35.33	5.45	33.72	100	83	Average

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	100	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5470	60.78	-13.22	74	53.63	35.39	5.47	33.71	100	343	Peak
5470	43.3	-10.7	54	36.15	35.39	5.47	33.71	100	343	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
5467.44	72.53	-1.47	74	65.38	35.39	5.47	33.71	100	270	Peak
5470	50.36	-3.64	54	43.21	35.39	5.47	33.71	100	270	Average



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	140	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5725.88	65.65	-8.35	74	58.18	35.52	5.65	33.7	200	281	Peak
5725.08	42.79	-11.21	54	35.32	35.52	5.65	33.7	200	281	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
5725.64	70.03	-3.97	74	62.56	35.52	5.65	33.7	100	348	Peak
5752.36	46.07	-7.93	54	38.56	35.53	5.68	33.7	107	273	Average

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5148.45	61.61	-12.39	74	54.75	35.25	5.38	33.77	100	254	Peak
5128.1	40.85	-13.15	54	34.01	35.24	5.38	33.78	100	254	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
5150	71.39	-2.61	74	64.53	35.25	5.38	33.77	104	89	Peak
5128.45	47.62	-6.38	54	40.78	35.24	5.38	33.78	104	89	Average



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	52	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5139.85	51.9	-22.1	74	45.04	35.25	5.38	33.77	100	255	Peak
5137.5	38.54	-15.46	54	31.7	35.24	5.38	33.78	100	255	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
5137.8	51.87	-22.13	74	45.03	35.24	5.38	33.78	114	87	Peak
5140.35	39.02	-14.98	54	32.16	35.25	5.38	33.77	114	87	Average

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	64	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5351.65	62.79	-11.21	74	55.75	35.32	5.45	33.73	159	348	Peak
5350.6	41.48	-12.52	54	34.44	35.32	5.45	33.73	159	348	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
5351.8	71.8	-2.2	74	64.76	35.32	5.45	33.73	100	64	Peak
5350	46.97	-7.03	54	39.93	35.32	5.45	33.73	100	64	Average



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	100	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5469.76	62.3	-11.7	74	55.15	35.39	5.47	33.71	100	344	Peak
5470	43.34	-10.66	54	36.19	35.39	5.47	33.71	100	344	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
5468.72	71.46	-2.54	74	64.31	35.39	5.47	33.71	110	270	Peak
5470	50.42	-3.58	54	43.27	35.39	5.47	33.71	110	270	Average

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	140	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5725.08	65.14	-8.86	74	57.67	35.52	5.65	33.7	200	282	Peak
5751.8	41.87	-12.13	54	34.36	35.53	5.68	33.7	200	282	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
5725.72	72.04	-1.96	74	64.57	35.52	5.65	33.7	190	250	Peak
5751.8	45.43	-8.57	54	37.92	35.53	5.68	33.7	190	255	Average



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5146	60.75	-13.25	74	53.89	35.25	5.38	33.77	100	255	Peak
5149.95	43.45	-10.55	54	36.59	35.25	5.38	33.77	100	255	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
5150	69.94	-4.06	74	63.08	35.25	5.38	33.77	103	87	Peak
5150	52.1	-1.9	54	45.24	35.25	5.38	33.77	103	87	Average

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	54	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5148.7	56.04	-17.96	74	49.18	35.25	5.38	33.77	109	225	Peak
5149.95	40.95	-13.05	54	34.09	35.25	5.38	33.77	109	255	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
5144.9	62.86	-11.14	74	56	35.25	5.38	33.77	100	68	Peak
5150	45.26	-8.74	54	38.4	35.25	5.38	33.77	100	68	Average



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	62	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5350.9	69.24	-4.76	74	62.2	35.32	5.45	33.73	159	349	Peak
5350.45	47.5	-6.5	54	40.46	35.32	5.45	33.73	159	349	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
5356.25	72.28	-1.72	74	65.24	35.32	5.45	33.73	115	282	Peak
5350	50.29	-3.71	54	43.25	35.32	5.45	33.73	115	282	Average

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	102	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5469.28	60.1	-13.9	74	52.95	35.39	5.47	33.71	100	345	Peak
5469.92	40.33	-13.67	54	33.18	35.39	5.47	33.71	100	345	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
5467.04	71.01	-2.99	74	63.86	35.39	5.47	33.71	100	49	Peak
5470	45.65	-8.35	54	38.5	35.39	5.47	33.71	100	283	Average



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	134	Relative Humidity :	43~44%
Test Engineer :	Stone Gu		

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
5725.88	61.45	-12.55	74	53.98	35.52	5.65	33.7	200	281	Peak
5725.16	44.8	-9.2	54	37.33	35.52	5.65	33.7	200	285	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
5729.24	69.37	-4.63	74	61.9	35.52	5.65	33.7	177	287	Peak
5725	51.61	-2.39	54	44.14	35.52	5.65	33.7	173	286	Average

3.5.6.2 Test Result of Unwanted Radiated 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 :	802.11a	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10359 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5180	101.96	-	-	95.08	35.26	5.39	33.77	100	165	Peak
5180	90.34	-	-	83.46	35.26	5.39	33.77	100	165	Average
10359	35.78	-38.22	74	61.09	1.46	7.72	34.49	100	52	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10359 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5180	111.3	-	-	104.42	35.26	5.39	33.77	100	104	Peak
5180	100.04	-	-	93.16	35.26	5.39	33.77	100	104	Average
10359	42.76	-31.24	74	68.07	1.46	7.72	34.49	100	251	Peak



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	52	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10521 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5260	100.7	-	-	93.74	35.29	5.42	33.75	100	279	Peak
5260	89.44	-	-	82.48	35.29	5.42	33.75	100	279	Average
10521	38.63	-35.37	74	63.63	1.58	7.81	34.39	100	59	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	52	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10518 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5260	112.99	-	-	106.03	35.29	5.42	33.75	102	85	Peak
5260	101.62	-	-	94.66	35.29	5.42	33.75	102	85	Average
10518	42.57	-31.43	74	67.57	1.58	7.81	34.39	100	41	Peak



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	64	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5320 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
5320	103.54	-	-	96.52	35.31	5.44	33.73	159	348	Peak
5320	92.45	-	-	85.43	35.31	5.44	33.73	159	348	Average
10641	35.34	-38.66	74	60.08	1.7	7.87	34.31	100	113	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	64	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5320 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
5320	112.22	-	-	105.2	35.31	5.44	33.73	100	83	Peak
5320	99.13	-	-	92.11	35.31	5.44	33.73	100	83	Average
10641	40.05	-33.95	74	64.79	1.7	7.87	34.31	100	61	Peak



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	100	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5500 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
156.1	25.9	-17.6	43.5	48.58	9.76	1.14	33.58	-	-	Peak
199.75	26.62	-16.88	43.5	49.88	9	1.3	33.56	-	-	Peak
298.69	27.75	-18.25	46	46.54	12.99	1.6	33.38	-	-	Peak
480.08	30.24	-15.76	46	44.53	16.87	2	33.16	-	-	Peak
676.99	22.07	-23.93	46	33.5	19.12	2.36	32.91	-	-	Peak
720.64	31.65	-14.35	46	42.53	19.53	2.43	32.84	120	162	Peak
5500	103.22	-	-	96.03	35.41	5.48	33.7	100	343	Peak
5500	91.71	-	-	84.52	35.41	5.48	33.7	100	343	Average
10998	39.12	-34.88	74	62.79	2.21	8.12	34	100	195	Peak



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	100	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5500 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
46.49	34.46	-5.54	40	58.55	8.88	0.64	33.61	100	151	Peak
100.81	32.41	-11.09	43.5	54.47	10.62	0.93	33.61	-	-	Peak
201.69	36.53	-6.97	43.5	59.7	9.08	1.31	33.56	-	-	Peak
331.67	32.64	-13.36	46	50.31	14.02	1.67	33.36	-	-	Peak
450.01	28.09	-17.91	46	43.05	16.3	1.95	33.21	-	-	Peak
722.58	26.66	-19.34	46	37.51	19.56	2.43	32.84	-	-	Peak
5500	113.93	-	-	106.74	35.41	5.48	33.7	109	270	Peak
5500	101.94	-	-	94.75	35.41	5.48	33.7	109	270	Average
11001	43.5	-30.5	74	67.17	2.21	8.12	34	100	59	Peak



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	116	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5580 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
5580	101.1	-	-	93.83	35.45	5.52	33.7	100	343	Peak
5580	89.45	-	-	82.18	35.45	5.52	33.7	100	343	Average
11154	44.06	-29.94	74	66.92	2.82	8.32	34	100	164	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	116	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5580 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
5580	114.39	-	-	107.12	35.45	5.52	33.7	109	285	Peak
5580	102.45	-	-	95.18	35.45	5.52	33.7	109	285	Average
11166	50.67	-23.33	74	73.43	2.9	8.34	34	100	261	Peak



Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	140	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5700 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
5700	103.8	-	-	96.38	35.5	5.62	33.7	200	281	Peak
5700	92.47	-	-	85.05	35.5	5.62	33.7	200	281	Average
11403	44.35	-29.65	74	65.48	4.13	8.74	34	100	59	Peak

Test Mode :	802.11a	Temperature :	23~24°C
Test Channel :	140	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5700 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
5700	111.66	-	-	104.24	35.5	5.62	33.7	107	286	Peak
5700	100.32	-	-	92.9	35.5	5.62	33.7	107	286	Average
11400	50.75	-23.25	74	71.88	4.13	8.74	34	100	26	Peak



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10359 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5180	100.94	-	-	94.06	35.26	5.39	33.77	100	254	Peak
5180	89.59	-	-	82.71	35.26	5.39	33.77	100	254	Average
10359	35.42	-36.58	74	60.73	1.46	7.72	34.49	100	61	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	36	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5180 MHz is fundamental signal which can be ignored. 2. 10371 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5180	111.99	-	-	105.11	35.26	5.39	33.77	104	89	Peak
5180	100.42	-	-	93.54	35.26	5.39	33.77	104	89	Average
10371	41.08	-32.92	74	66.39	1.46	7.72	34.49	100	149	Peak



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	52	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10530 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5260	101.07	-	-	94.11	35.29	5.42	33.75	100	255	Peak
5260	89.02	-	-	82.06	35.29	5.42	33.75	100	255	Average
10530	38.9	-35.1	74	63.86	1.6	7.82	34.38	100	26	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	52	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5260 MHz is fundamental signal which can be ignored. 2. 10521 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5260	113.43	-	-	106.47	35.29	5.42	33.75	114	87	Peak
5260	101.85	-	-	94.89	35.29	5.42	33.75	114	87	Average
10521	43.17	-30.83	74	68.17	1.58	7.81	34.39	100	162	Peak



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	64	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5320 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
5320	101.24	-	-	94.22	35.31	5.44	33.73	159	348	Peak
5320	89.48	-	-	82.46	35.31	5.44	33.73	159	348	Average
10640	35.05	-38.95	74	59.79	1.7	7.87	34.31	100	231	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	64	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5320 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
5320	112.7	-	-	105.68	35.31	5.44	33.73	117	2	Peak
5320	100.03	-	-	93.01	35.31	5.44	33.73	117	2	Average
10647	41.33	-32.67	74	66.07	1.7	7.87	34.31	100	16	Peak



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	100	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5500 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
5500	102.01	-	-	94.82	35.41	5.48	33.7	100	344	Peak
5500	90.64	-	-	83.45	35.41	5.48	33.7	100	344	Average
11010	38.84	-35.16	74	62.43	2.27	8.14	34	100	16	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	100	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5500 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
5500	111.6	-	-	104.41	35.41	5.48	33.7	110	270	Peak
5500	100.21	-	-	93.02	35.41	5.48	33.7	110	270	Average
11001	44.2	-29.8	74	67.87	2.21	8.12	34	100	95	Peak



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	116	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5580 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
5580	98.82	-	-	91.55	35.45	5.52	33.7	100	343	Peak
5580	87.62	-	-	80.35	35.45	5.52	33.7	100	343	Average
11163	45.24	-28.76	74	68	2.9	8.34	34	100	41	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	116	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5580 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
5580	110.97	-	-	103.7	35.45	5.52	33.7	120	269	Peak
5580	99.16	-	-	91.89	35.45	5.52	33.7	120	269	Average
11157	50.87	-23.13	74	73.73	2.82	8.32	34	100	261	Peak



Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	140	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5700 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
5700	103	-	-	95.58	35.5	5.62	33.7	200	282	Peak
5700	91.77	-	-	84.35	35.5	5.62	33.7	200	282	Average
11406	43.54	-30.46	74	64.67	4.13	8.74	34	100	126	Peak

Test Mode :	802.11n HT20	Temperature :	23~24°C
Test Channel :	140	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5700 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
5700	108.08	-	-	100.66	35.5	5.62	33.7	190	252	Peak
5700	97.8	-	-	90.38	35.5	5.62	33.7	190	252	Average
11412	49.74	-24.26	74	70.87	4.13	8.74	34	100	29	Peak



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5190 MHz is fundamental signal which can be ignored. 2. 10380 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5190	95.79	-	-	88.91	35.26	5.39	33.77	100	255	Peak
5190	84.27	-	-	77.39	35.26	5.39	33.77	100	255	Average
10380	35.19	-38.81	74	60.46	1.48	7.73	34.48	100	258	Peak

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	38	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5190 MHz is fundamental signal which can be ignored. 2. 10380 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5190	109.34	-	-	102.46	35.26	5.39	33.77	121	247	Peak
5190	98.7	-	-	91.82	35.26	5.39	33.77	121	247	Average
10380	36.76	-37.24	74	62.03	1.48	7.73	34.48	100	41	Peak



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	54	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5270 MHz is fundamental signal which can be ignored. 2. 10542 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5270	103.46	-	-	96.5	35.29	5.42	33.75	109	255	Peak
5270	92.06	-	-	85.1	35.29	5.42	33.75	109	255	Average
10542	40.26	-33.74	74	65.22	1.6	7.82	34.38	100	91	Peak

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	54	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5270 MHz is fundamental signal which can be ignored. 2. 10542 MHz is not within a restricted band and satisfies both the average and peak limits of 15.209.		

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
5270	113.5	-	-	106.54	35.29	5.42	33.75	100	68	Peak
5270	102.22	-	-	95.26	35.29	5.42	33.75	100	68	Average
10542	45.48	-28.52	74	70.44	1.6	7.82	34.38	100	28	Peak



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	62	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5310 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
5310	97.71	-	-	90.69	35.31	5.44	33.73	159	349	Peak
5310	86.99	-	-	79.97	35.31	5.44	33.73	159	349	Average
10620	34.28	-39.72	74	59.06	1.68	7.86	34.32	100	29	Peak

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	62	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5310 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
5310	110.48	-	-	103.46	35.31	5.44	33.73	143	290	Peak
5310	100.07	-	-	93.05	35.31	5.44	33.73	143	290	Average
10614	39.33	-34.67	74	64.11	1.68	7.86	34.32	100	15	Peak



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	102	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	1. 5510 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
5510	95.9	-	-	88.71	35.41	5.48	33.7	101	344	Peak
5510	85.06	-	-	77.87	35.41	5.48	33.7	101	344	Average
11028	38.53	-35.47	74	62.04	2.33	8.16	34	100	26	Peak

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	102	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	1. 5510 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
5510	105.93	-	-	98.74	35.41	5.48	33.7	100	284	Peak
5510	95.12	-	-	87.93	35.41	5.48	33.7	100	284	Average
11028	42.94	-31.06	74	66.45	2.33	8.16	34	100	231	Peak



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	110	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	5550 MHz is fundamental signal which can be ignored.		

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
5550	102.82	-	-	95.57	35.44	5.51	33.7	123	259	Peak
5550	92.11	-	-	84.86	35.44	5.51	33.7	123	259	Average
11100	52.08	-21.92	74	75.24	2.6	8.24	34	100	36	Peak
11100	38.97	-15.03	54	62.13	2.6	8.24	34	100	36	Average

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	110	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	5550 MHz is fundamental signal which can be ignored.		

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
5550	109.58	-	-	102.33	35.44	5.51	33.7	100	285	Peak
5550	98.77	-	-	91.52	35.44	5.51	33.7	100	285	Average
11100	56.43	-17.57	74	79.59	2.6	8.24	34	100	95	Peak
11100	43.62	-10.38	54	66.78	2.6	8.24	34	100	95	Average



Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	134	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Horizontal
Remark :	5670 MHz is fundamental signal which can be ignored.		

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
5670	101.86	-	-	94.46	35.5	5.6	33.7	200	281	Peak
5670	90.41	-	-	83.01	35.5	5.6	33.7	200	281	Average
11340	55.52	-18.48	74	77.05	3.83	8.64	34	100	269	Peak
11340	42.62	-11.38	54	64.15	3.83	8.64	34	100	269	Average

Test Mode :	802.11n HT40	Temperature :	23~24°C
Test Channel :	134	Relative Humidity :	43~44%
Test Engineer :	Stone Gu	Polarization :	Vertical
Remark :	5670 MHz is fundamental signal which can be ignored.		

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
5670	108.53	-	-	101.13	35.5	5.6	33.7	177	287	Peak
5670	98.06	-	-	90.66	35.5	5.6	33.7	177	287	Average
11340	61.01	-12.99	74	82.54	3.83	8.64	34	100	29	Peak
11340	47.77	-6.23	54	69.3	3.83	8.64	34	100	29	Average

3.6 Frequency Stability Measurement

3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

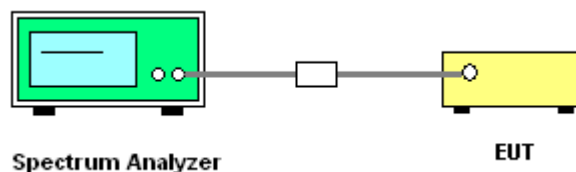
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.6.4 Test Setup





3.6.5 Test Result of Frequency Stability

Test Band :	5GHz band 1,2,3	Temperature :	23~24°C
Test Engineer :	Adonis Li	Relative Humidity :	47~48%

Mod.	Data Rate	N _{TX}	Channel	Frequency (MHz)	Center Frequency (Hz)	Frequency Deviation (Hz)	Frequency Stability (ppm)
11a	6Mbps	1	36	5180	5180000000.00	0.00	0.00
11a	6Mbps	1	48	5240	5240000000.00	0.00	0.00

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Center Frequency (Hz)	Frequency Deviation (Hz)	Frequency Stability (ppm)
11a	6Mbps	1	52	5260	5260025000.00	25000.00	4.75
11a	6Mbps	1	64	5320	5320000000.00	0.00	0.00

Mod.	Data Rate	N _{TX}	Channel	Freq. (MHz)	Center Frequency (Hz)	Frequency Deviation (Hz)	Frequency Stability (ppm)
11a	6Mbps	1	100	5500	5500000000.00	0.00	0.00
11a	6Mbps	1	140	5700	5700000000.00	0.00	0.00

Note: Center Frequency = (Low Frequency + High Frequency) / 2.

3.7 Automatically Discontinue Transmission

3.7.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.7.2 Measuring Instruments

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

3.7.3 Test Result of Automatically Discontinue Transmission

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.



3.8 Antenna Requirements

3.8.1 Standard Applicable

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

3.8.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.8.3 Antenna Gain

The antenna gain 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
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz; Max 30dBm	Dec. 29, 2012	Dec 17, 2013	Dec. 28, 2013	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	30MHz~40GHz (-20~+20dBm) Max input Power 23dBm	Feb. 28, 2013	Dec 17, 2013	Feb. 27, 2014	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Feb. 28, 2013	Dec 17, 2013	Feb. 27, 2014	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz / Max-input30dBm	Nov. 05, 2013	Dec. 19, 2013	Nov. 04, 2014	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP30	101399	9kHz~30GHz;Ma x-intput 30dBm	May 23, 2013	Dec. 19, 2013	May 22, 2014	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Oct. 09, 2013	Dec. 19, 2013	Oct. 08, 2014	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 06, 2013	Dec. 19, 2013	Dec. 05, 2014	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Dec. 06, 2013	Dec. 19, 2013	Dec. 05, 2014	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Nov. 22, 2013	Dec. 19, 2013	Nov. 21, 2014	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701030	1GHz~18GHz /AMP 25dB +/- 2	Nov. 18, 2013	Dec. 19, 2013	Nov. 17, 2014	Radiation (03CH01-KS)
Amplifier	com-power	PA-103A	161069	1MHz~1GHz /32 dB	May 23, 2013	Dec. 19, 2013	May 22, 2014	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz >23dB	Dec. 29, 2012	Dec. 19, 2013	Dec. 28, 2013	Radiation (03CH01-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Dec. 19, 2013	NCR	Radiation (03CH01-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Dec. 19, 2013	NCR	Radiation (03CH01-KS)



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 (30MHz ~ 1000MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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